Government of Jammu and Kashmir
Department of Forests, Environment & Ecology
Civil Secretariat, Srinagar.
www.jkforestadm.nic.in

Subject : Sanction of Draft Working Plan of Ramban Forest Division.
Reference : Pr.Chief Conservator of Forests, PCCF/WPR&T/F-144/23-25 dated 20-02-2018.

Government Order No : 113 – FST of 2018
D a t e d : 27 - 03 - 2018

Sanction is hereby, accorded to the operation of the Working Plans of Ramban Forest Divisions as recommended by the Principal Chief Conservator of Forests, (HoFF) J&K, Jammu after being approved by the Working Plan Committee constituted vide G.O. No. 67-FST of 2016 dated 03-03-2016.

		Existing Working Plan		Revised Working Plan	
S. No.	**Division**	**Name of the Working Plan Officer**	**Period originally approved**	**Name of the Working Plan Officer**	**Period approved**
1.	Ramban	Shri. Pritam Chand, IFS	1985-86 to 1994-95 extended till 2017-18	Shri. Sat Paul, IFS	2018-19 to 2027-2028

The above revised Working Plan is subject to the following conditions :

1. That in the event of ban on the felling of green trees in the forests of J&K being lifted, extraction of green trees will not be allowed during the extended period unless the table of felling for each working circle is approved by the Working Plan Committee; and
2. That the Divisional Forest Officers shall compile the extraction data according to the relevant control forms for the corresponding working plan periods, and the period that has elapsed thereafter, so that the same is taken into account during the extended period.
3. That no activity is permitted to be taken up in the forest area in violation of the provisions of the J&K Forest (Conservation) Act.

4. That it shall be ensured that the provisions of the J&K Forest (Conservation) Act and guidelines issued there under are strictly followed while implementing working plan prescriptions.
5. That the standing instructions issued by the Hon'ble Supreme Court of India from time to time in Writ Petition 202/95 as well as in similar Writ Petitions shall meticulously be followed.
6. That this approval does not **ipso facto** imply approval of any proposed non forestry activities requiring separate clearance under Jammu and Kashmir Forest (Conservation) Act. Such activities shall not be undertaken until separate Forest / wildlife / Environmental clearances, as the case may be are obtained under the Act.

By order of the Government of Jammu and Kashmir.

Sd/-
(**Saurabh Bhagat**) **IAS**
Commissioner / Secretary to Government
Department of Forest, Environment & Ecology

No : FST/Land /21/2018 Dated : 27-03-2018

Copy to the :

1. Principal Chief Conservator of Forests, (HoFF) J&K Jammu.
2. Principal Chief Conservator of Forests, (Working Plan) J&K Jammu.
3. Chief Conservator of Forests, Jammu.
4. Conservator of Forests, Working Plan, J&K Jammu.
5. Shri. Sat Paul, IFS,DCF, Divisional Forest Officer, Working Plan Division-III, Doda.
6. Director, Archieves, Archaelogy & Museums J&K Jammu.
7. Officer on Special Duty with the Hon'ble Minister for Forests, Environment & Ecology.
8. Special Assistant to Hon'ble Minister of State for Forests, Environment & Ecology.
9. Pvt. Secretary to Commisioner/Secretary to Government, Department of Forests, Environment & Ecology.
10. Government Order file/stock file.

(**Riaz-Ul-Haq**)
Under Secretary to Government
Forest, Environment & Ecology Deptt.

INTRODUCTION

This Working Plan is the revision of seventh Plan for period of 1985-86 to 1994-95 for Ramban Forest Division prepared by Sh.Pritam Chand, IFS for area of present Ramban Forest Division. This is the second revision of the plan after reorganisation of Ramban Forest Division in January 1982 and covers the area under Ramban and Banihal Range. Due to unavoidable circumstances in the state there was no revision of plan from year 1994-95 to 2016-17 so plan prepared by Sh.Pritam Chand was considered as extended till 2017-18. It was further exacerbated by the rulings of Hon'ble Supreme Court the concerns of environment protection and conservation of forests were taken in to consideration and moratorium was issued on working of forests particularly in the State of Jammu and Kashmir. Due to ban on green felling and in the absence of working plan there was impact on the stand characteristics of forests and its extent. The same has also resulted in progressive degradation of forests due to cessation of important management interventions in the forests. The situation is accentuated by the increasing population and its dependence on forests. Moreover increase in development activities like construction of roads, railways, buildings etc in or across forest land too exerted extra pressure on the forest land and caused fragmentation of habitat. The stoppage of working and flow of associated benefits to the local people together with strict policing by forest department resulted in indifferent attitude of local people toward forests and its protection. It is in this background that working plan exercise has been carried out and prescriptions have been given for mitigations of problems and improvement of health of forests and improvement of livelihood opportunities for local people.

A balance is desired to be achieved between commercial and conservation working of forests in this plan. Local people have been accepted as active stakeholders and flow of real and sizable benefits have been prescribed to ensure the cause of conservation. One highlight of the plan is classification and designation of plan in to conservation and production zones in order to arrive a deft balance between the countervailing demands to derive optimum output. Emphasis has been laid on the involvement of local people and benefit sharing with the fringe communities in a manner that adequate benefits are derived by the locals. The already existing institution of Village Forest Committee (VFC) is recommended to be strengthened by increasing its functionality and relevance so that locals have say in management of forests and benefit sharing. It is pertinent to mention that field exercise has been carried out before 2014 but attempt has been made to conform the prescription to the guidelines of National Working Plan Code 2014 for sustainable management of forests and biodiversity.

In this working plan revision extensive use of technology especially Geographical Information System (GIS) based spatial outlay and analysis has been

done. The compartment, Beat, Block, Range and Division boundaries have been properly digitised and forest area has been calculated accordingly. Forest areas have been classified on the basis of density in to classes as very dense forests, dense forests, open forests and blanks or un-cropped area. In the estimation of growing stock method of stratified random sampling based on crop density has been adopted and data was collected from sample plots. The application of technology and adopting stratified random sampling saved time and resource. The stock mapping was done from satellite imagery analysis and it was verified using Google earth image and confirmed by ground truthing. Satellite imagery of LISS-IV acquired from NRSC Hyderabad and Landset-V available free has employed to undertake this exercise.

Forest area has been divided in to four Territorial Working Circles viz. Mix Conifer Selection Working Circle, Fir Working Circle, Reboisement Working Circle and Conservation Working Circle, different compartments have been allotted to these working circles. The Silviculture system adopted is Selection System as the forests of this division are not suitable for concentrated felling. The yield calculation has been done by both Brandis Diameter Class Method and Von Mantel's formula and lower figures of the two were taken for final calculation. Mix Conifer Selection Working Circle and Fir Working Circle are the two commercial working circles constituted and exploitable diameter is prescribed as 70 CM d.b.h for Deodar and Kail and 80 CM d.b.h for Fir. The areas of commercial working circles that failed in obtaining adequate regeneration during the course of time but have potential to regenerate and support forest crop have been placed in Reboisement Working Circle. Intensive measures to protect and rehabilitate these forests through artificial sowing and planting have been prescribed. The areas which are inaccessible and require protection on account of their importance to perennial flow of water and from soil and water conservation have been grouped in conservation working circle. No felling of any kind has been prescribed in this working circle except for concessional marking of dead dry and fallen trees.

Tapping of resin and felling of green Chir trees has been prescribed to remain suspended during the currency of this plan. Thin, degraded and malformed Chir forests of this divisions have suffered in past on account of resin tapping and have not recovered fully so resin tapping is not at all recommended in this plan.

In this working plan separate overlapping working circles have been prepared for Forest Protection, Wildlife Management, Non-Timber Forest Produce Management, Eco-tourism, Grassland management, Joint Forest Management, Plantation etc. Keeping in view the huge dependence of local people on the forests of Ramban Forest Division the existing management practices have been discussed evaluated and fresh prescriptions have been given in each working circles to

improve the overall management of these working circles to ensure active participation and free flow of benefits to the local communities.

The field exercise for data collection and layout of this working plan was done by field staff of Ramban Forest Division under supervision of DFO Ramban in year 2011-12 and 2012-13 and thereafter the writing work remained unattended for few years. In January 2017 undersigned was posted in Working Plan division-III, Doda and field data and rough draft was taken over from DFO Ramban to continue the writing part. The shortage of staff and lack of funds remained major constraints during the preparation of this working plan. WPO was provided with only one I/C Range Officer and two forest guards on deputation basis and no office staff. It was extremely difficult to run the office.

The Working Plan Officer (WPO) is highly indebted to Sh. Ravi Kumar Kesar IFS, Principal Chief Conservator of Forests, for being entrusted with the responsibility of handling this prestigious assignment. I would like to express my sincere gratitude to Additional Principal Chief Conservator of Forests Sh. P.K Singh, IFS, Sh. James Francoi, Chief Conservator of Forests, Sh. Samuel Changlkija, IFS Conservator of Forests, Central Circle for their guidance and support during preparation of this working plan. The Working Plan Officer takes this opportunity to place on record his heartfelt gratitude to Sh. Naveen Kumar Shah, IFS Conservator of Forests Working Plan and Dr. K. Anandh, IFS then Conservator of Forests Working Plan and for their guidance for compilation of working plan. Undersigned is also indebted to Sh. Vivek Verma, IFS Divisional Forest Officer Bhaderwah and Dr. Jitendra Kumar Singh, IFS Working Plan Officer, Working Plan Division-II Rajouri, and Smt. Shweta Jandial, IFS for the valuable inputs in the compilation of plan revision.

Thanks are also due to Officers who worked as Divisional Forest Officer Ramban during period of preparation of this Working Plan, Sh. Mohammed Amin Mir, then Divisional Forest Officer Ramban and field staff of the Ramban Forest Division who conducted field work and data collection, Sh. Vijay Kumar Verma, Deputy Director, Forest Protection Force Kathua, for giving important inputs in the plan and Sh. Zuhaib Choudhary, Divisional Forest Officer Ramban for kind cooperation. I am also thankful to Sh. Kuldeep Mehta for support on GIS based work, Sh. Majid Shafi I/C Range Officer Working Plan, Sh. Romesh Singh, Computer Operator Ramban Forest Division, Sh. Anil Kumar, Forest Guard and Sh. Sanjeet Kumar, Forest Guard Working Plan for their contribution during compilation of this Working Plan.

(Sat Paul, IFS)
Working Plan Officer
Ramban Forest Division

CONTENTS

1. Common Medicinal Plants of Ramban Forest Division

S. No.	Common Name	Botanical Name	Family
1	Agg jari	***Saxifraga jacquemontiana***	Saxifragaceae
2	Anemone	***Anemone obtusiloba***	Ranunculaceae
3	Ban tambaku	***Verbascum Thapsus***	Scrophulariaceae
4	Banafsha	***Viola odorata***	Violaceae
5	Bankakdi	***Podophyllum hexandrum***	Berberidaceae
6	Belladonna	***Atropa belladonna***	Solanaceae
7	Bhang	***Cannabis sativa***	Cannabanaceae
8	Bhutyata	***Corydalis govaniana***	Papaveraceae
9	Blue poppy	***Meconopsis aculeatal***	Papavaraceae
10	Brand	***Phytolacca acinosa***	Phytolaccaceae
11	Chalander	***Viburnum grandiflorum***	Adoxaceae
12	Chora	***Angelica glauca***	Apiaceae
13	Chukri	***Rheum austral***	Polygoniaceae
14	Chuku	***Oxalis corniculata***	Oxalidaceae
15	Dand jari	***Rhodiola himalensis***	Crassulaceae
16	Dhad Kopdi	***Bergenia Stracheyi***	Saxifragaceae
17	Ephedra	***Ephedra gerardiana***	Ephedraceae
18	Feku	***Ficus palmate***	Moraceae
19	Gaddo	***Salvia moorcroftiana***	Lamiaceae
20	Guggal	***Jurinea dolomiaea***	Asteraceae
21	Gul-e-snobar	***Geranium wallichianum***	Geraniaceae
22	Hamesh bahar	***Calendula officinalis***	Asteraceae
23	Handh	***Taraxacum officinale***	Asteraceae
24	Hillu	***Impatiens glandulifera***	Balsamiaceae
25	Jarjam	***Sanecio chrysanthemoides***	Asteraceae
26	Kaimal	***Berberis lyceum***	Berberidaceae
27	Kajuban	***Arnebia benthami***	Boraginaceae
29	Kalishadi	***Daphne oleoides***	Thymelaeaceae
30	Kanhaji	***Sorbaria tomentosa***	Ranunculaceae

S. No.	Common Name	Botanical Name	Family
31	Kareel Kaimbul	***Berberis aristata***	Berberidaceae
32	Kesar	***Crocus sativus***	Iridaceae
33	Kim	***Morina longifolia***	Dipsacaaceae
34	Kinns	***Diascorea deltoidea***	Dioscoreaceae
35	Kour	***Picrorhiza Kurrooa***	Scrophulariaceae
36	Kuppad jari	***Sedum ewersii***	Crassulaceae
37	Kuth	***Saussurea lappa***	Asteraceae
38	Maiden Hair	***Adiantum Venustum***	Cryptogamae
39	Mooin	***Artemisa maritime***	Asteraccae
40	Mori	***Delphinium roylei***	Ranunculaeeae
41	Mulam	***Inula royeleana***	Asteraceae
42	Murma	***Valeriana dubia***	Valerianaceae
43	Nag Rus	***Acorus calamus***	Araceae
44	Neel Kanth	***Ajuga bracteosa***	Lamiaceae
45	Nichni	***Rhododendron campannalatum***	Ericaceae
46	Patish	***Aconitum heterophyllum***	Ranunculaceae
47	Postul	***Taxus baccata***	Taxaceae
48	Sapp Google	***Arisaema flavum***	Araceae
49	Shemar	***Desmodium elegans***	Leguminosae
50	Sheshak	***Rhabdosia rugosa***	Lamiaceae
51	Shutenger	***Rhododendren anthopogon***	Ericaceae
52	Suchal	***Malva neglecta***	Malvaceae
53	Tatnu	***Caltha palustris***	Rannnculaeeae
54	Yam	***Dioscorea deltoids***	Dioscoreaceae

2. Common Herbs of Ramban Forest Division

S. No.	Common name	Botanical name	Family
1	Avens	***Geum elatum***	Rosaceae
2	Baby's breath	***Gypsophila cerastioides***	Caryophyllaceae
3	Black Henbit, Henbane,	***Hyoscyamus niger***	Solanaceae
4	Bladder Campion	***Silene vulgaris***	Caryophyllaceae
5	Burdock	***Arctium lappa***	Asteraceae
6	Cinquefoil	***Potentilla argyrophylla***	Rosaceae
7	Cow Parsnip	***Heracleum candicans***	Apiaceae
8	Crame's bill flower	***Geranium pratense***	Geraniaceae
9	Cudweed	***Gnaphalium hypoleucum***	Asteraceae
10	Dandelion	***Taraxacum officinale***	Asteraceae
11	Darnel grass	***Lolium temulentum***	Poaceae
12	Foreget-me-Not	***Myosotis sylvatica***	Boraginaceae
13	Golden Rod	***Solidago virgaurea***	Asteraceae
14	Granny's Bonnet	***Aquilegia fragrans***	Ranunculaceae
15	Groundsel	***Senecio***	Asteraceae
16	Helleborine	***Epipactis latifolia***	Orchidaceae
17	Helleborine Orchid	***Epipactis wallichii***	Orchidaceae
18	Hound's Tongue	***Cynoglossum zeylanicum***	Boraginaceae
19	Kashmir Sage	***Salvia hians***	Lamiaceae
20	Larkspur	***Delphinium vestitum***	Ranunculaceae
21	May Apple	***Podophyllum hexandrum***	Berberidaceae
22	Milkvetch	***Astragalus***	Fabaceae
23	Millfoil	***Achillea millefolium***	Asteraceae
24	Mountain Sorrel	***Oxyria digyna***	Polygonaceae
25	Nepal Cinquefoil	***Potentilla nepalensis***	Rosaceae
26	Nepal Dock	***Rumex nepalensis***	Polygonaceae
27	Northern Bedstraw	***Galium boreale***	Rubiaceae
28	Pink Evening Primrose	***Oenthera rosea***	Onagraceae
29	Red Clover	***Trifolium pretense***	Fabaceae
30	Rock splitter	***Bergenia stracheyi***	Saxifragaceae
31	Silky Woundwort	***Stachys sericea***	Lamiaceae
32	St. John's Wort	***Hypericum perforatum***	Hypericaceae
33	Sun Spurge,	***Euphorbia helioscopia***	Euphorbiaceae
34	Touch me not	***Impatiens thomsonii***	Balsaminaceae
35	Wallich's Willow Herb	***Epilobium wallichianum***	Onagraceae
36	White spotted	***Pedicularis punctata***	Orabanchaceae

S. No.	Common name	Botanical name	Family
37	Wild Indigo	***Indigofera heterantha***	Fabaceae
38	Wild Lettuce	***Lactuca longifolia***	Asteraceae
39	Wild Rose	***Rosa webbiana***	Rosaceae
40	Wild Strawberry	***Fragaria nubicola***	Rosaceae

3. Checklist of Mammals of Ramban Forest Division

S. No.	Common Name	Scientific Name
1	Beach of Stone Marten	***Martes foina***
2	Brown Bear	***Uusus arctos***
3	Common Langur	***Semnopithecus***
4	Himalayan Black Bear	***Ursus thibetanus***
5	Himalayan Marmot	***Marmot bobak***
6	Himalayan Mouse Hare	***Ochotona roylei***
7	Himalayan Yellow Throated Marten	***Martes flavigula***
8	Ibex	***Capra ibex***
9	Jackal	***Canis aureus***
10	Jungle Cat	***Felis chaus***
11	Leopard	***Panthera pardus***
12	Long Tailed Marmot	***Mamot caudate***
13	Musk Deer	***Moschus chrysogaster***
14	Red Fox	***Vulpes vulpes***
15	Snow Leopard	***Uncia uncial***

4. Check list of birds of Ramban Forest Division

S. No.	Common Name	Scientific name	Family
1	Alpine accentor	***Prunella collaris***	*Muscicapidae*
2	Alpine swift	***Tachymarptis melba***	*Apodidae*
3	Bearded vulture or Lammergeier	***Gypaetus barbatus***	*Accipitridae*
4	Black and yellow grosbeak	***Mycerobas icterioides***	*Muscicapidae*
5	Black redstart	***Phoenicurus ochruros***	*Muscicapidae*
6	Black tit	***Parus rufonuchalis***	*Muscicapidae*
7	Black-eared Kite	***Milvus migrans***	*Accipitridae*
8	Black-naped green wood-pecker	***Picus canus***	*Dicidae*
9	Blue rock pigeon	***Columba livia***	*Columbidae*
10	Blue Rock Pigeon	***Columba livia***	*Columbidae*
11	Blue rock thrush	***Monticola solitaries***	*Muscicapidae*
12	Blue whistiling thrush	***Myophonus caeruleus***	*Muscicapidae*
13	Blue-headed redstart	***PhoenicurusCaeruleocephala***	*Muscicapidae*
14	Blyth's leaf warbler	***Phylloscopus reguloides***	*Muscicapidae*
15	Booted eagle	***Hieraaetus pennatus***	*Accipitridae*
16	Brown bullfinch	***Pyrrhula nipalensis***	*Muscicapidae*
17	Brown dipper	***Cinclus pallasii***	*Muscicapidae*
18	Cheer pheasant	***Catreus wallichi***	*Falconidae*
19	Chukar patridge	***Akectirus chukar***	*Falconidae*
20	Cinamon tree sparrow	***Passer rutilans***	*Muscicapidae*
21	Collared grosbeak	***Mycerobas affins***	*Muscicapidae*
22	Common cuckoo	***Cuculus canorus***	*Cuculidae*
23	Common kingfisher	***Alcedo atthis***	*Alcedinidae*
24	Common myna	***Acridotheres tristis***	*Sturnidae*
25	Crested black tit	***Parus melanolophus***	*Muscicapidae*
26	Crested lark	***Galerida cristata***	*Alaudidae*
27	Durskey crag-martin	***Hirundo concolor***	*Hirundinidae*
28	Eagle owl	***Bubo bubo***	*Strigidae*
29	European roller	***Coracias garrulous***	*Coracidae*
30	Fire capped tit	***Cephalopyurs flammiceps***	*Muscicapidae*
31	Gold billed blue magpie	***Urocissa flavirostris***	*Corvidae*
32	Gold crest	***Regulus regulus***	*Muscicapidae*
33	Golden eagle	***Aquila chrysaetos***	*Accipitridae*
34	Golden oriole	***Oriolus oriolus***	*Oriolidae*
35	Green backed tit	***Parus monticolus***	*Muscicapidae*
36	Grey- headed flycatcher	***Culicicapa ceylonensis***	*Muscicapidae*
37	Grey headed thrush	***Turdus rubrocanus***	*Muscicapidae*
38	Grey tit	***Parus major***	*Muscicapidae*
39	Grey wagtail	***Motacilla cinerea***	*Muscicapidae*
40	Grey winged blackbird	***Turdus boulboul***	*Muscicapidae*
41	Griffon vulture	***Gyps fulvus***	*Accipitridae*
42	Himalayan Bearded Vulture	***Gypaetus barbatus***	*Accipitridae*

		hemachalanus	
43	Himalayan Golden Eagle	***Aquila chrysaetos***	*Accipitridae*
44	Himalayan Griffon Vulture	***Gyps himalayensis***	*Accipitridae*
45	Himalayan Monal	***Lophophorus impejanus***	*Falconidae*
46	Himalayan pied wood-pecker	***Dendrocopos himalayensis***	*Dicidae*
47	Himalayan Rufous Turtle Dove	***Streptopelia orientalis meena***	*Columbidae*
48	Himalayan snowcock	***Tetraogallus Himalayensis***	*Falconidae*
49	Himalayan swiftlet	***Collocalias brevirostris***	*Apodidae*
50	Himalayan tree-creeper	***Certhia discolour***	*Muscicapidae*
51	Hodgson's mountain finch	***Leucosticte nemoricola***	*Muscicapidae*
52	Hoopoe	***Upupa epops***	*Upupidae*
53	House crow	***Corvus splendens***	*Corvidae*
54	House sparrow	***Passer domesticus***	*Muscicapidae*
55	House swift	***Affinis***	*Apodidae*
56	India white-backed vulture	***Gyps bengalensis***	*Accipitridae*
57	Indian cuckoo	***Cuculus micropterus***	*Cuculidae*
58	Indian ring dove	***Stretopelia decaocto***	*Columbidae*
59	Indian tree pie	***Dendrocitta vagabunda***	*Corvidae*
60	Jungle crow	***Corvus macrorhynchos***	*Corvidae*
61	Kashmir nuthatch	***Sitta cashmirensis***	*Muscicapidae*
62	Kashmir red breasted Flycatcher	***Ficedula subrubra***	*Muscicapidae*
63	Kastrel	***Falco tinnunculus***	*Falconidae*
64	Kestrel	***Falco tinnunculus***	*Falconidae*
65	Koklass	***Pucrasia macrolopha***	*Phasainidae*
66	Koel	***Eudynamys scolopaceas***	*Cuculidae*
67	Koklass pheasant	***Pucrasia macrolopha***	*Falconidae*
68	Lesser pied kingfisher	***Ceryle rudis***	*Alcedinidae*
69	Linnet	***Carduelis cannabina***	*Muscicapidae*
70	Little forktail	***Enicurus scouleri***	*Muscicapidae*
71	Little owl	***Athene noctua***	*Strigidae*
72	Little pied flycatcher	***Ficedula westermanni***	*Muscicapidae*
73	Long-eared owl	***Asio otus***	*Strigidae*
74	Olivaceous leaf-warbler	***Phylloscopus griselous***	*Muscicapidae*
75	Orange bullfinch	***Pyrrhula aurantiaca***	*Muscicapidae*
76	Orange flanked bush-robin	***Tarsiger cyanurus***	*Muscicapidae*
77	Pallas leaf-warbler	***Phylloscopus proregulus***	*Muscicapidae*
78	Paradise flycatcher	***Terpsiphone paradise***	*Muscicapidae*
79	Pariah kite	***Milvus migrans govinds***	*Accipitridae*
80	Peregrine	***Falco peregrines***	*Falconidae*
81	Pied or white wagtail	***Motacilla alba***	*Muscicapidae*
82	Pink-browed rosefinch	***Carpodacus rodochrous***	*Muscicapidae*
83	Plain leaf-warbler	***Phylloscopus neglectus***	*Muscicapidae*
84	Plain or yellow browned	***Phylloscopus inornatus***	*Muscicapidae*

	leaf-warbler		
85	Plumbeous water-redstart	***Rhyacornis fuliginosus***	*Muscicapidae*
86	Red jungle fowl	***Gallus gallus***	*Falconidae*
87	Red turtle dove	***Stretopelia tranquebarica***	*Columbidae*
88	Red-breasted rosefinch	***Carpodacus puniceus***	*Muscicapidae*
89	Red-headed bullfinch	***Pyrrhula erythrocephala***	*Muscicapidae*
90	Red-mantled rosefinch	***Carpodacus rhodochlamys***	*Muscicapidae*
91	Rofous backed shrike	***Lanius schach***	*Lanidae*
92	Rose ringed parakeet	***Psittacula krameri***	*Psittacidae*
93	Rufos-streaked accentor	***Prunella himalayana***	*Muscicapidae*
94	Rufous trustle dove	***Stretopelia orientalis***	*Columbidae*
95	Rufous-tailed flycatcher	***Muscicapa ruficauda***	*Muscicapidae*
96	Scaly-bellied green wood-pecker	***Picus squamatus***	*Dicidae*
97	Shikra	***Accipiter badius***	*Accipitridae*
98	Slaty blue flycatcher	***Muscicapa leucomelana***	*Muscicapidae*
99	Slatyuheaded parakeet	***Psittacula himalayana***	*Psittacidae*
100	Snow patridge	***Larwa lerwa***	*Falconidae*
101	Snow pigeon	***Columba leuconota***	*Columbidae*
102	Sparrow hawk	***Accipiter nisus nisosimilis***	*Accipitridae*
103	Spot winged grosbeak	***Mycerobas melanozanthos***	*Muscicapidae*
104	Spotted dove	***Stigmatopelia chinensis***	*Columbidae*
105	Spotted forktail	***Enicurus maculates***	*Muscicapidae*
106	Starling	***Sturnus vulgaris***	*Sturnidae*
107	Swallow	***Hirundo rustica***	*Hirundinidae*
108	Swift	***Apus apus***	*Apodidae*
109	Tickells leaf-warbler	***Phylloscopus affinis***	*Muscicapidae*
110	Tree sparrow	***Passer montanus***	*Muscicapidae*
111	Tytler's leaf-warblers	***Phylloscopus tytleri***	*Muscicapidae*
112	Variegated laughing thrush	***Garrulax variegates***	*Muscicapidae*
113	Western tragopan	***Tragopan melanocephalus***	*Falconidae*
114	White breasted kingfisher	***Halcyon omyrnensis***	*Alcedinidae*
115	White cheeked bulbul	***Pycnonotus leucogenys Leucogenys***	*Pycnonotidae*
116	White cheeked nuthatch	***Sitta leucopsis***	*Muscicapidae*
117	White throated tit	***Aegithalos leucogenys***	*Muscicapidae*
118	White-breasted dipper	***Cinclus cinclus***	*Muscicapidae*
119	White-browned rosefinch	***Carpodacus thura***	*Muscicapidae*
120	White-capped water-redstart	***Chairmarrornis leucocephalus***	*Muscicapidae*
121	White-winged redstart	***Phoenicurus erythrogaster***	*Muscicapidae*
122	Wren	***Troglodytes troglodytes***	*Muscicapidae*
123	Wryneck	***Jynx torquilla***	*Dicidae*
124	Yellow wagtail	***Motacilla flava***	*Muscicapidae*
125	Yellow-headed wagtail	***Motacilla citreola***	*Muscicapidae*

CONETENTS

LIST OF ANNEXURES

PART –I

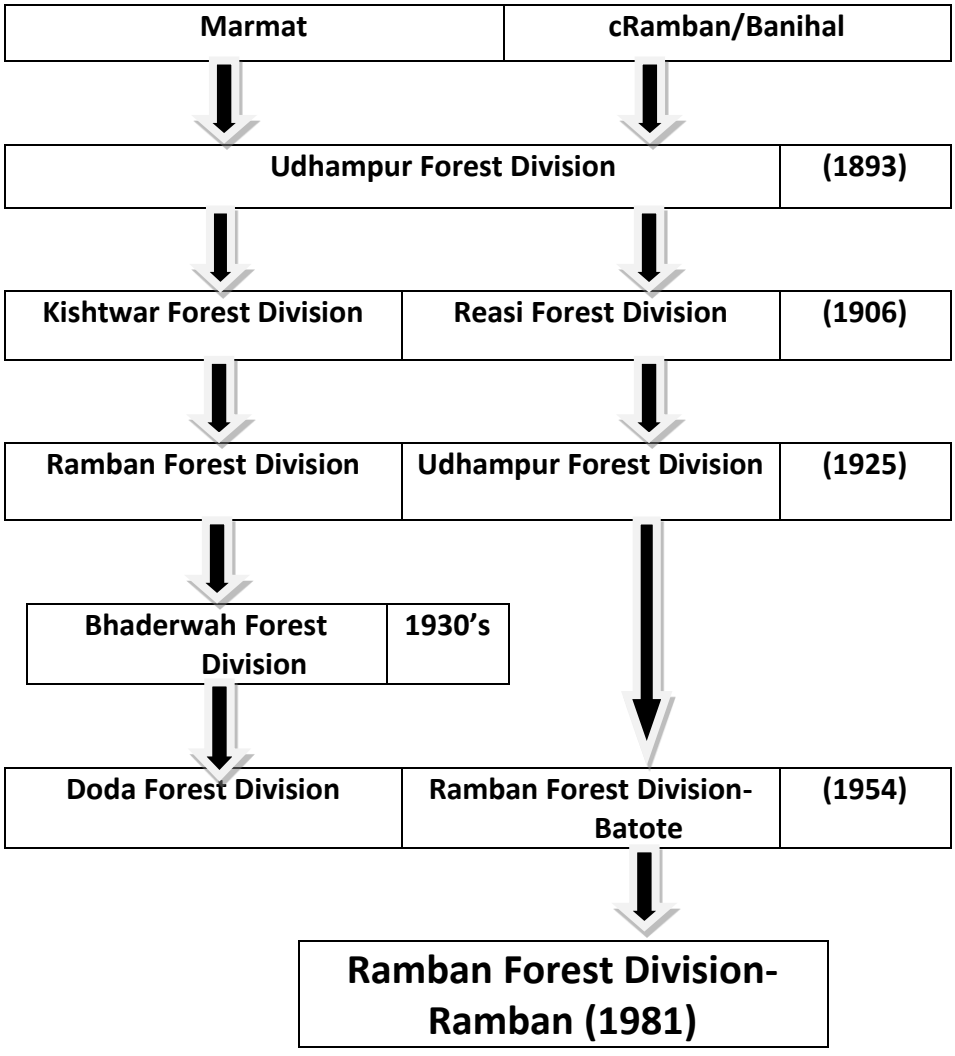
Summary Of The Facts On Which Proposals Are Based

CHAPTER-I

The Track Dealt With

1.1. Name and Situation

1.1.1. Ramban Forest Division was constituted on 1st January 1982 comprising of Ramban (Co.01 to 70) and Banihal (Co.01 to Co.55) Ranges of erstwhile Ramban Forest Division. The area comprising Raman Forest Division falls mainly under Civil Jurisdiction of newly created Ramban district and is a part of Chenab Circle, Doda. The tract lies within North Latitude **33 ^{0}** 9' 5" N to **33 ^{0}** 32' 26" and East longitude **75 ^{0}** 0' 39" E to 75 ^{0} 25' 8". The entire area is covered by Survey of India 1:50000 G.T. Sheets 43 $^{0/2}$, 43 $^{0/3}$,43 $^{0/4}$, 43 $^{0/7}$ 43 $^{0/8.}$ The aerial distance of division is spread over a maximum length of 49.75 Km and 26.25 Km breadth. The following flow chart depicts time line of Ramban Forest Division in relation to the administrative jurisdiction of various divisions over Ramban and Banihal Ranges over a period of time.



1.1.2. The description of the boundaries of the Ramban Forest Division is as under:

a) North and North east by the Pir Panjal Range, forming the boundary with Anantnag Forest Division.

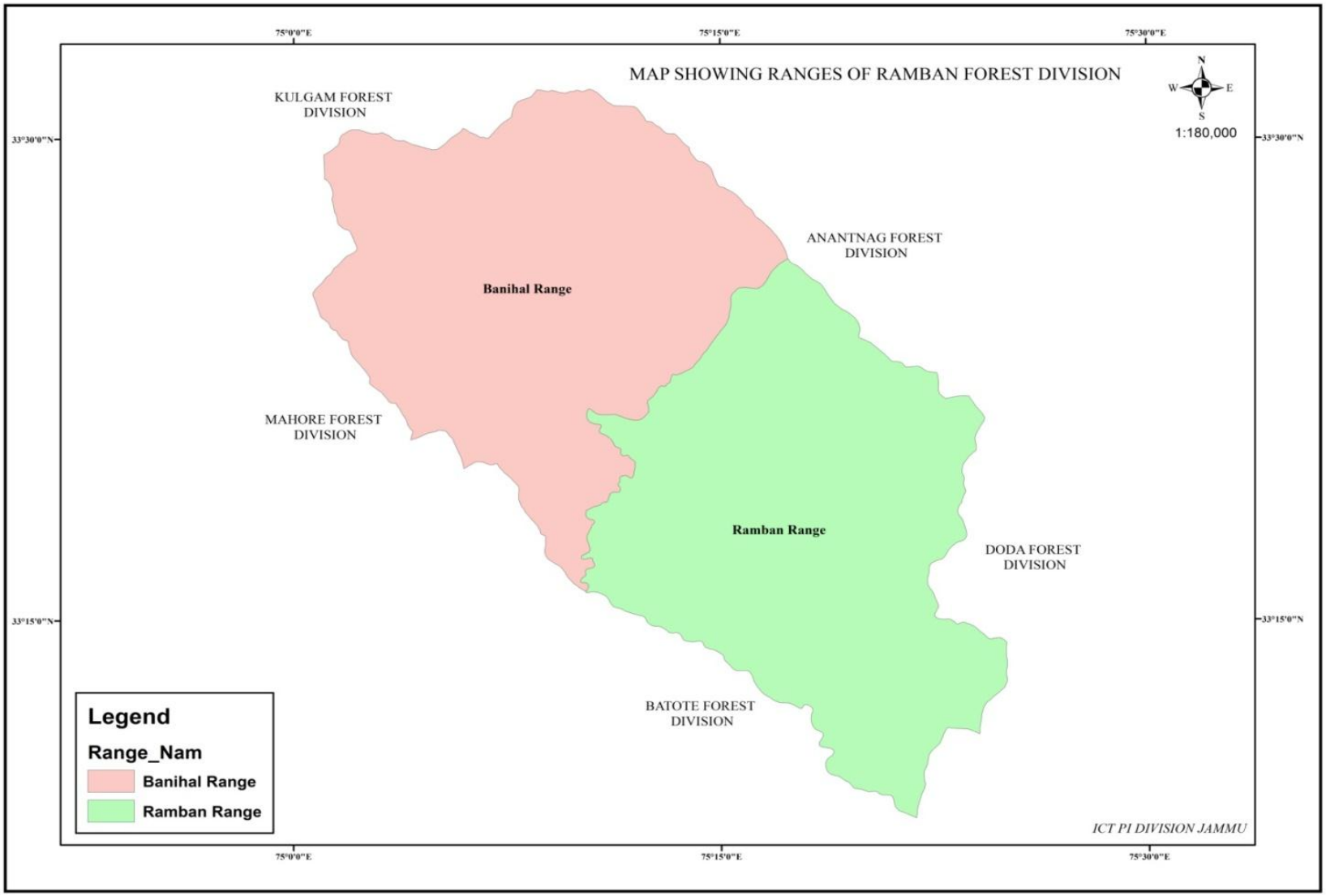
b) East by Dhupdanda- Sharwa- Dhymni- Jwarta- Dhandal – Gown Ridge , forming boundary with Doda Forest Division.

c) West by, Didon- Achaan Mal- Reliar Muninal- Sarkanthmal- Pahlbathali- Sinkhali-Cotog Ridge, forming boundery with Anantnag and Mahore Forest Divisions.

d) South and south west: Chenab (Chanderbhaga) river forming boundary with Batote Forest Division.

The Jammu Srinagar National Highway-IA (renamed as NH-44) enters RambaForest Division at Karol bridge over river Chenab and runs through the division up to Jawahar Tunnel.

Map of Ramban Forest Division - Showing Location and Boundaries.



1.2. Configuration of the ground

1.2.1. The entire Ramban Forest Division is hilly and mountainous with rugged topography, steep slopes, high ranges, and deep valleys, gently sloping meadows. There is huge altitudinal variation of the tract with the lowest point of the division with an elevation of 640 meters where division boundary with the Mahore Division merges in the river Cheneb and rises up to 4553 Metres at Monimal highest peak of the division on the Pir Panjal range. In between this range there are few prominent peaks worth mentioning. These are **Didam Achhan Mal (4209 meters),** Sarkanthmal (4092 meters), Reliar Mal (4006 meters), Pahal Bathali 3796 meters), Kaucat, (3816 metres), Dumni (3370 meters) Hansraj (3970 meters) etc. There are few passes crossing the Pir Panjal range the most important being the Kaokut Gali, Dumni Gali, Nuse Gali, Safawan Pass and Banihal Pass. These are mostly used by the nomads during the summer month.

1.2.2. The tract forms the watershed mainly of Grel Dharote, Karol Balhote, Pogal -Paristan, Neel nallas in Ramban Range and Mohumangit and Banihal nallas forming Bachlari River in Banihal Range. The whole water shed drains into Chenab, some of these streams including Mohu Mangit, Banihal, Pogal Paristan and Neel nallas are perennial and carry adequate water throughout the year rendering them suitable for floating sleepers. The southerly aspect is the most prevalent whereas other aspects especially westerly and easterly are less common.

1.3. Geology: Rocks and Soil

1.3.1. Geographically this division forms a part of the South- Western flank of the great Pir Panjal range therefore this tract is a part of lesser Himalayas.

1.3.2. Geologically, the area has its origin in the Himalayan organic movement and exposes a normal sequence of geological formations from Precambrian to Miocene and a few river traces of recent origin. The geological history of the area, is therefore, not much different from that of Himalayan Range. The Precambrian of the Himalayas are ancient rock formation which were originally deposited in the region lying to the north of Indian peninsula known as “Tethys Sea,” and are represented by Salakhalas. Salakhalas are highly folded and compressed rock formations as these had been involved in the movement which brought Himalayas in to being. The grade of metamorphism varies from place to place and the underlying rock comprises of slates, philistines, quartzite, mica, micaceous schist, carbonaceous and graphitic schist biotite, gneiss, hornblendic gneiss, prophylactic, and banded gneiss.

1.3.3. The area is covered with rock formations ranging from Precambrian slate phyllites to Miocene sandstone and shales with conformable and gradational passage from the

oldest to the youngest formation. The various geological formations found in the tract and their Lithological description and age are a summarized as under:-

S.No	Formation	Lithological Description	Age
1	Alluvium and Soil		Recent
2	Murree series (lowerMurree)	Red, brown, grey and green sandstone, Purple Shales murre thrust.	Miocene
3	Panjal group -Trap member -Agglomerate Slate Member	Schi (1.)Trap members- Vesicular amygad aloidal and massive esitic trap. Panja (2.)Agglomeratic –Quartzite slates Pebby phyllites and quartzite.	Upper Carboniferous Phyllites and quartzite
4	Dogra Slates	Dark grey and buff slates laterally grading in to phyllite and schists.	Late Precambrian to earliest Cambrian
5	Salkhalas series	Garnet phyllites, Schists para gnessisetc. Intruded by acidic and basic intrusive with bands of calcite Magnesitic termolite rock.	Older Precambrian
6	Intrusive granite	Coarse medium grained prophyritic and equigranular homogenous granite with zoneliths of country rock and the basic rock.	Syn or post tectonic to Hercynian Orogeny.
7	Jurassics of (Banihal)	Dolomitic Limestone shale, light blue lime stone.	Jurassic
8	Trias Lime stone	Massive and flaggy limestone and calcareous shales with shale parting.	Triassic
9	Zewan formation	Carbonaceous and Micaceous shale and sandstone.	Permian
10	Fenestella shales	Black Carbonaceous sandy shales with black or light grey Quartizite Coarse sandstone and boulder beds.	Lower to middle carboniferous
11	Syringothyris lime stone (Passage zone)	Grey arenaceous limestone grey brown, Yellow flaggy lime stone calcareous sandstone laterally grading into calcareous. Slates, pebbly slates and conglomerate shale slates and sandy shale with thin quartzite bands.	Lower to middle carboniferous
12	Muth quartizite	White and grayish hard massive and flaggy quartzite, sporadically pebbly and gritty with bands of calcareous quartzite and slate and para gneisses.	Devonian

1.3.4. The area wise distribution of the different geological formation is given below:

a) **Salkhalas:-** The Salkhalas are the oldest rocks of the area. The salkhala are found in this tract are described to have comprised of high grade schist, carbonaceous and graphitic schist with bounds of limestone granite phyllites, gneisses etc. The salkhala of the garnet phyllites with sizeable deposits of higher grade beaded gypsum are well exposed in Marsu, Rajgarh area. An extensive belt of Salhkala has been mapped in Ramsu-Digdaul, Chamalwas area along the Jammu – Srinagar National Highway comprising of wavy crystalline schist and phyllites carbonaceous slates altered to graphitic phyllites with grey and white lime stone altered to saceharoidel marble schist and quartzite. The Salkhalas comprising of slates and garnet phyllites, Tremolite Marble rock schist, gneisses and granite are well developed in Sildhar, Garmman, Dhundrat, Laggali, Durbot, and Gandhot. This rock also extends to Banihal Range across Bichilari River and contain thick band of quartzite and schist. The rock is exposed at many places in this division.

b) **Dogra Slates:-** These rocks consist essentially of thick series of Phyllitic black and green colour massive cleavage slates. The Dogra slates are found in Ramban area are dark grey and buff slates latterly grading into phyllites and schist. This rock is exposed at many places in this division.

c) **Muth Quartzite:-** The rock of Dogra slates and Salkhalas grade upward into a persistent quartzite band whose stratigraphic position and Lithological character are identical to the Muth quartzite of Kashmir and as such has been tentatively designated as Muth Quartizite. This formation has been traced from Duligam area, east of Banihal in the North- West. It is also developed between Ramsu and Injantrang area, Hamer Gali, Khitmarg, Gajpat forest and Batwase, Dighori Gam area.

d) **Passage zone**:- This zone of rocks occurs above the Muth quartzite and below the syringothyris limestone and forms a passage zone between two distinct lithostrgatigraphic units of definite stratigraphic position. The passage zone comprises Shale slates and quartzite slates of yellowish brown colour. This formation is well developed in North of Chuntwan, Paristan, Gad and South of Tatnihal in Banihal area. It is also seen in Wolaw, North-East of Ladna- Gali and at several places between Kun and Mundak basin of Mohumangat valley. It is also visible in Chamalwas, Khari and Nachalana area.

e) **Syringothyris limestone:-** The Syringothyris limestone comprises bands of impure grayish, cream and Ochrous yellow lime stone and calcareous quartzite which at places is gritty and pebbly. This rock is very well exposed between Banihal toll post (old) and Chreel on Banihal Srinagar Rod, Neel, Pogal and Paristan Valleys, Hingun Gali and Zealnth area.

f) **Fenestella Shales**:- The Syringothyris limestone band of Banihal area grades upwards into Fenestella Shales which is very well developed in Banihal, Mohumangat, Zealnth Gali, and Kaukat area. These formations are also exposed in Banihal, Wamwar, Malayansar, Khanglesh Nandmarg, Hingun gali and Mandarla area.

g) **Panjal formations**: 1.) Anglamaratic slates:- The fenestella shale is conformably overlain by agglomeratic slate which has been traced from Shatani nala area on the National Highway to Manalgate area North-West of Hansraj peak. It has also been traced in area between Wamwas and Godan Peak

(2.) Panjal tract: A very thick and persistent band of Panjal tract has been traced from Banihal Pass in the North West to Kaukat peak area in the South East forming the crust of Pirpanjal in this sector.

h) **Zewan formation:-**The Pir Panjal tract is conformably overlain by a thin band of fossiferrous Zewan formation which has been observed in the Nandmarg Gali where it occurs in the form of a small out crop on the North- Eastern flank of Pirpanjal Range. It comprises carboniferous to rust brown shale, slates, sandy shale and micaceous sand stone.

i) **Triassic limestone**:- The Zewan formation is conformably overlain by Triassic limestone which is exposed in the very small area in Banihal Range. These rocks comprise massive and platy lime stone with shale bands.

j) **Intrusive Granite:-** The area is intruded by several granite bodies having variable areal extensions. Important granite bodies found in the area are Dhandrat granite, Marman top granite and also granite. All these granites have identical, physical, Peterological and mineralogical characters and are thus considered to represent the same magmatic phase. In general all these granites comprise massive, highly jointed, medium to coarse grained granular homogenous to inequi- granular porphyritic granular.

k) **Muree thrust**:- Murree thrust is well marked tectonic plain along which the pre-tertiary rocks have come to rest over the tertiary belt. This thrust which is high angle reversed fault has been traced from a point in the South West Dharmund -Peerah area in Ramban – Batote section. It has originated after the deposition of Murree's. Murree thrust dies out in Chanderkot, Blout, Khad Ganga area but again reappears in Tattapani area.

l) **Murree Series**:- Murree comprise red, brown and grey crumbling sand stones and shales. This formation exhibits plant impressions, ripple marks and rain prints on shales and sandstones. Murree are very well exposed at many places in the division.

1.4. Mineral Resources:

1.4.1. The important minerals and rocks of important significance found in this tract are briefly described as under:

a) **Gypsum:** Gypsum is an important mineral used in the manufacture of chemical fertilizers, cement, plaster of Paris etc. Extensive deposit of gypsum of about 85% purity occur in the form of lanticular bands in the carbonaceous and brown shale-slate with bands of limestone below which occur associated with the outer Panjal trap band are known to occur in sizeable quantities in Ramban area.

b) **Limestones:** Lime stone is the one of most important industrial mineral used in the manufacture of cement, iron and steel, chemical fertilizer, lime etc. It is also used as building material. Thick bands of limestone have been recorded at several places in this division some of these form the limestone bands of Banihal, Ramsoo- Ramban-Kaukat area.

c) **Talc:** Small thin impersistent veins of talc have been noticed within slates and phyllites which do not carry much economic importance.

d) **Nickel:** Is an important industrial metal, Nickel-ferous pyrrotite is known to occur in Ramsu area of this division.

e) **Copper:** Copper is an important industrial metal used in a large number of industries. Copper mineralization in the form of chalcopyrite has been reported from Banihal area.

f) **Slates:** Slates are used for writing as well as roofing purposes. Good qualities slates occur in Chamalwas, Ramsu and Ramban, Rajgrah area, mostly used for roofing purpose.

g) **Ochre's (Mineral Pigments**): Ochre's is reported as isolated surface deposited in Banihal area.

h) **Building Material:** The rock which can be used as building material in this area are granites, Slates, quartzite, limestone and trap. Un-weathered granite and Panjal trap blocks can be used as a good construction material. The Muth quartzite at places is flaggy and schistose and splits into large flakes which can be easily quarried for roofing and ceiling purposes.

1.4.2. Commercial exploitation of the minerals from this tract is not feasible from ecological, economical and geological point of view. The geological formation at many places is at considerable distance and is loose, fragile and highly susceptible to landslides. Important land slide prone areas like Seri, Panthyal, Khuninallah, Shergalli

(Co:45/R), Karol Nallah Co:46/R), Kundi (Co 47 R) Khudi Dhar (Co 64/R), Jangle Dhar (Co 65/R) , Chaka Kundi (Co : 65/R).

1.5. Soils

1.5.1. The soils of the area have so far not been classified but by and large, soils are shallow and immature containing large portion of un-decomposed mineral matter. These are sandy, porous and fair in soil humus except those having luxuriant tree growth. Generally soils are acidic in nature.

1.6. Climate

1.6.1. Because of the variation in the altitude from 645 to 4553 meters, there is considerable variation in the climate also. Major portion of this division falls above 1850 feet altitude and consists of high hills, with a temperate climate. In these areas winter is very cold and severe whereas summers are moderate and pleasant. It receives snow during winter and rain during summer months. Major portion of the precipitation comes during the winter months in the form of snow. The low lying area, commonly known as "Kandi area" though small in extent experiences subtropical climate. The winter in this area is mild to moderate whereas summers are very hot having scorching heat. The summers here are usually trying and oppressive the temperature rises as high as 42^0 C in the low line areas located in between steep mountains and seldom goes below 1.5^0 C in high altitude areas. The working season in a year remains restricted to eight (8) months because of typical weather conditions of the area. During winters, the whole region, except the Kandi, is blanketed with snow. The interior and high lying areas receive snowfall as early as November whereas in the main valley it falls in the mid- December. In protracted winter periods, the kandi, at times also gets its share of snow. The snow remains on the ground for about 4 to 5 months and the main passes remain closed up till mid April. The climate on the whole is temperate and healthy, favorable for the forest growth of various conifer species found in the locality.

1.6.2. Monsoon is often weak and reaches late. As a rule southern slopes, as they face these winds, receive more rainfall and the more porous, dry soils on the southern slopes get compensated by higher rainfall, than the heavy, rich and deep soils on the northern and colder regions. Spring rains are frequent and helpful in promotion of regeneration. Bulk of rainfall is received during July and August. Fairly good amount of spring rains are received in April and May. In the inner valley snowfall has been recorded in early November. Bulk of the snow fall is received in between January and March. Average monthly rainfall of Ramban is given in table 1.1.

1.7. Precipitation

1.7.1 The tract receives most of its precipitation during winter months from December to March in the form of snow and rain. Some rain fall is received during monsoon also. The rainfall data, for the period from 2012 to 2016 has been compiled under Table 1.1.

Table No. 1.1. Average Monthly Rainfall Data for Ramban District (mm)

(Source: From website of India Meteorological Department)

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sept.	Oct.	Nov.
2012	267	218	69.8	168.6	46.7	25.2	67.6	163.6	154.3	7.8	25.5
2013	108.8	334	101	45.5	72.6	77.9	67.1	250.2	28.2	20.3	10.4
2014	205.7	147.0	300.1	149.7	77.3	25.2	35.0	82.4	542.0	38.7	41.0
2015	47	271	558.4	242.8	74.2	195.5	243	43.6	169	128.9	47.2
2016	37.7	66.8	318.5	105.4	111	46.4	105.6	100.5	31.9	1.5	0

1.8. Temperature

1.8.1. The month wise data of mean maximum and minimum temperature for the period 2007-2016 recorded at Banihal is given in Table 1.2. Data shows that the climate of the area is temperate with June, July and August being the warmest months and January and February being the coolest months when temperature is below zero degree.

Table No. 1.2. Mean Monthly Maxium and Minimum Temperature (Degree Celsius) for Last 10 Years
(Source: Department of Environment and Remote Sensing).

Year	Month-	Jan	Feb	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
2007	Max	1.38	8.16	18.90	22.08	28.94	29.21	23.04	24.68	24.64	24.38	19.69	15.27
	Min	-11.98	-2.64	5.90	8.69	13.87	17.06	11.90	15.77	1.97	10.03	5.97	3.53
2008	Max	5.40	8.16	18.90	22.08	28.94	29.21	26.66	24.68	24.64	24.38	19.69	15.27
	Min	-3.99	-2.64	5.90	8.69	13.87	17.06	16.87	15.77	12.97	10.03	5.97	3.53
2009	Max	11.42	12.02	18.17	22.20	29.06	31.93	29.48	26.99	26.86	22.56	16.75	12.18
	Min	1.06	1.10	4.72	8.69	13.46	16.30	17.18	16.03	13.63	8.48	4.35	1.77
2010	Max	12.97	10.59	21.28	27.76	30.17	30.54	28.21	24.23	23.08	21.46	18.42	13.35
	Min	1.27	0.19	7.51	12.27	14.48	15.77	17.32	16.93	13.31	9.73	5.72	1.96
2011	Max	10.70	10.50	17.20	20.30	27.60	28.10	27.80	27.70	27.70	24.60	20.30	15.20
	Min	-0.70	2.50	5.20	7.60	12.30	15.40	17.40	17.60	13.20	7.80	6.00	1.40
2012	Max	7.60	9.40	17.00	20.36	26.02	28.60	27.60	27.60	27.60	24.10	19.60	12.40
	Min	-2.40	1.30	5.40	8.03	11.54	14.40	18.00	18.50	13.90	4.90	3.20	3.20
2013	Max	11.00	11.90	18.70	21.10	26.02	28.40	28.50	26.80	27.90	25.40	18.70	14.60
	Min	0.40	1.20	5.90	8.10	11.54	15.80	18.20	17.90	13.00	9.70	3.10	1.40
2014	Max	9.60	10.60	13.40	19.10	24.60	29.30	28.50	28.00	24.90	23.20	19.30	15.70
	Min	0.10	1.50	4.30	8.00	11.10	14.60	18.40	16.70	12.70	8.10	3.80	0.30
2015	Max	13.40	12.40	13.90	20.90	25.80	26.00	27.30	28.70	27.30	23.00	18.10	14.33
	Min	0.70	2.50	3.70	8.50	11.20	12.90	18.00	17.40	10.70	7.50	4.60	1.88
2016	Max	13.11	17.12	17.25	21.37	27.33	30.06	28.76	27.89	28.79	26.77	22.00	18.49
	Min	2.62	3.30	6.42	8.33	12.05	16.05	18.14	18.02	15.10	7.65	3.95	3.45

1.9. Wind

1.9.1. Though complete data related to wind speed is not available but the wind speed is highest during the month of December and January and minimum from August to November.

1.10. Water Supply

1.10.1. The status of water supply is variable throughout the division and varies with season at any given place. Generally speaking, water is scarce in the low lying Chir bearing areas. Water supply in and around the temperate forests that are better stocked is better. A noticeable decrease in the water flow has been recorded in the past decades. Many springs and streams that were earlier perennial have either gone dry or have become seasonal. With increased biotic interference in the catchment areas, the situation is likely to worsen. In any given year, the adequacy of water supply also depends on the quality, amount and distribution of precipitation. If there is adequate snow fall in winter coupled with frequent showers at regular intervals during summers, the water supply remains satisfactory. However, if snow fall in winter is deficient, then perennial supply of water is adversely affected. To some extent, the paucity of water at certain places and at certain times of the year can also be linked to inadequacy of water storage capacity and faulty system of water supply. Very often in the forests, one comes across breached pipelines where from precious water leaks and flown away in large quantities. Proper maintenance of pipelines alone can ease the problem of water scarcity to a significant extent. PHE department of J& K Govt. has been entrusted with the responsibility of providing water to the people settled in different parts of the tract. However the availabity of water for watering to the new plantation is not feasible.

1.11. Distribution of Area

1.11.1. The forests of Ramban Forest Division are spread over in the form of compact and regular patches interspersed by blank area rendered so by excessive biotic interference in the past. The presence of large number of *chaks* inside the demarcated forest is a prominent feature of this division. The lower fringes of forests are honey combed with human habitation under heavy biotic pressure. The forests are bounded all along their length at least one side by the habitation. With increase in population and due to less strict vigil by the forest department most of the lower fringes of the forest have already been encroached upon. There is every likely hood of further encroachments inside the demarcated forests near and around the *Chaks*. Generally speaking, in most places where the land is flat or gently sloping, either on the top of the ridges, or along the nallas. The area is used for cultivation. Good forests are located on slopes that are too steep for cultivation.

1.11.2. The area under the jurisdiction of Ramban Forest Division is part of the Chenab watershed spread over a part of Ramban and Banihal Tehsils of Ramban District.The grosss area of watershed including forest and revenue area is reported in previous working plan revision is as under.

Table No. 1.3. Area of two Watersheds of Ramban Forest Division.

Range	Gross area of the water shed (km^2)	Remarks
Ramban	418.03 Sq . Kms	The area figures have been coumputed from 1:50000 scale toposheet by applying graphical method of area calculation
Banihal	403.75 Sq. Kms	
Total	821.78 Sq.Kms	

1.11.3. For the purpose of management of the forests of Ramabn Forest Division are divided in to two ranges and enabling distinct locational reference the ranges have been further been divided into Blocks, Beats & Compartments. Besides two territorial ranges there is one overlapping Soil Conservation Range in Ramban Forest Division. The compartment wise detailed area statement is included in **Annexure-II**. Administrative constitution of different ranges in terms of number of Blocks, Beats and Compartments as per previous working plan is given below.

Administrative Units	Range		Total
	Ramban	Bahihal	
Block	4	3	**7**
Beats	17	17	**34**
Compartments[1]	72	81	**153**

1.11.4. Though there has been no formal reorganisation of Ramban Forest Division by competent authority but due to large size and administrative need there has been increase in number of Forest blocks and beats by orders of DFO or CF that might have been issued temporarily but were carried as such and became permanent with time. In Banihal range, Block Duligaam (45/Bnl to 49/Bnl) and Chamalwas (52/Bnl to 55/Bnl) have been carved as new blocks from Banihal Block. In Ramban Range, Pogal block (13/Rbn to 19/Rbn) has been carved from the Neel Block. No of beats has also been increased to 36. There are two non-territorial blocks called as town block Banihal and town block Ramban.The detailed proposal for administrative reorganisation of Ramban forest division has been submitted by DFO Ramban to higher authorities the proposal has been enclosed as **Annexure XVIII.**

Table No. 1.4. Abstract of Area Comparison between Previous and Present Revision.

S. No.	Range	Area as per the Previous Working Plan			Area Estimation by GIS (Ha.)			Differnce in area (Ha.)
		Commercial	Un-commer	Total	Commercial	Un commercial	Total	
1	Banihal	7206	16930	24136	8296.9	16129.11	24426.01	290.01
2	Ramban	13233	10910	24143	11173.7	12758.9	23932.57	-210.43
	Total	**20439**	**27840**	**48279**	**19470.6**	**28888.01**	**48358.58**	**79.58**

1.11.5. A perusal of the areas statement shows that commercial forest area constitute 40.26 % of the total demarcated forest area, 59.74 % is un-commercial area out of which 22.64 % area is open forest 37.10 % area is non-wooded (blank area). The demarcated forest area constitute of the gross area of the watershed area of the division.

1.11.6. From the estate area revision of previous working plan and present Revision of working plan the 4.5 percent decrease in commercial area of the division is on account of different methodology used. The area of Ramban Forest Division calculated by using GIS based method is 0.16 percent more than the total estate area of Ramban Forest Division as calculated in the previous working plan. The difference in overall estimation of area is very less and negligible. The area of individual compartment shows some variation when compared to area calculated in previous working circle this difference is on account of different methodology used for area calculation.

1.11.7. The list of forests of Ramban forest division as per Form-1 is given in **Annexure-I.**

1.11.8. The area of individual compartment/sub-compartment in the last Working plan has been calculated by applying dot grid method on the GT sheets 1:50000 scale. The compilation of the estate area in this working plan has been done in this revision by using the following procedure.

1.11.9. The area of the compartment and sub-compartment has been calculated using GIS. The boundaries of compartment and sub-compartment boundaries have been digitized and accordingly the area has been calculated. The estate area of each compartment has been divided in to blank area, open forests, moderately dense and very dense classes according to the density of the crop.

a. Individual compartment stock maps were first prepared on the scale of 1:15000 in the field on the basis of ocular estimation.
b. Compartment/sub-compartment maps of the division were prepared from G.T. sheets on the scale of 1:50000 on the tracing film.

c. The division map was super imposed on the corresponding 1:50000 geo-coded, False Color Composed IRS-IB satellite imageries. LISS-IV satellite imagery was used. Using the visual interpretation technique, and the stock map prepared in the field, area under blanks, high pasture land, landslides and different species were delineated and colored for each compartment individually.

d. Area under different categories was then computed compartment wise by applying dot grid method on the scale of 1.50000 and by GIS technology.

The area statement above does not reflect the changes on account of diversion of forest land for non-forest purpose under the forest conservation Act, 1997.

1.11.10. The horizontal area calculated by Arc GIS during the present revision of the working plan is used for calculation of the growing stock. It is suggested that all the forests shall be demarcated during the current working plan period and the boundary pillars must be geo-referenced and transferred to the GIS plat form so that the polygons corresponds to the forests can be created and the area be estimated more accurately in future.

1.12. State of Boundaries

1.12.1. The absence of boundaries pillars on ground has resulted in lot of difficulties in layout of compartments. By and large there is hardly any authentic trace of boundary pillars**.** Except for the pillars that have been recently renovated, the forest demarcation line is in a pathetic condition. The forests had been demarcated by erecting a colonial stone pillar consisting of loose rubble with a wooden post in the centre. The pillars being of temporary nature are generally displaced or dismantled by the local people in order to encroach upon the forest land. This practice in the near past seems to have been going on in large scale to grab as much forest land and trees as much possible for cultivation, grazing and timber. Record keeping of demarcation pillars is rather unscientific, with no reference to bearing with respect to each other, or to fixed bench marks. Demarcation of forests is one such area that needs to be taken up on priority if the ever increasing tide of encroachment is to be checked.

1.12.2. Most of the encroachments are old and it is very difficult to eject the encroachers unless there is strong will and commitment from the Govt. to enforce The Forest Act. And also pass rigorous legislations to get rid of this menace. The demarcation aspect of the department has been neglected by the department for many decades as a result scant attention has been paid by the territorial functionaries of the forest department as a result over the years forest encroachment has been increasing in this division. Most of the territorial staff is not well conversant with the demarcation record and the position of the boundary pillars on the ground.

Table No. 1.5. Statement Showing Demarcation of Erstwhile Ramban Forest Division.

Range	Year of demarcation	Area of forest in hect.	No of Boundary pillars	Length of Main line (km)	Area of Chaks (Hac)	Boundary Pilars in chaks	Length of line in Chaks (km)
Banihal	1969-70	25196.55	815	331-196	432.506	1826	142.117
Ramban	1969	246761.51	1629	398-690	865-117	2931	203.357
Total		**271958.06**	**2444**	**729.886**	**1297.613**	**4757**	**345.474**

1.12.3. Forest department has taken initiative for the preservation of demarcation record of all the divisions and accordingly the Old demarcation record has been digitalized and provided to all the division on the server (Internet) to ensure that there is no risk to the demarcation record and it is preserved for posterity.

1.12.4. **Demarcation Boundary Pillars:**

1**. PreCast BPs** .Have been used by the department for delineating forest boundary till year 2012-13. The 105 cm long Pillar having four rectangular faces and end cross sections of 10cmx10cm and 12.5cmx12.5cm respectively is cast in cement concrete reinforced with evenly spaced 4 steel wires and is got manufactured and procured by the department through SICOP as per specifications provided in the schedule for forestry works. It is procured by the department in ready to fix form and is embedded at the site in cement concrete block of size 45cmx45cmx60cm. The Precast BPs is embedded 60 cm below ground in cement concrete and remains 45cm above ground. Precast BPs become inconspicuous in tall grass and shrubby growth in the forest and it is easy for encroachers to dislocate the embedded BP from its original spot along with the concrete block. This led to the adoption of a new design of BP in the year 2013-14 so that deficiencies in this design can be overcome.

2. **In –Situ Boundary Pillars.** New design of BP was approved and adopted by Forest Department in year 2013-14. This BP is cuboidal, 6’-0" long 1'-6" wide and 0'-6" thick is cast on site in cement concrete reinforced with steel bars. Three feet BP is cast below ground and 3'-0" is constructed above ground. The cement concrete is reinforced with 6'-0" four vertical steel bars evenly spaced at 0'-5" and eight horizontal crosses evenly spaced at 0'-9". The BP No. and direction of the demarcation line in the form of an arrow is carved on the top flat surface of the pillar. As per guidelines for demarcation of forests, In-situ BP has to be used for delineation of all chaks in a forest as well as the mainline of the forest which is highly vulnerable to encroachment and adjacent to proprietary land. Mainline BPs are painted Red whereas Chakline BPs are painted Yellow. Forest Department Logo is painted in White (Mainline) and Green (Chakline) on the broader face of the BP which is prominently visible.

Table No. 1.6. Renovation of Demarcation Boundary Pillars undertaken by Demarcation Division Bhaderwah in Ramban Forest Division in Last Ten years.

S.No	Year	Schem	Name of Forest	Comp.No	Area (Ha)	Main Line BP/Length in Km	Total Number of Chaks.	Chak Line BP/Length in Km	Total BP of Forest	Physical Acievement (Number)		
										In-situ BPs	Precast BPs	Total BPs
1	2011-12	CAMP	Ganote-Dhandhrat	53-65/RBN	2485.20	305/55.477	52	602/37.142	907	305	0	305
2	2012-13									147	0	147
	2013-14									53	0	53
	2014-15									280	122	402
3	2015-16	State Plan	Neel	1-7/BNL	2299.03	47/31.02	4	33/2.263	80	77	0	77
Grand Total									**987**	**862**	**122**	**984**

Note: Demarcation work involving repair of Boundary Pillars in year 2011-2012 was done by concerned Territorial Division

1.13. Legal Position

1.13.1. All these forests are the property of Government of J&K State and their administration vests with the forest department. Thus the State Forest Department is responsible for the protection, management and betterment of the flora and fauna found in these forests. The control of regulating grazing is with the Forest Department. Closure of any forest area up to half of any forest subject to maximum of one quarter of the total area of a forest range, at a time, with adequate and suitable provision for right of way, can be affected by the forest department.

1.13.2. Berun-line forests (Un-demarcated) presently under control of State Revenue Department have been ordered to be taken over and managed by the forest department but not much has so far been done in this direction, with the result these forests continued to be ill managed. Berun line forests include large forest area in this tract, with scant and depleted vegetative cover. These forests are likely to lose to whatever is left with them, in case they are not transferred to the forest department and managed on the scientific lines. Such guidelines were also mentioned in the previous working plan but remained confined to the plan only.

1.13.3. All demarcated forests come under the preview of The J&K Forest Act. of Samvat 1987 Act No. II of 1987 (1930 AD) as amended up to December 1997 AD. Under the amended Act the respective Territorial DFO's, have also been designated as Authorized Officers and have been conferred with powers to issue orders of confiscation in respect of timber, vehicle, implements, etc involved in the commission of forest offences. In Ramban Forest Division various such cases have been registered during last ten years in which confiscation proceedings were initiated and timber confiscated as well.

1.13.4. To ensure that the records of the division are not confounded with the record and function of *Authorized Officer*, provision for a separate court room, record room and necessary ministerial staff needs to be made on priority, besides proper prosecution of the cases by well known law officer.

1.13.5. The following are the other acts enacted by the State Government from time to time which governs the various process of law as are applicable to these forests for their management preservation, regulation and control.

i. The J&K Forest Act 1987 (1930 AD).
ii. The J&K forest (Conservation) Act 1997.
iii. The J&K Forests (Sale of timber) Act 1987.
iv. The Cattle Tress pass Act 1977 (1920 AD).
v. The J&K Land Improvement Scheme Act 1972.
vi. The J&K Kahcharai Act. 2011(1954AD)
vii. The J&K State Forest Corporation Act 1978 Act.
viii. The J&K Wild life (Protection) Act 1978.

ix. The J&K Public premises (Eviction of Un-Authorized Occupants) Act 1969.
x. The J&K Nationalization of Forests working Act, 1987.
xi. The J&K Extraction of Resin Act, 1986.
xii. The J&K Preservation of Specified Trees Act, 1969.
xiii. The Jammu and Kashmir Forest (Protection) Force Act 2001.
xiv. The Jammu and Kashmir Willow (Prohibition on export and movement) Rules 2002.
xv. The Biological Diversity Act 2002.
xvi. The Environment Protection Act, 1986.
xvii. The Sawmill (Registration and Control) Rules 2012.

1.14. Rights and concessions

1.14.1. No rights have been recognized by the State. However, the villagers, including Zamindars and other categories are classified under Jammu Forest Notice, living in and around the forests within the radius of five Km from the boundary of the forests enjoy a number of liberal concessions from these forests, in lieu of obligatory discharge of certain duties as mentioned in the said notice. Depending upon the distance from the boundary of demarcated forests, the concession have been categorized into "A" and "B" classes for the purpose of granting major concessions like timber etc. The trees of Kail, Fir and Chir are granted from the demarcated forests at a highly concession rate to the villagers in and around within a radius of five KM from demarcated forests, for their bonafide domestic requirements. The timber may be granted as free of cost in case of fire and other natural calamities.

Other concessions enjoyed by the local inhabitants are briefly described as follows:-

a) Collection of dead, fallen material for bonafide domestic use as firewood and small timber.
b) Collection of felling debris/ refuse from the vacated coupes.
c) Lopping of tree for fodder and other domestic purpose only is allowed in case of forest trees other than conifers and special class broad leave trees such as Walnut, Ash, Ton, Acer, Prunes etc.
d) All non-timber forest produce not forbidden by any special order.
e) Grass cutting and grazing allowed in all the forests except those which are closed for the purpose of conservancy.

The following tabular statement shows the volume of timber issued to concessionists over the last 10 years period as free grant, at concessional rates. On an average only 310 trees per year have been allotted to concessionists of Ramban Forest Division.

Table No. 1.7. Detail of Timber Issued to Concessionists from Ramban Forest Division Since Year 2007-08 to 2016-17.

S.No	Year	No. of trees	Volume (CFT)
1	2007-08	435	60074
2	2008-09	260	37935
3	2009-10	278	45300
4	2010-11	348	52688
5	2011-12	337	56271
6	2012-13	383	72135
7	2013-14	388	72338
8	2014-15	318	58263
9	2015-16	196	35354
10	2016-17	162	29464
Total		**3105**	**519822**

1.14.2. In addition to the above figures, the timber is also removed by local inhabitants from the forest illicitly, which remains mostly undetected/ unaccounted for. The damage cases, when registered, are generally compounded/ settled departmentally after the recovery of the cost and compensation, much lower than the prevailing rates in the open market.The quantum of volume being granted to the concessionists does not show any particular trend over the period of time. However there is increase in population and general rise in the standard of living of the people in the rural areas.

1.14.3. There is urgent need to review the whole process of granting concessions to the local people. Present system being followed by the department is not rational and cause huge loss to the Govt. exchequers and has alienated the local population. Timber distribution and proposed changes for better protection of forests have been discussed in detail in chapter for Protection (Overlapping) Working Circle.

1.15. Grazing

1.15.1. Most of the forests areas of Ramban Forest Division are subjected to grazing throughout the year, the unrestricted, uncontrolled and unscientific grazing in the forests areas is largely been responsible for degradation of Fir and Chir Forests and it has invariably prevented the regeneration. Over grazing is the main cause for the failure of regeneration to come up and establish. However, Deodar-Kail Forests also face the problem of excessive grazing but regeneration is not so much effected. The pressure of grazing on the forests is increasing day by day with the rapid increase in the live stock population, and fast disappearance of grazing grounds outside the demarcated forests. Most of the grazing grounds, comprising Kahcharai/ hamlet/ common lands have either been encroached upon or put to uses other then grazing. The livestock data of Ramban district as provided District Chief Animal Husbanday Officer and Distrcit Sheep husbandary Officer (As per Live stock census of 2012) is as under.

Table No. 1.8. Live stock Population in Ramban District.

Category of Livestock	Cattle	Buffalo	Horse/ Mules	Sheep	Goat	Total
Population	99497	13489	5493	104022	45628	268129

The above figures indicate that a very large livestock population is either completely or partially dependent on the forests of Ramban Forest Division. Proper management of forests for increasing the carrying capacity of these forests will help in the long run in improving the livelihood of people dependent of the forests. The high altitude pastures and locally growing fodder species need to be given the special attention.

1.15.2. Village livestock graze the low lying forest areas during winter months, and generally move to the high pasture during the summer season. In addition to the local live stock population, seasonal, migratory live stock also graze in these forests during summer months. Detail of live stock grazing annually in the forests of this division is given as above in the table.

1.15.3. The figures stand no comparison to actual incidence of grazing in the forests by migratory grazers.This division falls on the route adopted by the migratory grazers, (Gujjar, Bakarwals and Gaddies) during their seasonal movement top and from their winter and summer pastures outside the jurisdiction of this division. The details of animals that crossed the Forest check post, annually over the last 10 years is given in table 14.3. It is estimated that at a large percentage of the above numbers do pass through these forests, which goes undetected. A substantial number of total livestock populations is constituted by unproductive animals. The animals graze at liberty in the open and concept of stall feeding is virtually nonexistent.

Table No. 1.9. Rate levyable for Migratory Cattle (in Rs.)

S. No	Animal Type	Rate 'A'	Rate 'B'	Rate 'C'
01	Pack Bullocks	0.80	0.80	0.80
02	Teli Bullocks	0.50	1.00	2.00
03	Buffaloes	1.80	3.15	11.25
04	Riding Ponies	2.50	3.75	7.50
05	Pack Ponies, Mules	2.80	2.80	5.00
06	Donkeys	0.65	0.65	0.65
07	Sheep for Ladakh	0.15	0.20	0.60
08	Camels	5.00	10.00	15.00
09	Goats imported for commercial purpose	---	---	2.50
10	Sheep for rest of State	0.15	0.20	0.65
11	Sheep imported for commercial purposes	---	---	0.20

CHAPTER-II A
Forest Flora

2.1.1. Trees

2.1.1.1. The elevation of Ramban Forest Division varies from around 640 meters to 4553 meters above mean sea level so the tract support different types of forests containing variety of species. The forests of the division are predominantly coniferous with sprinklings of broad leaved species. The conifer trees of economic importance are Deodar (*Cedrus deodara*), Kail (*Pinus wallichiana*), Fir (*Abies pindrow*) and Spruce (*Picea smithiana*). Pines also have their representation in this region. Chir pine occurs mainly in the low lying areas along the National Highway. Chir crop of this division suffered a lot on account of resin extraction and land slides due to road construction in the areas. Associations of Yew (*Taxus buccata*) and traces of Juniper (*Juniperus recurva*) are also met with locally at higher altitudes. The distribution pattern of conifers viz; Deodar, Kail and Fir generally conform to the altitudinal zonation, however climate, aspect, slope, geology and soil type exercise their influence as well. The conifers get purer within their respective habitats. Deodar, as a pure crop or as an associate of Kail is represented mainly in the drainage of various tributaries of Chenab and is well distribted in both the ranges, albeit some stray patches of it also are conspicuously encountered elsewhere in the division. Kail constitutes the main crop in lower elevations. It generally prevails on the southern aspects and on exposed slopes. Fir comes as a principal species in higher altitude and extends to the alpine zones, above where it gives way to Rhododendrons, Birch, Juniper and high altitude willows. At higher altitudes alpine pastures with their luxuriant ground flora appear. Spruce, in small percentage, is found admixed with Fir while at certain locations Yew occurs in patches locally. The broad leaved trees occur more or less in pure patches and are found along nallas, cooler aspects and shady ravines. The Oaks (*Quercus ilex, Quercus incana, Q. dilitata, Q. semicarpifolia*), Walnut (*Juglans regia*), Horse Chest nut (*Aesculus indica*), Maples (*Acer caesium*), Ash (*Fraxinus excelsior*), Pohu (*Parrotiopsis jacquemontiana*) constitute the main broad leaved species found in the tract.

2.1.1.2. Ramban Forest Division is bestowed with valuable conifer species and number of broad leaved tree species. List of important trees species found across the terrain of this division along with their altitudinal zonation is given as below.

Table No.2.1. Common Tree Species of Ramban Forest Division.

Botanical Name	CommonName	Elevation (above MSL)	Family
Abies pindrow	Fir/ Budlu	2300-3600	Pinaceae
Aesculus indica	Hunakdun	2000-2800	Sapindaceae
Cedrus deodara	Deodar	1600-2500	Pinaceae
Celtis australis	Hackberry	100-1800	cannabaceae
Olea cuspidate	Indian olive	900-1500	Oleaceae
Dalbergia sisoo	Talhi	300-1200	Fabaceae
Juglans regia	Akhroot	2000-3000	Juglandaceae
Morus nigra	Tul	1500-2000	Moraceae
Parrotiopsis jacquemontiana	Poa	1800-3500	Hamamelidaceae
Picea smythiana	Spruce	2400-3600	Pinaceae
Pinus roxburgii	Chirpine	500-2000	Pinaceae
Pinus excela	Kail	1500-2500	Pinaceae
Populus alba	Phrast	2000-2200	Salicaceae
Populus ciliata	Phrast	2000-2200	Salicaceae
Populus nigra	Phrast	2000-2200	Salicaceae
Robina pseudoacacia	Kikur	1500-3000	Fabaceae
Taxus baccata	Yew	2000-3500	Taxaceae
Ulmus wallichiana	Bren	2200-3000	Ulmaceae
Betula utilis	Birch	2500-2700	Betulaceae
Rhodhodendron companulatum	Chew	2500-3000	Ericaceae
Alnus nitida	Champ	1500-2300	Betulaceae
Quercus semicarpifolia	Kharsu	1800-2200	Fagaceaea
Quercus ilex	Heru	1000-1500	Fagaceaea
Quercus incana	Ban	1000-1500	Fagaceaea
Quercus dilitata	Mohru	1300-1700	Fagaceaea
Corylus colurna	Thangi	1800-2000	Betulaceae
Platanus orientalis	Chinar	1000-1700	Platanaceae

2.1.2. Deodar Forests

2.1.2.1. Commercially important Deodar forests are found abundantly in the division. It is usually found on higher altitudes of mountain slopes along the northern aspects between at an elevation of 1700 mtrs, to 2300 meters above M.S.L. They preponderate on easier slopes having well drained loamy soil. Deodar occurs either as pure crop or mixed with Kail. It is found in the form of a uniform belt in both Ramban and Banihal Ranges. The composition of the species is between middle aged to young throughout the Division. The crop in general is of good health. Deodar generally demonstrates ample regeneration in its habitat zone where dense seedlings and saplings occur in abundance. However, natural

regeneration of Deodar is found insufficient throughout the division area, baring a few exceptions. The major reason of which seems to be the presence of over arching canopy cover disallowing any perculation of sunlight to enable establishment of new regeneration. Suppression resulting out of the tangled growth of Pohu (*Parrotiopsis jacquemontiana*) and heavy incidence of grazing as well as abundant liter on forest floor are also attributable minor impediments to regeneration. The broad leaved associates of Deodar include Walnut (*Juglans regia*), Bird cherry (*Prunus cornuta*) Thangi (*Corylus colurna*), Maple (*Acer spp*), Horse Chest-nut (*Aesculus indica*), Hum (*Fraxinus excelsa*) and Morhu (*Quercus dilatata*), Heru (*Quercus ilex*). The common shrubs constituting the undergrowth are *Viburnum foetens*, *Cotonaster* spp and *Indigofera* spps. The ground cover is comprised of Banafsha (*Viola canescens*), Wild Strawberry (*Fragaria vesica*) and Gebo grass (*Oryzopsis aquiglumis*).

2.1.2.2. Though Deodar forests are found in both ranges in its natural zones but excellent forests of Deodar are found in Compartments viz10/B, 12/B,13/B, 14b/B, 15/B, 19/B,20/B, 35/B, 10/R,11/R,45/R,47/R etc.

2.1.3. Kail Forests

2.1.3.1. Kail is the other main conifer in the Deodar Kail zone. The species is usually found as mixed crop with Deodar in its zone or with Fir over higher reaches on warmer aspects. At certain locations which are prone to disturbance or abrupt opening Kail is found in pure patches. The mature trees are discernible near habitations, along the lower fringes of forests and where ever the canopy is broken. Being a colonizer, Kail takes a lead over other conifers in establishing itself on the fresh alluvial sites, stiff clays; ill drained soils and openings, whether easy or steep, provided given some time and protection. As the habitat conditions improve and become damp, Kail is seen giving way to comparatively more mesophytic Deodar. It occurs gregariously on all aspects between 1700 to 2200 meters, above M.S.L. but at times may extend upto 2400 meters, as well, on warmer aspects.

2.1.3.2. The natural regeneration of Kail comes up profusely if accorded a little protection. The regeneration, however, suffers considerably from the odds of heavy grazing and illicit damage. Satisfactory regeneration is observed in the forests that have less grazing pressure. In areas closed for plantation Kail regeneration comes profousely. Pure Kail forests as well as Deodar-Kail mixed forests are found through out the division. Some compartments having good kail forests are compartment number 10/R, 11/R, 31/R to 39/R, 50/R-59/R, 3b/B, 5b/B, 12/B to 19/B, 52/B, 53/B, 54/B etc.

2.1.4. Fir Forests

2.1.4.1. The Fir zone lies between 2100 mtrs, and 3400 mtrs, above M.S.L. The Fir forests are essentially found as more or less pure stands in regions bordering alpine pastures. The species, however, forms a light mixture with Kail on exposed sites

and extends down into the Kail zone along the cooler damp aspects and shady depressions. The Fir forests are also associated with Spurce (*Picea smithiana*) and Yew (*Taxus baccata*) at places. Beyond 3380 meters elevation, Fir attains a stunted form to get finally replaced by the high level broad leaved species viz, Betula, Rhododendron etc. Spruce forms a little percentage of the Fir crop, regeneration of Fir species as a whole in the division in itself, is never a problems but its establishment is. The inimical factors responsible include thick deposits of undecomposed humus, unregulated and excessive summer grazing, heavy weed growth and the low moisture retentively of the higher steep reaches.

2.1.4.2. Broad leaved associates of the Fir are Bird cherry (*Prunus Cornuta*), Maples (*Acer caesium*), Horse Chest-nut. (*Aesculus Indica*), Thangi (*Corylus colurna*) etc, the shrubs met with include Vibur num sp. *Sambucus ebulus*, *Skimmia laurea*, *Podophyllum hexandrum* and *Parrotiopsis jacquemontiana*. The ground flora includes *Viola* spps, *Fragaria* spp, *Polygonum* spp, *Rumex* spp, *Anemone* spp, *Phytolaca* spp, Aralias and *Atropa* spp. etc. Some compartments having excellent forests of Fir are 9/R, 25/R, 28/R,29/R, 57/R,67/R, 68/R, 6a/B, 7b/B, 12b/B, 13a/B, 16/B, 18/B, 24/B, 30/B, 31/B etc.

2.1.5. Broad Leaved Species

2.1.5.1. The Broad leaved species are confined in patches, and generally seen in the moist depressions, damp aspects and glens formed by the streams in the coniferous zone. Heru is an exception and is the most distinct broad leaved species found in the division. It stands out from other broadleaf species by being represented as a uniform band between conifer forests and agriculture land along the northern aspects across all the three ranges of the division. The Heru wood makes very good firewood and these forests have reached a miserable state owing to ruthless felling for firewood and due to overgrazing impacting its regeneration. Heru trees are unable to flower and fruit properly because of intense lopping and felling. *Dalbergia sisoo* also can be seen in lower altitudes on rocky and baldened southern aspects along river.

2.1.5.2. The important species met with in such forests are walnut (*Juglans regia*) Horse chest nut (*Aesculus indica*, Bird cherry (*Prunus cornuta*), Maples (*Acer caesium*), Urni (*Corylus colurna*) Ash *(Fraxinus excelsior*) Arkhor (*Rhus succedenea*) and Pohu (*Parrotiopsis jacquemontiana*). With the rise in altitude the Fir zone gradually fades into a vast grassy tract of alpine meadows, popularly called as margs, which extend right upto the perpetual snow line. Beyond 3200 mtrs, elevation alpine scrub of Junipers (*Juniperas recurva*), High level Rhododendrons, willows and patches of Birch (*Betula utilis*) replace Fir. 'The Margs, sustain a rich variety of alpine flora consisting of the species of *Potentilla* spp., *Primula* spp., *Corydalis* spp., *Caltha* spp., *Gentiana* spp., *Aconite* spp., *Jurenuia* spp., Anderosace, *Anemone*, Agrotis, Dactylis etc. These pasture lands are the source sustenance for the flocks of Bakerwals, grazing there during summer months. Some

compartments having considerable broad leaved trees are 13a/R, 21/R, 25/R to 34R/, 43/R-46/R, 67/R, 68/R, 1/B, 6b/B, 5/B, 9b/B, 11/B, 14/B etc.

General Description of the Growing Stock

For the purpose of general description, the forests of this division can be divided into the following zones of vegetation depending upon the elevation:-

a. Sub-tropical Zones.
b. Temperate Zones.
c. Alpine Zones

2.1.6. Sub-tropical Zone

2.1.6.1. About 12% of the total area of the division falls under this zone of vegetation. About two third subtropical area of this division falls in Ramban Range. Predominant species of this zone is Chir which occupies low lying areas along Chenab and other side Valleys. It occupies about 35% percent of the total area of this zone. The common tree associates of this species are *Quercus leucotrichophora, Quercus ilex, Olea cupidata, Pistaciai ntegerrima, Punica granatum, Lyoniaovalifolia, Pyrus Phashia, Alnus nepalensis, Acacia modesta, Caltisaustralis, Rhus spp and Coryluscolurna.* Shrubs commonly found in this zone are *myrsine africana, Dabregeasia hypoleuca, Berberis spp, Nerium indicum, Plectranthus rogosus, Daphne cannabina, Zizyphus spp, Spiraea sorbifolia, Pirinsepia utilis, Rubus ellipticus, Woodfordia floribunda, Rosa moschata and Punica granatum. These* shrubs constitutes the under growth in Chir forests. The intensity of undergrowth in Chir Forests varies from light to heavy. The ground flora generally comprises *Fragaria vesca, Viola spp, Polygonum spp, Girardinia heterophylla, Ainsliaea aptra, Impatiens glandulifera,* and a variety of grasses and ferns. The common climbers of this zone are *clematis spp, Jasminum humile, Vitis spp, Rosa moschata etc.*

2.1.7. Temperate Zone

2.1.7.1 About 67 % area of this division falls under this Zone of vegetation; Kail and Fir are the two predominant species of this zone occurring over 75 % of the total wooded area of this division occurring almost in equal proportion followed by Deodar, Spruce and sprinkling of *Taxus baccata.* The conifer species occur either in pure form or mixed with each other and broad leaved species. These species in association with broad leaved species cover roughly 80-85% of the forest area of this zone and the remaining area is either blank scrub or rocky wasteland.

2.1.7.2.The common broad-leaved trees associates of Deodar, kail and Fir are A*esculus indica, Alnus nitida, Ulmus wallichiana, Prunus padus, Quercus dilatata, Quercus semecarpifolia, Quercus incana, Celtis austnialis, Pyrus pashia, Corylus colurna, cederella spp, Toona serrata, Populus spp,* broad leaved species covers about12% of the total area of this zone.

2.1.7.3.The incidence of the under growth in these forests varies in intensity from scant to moderate and the commonly found species are *Viburnum foetens, Viburnum nervosum, Skimmia laureola, Podophyllum hexandrum, Parrotia jacquemontiana, Desmodium spp, Sarcococca saligna, Indigofera pulchella, Prinsepia utilis, Rubus spp, Rosa spp, Berberis spp, Daphne cannabina, Acer pictum, Cotoneaster spp etc. The* incidence of climbers is very low the common climbers found in this zone are *Vitis semicordata, lonicera spp, hedera helix etc.*

2.1.7.4. The herbaceous ground flora include *Viola canescens, Fragaria vesca,Rumex hastatus, Anemone spp, Polygonum spp, Girardinia heterophylla, Impatiens glandulifer, Atropa belladonna, Podaphyllum hexandrum,* and a variety of miscellaneous grasses and ferns *Oryzopsis acquqlimisi*, a poisonous grass which favours coolers aspect under light shade, is quite common in Deodar Kail forest in this zone on the Northern Aspects.

2.1.8. Alpine Zones

2.1.8.1. 21% of total area of this division comprises alpine and sub-alpine zone of vegetation. This is the area above tree line and it comprises high level pasture lands, bare rocky and stony hill tops. At altitude above 3000 meters Fir forests gradually replaced by the alpine brush wood of Junipers and occasionally Brich, high level *Rhodotandron, Salix spp* and *Spiraea spp,* are also found. Finally, these trees species gave way to grassy expanses which are rich in variety of medicinal plants. This provides excellent grazing ground for large number of cattle's, sheep and goats during the summer months. The rocky and stony hilltops remain covered under the thick layer of snow for most part of the year. As a result, these are devoid of tree growth.

2.1.8.2. Alpine pastures are used as summer pastures by the nomads and other cattle /sheep rearing communities of Jammu and Kashmir. Alpine pastures have immense influence on the economic and cultural life of the people.

2.1.9. General Description of the Forest Type

2.1.9.1. The forests of this division can be classified into the following forest types in accordance with the 'Revised Survey of Forest Types of India' by Champion and Seth the list of which is tabulated as under in the table 2.2.

Table No.2.2. Forest Types found in Ramban Forest Division

S. No.	FOREST TYPE	Classification code
	MONTANE SUBTROPICAL FORESTS	
	Sub Tropical Dry evergreen Forests	
1.	Himalayan or Montane Chir pine forests	9/C1b
2.	Sub-Tropical dry evergreen	10/C1
2 a.	*Olea cuspidate* scrub forest	10/C1a
2 b.	*Acacia modesta Scrub*	10/C1b
	MONTANE TEMPERATE FORESTS	
	Himalayan Moist Temperate Forests	
3.	*Ban* oak forest *(Quercus leucotrichophora)*	12/C1a
4.	*Moru* oak forest *(Quercus dilatata)*	12/C1b
5.	Moist deodar forest *(Cedrus deodara)*	12/C1c
6.	Western mixed coniferous forest	12/C1d
7.	Moist temperate deciduous forest	12/C1e
8.	Low level blue pine forest *(Pinus wallichiana)*	12/C1f
9.	Himalayan temperate secondary forests	12/c1/DS2
10.	*Kharsu* oak forest *(Quercus semicarpifolia)*	12/C2a
11.	West Himalayan upper oak forests	12/C2b
12	West Himalayan temperate pastures	12/DS3
13.	Alder forest	12/1S1
	Himalayan Dry Temperate Forests	12/D
14.	West Himalayan high-level dry blue pine forest *(Pinus wallichiana)*	13/C4
	SUB ALPINE FORESTS	
15.	West Himalayan subalpine Birch / fir forest	14/C1a
	ALPINE SCRUB	
	Moist Alpine Scrub	
16.	Birch / *Rhododendron* scrub forest	15/C1
17.	Alpine pastures	15/C3

9/C1b Upper or Himalayan Chir Pine Forests

2.1.9.2. This forest covers about 3.99% of the total forest area of this Division. This sub-type covers all the Chir bearing trees in Ramban and Banihal forest ranges and consists of high forest of Chir pine with open canopy. Annual fires and excessive grazing prevent the development of the shrubs which could otherwise from the under growth. These factors are equally been found inimical for the development and establishment of Chir seedling. Over wood consists of pure crop of Chir pine. Towards the upper, limit it is mixed with Kail and Deodar and Oak forests at places while on the lower limit it is mixed, but rarely, with broad leaved species mostly along nallas/streams and depressions.

2.1.9.3. The Chir pine forests have been accorded a status of climatic climax by Champion and Seth. Chir occupies a definite altitude zone between 1000 and 1800 meters on the Southern exposures and rather lower limit on the northern aspects varying naturally with micro relief and should be accorded a ecological status of climatic climax in these area. It occurs on quartzite, and stone, conglomerates and schist and colonizes exposed slope in its natural zone.

General Floristic

Pinus roxburghii, Quercus leucotrichophora, Pyrush pashia, Acacia modesta, Olea cuspedita, Pistacia integerrima, Ficus roxyburgii.

Woodfordia floribunda, Rubus ellipticus, Colebrookia oppositifolia, Berberies lyceum, Mysrine africana, Punica granatum, Zanthoxylum alatum, Rhus cotinus, Nerium indicum, Prinsepia utilis. Crataegus crenulata, Indigofera pulchella.

Rumex hastatus, Taraxacum officinale, Myosotics mycrantha, Plectranthus rugosus, Artemisia vulgaris, Desmodium spp, Fragaria vesca.

Cynondon dactylon and miscellaneous grasses.

Rosa moschata, Vitis spp, Clematis spp, Jasminum humile.

Eclogical Status

2.1.9.4. The Chir pine forests have been accorded a status of climatic climax by Champion and Seth. Chir occupies a definite altitude zone between 1000 and 1800 meters on the Southern exposures and rather lower limit on the northern aspects varying naturally with micro relief and should be accorded a ecological status of climatic climax in these area. It occurs on quartzite, and stone, conglomerates and schist and colonizes exposed slope in its natural zone.

10/C1 - Sub-tropical Dry Evergreen Forests

2.1.9.5. This type of forests occupies a very negligible area in this division and is confined to lower fringes up to 1050 meters elevation above mean sea level along river Chenab in Karol, Ramban belt. The climate of the area is characterized by long hot and dry season and cold winter. This forest type constitutes low practically scrub forest of small leaved evergreen tree and shrubs. It grows on alluvium, conglomerates, sedimentary rocks, shale and lime stone in places having shallow and dry soil. Actually, this forest type overlaps with Chir pine forests. This type is divided into two sub-types viz.

Sub-type 10/C1a- *Olea cuspidata* Scrub Forest

Sub-type 10/C1b- *Acacia modesta* Scrub Forest

2.1.9.6..Both these sub-types occur intermixed over a small area. *Acacia modesta* scrub forest is rare, and a few patches are confined along Maitra- Dhramkund road mixed with *Olea cuspidate, Punica granatum, Pistacia integerrima* and Chir. Olea cuspidate scrub forests are encountered in Peeerah, Chanderkote and Maitra-Dharamkund belt in association with *Acacia modesta, Pistacia integerrima, Punica granatum*, and Chir pine.

12- Himalayan Moist Temperate Forest

2.1.9.7. The most important coniferous forests of the Division fall under this group. Dominant species are very few in number, in fact more or less pure crop are almost more frequent than the mixed ones. There is a little admixture of broad

leaved species. Coniferous tend to avoid hot southern exposures and have been replaced there by the broad leaved forests. The conifers generally comprises of quality with varying amount of under wood. The under growth generally comprises of deciduous shrubs. Its preponderance is determined mainly by the canopy density and intensity of grazing. Some ever green shrubs such as *Sarcococca salgina, Daphne cannabina and Viburnum* spp. are generally encountered. The climbers of temperate region such as *Rosa moschata, Clematis, Hedera helix and Vitis* are rare. A variety of ferns mosses and grasses grow frequently within this forest type.

2.1.9.8. This group occupies a significant portion of the division covering about 53.25% and lies between the Sub-tropical Pine forests and sub-alpine scrub varying with aspect and configuration. This group is further distinguished into the following types and sub-types.

12/C1a Ban OakForests *(Quercus Leucotrichophora)*

2.1.9.9. This forest type is confined to a small area having clayey soil. The forests are open with trees having short bole and low branches. The stand is low and under growth is scant. It occupies the lowest portion of the temperate belt extending a long way down towards to sub-tropical zone in moist localities. These forests are heavily lopes for fuel and fodder and it may lead to the final disappearance of this type over a large area in a due course of time. Though the distribution of these forests has been considerably reduced due to anthropogenic pressure but it is considered to be a climatic climax.

General floristic

Quercus dilatata, Quercus leucotrichophora, Aesculus indica, Abies pidrow. Pinus wallichiana, Acer spp., Picea Smithiana, Cedrus deodar, Toona serrata, Pyrush pashia, Rhododendronn spp, Fraxinus floribuna, Taxus bacccata.

Rosa macrophylla, Rubus spp, Viburnunm spp, Berberies aristata, Strobilanthes wallichii, Indigofera pulchella, Daphne cannabina, Sarcococca saligna, Desmodium spp, Skimmia laureola.

Viola, fragaria, Rumex spp and Ferns.

Hedera helix, Vitis spp, Rosa moschata etc.

12/C1b/- Moru Oak forests (*Quercus diltata*)

2.1.9.10. This sub-type is found over areas adjoining or easily accessible to human settlement extending form Ban Oak to Moru Oak types. Intense lopping of fodder, combined with continues grazing and felling for fuels, are responsible for reducing Oaks and associated species to low stunted , unsound trees/scrubs which generally coppice. The common associates are bushes of *Berbaris* species, *Aesculus spp.* Acer sp., *Crataegus spp, Prinsepia utilis, Wikstroemia spp, and Indigofera spp. etc.* This degradation stage is well represented in the proximity of large human settlement in temperate belt of Ramban and Banihal Ranges. The

accessible forests have been heavily lopped. This forest type is considered to be climatic climax.

General Floristic

Quercus diltata, Quercus incana, aesculus spp, Abies pindrow Olea cuspedita, Cedrus deodara, Pinus wallichiana, picea spp,

Woodfordia floribunda, Rubus ellipticus, Myristine africana, rubus spp., Berberies lyceum, Mysrine africana, V*iola Fragaria, Rumex hastatus, Taraxacum officinale, Myosotics mycrantha, Plectranthus rugosus, Artemisia vulgaris, Desmodium spp,Fragaria vesca.*

Cynondon dactylon and miscellaneous grasses.

Rosa moschata, Vitis spp, Clematis spp, Hedera helix.

12/C1c – Moist Deodar Forests

2.1.9.11. *Cedrus deodara* is the typical species of this type which occurs mainly as pure crop but some Kail and little Fir and Spruce is commonly present. This does not appear to have reached true climax as most of the Deodar forests have been considerably influenced directly or indirectly by biotic interference. The canopy is complete and dense in young crops. There is, at places, sprinkling of Oaks under the conifers with scrubs growth in varying amounts depending upon the intensity of the grazing. Deodar forests occurs in the altitude zone of 1800-2500 meters which , at places, has descended to lower level on the cool northern aspect and ascended up to 3000 meters on the hot southern aspects thereafter it is replaced by Kail and Fir. This forest type avoids heavy and badly drained soils. Fires rarely damage these forests except natural regeneration and light grazing is considered useful in inducing natural regeneration. This sub-type is mainly represented in abundance in Ramban and Banihal Ranges and constitutes all valuable deodar forests which have been brought under conversion to uniform it occurs on all geological formations over well drained soil. The under storey is generally absent from the area having dense deodar crop.Naturally regeneration of deodar and kail is satisfactory except on badly drained soil and being subjected to heavy grazing.

2.1.9.12. This sub-type**,** dominated by Deodar practically in the form of a pure crop, has the status of secondary seral (normal) stage. It may be accorded a climax status over an area where it is found as pure crop.

General floristic

Cedrus deodara, Abies pidrow. Pinus wallichiana, Acer spp., Picea smithana, Quercus Dilatata, Quercus leucotrichophora, Aesculus indica, Quercus ilex, Rhus succedanea, Toona serrata, Prunus padus, Rhododendron arboretum,Alnus nepalensis, Corylus colurna.

Parrotia jacquemontiana, Viburnunm spp, Indigofera spp, Desmodium spp, Sarcococca saligna, Deutzia spp, berberies spp, Wikstroemia canescens, Buddleja paniculata, Prinsepia utilis.

Viola, Fragaria, Rumex, Gallium.

Smilax, Clematics Montana, Hedera helix, Rosa moscchata, Vitis himalayana are rare but important climmers of these forests.

2.1.9.13. The important fungi are *Fomes pinii* and *Arceuthobium minutissimum* (attack kail on large scale in this sub-type.)

12/C1d-Western Mixed Coniferous Forests

2.1.9.14. This sub-type comprises varying mixture of conifers like Kail Deodar, Fir, and Spruce along with evergreen and deciduous broad leaved trees in patches it is found throughout the division, occupying mostly northern slopes from 2275 to 2875 meters ascending above this limit on warmer aspects. It occurs mainly above Deodar forests at an altitude of 2400 to more than 3000 meters. Pure blue pine crop is found in it and above as well as below with varying mixture of broad-leaved species. This type occurs on all types of rock formations and typical temperate soil of coniferous forests. It is interspersed, at places with open grazing grounds and their presence of cattle exerts a far reaching influence on the ground vegetation and regeneration of tree species mainly Fir and Spruce.

2.1.9.15. This sub-type is known for its association with abundant medicinal flora and includes all workable Fir and Deodar-Kail forests of this division. The growing stock is characterized by higher proportion of mature and our mature trees and deficiency in younger age classes in case of Fir and Spruce owing to excessive biotic interference. In Deodar there is abundance of young generation with adequate amount of middle aged crop and lesser proportion of mature and over mature trees. The fact of grazing and human pressure is pronounced around summer grazing rounds and area in proximity of huge human settlements. Kail contributes in colonizing bare hotter gaps whereas Deodar comes to occupy very steep and broken grounds. This sub-type appears to be bio-climatic climax.

General floristic

The top canopy consists of Kail, Deodar, spruce, and Fir inter-mixed with broad leaved species in *Cedrus deodara, Abies pidrow. Pinus wallichiana, Acer spp., Picea smithana,*

Quercus dilatata, Quercus leucotrichophora Aesculus indica, , Prunus padus, Alnus nepalensis, quercus semecarpifolia, Acer acuminatum, Acer caesium,Acer pictum, Taxus baccata, Betula utilis, Ulmus wallichiana, Juglans regia Populus cliata, Fraxinus floribuna, Corylus clourna, Salix spp.

Viburnunm nervosum, Viburnunm foetens, Skimmia spp, Indigofera spp, Desmodium spp,

Fragaria spp, Viola canescans, Valeriana wallichii, Oxalis, Galium, Polygonum and variety of mosses ferns and grasses.

*Vitis himalayana, Clematis, Hedera helix, Schizandra spp. o*varying proportion varying with aspects and altitude. The broad leaved associates and Oaks are subordinates to coniferous.

12/C1e-Moist Temperate Deciduous Forests

2.1.9.16. This sub-type consists of forests of deciduous high forests, mostly occurring mixed, single or in groups of varying extent with moderate to scant under growth. This sub-type is met occasionally over a small area between 1800-2700 meters with 12/C1c and 12/C1d type seen in the division along suitable sites throughout the moist localities. These forests are mostly found in shady depressions along Nallas and stream banks. It comprises of broad leaved trees like *Alnus nitida, Aesculus indica, Juglans regia, Acer spp, Prunus padus, Corylus colurna, Celtis australis, Populus ciliate, Ulmus wallichiana, Rhus spp, Salix spp, Betula utilis, Quercus semecarpifolia.* Under growth is represented by *Viburnum foetens, Rubus spp, Berberis spp, Spiraea sorbifolia, Cotoneaster spp, Jaminum humile, Sarcococca saligna.*Ground flora includes *Impatiens spp,* variety of ferns and grasses. Climbers commonly met with are *Hedera helix,* and species of *Vitis, Clemetis and Rubus.*

2.1.9.17. This type seems to be in a state of stable edaphic climax and occurs only in shady moist localities. The regeneration of constituent species is often inadequate. It is subjected to heavy loping, griddling, and felling for fodder/firewood and small timber wherever it occurs in the proximity of the human settlements.

12/C1f-Low level blue Pine Forests (Pinus Wallichiana)

2.1.9.18. All Blue Pine forests occurring with *Q. incana, Q. diltata* types and mixed coniferous zones as a more or less pure blue pine of varying extent constitute this type. These forests are secondary to the destruction of the pre-existing forests of the various types from natural or biotic cause. *Pinus wallichiana* is universal colonizer of vacant sites. Therefore, this sub-type is considered as other primary or secondary seral type. The top canopy consists of *Pinus wallichiana* with occasional *Picea smithiana*, *Abies pindrow* and *Cedrus deodara*. The middle story is practically absent through occasionally some broad leaves, species like, *Quercus leucotrichophora*, *Quercus dilatata*, *Acer spp. Prunus spp* are present. The undergrowth and ground flora are scanty.

2.1.9.19. The pure crop of Kail is secondary seral formation which has come up after destruction of original vegetation as a result of its colonizing habitants regular seeding.

12/C1/DS2-Himalayan Temperate Secondary scrub

2.1.9.20.This sub-type occur along the sites of a abandoned cultivation, on burnt areas especially on Southern slopes, excessively grazed and loped sites near villages,

and other similar sites consisting of an irregular, but often dense, and extensive scrub cover with a few pre-dominant species.

General floristic

Quercus leucotrichophora, Pinus wallichiana, Cedrus deodara
Plectranthius rugosus, Berberis species, Crataegus crenulata, Indigofera pulchella, Pyrus pashia etc.

12/C2a Kharsu Oak Forests (*Quercus semecarpifolia*)

2.1.9.21. This sub-type consists of *Quercus semecarpifolia* forests occurring in typically gregarious nature and forming pure crops in its optimum zone. But it is frequently mixed with *Abies pindrow, Picea smithiana and Quercus dilatata*. This type includes mixed coniferous on Southern slopes and merges with alpine zone above. At places, an under story with Fir and replaces it where biotic interference is excluded. This sub-type occurs between 2500 to 3300 meters on Northern and Southern aspect. It is well developed over small areas in Ramban and Banihal Range.The top canopy consist of *Quercus semecarpifolia.* The second story is mostly absent. The ground cover mostly consist deciduous shrubs with varying amount of grasses ferns and herbaceous growth. This forest type is considered as stable climatic climax in localities favourable to oak.

General floristic

Quercus semecarpifolia, Quercus dilatata, Acer spp, Abies pindrow, Betula alnodes.
Rhododandron arboretum, Betula utilis.
Rosa macrophylla, Viburnum foetens, Cotoneaster acuminate, Salix elegans.
Medicinal herbs and miscellaneous grasses.
Clematis , Montana, Vitis himalayana.

12/C2b- West Himalayan upper Oak- Fir Forests

2.1.9.22. This sub-type occurs between 2600 meters and tree line where it disappears into pure Oak forests or merges into alpine/sub-alpine vegetation. The characteristic species of this type is *Quercus semecarpifolia, Abies pindrow,* with sprinklings of Spruce here and there. It lies above the mixed coniferous forests. It is typically two storied high forest with Fir standing singly or in groups over the Oaks and other broad leaved trees. Thus the top canopy consists of *Abies pindrow with occasional Picea smithiana.* The middlle storey consist of *Quercus semcarpifolia, Quercus dilatata Rhododandron ,Acer and Betula spp* with shrubs like *Sarcococca sligna Indigofera, Cotoneaster pruniformis, Wikstroemia spp, below them.* Ground flora consists of species of *Rumex, Polygonum, Valeriana, Fragaria Galium and Voila.*

2.1.9.23. This type has not been considered as commercial forest. It is present in some of the interior compartments of Ramban and Banihal Ranges. This type is a

transitional stage between pure Fir and pure Kharsu Oak type.This type is considered as climatic climax.

12/DS3- Himalayan Temperate Pastures

2.1.9.24. This sub-type consist of the area where grazing has taken place in the temperate forests. Favourable sites on ridges and gentle slopes near moist localities have gradually been cleared, passing through the park land stage and to open grass lands. This type includes blank areas commonly known as '*Behak*' or '*Dhar'* conspicuously devoid of tree growth. The ground is completely covered with grasses and herbaceous flora. These pasture lands are mostly near the water source. This type is heavily grazed behind its carrying capacity during the summer months. It supports a variety of palatable and non-palatable grasses. This sub-type is in both ranges above the conifer limit.

12/1S1 Alder Forests

2.1.9.25. This sub-type is confined, in pure form, to the stream sites and exposed unstable hill sides and on land slip areas. This type is limited to sites with permanent water supply and extends over a wide altitudinal Range from sub-tropical belt to temperate region. Ground flora is represented by a variety of ferns and local grasses.

2.1.9.26. These forests have, now assumed commercial importance and are in great demand for pencil factories. These forests meet the local demand for fuel, fodder and small timber. This sub-type is represented along perennial stream all over the Division.

General floristic

Almus nepalensis, Populus ciliate, Ulmus wallichiana, Celtis australis.
Sarcococca saligna, Spiraea, Crataegus crenulata.
Plectranthus spp, Berberis spp, Prinsepia utilis.

13/C4 Western Himalayan dry high-level blue Pine Forest (*Pinus wallichiana*)

2.1.9.27**.** *Pinus wallichiana* is the characteristic species often found pure occurring between 2200 to 2800 meters. Fir and spruce are the main associates. Deodar is found inter mixed and occurs in the lower limit. This sub-type consists of typically even-aged, pure, strongly predominating blue pine. It consists of dense forests, unless thinned out, with little under growth.This sub-type occurs on sites which are usually at the lower edge of the forests on moderate slopes adjoining village cultivation. This sub-type has come up on the sites which had been destroyed by fire, grazing, lopping and firewood collection. Most of the blue pine in this sub-type undoubtedly owes it origin to the introduction of forest conservancy and protection in this division.

General floristic

Pinus wallichiana
Quercus dilatata, Quercus leucotrichophora.
Viburnum spp, Sarcococca saligna, Wikstroemia, Myrsine africana.
Fragaria, Viola, adiantum.
Rosa moschata.

14/C1a West Himalayana Sub-alpine Birch/Fir Forests

2.1.9.28. This type forms the last limit of trees below the alpine scrub. It includes irregular forest consisting largely of Fir/Betula and *Rhododendron* in a varying proportion. In moist localities *Quercus semecarpifolia* also extends into this sub-type. Conifers mostly tend to occupy ridges and slopes where snow slides are less frequent. Found in the interior of Ramban and Banihal Ranges.

General floristic

Abies pindrow, Pinus wallichiana, Picea smithiana
Rhododendron, Taxus baccata, Prunus spp.
Strobilanthes spp, Smilax spp, Viburnum foetens, Deutzia spp, Berberies spp.
Anemone spp, Geranium spp.
Clematis montana and Vitis.

15/C1 Birch/Rhododendron Scrub Forests

2.1.9.29. This sub-type is restricts to the upper most areas of the alpine catchment consisting of *Betula* as predominate species, along with *Rhododandron campanulatum.* This type is heavily grazed*. Brich* may form a pure stand above the Fir forests.

General floristic

2.1.9.30. *Betula utilis, Rhododandron campanulatum, Quercus semecarpifolia, Viburnum nervosum, Berberis species, Cotoneaster, Primula spp, Spiraea spp, Clematis.*

15/C3 Alpine Pasture

2.1.9.31. These are continuous with those lower down and differ only in having shorter snow free period and in floristic detail. The characteristic vegetation is only herbaceous. The meadows are comprised mostly of perennial mesophytic herbs with a little grass. Conspicuous among the herbs are *Primula, Anemones, Iris, Gentiana* with many *Rananculaceae, Cruciferea, Compositae* and *Cryophyllaceae* members. This type is well developed on the upper reaches of Ramban and Banihal Ranges. These pastures are over grazed by buffaloes, sheep and cattle during summers.

2.1.10. Injuries to Which the Crop is Liable

2.1.10.1. Various agents causing injuries to the forest crops of the division, directly or indirectly, are enlisted below-

a. Human being and Livestock
b. Fires
c. Wild animals
d. Insects, fungi and parasites.
e. Physical causes. (Climatic factors)

2.1.11. Human beings and Livestock

2.1.11.1. The greatest threat that the forests of this Division face directly or indirectly from human beings and domestic animals. The damage caused by over grazing, grass cutting, lopping, girdling, torchwood extraction, illicit felling, stump extraction, encroachments and intentional fires for getting fresh flush of grass, illicit damage and ill management is assuming alarming proportions and is threatening the very existence of the forests in the area.

2.1.12. Grazing

2.1.12.1. Here has been a steep increase in the population of livestock over the years. The number of animals grazing per hectare has increased and is in excess of the carrying capacity of these forests. Furthermore, grazing is practiced in an unscientific and uncontrolled manner. In addition to the livestock of local farmers, the forests and grass lands of this Division are burdened by the animals of migratory graziers also. Overgrazing affect the forests in primarily three ways. Firstly, the young generation of tree species gets destroyed. Secondly, due to trampling, the soil gets compacted and makes it extremely difficult for the seedlings to establish after seed germination. Compacted soil also results in excessive run off, which in turn causes soil erosion and has adverse effect on the hydrological regime of the locality. Thirdly uncontrolled and continuous grazing results in disappearance of palatable grasses which gradually get replaces by coarse, unpalatable species.

2.1.12.2. The most serious damage due to grazing is witnessed in the Chir and Fir forests of this Division. In these areas, regeneration is practically absent. With older trees dying due to various reasons, and no regeneration coming up, considerable gaps have been created in the canopy. The problem is more acute near villages and camps of migratory graziers. Once the trees in these forests are past their physical rotation, degradation is going to set in rapidly. Till date department has not been able to effectively formulate and implement the grazing policy for the state to ensures that the basic needs of the local people are met without any disturbance in the ecological balance.

2.1.13. Grass Cutting

2.1.13.1. Grass cutting, if properly done, actually reduce the chances of fire thereby helping the establishment of regeneration. Unfortunately, villagers who maintain the grass reserves, locally known as kaps/Rakhs do cut and remove the coniferous recruits and seedlings indiscriminately along with the grass. They also girdle/fell the trees from kaps in a bid to expand the area of kaps and maximise grass production. As a result of this practice the area continues as permanent blank and it is a common feature all over the division.

2.1.14. Lopping

2.1.14.1. Lopping of broad leaved tree species, especially Oaks, *Aesculus, Acer, Ulmus, Celtis and Juglan* is very common in this division and is carried out on a large scale by the villagers for stall feeding their cattle during the winter months. Migratory graziers also lop the trees of Fir and *Taxus baccata* in the absence of adequate availability of fodder leaves from broad leaved trees and grasses. Lopping of conifers for firewood has is very common in the vicinity of towns and large sized villages. The forests that have suffered the burnt of lopping present a very shabby and sticky appearance. Heavy lopping of Oak and Olea at many places has rendered these species as scrubs. Lopping results in attenuated crowns, thereby severely reducing photosynthetic activity, rate of increment and seed production. It also renders the trees more susceptible to insect and fungal attacks. Consequently, the health of forest and its regenerative capacity is adversely affected.

2.1.15. Torch wood Extraction

2.1.15.1. It is done by villagers more often from the standing trees of both Chir and Kail. Sometimes, it leads to girdling of the trees. In general, the trees get weakened at base and become vulnerable to wind throw and snow break. Torch wood extraction also exposes the tree to fungal infection and insect attack. This practice is frequent in remote areas of this division, where it has actually to be extracted from the old marked stumps.

2.1.16. Encroachments

2.1.16.1. The tremendous increase in human population and the number of households has heightened the demand of land for agriculture and settlement. Encroachments are a consequence of this increased land hunger. Villagers often girdle, scoop and fell the trees around their proprietary land/chaks with the objective of expanding their land holding. This insidious expansion of chaks has resulted in honeycombing of forests and degradation of forests adjacent to chaks. Also, since the cultivation is carried out on the sloppy land as well, normal agricultural practices like terracing are not adopted and this in turn results in severe soil erosion and further degradation of forests. Unfortunately, this process goes on unnoticed and unrecorded.

2.1.16.2. Forest department has recently conducted a survey of encroachment in the Division and accordingly arrived at the data provided below.

Table No. 2.3. Blockwise Abstract of Encroachments in Ramban Forest Division.

S. No	Range	Name of Block	No of cases	Pacca Structure		Kacha Structure		Land Breaking	Total Area Encroached
				No. of c	Area	No.	Area Kanal	Area in Kanal	Area in Kanal
1		Sarbagni	748	221	40.75	206	36.8	2522.3	2599.85
2		Mahu	471	32	9.35	341	69.5	569.05	647.9
3	**Banihal**	Banihal	208	17	2.85	83	10.37	590.7	603.92
4		Doligam	110	9	1	30	2.375	185.85	189.225
5		Chamalwas	139	31	20.75	50	11.2	399.65	431.6
Sub Total			***1676***	***310***	***74.7***	***710***	***130.24***	***4267.55***	***4472.49***
1		Neel	308	85	15.65	147	19.15	840	874.8
2		Pogal	255	16	1.95	133	13.375	1920.7	1936.025
3	**Ramban**	Bhangara	1329	111	23.7	710	123.6	18877.5	19024.8
4		Ramban	919	215	48	507	73.15	9505.1	9626.25
5		Rajgarh	324	39	9	152	22.3	2399	2430.3
Sub Total			***3135***	***466***	***98.3***	***1649***	***251.58***	***33542.30***	***33892.18***
G.Total			**4811**	**776**	**173**	**2359**	**381.82**	**37809.85**	**38364.67**

Abstract of Encroachments in Ramban Forest Division.

Particulars	Area in Kanal	Area in Ha
Pacca Structure	173	8.65
Kacha Structure	381.82	19.091
Land Breaking	37809.85	1890.49
Total	38364.67	1918.23

2.1.16.3. A perusal of **Table No. 2.3.** shows that 1918.23 hectares of forest land is under encroachment, whereas the fact of the matter is that the actual encroachment figure is far in excess of the reported figure. At this point in time, it is very important that reforms are carried out with regard to the ownership status of forests which should actually vest in the forest department. Also, the necessary formalities regarding mutation of forest lands have to be taken up on priority. The level of encroachment is momentous and it reflects upon the working for forest departments and calls for immediate need to intiate the process of encroachment eviction form the forest land. During the period from 1980s to 2016-17 it seems that very few encroachment cases have been registered by forest department and no action was taken to remove encroachments from the forest land. As **776 pucca structures and 2359 kucha** structures exist besides the land breaking in number of cases land breaking. The situation is extremely critical and is futher encouraging the encrachers to encroach upon the forest land with out fear of law. Forest staff too has become habitual to ignore all these violations and just perform the day to day activities with out any professionalism and moral integrity. The situation is extremely critical and department needs to

give special attention to this aspect as already irrerapairbale damage has been done to the forests of Ramban Forest Division.

2.1.16.4. Recentally digitalization of demarcation record as envisaged in the new J&K State Forest Policy 2011 has been initiated and department has carried out the digitalisation of most of the forest record to ensure that it is save to posterity and to ensure that in case of loss or damage to forest record, we have paperless record readily available for the department to ensure that protection of forest is not hampered.

2.1.16.5. Govt. should give special focus to prevent encroachment and evict the encroachers from the encroached forest land. Work environment need to be created in such a way that honest and upright field official are encouraged and rewarded and the defaulters and those who cannive in encroachment cases should be penalised. Forest department need to update its data regarding encroachers and all sort of concessions from forest should be stopped toi them. Moreover list of such encroachers should be prepared and sent to Govt. with the recommendation that these encroachers should be barred from all sort of benefits from various social welfare schemes of the Government. Capacity building of the staff and focus on the protection related activities.

2.1.17. Illicit Felling

2.1.17.1. As a result of the increase in human population, there has been a tremendous increase in the demand for timber. At the same time, felling of green trees was banned in the year 1990 vide Government Order No. 24-FST of 1990 dated 15-01-1990, Consequently, the volume of timber extracted from forests fell sharply. This has created a large gap between the demand and supply of timber. This demand is therefore, very often, met through timber illicitly extracted from the forests by the locals Table 2.4. below shows number of cases registered for breach of Jammu and Kashmir Forest Act 1987.

2.1.17.2. The figures below are a small fraction of actual incidence of illicit damage. Many such cases go unnoticed and unregistered for want of strict vigil over the vast area under the field staff. The fact that the National Highway passes throughout the length of the Division makes it more susceptible to illicit removal of timber. There is huge number of undispoed off cases in Ramban Forest Division which is blockade of revenue. DFO should ensure that proper attention is given to damage cases and all the cases are disposed as per law.

Table No. 2.4. Forest Damage Cases in Ramban Forest Division in last TenYears under the J&K Forest Act 1987.

S.No.	Year	OB	Receipt	Disposal	Total
1	2007-08	1620	15	--	1635
2	2008-09	1635	11	1	1645
3	2009-10	1645	7	6	1646
4	2010-11	1646	9	12	1643
5	2011-12	1643	11	6	1648
6	2012-13	1648	14	14	1648
7	2013-14	1648	10	1	1657
8	2014-15	1657	21	12	1666
9	2015-16	1666	38	69	1635
10	2016-17	1635	16	15	1636
Total			**152**	**136**	

2.1.18 Forest Fires

2.1.18.1. Chir forests of this Division suffer heavily on account of fires every year. Chir needle, which accumulate in large quantities are highly inflammable and are responsible for frequent fires during summer and autumn dry needles are also responsible for fires in Kail forests. Fire not only damages regeneration but also severely damages the Chir crop under resin tapping. In most cases, the villagers and migratory graziers are responsible for setting the forest floor on fire in order to get a fresh flush of grasses. In addition, frequent fires lower the soil fertility and accelerate the process of soil erosion. The data on forest fire indicates a general trend that there are more incidents of forest fire in the alternative years. More strict vigil by forest department , active role of Village Forest Committees, control burning, forest fire mitigation and forest fighting strategies can help in bring down the incidents of forest fire and help in preventing the loss of forest on account of forest fire.

Table No. 2.5.
Detail of Fire Damage Cases in Ramban Forest Division in last Ten Years.

S.No	Year	No. Of Fire cases	Area affected(Ha)
1	2007-08	30	73.60
2	2008-09	4	2.60
3	2009-10	26	35.20
4	2010-11	0	0
5	2011-12	4	4.80
6	2012-13	7	6.40
7	2013-14	26	31.60
8	2014-15	18	24.80
9	2015-16	6	6.00
10	2016-17	26	39.86
Total		**147**	**224.86**

2.1.19. Wild Animals

2.1.19.1. Injuries caused to the forests by wild animals are negligible as compared to the damage done by man and his animals. The extent of such injuries has gone down further because of a decrease in the population of wild animals. Black bears, rarely found in a few pockets, de bark the young deodar and Kail trees which subsequently dry up. Such damage is negligible at present in these forests. It has only been noted in the remote pockets of Ramban and Banihal Ranges. Monkeys and langurs eat up Chir and Kail seeds and sometime damage young seedling of conifers in the nurseries and young plantations. Porcupines dig up the roots and eat away the seedlings of Chir. In many instances young plantation are also destroyed by the Porcupines and other redents. Grafting done on Pyrus phasia (Kainth) are also destroyed by monkeys who remove the polythene used in grafting and as result scion and stock are unable to for joint for successful growth.

2.1.20. Insects Fungi and Parasites

2.1.20.1. The most injurious fungus in *Fomes pinii*, which attacks Kail, especially the wounded and lightening struck ones, and causes pith rot. The attack is severe in moist localities. The incidence of ring disease has been observed at a few places on Fir trees in Banihal Range. Kail is generally attacked by an angiosperm parasite (*Arceuthobium minutissimum*) which enters the host through some injured part. Its attack is visible after the appearance of witches broom formation. Generally, healthy standing trees are not attacked by the insects and only damaged and fallen trees are susceptible to insect attack.

2.1.21. Climate (Physical causes)

2.1.21.1. Strong winds uproot the over mature; rot stricken and base scooped trees, especially of Chir which was heavily tapped in the past. Snow breaks the tops of saplings and poles of Kail and Deodar and sometimes causes full-grown trees to topple over. Basal bends due to the rolling of snow are quite common in steeply sloped area that receives snowfall. Forest damage due to snow is occasional, depending upon the intensity of snowfall. Drought retards the growth of trees especially young generations and damages the seedlings and saplings. Its effects are quite visible in Chir crop on the hotter aspect. The drought-affected trees are less resistant to fires. Heavy downpours lead to landslides and erosion of soil and cause uprooting of trees. Lightening does, but negligible, damage to forest trees. Every year a few trees are struck by lightning. Such trees dry out eventually. Landslides are quite common in the low lying area, especially Chir belt, because of weak and young geological formations. Some of the compartments have been badly hit by landslides. Avalanches in the interior area of Ramban Forest Division do damage the forest growth. Moreover the widening work of national high way triggered a series of landslides which led to destabilisation of forest area along National Highway on downhill and uphill of the road.

2.1.22. Resin Tapping

2.1.22.1. Chir forests of Ramban Forest Division have suffered heavily on account of uncontrolled and heavy resin tapping in 1970 and 1980s. Irregularities of serious nature in respect of resin tapping were noticed all over the Chir forests in this Division. Though the Resin Extraction stands stopped since 2003-04, the same needs to be continued for at least 15-20 years more till the condition of the crop is improved.

CHAPTER-II B
Forest Fauna

2.2.1. General description

2.2.1.1. A variety of fauna is found in this Division because of diverse climatic conditions and altitudinal zonation prevailing in the tract. The ever-increasing pressure of human population is responsible for sharp decline of faunal population in this region, as elsewhere in the state. The worst sufferers are mainly game animals and birds. Excessive interference by the graziers, and their large herds of grazing animals, has resulted in the decline of chertain species of wild animals like wild goats, Musk deer, Brown bear and Snow Leopard. Apart from large scale killing of game animals and birds by humans, deforestation and consequent habitat reduction is also responsible for sharp reduction in their number. The faunal species specially the animals and birds described below are on constant decline and are represented by few numbers at present.

2.2.2. Mammals

A) Carnivora

a) **The Leopard or Panther** (*Panthera pardus*)), is commonly known as "Chita" "or "Chitra" by the locals. Though its range of occurrence covers almost entire tract of this division, yet is only confined to a small portion of sub-alpine belt mostly close to villages. Sometimes it kills domestic animals, with the result that locals hunt this animal largely for protecting their livestock. Its number is on sharp decline. It has been declared as special game under the Jammu and Kashmir Wild Life Protection Act 1978.

b) **The Snow Leopard** (*Unica unica*), is expected to be living in the higher altitudinal zones above 3500 meters. It generally inhabits the snow capped mountains. It has been included in scheduled 1 of the Jammu and Kashmir Wild Life Protection Act 1978 and its killing is totally prohibitted.

c) **The Leopard cat** (*Felis bengalensis*), this beautiful forest cat is now almost extinct in this tract because of its indiscriminate killing for its attractive skin. It is almost the size of domestic cat expect that its legs are larger than the latter. It is nocturnal in habit, rarely seen during daytime. Its colour and marking pattern are almost similar to those of panthers and thus it looks like a miniature panther. It prays upon small animals and birds. It has since been included in Schedule I of the J&K Wild Life Protection Act 1978 and its killing is totally prohibited in the State.

d) **The Jungle Cat** (*Felis chaus*), small number is found in lower scrub forests of this division. It preys upon small animals and birds. This cat has long legs comparatively short tail, and distinctive pale green eyes exhibiting a cruel expression.

e) **The Small Indian Mangoose** (*Herpestes auropunctatus*), small in size, shorter tail, olive brown gold-flecked, soft silky fur are distinctive. This animal lives in holes it burrows by itself. It is mostly found in low lying areas of this Division in and around cultivated fields. It feeds upon Rates, mice, snakes, scorpions, centipedes and insects.

f) **The Jackal** (*Cains aureus*), this animal is commonly found in the division up to elevation of 1500 meters above mean sea level, mostly around towns, villages and cultivation areas, sheltering in holes in the ground, dense grass and scrub. It is nocturnal in habit. It sometimes attacks small domestic animals like goat, sheep, and their young ones and birds. It is one of the most common scavengers in nature.

g) **The red Fox** (*Vulpes vulpes*), is mostly found in the upper sub-temperate and temperate zone of the tract. It is generally red in colour.

h) **The Indian Fox** (*Vulpes bengalensis*), this fox is frequently found in the subtropical zone of the division. It lives in burrows dug by itself in open grounds or in the scrub. It feeds on small mammals, birds, reptiles and insects. It has been declared a vermin as per the J&K Wild Life Protection Act, 1978.

i) **Brown Bear** (*Ursus arctos*), is commonly known as " Lal Bhalu " because of reddish brown colour of its coat. It is heavier in built than black bear. Open peaks high above the tree line is where it usually hunts. Only interior areas of Ramban and Banihal Range of this Division are believed to have few number of this bear. It is omnivorous; prefers grasses, ants, termites, honey bee, variety of fruits and flowers. Many a times it attacks sheep and goats when hungry.

j) **The Himalayan Black Bear** (*Selenarctos thibetanus*), is black in colour with characteristic 'V' shaped breast mark which may be white, yellow or buff. In summer it is found near the tree line (3000 to 3500 meters), whereas it descends to low lying areas during the winter months. It lives in a variety of wild fruits berries, insects, termites and larvae. It raids the maize fields and sometimes causes heavy damage to the crop. It is more carnivorous in food habits than other bears and kills sheep, goats and even larger domestic animals. Many a times, even human beings are mauled/killed by this animal.

k) **The Common Otter** (*Lutra lutra*), this animal is found, but rarely, in the stream and springs throughout the Division. It generally thrives on fish and other aquatic animals. Its fur is much valued.

l) **The Himalayan Weasel** (*Mustela sibirica*), lives in temperate and alpine forests and open grass and scrub above tree line. It is sometimes seen in the sub-alpine area of Ramban and Banihal Range. It hunts rats, birds and their eggs.

m) **The Stone Marten** (*Martes foina*), its built suggests a mixture of squirrel and cat. It has moderately long legs and tail about half as long as its head and body. It

generally inhabits the temperate and alpine zone of the division and rarely found below 1500 meters. It lives both in the forests and on the barren heights above tree line. It prays on wolves, mouse-hare, lizards and snakes. It also feeds on honey, nuts and fruits.

B) Rodents

The Red flying Squirrel (*Petaurista petaurista*), inhabits the Deodar, Kail and Fir forests. It is rarely seen in the sub-tropical belt. It has a thick fur covering and a tail longer than the length of the body. It produces a sound like that of a falling parachute while leaping from one tree to another. It feeds on fruits and nuts of various trees, barks, gums, resin and sometimes on small insects and their larvae.

a) **Five Stripped Palm Squirrel** (*Funambulus Penanti*), is quite common in sub-tropical belt of this Division. It is rarely found in the forests but lives around the human dwelling and agricultural fields.

b) **The Indian Field Mouse** (*Mus booduga*), is common in fields, compounds, and generally ventures into the houses. It lives in burrows and feeds on grass, fruits, roots and nuts etc. It damages agricultural crops, nurseries and plantations.

c) **The Indian Procupine** (*Hystrix indica*), favours rocky hill sides of sub-tropical and tropical belt and is encountered in the lower zone of Ramban Range. Its hair is completely modified into spine like structures. The neck and shoulders are crowned with a crest of bristles 15 to 30 cm long. The quills on the back are very profuse, and are ornamental with deep brown or black and white rings. It sometimes damages nurseries and young plantations.

d) **Indian Hare** (*Lepus nigricollis*), this animal is commonly found up to an elevation of 2500 meters. It is earthy brown in colour and generally weighs between 2-3 kg. When fully grown up. It runs fast and damages agricultural crops in Kandi belt.

C) Goat Group

a) **The Himalayan Ibex** *(Capra ibex sipirca),* this species of wild goat once believed to in large number, inhabited at higher elevation above 3600 metres in this Division, is hardly surviving at present. The male had large backward curving horns like scimitars. It is a sturdy thick set goat. It favours high elevation above tree line. They graze in the morning and evening and hide for security and shelter in precipitous cliffs and ridges This species is always lives in herds. It hunted for its soft woolly under fur coat, skin and meat.

b) **The Grey Himalayan Goral** *(Nemorhaedus goral)* It is stocky goat like animal. It has short insignificant horns. Generally its colour is yellowish grey fused with black. It favours elevations of 900 to 2700 meters. Once believed to be in large numbers, its numbers have reduced to a few in this area at present. It generally weighs 25 to 30 kg.

c) **Barking Deer** (*Munitiacus muntjak*), is found in a very few number in low lying Chir bearing areas of Ramban ranges and locally known as kakar. This deer has well developed horns on bony pedicles. Its haunts are thickly-wooded hills. The male is distinguished by sharp exposed canine teeth and small upright antlers. It is diurnal in habit. Its food consists of leaves, grasses and wild fruits

d) **The Musk Deer** (*Moschus moschiferus*), is a small, horn-less deer, not more than 50 cm heights at the shoulder. Its food consists of grasses, lichens, leaves and flowers. The male of the species secretes musk. This deer has mercilessly been killed for its musk pod and is now threatened with extinction. The males carry no antlers, but have peculiar tusks, which are elongated upper canine teeth. Musk is secreted in a glandular sac under the skin on the abdomen in males. It has a strong odour and is largely used in perfumery. It, therefore, needs special protection.

D) Pigs

a) **The Indian Wild Boar** (*Sus scrofa*), once existed in large numbers, is now reduced to a few numbers found mostly in the sub-tropical belt of Ramban Range up to an altitude of 2500 meters. It lives in grass or scanty bush jungle. It is omnivorous and destroys crops in cultivated areas. This is the reason for its large scale killing by the locals.

E) Primates

a) **The Common Langur** (*Presbytis entellus*), locally known as *langur,* it is frequently found in Ramban and Banihal Range seen as much around the habitation as in the forests. It has a long limbed black faced and long tailed primate. It inhabits altitudes up to 3500 meters above mean sea level. In general more arboreal in habit than Macaques. *Langurs* are herbivores. They eat wild fruits, flowers-buds, shoots and leaves. They occasionally pillage garden and cultivation. *Langurs* live in fairly large groups of all ages and both sexes.

b) **The Rhesus Macaque** (*Macaca mulatta*), locally known as Bandar, it is found almost all over this division in the low lying areas up to 2500 meters altitude. It is heavier in its build than the *langur.* The hair on its crown radiate backward from the forehead without the near centre parting. This monkey lives in troops. It generally damages young seedlings of Chir by uprooting and chewing them.

2.2.3. Aves (Birds)

a) **Land Birds.** Because of the altitudinal variation, the avifauna of Ramban Forest Division exhibits a great degree of diversity. Important bird species that are found in this division are as follows

1.) Pheasants and Fowl group

a) **The Monal pheasant** (*Lophophorus impejanus),* magnificent pheasant with a brilliant metallic green head and crest of wire like spatula-tipped feathers,

glistening purple upper parts, white patch on back, cinnamon coloured, short broad and square cut tail. Found in high level fir and sub alpine zone in summer and descends down in winter.

b) **The koklas Pheasant** (*Ceriornis macrolophus),* the cock is of size of domestic fowl is grey above, streaked blackish, chestnut below. Brown crest between two long metallic green horn like tufts jutting out behind its metallic green head. White patch on both sides of head, tail reddish-brown and pointed. Found in Ramban and Banihal Ranges.

c) **The White Crested kaleej Pheasent** (*Gennaeus hamiltoni),* Male black above, glossed with steel blue, with a whitish rump, long white lying-down crest. Tail long, of glossy black sickle-shaped pointed feathers.

d) **Red Jungle Fowl** (*Gallus gallus),* Golden brown and black, similar to domestic bantam breed. Found in Chir zone of this division. It is rarely seen beyond sub-tropical belt.

2.) Partridges and Quail Group

a) **Black Patridge** (*Frabcikubys francolinus*), chiefly black, glistening white cheek patches and chestnut collar of the male diagnostic. Found in sub-tropical zone of the division.

b) **Grey Patridge** (*Francolinus pondicerianus*), stub tailed, greyish brown with chestnut blotches and black vermiculations. Chestnut tail, Rufus buff throat.

c) **The Chukor** (*Alectoris graeca*), pinkish grey-brown partridge with a black band running across forehead through the eyes and down sides of the neck to meet on the upper breast. Found on bare rocky hill sides at higher altitudes.

d) **The Ram Chakur or Himalayan snowcock** (*Tetraogallus himalayensis),* looks like a giant edition of grey partridge with mixed grey, white, chestnut and black plumage. Found in uppermost portion of Ramban and Banihal Range.

e) **Common or grey Quail** (Coturnix *coturnix),* a plumb, squat almost tailless pale brown bird with buff spear shaped streaks. Found in the lower portion of the division.

3.) Dove and Pigeon Group

a) **Blue rock Pigeon** (*Columba livia),* slaty grey bird with metallic sheen of green, purple and magenta. Two dark bars on wings. Found on rocky hills of the division.

b) **Ring Dove** (*Streptopelia decaocto),* vinous grey and brown with narrow black ring on hind neck found in the lower open Chir bearing areas.

c) **Spotted Dove** (*Streptopelia chinensis),* white spotted pinkish brown and grey above. White and Black chessboard on hind neck. Found all over sub-tropical to temperate areas of the division.

e) **Rufous Turtle Dove** (*Streptopelia orientalis),* large reddish brown dove. Scaly pattern above and a black and white 'chessboard' on sides of neck. Found all over upper portion of the division in summers.

4.) Vultures

a**)** **White Backed or Bengal Vulture** (*Pseudogyps bengalensis*), white back and white band on under side of wings diagnostic. Found in lower areas of the division.

b) **Himalayan Griffon Vulture** (*Gyps himalayensis),* enormous sized bird with long necked scrawny neck and un-feathered bald head. Colour sandy white or khakhi. Found in higher reaches.Vultures are under threat from the Vetenary drug namely Diclofenac, non-steroidal anti inflammatory drug(NSAID) used to treat livestock. Vultures feeding on the carcasses of the animals recently treated with Diclofenac suffer renal failure and die. Vulture provides a crucial ecosystem serves through the livestock carcasses and their loss has had huge socio economic impact across the Indian sub-continent. Without Vultures hundreds of thousands carcasses have gone uneaten- left to rot in the sun, these pose a serious risk to human health. Livestock carcasses provide a breeding ground for numerous infectious diseases including Anthrax and encourage the proliferation of pest species such as rats.In 2006, the Government of India, Pakistan and Nepal finally introduced a ban on the manufacture of Diclofenac and pharmaceutical firms are now encouraged to promote an alternative drug " Meloxicam" which is proven be harmless for Vulture

c) Fulvous or Indian Griffon Vulture (*Gyps fulvus*), smaller than above two the adult is cinnamon brown but often quite pale. Found in higher zone.

5.) Other birds

a) **Roseringed Parakeet** (*Psittacula Krameri)* ,smaller edition of the Alexandrine parakeet but lacking maroon shoulder patches. Female lacks the black and rose-pink collar. Found in lower altitudes.

b) **Pied Crested Cuckoo** (*Clamator jacobinu)* crested black and white bird. White tips to tails. Restricted to lower areas.

c) **Crow Pheasant** (*Centropus sinensis),* glossy black bird with conspicuous chestnut wings and long black graduated tail. Found in lower areas of the division.

d) **Roller Or Blue Jay** (*Coracias benghalensis),* blue above with brown breast and pale blue abdomen and under tail. Found near cultivated areas in lower regions of the division.

e) **Small Yellownaped Woodpecker** (*Picus chlorolophus),* yellowish green with golden nuchal crest. Forehead, moustachial streak crimson. Found in wooded areas.

f) **Brahminy Myna** (*Sturnus pagodarum),* grey above, reddish fawn below with glossy black crown and long recumbent crest. Found near cultivation in lower areas.

f) **Indian Myna** (*Acridotheres tristis),* dark brown with bright yellow bill, legs and orbital skin. Found near habitations throughout the division.

g) **Jungle Myna** (*Acridotheris fuscus),* similar to Indian myna but more greyish devoid of yellow skin around eyes. Found in almost all areas except lowermost portion.

h) **Yellow Billed Blue Magpie** (*Cissa flavirostris),* purplish blue with black head, neck and breast. White patch on nape. Long streamer tail, bill yellow, legs orange. Found in dense forests as well as open areas in the temperate zone.

i) **Tree Pie** (*Dendrocitta vagabunda),* chestnut brown bird with sooty head and neck. Black tipped grey tail.

j) **Himalayan tree Pie** (*Dendrocitta formosae*), sooty brown tree pie with chestnut under tail. Found in wooded areas.

k) **Jungle Crow** (*Corvus macrorhynchos),* a glossy, jet-black crow with a hoarse *caw* call. Found in wooded country and near habitations all over the division.

l) **House Crow** (*Corvus splendens),* grey neck and smaller size distinguishes it from Jungle crow. Found near habitations all over the division.

m) **White Cheeked Bulbul** (*Pycnonotus leucogenys),* glistening white cheeks and sulphur yellow under rood of tail diagnostic. Found near habitations throughout the division.

n) **Rufostailed Flycatcher** (*Musciicapa ruficauda),* drak brown, found in temperate zone on the division.

o) **Paradise flycatcher** (*Terpsiphone paradise),* adult male with metallic black crested heads, silvery white body and tail streamers. Female are chestnut above and white below.

p) **White Spotted Fantail Flycatcher**, sooty brown with white spotted breast and flanks. Found in temperate zone in wooden localities.

q) **Tailor Bird** (*Orthotomus sutorius), s*mall olive green bird, white underneath, rusty crown and two elongated pinpointed feathers in tail. Seen in bushes and around habitation.

r) **Black Redstart Black** and orange chestnut bird with constantly shivering orange chestnut tail. Found along nallas in temperate regions of the division.

s) **Indian Robin** (*Saxicoloides fulicata),* male black with white wing patch, rusty red under root of tail. Shy brown, no wing patch. Found near habitations and cultivated areas.

t) **Himalayan Whistling Thrush** (*Myiophonus caeruleus),* dark purple blue, spotted with glistening blue. White spots on wing coverts bill yellow. Found in dense forests and along nallas throughout the division. Song resembles human whistle.

u) **Grey Tit** (*Parus major),* glossy under crested black head, glistening white cheek patches. Found near habitation and light wooded areas.

v**)** **House Sparrow** (*Passer domesticus),* male with grey crown, black around eyes, chestnut in back. Very common around human habitation throughout the division.

w) **Himalayan Great Barbet** (*Megalaima virens),* brightly coloured barbet with heavy yellow bill with bristles at base. Maroon crown with violet blue, black head. Bright scarlet patch under tail. Visit this division in spring and summers.

B). Aquatic Birds

A few species of migratory ducks are encountered seasonally along the river Chenab and Banihal nalla.

2.2.4. Reptiles

2.2.4.1. A variety of both poisonous and non-poisonous snakes are found all over the Division. Among the poisonous snakes Cobra, and Pit Krait, Rat snake viper are worth mention. Lizards are common in sub-tropical and sub-temperate belt.

2.2.5. Fishes

2.2.5.1. Local varieties of fishes including Himalayan trout are of common occurrence in the river Chenab and its tributaries.

2.2.6. Injuries to Which Fauna is Liable

2.2.6.1 The fauna of the tract is liable to injuries by man, wildlife, epidemics, atmospheric influences and fires.

2.2.7. Injuries by Man

2.2.7.1. Man poses the biggest threat to the fauna. Hunting (both legal as well as illegal) of wild animals and birds has always been a sport for man. Wild animals and birds are killed for their valuable skins, horns and flesh. Even the slightest damage by

the wild animals to the crop is not tolerated, and this results in the killing of the wild animals and birds. Also ever since the portions of this division have been affected by the militancy, the threat to the wild animals has increased considerably. The issuance of gun licenses on the large scale to the local inhabitants under the garb of self-protection has mainly been responsible for large scale killing of wild animals and birds. Man is responsible for creating a ecological imbalance in the biological pyramid by killing certain forms of wild life. Large scale destruction of forests, encroachments, excessive felling and frequent fires are also responsible for destroying the habitat of the wild life.

2.2.8. Injuries by Epidemics

2.2.8.1. Epidemic is rare among the wild animals and birds. No attempt has so far been made to study this aspect of the wildlife. However sometimes contagious diseases do spread among the wild animals mainly through the domestic animals grazing inside the forests.

2.2.9. Injuries by Fire

2.2.9.1. Fire is responsible for large-scale destruction of small animals, birds and micro-fauna. At times wild animals also get trapped and killed in the forest fires.

2.2.10. Injuries by Atmospheric Influences

2.2.10.1. Though the wildlife has an inbuilt capability to withstand and survive the vagaries of nature, yet unlikely atmospheric influences do effect the young once of the wild animals and the birds. Birds suffer from heavy snowfall, rain, storms and drought as their young ones and eggs are destroyed by the atmospheric influences.

CHAPTER-III
Utilisation Of The Forest Produce

3.1. Agricultural customs and wants of the population

3.1.1. **Demography:** Ramban district having an area of 1313.92 Sq Km was carved out from erstwhile Doda district in 2007 by detatching Ramban and Banihal tehsils. Ramban town is the district headquarters. The town is located midway between Jammu and Srinagar along the Chenab River, on National Highway-44, (originally National Highway 1A), approximately 150 km from Jammu and Srinagar. District Ramban is very mountainous and least developed; it shares its boundary with Reasi, Udhampur, Doda, Anantnag and Kulgam. Ramban Forest Division comprises of Banihal and Ramban areas however Baotote and Gool areas of Ramban district falls in Batote and Marwah Forest Divsion respectively. While rural sector of the district is constituted of 127 villages including 2 uninhabited villages and one forest block, its urban areas are Banihal, Ramban and Batote Municipal Committees are made up of 7 wards each. As per 2011 Census, the district has recorded a population of 283,713, number of males and females is of the order of 149,132 and 134,581 respectively and total number of household is 55490. The number of females per 1000 male's i.e sex ratio in the district is 902 which is higher than the corresponding ratio of the State. 54.27 per cent of the total population of the district have been recorded as literate which is lower as compared to that of the corresponding proportion of the State (67.16 per cent). Out of total population Muslims constitute 70.68 %, Hindus 28.56% and rest are others religions. Schedule caste population is just 4.91 % and Scheduled tribe population is 14.01 % and major tribes of this district are Gujjars, Bakerwals, and Gaddies etc. who are dependent on the Forest areas. The sex ration of the district as per 2011 census is 902 which is better than that of the state. The living standard of local people is not very high and most of the people are engaged in the primary economic activities. Besides agriculture local people are employed in the Govt. jobs and tourism realted activities. There are no industrial units in this district worth mentioning. Though Govt. has taken many initiatives like Sarve Shiksha Abhiyaan, Mid Day Meal Scheme, Rashtriya Madhyamik Shiksha Abhiyan etc for improvement of education system but the quality of education is not up to mark. Construction of house in the area is dependent largely on the timber from the forests. People having better economic conditions reside in two or three storey house made of sun burned bricks, dressed stone, with roof made of tin covered truss. However those having poor economics conditions and residing in remote areas construct huts made of stone and mud walls having timber reinforcement with mud roof. After creation of Ramban as new district and as a result of various social welfare schemes of the Govt. there is gradual improvement in the socioeconomic conditions of the local people.

3.1.2. **Agriculture:** Agriculture, Government jobs and tourism related jobs are the main occupation. The agriculture practices are primitive and due to absence of mechanised agriculture the productivity of the area is very low. The agriculture is

more or less of subsidence level as land holding is very small and fields have poor fertility besides the problems of soil erosion. As 95.84 % of population resides in rural areas and is dependent on agriculture which is dependent of forests of the region. Net sown area of the district is 18423 ha which comes to 8.93% of the total area of the district. Total cropped area is 24943 Ha and out of which only 6520 Ha area is sown twice and in rest of the area single cropping is practiced.

3.1.3. The overall per capita holding of the farmer in the district is very small. The main Kharif crops are Maize and Paddy and the main Rabi crop are Wheat and Mustard. People also keep livestock such as cow, sheep, and goats and in the upper regions of the Division horses and ponies are being domesticated. The tribal population of the area is dependent on forest area for rearing their sheep, goats, cattle.

3.1.4. The forests play vital role in the lives of villagers who depend upon them profoundly for their requirements. Forest form 46.21 % of land in the district and more than 80% of villages are located adjoining forests. Villagers as well as the town dwellers requirement for constructional timber, firewood, torchwood and fodder for livestock are met from the forests. These demands of the local population exert tremendous pressure on the forests, which has resulted in progressive deterioration of crop stand and at certain places led to its depletion. Forest department is unable to fully meet demand of local people for timber and firewood as a result many times they resort to forest damage.

3.2. Markets and marketable products

3.2.1. There is no well developed market in Ramban, Banihal or Batote. The nearest market is Jammu. However due its unique geographical location, there exists ample scope for development of local markets for niche products. The niche products of Ramban that can be marketed successfully are forest timber, forest based NTFPs, Gucchi, horticulture crops and floriculture. As both Ramban and Banihal towns are on the national highway so there is good scope for the development of a vibrant market.

3.2.2. The forests of Ramban are rich in timber species of Deodar, Kail and Fir. Traditionally this area was major source of timber to the state during the operations of lessees, during when green marking was in vogue. However the ban on green felling significantly contracted the timber trade to insignificance. This has led to overall loss of economic activities in the region. The broad leaved species of the area are used primarily for firewood and for construction of agriculture implements and furniture. Resin extracted from Chir pine was one of the most important product have multiple uses in various industries and department used to extract sufficient revenue but due to excessive extraction over period of time its extraction has been stopped for the time being. NTFPs like medicinal plants from the wild upper and middle Himalayas are of the best quality in terms of the concentration of active ingredient from a given unit

weight. Prominent among them are Kuth, Dioscorea, Patis, Dhup, Anardana, Bankakri, Belladona, Artemesia, Suranjan talakh, Muskhbala, Banafsha, Aconitum etc. In the recent time another herbs Nagchatri (*Trillium govanianum*) has been in quite a demand in markets in Amritsar. Guchhi is also premium products found in the area which can be marketed. The detail of yearwise extaction of NTFP is given in Chapter for NTFP.

Demand and Supply of forest produce and pressure on forests

3.3. Timber Requirement

3.3.1. Population living in jurisdiction of Ramban Forest Division is 201402. An average size of household is 5.11 as per census of 2011 and hence number of families worked out to be 39413. In the remote places of this division timber is the major component of building construction. It was observed that for construction of a good quality house about 15 cum of wood is required. Also the constructed houses require complete renovation after 25 years. The decadal growth rate of population is about 25% in this area, on an average 985 new houses need to be built each year. Due to construction of road network considerable number of people are constructing the Pucca house with cement concrete roof in ares near the road more over there are some private timber sale depots that sell imported timber or timber brought from private lands . Due to socio- economic reasons and people prefer to live in joint family system hence approximately 300-400 new houses are built and about 600-700 houses are renovated every year in this division and all people are not i position to repair their house when required because of poor economic condition and less than 50 percent houses are repared timely . Moreover there is a trend in increase in rate of sale of timber from private timber sale depots. In year 2007-08 only 150 cft timber was sold but in year 2016-17 timber sale from private depots rose to 8945 cft the datails is given in **Annexure XIX.** Timber required to repair each house is about 5 cum so total annual timber requirement is worked as under .

Timber requirement for construction of new houses = 350 x 15 = 6000 cum

Timber requirement for renovation of houses = 600 x 5 = 3000 cum

Table No. 3.1. Annual Timber Requirement Estimated.

Timber requirement	Calculation	Volume of Timber (cum)
Annual timber requirement for new houses	400 x 15	6000
Annual timber requirement for the renovation of old houses. (Assuming 5 cum of timber for old house repair)	600 x 5	3000
Total Annual Timber requirement		9000

3.3.2. Most of the timber requirement is met through concession. Sometimes illicit damage does occur to meet the timber requirement.

3.3.3. For the concessionists who are living in the vicinity of the forests, dry fallen Kail and Fir trees are sanctioned by the DFO for construction purposes under Jammu Forest Notice. For fire victims the trees are sanctioned at free of cost. Also extracted timber in the form of scants is sold to the concessionists through Timber Sale Depots in subsidized rates in this Division.

3.3.4. Also forest lessees, later the State Forest Corporation (SFC) worked out the forests. They extracted the timber in log as well as sawn form. Earlier lessees had installed band saws in the forests for extraction. The extracted timber was transported by Patroo, rope ways and head load upto the road head or launching sites. River mahaning was the common practice in this division. Earlier forest department used to provide timber to other Govt. department for construction purposes but it has now been stopped by Govt.

3.4. Firewood

3.4.1. People require firewood for cooking, heating and cremation purposes. The population in the urban locality has access to LPG gas cylinder for cooking. It can safely be assumed that there is no requirement of firewood for cooking in town area. In order to cut cost the hotels in the town area resort to sourcing firewood, illegally. It is expected that the recent move of Government to cap the number of subsidized cylinders is going to nudge the population to relook for cheaper cooking options, which invariably would be firewood. During peak winter when the roads are blocked and power lines snapped, arrangement of firewood is a must. The non availability of firewood from firewood depot encourages the petty thieves for their illegal supply. The activities of the thieves although appear petty but nevertheless when carried on unabated takes a heavy toll on the forest crop especially Heru. The people in the villages are bereft of any access to LPG cylinder, and depend entirely on forests for firewood. Trouble arises when forest floor along profusely habituated stretch is devoid of any dead, dry fallen wood, and resultantly in order to sail over the winters the village folks are forced to hack down standing trees. Majority of the area situated in temperate zone and local residents require fire wood for their domestic needs and warming their house during winter. Approximately about 4 kg of firewood is required per soul per day during winter. About 1 kg of firewood is required during summer season. Hence the total requirement of firewood is 1837793 quintals. Most of the firewood is collected from the forest area only a small percentage is extracted from private land. Below given data provided by Ramban Forest Division is just small percentage of annual firewood requirement.

Table No. 3.2. Firewood Sold from Departmental Firewood Depots in Last 10 Years.

S.N	Year	Firewood Sold for Cremation/ Religious purposes (in Qtls)	Firewood Sold to Security Forces/ Commercial Purposes (in Qtls)	Total (Qtls)
1	2007-2008	200	575	775
2	2008-2009	292	500	792
3	2009-2010	344	510	854
4	2010-2011	226	414	640
5	2011-2012	316	413.5	729.5
6	2012-2013	444.5	754.6	1199.1
7	2013-2014	1210.5	132	1342.5
8	2014-2015	447	302	749
9	2015-2016	390.5	30	420.5
10	2016-2017	--	--	0
Total		**3870.5**	**3631.1**	**7501.6**

3.4.2. To meet the demand of firewood for cremation and other purpose there is need to maintain a stock of atleast 2000 qtls. Presently this division has registered firewood depots at Ramban/Banihal catering primarily to the cremation needs of the people. Firewood for cremation purpose is supplied on concessional rate. The annual sale of firewood from the depot in the previous ten years given as below in table 3.2. However it is pertinent to mention that in most cases people do use the firewood from the private land.

3.5. Methods of harvesting and their costs

3.5.1. The forest felling extraction operations are still manual by use of axe two man saw. The felled tree is delimbed and logs are cross cut to 10-12 feet sizes. The logs are then debarked and then converted into standard B.G size scants. In situations where the extracted scants are minimal and road head less than 5 km head load carriage to nearest road head is opted. Whereas, in coupes with copious volume outturn and in absence of nearby road head, slide methods are opted. In areas having stream with appropriate flow speed, wet slides are established and in their absence dry slides are the rule. Scants are later launched into the river and later collected downstream by catching scants by making a boom. However when the sleepers have to cross longer distance and down many deep valleys aerial ropeways or cranes are used. When sleepers are to be transported down the slope Tar spans working on principle of gravity are also used. Usually more than one tar span are required to be established to transport to road head due to high mountains. When sleepers are to be moved against gravity cranes are used which are powered by diesel engines. Movement of scants is regulated by issuance of launching permission and transportation permission by river and road. In movement through river River F-25 is issued and in case of mechanical transportation by road F-25 is issued. The permission for transportation is issued

by Divisional Forest Officer within his territorial jurisdiction and when transported outside the division the permission is issued by the concerned CF territorial. Timber after reaching the sale depots are graded and arranged into lots and then sold by open auction.

3.5.2. The extraction of resin is carried out by Rill Method which is considered less harmful than Cup and Lip method however resin extraction is not prescribed in this working Plan.

3.6. Lines of export

3.6.1. In the earlier times rivers were the preferred mode of transport. This division is located on the National Highway and the division headquarter is very well connected to Jammu and Srinagar cities moreover adequate road network has been laid to connect various parts of this district to the main national highway. The opening of the Chenani-Nashri tunnel which is the longest tunnel in India has futher improved the connectivity of this district with the rest of India. The transportation of timber from Ramban to rest of markets by road is not an impediment to this division. However the transportation of timber and firewood from interiors of division up to the national highway is sometime hindered due to poor/kucha roads .The firewood and timber from interior to pucca road is sometime done economically by floating in rivers /nallas. It would also be necessary to construct fair weather road to interior forest areas to enable uniform forest working and to improve access to facilitate protection of forests and transport of forest produce. It has been noticed that non availability of easy access has often resulted in the forests being not worked according to plan. The construction of Banihal-Qazikund railway line has connected Ramban district to markets of Kashmir region and local people as well as forest department have choice to sell their produce markets of their choice. The transport of forest produce outside the state is easily done by rail and road connectivity.

3.7. Past and Current Prices

3.7.1. The timber in the division area is supplied to people either directly from the forests or from the Timber Sale Depots. The price of timber direct from forest is governed as a proportion of the standard rates. The standard rate proposed in the year 1992 is still being charged and in course of time has become completely outdated. There is a need to revise the standard rates to give it some semblance of the prevailing market rate. The financial feasibility of working plan would depend on fixation of the rates in such a way that it is in accordance with the markets rates. The standard rate adopted at present is as below.

Table No. 3.3. Diameter Class wise Standard Rates (in Rs.)

Dia-Class	Deodar	Kail	Fir	Chir

Dia-Class	Deodar	Kail	Fir	Chir
0-10	170	110	70	40
20-20	650	410	270	110
20-30	1310	720	750	215
30-40	2450	1540	1130	625
40-50	4250	2740	2060	1480
50-60	6700	4560	3940	2830
60-70	10480	6780	6480	4570
70-80	14030	8890	9060	6260
80-90	18110	10880	10970	7990
90-100	24080	13620	13670	9020
100-110	26460	14940	14820	10000
110-120	28360	15280	15770	11400
120-130	29800	16000	16460	11810
130-140	30840	16320	17120	12170
140-150	32040	17000	17580	12420
150 & over	33120	17400	17900	17580

3.7.2. The standard rates mentioned above have been revised by Govt. Order number 10-FST of 2018 dated 09.01.2018 of Jammu and Kashmir in pursuance to cabinet decision number 218/13/2017, dated 21.12.2017. Sanction was accorded by Govt. for fixation of Standard Rates under different usage categories of Forest Trees viz.Commercial supply, Supply to Govt. DepartmentsAssesment of compensation under forest Conservation Act. Supply under Kashmir and Jammu Notice and compounding of damage cases. The new rates are as under:

Table No. 3.4. Diameter Class wise Standard Rates (in Rs.)

Dia-Class	Deodar	Kail	Fir	Chir
0-10	1303	658	258	77
20-20	4559	2304	904	231
20-30	9118	4608	1549	462
30-40	17586	8887	3873	1309
40-50	30612	15799	7101	3080
50-60	48198	26332	13556	6006
60-70	72297	38839	22335	9626
70-80	100955	51346	31243	13245
80-90	130264	62208	37827	16864
90-100	157619	71424	42863	19020
100-110	173902	78336	46477	20330
110-120	185626	79982	49447	23256
120-130	195396	83932	51642	24026
130-140	201909	85577	53836	24796
140-150	209725	89198	55257	25335
150 & over	216890	91173	56289	25643

3.7.3. The Standard Rates for Broad Leaved class shall be calculated as follows:

Special Class	"A Class"	"B Class"	"C Class"
Equal to Deodar	Half of Deodar	One third of Deodar	One eighth of Deodar

3.7.4. The supply of timber from Timber Sale Depots is as per rates prescribed by the Government every year. The present rate and previous revision of the depot rates is given below for reference.

Table No. 3.5. Zone wise Rates of Timber of Various Species Sawn and Log form (Rs/cft)

S. No.	Govt. order	Zone	Timber Form	Deodar	Kail	Fir
1	2016	A	Log	266	187	108
			Sawn	310	230	150
		B	Log	535	380	214
			Sawn	581	426	260
		C	Log	854	599	341
			Sawn	904	649	391
		MC	Log	391	226	156
			Sawn	474	307	173
2	212 FST of 2010 dt:13/5/2010	A	Log	185	130	74
			Sawn	215	160	104
		B	Log	345	245	138
			Sawn	375	275	168
		C	Log	513	360	205
			Sawn	543	390	235
3	278 FST of 2006 dt:19/5/2006	A	Log	161	102	59
			Sawn	202	121	81
		B	Log	246	160	120
			Sawn	281	193	136
		C	Log	299	173	119
			Sawn	362	231	132
		M/C	Log	391	226	156
			Sawn	474	307	173
4	314 FST of 2005 dt:1/8/2005	A	Log	146	93	54
			Sawn	184	110	74
		B	Log	197	128	96
			Sawn	225	154	109
		C	Log	299	173	119
			Sawn	362	231	132
		M/C	Log	391	226	156
			Sawn	474	307	173
5	501 FST of 2003 dt:21/10/2003	A	Log	146	93	54
			Sawn	184	110	74
		B	Log	197	128	96
			Sawn	225	154	109
		C	Log	272	157	108
			Sawn	329	213	120
			Sawn	204	122	82
		B	Log	246	160	120
			Sawn	281	192	136
		C	Log	340	196	134
			Sawn	411	266	150

3.7.5. The demand for timber is more and Government outlets are unable to meet it so private Timber Sale Depots have come up in the areas and locals are purchasing timber from them. The private TSDs are registered by the Divisional Forest Officer. The private TSDs prefer sale of imported timber, however, the demand for the same is still to catch up. The sale trend of timber in Ramban Forest Division from the private Timber Sale Depots is as under.

3.7.6. The average price of timber sold by SFC Depot at Jammu is as below.

Table No. 3.6. Species wise Rates for Year 2012-13. (Rs.)

Year	Species	Rate/ cft.	Class
2012-13	Deodar	1841	B
	Deodar	1013	C
	Kail	1142	B
	Kail	584	C

Table No. 3.7. Timber Sale Year wise Trends from Ramban Forest Division.

S. No	Year	Ramban Range No. of Pvt. TSDs	Volume Sold (CFT)	Range Banihal No. of Pvt. TSDs (Cft)	Volume Sold (in Cfts.)	Total Vol of Timber Sold (Cft)
1	2007-08	1	150	0	0	150
2	2008-09	01	165	0	0	165
3	2009-10	01	185	3	580	765
4	2010-11	01	200	3	550	750
5	2011-12	01	195	3	520	715
6	2012-13	01	205	4	690	895
7	2013-14	01	215	5	900	1115
8	2014-15	01	180	5	1000	1180
9	2015-16	01	200	7	1300	1500
10	2016-17	01	210	7	1500	1710
Total			**1905**		**7040**	**8945**

CHAPTER-IV
Activiries 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 lessees before creation of SFC and later the forest working was nationalised by The Jammu and Kashmir Nationalisation of Forest Working Act, 1987.

4.1.2 Forest Department hands over the coupes to SFC and levies the royalty. The royalty rates were fixed in the year 1989-90 and species wise rates per cft for deodar, Kail and fir are Rs.94.23, 44.77 and 35.02 respectively. 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) 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 for 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 only it is enumerated for dry / fallen trees. The CF (Working Plan Circle) issues the technical clearance. Based on the technical clearance, the trees in the compartment are marked. The marking list is sent to CF (Working Plan Circle) for issue of technical sanction. The CCF (Territorial) issues the administrative approval, based on the TS. Then the marking in the compartment is handed over to the SFC for extraction. Total marking handed over to SFC in Ramban Forest Division as standing volume is given as under standing volume species wise in CUM.

Table No. 4.1. Table Showing the Volume (in cft) handed over to SFC from Ramban Forest Division during 1979-80 to 2012-13.

Year of Handing over	Deodar (CUM)	Kail (CUM)	Fir (CUM)	Grand Total (CUM)
1985-86	3735.034	3343.645	21406.86	28485.53
1986-87	0	169.1491	14171.56	14340.71
1987-88	247.5967	111.5303	7839.903	8199.03
1988-89	407.8313	294.7162	5942.151	6644.699
1989-90	1039.827	895.2422	22730.74	24665.81
1990-91	0	0	0	0
1991-92	0	0	0	0
1992-93	0	0	0	0
1993-94	40.469	598.4318	281.4718	920.3726
1994-95	480.3642	1980.66	1449.3	3910.324
1995-96	1757.855	9612.972	7957.253	19328.08
1996-97	0	0	0	0
1997-98	764.1849	9251.213	13804.46	23819.86
1998-99	0	493.552	335.921	829.473
1999-00	586.1213	4172.977	677.5303	5436.628
2000-01	177.4127	2613.59	1657.588	4448.59
2001-02	1605.601	5082.001	723.9706	7411.572
2002-03	53.6568	1454.28	4480.371	5988.308
2003-04	53.0908	597.6677	2492.169	3142.927
2004-05	0	0	0	0
2005-06	42.69055	2787.833	6145.076	8975.6
2006-07	364.1786	513.1356	0	877.3142
2007-08	0	0	0	0
2008-09	0	25.4983	0	25.4983
2009-10	612.7799	1893.072	3402.934	5908.785
2010-11	0	0	0	0
2011-12	0	0	0	0
2012-13	434.0654	224.0228	1128.944	1787.032
2013-14	0	0	0	0
2014-15	168.5548	3881.373	2431.678	6481.606
2015-16	771.5288	698.911	2448.544	3918.984
2016-17	65.4013	1275.382	2193.038	3533.821

4.1.4 The SFC prepares the estimate for the timber operation, based on the expected out turn and calculates the 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 is monitored closely 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 is 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 be on the down side. The falling tree shall never injure the other standing trees. Likewise there are many conditions. The territorial department shall be reported about the progress of the 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 for sale 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 move 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. If smooth moving water channel is available, the from the origin upto the destination, scants are launched in water body and caught at the *boom* erected at the destination. From the road-head 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 Rates of Extraction

4.1.7. Mostly, the timber is sold in open auction by SFC the rates of extraction by SFC from forests is as under:-

The Rates in vogue in SFC for timber operations during 2015-16 are as follows.

	Activity	**Category (Norm Rate in Rupees)**			
	SAWN FORM	D	C	B	A
(a)	**Extraction (on FMM)**				
1	Felling (per cft)	3.37	2.82	2.56	2.01
2	Hand Sawing – under/odd size (per cft)	44.66	40.80	37.79	34.37
b.	Hand Sawing – standard size (per cft)	51.04	46.63	43.18	39.28
(b)	**Off–road Transportation (on DMM)**				
3	Pathroo (per cft/Km of 33 chain)	7.46	7.26	7.07	6.88
4	Pacci nail (per Cft/Km of 33 chain)	2.79	2.51	2.51	2.41
5	Tarspan (per span/cft)	6.30	5.99	5.99	5.99
6	S.N Mahan (per cft per km of 33 chain)	1.96	1.85	1.85	1.71
7	Main Nallah Mahan (cft/Km)	1.71	1.71	1.71	1.71
8	Head carriage (forests) (per cft/chain)	0.55	0.55	0.55	0.55
9	Crane (per cft/Km)	9.44	8.97	8.97	8.97
10	H/C after nikkasi (per cft/chain)	0.58	0.58	0.58	0.58

(c)	Minor Related Activity (on DMM)	
11	Launching (S.N Mahaning) / Cft	0.41
12	Nikassi (per cft)	0.83
13	Stacking (per cft)	0.78
	LOG FORM	
(d)	**A. EXTRACTION (A1 +A3)**	7.55
	A1 CONVERSION	5.03
14	A1.1 Debranching &Debarking /cft	1.03
15	A1.2 Sawing &log marking/cft	4.01
16	A3 Felling (per cft)	2.52
17	Loading logs (per cft)	4.55
18	Un- loading Logs (per cft)	0.06

(e) Log Rolling

#	Log rolling upto Kutcha Loading Point (Per cft chain)	Norms Rate in Rupees
1	Category A (0-20 degrees)	0.93
2	Category B (20-30 degrees)	0.67
3	Category C (30-40 degrees)	0.49
4	Category D (> 40 degrees)	0.22

(f) Kutcha Road Transportation (Log Form) **(Figures in Rupees)**

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) (Fig. in Rs.)

#	Distance slab in Km	Rate(in Rs/cft/Km)	Rate with 15% Contractor's 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 (Fig. in Rs.)

#	Distance slab in Km	Rate (in Rs/ cft/Km)	Rate with 15% Contractor's 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

4.1.8. Rates of firewood extraction by SFC.

Table No. 4.2 Rates in vogue in SFC for Extraction and Transportation ofFirewood During 2016-17.

S.No.	Item of work	Unit	Revised rate for 2016 17 by SFC (in Rs)
1	Extraction	Quintal	105.57
2	Weighment	Quintal	03.12
3	Loading	Quintal	10.97
4	Unloading	Quintal	3.12
5	Depot Handling	Quintal	2.31
6	Other miscellaneous	Quintal	1.96
	Total		127.05
7	Transportation up to 40 Km and Beyond 40 Km	Quintal/Km	1.9 1.38
8	Additional Loading and Unloading(*)	Quintal	14.09
*Only allowed in exceptional Circumstances subject to authentication/verification and consideration shall be on case to case basis and as per actual.			

4.2. Results of Socio Economic Survey

4.2.1. There are 127 villages and three towns in Ramban district out of which two towns and many villages lie in Ramban Forest Division. There are 54206 households in district and average size of household is 5.2 i.e. five persons per household. Most of the people are dependent on agriculture, Govt. jobs, tourism and construction activities for their livelihood. Literacy rate is 54.27 % and sex ratio is 902 and only 4.88 % people have access to computer/laptops. Main source of drinking water is spring and river/ canal.

4.2.2. Large percentage of population i.e.89.11% is dependent on the forewood from forests as source of fuel for cooking.

4.2.3. The people are largely benefitted by the welfare schemes of the Government such as MGNREGA, etc. Many people got seasonal employment in GREF under road construction activity. The food grains are supplied by fair price shops in the interior parts of the terrain, so that people are getting something to eat. The

irony is that the cost of transportation of food grains is more than double its actual cost, as the only mode available for transportation is depends on *ponnies*.

4.2.4. As the tract is the remotest part of the State, some of the places are not covered under conventional electric grid. Parts of Pogal Paristan and Banihal Range are covered with electricity poles. The remaining portions of these ranges are still uncovered by electrical grid. People are being distributed with solar operated light but it is not sufficient. People are still using the torch wood and kerosene lamps for lighting purpose.

4.2.5. As the most part of terrain is unconnected by road network, the modern fuels still not reached households of these villages and hamlets. People are still using the firewood for cooking and warming of their houses during winter.

CHAPTER-V
Staff And Labour Supply

5.1. Staff

5.1.1. The sanction strength and working strength of Ramban Forest Division has been given in table below in order to analyse the change in number of employees under various posts working in this Division over a period of time.

Table No. 5.1. Detail of Sanctioned Staff Strength of Ramban Forest Division in Year 1985-86.

S.No	Designation	Scale of Pay	Sanctioned strength	Actual working
1	DCFs	15600-39100	1	1
2	ACFs	9300-34800	2	1
3	RO Grade-I	9300-34800	2	2
4	RO Grade-II	9300-34800	2	2
5	Head Assistant	9300-34800	0	0
6	Foresters	5200-20200	17	10
7	Dy. Foresters	5200-20200	2	1
8	Forest Guards	5200-20200	62	57
9	Sr. Asstts.	5200-20200	1	1
10	Jr. Asstts	5200-20200	5	2
11	Sr. Driver	5200-20200	1	0
12	Mali	5200-20200	3	3
13	Fresh	4440-7440	1	1
14	Chowkidar	4440-7440	6	6
15	Orderly	4440-7440	9	7
16	Helpers	4440-7440	39	38
17	Watchers	4440-7440	9	9
	Total		**162**	**141**

Table No. 5.2. Detail of Sanctioned Staff Strength of Ramban Forest Division in Year 2016-17.

S.No	Designation	Scale of Pay	Sanctioned strength	Actual working
1	DCFs	15600-39100	1	0
2	ACFs	9300-34800	1	1
3	RO Grade-I	9300-34800	2	1
4	RO Grade-II	9300-34800	2	0
5	Head Assistant	9300-34800	0	0
6	Foresters	5200-20200	25	11
7	Dy. Foresters	5200-20200	8	4
8	Forest Guards	5200-20200	78	60
9	Accountant	5200-20200	1	0
10	Sr. Asstts.	5200-20200	1	0
11	Jr. Asstts	5200-20200	6	5

12	Sr. Driver	5200-20200	1	0
13	Mali	4440-7440	2	2
14	Farash	4440-7440	1	0
15	Chowkidar	4440-7440	3	5
16	Orderly	4440-7440	4	2
17	Watchers	4440-7440	40	39
	Total		**176**	**130**

5.1.2. Comparasion of sanction strength and actual working strength for year 1984-85 and year 2016-17 indicates that instead of increase, overall working strength of eomplyees posted in this division there is decrease in total number of employees working in Ramban Forest Division. The population pressure has increased considerably over the period of time. There is shortage of Foresters, Deputy Foresters and Forest guards who are most important officials to ensure the protection of forests. There is need for increase in existing strength sanctiontion strength and working strength so that all the objectives of forest protection can be achieved without any hinderence.

Table No. 5.3. Abrtract of Executive and Ministrial Staff.

Type of Staff.	Sanctioned strength	Actual working	Vacancy	% Vacancy
Executive Staff	159	125	34	21.38
Ministrial Staff	17	14	3	17.65
Total	**176**	**139**	**37**	**21.02**

5.2. Labour supply

5.2.1. Supply of labour for plantation activities and firewood extraction is usually met locally as there is no requirement of skilled labour for such activities. Plantation activities do not necessarily involve skilled labour but still some difficulty is faced in sourcing labour during the season. There is an acute shortage of skilled labour especially for timber extraction of timber. The department is carrying out timber extraction manually which is labour extensive activity and the efficiency is very poor. Due to the improvement in standard of living, less people are ready to take up the vocation of sawing. Moreover due to number of employment assurance schemes like MGNREGA less people are attracted to timber extraction work because most of the time work site is located in remote areas deep inside forests where facitlites may not be adequate for labourers. It is pertinent to mention that over the period of time number of roads have been constructed in rural areas under state plan and central Govt. schemes like PMGSY and as a result in the coming years it would be more appropriate to shift to mechanised timber extraction and timber should be extracted in log form and should be carried mechanically to the sawmills so that there is minimum wastage of timber and quality of timber is not affected.

5.3. Labour rates

Table No. 5.4. Labour Rates.

Government Order No and Date	Rates	From
10-F of 1999 Dated:-10-02-1999	Rs.45.00 per day	
69-F of 2001 Dated:-19-03-2001	Rs.60.00 per day	01-04-2001
253-F of 2004 Dated:-31-12-2004	Rs.70.00 per day	01-01-2005
190-F of 2009 Dated:-31-08-2009	Rs.110.00per day	10-08-2009
117-F of 2011 Dated:-19-04-2011	Rs.125.00 per day	Only or DRW's
27-F of 2018 Dated 25.01.2018	Rs.225 per day	01.01.2018

CHAPTER-VI
Past System Of Management

6.1. General History of the Forests

6.1.1. Very little is known about the ancient history of these forests. However, it is certain that prior to 16th century AD, the forests of this Division formed a part of small territories ruled by chieftains. The tract was ruled by Rajput Kings of Katoch, Chib, Manahas and Thakur clans. These petty chieftains were at constant enmity with each other and the area, under their control changed hands several times. In those days of warfare, people lived mostly on the tops of the hills for their safety. This has been proved by the fact that their places of worship and other stone monuments are found even now on the summits of the hills. The remnants of old civilization are still found in the forests near water springs, deserted agricultural fields and many others monuments of stone.

6.1.2. The area was subjugated by Maharaja Gulab Singh in the year 1849 AD. In the years that followed, the supremacy of the Maharaja on the local Chiefs was fully established. Peace and amity was ensued in the area, with the result many of the squatters gave up their holdings in the forests and settle down in the plains of the' Kandi.' This is how the even aged patches of the Deodar and Kail sprang up in the erstwhile fields. In the earlier times, the administration of the forests was under the control of the Civil Authorities, the *Wazir-I-Wazarat*, being in charge of the district, while the Tehsildar under him used to manage the affairs of the Tehsil. One *Moharrir* with *Wazir-i-Wazarat* constituted all the office establishment deemed necessary for administration of forests. The field used to be looked after by a *Girdawar* or K*umbedan* most often illiterate, in each *illaqa* with few *Rakhas* or Chaorassis under him. The *Girdawar* used to collect *Rasum*, or forest dues, initially from individuals and latter on from village communities as a whole, for various forest produce consumed and utilized by the villagers. The *Rasum* used to be collected at will of the administration and no protection of forest was ever thought of. The forests were burnt at will, and there was no control over the quantity of forest produce consumed by the locals so long as 'Rasum' was paid. Thus the forests were only worked with an object of getting some revenue from them.

6.1.3. There are no records available to show the extent to which these forests were worked for timber. It is stated that the felling for export of timber was started around Samvat 1912 (1833AD) originally by the traders from Punjab and afterwards by the local contractors. The *pattas* and *written* permits were granted to fell a certain number of trees anywhere they wanted and found convenient and were issued to the traders on payment of fixed sum per tree in advance. The permit holders therefore, mostly felled the trees at places they found most convenient and economical. Generally these contractors used to employee local labourers, who preferred to fell trees around their cultivation near their villages and as close as possible to the stream to be used for floating timber. The timber

was not sawn in those days and it was mostly extracted in the form of logs. Concentration of felling around villages resulted in the creation of large gaps, which are now covered with various broad leave species, depending upon the locality factors. This practice resulted in heavy felling in area near and around villages and stream, whereas, the areas away from the villages and floating streams, escaped heavy cut.

6.1.4. A regular Sate Forest Department under the control of Conservator of Forests Mr. J. Mac Donell was started in 1891 AD. The forests were split up to into beats, which were grouped to form various ranges and effective steps were immediately taken to check illicit felling. Udhampur Forest Division, comprising, the Udhampur and Reasi Wazarats were formed under a Divisional Forest Officer. In Samvat 1950 (1893 AD) steps were taken for wasteful and destructive methods of old regime. The Udhampur Forest Division then comprised the present Bhaderwah, Kishtwar, Doda, Ramban, Udhampur, Reasi and Mahore Forest Division. Forest regulation No.1 of Samvat 1951(1894 AD) was passed by the State Council and rules for the protection of the forest property were drawn up under the said regulation. Demarcation was commenced, and survey of boundaries was under taken. Gradually, the forest department expanded its establishment to cope up with the work. Forest fires were discouraged. Many roads and paths to open up the area were constructed. The felling of green trees was discontinued for some times and energies of the department were devoted mainly on the extraction of timber from the felled trees, logs and sleepers left in the forests by the former workers and also the felling of dying and deformed trees which were not to be expected to survive for long was carried out. In Samvat 1961(1904 AD), departmental working of forest was abounded and the procedure involving sale of standing trees to the purchasers as practiced by the forest department of the other provinces was adopted.

6.2. The Creation of Ramban Forest Division

6.2.1. The Udhampur Forest Division was split into Kishtwar and Reasi Forest Division in Samvat 1963 ((1906 AD), Ramban, Banihal ranges besides others formed a part of Reasi Forest Division. In Samvat 1981 (1924 AD) Ramban Forest Division was formed. Consequently, Kuntwara, Siraj and Marmat ranges from Kishtwar Division and Ramban-Banihal Ranges from Reasi Forest Division were excluded and transferred to the newly formed Ramban Forest Division. The Udil Range of Kishtwar Forest Division was also transferred to Ramban Forest Division by the end of Samvat 1988 (1931 AD). Somewhere in the mid thirties, Marmat Range of Ramban Forest Division was transferred to Bhaderwah Forest Division for administrative convenience.

6.2.2. In year 1954 A.D. Ramban Forest Division and Doda Forest Division were constituted as a result of re-organization of the then Ramban and Bhaderwah Forest Divisions consequently Ramban and Banihal Ranges from the then Ramban Forest Division and Batote- Gandhri Ranges from Udhampur Forest Division were

transferred to form then Ramban Forest Division with its headquarter at Batote. Three ranges namely Siraj, Kuntwara and Udil from the then Ramban Forest Division and Marmat Range from Bhaderwah Forest Division were transferred to constitute Doda Forest Division with its head quarter Doda.

6.2.3. The present Ramban Forest Division Comprising Ramban and Banihal Ranges with its headquarter at Ramban which were transferred from Ramban and Doda Forest Divisions respectively, came into being with effect from Morch 1981 as a result of the Re-Organization of the erstwhile Ramban and Doda Forest Divisions, in pursuance of Government Order No:-34-FST of 1981. Simultaneously, the Soil Conservation Range, Banihal of the erstwhile National Highway Division Batote was transferred to Ramban Forest Division, resulting in winding up of National Highway Forest Division.

6.3. Past System of Management and their Results

6.3.1. The brief history as discussed above clearly indicates that the present Forest Division has been constituted of two distinct forest areas namely Ramban and Banihal Ranges. Since these ranges have formed parts of different Forest Division prior to their inclusion in the present Batote Forest Division. There was no working plan for the Ramban and Banihal Ranges for the early stages and the forests were worked under the selection-cum- improvement system. The marking were left at the discretion of the marking officer who were usually foresters or forest guards. This resulted in heavy and haphazard felling.

6.4. Bhai Sher Singh's Plan Samvat 1985 to Samvat 1994 (1928 to 1937) for Ramban Forest Division

6.4.1. In 1928 AD Bhai Sher Singh prepared first regular Working Plan for Ramban and Banihal Ranges. He allotted Deodar-Kail compartments on easy slope to Uniform Working Circle and rest of the compartments to Selection-cum –Improvement Working Circles. The period of this Plan was 1928 A.D.to 1937 A.D.

The following working circles were constituted in this Plan:-

1) Uniform Working Circle
2) Selection Working Circle.
3) Improvement Working Circle.
4) Unregulated Working Circle
5) Un-commercial Working Circle

The area of this range was allotted amongst all the above working circles except Improvement Working Circle. Fellings were conducted in first two working circles.

1. **Uniform Working Circle**: This working circle included important Deodar and Kail forests lying on easy slopes. The blue pine forests were young to middle aged, whereas the Deodar forests were irregular with marked deficiency of mature trees. The Silviculture system introduced was Modified Shelterwood

Compartments System. The main object was to regenerate the forest by giving adequate light conditions by removing the over wood in gradual stages of felling operations. The intensity of felling was left to the discretion of the territorial Divisional Forest Officer depending upon the situation and condition of the crop. Regeneration period of 24 years with a rotation of 120 years was fixed. Only Periodic Block-I areas were defined which comprised compartments having considerable proportion of their crop as mature trees of those having abundant advance growth with an open overwood of mature trees. The overall picture of the compartment was taken into consideration in assigning the compartments to P.B.I although some of these had a considerable stretch of pole crop and these portions could be allotted to P.B.II or III or IV, only if the sub-compartmentation had been done at that time.The Working Plan Officer was of the view that the absence of the mature or overmature trees and the preponderance of the younger ages classes of the crop caused little difference in assigning the area to P.B.I. The choice led either in forcing conversion in young crop or leaving a big portion of the forest unworked. The allotment of different Periodic blocks was not based on logic so readjustment was proposed in next revision. This resulted in the following results in the management of the forests:-

I) Tract was steep and the system did not suit there. Accordingly some of the worked compartments failed to regenerate well. Examples are Co:30, 39 and 40/Ramban.

II) The cultural operations were not carried out vigorously in P.B.I areas which resulted in failure of regeneration. Fires and grazing were not controlled which resulted in the failure of regeneration in some areas.

2. **Selection Working Circle.** This working circle comprised all such Deodar and Kail forests in Ramban and Banihal Ranges which were situated on steep ground and were uniform system could not be applied. These forests had also some proportions of Fir and broad leaved forests. The crop was irregular and proportions of various age classes was far from normal, the upper age classes were underrepresented. The selection system was adopted to remove mature and over mature trees. The Indian selection system applied in past was found unsuitable to induce sufficient regeneration so the work was concentrated in smaller areas and the felling were confined to mature and better stocked crops. The coming up of Deodar and Kail was encouraged in Fir belts. To have concentrated working a felling cycle of 30 years was adopted with an exploitable diameter of 30”d.b.h was fixed to get B.G sleepers. Complete enumeration of all Deodar, Kail and Chir stocks above 12” d.b.h was conducted in 6” diameter classes and the yield was calculated by applying the Howard’s Modification of Von Mantel’s formula.The system was found suitable for the forests despite rugged and very steep topography of the tract but the desired results could not be achieved due to the fact that prescriptions were not followed rigidly. Also heavy grazing and frequent fires coupled with cultivations on steep slopes accelerated the erosion in the tract.

3. **Unregulated Working Circle.** The unworked compartments having such species, which were uncommercial or compartments lying on far flung precipitous grounds, were allotted to this working circle. The working of these forests was left at the discretion of the Chief Conservator of Forests.

4. **Uncommercial Working Circle.** This working circle had crop of little commercial value and mostly contained Fir, broad leaved species and pasture lands. The working in this circle was left at the discretion of the Chief Conservator of Forests. On the whole this area was given protection but no protection could be afforded to this area against fires and heavy grazing.

6.5. Revised Working Plan for Ramban-Banihal by Bhai Sher Singh (1993-2004 Samvat) (1936 to 1947A.D)

6.5.1. The first working plan was revised again by Bhai Sher Singh in S.1993 and the following working circles were constituted:

1. **Selection Working Circle.** The Working Plan Officer observed during the period the period that the commercial forests of these ranges were found unsuitable to be worked under uniform system owing to rugged and precipitous nature of the tract and poor stocking of the forests. So he abandoned uniform system in the revised plan and adopted selection system. All Deodar and Kail forests on workable slopes were allotted to this working circle. The exploitable size of 30" at breast height with a felling cycle of 30 years and a rotation of 150 years was fixed. Complete enumeration of growing stock above 18" d.b.h was carried out in 6" diameter classes and the yield was worked out by the formula G/75 where G represented the growing stock and 18" d.b.h tree and 75 the years taken by 18" d.b.h. tree to attain exploitable size of 30" d.b.h. The yield thus derived at was compared with the formula G/30 where G represents volume of growing stock above 30" d.b.h and 30 the number of years taken by an average tree of 24"-30" d.b.h. to obtain exploitable size. The yield was further reduced by 5% on account of possible errors or for other allowances. The prescribed yield for Deodar was 68000 Cft and for Kail 98000 Cft. The areas allotted for working was $2/5^{th}$ of the felling series. The method of executing felling was left at the discretion of the CCF. Definite coupes were laid out and the following compartments were assigned for working:-

   Ramban Range: 27,31,32,33,34,37,41,42,43 and 44

   Banihal Range :- 3,5,8,9,,10,12,13 and 14.

   Result:

I) The system saved the forests from heavy opening, but the allotment of different compartments was found not have been done rationally.

II) Uncommercial areas have not been marked properly and the top precipitous areas have been treated as commercial.

III) The prescriptions of the plan were not carried out vigorously thus the compartments allotted for working could not regenerate fully. Examples are Co: 30, 33 and 35/Ramban and 9 and 10/ Banihal.

2. **Unregulated Working Circle:**

6.5.2. All Deodar, Kail, Fir and Chir forests with poor quality and low density lying on precipitous ground which were not allotted to the other working circle mentioned above had been allotted to this working circle. Also the Uncommercial Working Circle of the previous plan was discontinued and its area merged with unregulated working circle for protection purposes. However the DFO was at liberty to meet the demand of concessionists from the compartments assigned to this working circle and to make a scheme for fir felling whenever the demand of fir arose.

Results:-

a) All the mature trees of Deodar, Kail, Fir or Chir in this working circle deteriorated as these were not felled in time, with the result that advance growth and pole crop at places got suppressed.

b) No cultural or improvement operation as prescribed were carried out to benefit the crop.

6.6. Separate Plan for Ramban- Banihal Ranges by Sh. A. N. Koul (S.2002) (1945 A.D.)

6.6.1. Revision of a separate plan for Ramban – Banihal was taken up by Sh. A.N.Koul in (1945 AD). Though this plan never came into operation in all its prescriptions, yet the yield prescribed by the Working Plan Officer was adopted for future marking. The following working circles were constituted in this plan:-

1. **Deodar-Kail Selection Working Circle.** All accessible Deodar-Kail forests were allotted to this working circle. The system adopted was Selection System with a felling cycle of 30 years and a rotation of 150 years. The exploitable diameter for both the species was fixed at 30”d.b.h.

Result:

I) Plan prescription for felling, had been carried out with sincerity, whereas other prescriptions for improvement and cultural operation were ignored as a result regeneration failed to come up.

II) Fire protection was not given full attention and thus the fires caused great damage to the forests.

III) No sequence of felling was prescribed and the forests were taken up for felling indiscriminately without caring for presence or absence of generation.

2. **Fir Selection Working Circle:** All the accessible Fir bearing compartments were allotted to this working circle to be worked under Improvement-cum- Selection System. A felling cycle of 30 years and an exploitable diameter of 30” d.b.h was fixed.

Result:

I) No proper sequence of felling was prescribed which resulted in the deterioration of mature trees in some of the compartments.

II) Prescribed cultural operations were carried out and some pure Fir areas which could be sub-compartmented from Deodar-Kail forests had not been separated out.

III) This circle also covered that high pasture lands and measures were suggested by the Working Plan Officer to improve these grazing lands which had been overgrazed and required protection.

3. **Fuel Working Circle.** To meet the fuel requirement of Banihal town this working circle was formed and Neel Fir forests were also covered by this working circle.

Results: Prescriptions for this working wircle were not followed, Fir forests of Neel were not economical for working for fuel supply to Banihal Town. The demand for firewood had also increased and it would have been better to work these forests under Selection System for timber rather than fuel supply for Banihal town. The fuelwood supply could be met from adjoining drainage of Mahu-Mangit where the removal of broad leaved species was urgently required to induce the natural regeneration of Deodar.

4. **Unregulated Working Circle.**

This Working Circle comprised all such compartments which were considered unfit for working.

Results: This working circle had mostly very precipitous forests or upper limits of tree growth which required strict protection, but no protection against uncontrolled grazing and fires was provided, thus the forests started depleting.

6.7. First Working Plan for Fir Forests of Ramban-Kishtwar and Bhaderwah (S.2001 to 2008) 1944AD to 1951 AD) by Sh. Ghulam Rasool

6.7.1. This plan was prepared with a view to prescribe treatment for Fir forests of Ramban , Kishtwar and Bhaderwah Forest Divisions, as the working plans of the Chenab valley Forest Division did not prescribe special treatment for the Fir forests and there was no demand for Fir in the timber market. The plan was aimed to assess the availability of Fir to be supplied as raw material to the paper mills which was proposed to be set up at Akhnoor. This plan covered only the Pogal- Paristan area of present Ramban Forest Division. These forests were proposed to be worked under selection system. The prescriptions of this plan could not be implemented as the proposed paper mills never came up with the results no area was worked under this plan.

6.8. Revised Working Plan of Ramban Forest Division by Sh. Jagrag Singh Jamwal (1961-62 AD to 1971-72)

6.8.1. Sh. Jagraj Singh Jamwal revised the Ramban–Banihal Plan of Sh. A.N.Koul, which formed a part the then Ramban Forest Division. Thus Jamwal's plan was the first combined plan for the Batote-Gandhri and Ramban-Banihal Ranges. He constituted the following working circles.

1) Kail Conversion Working Circles
2) Deodar-Kail Selection Working Circle
3) Chir Interim Working Circle
4) Fir Selection working Circle
5) Protection-cum-Improvement Working Circle
6) High Pasture Land Development Working Circle

1) **Kail Conversion Working Circle** This working circle covered the important Deodar-Kail forests situated on easy slopes. The method of treatment was conversion to more or less uniform crop under Shelterwood Compartment System. The crop consisted of young to middle aged Kail forest in even-aged groups and Deodar crop in irregular form with marked deficiency of young regeneration. The immediate requirement of the crop was the removal of over-wood as early as possible in consistence with the realization of sustained yield from mature trees during the conversion period. Creation of normal age class distribution as envisaged in the theoretical Shelter wood compartment system was aimed to achieve by Working Plan Officer, at least during the first rotation. Therefore, in areas under regeneration fellings everything up to 18" d.b.h was taken as regeneration, forming a part of the future crop. Also pole crops of higher limits averaging 20"-21"d.b.h occurring in uniform patches was to be retained as part of future crop. Thus sacrifice of immature stock was avoided as best as possible. A rotation of 150 years with a regeneration period of 30 years was adopted. Conversion period was fixed at 80 years. The forests were divided into two main blocks viz. regeneration block and unallotted block. The regeneration block was further divided into conversion block and converted block.

a. Conversion Block. Contained mostly PB-1 areas of the past plan, that had more or less two storied crop and where the removal of over-wood was badly required. A few compartments in until allotted to selection working circle under Sh. Sher Singh's plan having two storey crop were also allotted to this block as these compartments were situated on easy slopes and were capable of being worked under Shelterwood Compartment System.

b. Converted Block. This block mostly contained PB-V areas of the past plan, where major fellings had been completed during the past 25 years. The only operation required in this block was the removal of few seed bearers which were still standing over the young regeneration.

c. Unalloted Block. Rest of the area in working circle was assigned to unalloted block where thinning and improvement felling were prescribed. Fifty percent of the crop in the working circle was enumerated down to 12"d.b.h.

Result:

I) Prescriptions of the plan were quite sound but these were not followed vigorously. Thus no cultural operations were carriedout; consequently regeneration could not keep pace with fellings.

II) No protection could be afforded to the areas in regeneration block against heavy grazing and fires, which hampered the progress of regeneration.

III) No protection was afforded to the forest against repeated fires which further deteriorated the crop and site.

IV) The allotment of compartments had been done wrongly in some of the cases.

2. **Deodar –Kail Selection Working Circle.**

This working circle covered all Deodar-Kail forests lying on steeper terrain than those assigned to Kail Conversion Working Circle. The crop assigned to this working circle was the more or less selection type though the proportion of different age classes was far from normal- the higher age classes being over represented and forests being under stocked. The crop generally had young to middle age Kail and middle aged to mature Deodar. The compartments assigned to the working circle also contained some patches of middle aged to mature Fir at the top. The silvicultural system adopted was selection system. A rotation of 180 years with 30 years felling cycle was adopted. Exploitable diameter for Deodar and Fir was fixed with 30" d.b.h and for Kail it was fixed at 24" d.b.h. Twenty-three percent enumeration was conducted in this working circle down to 12" d.b.h and yield was calculated using Brandis Method. The yield thus calculated was compared calculated by Von Mantel's formula, Y = 2V/R where V is the volume of the entire growing stock 12" and above diameter and R the rotation. It was found that the yield prescribed is quite conservative and safe.

Result:

I) Prescriptions laid down were quite elaborate, but the desired result was no achieved because the cultural operations were totally neglected by the territorial staff.

II) Heavy grazing and repeated fires further deteriorated the crop and site in the working circle.

III) Allotment in some cases was found to be defective.

3. **Chir Interim Working Circle.**

This working circle included all the pure Chir bearing compartments lying on easy terrain only in Batote and Gandhri Forest Ranges. Chir Forests of Ramban-Banihal Ranges were not allotted to this working circle because these were mostly found on precipitous ground and their protection is very essential from soil conservation point of view. Moreover these forests are mostly found along

the National Highway, where their protection is essential for the stabilization of the road side slopes.

4. **Fir Selection Working Circle**

This working circle contained compartment having pure crop of Fir. The crop consisted mainly of mature to over mature-stock with adequate representation of younger age classes. Kail is coming up in these forests as a sign of retrogressions. Thirty eight percent enumerations were carried out in this circle. Silvicultural system adopted was Selection-Cum-Improvement and fellings were prescribed for trees of exploitable size and over, and improvement felling was prescribed in rest of the crop. To check heavy grazing in these forests high pasture land limits were delineated on the spot so that grazing is confined to these portions of the forests only. A rotation of 180 years with 30 years felling cycle was adopted. The exploitable diameter for Fir, Kail and Deodar was fixed at 30", 24" and 30" respectively. The yield was calculated by Brandis Diameter Class Method and it was compared with the yield calculated by Von Mantel's formula and it was found to be on the safer side.

Result:

I) The prescriptions of the Plan were quite elaborate but the desired results could not be achieved as these were not followed rigidly.

II) Heavy grazing in these forests further hampered the progress of regeneration and also led to further deterioration of the crop.

5. **Protection-cum-Improvement Working Circle**

This Working Circle covered all such Forests whose exploitation was not economical on account of their situation on precipitous ground or poor stocking. Most of these forests are situated on the protective belt along the National Highway or along River Chenab where their retention is obligatory from soil conservation point of view.

Complete rest was prescribed to the areas allotted to this Working Circle. The treatment prescribed was strict fire protection and closure to grazing.

Result: The prescriptions of the Plan were quite sound but were not carried out and the area could not be given protection against heavy grazing and un-controlled repeated fires. Both these factors led to the further deterioration of the site and crop in this working circle.

6 **High Pasture Land Working Circle.**

This working circle was formed for the first time for the development of high pasture lands and protective purposes as it covers the water shed of various streams. The vegetation consists of *Viburnum foetens, Viburnum nervosum, Cotoneaster spp*, and a variety of legumes and grasses like *Aquilegia vulgaris,*

Thalictrum alpinum, Ranunculus spp., Epilobium latifolium, Poterntilla spp. The high pasture lands were separated from the forests by means of coal tar rings marked on suitable trees. For distinction, symbols of arrow mark and letters 'HP' had been marked on the trees, showing the delineation of the boundary of high pasture. The various prescriptions were as under:-

1. Cattle of nomadic graze were not to be permitted to go below the limit of high pasture land. Similarly no local Zamindars should be allowed to go to high pasture land as they enjoyed grazing facilities in the forest areas.
2. One fifth of the total area of high pasture land should to be closed to grazing.
3. Subject to the availability of funds improvements works like removal of undesirable herbaceous plants, introduction of better variety of grasses be done. Also channels for safe removal of runoff may be constructed.

Result:

I) The prescriptions of this working circle were good but these were not followed at all thus heavy grazing further deteriorated the vegetation in these areas and increased erosion hazards in this locality.

II) Plan prescriptions regarding improvement of the High pasture land could not be followed as they were contrary to the grant of concession for grazing which were enjoyed by the grazers for the long past.

III) The separation of high pasture lands by means of coal tar rings was wrong as it often confused the staff for compartment boundary rings. It would have been better to separate these areas by means of dry rings on tree holes with words "H.P" written on them in coaltar.

6.9. M.S. Jamwal's plan for Ramban Forest Division (1972-73 to 1981-82)

6.9.1. Sh. MS Jamwal revised the working plan of Ramban Forest Division by sh. Jagraj Singh Jamwal for the period of 1972-73 to 1982-83. Mr. M.S Jamwal constituted the following working circles.

1. Deodar-Kail Regular Working Circle
2. Deodar-Kail Selection Working Circle
3. Chir Interim Working Circle
4. Fir Selection Working Circle
5. Coniferous Rehabilitation Working Circle
6. Protection-cum-Improvement Working Circle
7. High Pasture Land Development Working Circle

1. **Deodar-Kail Regular Working Circle**

This working circle included all the easily accessible Deodar-Kail forests, which were capable of being worked under system of concentrated regeneration felling. The compartments allotted to this working circle contained at some places a little but unavoidable amount of other conifers like Chir and Fir which could not be

separated into sub-compartments. Shelter Wood Compartment System advocating removal of over-wood above 45 cm d.b.h from the areas having been adequately regenerated with an objective to bring these forests to normalcy was prescribed. In area under regeneration felling everything up to 40 cm d.b.h was treated as regeneration forming a part of the future crop. A rotation of 150 years corresponding to exploitable size 60 cm d.b.h for Deodar and Kail, conversion period of 80 years from the start of the plan and regeneration period fixed at 30 years were adopted. Entire working circle formed one felling series. The working circle was divided into three floating periodic blocks namely conversion block, converted block and unalloted block. Conversion and converted block together constituted the regeneration block. Yield for the entire working circle was calculated on the basis of the results of complete enumeration down to 30 cm d.b.h in most of the well stocked compartments deemed fit for working during the plan period. The yield was calculated by adopting formula.

Y = V/Conversion period

Where V is total enumerated growing stock over entire working circle. Only the growing stock over 50 cm d.b.h was actually taken into account for calculation of the total yield proposed to be realized from the working circle.

a. **Conversion Block**

The conversion block comprised of three categories of the crop area:

I. In the first category compartments having been worked under regeneration felling during the past plan resulting into more or less two storied forests were included. The presence of over-wood was considered injurious to the future development of the regeneration and prescribed to be removed as secondary-cum-final felling.

II In the second category areas having a lot of mature over-wood with some regeneration was included. These forests were suggested to be opened up to induce and free young regeneration. Most of these areas formed part of unalloted block in the previous plan.

III. The third category included the compartments having adequate and established regeneration with few mature and over-mature trees intermixed with young and middle aged crop.

b. **Converted Block**

This block comprised of area having more or less adequate and established regeneration and regeneration fellings almost completed. Some mature and over mature trees were found scattered and interfering with the regeneration all over the block were suggested to be removed during the plan period. The yield in regeneration block was calculated and adopted in terms of number of exploitable trees which would be available during the exploitable period, arrived at 30 years after due deduction on account of mortality. The yield from thinning in converted block was ignored in favour of possible errors in the calculation.

c. **Unalloted Block**

The rest of the area of Deodar-Kail Regular Working Circle constituted and unalloted block. This block constituted more or less middle aged crop. Only thinning and hygienic felling to remove dead and diseased trees were prescribed. The yield in unallotted block was calculated as difference between the yields calculated for whole of the working circle and regeneration block. "Area check" over the volume yield was provided in this block. The compartments allowed for working during the currency of the plan on priority basis were 30, and 58/ Ramban.

2. **Deodar Kail Selection Working Circle.** This working circle included all the commercial Deodar –Kail other than those included in deodar regular working circle. The compartments allotted to their working circle situated on comparatively steeper slopes and contained Deodar –Kail crop mixed at places with unavoidable Fir in varying proportion. The forests under this working Circle were prescribed to be treated under selection system with rotation of 150 years corresponding to exploitable size of 60 cm d.b.h. for Deodar-Kail and 70 cm d.b.h. for Fir and felling cycle fixed at 30 years. The entire working Circle was constituted into a one felling series. The growing stock was assessed by complete enumeration down to 30 cm d.b.h. and almost all the well stocked compartments assigned to this working Circle. The yield was calculated by adopting the Brandis Method of yield calculation depending upon the availability of trees of exploitable diameter. No area check over the volume yield was prescribed. The compartments suggested to be worked during the plan period were 54, 57, 63 and 67/Ramban and 19b and 37/ Banihal, 31, 33a, 43, 44 and 66 /Ramban and 5b and 15/ Banihal. Neither any sequence of felling nor any normal coupes were constituted.

3. **Chir Interim Working Circle.** None of the Chir compartments of Ramban and Banihal Ranges were included in this working circle by Mr, M.S. Jamwal because of their poor stocking and steep to precipitous slopes along National Highway**.**

4. **Fir Selection Working Circle.** This working circle covered all the commercial Fir forests. The compartments allotted to this working circle mostly contained the pure crop of Fir with some amount of deodar and kail at places mixed in varying proportion and could not be separated out. The forests were proposed to be worked under Selection System with slight modification here and there to suit the local requirements of the crop and site. Rotation of 180 years corresponding to exploitable size of 70 cm d.b.h. for Fir and felling cycle of 30 years was adopted. The yield was calculated on the basis of the result of total enumeration down 30 cm d.b.h. The yield was calculated depending upon availability of trees of exploitable size using Brandis Method of yield calculation. The compartments proposed to be worked on priority basis were 16,24,29,62/Ramban, 18,21/ Banihal,2, 25a,23b and 34b/Ramban and 5a,6,a,29a,31 and 37/ Banihal.

5. **Coniferous Rehabilitation Working Circle.** The area of this working circle was classified into three distinct categories .First category included such areas where

regeneration was absent as a result of heavy grazing and repeated fires due to their proximity to human habitation. Exhaustive prescriptions including closure of the area, artificial sowing and planting, control of fires and soil working were prescribed to treat this category. The second category included areas containing mostly Fir, mixed with Deodar, Kail, and broad leaved trees in the lower portion. Fir crop mostly found as over mature and the regeneration was practically absent. The over mature trees were gradually falling down thus creating big blanks in these forests. The incidence of nomadic grazing is very heavy in these forests during summers. Complete closures, cleaning, shrub cutting, soil working, patch sowing and planting were prescribed to treat this area. Third category included badly encroached area here and there spread all over the division. Effective measures to eject the encroachers followed by complete closures, soil working. Sowing and planting were prescribed. The fourth category includes compartment in the vicinity of Banihal town. These compartments comprised of large blanks areas with rare scant growth of Kail in patches or solitary trees. These areas have been suffering vary badly because of heavy incidence of illicit damage, Strict closure of the area followed by plantation of nursery raised plants of locally most preferred tree species including Walnuts and Mulberry were suggested. No felling was prescribed in this working circle except removal of dead, dying, diseased trees.

6. **Protection-cum-Improvement Working Circle.** This working circle comprised of all such forests, where the crop was of poor density and the forests situated on very rugged and highly precipitous slopes. The removal of trees from such sites was likely to accelerate the process of erosion, which has already started in most of these compartments. Detailed prescriptions for protection of site from fire and grazing, raising of broad leaved species and grasses of local importance, protection of watershed, and control grazing were laid down.

7. **High Pasture Land Development Working Circle.** This working circle was formed for the first time by Sh. Jagraj Singh Jamwal in his plan and definite prescription were suggested for the improvement of high level grazing grounds which are deteriorating day by day and thus increasing the erosion hazards in the locality. But the prescriptions were altogether ignored by the territorial staff and no improvement worth to name could takes place in these grazing grounds. The working circle was continued with the hope that the prescriptions would be followed vigorously by the territorial staff and the potential capability of the pasture improve to allow sustainable grazing and to maintain a dependable water regime in the locality. This working circle covered all the pasture land found in the sub-alpine zone in the division. To safeguard the valuable forests and cultivation against erosion, it was essential to manage these pastures scientifically.

   Detail prescriptions for control of grazing and development of deteriorated pasture land including complete closures, fertilization and sowing of better variety of palatable grass were prescribed.

Results of Plan. The revised plan by Mr. M.S.Jamwal which came into force w.e.f. 1972 expired in March 1982 but due to delay in preparation of next plan it was plan was automatically deemed to be extended upto March 1985.The prescriptions of this plan so far as they were related with felling, were implemented fully with sincerity. This has resulted in heavy removal from some of the compartments. However the prescriptions of the plan relating to the regeneration of the failed area, protection and improvement of the forests seem to have been ignored by the territorial DFO.

I) Taking in to account the Ramban and Banihal Ranges of then Ramban Forest Division the pace of convertion has remained quite slow and negligible area was converted in Deodar-Kail Regular System during the plan period. No fellings were carried out in conversion block. In this area total removal was 16000 M^3 deadar, 15000 M^3 Kail, 2300 M^3 Fir. Thinning that was prescribed was carried out only in accessible areas.

II) In Deodar-Kail Selection Working Circle 9000 M^3 of Deodar, 24000 M^3 of Kail and 30000 M^3 of Fir have been remoed by way of main and supplementary fellings the past plan period. Cultural operations for improvement of crop were not carried out.

III) During the past plan period and 7000 M^3 of Deodar, 12000 M^3 of Kail and 49000 M^3 of Fir have been harvested from forests of this working circle. No prescriptions related to cultural operations were carried out.

No operation worth mention were taken to implement the prescriptions of the plan relating to Conferous, Rehablitation Working Circle, Protection- Cum-Improvement Working Circle and High Pasture land Development Working Circle. The resin tapping started in mid seventies and continued by using crude and unscientific metods of resin tapping. In absence of prescriptions the resin tapping have been given least attention by the territorial staff. This resulted into haphazard working and gross violation of the norms fixed for resin tapping.

6.10. Pritam Chand's Working Plan for Ramban Forest Division (1985-86 to 1994-95)

6.10.1. Sh. Pritam Chand IFS prepared the first Working Plan for Ramban Forest Division after its creation in 1981 consequent upon the amalgamation of Ramban and Banihal Ranges of erstwhile Ramban Forest Division. This plan, therefore, was the revision of sixth plan for the period of 1971-72 to 1981-82 for the Ramban Forest Division prepared by Mr. M S Jamwal. Point sampling technique / plotless sampling or Bitterlich method of point sampling was used in preparation of this plan. The calculation of yield has been made by adopting Brandis Diameter Class Method.The silviculture method prescribed to be adopted in case of working circles was Shelterwood system and Selection System.

6.10.2. The plan period coincided with the Nationalization of Forest working and a dramatic end to working of forests by contractors. The Nationalization of Forest

Working Act came into being in the year 1987AD after being twice promulgated as ordinance in the year 1985. The forests were henceforth worked by the newly constituted state owned State Forest Corporation. As such during the currency of plan major extraction of timber is attributable to the Lessee Contractor and then subsequently by the SFC. It is also during this period that there was a resurgence of environmental activism in view of global climate change and a resultant slew of measures from the government as well as the Supreme Court of India to address this issue by Legislation and landmark judgments respectively. It was in one such judgement that the Supreme Court of India held that all the green felling in the state of Jammu and Kashmir is banned forthwith. This has resulted in the stoppage of working of forests from 1997 onwards and all the removals from forests were only of the nature of hygienic marking consigned to removal of dry, dead, diseased and infested trees only. This temporary cessation of operations has undoubtedly augured well for forests to help recoup from any inherent distress attributable to working of forests. However, it remains to be seen what effect it has had on the desirable crop stand. This phase has also witnessed the evolution of State Forest Policy, which lays key stress on sustainable development and livelihood generation, alleviation of poverty, restocking of degraded forests and timber substitution. The period also marked a departure from the policing attitude of the forest department to an attempt for participative management of forest resource. Emergence of Joint Forest Management and recognition of local communities as an important stakeholder along with stress on sustainable management changed the attitude and aim of forest department to manage forests not only for timber but more impotantly from the perspective of environment and ecological value.

6.10.3. Sh.Pritam Chand in his working plan constituted the following territorial working circles besides few overlapping working circles:

1. Deodar -Kail (R) Working Circle
2. Mixed Conifer (Selection) Working Circle
3. Fir Selection Working Circle
4. Reboisement Working Circle
5. Protection Working Circle

Table No. 6.1. Area Allotted to Each Territorial Working Circle in Previous Working Plan Revision.

Working Circle	Commercial	Total Area	Remarks
Deodar-kail Regular working Circle	1719	2411	Area Calculation only for academic purpose
Mixed Coniferous Selection Working Circle	5228	8054	
Fir Selection Working Circle	7408	14435	
Reboisement Working Circle	3856	13670	
Protection working Circle	2228	9709	
Total	**20439**	**48279**	

6.10.4. A proper evaluation of how the working plan prescriptions have been applied over a period of time is possible only if the data pertaining to the said period are maintained meticulously, compartment/sub-compartment wise and working circle wise. Unfortunately, neither the control forms nor the compartment history files were maintained for the plan period. In fact, the Division Office is in the possession of neither the compartment history files, nor the stock maps prepared at the time of revision of the plan by Sh. Pritam Chand. To make the matters worse ,the records pertaining to the marking lists ,abstracts of marking lists for sub-compartments, and sometimes even different compartments, were clubbed together thus confounding the marking carried out in one working circle with another working circle. The subcompartments of earlier working plans were treated as separate compartments by Sh.Pritam Chand and were accordingly allotted to different working Circles as per the need of treatment but a careless approach was adopted and extraction was done with out much regard for prescription these separate compartments were treated as subcompartments. The data pertaining to extraction supplied by the J&K State Forest Corporation (SFC) also suffered from similar defects. In addition, whereas the volume marked by the forest department is in terms of whole tree volume, the extraction figures supplied by the SFC are in terms of sawn outturn. However circle wise assessment of implementation of prescription is given as under

1. **Deodar-Kail (R) Working Circle.** All well stocked Deodar-Kail forests occupying easier slopes that were considered suitable for concentrated working and conversion to uniformity were allotted to this working circle. The Deodar-Kail working circle was prescribed to be worked under the Shelterwood Compartment System. Existence of regeneration was the main criteria while effecting removals. Thus in view of irregular distribution of age classes and prevailing locality factors, uniformity was not aimed at during the first rotation. A rotation of 150 years with a balance conversions period of 60 years was adopted. Anything below 50 cm in diameter was to be treated as advance growth. There was only one felling series and annual coupe size was 225 hectares.

   Yield regulation. The yield was calculated on the basis of available trees above 50 cm diameter after subjecting this growth stock to availability coefficient percentage based on past experienced and marking date. Only commercial areas were taken into account for the purpose of yield calculation.

The yield prescribed for this working circle and removals during plan period are given as under:

Species	Yeild Prescribed for Plan period (CUM)	Total SFC Extraction in year 1985-86 to 2016-17 (CUM)	Total Departmental Extraction in year 1985-86 to 2016-17 (CUM)	Total Extraction (CUM)
Deodar	8000	1977.4	419.7	2397.1
Kail	23000	11878.72	917.8	12796.52
Fir	3000	3441.8	40.2	3482
Total	**34000**	**17297.92**	**1377.7**	**18675.62**

6.10.5. The total removals compiled from different records in the division show above figure. It is observed that the removal from forests have been within limits and fall grossly short of prescribed yield particularly with respect to Deodar & Kail and Fir. The possible reason for deficient removals would be poor accessibility of the compartments in this circle and ban of Green felling in the state. Total removals by SFC and departmental extraction in 31 years since 1985-86 are even less than the removals prescribed for ten years. The ban in green felling certainly didn't allowed prescribed removals and as as result trees with higher diameter class increased in the forests. This could have affected the overall growth and regeneration of main timber species.

6.10.6. **Application of prescriptions and result.**

a. Felling of green trees was banned by the Govt of Jammu and Kashmir in January 1990s. Therefore, the only major markings that were carried out were prior to 1996. Therefore, removals have been restricted to dry, fallen trees, and trees marked in connection with development project only.The table above shows how the prescription has been applied in so far as they relate to extraction of the prescribed yield.The volume marked for felling is considerably less than the prescribed yield for the period. Due to ban on green felling there is general increase in proportion of trees in higher dia classes.

b. In order to secure adequate regeneration, it was prescribed that regeneration areas be closed to grazing. In addition, patch sowing and planting of saplings raised in-situ in polythene tubes was prescribed for refractory areas. But no special efforts were done to ensure the regeneration of deodar, kail and fir species. The regeneration was not at all encouraged and canopy was fully covered and so seedling couldn't grow due to lack of proper sunlight and space.

c. Though very pertinent prescription were given by Working Plan Officer on regeneration, disposal of debris, tending, controlled grazing but all aspects related to regeneration have been thoroughly neglected. The areas proposed to be regenerated were exposed to continuous grazing. Little was done by way of artificial regeneration of local species and the plantation programme has mostly concentrated in fast growing exotics like Robinia and Ailanthus. Even in the nurseries more focus was given to the broad leaved species and conifer tree species were not given priority.

d. Though prescriptions of working plan wre not carried as such due to ban on green felling but the most serious negligence on part of forest officers who worked in this division is the poor maintenance of record, control forms, compartment histories forest journals which have bearing on the management of forests have been not at all maintained in division office and range offices.

2. **Mixed Coniferous (Selection) Working Circle.** Compartments containing well stock commercial forests of Deodar, Kail and Fir with sprinkling of spruce here and there in the higher reaches and rare stray trees of Chir in the lower areas.

These forests occupy steep slopes and rugged grounds considered unfit to be managed under the system of concentrated regeneration felling because of comparatively low status of stock and for the consideration of protection of soil and site. This working circle by and large includes those areas of the present Ramban Forest Division which formed part of Deodar Kail Selection Working Circle in the previus plan of Mr. M.S.Jamwal. Keeping in view the importance of these forests in soil and water conservation, Selection System was prescribed for management of these forests. Silvicultutrally available trees above exploitable diameter from areas having adequate and established regeneration were proposed to be removed. Exploitable diameter was fixed at 70 cm for deodar and Kail and 80 cm for Fir corresponding to a rotation of 150 years in Deodar 120 year for Kail and 210 years in Fir. A felling cycle of 30 year was adopted. The size of annual coupes worked out to175 Hct.

Yield Regulation.

The yield for Mixed Conifer (Selection) Working Circle was calculated on volume basis using Modified Brandis Diameter Class Method. An area check was also provided. The yield was computed on the basis of commercial growing stock only. Accordingly, the annual yield from entire Working Circle was fixed as follows:

Deodar = 2700 cum, Kail, = 8400 cum, Fir =3600 cum

Total: =14700 cum

Results. In order to secure regeneration, measures like removal of shrubs, raking of leaf litter and top layer of soil, patch sowing in planting of nurseries raised seedling along with closures to control grazing were prescribed. In this respect it was proposed that an area equal to the size of annual coupes be taken up for effecting closures each year, evenly distributed over the entire working circle.

Application of the prescriptions and Results:

Species	Yield prescribe for 10 years (CUM)	Volume Extacted by SFC in year 1985-86 to 2016-17. (CUM)	Departmental Extraction in year 1985-86 to 2016-17. (CUM)	Total Extraction (CUM)
Deoadar	27000	7437.82	600	8037.82
Kail	84000	27378.73	898.8	28277.53
Fir	36000	40671.98	623.75	41295.73
TOTAL	147000	75488.53	2122.55	77611.08

Only small percentage of the prescribed volume was actually marked for felling. Total volume of Deodar, Kail and Fir removed in 31 years by SFC and departmental extraction is far less than even the removals recommended for 10 yeras by the Working Plan Officer. The prescriptions relating to securing of regeneration were largely ignored and this is reflected in the inadequacy of established regeneration over most of the working circle area. The canopy was not opened and saplings remained suppressed under the shadow of mature and

over mature trees. Th percentage of trees in higher dia class increased and it adversally affected the regeneration potential of the forests.

6.10.7. **Application for prescriptions and result.**

a. Felling of green trees was banned by the Govt of Jammu and Kashmir in January 1990s. Therefore, the only major markings that were carried out were prior to 1996. Therefore, removals have been restricted to dry, fallen trees, and trees marked in connection with development project only. Above table shows how the prescription has been applied in so far as they relate to extraction of the prescribed yield. The volume marked for felling is meagure compared to the prescribed yield for the period. Not much importance was attached to the sequence of felling suggested by the Working Plan Officer in the selection of annual coupes. Due to ban on green felling there is general increase in proportion of trees in higher dia classes.

b. In order to secure adequate regeneration, it was prescribed that regeneration areas be closed to grazing. In addition, patch sowing and planting of Saplings raised in-situ in polythene tubes was prescribed for refractory areas. But no special efforts were done to ensure the regeneration of Deodar, Kail and Fir species. The regeneration was not at all encouraged and canopy was fully covered and so seedling couldn't grow due to lack of proper sunlight and space.

c. Though very pertinent prescriptions were given on regeneration, disposal of debris, tending, controlled grazing but all aspects related to regeneration have been thoroughly neglected. The areas proposed to be regenerated were exposed to continuous grazing. Little was done by way of artificial regeneration of local species and the plantation programme has mostly concentrated in fast growing exotics like Robinia and Ailanthus and conifer tree species were ignored.

d. Though prescriptions of working plan regarding extraction were not carried as such due to ban on green felling but the most serious negligence on part of forest officers who worked in this division is the poor maintenance of record, control forms, compartment histories forest journals which have bearing on the management of forests have been not at all maintained in division office and range offices.

3. **Fir (Selection) Working Circle.** All well stocked commercially exploitable Fir forests of Ramban Forest Division were allotted to this working circle mostly confined to the hill slopes. Mature and over mature trees formed a large proportion of the growing stock in this working circle. The condition of regeneration was more or less satisfactory. These forests were proposed to be managed under Selection System. Removal of exploitable sized silvicultutrally available trees was prescribed from areas having adequate and established regeneration. Deodar Kail trees above 70 cm and Fir trees above 80 cm were considered exploitable. A felling cycle of 30 year was adopted. The volume yield

was subjected to area check and the size of annual coupe was fixed at 250 hectares.

Yield Regeneration.

The yield was calculated using the Modified Brandis Diameter Class Method and was subjected to area check. Only commercial growing stock was taken into account for the purpose of yield calculation. The annual yield for the entire working circle was prescribed as under:

Deodar = 225 cum
Kail = 2125 cum
Fir = 21450cum
Total: =23800 cum

Application for prescriptions and Results:

The following table provided the species wise marking and extraction figures.

Species	Yield prescribed for 10 years (CUM)	Volume Extracted by SFC in year 1985-86 to 2015-16 (CUM)	Departmental Extraction in year 1985-86 to 2015-16 (CUM)	Total Extraction (CUM)
Deodar	2250	3444.2	0	3444.2
Kail	21250	11827.72	9.5	11837.22
Fir	214500	75351.93	1574.08	76926.01
Total	**238000**	**90623.85**	**1583.58**	**92207.43**

Only small percentage of the prescribed yield has been extracted in 31 years after implementation of the plan from the forests of this working circle. Timber of all the species extracted is very less than prescribed extraction. Other prescriptions relating to cultural operations, artificial regeneration and grazing control were ignored as a result of which the status of regeneration of Fir areas is pathetic.

a. Not much importance was attached to the sequence of felling suggested by the Working Plan Officer in the selection of annual coupes. Due to ban on green felling and due there is general increase in proportion of trees in higher dia classes.

b. In order to secure adequate regeneration, it was prescribed that regeneration areas be closed to grazing. In addition, patch sowing and planting of Saplings raised in-situ in polythene tubes was prescribed for refractory areas. But no special efforts were done to ensure the regeneration of deodar, kail and fir species. The regeneration was not at all encouraged and canopy was fully covered and so seedling couldn't grow due to lack of proper sunlight and space.

c. Though very pertinent prescription were given by Working plan officer on regeneration, disposal of debris,tending, controlled grazing but all aspects related

to regeneration have been thoroughly neglected. The areas proposed to be regenerated were exposed to continuous grazing.

d. Though prescriptions of working plan were not carried as such due to ban on green felling but the most serious negligence on part of forest officers who worked in this division is the poor maintenance of record, control forms, compartment histories forest journals which have bearing on the management of forests have been not at all maintained in division office and range offices.

4. **Reboisement Working Circle.** Potentially productive areas that had undergone degradation either due to excessive biotic interference or due to failed regeneration after drastic treatment were allotted to this working circle. This working circle as such formed of by and large Protection- um- Improvement Working Circle some compartments from Deodar-Kail Working Circle, Mixed Conifer Selection Working Circle, Fir Selection Working Circle and Chir Interim Working Circle also transferred to Reboisement Working Circle. Some areas which though adequately stocked but located near human habitation along National Highway and at places of Tourist interest were allotted to this working Circle. A total of 13670 hectare forest area was placed under this working circle out of which 3856 hectare was having commercial forests these forests were proposed to be treated for rehablitation. No regular fellings were prescribed in this working circle and removals were to be restricted to dry fallen and meeting of the demands of concessionist.

Application of Prescriptions and Results. Prescriptions relating to regeneration of conifers were not implemented to any significant extent. Plantations have been limited to raising of fast growing exotics like *Robinia* and *Ailanthus*. About1847.59 cum timber of dedar kail and fir species was removed from this circle in connection with installation of transmission lines, road construction, or marking of dry and fallen trees.

5. **Protection Working Circle.** All those compartments of Ramban Forest Division that had not been allotted to any of the working circles above were placed under this working circle. Generally these areas included all the rockey and stoney forest areas consisting of steep to preciptious top hill slopes devoid of vegetation cover, inherently unproductive and uneconomical. This working circle was spread over 9709 hectares of forest area. No felling of whatsoever nature was prescribed in this area.

Application of prescriptions and Result. Prescriptions relating to regeneration of conifers were not implemented to any significant extent. About 2505.7 cum timber of deadar, kail and Fir was removed from this working circle in connection with installation of transmission lines, road construction, or marking of dry trees and falled trees.

Pasture Land development Working Circle. The area under pasture development land in the alpine and sub-alpine zones, are mostly devoid of tree growth mostly 2000 to 3200 meters altitude and sustain a variety of medicinal herbs, shrubs and

palatable and un palatable grass. Out of 3134 hectares under high pasture land, 1870 hectares falls in Banhal Range, 1264 hectares in Ramban Range. Both local and migratory livestock graze in these forests for about 06 months of the year. Grass, leaf fodder from a number of tree species is procured by the local population for feeding their livestocks, resulting thereby fodder trees are mercy less lopped for the said purpose. Little seems to have been done for the betterment of these pasture lands/ forests. No prescriptions were followed and nothing much was done to improve the productivity of pastureland.

Resin Tapping

The Chir forests of this division have been under tapping since 1974-75. Resin tapping was carried out in utter disregard to the Working Plan prescriptions before 1980 and crop suffered immense damage. In view of the immense damage then working plan officer recommended complete ban on resin extracton and as a result no resin extraction was done during the plan period of previous working plan. In this working plan also it is recommended that blanket ban on resin extraction may be continued to ensure that rejuvenation of chir crop can take place. Chir crop has also suffered on account of the damage due to landslide triggerd due to road construction.

6.11. Special Works of Improvement Undertaken

6.11.1. No special works worth mentioning have been done during the plan period under revision.

6.12. Nurseries

6.12.1. At time of revision of this working plan, 06 nurseries exist in Ramban Forest Division with an area of 15.25 Hact. There is incremental improvement in the nurseries and attempts are being made to raise conifer plants in the nurseries but no modern technologies have been tried or being used. Though there is adequate availability of funds under CAMPA schemes but no central nursery on modern facilities and controlled temperature and humidity conditions have been raised in this dividion. Traditional methods are being continued. The list of nurseries as they exist during the year 2016-17 appears in **Annexure –XVII.** There has been little improvement in the nursery technique over the last decades. Technologies like root trainers, glass houses etc have been tried even at an experimental level. Raising of conifers in the nurseries, is by and large neglected, and more stress is laid on the raising of fast growing exotics like *Robiniea pseudoacacia* and *Ailanthus excelsa*. Other broad leaved species raised in the nurseries are *Aesculus indica, Juglans regia, Populus ciliate, salix* etc. There is need to give special focus on raising conifer species especially Fir. Fir forests are facing the problem of regeneration due to overgrazing and compaction of soil. Division need to have atleast two nurseries at places of high altitude so that more Fir sapling can be

raised in nurseries and further planted in the forests to ensure its assisted regeneration in the forests.

6.13. Roads and bridge

6.13.1. Ramban Forest Division is very well connected to Batote- Anantnag Divisions by Jammu- Srinagar National highway. Other roads falling within this division are, Karol- Rajgrah, Makarkot- Pogal, Chamalwas-Neel and many other are under construction under PMGSY. Considerable damage has already been caused to the forests of this division by the construction of these roads. In addition to the above various roads remained under construction under PMGSY/PWD in the division which has also caused considerable damage to the forests.

6.14. Buildings

6.14.1. There are large numbers of buildings existing in this division, most of them locating at Divisional Headquarter, Ramban. Unfortunately, for want of adequate funds, majority of the buildings are in dilapidated condition and many of them may collapse in the near future. The list of buildings existing in this division as on 31-03-2017 is provided under **Annexure- VIII.**

6.15. Soil Conservation works

6.15.1. Abstract of soil conservation works including sowing, planting and minor engineering works, carried out in the division during the proceeding plan period (2017-08 to 2011-12) are listed under **Annexure –XI.** The works done are not commensurate to the extent of problem this division faces in relation to soil conservation and landslide. Because of the weak geological formations along National high way, this aspect needs special attention. The National Highway Project, with its headquarter at Batote is engaged in activities related to the stabilization of landslides along National Highway since 1996 and is still continuing in the job.

6.16. Past Yield

6.16.1. The compartment wise and working circle wise detail of volume of timber marked and extracted have been calculated. The Working Circle wise abstract of timber harvested by SFC and Forest Department during the period from 1985-86 to 2016-17 from Ramban Forest Division is tabulated as under:-

Table No. 6.2. Species wise Volume of Timber Extracted (CUM) Circle wise.

Working Circle	Deodar	Kail	Fir	Total
Deodar-Kail Regular Working Circle	2397.1	12796.52	3482	18675.62
Mixed Conifers Selection Working Circle	8037.82	28277.53	41295.73	77611.08
Fir Selection Working Circle	3444.2	11837.22	76926.01	92207.43
Reboisement Working Circle	634.83	973.23	239.53	1847.59
Protection Working Circle	71.77	330.82	2103.11	2505.7
Grand Total	14585.72	54215.32	124046.38	192847.42

6.17. Past Revenue and Expenditure

6.17.1. The following tablur statement gives the year wise revenue and expenditure (Non-Plan) figures from 20-07-08 to 2016-17 for Ramban Forest Division. However annual expenditure under various schemes is given in the various annexures attached.

Table No. 6.3. Statement for Revenue and Non-Plan Expenditure in last 10 Years of Ramban Forest Division.

S.No.	Year	Revenue (Rs.In lacs)	Expenditure (Rs.in Lacs)
1	2007-2008	14.39	179.10
2	2008-2009	17.97	192.33
3	2009-2010	37.25	232.84
4	2010-2011	55.16	263.14
5	2011-2012	39.21	289.66
6	2012-2013	68.22	420.31
7	2013-2014	52.33	440.57
8	2014-2015	68.33	419.53
9	2015-2016	82.34	554.30
10	2016-2017	13.99	511.48
Total		**449.18**	**3503.25**

The revenue receipts and also the revenue surplus register a steady increase. However keeping in view the potential of this division the revenue is extremely low because of ban on green felling and no resin extraction activities in division in last ten years. Very low revenue receipts in years 2016-17 is because the timber sale depots have been handed over to SFC and sale of timber is being done by SFC. Since then the revenue receipts are very low also due to almost non payment of royalty by State Forest Corporation. There has been a steady rise in the actual expenditure, but the increment is definitely not in proportion to the rise in the salaries, wages, inflation and cost of livings. In real terms, therefore, the allotments have actually decreased over the year. The biggest casualty in this regard has been the forest conservancy related operations like Fire protection, subsidiary silvicultural operations, buildings and paths, nurseries etc. Similarly, the volume of work in terms of plantation and soil conservation activities has also increased

CHAPTER-VII
Statistics Of Growth And Yield

7.1. Volume Table

7.1.1. Local volume tables are not available for the important tree species found in this region. No sample plots are maintained either by the State Forest Research Institute or by the Territorial Divisions. There has been a practice so far to prepare local volume table by developing some local equations, for academic interests only. The local volumes so prepared have never been adopted for actual yield calculation. At the time of the preparation of the Plan by Sh. Pritam Chand, it was decided that Kullu volume table shall be adopted in actual yield calculation. For the sake of continuity, and in the absence of the appropriate local volume tables, Kullu volume table has been adopted in respect of all the four conifers species of this division and is being adopted in the present revision of the Working Plan.

Comparasion of Local Volume tables derived from different sources.

Table No. 7.1.1. Deodar

Dia class	Kishtwar local volume table	Preinvestment survey for Chenab valley	Doda local volume table	Kulu volume table	Tickoo's volume table for Chenab
10-20	0.15	0.17	0.15	0.13	0.22
20-30	0.36	0.47	0.45	0.13	0.66
30-40	0.94	1.00	0.95	0.76	1.36
40-50	1.87	1.77	1.65	1.33	2.31
50-60	2.88	2.77	2.55	2.10	3.5
60-70	4.24	4.01	3.70	3.14	4.87
70-80	5.87	5.49	5.05	4.39	6.43
80-90	7.75	7.20	6.65	5.66	8.04
90-100	9.89	9.15	8.45	6.85	9.79
100 & above	12.30	11.34	10.55	7.56	11.57

Table No. 7.1.2. Kail

Dia class	Kishtwar local volume table	Preinvestment Survey for Chenab valley	Doda local volume table	Kulu volume table	Tickoo's volume table for Chenab
10-20	0.39	0.12	0.20	0.13	0.22
20-30	0.50	0.36	0.58	0.13	0.67
30-40	0.86	0.88	1.00	0.76	1.41
40-50	1.64	1.64	1.70	1.36	2.30
50-60	2.78	2.65	2.60	2.27	3.20
60-70	4.28	3.91	3.65	3.34	4.21
70-80	6.15	5.43	4.90	4.42	5.32

80-90	8.39	7.20	6.35	5.35	8.04
90-100	10.98	9.22	7.95	6.14	9.79
100 & above	13.95	11.49	9.80	6.74	11.57

Table No. 7.1.3. Fir

Dia class	Kishtwar local volume table	Preinvestment survey for Chenab valley	Doda local volume table	Kulu Volume table	Tickoo's volume table for Chenab
10-20	--	0.11	0.10	0.13	0.12
20-30	--	0.41	0.25	0.13	0.39
30-40	0.87	0.97	0.80	0.85	0.87
40-50	1.70	1.80	1.50	1.56	1.59
50-60	2.95	2.90	2.40	2.97	2.56
60-70	4.34	4.26	3.55	4.90	3.78
70-80	5.96	5.90	4.95	6.85	5.24
80-90	7.82	7.80	6.65	8.30	6.94
90-100	9.92	9.99	8.65	9.40	8.83
100 & above	12.22	12.42	11.00	10.19	10.93

7.1.2. From the above tables it is evident that the Doda local volume table is very close to the volume table prepared by the pre-investment survey for Chenab region. The other two tables such as local volume table for Kishtwar and Tickoo's volume table for Chenab region are very close to each other and Kullu Volume table recorded lesser volume than the other tables in many instances. As a policy the Kullu volume table is used by the forest department in this state.

7.2. Quality Class

7.2.1. The quality class of forests in Ramban Forest Division varies from place to place, depending upon the locality factors of the area. On an average, the quality class of Deodar, Kail and Fir in this division is generally I, except on exposed south western aspects, spurs and ridges where it falls down towards class II. The quality class of Chir Varies from II/III to III in this area.

7.3. Growth Studies

7.3.1. Sh. Pritam Chand carried out growth studies at the time of preparation of the Working Plan. Basesd on the results of the data analysed, the following diameter-age tables were then prepared. The same have been utilized for calculation in Mr. Vasu Yadav Plan for Batote and in this Plan as well.

Table No. 7.2. Growth Studies of Important tree species.

Diameter Class (cm)	Age in years.		
	Deodar	Kail	Fir
10	30	18	48
20	44	28	71
30	60	42	92
40	74	57	114
50	90	71	134
60	106	87	153
70	121	1103	173
80	137	119	203
90	152	135	232
100& above	180	152	251

7.3.2. For the purpose of calculation of yield, the following survival coefficient percentages based on the All India Volume Tables in respect of Deodar, Kail, Fir and Spruce have been used.

Table No. 7.3.

Diameter-class D.B.H (cm)	Survival percentage of species		
	Deodar	Kail	Fir & Spruce
30	30%	45%	20%
40	60%	60%	40%
50	80%	80%	50%
60	90%	90%	60%
70	95%	95%	85%
80	--	--	95%

7.3.3.. While examining the crop stand and age class distribution the following table on normal distribution of stem over the age classes has been utilized.

Table No. -7.4.

Diameter – class (cm)	10-20	20-30	30-40	40-50	50-60	60-70	70 <
Normal Distribution in percentage	41%	25%	15%	9%	5%	3%	2%

7.4. Preliminary Exercise

7.4.1. **Calculation of Area.** It was for the first time after formation of Ramban Forest Division that demarcated forest maps were resolved to be digitized first. It was conceived that digitization of boundaries of forest maps shall be undertaken in ArcGIS 10 platform. The task was being done for the first time in the state and it must be added that the task was excruciatingly demanding and at times testing. The digitization was then cross verified with the Survey of India GT (1:50000) for accuracy. As a part of this exercise all the forests were digitized, their area

ascertained, compartments falling under different forest recorded and each forest was assigned unique identity number for purpose of future reference. This exercise shall only act as a beginning of the digitization of demarcation record and the accuracy of the maps should be further improved upon separately by the Demarcation Divisions. As a natural progression, the compartment, beat block and range maps were also prepared on the GIS platform and overlaid on the demarcation map layer. The exercise has ensured the creation GIS based spatial database for the division. The layers have been connected to attribute table enumerating the individual compartment characteristics. Based on this exercise the area of the forest and the administrative units were ascertained and the values so derived has been reflected in Chapter-I. Photointerpretation division of Forest department assisted in digitization work of the exercise as GIS facility is not available in the office of the DFO Working Plan Division-III, Doda.

7.4.2. **Assessment of Growing Stock.** The revision of field exercise was undertaken by the staff in the territorial division. The estimation of growing stock shall involve the preparation of stock map, collation of information on compartment description and sampling to ascertain the Growing Stock.

7.4.3. For the purpose of assessment of crop stand in the compartments and its inventorization, stock mapping was done with the help of Satellite imagery and Google earth images. From the Satellite imagery the extent of forest was delineated. For this purpose classified image supplied by FSI dehradun, google earth images were used. Spatial resolution obtained from NRSA Hyderabad as well as Landsat-V imagery were used. The LISS-IV imagery will also act as the base line information for the current date when the exercise was taken up. It shall be of application in assessing future change in crop spread, density and land use. It shall be of particular use in ascertaining encroachment status at a future[e date.

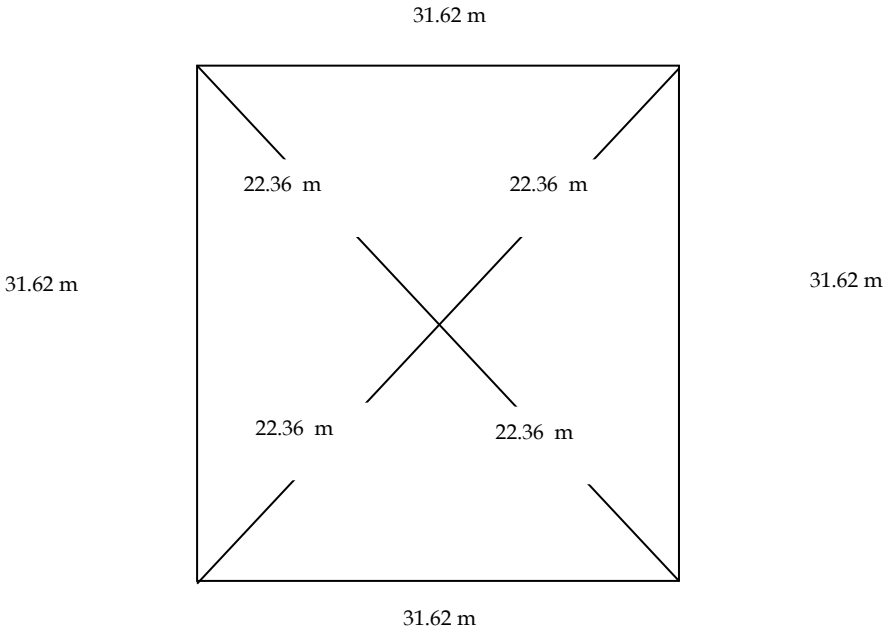
7.5. Field Exercise for Assessment of Growing Stock

7.5.1. **Sampling Technique**. For the estimation of growing stock sampling technique of partial enumeration by sample plots has been adopted. Sample plots of the size of 0.1 ha. was used. As the immediate accomplishment of the revision exercise was a major exercise parameter, the sampling method of stratified random sampling was used. Stratified sampling technique was appropriate as it reduces the number of samples required for estimation of crop without sacrificing accuracy. Based on the crop stand the forests were classified into dense and open layer. The classification was done using processing of Satellite imagery on ArcGIS 10 and cross verification with Google earth images and ground truthing. Satellite imagery of Landsat-V was used and treated by interactive supervised classification based on sampled pixel values. Two layers of dense crop and open crop were extracted and over laid on the compartment layer on GIS platform. Both layers were then merged to obtain compartment wise dense and open cropped area. The compartments based on the crop stand its quality and general health were assigned to different Working Circles and sampling conducted in

them. The sample points were randomly placed on the stratified layer of dense forest. These points are selected by fixing the co-ordinates on sample frame, using pairs of random number taken from table of random numbers. The location of the point on the sample frame is then transferred to the base map, and the relevant GT sheet of the area. Once the points are located on the map and GT map of the area, the points were objectively located in the field with the help of GPS. After locating the point, the sample plot is laid and the data is recorded on the Enumeration data sheet.

7.5.2. **Procedure for laying of sample plots**. The sample plots were laid in a uniform representative dense patch in the selected compartments as arrived from random coordinates. The area of the sample plot was 0.1 hectare and laid in square shape with each side having length of 31.62 mtrs. First the area was cleared for bushes, if any, with khukri and the premeasured ropes were laid on ground securing the corners with pegs. The length is measured with tape for correction if any. All trees inside the plot were measured and the readings of diameter at breast height are recorded for each tree inside the layout by a group of 3 members (1 B.O, 1 Guard, 1 Daily Wager). The trees at the corner are marked with 2 rings to distinguish the plot area. The trees located on boundary line of one side were not counted; correspondingly on another side, the boundary trees were counted. Hence, on lengthwise, it will be counted in one side and on the contour sides; it will be counted in one side only.

Figure-7.1.



Design of Sample Plot

7.5.3. **Layout and Delimitation of boundaries.** In the revision exercise the layout and delimitation of compartment boundaries and Range boundaries has been undertaken. The layout of boundaries of Range and Compartments was undertaken after detailed ground survey using GPS and existent working plan map. The boundaries were delinested on ground by marking the trees located on or adjacent to the boundary by coal tar rings. As per past convention in such delimitation exercise, single ring was used to denote compartment boundary, two rings to denote range boundary and three rings for divisional boundary. And the rings are marked in such a manner that from one ring the other ring is visible. At places of prominence where the Compartments are separated were marked by boards on the tree trunk. The boards depict the compartment number and the natural feature separating them along with the direction of location of the compartments by arrows. Boards that already existed were refreshed.

7.6. Analysis of Data

7.6.1. The data obtained from the field was compiled in the computer. The data was further processed and analysed using Microsoft Excel software. The sampling data obtained was then put to statistical test to arrive at acceptable accuracy levels. From the field data was then ascertained the average stem distribution in dia-classes per hectare. This data was then extrapolated for the entire area of the Working Circle to arrive at an estimate of the stem stand and the growing stock of the Circle. The allowable cut was calculated taking into account the growing stock in dense forested area alone. For the purpose of calculation of yield Brandis Diameter Class Method (Indian Method) was used and the annual yield so arrived at was cross checked by Von Mantel's Formula limit for normal forest.