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

Subject : Sanction of Draft Working Plan of Kathua Forest Division.
Reference : Pr.Chief Conservator of Froests, PCCF/Coord/Working Plan Kathua and Poonch/DWP/2706 dated 06-01-2018.

Government Order No : 93 – FST of 2018
D a t e d : 20 - 03 - 2018

Sanction is hereby, accorded to the operation of the Working Plans of Kathua 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.	Kathua	Dr. TS Ashok Kumar	2002-03 to 2012-13	Dr. Harpreet Kaur, SFS (Divisional Forest officer) Resources Survey Division, Jammu	2017-18 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/39/2017 Dated : 20-03-2018

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. Dr. Harpreet Kour, SFS, Divisional Forest Officer, Resources Survey Division, Jammu.
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.

(**Umesh Sharma**)
Under Secretary to Government
Forest, Environment & Ecology Deptt.

INTRODUCTION

The forests of Kathua are an important repository of subtropical biodiversity. These are the only forests in the State where bamboo is found growing naturally. The area is a natural habitat for the Shiwalik Chir Pine as well, which is akey forest crop in terms of ecological as well as economic importance.

The previous Working Plan for Kathua Forest Division was written by Dr TS Ashok Kumar, covering the period from 2002-03 to 2012-13. The working circles and their compartment allocation constituted in the previous plan have been continued for the working circles pertaining to Chir and Khair crops. The working circle earlier named for Khair has been renamed to focus on Broadleaf forests. The constitution of the working circle for Bamboo as maintained historically has been restored and the working circles for Grazing and Plantation have been constituted as overlapping circles rather than dedicating specific compartments for the same.

The immense pressure for land which is resulting in encroachment of forest land and leading to change in the land use/land cover has emerged as the biggest challenge to forest conservation. Forest Protection is the foundation on which the entire structure of forest conservation and management rests. The other important issue, especially in the case of Chir forests is that of securing regeneration which is becoming increasingly difficult because of frequent forest fires. The proposed Working Plan has included this aspect in each Working Circle and it is expected that the same level of importance will be given to these issues by the territorial staff as well.

The proposed Plan incorporates volume estimation of broadleaved species, which has been attempted for the first time. The mapping has been done using GIS to obtain a realistic picture of the ground situation.

The revision exercise passed through several hands as initially the territorial DFO was allocated the work. Later a Working Plan Officer (WPO) was also deputed on the job who wrote the Preliminary Working Plan Report and completed the work of layout. Finally this Division was entrusted to take over the remaining work pertaining to collection of field data, completion of analysis and compilation of the Plan. Thus the revision of this Working Plan faced considerable difficulties. Field work suffered because of inadequacy of trained staff. Also, the sharing of records and data left a lot to be desired as far as communication between and among the various wings and offices of the Department is considered.

The writing of this plan also presented a peculiar problem. The compartments of Samba range are numbered according to two drainage series named after Devak and Basantar rivers. However, there was no clarity on which compartments belonged to which series. Resolving this issue was a learning exercise in itself.

The completion of this exercise of revision of the Working Plan was made possible only through cooperation and teamwork. I am extremely thankful to Sh. AK Singh,

Principal Chief Conservator of Forests (HOFF), for entrusting me with the responsibility of handling such an important assignment. My sincere thanks are also due to Sh. RS Jasrotia and Sh. J Frankoi, Chief Conservators of Forests, Working Plan, Research and Training for their kind support.

I am indebted to, and offer my heartfelt gratitude towards the Conservators of Forests, Working Plan Circle, Sh. Vasu Yadav and Dr. Anandh K. for the immense support they gave me. Their invaluable help and the trust that they reposed in me gave me the confidence to take up and complete this exercise.

I take this opportunity to place on record my sincere thanks to the DFO, Kathua Forest Division, Sh. Ashwani Kumar, DFO, Social Forestry Division Kathua, Sh. Sagar Singh and Wildlife Warden, Kathua, Dr. Priyanka Sareen for their valuable support and cooperation throughout the revision exercise. The help and co-operation received from the field and office staff of Kathua Forest Division, is also acknowledged with gratitude.

I would like to record my appreciation and thanks to the staff of the Resources Survey Division who were associated with this exercise. Sh. Mohd Ayoub Khan, the earlier DFO of the Division and Range Officers Sh. Ravi Kumar and Sh. Neeraj Baru completed fieldwork for one range. Sh. Gian Singh, Sh. Janak Raj, Sh. Rajesh Abrol, Sh. Drowji Koul, Range Officers, and Sh. Parvaiz Shagoo, Forester, assisted by Sh. Rajesh Lalla, Sh. Anil Kumar and Sh. Manoj Bhan completed the field assignments. Sh. Shagoo also provided a comprehensive list of birds which he reported from Kathua and helped in checking of data.Sh. Ashok Kumar, consolidated worker, was of great help throughout the field exercise, especially in identification of local plants. In addition, the undersigned was assisted by Sh. Mohd Sultan, Sr. Asstt.,in collection of data, Smt. Nimme Bakshi in typing work and Sh. Mohinder Singh, who worked as the driver.

(Dr. Harpreet Kaur)
Divisional Forest Officer
Resources Survey Division
Jammu.

CONTENTS

Photo credits:- DRHK : Dr. Harpreet Kaur
PS : Parvez Shagoo
RL : Rajesh Lalla

List Of Plants Commonly Found In The Tract

(Sorted According To Botanical Name)

BOTANICAL NAME	**COMMON NAME**	**FAMILY**
Abrus precatorius	Rati	Leguminosae
Acacia catechu	Khair	Leguminosae
Acacia farnesiana	Exotic acacia	Leguminosae
Acacia modesta	Phulai or Fly	Leguminosae
Acacia nilotica	Kikar	Leguminosae
Achyranthes aspera	Parkanda	Amaranthaceae
Aegle marmelos	Bel	Rutaceae
Aerva sanguinolenta	Nuriya	Amaranthaceae
Agave americana	Ramban	Asparagaceae
Albizia lebbeck	Kala Siris	Leguminosae
Albizia odoratissima	Kramblu	Leguminosae
Albizzia procera	Safed siris	Leguminosae
Aloe barbadensis	Kuad Gandal	Xanthorrhoeaceae
Amaranthus viridis	Chaleri Saag	Amaranthaceae
Artemisia parviflora	Seski	Compositae
Artocarpus heterophyllus	Kathal	Moracae
Arundo donax	Nad	Poaceae
Azadirachta indica	Neem	Meliaceae
Bambusa bambos	Bamboo	Poaceae
Bambusa nutans	Bamboo	Poaceae
Bauhinia purpurea	Kachnar	Leguminosae
Bauhinia vahlii	Baloonger	Leguminosae
Bauhinia variegata	Kachnar	Leguminosae
Bombax ceiba	Simbal	Malvaceae
Broussonetia papyrifera	Jungli toot	Moraceae
Butea monosperma	Plaah	Leguminosae

BOTANICAL NAME	**COMMON NAME**	**FAMILY**
Cannabis sativa	Bhang	Cannabaceae
Carissa spinarum	Garna	Apocynaceae
Casearia tomentosa	Chilla	Salicaceae
Cassia fistula	Krangal	Leguminosae
Catunaregum spinosa	Mainphal	Rubiaceae
Cenchrus ciliaris	Aajan Grass	Poaceae
Centella asiatica	Brahmi buti	Apiaceae
Chenopodium murale	Karun	Amaranthaceae
Chrysopogon zizanoides	Khas Khas	Poaceae
Cinnamomum camphora	Kapoor	Lauraceae
Cirsium arvense	Bhus	Compositae
Colebrookea oppositifolia	Sanali or Dussa	Lamiaceae
Corymbia citriodora	Safeda	Myrtaceae
Crateva religiosa	Barna	Capparaceae
Cuscuta reflexa	Amar Bel	Convolvulaceae
Cynodon dactylon	Doob Grass	Poaceae
Cynoglossum lanceolatum	Shudri	Boraginaceae
Cyperus rotundus	Deela	Cyperaceae
Dalbergia sissoo	Tali	Leguminosae
Datura stramonium	Dhatura	Solanaceae
Dendrocalamus strictus	Baans	Poaceae
Dichanthium annulatum	Palain	Poaceae
Dicliptera bupleuroides	Kalu grass	Acanthaceae
Dioscorea melanophyma	Sadhun	Dioscoreaceae
Dodonaea viscosa	Santha	Sapindaceae
Duranta erecta	Duranta	Verbenanaceae
Ehretia acuminata	Chamror	Boraginaceae
Ehretia laevis	Chamror	Boraginaceae
Erythrina suberosa	Dhol Dhak	Leguminosae

BOTANICAL NAME	**COMMON NAME**	**FAMILY**
Erythrina variegata	Pangara	Leguminosae
Eucalyptus camaldulensis	Safeda	Myrtaceae
Eucalyptus tereticornis	Hybrid safeda	Myrtaceae
Eulaliopsis binata	Bubbeain	Poaceae
Euphorbia royleana	Thor	Euphorbiaceae
Ficus auriculata	Trimbal	Moraceae
Ficus benghalensis	Bohr	Moraceae
Ficus palmata	Fagora	Moraceae
Ficus racemosa	Rumble	Moraceae
Ficus religiosa	Badh or Pipal	Moraceae
Flacourtia indica	Kakoa	Salicaceae
Flemingia chappar	Kanphuta	Leguminoceae
Gomphrena celosioides	Bhattani	Amaranthaceae
Grewia optiva	Dhaman	Malvaceae
Heteropogon contortus	Lamb grass	Poaceae
Ipomoea carnea	Aakh	Convolvulaceae
Ipomoea purpurea	Kharpoway	Convolvulaceae
Jasminum officinale	Chameli	Oleaceae
Jatropha curcas	Ratanjot	Euphorbiaceae
Justicia adhatoda	Brenker	Acanthaceae
Lannea coromandelica	Kembal	Anacardiaceae
Lantana camara	Panjphuli	Verbenaceae
Lathyrus sativus	Mithu grass	Leguminoceae
Mallotus philippensis	Kamila	Euphorbiaceae
Malvastrum coromandelianum	Baryar	Malvaceae
Mangifera indica	Aam	Anacardiaceae
Melia azedarach	Drehnk	Meliaceae
Mitragyna parvifolia	Kaam	Rubiaceae
Morus alba	Toot	Moraceae

BOTANICAL NAME	**COMMON NAME**	**FAMILY**
Murraya koenigii	Drenkeri	Rutaceae
Nerium oleander	Gandila	Apocynaceae
Olea europaea* subsp. *cuspidata	Kua	Oleaceae
Opuntia elatior	Chhitter	Cactaceae
Oroxylum indicum	Tetar	Bignoniacae
Parthenium hysterophorus	Congress Grass or Jari	Compositae
Pennisetum pedicellatum	Deena nath grass	Poaceae
Pennisetum purpureum	Napier grass	Poaceae
Phoenix sylvestris	Khajoor	Arecaceae
Phyllanthus emblica	Amla	Phyllanthaceae
Pinus roxburghii	Chir	Pinaceae
Punica granatum	Daduni	Lythraceae
Pupalia lappacea	Jojra	Amaranthaceae
Reinwardtia indica	Basant panchami	Linaceae
Ricinus communis	Arnid	Euphorbiaceae
Rumex hastatus	Junglee Palak	Polygonaceae
Saccharum bengalense	Khar	Poaceae
Saccharum spontaneum	Kai	Poaceae
Sapindus mukorossi	Reetha	Sapindaceae
Senna occidentalis	Bari kasondi	Leguminocae
Senna siamea	Kassod	Leguminosae
Senna sulfurea	Cassia	Leguminosae
Senna tora	Panwar	Leguminosae
Setaria sphacelata	Kezun grass	Poaceae
Solanum americanum	Kayan Kothi	Solanaceae
Solanum erianthum	Ban tamakoo	Solanaceae
Syzygium cumini	Jamun	Myrtaceae
Tamarindus indica	Imli	Leguminosae
Tarxacum campylodes	Phul dudi	Asteraceae

BOTANICAL NAME	**COMMON NAME**	**FAMILY**
Terminalia arjuna	Arjun	Combretaceae
Terminalia bellirica	Bahera	Combretaceae
Terminalia chebula	Harar	Combretaceae
Tinospora sinensis	Giloe	Menispermaceae
Toona ciliata	Tunu	Meliaceae
Trema orientalis	Jiyo	Cannabaceae
Tribulus terrestris	Pakhra	Zygophyllaceae
Tulipa clusiana	Kayalu	Liliaceae
Urena lobata	Bachita	Malvaceae
Vitex negundo	Bana	Lamiaceae
Wendlandia exserta	Pansar	Rubiaceae
Woodfordia floribunda	Dhain	Lythraceae
Woodfordia fruticosa	Dhain	Lythraceae
Wrightia arborea	Dudhi	Apocyanaceae
Xanthium strumarium	Jojera	Compositae
Zanthoxylum armatum	Timbru	Rutaceae
Ziziphus jujuba	Ber	Rhamnaceae

List Of Plants Commonly Found In The Tract

(Sorted According To Common Name)

COMMON NAME	***BOTANICAL NAME***	**FAMILY**
Aajan Grass	***Cenchrus ciliaris***	Poaceae
Aakh	***Ipomoea carnea***	Convolvulaceae
Aam	***Mangifera indica***	Anacardiaceae
Amar Bel	***Cuscuta reflexa***	Convolvulaceae
Amla	***Phyllanthus emblica***	Phyllanthaceae
Arjun	***Terminalia arjuna***	Combretaceae
Arnid	***Ricinus communis***	Euphorbiaceae
Baans	***Dendrocalamus strictus***	Poaceae
Bachita	***Urena lobata***	Malvaceae
Badh or Pipal	***Ficus religiosa***	Moraceae
Bahera	***Terminalia bellirica***	Combretaceae
Baloonger	***Bauhinia vahlii***	Leguminosae
Bamboo	***Bambusa bambos***	Poaceae
Bamboo	***Bambusa nutans***	Poaceae
Ban tamakoo	***Solanum erianthum***	Solanaceae
Bana	***Vitex negundo***	Lamiaceae
Bari kasondi	***Senna occidentalis***	Leguminocae
Barna	***Crateva religiosa***	Capparaceae
Baryar	***Malvastrum coromandelianum***	Malvaceae
Basant panchami	***Reinwardtia indica***	Linaceae
Bel	***Aegle marmelos***	Rutaceae
Ber	***Ziziphus jujuba***	Rhamnaceae
Bhang	***Cannabis sativa***	Cannabaceae
Bhattani	***Gomphrena celosioides***	Amaranthaceae
Bhus	***Cirsium arvense***	Compositae
Bohr	***Ficus benghalensis***	Moraceae
Brahmi buti	***Centella asiatica***	Apiaceae

COMMON NAME	***BOTANICAL NAME***	**FAMILY**
Brenker	***Justicia adhatoda***	Acanthaceae
Bubbeain	***Eulaliopsis binata***	Poaceae
Cassia	***Senna sulfurea***	Leguminosae
Chaleri Saag	***Amaranthus viridis***	Amaranthaceae
Chameli	***Jasminum officinale***	Oleaceae
Chamror	***Ehretia acuminata***	Boraginaceae
Chamror	***Ehretia laevis***	Boraginaceae
Chhitter	***Opuntia elatior***	Cactaceae
Chilla	***Casearia tomentosa***	Salicaceae
Chir	***Pinus roxburghii***	Pinaceae
Congress Grass or Jari	***Parthenium hysterophorus***	Compositae
Daduni	***Punica granatum***	Lythraceae
Deela	***Cyperus rotundus***	Cyperaceae
Deena nath grass	***Pennisetum pedicellatum***	Poaceae
Dhain	***Woodfordia floribunda***	Lythraceae
Dhain	***Woodfordia fruticosa***	Lythraceae
Dhaman	***Grewia optiva***	Malvaceae
Dhatura	***Datura stramonium***	Solanaceae
Dhol Dhak	***Erythrina suberosa***	Leguminosae
Doob Grass	***Cynodon dactylon***	Poaceae
Drehnk	***Melia azedarach***	Meliaceae
Drenkeri	***Murraya koenigii***	Rutaceae
Dudhi	***Wrightia arborea***	Apocyanaceae
Duranta	***Duranta erecta***	Verbenanaceae
Exotic acacia	***Acacia farnesiana***	Leguminosae
Fagora	***Ficus palmata***	Moraceae
Gandila	***Nerium oleander***	Apocynaceae
Garna	***Carissa spinarum***	Apocynaceae
Giloe	***Tinospora sinensis***	Menispermaceae

COMMON NAME	*BOTANICAL NAME*	FAMILY
Harar	***Terminalia chebula***	Combretaceae
Hybrid safeda	***Eucalyptus tereticornis***	Myrtaceae
Imli	***Tamarindus indica***	Leguminosae
Jamun	***Syzygium cumini***	Myrtaceae
Jiyo	***Trema orientalis***	Cannabaceae
Jojera	***Xanthium strumarium***	Compositae
Jojra	***Pupalia lappacea***	Amaranthaceae
Junglee Palak	***Rumex hastatus***	Polygonaceae
Jungli toot	***Broussonetia papyrifera***	Moraceae
Kaam	***Mitragyna parvifolia***	Rubiaceae
Kachnar	***Bauhinia purpurea***	Leguminosae
Kachnar	***Bauhinia variegata***	Leguminosae
Kai	***Saccharum spontaneum***	Poaceae
Kakoa	***Flacourtia indica***	Salicaceae
Kala Siris	***Albizia lebbeck***	Leguminosae
Kalu grass	***Dicliptera bupleuroides***	Acanthaceae
Kamila	***Mallotus philippensis***	Euphorbiaceae
Kanphuta	***Flemingia chappar***	Leguminoceae
Kapoor	***Cinnamomum camphora***	Lauraceae
Karun	***Chenopodium murale***	Amaranthaceae
Kassod	***Senna siamea***	Leguminosae
Kathal	***Artocarpus heterophyllus***	Moracae
Kayalu	***Tulipa clusiana***	Liliaceae
Kayan Kothi	***Solanum americanum***	Solanaceae
Kembal	***Lannea coromandelica***	Anacardiaceae
Kezun grass	***Setaria sphacelata***	Poaceae
Khair	***Acacia catechu***	Leguminosae
Khajoor	***Phoenix sylvestris***	Arecaceae
Khar	***Saccharum bengalense***	Poaceae

COMMON NAME	***BOTANICAL NAME***	**FAMILY**
Kharpoway	***Ipomoea purpurea***	Convolvulaceae
Khas Khas	***Chrysopogon zizanoides***	Poaceae
Kikar	***Acacia nilotica***	Leguminosae
Kramblu	***Albizia odoratissima***	Leguminosae
Krangal	***Cassia fistula***	Leguminosae
Kua	***Olea europaea* subsp. *cuspidata***	Oleaceae
Kuad Gandal	***Aloe barbadensis***	Xanthorrhoeaceae
Lamb grass	***Heteropogon contortus***	Poaceae
Mainphal	***Catunaregum spinosa***	Rubiaceae
Mithu grass	***Lathyrus sativus***	Leguminoceae
Nad	***Arundo donax***	Poaceae
Napier grass	***Pennisetum purpureum***	Poaceae
Neem	***Azadirachta indica***	Meliaceae
Nuriya	***Aerva sanguinolenta***	Amaranthaceae
Pakhra	***Tribulus terrestris***	Zygophyllaceae
Palain	***Dichanthium annulatum***	Poaceae
Pangara	***Erythrina variegata***	Leguminosae
Panjphuli	***Lantana camara***	Verbenaceae
Pansar	***Wendlandia exserta***	Rubiaceae
Panwar	***Senna tora***	Leguminosae
Parkanda	***Achyranthes aspera***	Amaranthaceae
Phul dudi	***Tarxacum campylodes***	Asteraceae
Phulai or Fly	***Acacia modesta***	Leguminosae
Plaah	***Butea monosperma***	Leguminosae
Ramban	***Agave americana***	Asparagaceae
Ratanjot	***Jatropha curcas***	Euphorbiaceae
Rati	***Abrus precatorius***	Leguminosae
Reetha	***Sapindus mukorossi***	Sapindaceae
Rumble	***Ficus racemosa***	Moraceae

COMMON NAME	***BOTANICAL NAME***	**FAMILY**
Sadhun	***Dioscorea melanophyma***	Dioscoreaceae
Safed siris	***Albizzia procera***	Leguminosae
Safeda	***Corymbia citriodora***	Myrtaceae
Safeda	***Eucalyptus camaldulensis***	Myrtaceae
Sanali or Dussa	***Colebrookea oppositifolia***	Lamiaceae
Santha	***Dodonaea viscosa***	Sapindaceae
Seski	***Artemisia parviflora***	Compositae
Shudri	***Cynoglossum lanceolatum***	Boraginaceae
Simbal	***Bombax ceiba***	Malvaceae
Tali	***Dalbergia sissoo***	Leguminosae
Tetar	***Oroxylum indicum***	Bignoniacae
Thor	***Euphorbia royleana***	Euphorbiaceae
Timbru	***Zanthoxylum armatum***	Rutaceae
Toot	***Morus alba***	Moraceae
Trimbal	***Ficus auriculata***	Moraceae
Tunu	***Toona ciliata***	Meliaceae

List Of Fauna Reported From Kathua Forest Division

(Listed According To Common Name)

Common Name	***Scientific Name***
Mammals	
Barking Deer	***Muntiacus muntjak***
Chital	***Axis axis***
Five striped Palm Squirrel	***Funambulus pennanti***
Goral	***Nemorrhaedus goral***
Grey Langur	***Semnopithecus entellus***
Indian Crested Porcupine	***Hystrix indica***
Indian Fox	***Vulpes benghalensis***
Jackal	***Canis aureus***
Jungle Cat	***Felis chaus***
Leopard	***Panthera pardus***
Nilgai	***Boselaphus tragocamelus***
Rhesus Macaque	***Macaca mulatta***
Birds	
Alexandrine Parakeet	***Psittacula eupatria***
Ashy-crowned Sparrow-lark	***Eremopterix griseus***
Ashy Prinia	***Prinia socialis***
Asian Barred Owlet	***Glaucidium cuculoides***
Bank Myna	***Acridotheres ginginianus***
Barn Swallow	***Hirundo rustica***
Baya Weaver	***Ploceus philippinus***
Black-crowned Night Heron	***Nycticorax nycticorax***
Black Drongo	***Dicrurus macrocercus***
Black Francolin	***Francolinus francolinus***
Black Kite	***Milvus migrans***

Common Name	***Scientific Name***
Black Redstart	***Phoenicurus ochruros***
Black-rumped Flameback (Lesser Goldenbacked Wood pecker)	***Dinopium benghalense***
Blue Rock Pigeon	***Columba liva***
Blue Tailed Bee Eater	***Merops philippinus***
Blue Whistling Thrush	***Myophonus caeruleus***
Brahminy Starling	***Sturnia pagodarum***
Brown-fronted Woodpecker	***Dendrocopos auriceps***
Brown Rock Chat (Indian Chat)	***Oenanthe fusca***
Brown-headed Barbet (Large Green Barbet)	***Megalaima zeylanica***
Cattle Egret	***Bubulcus ibis***
Chakore (Rock Partridge)	***Alectoris graeca***
Chestnut-bellied Nuthatch	***Sitta cinnamoventris***
Chestnut-shouldered Petronia	***Gymnoris xanthocollis***
Cinereous Tit (Great Tit)	***Parus cinereus***
Cinereous Vulture	***Aegypius monachus***
Citrine Wagtail	***Motacilla citreola***
Common Babbler	***Turdoides caudate***
Common Chiffchaff	***Phylloscopus collybita***
Common Hawk Cuckoo	***Hierococcyx sparverioides***
Common Hoopoe	***Upupa epops***
Common Iora	***Aegithina tiphia***
Common Kestrel	***Falco tinnunculus***
Common Kingfisher (Small Blue Kingfisher)	***Alcedo atthis***
Common Moorhen	***Gallinula chloropus***
Common Myna	***Acridotheres tristis***
Common Pochard	***Aythya ferina***
Common Raven (Northern Raven)	***Corvus corax***
Common Sandpiper	***Actitis hypoleucos***
Common Tailorbird	***Orthotomus sutorius***

Common Name	***Scientific Name***
Common Teal (Eurasian Teal)	***Anas crecca***
Common Woodshrike	***Tephrodornis pondicerianus***
Common Quail	***Coturnix coturnix***
Coppersmith Barbet	***Megalaima haemacephala***
Crested Kingfisher	***Megaceryle lugubris***
Crimson Sunbird	***Aethopyga siparaja***
Crow Pheasant (Greater Coucal)	***Centropus sinensis***
Egyptian Vulture	***Neophron percnopterus***
Eurasian Collared Dove	***Streptopelia decaocto***
Eurasian Griffon (Griffon Vulture)	***Gyps fulvus***
Fulvous-breasted Woodpecker	***Dendrocopos macei***
Gadwal	***Anas strepera***
Golden Eagle	***Aquila chrysaetos***
Golden Oriole	***Oriolus kundoo***
Great Cormorant	***Phalacrocorax carbo***
Green Bee Eater	***Merops orientalis***
Grey Bushchat	***Saxicola ferreus***
Grey-capped Pygmy Woodpecker	***Dendrocopos canicapillus***
Grey Francolin	***Francolinus pondicerianus***
Grey Heron	***Ardea cinerea***
Grey-hooded Warbler	***Phylloscopus xanthoschistos***
Grey Wagtail	***Motacilla cinerea***
Hair-crested Drongo	***Dicrurus hottentottus***
Hen Harrier (Northern Harrier)	***Circus cyaneus***
Himalayan Bulbul (White-cheeked Bulbul)	***Pycnonotus leucogenys***
Himalayan Buzzard	***Buteo burmanicus***
Himalayan Griffon (Himalayan Vulture)	***Gyps himalayensis***
House Crow	***Corvus splendens***
House Sparrow	***Passer domesticus***

Common Name	***Scientific Name***
Indian Cormorant	***Phalacrocorax fuscicollis***
Indian Grey Hornbill	***Ocyceros birostris***
Indian Paradise Flycatcher	***Terpsiphone paradisi***
Indian Peafowl	***Pavo cristatus***
Indian Pond Heron	***Ardeola grayii***
Indian Robin	***Saxicoloides fulicatus***
Indian Roller	***Coracias benghalensis***
Indian Silverbill (White-throated Munia)	***Euodice malabarica***
Indian White-rumped Vulture	***Gyps bengalensis***
Jungle Babbler	***Turdoides striata***
Jungle Prinia	***Prinia sylvatica***
Kalij Pheasant	***Lophura leucomelanos***
Large-billed Crow	***Corvus macrorhynchos***
Laughing Dove (Little Brown Dove)	***Streptopelia senegalensis***
Lesser Whitethroat	***Sylvia curruca***
Little Cormorant	***Microcarbo niger***
Little Egret	***Egretta garzetta***
Little Ringed Plover	***Charadrius dubius***
Long-tailed Shrike	***Lanius schach***
Mallard	***Anas platyrhyncos***
Long-tailed Minivet	***Pericrocotus ethologus***
Northern Goshawk	***Accipiter gentilis***
Northern Pintail	***Anas acuta***
Northern Harrier	***Circus cyaneus***
Oriental Magpie Robin	***Copsychus saularis***
Oriental Turtle-Dove	***Streptopelia orientalis***
Oriental White eye	***Zosterops palpebrosus***
Peregrine Falcon (Shaheen)	***Falco peregrinus***
Pied Bushchat	***Saxicola caprata***

Common Name	***Scientific Name***
Pied Kingfisher	***Ceryle rudis***
Pine Bunting	***Emberiza leucocephalos***
Plain Prinia	***Prinia inornata***
Plum-headed Parakeet	***Psittacula cyanocephala***
Plumbeous Water Redstart	***Rhyacornis fuliginosa***
Puff-throated Babbler	***Pellorneum ruficeps***
Purple Sunbird	***Cinnyris asiaticus***
Red Jungle Fowl	***Gallus gallus***
Red-vented Bulbul	***Pycnonotus cafer***
Red-wattled Lapwing	***Vanellus indicus***
Ring Dove	***Streptopelia capicola***
Rock Bunting	***Emberiza cia***
Rose-ringed Parakeet	***Psittacula krameri***
Rufous-breasted Accentor	***Prunella strophiata***
Rufous Treepie	***Dendrocitta vagabunda***
Russet Sparrow	***Passer rutilans***
Scaly-bellied Woodpecker	***Picus squamatus***
Scaly-breasted Munia (Spotted Munia)	***Lonchura punctulata***
Scarlet Minivet	***Pericrocotus speciosus***
Siberian Stonechat	***Saxicola maurus***
Small Minivet	***Pericrocotus cinnamomeus***
Spotted Dove	***Streptopelia chinensis***
Spotted Owlet	***Athene brama***
Steppe Eagle	***Aquila nepalensis***
Striated Heron	***Butorides striata***
Striated Prinia	***Prinia crinigera***
Tree Pipit	***Anthus trivialis***
Verditer Flycatcher	***Eumyias thalassinus***
White-breasted Waterhen	***Amaurornis phoenicurus***

Common Name	***Scientific Name***
White-capped Bunting	***Emberiza stewarti***
White-capped Water Redstart	***Chaimarrornis leucocephalus***
White-throated Kingfisher	***Halcyon smyrnensis***
White Wagtail	***Motacilla alba***
White-browed Wagtail (Large Pied Wagtail)	***Motacilla maderaspatensis***
White-throated Fantail	***Rhipidura albicollis***
Wigeon (Eurasian Wigeon)	***Anas penelope***
Yellow-eyed Babbler	***Chrysomma sinense***
Yellow-billed Blue Magpie	***Urocissa flavirostris***
Reptiles	
Common House Gecko	***Hemidactylus frenatus***
Common Garden Lizard	***Calotes versicolor***
Common Indian Monitor (Bengal Monitor)	***Varanus bengalensis***
Common Three Keeled Land Tortoise	***Melanochelys tricarinata***
Common Water Monitor	***Varanus salvator***
Indian Chameleon	***Chamaeleo zeylanicus***
Indian Star Tortoise	***Geochelone elegans***
Keeled Indian Mabuya (Many-keeled Grass Skink)	***Eutropis carinata***
Fishes	
Angora Loach	***Oxynoemacheilus angorae***
Bengal Danio (Debari, Mukhni)	***Devario devario***
Freshwater Shark (Mali)	***Wallago attu***
Gangetic Latia (Lurali, Kalabatta)	***Crossocheilus latius***
Indian Torrent Catfish (Sudaal)	***Amblycepus mangols***
Kalabans	***Labeo dero***
Mahseer	***Tor putitora***

Common Name	***Scientific Name***
Mottled Loach (Chikli)	***Acanthocobitis botia***
Slender Rasbora (Raankaale)	***Rasbora daniconius***
Smooth-breasted Snakefish (Dorrah)	***Channa orientalisa***
Spiny Eel (Bam)	***Mastacembelus armatus***
Stinging Catfish (Singhi, Nullie)	***Heteropneustes fossilis***
Two-spot Barb (Tit punti)	***Puntius ticto***
Vagra (Glar, Chal)	***Barilius vagra***
Zebra Danio (Anju)	***Danio rerio***

Glossary Of Vernacular Terms

Anardana	Dried pomegranate seeds.
Bakerwals	Nomadic graziers who raise goats and sheep.
Behak	Summer grazing grounds.
Bhisti	Water carrier.
Chaks	Cultivation areas inside the demarcated forests.
Choa	Seasonal stream draining copious rainwater in monsoons
Gaddis	Nomadic graziers who rear sheep and goats.
Ghat	River bank, place of launching.
Guchchi	Edible fungi (*Morchella aesculenta*).
Gujjars	Nomadic graziers who rear buffaloes, cows and deal in dairy products.
Illaqua	Tract of the area.
Jagir	Estate.
Kandi	Dry, Outer Shivalik tract.
Keri	A Small spur.
Khad	A stony stream.
Khar	*Sachharum munja* used for thatching roofs of cowsheds etc.
Kotha	Temporary hut.
Lamberdar	Village headman.
Maidan	Grassy blank.
Munji	Rice crop.
Nalla	Stream, seasonal or perennial.
Pathru	Dry slide.
Rasaunt	Extract from *Berberis* roots, used in medicine.
Talab	Pond
Tehsil	Revenue administrative unit.
Zila	District.
Zamindar	Landed cultivator.

CHAPTER-I

The Tract Dealt With

1.1 Name and Situation

1.1.1 The Kathua Forest Division with headquarters at Kathua is situated partly in Kathua District and partly in Samba district and falls under the jurisdiction of East Circle, Jammu. The division has boundaries with Jammu Forest Division in the east and north, Billawar Forest Division in north and Pathankote Forest Division of Punjab in the east. The forest area of the Division lies above the national highway in the south, although the international border forms its boundary for administrative purposes. The Division has three Territorial Ranges *viz* Kathua, Jasrota and Samba, one overlapping Soil Conservation Range and one Checkpost Range at Lakhanpur. While the Kathua and Jasrota Ranges are in Kathua district, the Samba Range is in Samba district.

1.1.2 Prior to 1914 CE Kathua, Jasrota, Basohli and Billawar Ranges were included in the Jasrota Forest Division. In 1914 CE this division was expanded by transferring Basantgarh, Dudu and Ramnagar Ranges and was named as Billawar Forest Division. In 1924 CE Dudu and Ramnagar Ranges were transferred back to Udhampur Forest Division. In 1938 CE, this division was renamed as Kathua Forest division with Head Quarters at Kathua. In 1955 it was again renamed as Billawar Forest Division with Headquarters at Billawar.

1.1.3 In 1981-82 the Billawar Forest Division was bifurcated into Kathua and Billawar Forest Divisions. Basantgarh range was transferred to Ramnagar Division while Kathua and Jasrota Ranges were included in Kathua Forest Division. That part of Bahu Range beyond the Devak river was separated from Jammu Division and became Samba Range of new Kathua Division. (Fig. 1.1 presents the flowchart of formation of Kathua Forest Division)

1.1.4 The tract is situated between 32^0 23' and 32^0 44' North latitudes and 76^0 02' and 32^0 44' East longitudes. It is covered by Survey of India topo-sheet numbers 43 P/2, 43 P/6, 43P/7, 43P/10 and 43P/11. (Fig. 1.2)

1.1.5 The maximum length of the Division is 68 km as the crow flies east to west, while its maximum width is 30 km. In the north, the physical boundary between Kathua and Jammu Forest Divisions is the main Siwalik Range which continues as the boundary between Kathua and Billawar Forest Divisions further towards the east. The Ravi river and the lake formed by Ranjit Sagar Dam form the natural boundary in the east with Billawar Forest Division, as well as the State boundary with Punjab. In the west, the Devak river forms the physical boundary with Jammu Forest Division.

1.1.6 In 2016, a new Forest Division was carved out of the existing Jammu and Kathua Forest Divisions and named Samba Forest Division. However, as on date of

submitting this Plan, the administrative formalities for the same had not been completed. Therefore, the prescriptions of this Plan shall remain valid for the new Samba Division as far as the compartments falling in the previous Samba Range of Kathua Forest Division are concerned, up to the period of this Plan.

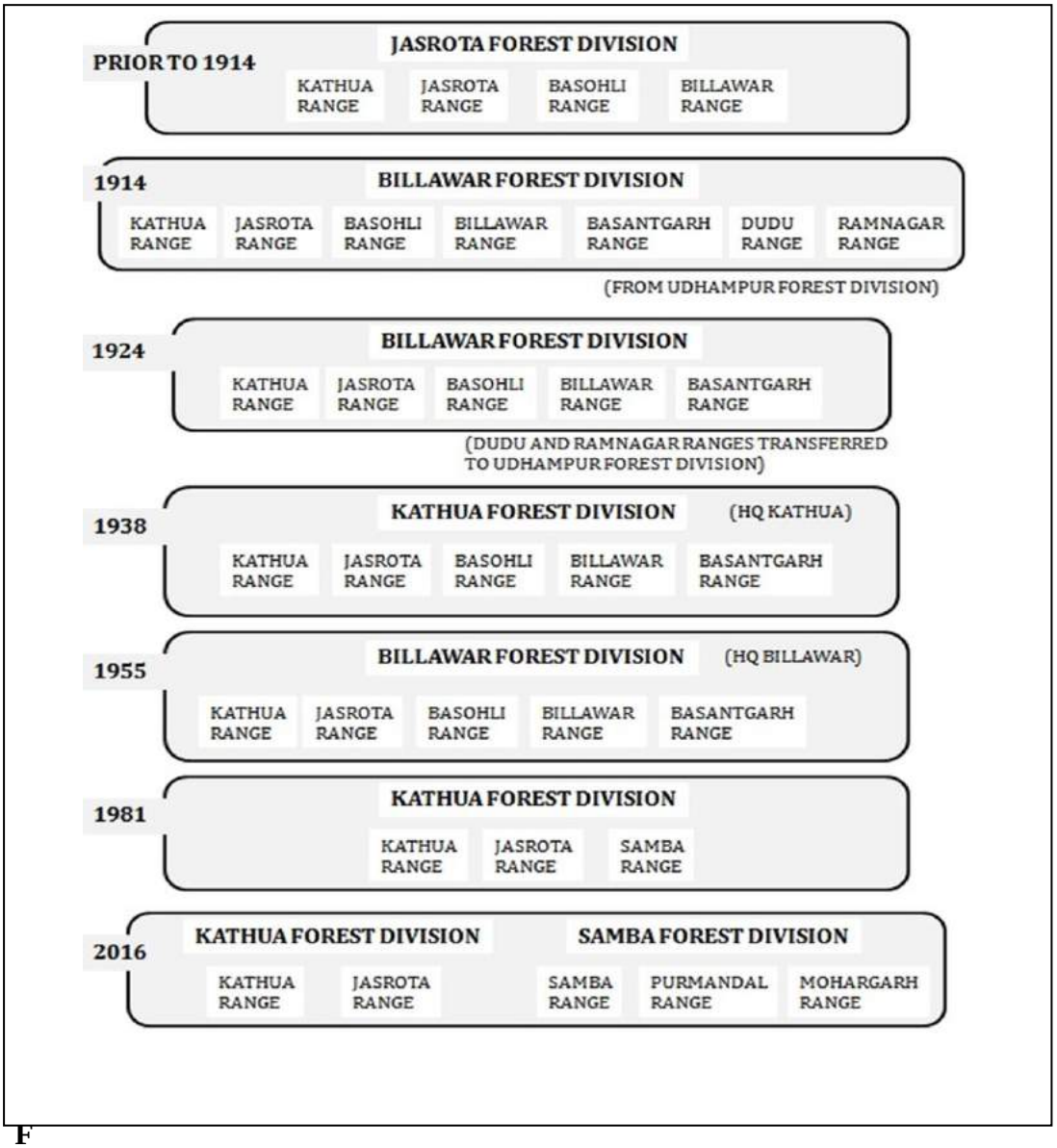

Fig 1.1.Flowchart showing the history of formation of Kathua Forest Division.

1.2 Configuration of the Ground

1.2.1 The whole tract lies at the confluence of the Shiwalik belt with the Outer Plains. The southern and south-western parts of the Division are covered by gentle terrain whereas the northern and north-eastern parts are covered by high hills. The major part of the division falls in Kandi area which is characterised by rugged, highly dissected terrain and harsh climate.

1.2.2 The whole area drains into Ravi river through numerous khads which run in North-South direction. Some of these khads are perennial. Some of the major khads in the Division are Basantpur Khad, Magar Khad, Kumbri-Kathera, Lower Ujh, Tarnah Khad, Bein Khad and Basantar Khad. The Ravi river basin is a sub-basin to the Indus river.

1.2.3 The slope is steep along the main high hills belt, moderately steep lower down and becomes gentler towards the National Highway-44 in the south. The elevation varies from 264 meters to 1256 meters above mean sea level.

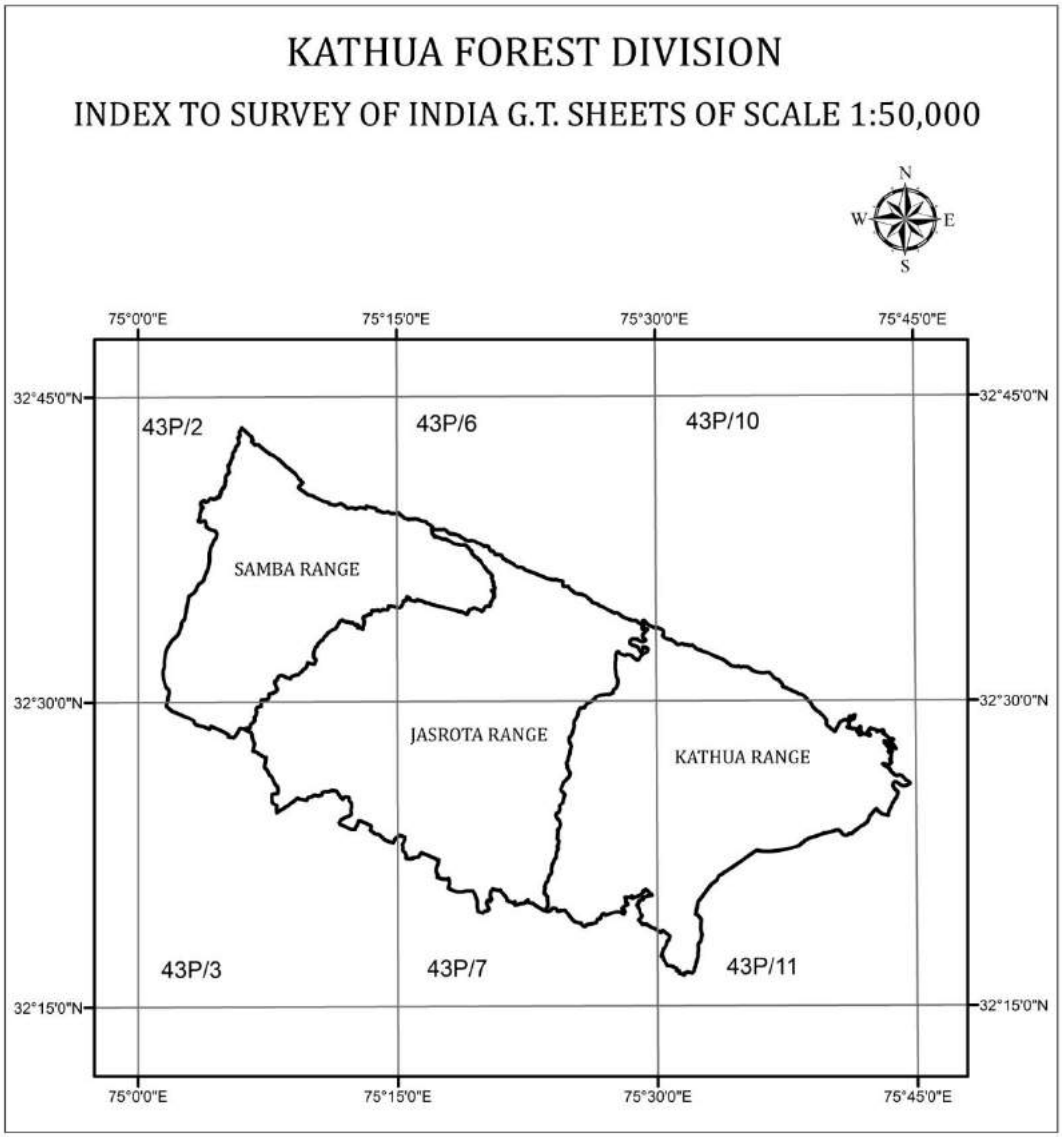

Fig. 1.2. Index to Survey of India GT Sheets of scale 1:50,000

1.3 Physiography

1.3.1 The Kathua Forest Division falls in the region of convergence of the Shiwaliks and the Outer Plains, which are the northernmost extensions of the Great Indian Plains. In the Division, the northern and eastern parts are characterized by rugged

hilly tracts while the southern parts comprise of the Sirowal and Kandi formations.

1.3.2 The northernmost ridge forming the boundary of the Division forms part of the Shiwalik formations continuing into a belt of high hills before the Kandis start. This area is characterized by rugged mountainous terrain varying in heights between 440 m and 1276 m ASL. The major physiographic slope is towards the south and southwest. The conspicuous features of this terrain are deep valleys and steep escarpments. The Kandi formation consists of coarse clastics ranging in size from boulders to gravels in loose clay matrix alongwith some kankar intercalations. The Sirowals are considered as the outwash of Kandi formations and the contact between the two is almost imperceptible.

1.3.3 The southern parts of the Division have gentle terrain with altitudes varying between 280 m and 440 m above mean sea level. The Kandi area starts from the foot of the outermost Shiwaliks and slopes towards south and south-west. It forms part of the Outer Plains which extends from Munawar Tawi in northwest Jammu Division to Ravi in the east in Kathua Division. The Kandi belt has a steep gradient of 1:100 between altitiudes of 320 m and 440 m ASL. At around altitudes less than 320 m ASL, the Kandis merge imperceptibly with the Sirowal. The contact line between the two is characterized by spring line with oozing water table.

1.4 Drainage

1.4.1 The Ravi river and its tributaries like Basantpur, Ujh, Tarnah, Bein and Basantar drain the Division from east to west. Most of the streams in the hills are ephemeral in nature and carry huge amounts of load during the monsoons. Apart from this major drainage system, there are a number of seasonal khads traversing the whole Division. They carry huge loads of boulders, pebbles, sand and silt during the monsoon period and also cause flash floods immediately after rain causing extensive damage downstream. The entire Division is profusely dissected by numerous ephemeral and small perennial streams which originate from northern mountainous region and are flowing in south and south-western direction. The combination of slope and gravelly soil results in excessive and quick drainage in forest area. Water logging is rarely seen.

1.4.2 The important drainage khads in the division are briefly introduced below:

i) Basantpur Khad, Magar Khad and Kumbri Kathera Khad

These are three important khads that drain forest area in Kathua Range into Ravi River. The Magar khad and Kumbri Kathera khads cause frequent floods during Monsoon period.

ii) The Lower Ujh, Tarnah Khad and Bein Khad

The three khads together drain the Jasrota Range. Some parts of Ujh catchment falls in Kathua Range. Frequent floods are reported in lower reaches of these khads during the months of July and August.

iii) Basantar and Devak River

These two streams drain the forest area of Samba Range.

Except for the Magar khad all other khads are perennial.

1.5. Geology Rock and Soil

1.5.1 The Outer Himalayas consist of a series of low hills gradually rising from the plains and is composed of rocks. These series of hills are called Shiwaliks. In European stratigraphy the Eocene, Oligocene, Miocene and Pliocene systems together constitute what is called the Tertiary group. One of the important events in Eocene and succeeding period is the upliftment of the Himalayas. The succeeding middle Miocence, Pliocene and lower Pleistocence systems are together called as Shiwalik system which were formed in the third phase of Himalayas upheaval.

1.5.2 Geologically, the area falling in this Division covers formations from Recent and sub-Recent to Miocene age. The characteristics of these formations are described as follows:

1.5.2.1 Upper Shiwaliks:

The upper Shiwalik formations belonging to Middle and Pleistocene age are exposed at a number of places in the northern part of the Division. These formations occur in the form of elongated hills running in north-west to south-east direction. These are chiefly composed of loosely cemented sandstone, clay and thin beds of boulders, gravel and pebbles. The dip of Shiwalik formation is between 25° and 30° towards south and south-west.

1.5.2.2 Kandi:

The southern slopes of the foot of Shiwalik hills are covered with loose talus material deposited by hill torrents which form alluvial fans. The alluvial fans have coalesced together to form what is known as the Kandi formation and which runs almost parallel to the Shiwalik hills. The width of the formation varies between 4 km in the south-east to 10 km at the central region. It exhibits steep gradient in the north and becomes gentle towards south. The surface gradient is towards south-west and varies between 37 m per km near the foothills to 9 m per km away from it. Boulders, pebbles, cobbles and coarse sand associated with clays constitute the Kandi lithology. The clay proportion increases towards south-west.

1.5.2.3 Sirowals:

The Kandi formations coalesce into Sirowal formations in the south which are formed by outwash of the finer materials of alluvial fans. The junction between Kandi and Sirowal formations is generally characterized by springs and the water oozes out along the contact zone causing marshy conditions. The number of springs are disappearing due to declining water table over the years. At some places the presence of the base flow in streams south of this line is conspicuous even now. The gradient of the surface in Sirowals is around 3 m per km.

1.5.3 Lithology

The rocks of the system are thickly bedded sand stone, grit stones, gritty sand stones, clays, pseudo-conglomerates and conglomerates. Some of the sandstones are nodular. False bedding and ripple marks and rows of water worn pebbles are common in sandstones. the lowest sandstones are mostly pepper and salt grey with abundant spangles of Mica. The important mineral composition of the tract is of bright red shales, sand stones, pseudo-conglomerates and hard red stones.

1.5.4 Paleontology

The fossils mostly consists of mammals. Pieces of thigh bones, skulls jaws and teeth of mammals are found in the sandstones. Besides mammals, remains of reptiles, fresh water molluscs and plants are found embedded in rocks. On the basis of vertebrate fossils the system is divided into three series *viz* lower, middle and upper Shiwalik Systems. The Lower Shiwalik Series of the region is 4000 to 5000 feet thick. The fossils are of Primates, Carnivores, Equus, Hippopotamus, Camel etc. The boulders conglomerate are the youngest members of the Shiwalik system and consist of quartzitic boulders cemented in an arnaeous and calcareous matrix.

1.5.5 Mineral Resources

Placer gold, Bentonite, China clay and glass sand are reported to be found in this area. Gold in small traces has been reported to be found in Shiwalik bed rock and terrace deposits in parts of Jammu and Kashmir Districts. Pockets of China clay and thin bands of white pink and greyish colored in Upper Shiwaliks at Kashmu and Rattanpur Serara in Kathua District. The China clay is quarried by local people for white washing and pot making. The quartizite boulders and sands occuring in streams and nallahs are reported to contain Silica and may be useful in glass manufacturing.

1.5.6 Soils

The soils in general are young in age, shallow in depth and full of pebbles and boulders. The water holding capacity is very low as the porosity is high and the drainage is excessive. In majority of area the soil is sandy and conglomeratic.

Patches of clay soils with good depth are seen in small valleys between mountains. The soil fertility is very low with deficiency of many nutrients and low content of organic matter.

1.6 Climate

The climate of area is sub-tropical with harsh summer and cold winter. Frequent drought during summers and flash floods during the rainy season are common. Often frost and dense fog are observed during peak winters but no parts of the Division receive snow fall.

1.6.1 Temperature

The Division lies in the subtropical region and experiences harsh conditions in both summers as well as during winters. Table 1.2 summarizes the mean monthly temperatures experienced in the Division during the last ten years. The mean summer temperatures remain in the high thirties and forties with the hottest month being June. December and January remain the coldest months with temperatures dipping even below zero degrees Centigrade for a couple of the years in January.

1.6.2 Rainfall

Table 1.1 presents the data regarding the monthly rainfall at Kathua during the years 2006 to 2016. The bulk of the rainfall is experienced in the months of July and August with average rainfall of 11.5 cm being received in August while that received in July is 7.9 cm. November is the driest month of the year, receiving only 0.18 cm of rainfall. However, May with average maximum temperature of 37.28°C and average rainfall of only 0.6 cm is the harshest of the summer months. In June, on the contrary, although the maximum temperature averages 37.60°C, the rainfall received is around 3.6 cm, making it very muggy and humid.

Table1.1.
Monthly amount of rainfall received at Kathua from 2006 to 2016

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
2006	1.15	0.56	1.46	0.47	1.25	2.12	9.34	7.45	4.51	1.02	0.46	1.64
2007	0.16	3.60	3.08	0.36	1.14	4.61	5.49	6.89	1.91	0.02	0.17	0.41
2008	1.75	0.69	0.35	1.90	1.27	7.65	8.04	5.90	2.12	0.62	0.09	1.27
2009	1.15	1.62	1.21	1.96	1.01	0.52	5.49	6.16	0.00	0.00	0.00	0.00
2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011	0.28	3.85	2.40	0.83	0.16	6.70	3.75	10.71	6.32	0.21	0.00	0.99
2012	5.24	0.84	0.92	0.00	0.00	3.26	0.00	22.95	5.18	0.58	0.18	1.52
2013	2.11	5.53	0.52	0.29	0.00	6.43	17.78	21.48	2.86	4.89	0.85	1.53
2014	3.43	3.89	3.48	1.97	1.14	1.68	5.05	10.63	7.65	0.77	0.00	0.33
2015	0.70	3.19	8.95	2.49	0.34	2.88	11.95	11.55	8.30	1.12	0.04	0.00
2016	0.08	0.00	3.99	0.54	0.25	4.26	12.13	11.36	0.86	0.11	0.00	0.00

Source: Deptt. Of Environment & Remote Sensing

Table 1.2.
Average monthly maximum and minimum temperatures of Kathua.

Year	Average temp (°C)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
2006	*Max*	10.36	17.23	17.24	24.15	28.21	27.26	24.76	23.75	22.05	21.52	14.97	12.90
	Min	-0.77	5.56	5.65	11.31	16.85	17.27	18.91	18.31	14.50	9.45	5.21	1.28
2007	*Max*	12.12	12.06	15.41	23.99	22.30	26.75	28.20	28.58	23.75	23.05	20.46	13.35
	Min	-0.91	2.16	5.05	11.25	13.77	17.98	17.74	18.07	14.98	10.26	7.54	0.91
2008	*Max*	18.75	23.39	33.86	36.05	42.31	38.74	36.06	32.89	36.54	34.87	30.03	25.95
	Min	7.41	9.54	18.06	21.00	26.28	27.77	27.08	25.13	23.44	21.17	15.98	12.67
2009	*Max*	23.02	25.40	31.86	36.83	43.21	44.80	37.84	34.06	35.65	32.83	27.89	23.18
	Min	10.34	11.93	16.49	21.43	26.95	29.12	27.30	25.79	24.25	19.75	14.56	10.44
2010	*Max*	23.10	24.34	34.24	41.02	43.55	44.25	38.09	32.03	30.79	30.23	28.31	22.66
	Min	8.94	11.50	19.02	25.07	27.69	29.30	27.85	25.42	23.32	20.14	15.17	9.70
2011	*Max*	17.12	21.16	27.92	33.35	40.10	37.04	33.88	32.39	31.91	30.98	26.51	21.74
	Min	6.19	9.72	14.12	18.15	24.17	24.76	25.79	24.90	23.93	18.35	13.66	7.84
2012	*Max*	16.69	18.49	25.97	31.96	38.46	41.30	34.33	32.46	31.93	31.27	26.54	19.98
	Min	6.05	7.83	12.47	17.30	22.93	26.55	25.12	24.83	23.35	16.78	11.17	8.12
2013	*Max*	16.82	20.38	27.46	33.78	38.46	37.45	34.34	32.08	32.30	30.68	25.89	20.67
	Min	6.22	9.09	13.71	17.37	22.93	25.24	24.75	24.22	22.63	19.87	10.81	7.14
2014	*Max*	17.01	18.69	22.61	30.71	36.65	39.16	34.86	33.84	32.25	30.59	27.13	19.18
	Min	6.52	7.79	12.61	16.22	22.25	25.16	25.44	24.60	22.65	17.66	10.91	6.26
2015	*Max*	16.48	21.18	25.03	29.99	38.65	38.01	34.25	33.54	33.31	31.64	26.33	20.39
	Min	6.14	9.27	12.04	17.45	22.37	23.77	24.49	24.47	22.57	18.16	11.87	7.34
2016	*Max*	17.79	23.47	26.76	33.30	38.19	38.20	33.96	32.65	33.41	40.81	34.83	22.29
	Min	6.94	9.42	14.54	19.08	24.27	26.29	25.31	25.01	24.20	18.46	11.62	8.55

Source: Department of Environment and Remote Sensing

1.7 Water Supply

1.7.1 The areas below National Highway 44 and in some parts above the highway have the provision of canal irrigation facility. However, in Kandi areas uphill of the Highway, the agriculture is mainly rain-fed. Due to deep water table, even drinking water is not regularly available round the year. Earlier, the entire belt used to be dotted by artificial water harvesting and storage structures like tanks and ponds. However, with the passage of time, and changing lifestyles, people are no longer maintaining these traditional structures, and demand for piped water is made in all villages.

1.7.2 Some groundwater occurs in the Shiwaliks and the high hills where it occurs under confined conditions with positive piezoelectric heads and shallow depth-to-water level. The Kandi and Sirowal formations are the main repositories of groundwater in the area, where it occurs in unconfined conditions with very deep water tables. Perched water bodies are also a common phenomenon in the Kandi area. In Sirowals, groundwater occurs in both confined and unconfined conditions and the water levels are generally shallow.

1.7.3 The chemical quality of groundwater of the area is by and large fresh and potable.

1.7.4 Many perennial streams are present which can be used to build small dams to store water, especially in upper reaches. Watershed management is important as the Kandi area is perpetually water-thirsty. Most of the forest compartments fall in the Kandi and high hills region and for effective management of the plantations, as also for management of livestock and wildlife, water supply is essential.

1.7.5 Tables 1.3 and 1.4 show the groundwater level data of ten years (in metres below ground level, BGL) of 37 locations in Kathua and Samba districts for May and November from the year 2005 to 2009 and from 2010 to 2014 respectively. The data for Bhagwal, Chankhatrian, Feruchak and Chanranga show a wide variation between May and November. It is evident from the data that Kathua town lies in the high water table region while Samba town is comparatively water-thirsty. Bhagwal, Kootah and Raiyan have very deep water tables especially in the summer (May). Lakhanpur experienced a progressive deepening of the water table while Kootah has shown improvement in the depth of water table especially in case of data pertaining to November from the years 2005 to 2014. Overall, the Division is differentiated into areas of high water table and those with deep water tables corresponding to Sirowal and Kandi geological regions as discussed earlier.

Table 1.3
Water Level Data of Ten Years (Samba- Kathua Districts)
in meter below ground Level (m bgl).

Location	May-05	Nov-05	May-06	Nov-06	May-07	Nov-07	May-08	Nov-08	May-09	Nov-09
Barni	6.89	5.99	6.77	5.92	6.50	5.4	6.71	5.25	6.77	6.7
Bengular	9.15	8.58	8.99	0.00	7.16	6.91	8.86	8.54	9.10	9.01
Bhagwal	23.18	12.59	23.42	12.41	21.75	11.64	24.50	12.64	26.76	17.17
Chakhariya	2.69	1.71	2.57	1.67	2.66	1.80	3.28	1.75	3.28	2.36
Chankhatrian	10.44	3.41	10.94	2.15	10.37	3.35	10.38	3.47	12.80	10.31
Chanranga	13.62	8.07	14.77	7.66	13.37	7.53	14.93	7.69	15.65	12.90
Daboh	4.38	3.33	5.36	3.41	4.89	3.43	4.78	3.40	6.73	4.68
Dulme Chak	3.99	3.71	4.47	3.52	4.28	3.29	4.25	3.69	4.71	4.90
Feruchak	5.15	1.29	4.48	1.52	9.81	3.58	6.06	1.71	6.79	3.71
Gadyal	2.18	0.52	2.75	0.42	2.51	0.58	3.43	0.66	3.20	2.36
Jandi	6.05	4.96	3.09	4.45	5.77	5.43	6.33	4.77	6.47	11.45
Karol-krishna	9.45	7.85	8.64	7.81	8.33	7.81	8.62	7.49	8.66	9.45
Kathua	1.17	0.84	2.01	0.82	1.50	0.67	2.10	0.81	2.10	0.88
Kerian Gandyal	4.40	1.88	4.29	3.47	4.07	3.69	4.4	3.66	4.20	3.70
Kerian Ramnagar	4.08	2.65	3.24	2.62	2.86	2.86	3.25	2.84	3.22	2.87
Khanpur	4.07	1.53	1.58	1.50	1.97	1.51	2.42	1.57	2.51	4.07
Khukhial	4.82	1.81	1.96	1.78	1.94	1.77	2.02	1.85	1.98	1.79
Konthal	5.00	4.70	5.41	4.72	5.16	4.77	5.38	4.52	5.30	7.20
Kootah	27.23	31.01	32.62	24.7	27.33	24.25	28.5	24.16	26.73	27.69
Kotepanu	3.50	1.97	1.91	1.97	2.17	1.77	2.3	1.83	1.97	1.67
Kothian	4.20	0.33	2.61	0.49	1.92	0.38	3.2	0.45	2.98	0.49
Lakhanpur	1.21	1.14	0.62	1.54	1.21	1.41	1.69	1.54	1.91	1.19
Lale Chak	2.73	2.20	3.00	2.18	1.97	2.10	3.12	2.27	3.43	3.33
Londi	6.22	5.78	6.55	5.66	6.38	5.61	5.19	5.78	5.12	6.64
Madun	2.59	2.58	3.08	2.37	3.07	2.57	2.80	2.54	3.04	2.75
Mukandpur	5.50	4.42	3.81	4.04	4.22	4.02	4.52	4.28	4.46	4.11
Nagri	2.07	1.72	2.24	1.76	2.04	1.68	2.35	1.73	1.74	1.63
Naran	8.76	6.93	9.19	6.83	8.79	6.63	8.87	6.02	9.27	8.83
Nilcha	11.79	10.71	12.23	9.9	11.98	8.64	12.13	10.33	12.46	11.38
Nud	2.24	2.32	4.21	1.85	2.61	1.90	3.32	2.51	3.29	2.71
Pansar	8.70	6.28	6.15	6.1	6.27	6.03	6.15	5.95	6.03	6.20
Patiari	7.82	3.75	9.34	3.99	7.64	3.35	7.82	4.08	7.00	5.96
Raiyan	21.08	16.39	20.54	17.38	20.86	17.82	21.28	17.68	21.28	21.14
Sadoh	9.83	8.45	11.67	9.84	10	12.09	10.71	8.37	10.26	9.16
Samba	13.12	13.77	15.32	14.51	15.46	14.68	16.64	14.36	16.56	16.83
Supwal	5.25	2.08	6.23	2.77	5.67	3.11	6.86	2.87	7.21	5.01

Source: Central Ground Water Board

Table 1.4:
Water Level Data of Ten Years (Samba- Kathua Districts)
(meter below ground Level m bgl).

Location	May-10	Nov-10	May-11	Nov-11	May-12	Nov-12	May-13	Nov-13	May-14	Nov-14
Barni	7.10	6.48	7.10	6.30	6.87	5.49	6.63	4.8	7.16	6.00
Bengular	8.29	7.23	0.00	6.91	7.53	7.28	7.63	5.59	6.06	5.10
Bhagwal	25.00	12.42	24.12	12.28	25.42	11.42	23.26	12.54	23.92	11.44
Chakhariya	5.30	1.90	3.04	1.70	3.30	1.71	3.20	1.76	2.68	1.60
Chankhatrian	16.67	4.60	12.47	6.49	9.40	3.84	10.42	3.75	10.58	3.20
Chanranga	20.52	10.72	16.67	8.86	17.36	10.32	16.2	8.69	10.78	4.25
Daboh	5.38	3.36	4.04	3.23	4.61	3.59	4.34	2.81	4.34	2.81
Dulme Chak	4.08	3.60	4.34	3.94	4.57	6.80	4.47	2.80	3.85	3.13
Feruchak	10.04	1.69	9.82	2.01	10.21	2.20	8.74	4.87	5.73	1.29
Gadyal	4.71	0.48	3.05	0.45	3.26	0.67	2.88	0.48	3.00	0.52
Jandi	10.98	4.98	5.38	4.90	6.41	5.02	6.05	3.71	4.86	4.22
Karol-krishna	8.54	7.75	8.66	8.16	9.40	7.78	8.89	7.10	9.10	7.08
Kathua	2.37	0.89	2.07	0.87	2.42	0.72	1.99	0.62	1.77	0.72
Kerian Gandyal	4.40	3.90	4.40	4.40	4.32	3.72	4.10	3.25	4.30	2.50
Kerian Ramnagar	4.08	2.80	3.50	2.780	3.54	2.89	3.50	2.71	2.65	2.76
Khanpur	0.99	1.47	2.24	1.47	2.46	1.40	2.16	1.46	2.46	1.48
Khukhial	1.86	1.51	1.81	1.8	2.01	1.64	1.69	1.20	1.69	1.46
Konthal	6.15	4.95	5.45	5.2	5.65	4.77	5.00	4.15	5.95	4.25
Kootah	27.4	22.86	28.16	25.68	31.31	25.25	35.00	21.25	25.47	23.61
Kotepanu	2.31	1.77	3.50	1.88	2.16	1.95	2.28	1.90	2.22	1.74
Kothian	4.20	0.33	2.77	0.43	4.20	0.40	2.73	0.14	2.46	0.22
Lakhanpur	1.84	1.63	3.14	1.58	3.20	1.90	3.29	3.59	3.14	3.64
Lale Chak	3.14	1.87	3.19	2.52	3.26	2.40	1.52	1.66	3.13	1.62
Londi	7.27	5.27	5.00	5.77	6.30	5.06	6.10	4.15	5.37	4.65
Madun	2.89	2.80	2.97	2.25	2.95	2.54	2.65	1.93	2.43	1.76
Mukandpur	4.57	4.05	3.70	3.89	4.30	3.93	4.13	3.97	4.08	3.91
Nagri	2.44	1.45	2.15	1.18	2.66	1.96	3.26	2.39	1.83	2.43
Naran	11.66	7.07	8.97	5.38	8.3	2.64	11.7	4.69	6.65	4.41
Nilcha	11.55	9.40	12.25	11.47	12.45	11.98	12.17	8.95	10.67	7.75
Nud	5.05	2.25	4.40	2.29	3.75	3.65	4.27	2.90	2.95	2.22
Pansar	6.59	6.38	6.48	6.16	6.43	6.38	6.48	5.95	6.11	5.68
Patiari	7.82	4.33	7.82	3.85	7.82	4.25	4.71	3.63	9.17	2.25
Raiyan	23.51	21.94	23.48	17.78	22.94	22.68	23.84	17.94	21.00	16.28
Sadoh	10.80	10.07	10.57	9.50	10.57	10.95	10.97	7.34	6.54	7.21
Samba	18.86	16.00	17.63	15.17	16.90	16.71	18.37	14.20	15.85	14.50
Supwal	8.35	3.07	7.24	2.90	7.03	4.26	7.22	2.60	6.43	3.33

Source: Central Ground Water Board

1.8 Distribution and Area

1.8.1 The Kathua Forest division has three Territorial Ranges, one overlapping Soil Conservation Range and one Check post Range at Lakhanpur. The total area of demarcated forests as per Form 1 is 30799.42 Ha. The Range-wise distribution of area as per previous Working Plan (using dot-grid method) is as follows:-

Table 1.5
Range-wise distribution of area of Kathua Forest Division
(Dot-grid method)

#	**Range**	**Area (Ha)**
1	Kathua	16390.00
2	Jasrota	14531.50
3	Samba	15802.50
	Total	**46724.00**

1.8.2 The working plan map has also been prepared using GIS. The range-wise area arrived at following this procedure is as follows:

Table 1.6
Range-wise distribution of area of Kathua Forest Division (GIS method)

#	**Range**	**Area (Ha) as per GIS**
1	Kathua	17594.23
2	Jasrota	14128.08
3	Samba	16945.92
	Total	**48668.23**

1.8.3 It must be noted that these figures of area of the ranges arrived at with the help of both Dot-grid method as well as by using GIS include the area under the Jasrota Wildlife Sanctuary (Cos. 1, 2, 3, 4, 5 and 6 of Jasrota Range) and Thein Conservation Reserve (Cos. 10, 11, 12, 13, 14 and 16 of Kathua Range). These compartments were included in the Estate Area calculation in the previous plan. The new area was calculated by digitizing the physical boundaries of the Division, Ranges and Compartments using georeferenced scanned copies of Survey of India toposheets, IRS-1D LISS-IV satellite imagery and contour map prepared using SRTM data. The Compartment Description documents of all the compartments were used as base information for identifying the physical boundaries.

1.8.4 The total difference between the area derived using Dot-Grid method and GIS method works out to be 1858.74 Ha. The area derived through the GIS method is cumulatively exceeding that arrived at using the older method. The comparison of the area of compartments derived through the two methods is given in Appendix XI. The usual difference varies up to ±60-70 Ha depending on the topography and the regularity of the shape of the compartment. However, a few compartments are showing a large difference amounting to more than a hundred hectares. In all but one of these compartments, namely 4/K, 14/K, 22/K, 27/J, 54/J and 59/D, a

discrepancy was observed between the boundaries given in compartment descriptions and the previous stock map. Since the stock maps of the previous Plan were available on a scale of 1:50,000, there has been a general trend towards variations in the area calculations as the revised mapping has been done using Toposheets at a scale of 1:15,000. However, in the case of one compartment, i.e., 9/K, a part of it has submerged along with some part of Co 8/K in the lake formed by Ranjit Sagar Dam and the new areas of compartments 8/K and 9/K have been mapped and calculated accordingly.

1.8.5 The revised Estate Area Statement of Kathua Forest Division arrived at using the GIS method is given in Appendix II. The revised area statement works out to be as follows:

Table 1.7
Revised Range-wise distribution of area of Kathua Forest Division

#	Range	Area (Ha) as per GIS
1	Kathua	14807.06
2	Jasrota	13367.70
3	Samba	16945.92
	Total	**45120.68**

1.8.6 The revised area given above excludes the areas of the Jasrota Wildlife Sanctuary and the Thein Conservation Reserve from the Area Statement of Kathua Forest Division. This is the value that has been used in subsequent calculations in succeeding chapters.

1.9 State of Boundaries

1.9.1 The number of boundary pillars in Kathua range is 3870, that in Jasrota range is 5818 and that in Samba range is 1632 according to information given in Form No. 1. The number of boundary pillars of interior chaks in Kathua, Jasrota and Samba ranges is 1302, 742 and 696 respectively. The work of renovating the boundary pillars and demarcation of boundaries of the Division is being carried out currently. As per the information received from Demarcation Division I, a total of 1047 BPs consisting of 426 precast boundary pillars and 621 *insitu* boundary pillars have been put up in eight forests of Kathua Division since the year 2000-01 up to 2015-16. The forests thus demarcated were Mohargarh, Danna Dannore, Gurah Panditan, Dinga Amb, Mahadevnal, Thein, Narodha and Jothana.

1.9.2 However, it has been observed that the forest demarcation line is in a pathetic condition. The boundary pillars have been removed or displaced by land-encroachers at several places. Also, due to indifference/negligence of field staff, BPs have been worn down or damaged due to natural wear and tear over the years and lack of maintainance. Maintenance of the demarcation line entails not only the proper physical exercise of demarcation, but also maintenance of the relevant records and periodical checking of the established line and the physical BPs. The upkeep of the records is not up to the mark in the Division and at several

places like Cos 2, 4, 8 and 31 of Kathua Range, or Cos 7b/D, 26/D and 28/D of Samba Range, the position of the forest boundary cannot be made out even vaguely. The details of demarcated forests as per Form No. 1 records of the Division are given in Appendix-I. The abstract of the same is given as follows:

Table 1.8
Details of Demarcated Forests as per Form No. 1 of Kathua Forest Division.

Range	Year of Demarcation	Area of Forest (Ha)	Boundary Pillars	Number of chaks	Area of Chaks (Ha)	Boundary Pillars in Chaks
Kathua	1869-1886	9665.57	3870	78	513.68	1302
Jasrota	1886	9061.92	5818	202	289.28	742
Samba	1886	12051.93	1632	26	260.00	696
Total		**30779.42**	**11320**	**306**	**1062.96**	**2740**

1.10 Legal Position

1.10.1 The ownership and responsibility of management of all the demarcated forest vests with the Jammu and Kashmir Forest Department.

1.10.2. The Jasrota Wildlife Sanctuary comprising of six compartments of Jasrota Range along with some State land totaling an area of 10.04 square km are managed by the Wildlife Department. Similarly, six compartments of Kathua Range comprising the Thein Conservation Reserve have been handed over by the Kathua Forest Division to the Wildlife Department.

1.10.3 Berun line forests are required to be transferred to the Forest Department from Revenue Department, therefore all Berun line forests are property of Forest Department. However, the detailed records pertaining to the same are not available and the demarcation/delineation of Berun line forests on ground has not been done.

1.10.4 The protection, conservation and management of forest and wildlife are done by the Forest Department under the following Acts and Rules:

a. The Jammu & Kashmir Forest Act 1987 (1930 A.D.) Act-III 1987.
b. The Jammu & Kashmir (Sale of Timber) Act 1987 (1931 AD) Act-III of 1987.
c. The Jammu and Kashmir Kuth Act, 1978 (1921 AD) Act I of 1987.
d. The Cattle Trespass Act, 1977 (1920 AD) Act VIII of 1977.
e. The J&K Land (Improvement Schemes) Act 1972 AD Act XXIV of 1972.
f. The J&K Games Preservation Act 1998 (1942 AD) Act XXIV of 1998.
g. The Jammu and Kashmir Kahcharai Act 2011, Act XVIII of 2011.
h. The J&K State Forest Corporation Act 1978, Act XII of 1978.
i. The J&K Preservation of Specified Trees Act 1969 Act V of 1969.
j. The J&K Wildlife (Protection) Act 1978, Act VIII of 1978.

k. The J&K Public Premises (Eviction of Unauthorised Occupants) Act 1959, Act XIII of 1959.

m. The Jammu Forest Notice and the Kashmir Forest Notice.

n. The Saw Mills (Registration and Control) Rules 1968.

o. The J&K Nationalisation of Forest Working Ordinance 1986, Ordinance V of 1986.

p. The J&K Extraction of Resin Act 1986 (Governors Act No. VIII of 1986).

q. Restriction on Commercial Fellings vide Government Order No. 24 FST of 1990 dated 15-1-1990.

r. The Jammu and Kashmir Forest (Conservation) Act (1990).

s. The Jammu and Kashmir Rehabilitation of Degraded Forest and Village Plantation Rules 1992 (SRO 16 of 1992 dated 29-3-1992, recast vide SRO 17 of 12-01-1999.)

1.11 Rights and Concessions

1.11.1 There is no mention of any specific rights of the local people in demarcated forests. The Jammu Forest Notice confers the following concessions to the local population residing within five kilometers from the boundary of forests for their bonafide use in lieu of certain duties which are obligatory in nature as per the said notice:

1. Grazing, grass cutting and browsing is allowed in forests except those which are closed for conservancy purposes.
2. Removal of dead, fallen material except special class and A class trees for bona fide domestic use as firewood and small timber is allowed.
3. Lopping (limited) of trees for fodder and other domestic purposes is allowed for trees other than conifers or special class broadleaf trees like *Tun*, *Sissoo* etc.
4. Grant of trees on concessional rates for bona fide domestic requirements, and also free grants in the event of calamity are allowed.
5. Free grant to the local people for crafts and agricultural implements are allowed.
6. All non timber forest produce not forbidden by any special order excepting those covered under the Kuth Act can be collected free of charge by the locals.

1.12 Grazing

1.12.1 The previous plans have made an allowance for grazing by dedicating an entire working circle comprising of 54 compartments for this purpose. Almost all these forests are open for grazing except for small proportion of area under closures. The Forest Department exerts control over grazing by collection of grazing fees under the Kahcharai Act. The nomadic livestock along with local cattle and livestock have been dependent on forests and alternative resources have not

been developed resulting in fast degradation of these forests. The grazing in forest areas is unscientific, uncontrolled and un-regulated. This has adversely affected the regeneration of Chir and led to depletion of native ground flora in other areas.

1.12.2 In addition to the local livestock population, herds of migratory livestock also pass over these forests on their way to and return from the higher alpine pastures of Pir Panjal. The districts of Samba and Kathua both have a high number of livestock as well as an overall high degree of agricultural productivity.

1.12.3 The grazing activity is regulated by the forest department under the Kahcharai Act and the rules framed thereunder. In Kathua Division, grazing has been going on under a dedicated grazing working circle under which 8460 Ha has been allotted for grazing purposes. Of this, the highest allotment has been in Samba Range (4063 Ha) followed by Kathua Range (2785 Ha) and Jasrota Range (1612 Ha).

1.12.4 Kathua Division does not have well developed pastures or grasslands like temperate regions of the state. The good growth of shrubs supports browsing animals and the open patches in forests provide the grass for grazing. According to the Kathua census report and data provided by the Sheep and Animal Husbandry Department, the livestock population for Kathua and Samba districts has been estimated as given in the following table:

Table 1.9
Livestock Population in Kathua and Samba Districts.

Category of livestock	Sheep	Goats	Total
Kathua	306394	212743	519137
Samba	43144	82480	125624
Total	**349438**	**295223**	**644761**

1.12.5 It should be noted, however, that the area of Kathua Forest Division does not include some tehsils of Kathua District, viz., Bani, Bilawar and Basohli. Therefore, a large number of this estimated livestock may not be resident in Kathua FD for a long period of time, and may only be grazing here during migration. An exercise to estimate the number of livestock grazing in these forests was conducted in the Division and the details of area allotted for grazing to allottee nomads (Bakerwals/Gaddies) along with the number of livestock in the districts falling under Kathua Forest Division is given in Table 1.10.

Table 1.10
Area allotted for grazing and number of livestock in Kathua Forest Division.

S.No.	District	Area allotted	Number of allottees	Livestock		
				Sheep	Goats	Total
1	Samba	845	30	5115	4943	10058
2	Kathua	846	47	9040	4810	13850
	TOTAL	**1691**	**77**	**14155**	**9753**	**23908**

1.12.6 As can be inferred from the information given in above tables, in addition to village livestock, a large number of migratory livestock also graze in these forests annually. Details of livestock grazing in the Division over the years are reflected by the grazing fee recovered from the graziers, tabulated as follows:

Table 1.11

Range-wise Grazing Fee (in Rs) recovered in Kathua Forest Division from 2000-01 to 2015-16

S. No.	Year	Kathua Range	Jasrota Range	Samba Range	Lakhanpur Range	Total
1	2000-01	14,575	29,845	4,557	4,58,109	5,07,086
2	2001-02	9,035	30,032	5,960	4,21,085	4,66,112
3	2002-03	10,962	29,229	6,330	5,02,866	5,49,387
4	2003-04	14,893	30,938	11,629	4,30,514	4,87,974
5	2004-05	9,186	11,927	9,977	4,10,093	4,41,183
6	2005-06	10,348	39,015	11,542	5,28,339	5,89,244
7	2006-07	6,376	22,681	14,545	5,45,053	5,88,655
8	2007-08	14,438	23,386	15,560	5,40,675	5,94,059
9	2008-09	11,806	22,415	7,911	5,12,307	5,54,439
10	2009-10	60,691	26,155	11,173	4,75,079	5,73,098
11	2010-11	7,382	25,096	6,158	3,87,779	4,26,415
12	2011-12	10,560	25,346	11,059	3,71,420	4,18,385
13	2012-13	11,046	24,327	11,627	3,58,369	4,05,369
14	2013-14	17,464	22,782	12,468	3,53,693	4,06,407
15	2014-15	10,617	26,670	14,230	3,06,385	3,57,902
16	2015-16	13,247	28,099	11,651	2,90,397	3,43,394
	TOTAL	**2,32,626**	**4,17,943**	**1,66,377**	**68,92,163**	**77,09,109**

1.12.7 The figures reflected above do not present the complete picture regarding grazing in the forests. The actual incidence of grazing is often much larger in magnitude in comparison with that which is reported. Sub-letting by the grazier who has received permission to graze his livestock happens all too often. Also, there is a reluctance among nomadic graziers to allow accurate counting of the number of animals because of the belief that such exercise exposes them to danger of life. The belief is so strongly held that graziers do not stay at the place where another grazier's livestock is being counted. The concepts of stall feeding are non-existent in these areas. There is competition between the local livestock and the migratory livestock also. With this backdrop, it becomes essential that regulation of grazing activity be done in accordance with the results obtained after detailed field study of the carrying capacity of these forests by the Territorial staff.

CHAPTER-II
Forest Flora And Fauna
PART-A FOREST FLORA

2.1 Occurence and Distribution of Species

2.1.1 The entire Division lies in the subtropical region and therefore the vegetation here is that characteristic of subtropical climate. The belt parallel to the national highway on the lower altitudes is occupied by broadleaf forests of *Lannea coromandelica* (Indian Ash or Kembal) and *Acacia modesta* (Blackwood or Phulai). In all the three ranges *viz* Kathua, Jasrota and Samba, the upper altitudinal zone is occupied by Shiwalik Chir pine. The associates of Chir pine like the Indian Ash Tree, *Wendlandia heynei*, *Mallotus philippensis* etc. are also seen here.

2.1.2 In the middle zone at some places the scattered Chir pine is found with broadleaved trees. The middle and lower attitudinal zones are comprised of mainly dry deciduous broadleaved trees. In degraded areas bushes and weeds are found. Slightly above the lowest altitudinal zone a belt bearing *Dendrocalamus strictus* is seen in Kathua and Jasrota Ranges.

2.1.3 In Kathua forest area, the slopes facing north have relatively dense vegetation as compared to slopes with southern aspect. Patches of dense vegetation are also found in the wedges and depressions of hills.

2.1.4 The entire area is heavily infested by *Lantana camara* (Punj-phulli) which is a major threat to the natural vegetation of the Division. *Carissa spinarum* (Garna) and *Murraya koenigii* (Drainkdi or Curry-patta) are commonly found occurring along with other major tree species all over the Division. *Dodonaea viscosa* (Santha) occurs on exposed sandstone rock faces.

2.1.5 The range-wise distribution of wooded area is shown in the following table:

Table 2.1

Range-wise distribution of wooded area in Kathua Forest Division.

Range	AREA (in hectares)						
	Chir	***Broadleaf***	***Bamboo***	***Scrub***	***Wooded***	***Blank***	***Total Area***
Kathua	3936.78	7994.71	711.18	1682.38	14325.05	482.01	14807.06
Jasrota	4038.20	1674.52	135.19	6685.00	12532.91	834.79	13367.70
Samba	4837.91	7418.20	0.00	3910.44	16166.55	779.37	16945.92
Total	12812.89	17087.43	846.37	12277.82	43024.51	2096.17	45120.68
Wooded Area (%)	30%	40%	2%	29%	100%		

2.2 Composition and Condition of Crop

2.2.1 The comparison of percentage distribution of stems over various diameter classes in the ideal case versus the actual distribution as observed on the ground is given in Table 2.2. Table 2.3 summarizes the diameter class-wise number of stems found over the forested area of the Division, as well as the volume of these stems in their respective diameter class. The values are also presented in percentage figures for easy reference. The figure below illustrates the comparison between the ideal state and the actual condition of the crop in Kathua Forest Division.

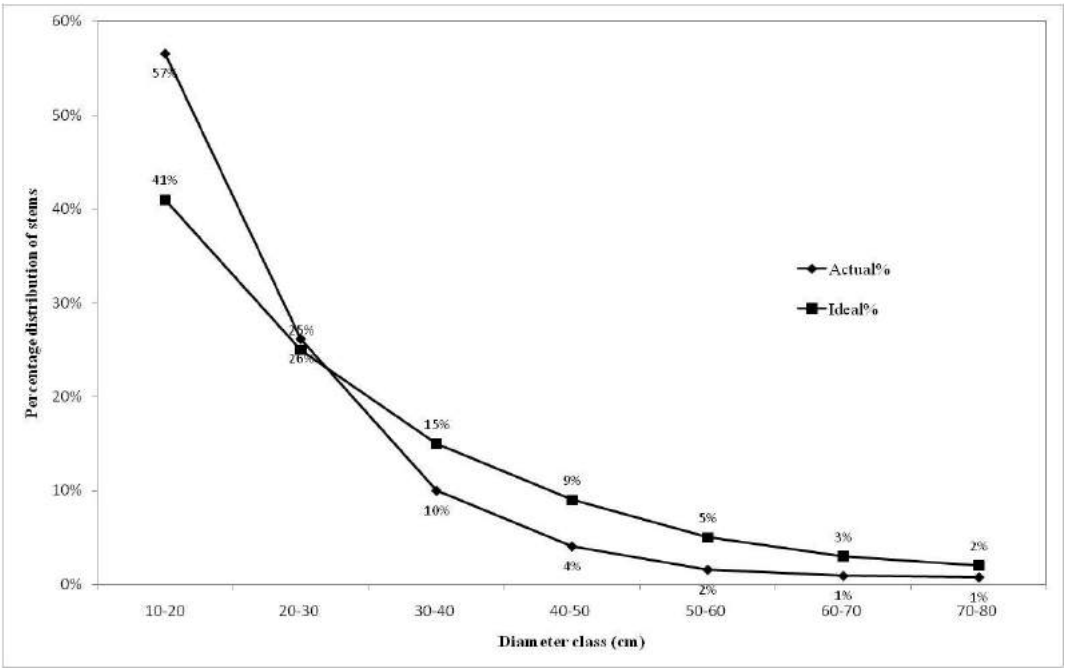

Figure 2.1 Percentage distribution of stems in Kathua Forest Division: Ideal v/s Actual.

Table 2.2
Percentage distribution of stems over different diameter classes in Kathua Forest Division compared with ideal distribution

Diameter Class (cm)	***10-20***	***20-30***	***30-40***	***40-50***	***50-60***	***60-70***	***>70***
Ideal Distribution (%)	41	25	15	9	5	3	2
Actual Distribution (%)	57	26	10	4	2	1	1

Table 2.
Diameter-class wise number of stems and volume of stems in Kathua Forest Division

	DIAMETER CLASS (cm)							
	10-20	20-30	30-40	40-50	50-60	60-70	>70	**Total**
No. of stems	27,51,180	12,72,495	4,85,721	1,96,706	76,151	44,071	36,986	48,63,310
%	***57%***	***26%***	***10%***	***4%***	***2%***	***1%***	***1%***	***100%***
Vol. of stems (m^3)	7,21,467	6,77,272	4,31,836	2,69,963	1,75,412	1,58,823	2,76,166	27,10,939
%	***26.61%***	***24.98%***	***15.93%***	***9.96%***	***6.47%***	***5.86%***	***10.19%***	***100.00%***

2.2.2 The curve for the number of stems actually present is closely following the ideal distribution of stems over various diameter classes, as can be observed from the figure given above. However, the bulk of this stock is composed of broadleaved species other than the major species occurring in these forests, i.e., Chir, Indian Ash Tree (*Lannea coromandelica*), Khair and the Blackwood tree (*Acacia modesta*). When seen together with other broadleaved species, the total number of stems in all diameter classes seems to fit well with the ideal curve of species distribution. However, the same cannot be said for Chir trees in isolation, where the lower diameter classes are well below the ideal distribution, and the majority of trees growing are of middle diameter classes. In contrast, in case of Khair trees, the stems above 30-40 diameter class are hardly observed and most of the trees encountered belong to the lower diameter classes.

2.3 General Description of Growing Stock

In general the forest can be divided into following categories :-

i. Chir pine forests

ii. Mixed Bamboo forests

iii. Broadleaf forests

iv Scrub forests

2.3.1 Chir Pine Forests

2.3.1.1 Chir pine occupies the higher altitudinal zone of the division at altitude ranging from 450 m to 1276 m. The chir is called Shiwalik chir which is stunted in growth. The crop is open and in many areas found mixed with broad leaved species.

2.3.1.2 The broadleaved associates of Chir are

Lannea coromandelica (Kembal), *Wendlandia heynei* (Pansar), *Dalbergia sissoo* (Shisham), Rhus, *Grewia optiva* (Dhaman), *Grewia eriocarpa* (Dhaman), *Mallotus philippensis*, *Syzygium cumini* (Jamun), *Terminalia bellerica* (Behera), *Toona ciliata* (Tun), *Phyllanthus emblica* (Amla) etc. The shrubs like *Dodonaea viscosa* (Santha), *Carissa spinarum* etc. occur with *Woodfordia fruticosa* and *Colebrookea oppositifolia*. *Bauhinia vahlii* and *Spatholobus roxburghii* are climbers that occur commonly. Among the grasses *Eulaliopsis binata*, *Heteropogon* spp. etc. are present.

2.3.1.3 The Chir crop is in highly degraded condition. Frequent fire and wind storms weaken the trees which are dying and falling down. The regeneration is poor. Except in some forest areas like Basantpur, Mastgarh, Mohargarh and some parts of Budhi, Goran and Soram, the Chir pine has degraded to the utmost extent. Frequent fires and uncontrolled grazing has resulted in very poor regeneration.

2.3.2 Mixed Bamboo Forests

2.3.2.1 The species *Dendrocalamus strictus* is indigenous to Shiwalik tract. Bamboo was abundant in this tract in the past and historically, the compartments bearing bamboo were numbered in a series and termed "Bamboo compartments" but over a period of time, due to over exploitation and continuous high biotic pressure its composition diminished. At present Bamboo occurs in degraded form mixed with broadleaved trees and shrubs. The poor management practices and heavy grazing have kept it in a suppressed form. The main species occurring with Bamboo are *Ficus* spp., *Acacia catechu*, *Dalbergia sissoo*, *Acacia modesta*, *Acacia nilotica* Var. indica, *Albizia lebbeck* and *Grewia optiva* etc.

2.3.2.2 The common shrubs associated with Bamboo are *Carissa spinarum, Justicia adhatoda*, *Bauhinia vahIii, Pueraria tuberosa*, *Clematis*, *Dioscorea* etc. At present Bamboo is found in a few compartments of Kathua and Jasrota Ranges.

2.3.3 Broadleaf Forests

2.3.3.1 In Kathua Forest Division the entire area is suited for broadleaved species and these occur even along with Chir pine trees in the highest altitudinal range. In some part of Kathua and Jasrota Ranges broadleaved species occur with Bamboo but at present due to high biotic pressure the broadleaved species have decreased in number leading to degradation of the area and occupation by weeds.

2.3.3.2 Khair (*Acacia catechu*)

Among the broadleaved species Khair is very important. Excluding some small pure patches it occurs mixed with other broad leaved species. This species colonises river beds and nallah beds.The entire Kathua tract is suitable for Khair as it comes up naturally and grows vigorously.

But over exploitation and poor protection has resulted in dwindling of growing stock of this species.

2.3.3.3 Phulai (*Acacia modesta*)

This species is an important component of broadleaf forests. It occurs in shallow rocky soils and exposed hotter aspects. The crop is stunted and rarely exceeds 6 m in height. Some pure patches of this crop are also seen in Samba and Kathua (Lakhanpur-Thein belt) Ranges.

Phulai is a source of valuable gum and its thorny brush wood is used in making “Araks”. It also supports wild birds and animals and is an ecologically important species. The regeneration of Phulai is being negatively affected by heavy biotic pressure. In natural conditions, seed production is abundant in this species.

2.3.3.4 Shisham (*Dalbergia sissoo*)

Shisham is another commonly occurring tree in the division. At some places specially adjacent to khads or rivers, it can be observed in pure patches. In other places it occurs mixed with other broadleaved species. Since Shisham is the valuable commercial timber it is experiencing high biotic pressure wherever found. It is also lopped for fodder. It is a hardy indigenous species and its regeneration is not a problem. It produces abundant seeds every year but heavy grazing is an obstacle for its establishment.

2.3.3.5 Kikkar (*Acacia nilotica* var. indica)

Acacia nilotica occurs in clayey soils and establishes less in shallow, rocky soils. It is seen mixed with other broad leaved species. Kikkar produces seeds abundantly every year. The regeneration is affected by grazing and browsing. The species is under pressure as it is a good fuelwood and its timber is used for construction purposes. It is extensively used for charcoal production also.

2.3.3.6 Kembal (*Lannea coromandelica*)

This species occurs commonly in broadleaf tracts. Some pure patches of Kembal are seen in some compartments of Jasrota and in such places it forms the top canopy. Kembal is a good source of gum and is also used as fuel wood.

2.3.3.7 Ber (*Ziziphus jujuba*)

Ber occurs in relatively degraded areas and sometimes small pure patches are also seen. It is a multi-purpose species providing fuel wood, fodder and fruits. It is a good source of small timber and its wood also gives excellent charcoal.

2.3.3.8 Pansar (*Wendlandia heynei*)

Pansar is another common broadleaved tree of this region and sometimes forms pure patches. It establishes quickly and grows vigorously in areas affected by landslides. The tree is of small size and its natural regeneration is good.

2.3.4 THE SHRUBS

2.3.4.1 A large number of shrubs occur in broadleaf and scrub areas. In completely degraded area and blanks only shrubs are observed. The important shrubs are *Carissa spinarum*, *Dodonaea viscosa* and *Justicia adhatoda*.

Carissa spinarum **(Garna)** is a good shrub which provides fodder and edible fruits. The shrub helps in soil conservation. It is regenerated easily and is a hardy plant.

Dodonaea viscosa **(Santha)** occurs extensively in all degraded and exposed areas. It is a good soil binder and a source of fuel wood. It regenerates abundantly.

Justicia adhatoda **(Brainkar)** also occurs extensively in degraded patches especially on lower altitudinal zones and forms thick pure patches. It is helpful in soil conservation and also has medicinal value.

2.3.4.2 The field survey and data of the earlier Working Plan suggest that the forests of this division are highly degraded and there is an immediate need for improvement and rehabilitation. The average growing stock is far below the normal. In Chir Working Circle, the growing stock of Chir is only 27.95 cum/ha and the average number of trees per ha is around 32.51. The crop is stunted and the age class is highly abnormal.

2.3.4.3 Similarly the khair crop is in a degraded condition. In Khair under the broadleaf substratum, the growing stock is only 6.02 cum/ha and the average number of trees per ha is around 20.56, while the Khair trees in 50-60 dia class and above are hardly seen. The natural regeneration of Khair comes up easily, but due to fire and biotic pressure it never establishes properly. The grazing pressure especially with the influx of nomadic graziers in winter, is very high and is a major reason for present degraded condition of the forests, although the local pressure has also been increasing with the passage of time due to increasing population.

2.3.4.4 The weeds have occupied the blank areas causing arrest of growth and regeneration of grasses and tree species. *Lantana* and *Parthenium* are the major weeds in Kathua forests. They cause fire hazards during the summer. The Bamboo crop in some compartments has a good potential for growth but the absence of management and biotic pressure has resulted in stunted unhealthy clumps. The dried Bamboo waste is a potential fire hazard. The entire area is highly susceptible to soil and water erosion and needs rehabilitation on priority basis.

2.4 General Description of Forest Types

According to the revised Champion and Seth classification (1968) the forests of Kathua fall under the following types:

2.4.1 Northern dry mixed deciduous forests (5B/C2):

This type of forest occurs in relatively fertile soils in valleys and sheltered places. The important species are:

Trees:

Acacia catechu (Khair), *Dalbergia sissoo* (Shisham), *Lannea coromandelica* (Kembal), *Bombax ceiba* (Semal), *Albizia lebbeck* (Siris), *Toona ciliata* (Toon), *Flacourtia* spp., *Ehretia laevis* (Chamror), *Mallotus philippensis*, *Acacia nilotica* var. *indica* (Kikar), *Holarrhena pubescens* etc.

Shrubs:

Carissa spinarum (Garna), *Dodonea viscosa* (Santha), *Justicia adhatoda* (Brainkar) and *Woodfordia fruticosa* and *Murrayya koenigii* (Drainkadi).

2.4.2 The degradation stages of 5B/C2

2.4.2.1 Dry deciduous Scrub (5B/C2/DS1)

This type forms the bulk of the forests of this Division. It consists of thorny stunted trees and shrubs. The soil is shallow, rocky and highly eroded. The area is under high biotic pressure and highly denuded.

The characteristics species are *Acacia modesta* (Phulai), *Ziziphus jujuba* (Ber), *Nyctanthes arbor-tristes* (Harshingar), *Aegle marmelos* (Bel), *Butea monosperma* (Palas), *Euphorbia royleana* (Thor), *Lannea coromandelica* (Kembal), *Cassia fistula* (Amaltash) etc.

Shrubs:

Carissa spinarum (Garna), *Dodonaea viscosa* (Santha), *Justicia adhatoda* (Brainkar), *Woodfordia fruticosa*, *Mimosa himalayana*, *Catunaregam spinosa* and *Ziziphus nummularia* etc.

Climbers:

Bauhunia vahlii (Balungar), *Dioscorea* spp., *Caesalpinia decapetala*, *Vallaris solanacea*, *Ichnocarpus frutescens* etc.

2.4.2.2 Dry Bamboo Brakes (5B/C2/E9):

It is thought that this forest type is a remnant of once flourishing Bamboo forests in this region. It is seen in some parts of Kathua and Jasrota Ranges. The forests consist of *Dendrocalamus strictus* mixed with broadleaved deciduous species and grasses. The over-wood consist of *Lannea* and *Ficus* species. The Bamboo crop is only 7 meter in height and the quality is low. The soil is stony with shallow depth due to heavy erosion. In fertile patches the Bamboo is found growing luxuriously.

Broad-leaved associates of Bamboo are *Acacia catechu*, *Dalbergia sissoo*, *Acacia modesta*, *Mallotus philippensis* etc. The shrubs are *Justicia adhatoda*, *Carissa spinarum*, *Woodfordia floribunda* etc.

2.4.3 Lower or Shiwalik Chir Pine Forests (9/C1a):

These forests occupy the main and secondary Shiwalik ridges. Some scattered patches are also seen to the South of the main ridge. *Pinus roxburghii* or Shiwalik Chir Pine is the main species. It is stunted in growth and has a rounded crown in this region. The associates of Chir are:

Trees:

Acacia modesta, *Lannea coromandelica*, *Acacia catechu*, *Dalbergia sissoo*, *Syzygium cumini*, *Phyllanthus emblica*, *Mallotus philippensis*.

Shrubs:

Woodfordia fruticosa, *Carissa spinarum*, *Colebrookea oppositifolia*, *Murraya koenigii*.

Grasses:

Cymbopogon spp., *Eulaliopsis binata*, *Dichanthium annulatum* etc.

Climbers:

Clematis spp., *Spatholobus parviflorus*, *Ichnocarpus frutesecence*.

2.4.4 Degradation Stage of 9C1a

2.4.4.1 Himalayan Sub-Tropical Scrub (9/C1/DS1):

This sub-type exists between the lower Shiwalik Chir Pine and upper or Himalayan Chir Pine (C1b). The main Shiwalik ridge separates upper and lower Chir Pine in Kathua Forest Division. Some trees of this sub-type occur among vast stretches of *Dodonaea viscosa*, *Carissa spinarum* and *Rhus* species. It is also not clear whether this type is a result of biotic pressure or edaphic conditions.

2.4.4.2 Sub-tropical Euphorbia Scrub (9/C1/DS2):

This type is a consociation of 9/C1a but some patches far away from 9/C1a are also existing. *Euphorbia royleana* is the principal species and is associated with *Lannea coromandelica*, *Rhus* species, *Mallotus philippensis*, *Acacia modesta*, *Pinus roxburghii*, *Carissa spinarum*, *Woodfordia fruticosa* etc.

2.4.5 Subtropical dry evergreen forests

These are low scrub forests of small leaved evergreen trees and shrubs including thorny species, which are more common on dry, hot exposures. During monsoons there is development of herbs and grasses, otherwise shrubby growth dominates.

2.4.5.1 *Acacia modesta* scrub forest (10/C1b):

Acacia modesta characterizes mixed scrub which colonises denuded hill sides in favorable conditions. This type of forest is most commonly seen in Samba Range of the Division, where it occurs as the dominant species in natural forests.

2.4.5.2 *Dodonaea* scrub (10/DS1):

Santha (*D. viscosa*) forms several large patches and is more of a coloniser on the exposed weathered sandstone of these areas than a degradation stage of the

subtropical dry evergreen forests. Associated grasses are *Cenchrus ciliaris*, *Chrysopogon fulvus*, *Eulaliopsis binata*, *Heteropogon contortus* and *Themeda anathera*.

2.4.6 The broad leaved species are in degraded condition at several places. The Khair trees above 30 cm DBH are rarely seen. The natural regeneration of Khair comes up but due to fire and biotic pressure never establishes properly.

2.4.7 The grazing pressure especially with the influx of nomads in winter is very high and is a major reason for present degraded condition of the forest.

2.4.8 The weeds have occupied the blank areas causing arrest of growth and regeneration of grasses and tree species. *Lantana* and *Parthenium* are the major weeds in Kathua Forests and cause fire hazards during the summer. The Bamboo crop in some compartments has a good potential for growth but the absence of proper management and biotic pressure have resulted in stunted, congested and unhealthy clumps. The dried Bamboo waste is a potential fire hazard. The entire area is highly susceptible to soil and water erosion and needs rehabilitation on priority basis.

The detailed inventory of flora of the division is given in the beginning of this document.

2.5 Injuries to which Forest Crops are Liable

2.5.1 Grazing and Browsing

2.5.1.1 Grazing and browsing in Kathua Forest Division are the major factors responsible for present degraded condition of the forests and are also a strong stumbling block in rehabilitation of these forests.

2.5.1.2 Apart from grazing by local livestock a huge number of goats and sheep of nomadic Bakerwals and Gujjars camp in these forests during winter. Nearly 7000 ha area of forest is being allotted to Gujjars and Bakerwals every year by the Forest Department for grazing. The Bakerwals and Gujjars use this area for construction of Behaks. They also sow some crops and vegetables near the Behaks. These compartments are being denuded and are gradually being converted into permanent settlements. The Bakerwals do not confine grazing to these compartments but use all forest areas excluding some closures for grazing.

2.5.1.3 Allowing grazing within the limits of carrying capacity of the area is not injurious. Excessive grazing affects natural regeneration and the health of the soil leading to degradation of forests. Heavy lopping of trees for fodder reduces seed production. The excessive grazing of palatable species of grasses results in dominance of unpalatable species and weeds in forest area.

2.5.1.4 Thus the grazing problem is resulting in loss of forest land suppression of natural regeneration, imbalance in species composition and soil erosion. Apart from this

the Gujjars and Bakerwals also depend on these forests for fuel wood and small timber requirements.

2.5.1.5 The Camel population is also increasing in the area as it is supported under Government schemes. The Camels injure seedlings and small sized trees by browsing. It is also seen that Camels are used for transport of illegal wood from forests to Bhatties located in Revenue lands. In many occasions recorded in the past, they were used in smuggling of Khair wood to Punjab through nallah beds.

2.5.2 Encroachments

2.5.2.1 The demand for land is excessive in hilly regions due to scarcity of cultivable land. This fact, coupled with increase in population is putting pressure on forest lands in Kathua also.

2.5.2.2 The demarcation line is in a sad state and boundary pillars are not visible on ground in most of the places. The demarcation records of reconstituted Kathua Forest Division are incomplete. In many cases the revenue records and records of Forest Department are not tallying.

2.5.2.3 The policy of allotment of compartments for grazing purposes to Gujjars and Bakerwals is resulting in loss of forest land. These people are gradually settling permanently in these allotted compartments by constructing semi-permanent structures.

2.5.2.4 The local Zamindars have the habit of enclosing adjoining forest areas near their fields with brush wood fencing. They protect these areas on their own and lease it to the Gujjars and Bakerwals during winter months in exchange for money. Such closed areas are being encroached by these Zamindars gradually. The negligence on the part of field staff is a major reason for encroachments.

2.5.3 Illicit Damage

2.5.3.1 In Kathua Forest Division the Khair and Bamboo are economically highly valued species. The Bamboo areas have shrunk over the years due to high biotic pressure and lack of proper management. The smuggling of Khair has been observed widely as this species is in high demand for Katha production (Pan Industry). The exploitation by the Department during earlier years and smuggling had reduced the number of Khair trees above 20 cms diameter to only a few in the division.

2.5.3.2 The Charcoal Bhatties have become a major wood based activity in Kathua. All of these bhatties are established in Revenue lands but a major part of firewood and raw material supply comes illegally from forests. As these Bhatties are spread over many villages in the vicinity of forests, the checking of supply of illicit wood is very difficult. For charcoal production even the wood from small trees and shrubs are used as this industry provides good income to the owners and small time

employment to local poor people who steal wood from forest areas and supply to these Bhatties either on head loads or using camel transportation.

2.5.3.3 Heavy lopping of trees for fodder and fuelwood by local people and nomadic Gujjars and Bakerwals is causing heavy damage to forests as the seed production and natural regeneration are being hampered.

2.5.3.4 The local people also cut Bamboo poles and other trees for various purposes like construction and agricultural implements. The Sissoo trees are in high demand for furniture making in the area.

2.5.4 Improper Forest Management

2.5.4.1 The Working Plan prescriptions have not been followed in the Division since past several years. The silvicultural practices recommended in the Working Plans have not been followed and unsustainable resin extraction has resulted in serious wind and fire damage to the trees. The recurrent fire incidences wipe out the regeneration of Chir trees. The absence of realistic policies regarding Charcoal Bhatties and private Khair has impacted forests negatively.

2.5.4.2 The plantation and developmental works are being carried out by Territorial Division and other sister agencies in a scattered manner and without any co-ordination. The rehabilitation of Bamboo as prescribed in the working plan has not been followed at all with the result that these forests are in a degraded state while an economically important crop which could have earned substantial revenue for the Division is allowed to deteriorate.

2.5.5 Weeds

2.5.5.1 The degradation of natural species occurring in the forests has lead to establishment and expansion of weeds in the forest area.

2.5.5.2 It is common in Kathua Forests that almost all the degraded patches where the canopy is completely open are occupied by obnoxious weeds like *Lantana*, *Parthenium* and Cocklebur (*Xanthium strumarium*). Once these weeds occupy an area it becomes difficult for the local species to regenerate in that area. These weeds belong to highly evolved families and have the ability to survive in adverse conditions. Mechanical removal, though not practicable economically, is the only effective means of clearing the ground and opening it for natural regeneration. However, preventive measures like protecting the existing natural cover and maintaining proper hygiene in the forests so that no more place and space is available for the weeds to expand, are also extremely important.

2.5.6 Diseases

2.5.6.1 Some of the severe forms of fungal diseases of plants are observed in the division. The major diseases are Ganoderma root rot of Khair, Fusarium wilt of Sissoo and Chir Pine stem rust, caused by *Cronartium himalayense*.

2.5.6.2 In recent years it has been observed that a large number of Sissoo trees of young and middle age have been drying up intermittently. The reasons for this have not yet been ascertained.

2.5.7 Pests

2.5.7.1 The defoliators of Shisham, Khair, Poplar and Willows are seen in this area especially during the monsoon season. The shoot borer in case of poplar is a major setback to cultivation of poplar by famers. Termites, chafer beetles, weevils and nematodes cause damage to seedlings in nurseries.

2.5.8 Wild Animals

2.5.8.1 The damage to forest trees and seedlings by wild animals is very less in Kathua mainly due to occurrence of few wild animals in the area. However wild boars, porcupines and rodents are found in forest areas and occasionally cause damage to seedlings and pole crop. Monkeys also cause damage to young seedlings in plantations.

2.5.9 Parasites

2.5.9.1 The major parasite observed in the area is *Loranthus*. This is a complete stem parasite occurring on many important forest tree species like Mango and Banyan. Most of the times the host tree is stunted and gradually killed over years.

2.5.10 Soil erosion and floods

2.5.10.1 The entire area of the Division is susceptible to soil erosion. Due to degradation of natural vegetation the erosion rate is accelerated. The loose bouldery soil with sloping terrain is a major fundamental factor responsible for flash floods and soil erosion in the region.

2.5.10.2 During the rainy season, flash floods occur commonly after a few intense showers. These flash floods destroy the plantations and forest land along the banks of major khads. The soil and water erosion results in loss of surface soil and shortage of water in kandi area. As the entire forest area of Kathua is affected by soil erosion, it is a fit case for forest management based on watershed principles.

2.5.11 Drought

2.5.11.1 The severe summer temperature coupled with drought conditions has been one of the leading causes for mortality of seedlings that are either naturally regenerated or planted in forest areas. The summer temperature also helps forest fires to reach devastating proportions. The summer temperature in May-June reaching up to 45°C is natural, but delayed or failed monsoons result in setbacks to plantation activities. This is because of creation of drought conditions due to the nature of the terrain and geology of the area.

2.5.12 Forest fire

2.5.12.1 Forest fires are a regular phenomenon in Kandi areas especially during the summer months. The non-availability of funds for drawing fire lines, ineffective/non-existent patrolling, ignorance and ulterior motives of local people are contributing factors for fire damage. The forests of this region are more vulnerable to fire. The dried up weeds and shrubs cause fire in the lower altitude belt. The unmanaged Bamboo clumps also help in aggravating the fire. Forest fire results in partial or complete burning of seedlings and trees, drying and compaction of soil, death of wild animals and birds and destruction of their habitat.

2.5.12.2 However, it should be kept in mind that forest fires are natural in these forests. These forests have adapted to the recurrent fires and it may be serving ecological benefits to the native flora and fauna. The increasing incidents of incendiary fire and arson should be effectively tackled by increasing the intelligence inputs and providing monetary or other incentives.

2.5.13 Frost

2.5.13.1 The natural forest in this area is usually not affected by frost. Some effect of frost is seen on nursery seedlings.

2.5.14 Hail Storms And Wind Storms

2.5.14.1 The fruits on horticultural trees and nursery seedlings are destroyed by hail-storms. The wind storms common in May-June period result in damage to resin tapped Chir trees. Other forest trees are also damaged by breaking of branches or uprooting of weak trees including those in plantations and road side strips.

PART-B

Forest Fauna

2.6 General Description

2.6.1 The forests of Kathua were used by the Chieftains of Jasrota and other principalities as game forests. These rulers used to maintain protected areas of forest as “Rakhs” for hunting purposes. In records no particular Rakhs have been mentioned. At present only one Wildlife Sanctuary is existing in the Division. The Jasrota Wildlife Sanctuary covers compartment 1 to 6 in Jasrota Range. The Jasrota fort is well inside the sanctuary. The Thein Conservation Reserve has been established in compartments 10, 11, 12, 13, 14 and 16 of Kathua Range.

2.7 Mammals

The following are some important wild mammals found in the division :-

2.7.1 The Leopard (*Panthera pardus*)

This animal is found in small numbers in the tract. The degradation of habitat and hunting have resulted in decreased number of this animal. Commonly this animal is called as “Chitra” by the local people.

2.7.2 The Jackal (*Canis aureus*)

It is a commonly occurring animal which is usually treated as vermin in the tract. It is a natural scavenger and lives in dense shrubs/grasses, holes in ground or cave like spaces among rocky hills. It is seen near habitations and agricultural fields also.

2.7.3 The Jungle Cat (*Felis chaus*)

This member of the cat family is characterized by long legs, short tail and pale green eyes and is commonly found in this tract.

2.7.4 The Indian Fox (*Vulpes bengalensis*)

This animal is found in small number in the division. It lives in burrows in open grounds and in scrub forest. It feeds on small mammals, reptiles and insects.

2.7.5 The Five Striped Palm Squirrel (*Funambulus pennanti*)

The animal feeds on fruits, nuts, young shoots, bark etc. It is found near agricultural fields and in forest patches adjacent to the villages.

2.7.6 The Indian Crested Porcupine (*Hystrix indica*)

This is a small sized robust and stocky animal with sharp quills on its back. The quills are profuse, ornamented with deep brown or black and white rings. The mature animal weighs about 10 Kgs. It is locally called "Saahi”.

2.7.7 The Grey Himalayan Goral (*Nemorhaedus goral*)

The animal is locally known as “Pijjar”. It is a ruminant having has stout limbs and sub-parallel horns. The animal is becoming rarer in the area. It stands about 70 cm high at shoulders and weighs about 30 Kgs, when mature. IUCN categorises these animals as Near Threatened.

2.7.8 The Barking Deer (*Muntiacus muntjak*)

The animal is locally called as “Kaakar”. A full grown animal is about 65 cm in height and weighs 25 Kgs, with well developed horns. The animal has upright molars and sharp exposed canines. The animal is now rarely seen in the area.

2.7.9 Nilgai or Blue Bull (*Boselaphus tragocamelus*)

It is a large antelope, standing 120-150 cm at the shoulder and weighing 100-280 kg. Small horns, growing to a maximum of 25-30 cm are present in the males. The animal is reported to exist in a small number in Jasrota Wildlife Sanctuary.

2.7.10 Chital or Spotted Deer (*Axis axis*)

The spotted deer is also reported to occur in small number in Jasrota Wildlife Sanctuary. These are large deer standing 75-100 cm at the shoulder and occurring in herds in a variety of habitats. The males weigh around 65-85 kg while the females weigh 45-55 kg. The antlers grow up to 75-85 cm in length.

2.7.11 The Indian Wild Boar (*Sus scrofa*)

This animal is seen widely in the forest area. It is black to rusty brown in colour, well grown, weighing about 25 Kgs and measuring about 90 cm in height. Frequently this animal visits agricultural fields and causes heavy losses to farmers.

2.7.12 The Grey Langur (*Semnopithecus entellus*)

This animal is widely found in the division especially adjacent to villages. It is characterized by black face, long limbs and long tail, and is herbivorous.

2.7.13 The Rhesus Macaque (*Macaca mulatta*)

These are locally called “Bandar” and are similar to Indian Langur in food habits. These macaques are quadrupedal and can be predominantly arboreal to predominantly terrestrial according to habitat. They are very well adapted to co-existing with humans and are found in high densities in areas disturbed by humans. They are omnivorous and also raid crops or forage by picking through garbage.

2.8 Birds

The Division is a representative of t*he* subtropical avi-fauna of the Western Himalayan eco-region. In addition, the area plays host to a variety of birds that migrate from the north during winter months. A comprehensive list of the birds

reported from the Kathua region is given at the beginning of this document in the list of fauna.

2.8.1 The Red Jungle Fowl (*Gallus gallus*)

It is commonly found in the tract but its numbers are rapidly decreasing due to unrelenting hunting by men.

2.8.2 Common Peafowl (*Pavo cristatus*)

This bird is found in the tract but in very small numbers.

2.8.3 Partridges and Quail group

The Black Francolin (*Francolinus francolinus*), the Grey Francolin (*F. pondicerianus*). The Chakor or Rock Partridge (*Alectoris graeca*) and Common Quail are reported to occur in the division in varying numbers.

2.8.4 The Blue Rock Pigeon (*Columba liva*)

This bird is characterized by metallic green, purple and majenta sheen on neck and upper breast.

2.8.5 The Spotted Dove (*Streptopelia chinensis*)

This is characterized by white spots, pinkish brown and grey upper parts and white and black chessboard on hind neck. Usually found in upper reaches of the division.

2.8.6 The Ring-necked Dove (*Streptopelia capicola*)

Ring Dove is characterized by a narrow black half ring on the hind neck. This is found commonly in the division.

2.8.7 The Indian White-rumped Vulture (*Gyps bengalensis*)

This scavenger bird is found throughout the division and can be spotted near carcasses of domestic animals. These are medium sized vultures with wing span of 180-210 cm. Adults are darker in color than juveniles with blackish brown plumage, white neck-ruff and a white patch of feathers on lower back and upper tail.

2.8.8 Other Birds

Other birds like Rose ringed parakeet, Common Mynah, Jungle Crow, House Crow, Asian Koel, Lesser Golden back woodpecker, sparrows, larks, white cheeked bulbul, red vented bulbul, coucal, Indian Roller, Bee-eaters, kingfishers, Indian Robin etc. are also found in the division.

2.8.9 Water Birds

The water body of Ujh barrage near Jasrota village attracts a number of water fowls. The following birds are reported to occur in the region.

(a)	*Anas platyrhynchos* (Mallard)	(b)	*Anas crecca* (Common or EurasianTeal)
(c)	*Anas acuta* (Northern Pintail)	(d)	*Anas penelope* (Eurasian Wigeon)
(e)	*Anas strepera* (Gadwal)	(f)	*Anas ferina* (Common Pochard)

2.9 Reptiles

2.9.1 The Kathua Forest Division being a sub-tropical belt provides congenial atmosphere for a variety of snakes and reptiles. The occurrence of numerous nallahs, bouldery river beds, irrigation canals and paddy fields are a boon to the reptiles. From May to September a wide variety of snakes are observed in this area.

2.9.2 The Cobra, Vipers, Kraits, Python and a variety of non-poisonous snake species are commonly seen in the area. The rocky desert type landscape in some forest compartments houses a wide variety of Lizards. Most of them are not identified. Some identified species of Lizards are :-

(a) The Common House Gecko (*HemidactyIus frenatus*)

(b) The Common Garden Lizard (*Calotes versicolor*)

(c) The Common Indian Monitor Lizard (*Varanus bengalensis*)

(d) The Common Water Monitor Lizard (*Varanus salvator*)

(e) The Keeled Indian Mabuya or Many-keeled Grass Skink (*Eutropis carinata*)

(f) The Indian Chameleon (*Chamaeleo zeylanicus*)

2.9.3 Tortoises are reported to occur in local water bodies. The two most common species occuring are:

(a) The Indian Star Tortoise (*Testude elegans*)

(b) The Common Three Keeled Land Tortoise (*Melanochelys tricarinata*)

2.10 Fishes

2.10.1 In the water bodies of Kathua Forest Division 17 species of fishes belonging to eight different families have been identified.

2.11 injuries to which fauna is liable

The fauna of the tract is liable to injury by way of loss of habitat, hunting, forest fires and diseases.

2.11.1 Injury by man

The biggest danger to fauna is from the ever increasing human population with the attendant problems of encroachment of forest land, change in land use and loss of habitat for the animals. Also, in this area, hunting is widely prevalent for sport. Moreover, animals like the Nilgai and wild pig are considered to be

hazardous to crops and even slight damages to crops are not tolerated resulting in hunting and killing.

2.11.2 Injury by fire and climatic influences

Forest fires are a common occurrence in Kathua especially in the summer months. These fires are responsible for destruction of small animals, reptiles, birds and micro-fauna. At times, even larger animals get trapped in the fires.

Unusual changes in atmospheric conditions, changes in seasons and other influences of climate change adversely affect the adaptive capacity of animals. Kathua also experiences severe thunderstorms, flash floods, hail, frost and damage by lightning storms in which sometimes large number of animals get hurt or killed. Although epidemics are rare, sometimes contagious diseases do get transmitted among wild populations through domestic animals grazing in the forests.

CHAPTER-III

Utilisation Of Forest Produce

3.1 Agricultural Customs and Wants of Population

3.1.1 The region in which the Division lies is characterized by rugged terrain, harsh climate and seasonal rainfall. The soil is sandy with hard conglomerates and boulders. It is poor in nutrient content and water holding capacity is also low. Therefore the crop productivity is very low in Kandi areas. The chaks and villages falling in the forest area are rain-fed and due to the parched nature of Kandi area, the agricultural productivity is quite low and agriculture is undiversified. However, the agricultural productivity is very high in the other regions which are irrigated.

3.1.2 There are two main crop seasons *viz*. Kharif and Rabi. During Kharif season, paddy is the main crop in Sirowal areas. Maize, Wheat, Pulses, Oilseeds, Bajra and Barley are other major agricultural crops grown in the region. There are four major cropping systems : Maize-Wheat/Mustard, Sesame - Wheat/Mustard, Mash – Wheat/Mustard and Maize – Toria – Maize (late sown) practiced in the region. Increasingly, short duration crops are being adopted and vegetables especially potato cultivation is being taken up. The area under double or triple cropping is also increasing. Although 30 % of the command area of Ravi-Tawi is irrigated, only 10% of the non command area is irrigated. In terms of agricultural productivity, Kathua district comprising of Billawar, Basohli and Dayalachak agricultural subdivisions, is ranked highest in the state along with Pulwama in Kashmir. The high productivity is attributed to adoption of improved cultivation technology, use of high yielding varieties, herbicides, pesticides, chemical fertilizers, assured irrigation, healthy cooperative movement, availability of credit, increasing use of mechanized agriculture, effective market organization and overall awareness of farmers.

3.1.3 However, with increasing mechanization of agriculture and use of irrigation, the problem of Stalinization of the soil has cropped up. Rising water tables in the command area have led to incidences of water logging, increasing salinity and alkalinity of the soils especially in Samba, Dayalachak, Rajpura and Kathua. The pH of soil in Dayalachak was reported to be 8.6 at a depth of 0-20 cm, while in Mathra chak it was 9.0 at 0-20 cm depth.

3.1.4 The farmers usually maintain a few trees of Eucalyptus, Siris, Khair, Sissoo, Ber, Dhaman and Bamboo for fodder, timber and commercial purposes. Some of the farmers have maintained and protecting small patches of pure khair forests in part of their field (which are not suitable for agriculture). These areas are leased to nomadic grazers for use during winter months in exchange for money.

3.1.5 Some farmers have a habit of closing areas adjoining their fields with brushwood fencing which they protect and lease to the Bakerwals for grazing purpose. This may lead to encroachment problems in future.

3.2 Timber Requirement

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

3.3 Market and Marketable Produce

3.3.1 The Kathua Forest Division is well connected with road network. The National Highway 44 passes through the administrative area of the Division. The Lakhanpur-Basholi Road, Dayala Chak-Challan road and Samba-Mansar roads run across the division and link NH44 with the Dhar-Udhampur road. Apart from these roads a large number of short distance roads connect various villages in the division.

3.3.2 As Kathua district is the gateway of Jammu and Kashmir and is bordering Punjab, markets like Chandigarh, Jalandhar, Pathankot and Delhi are available for any type of forest products including NTFP. For most of the forest products like timber, charcoal, Khair wood and bamboo poles, the markets exist within the State.

3.3.3 Marketable Produce

Resin, Charcoal, Khair wood, Bamboo poles, timber from Shisham and Acacia and firewood are important marketable products from Kathua forests.

3.3.4 Due to over exploitation and poor reinvestments in rehabilitation, resin tapping is not taking place at present. Khairwood extraction has been allowed only from non-forest lands. The Bamboo areas have not been managed well and no marketable Bamboo is being extracted. The timber from Sissoo and other trees are not being extracted due to low number of these trees. The Department is not producing charcoal but a large number of Charcoal Bhatties are run by local people in revenue lands. Thus, the objective of revenue returns from forest working in the forests of Kathua Division face the difficulties of lack of planning and foresight. The forests are capable of generating profitable returns by marketing of the forest products mentioned above.

3.3.5 Apart from above mentioned products grasses, fruits like Ber, Jamun, Mango and Amla and medicinal plants can be produced and/or collected in Kathua forest area.

3.4 Methods of Exploitation

3.4.1 Resin used to be extracted from Chir forests of this division by French Cup and Lip method. This method of Resin tapping resulted in heavy damage to the Chir trees.

By 1990-91 the resin tapping was altogether abandoned. Therefore the Rill method was not applied in the division. Resin extraction was done departmentally by auctioning of standing coupes to wage-mates.

3.4.2 For supply of Khairwood the Government had executed an agreement with M/s BK Katha Industries in 1975. This resulted in supply of Khairwood to this party at nominal rates for a long period of 20 years.

3.4.3 The wood for making charcoal in *bhatties* was earlier extracted by private parties after payment of royalties. The activities of charcoal making were regulated by the passage of SRO 295 of 2006, while the business of running sawmills was brought under regulation with the passage of SRO 103 of 2012. Now all charcoal *bhatties* and sawmills have to be registered with the Conservator of Forests and can only be established under specific rules and conditions. At present, Resin tapping and Khairwood extraction are not taking place in the forest areas. The Bamboo forests are not managed and no extraction has been done.

3.5 Lines of Export

3.5.1 The Division is situated all along the National Highway 44 and there are a sufficient number of connecting roads which connect the major areas of the forest to the highway on the south and also to the Udhampur Dhar road to the north. Kathua and Samba are important cities and their connectivity with Jammu and with the important markets of Punjab through both road and rail is assured and of good quality.

3.6 Import and Export

3.6.1 The Lakhanpur checkpost is located at the entry of the J&K state from Punjab and is also the last checkpost for the state's exports. The forest products being used by the inhabitants of the state and the requirement and demand of these products for the entire state can be reflected in the data being maintained at this checkpost. The abstract of timber imported from outside the state from 2004-05 to 2015-16 is given in Table 3.1.

Table 3.1
Timber imported from outside the state through Lakhanpur

S. No.	Year	Species	Number	Volume (cft)
1	2004-05	Timber	7,50,430	10,99,727
		Bamboo	2,025	
2	2005-06	Timber	5,75,783	NA
		Bamboo	NA	
3	2006-07	Timber	7,54,315	9,42,282
		Bamboo	17,533	
4	2007-08	Timber	11,82,398	15,47,957
		Bamboo	5,215	

S. No.	Year	Species	Number	Volume (cft)
5	2008-09	Timber	15,02,406	25,37,809
		Bamboo	885	
6	2009-10	Timber	25,17,459	43,02,712
		Bamboo	2,202	
7	2010-11	Timber	3,01,215	32,12,646
		Bamboo	3,560	
8	2011-12	Timber	68,72,431	37,76,598
		Bamboo	6,190	
9	2012-13	Timber	1,04,61,758	47,02,930
		Bamboo	31,543	
10	2013-14	Timber	97,36,823	41,42,410
		Bamboo	NA	
11	2014-15	Timber	1,33,38,847	44,83,116
		Bamboo	NA	
12	2015-16	Timber	91,42,860	37,62,910
		Bamboo	9,864	

3.6.2 In addition, sandal wood chips are also imported into the state, the corresponding data available for the years 2007-08 to 2015-16 is given in the following table:

Table 3.2
Amount of sandalwood chips imported into the state

S. No.	Year	Amount imported (kg)
1	2007-08	1,399
2	2008-09	NA
3	2009-10	NA
4	2010-11	17,900
5	2011-12	25,000
6	2012-13	1,21,169
7	2013-14	4,85,750
8	2014-15	2,13,518
9	2015-16	2,28,578

3.6.3 The export of medicinal plants has been happening from the state regularly over the past several decades. However, it has received new impetus after the opening up of the trade points at the Line of Control between India and Pakistan through the state. The data compiled for export of Minor Forest Produce being exported from the state is presented in Table 3.3. The major species of NTFPs exported from the State as local production are Harar (*Terminalia chebula*), Anardana (*Punica granatum*), Rasount (*Berberis aristata*) and Guchhi (Edible morel)

Table 3.3
Amount of NTFP exported through Lakhanpur checkpost by local or LOC traders

S. No.	Year	Amount exported (kg)	Remarks
1	2010-11	3,07,744	Anardana (1,19,339 kg), Guchhi (4,369 kg local product), Sandalwood powder (60,000 kg), Rasount (57,350 kg, local product), Harar (58,600 kg, local product)
2	2011-12	2,32,542	Anardana (1,32,565 kg), Guchhi (5,044 kg local product), Sandalwood powder (43,915 kg), Rasount (17,408 kg, local product), Harar (2,199 kg , local product)
3	2012-13	27,56,897	Anardana (20,93,635 kg), Guchhi (15,505 kg local product), Sandalwood powder (1,40,345 kg), Rasount (41,771 kg, local product), Harar (3,10,410 kg, local product)
4	2013-14	13,73,605	Anardana (1,63,561 kg), Guchhi (1,293 kg local product), Sandalwood powder (1,16,795 kg), Rasount (58,754 kg, local product), Harar (2,59,500 kg, local product)
5	2014-15	23,91,573	Anardana (43,501 kg), Guchhi (1,658 kg local product), Sandalwood powder (69,520 kg), Rasount (79,300 kg, local product), Harar (4,42,100 kg, local product)
6	2015-16	27,29,040	Anardana (79,056 kg), Guchhi (2,672 kg local product), Sandalwood powder (2,06,210 kg), Rasount (32,395 kg, local product), Harar (1,56,400 kg, local product)

3.7 Cost of Extraction

3.7.1 There has been no departmental extraction from Kathua Forest Division over the past many years. The needs of the populace are met by allotting timber obtained from other divisions.

3.8 Past and Current Prices

3.8.1 The revised sale rate of timber in A, B and C concession zones, municipal council/ committee and municipal corporation areas, fixed by the State Government in 2006 and revised latest in 2016 are as under:

Table 3.4:
Statement showing the price of timber sold through TSD's (Rs./Cft)

Zone	Form	Deodar	Kail	Fir/ Spruce
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

The rates quoted above are exclusive of all taxes. Source: SFC

CHAPTER-IV

Activities of State Forest Corporation

4.1. Jammu & Kashmir State Forest Corporation

4.1.1 The J&K SFC was created by the act of legislation, namely The Jammu and Kashmir State Forest Act, 1978 and rules related to its working were framed in 1981. Initially, the forests of the State were worked by lease system whereby forest lessees got the work of extraction done. Later the forest working was nationalised by The Jammu and Kashmir Nationalisation of Forest Working Act, 1987.

4.1.2 The Forest Department hands over forest coupes to SFC and levies royalty. Before the ban of felling of green trees, the SFC was handling huge volumes 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, the quantum of timber extraction by SFC reduced to a large extent. 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 (dryo or fallen; basically hygienic markings) can be cleared in the State for extraction every year, but except few years, the limit of 80 lakh cft was never touched hence it resulted in financial crunch to the corporation.

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

4.1.4 The SFC prepares the estimate for the timber operation, based on the expected out turn and calculates the financial cost for extraction and transportation of timber up to its central depots. Then it allocates the work to contractors for extraction of timber based on competitive bids. When the timber is dumped in the road head, the transportation of timber is permitted by either Conservator of Forests or the Chief Conservator of Forests (Territorial), after due verification of the stocks.

4.1.5 The entire operation of timber extraction and transportation is monitored by the territorial field staff. From the starting of felling operation up to the disposal of debris and handing over the compartment back to the forest department, all procedures have to be monitored properly. The felling of marked trees start only after the proper handing over of the markings to the SFC. The fellings are always towards the uphill side; rarely is it done along the contour and never on the downhill side. It has to be ensured that the falling trees do not damage the other standing trees. The SFC reports to the territorial department about the progress of the felling operation every month.

4.1.6 The felled tree is delimbed and logs of standard sizes are cut. The logs are debarked and rolled down to road head for further transportation in Kashmir valley, but extracted into scants in Jammu province. The 10'X10"X5" wooden sleepers are called as BG sleepers as it was meant for Broad Gauge Railway Sleepers. Apart from BG, the terms used by local people meant for under sized sleepers are *Pasale, Chakkoor* and *Dimdima*. The extracted scants are brought to road head either by head load, *Pathru* or aerial ropeway (*tar* span). The pathru is used when the extracted stuff is more than 30,000 sleepers and intended to be transported from the higher elevation point to the lower destination through steeper path. Over longer distances crossing deep valleys, aerial ropeways are used. If moving against gravity, diesel engines are used to power lift the scants but if transported along gravity, no extra power is used. Wherever smooth moving water channel is available from the origin up to the destination, the scants are launched in the channel and caught at the *boom* erected at the destination. From the road head the scants are loaded in trucks and transported. Form-25 (Transport permit) is issued by territorial division for monitoring the land transportation of forest produces.

4.1.7 Mostly, the timber is sold in open auction by SFC. However, in Kathua Forest Division, there has been no activity of SFC in the forests by way of handing over markings for felling. This is view of less potential of available markings in the Division. However, removal of plantation and roadside trees is being done by SFC in individual cases as requested by the Forest Division. In the year 2016-17, the following markings were handed over to SFC:

Table 4.1

Markings handed over to SFC in Kathua Forest Division in 2016-17

#	**Particulars**	**Units handed over**
1	Mixed Broadleaved species at Hariya Chak Nursery	2831 trees
2	Mixed Broadleaved species Ward No 11	45 trees
3	Mixed Broadleaved species at Divisional office, Kathua	45 trees
4	Bamboo culms at Co 3/K and 4/K	1,83,000 culms

4.2 Norm Rates

4.2.1 The rates of the various operations of the State Forest Corporation in timber extraction as well as firewood extraction are revised regularly. The rate structure of firewood extraction and transportation revised by SFC has also been approved for adoption by the Forest Department as well for the year 2016-17. The revised norm rates of SFC for the year 2015-16 are given in Table 4.2 for timber and Table 4.3 for firewood.

Table 4.2:
Statement showing the rates in vogue in SFC for timber operations during 2015-16
(All Figures in Rs.)

#	Activity	Category			
	SAWN FORM	**D**	**C**	**B**	**A**
(a)	**Extraction (on FMM)**				
1	Felling (per cft)	3.37	2.82	2.56	2.01
2	i) Hand Sawing – under/odd size (per cft)	44.66	40.80	37.79	34.37
	ii) 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)**	**7.56**			
	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)

Volume Slab Cft	Distance slab			
	0-50 km	6-10 km	11-20 km	Above 21 km
Upto 5000	3.45	2.65	2.05	1.62
5001-10000	3.39	2.45	1.72	1.19
10001-20000	3.21	2.38	1.69	1.16
20001-40000	3.06	2.26	1.60	1.10
40001-80000	2.90	2.10	1.47	0.97
Above 80001	2.74	1.96	1.36	0.91

(g) Pucca Road Transportation (Log Form)

#	Distance slab in Km	Rate in Rs/ cft/Km	Rate with 15% Contractor's profit (Rs/cft/km)
1	0-20	0.34	0.40
2	20-40	0.30	0.34
3	40-70	0.28	0.32
4	Above 70	0.25	0.28

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

#	Distance slab in Km	Rate in Rs/ cft/Km	Rate with 15% Contractor's profit (Rs/cft/km)
1	0-50	0.19	0.21
2	51-100	0.17	0.20
3	101-150	0.16	0.18
4	Above 151	0.14	0.16

(i) Loading charges (sawn timber)	Rs. 1.46/ cft/ km
(j) Road Transportation (Sawn form)	Rs. 0.23/ cft/ km
other than National Highways (with 15% contractor's profit)	
Activity	**Rate**
Extraction including felling, conversion rolling etc. (all operations) upto KLP	At the average rate of Rs. 244.00 per labour per day as per NPC procedure

Table 4.3.

Statement showing the rates in vogue in SFC for extraction and transportation of firewood during 2016-17 (All Figures in Rs.)

S.No.	**Item of work**	**Unit**	**Revised rate for 2016-17 by SFC (in Rs)**
1	Extraction	Quintal	105.57
2	Weightment	Quintal	03.12
3	Loading	Quintal	10.97
4	Unloading	Quintal	03.12
5	Depot handling	Quintal	02.31
6	Other miscellaneous	Quintal	01.96
	TOTAL		127.05
7	Transportation Upto 40 km Beyond 40 km	Qtl/km	 1.90 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.		

CHAPTER-V

Five Year Plans

5.1 Introduction to Five Year Plans

5.1.1 Planning is an essential process for assessment of resources so that current requirements are met and provisions are made for meeting future needs sustainably. Increasingly, the changes in climate and associated weather phenomena are making planning exercises contingent upon understanding these changes and making enough allowances for changes in future courses of action. With the increase in population of both human as well as livestock, forests are coming under great pressure due to demand for land, changing land use and excessive exploitation. Increasing deforestation for exploitation of forest products, pressure for agricultural land and urbanisation has led to a perilous situation for the future of the planet as the forest cover continues to shrink.

5.1.2 The Government of India has been allocating funds to the forestry sector right from the beginning of the First Five Year Plan. Although the main focus during the initial years of implementation was towards agricultural productivity, but regular provisions have been made for forestry development and forest based programmes.

5.1.3 The Five-year Plans (FYPs) were developed, executed, and monitored by the Planning Commission with the Prime Minister of the country as the ex-officio Chairman. The first Five Year Plan was launched in the year 1951. The National Institution for Transforming India, also called NITI Aayog, was formed to replace the Planning Commission via a resolution of the Union Cabinet on January 1, 2015. This was done in order to better serve the needs and aspirations of the people of India.

5.2 Development in Forestry during Five Year Plans in India

5.2.1 In first five year plan a sum of Rs. 9.50 crore was spent on forestry programmers in which emphasis was laid on afforestation, forest transport and communication, forest administration and small scale plantation by state governments. Similarly the central government gave priority to forest research, forestry education and wild life conservation.

5.2.2 In Second Five Year Plan an increased amount of 19.30 crore rupees was allocated for forestry development programmes. Here main focus was towards afforestation, development of plant species of commercial and industrial importance, increase production of timber and important minor forest products, wildlife conservation, improvement in the living conditions of forest personnel, forestry research, extension of new technological facilities and widening the scope of cooperation with the Central Government. Due to these efforts the value of major forest products increased from Rs 19.00 crore to Rs 59.00 crore and minor forest products from Rs 69.03 crore to Rs 111.03 crore during 1951-61.The area of reserved forests also increased from 27 crore square km to 36 crore square km while the number of forest personnel grew from 4 to 50 lakhs.

5.2.3 In Third Five Year Plan a provision of Rs. 51.00 crore was made for forestry development which led to the planting of quick growing varieties of trees on 64,000 hectares and trees of economic importance on 2,40,000 hectares. About 256 lakh hectares of forest land was replanted and 11,000 km long new roads were constructed besides the repairing of 4,000 km long old roads.

5.2.4 During Fourth Five Year Plan quick growing varieties of trees were planted on 4 lakh hectares of land to meet industrial demand (paper, plywood and match industries) besides doing afforestation on 3.4 lakh hectares of area for economically important trees (Teak, Semal and Shisham) and 75 lakh hectres for fuel wood. During this period about 2 lakh hectares of old forest land was reforested. For the proper development of forests about 16,000 km long new roads were constructed and 2,000 km long old roads were repaired. About 2 lakh hectares of forest land was also developed for providing fodder to the cattle.

5.2.5 During Fifth five Year Plan provision was made for planting quick growing varieties of trees on 8.6 lakh hectares of area along the roads, rivers, canals and rail lines and trees of economic and industrial use on 16 lakh hectares of area. The plan also proposed the construction of about 60,000 km of roads for the maintenance and development of forest areas.

5.2.6 During Sixth Five Year Plan an outlay of Rs 69.26 crore was made for forestry development with main objectives for the conservation of existing forests and the launching of country-wide afforestation and social forestry programmes to fulfil three sets of needs:

(a) ecological security,

(b) fuel, fodder and other domestic needs of the population; and

(c) the needs of village, small scale and large scale industries.

The programmes included forest conservation, social forestry, fuel wood, forest labour, forest survey, forest research and people's participation in forest development. The new thrusts included 'tree for every child programme', eco-development force, eco-development camps and agroforestry programmes. During this period afforestation was made over 21.5 lakh hectares of area. The Forest Conservation Act, 1980 restricted the transfer of forest land to other uses.

5.2.7 During Seventh Five Year Plan (1985-90) a sum of Rs. 185.91 crore was allocated for forestry development. It fixed up target for planting trees on 50 lakh hectares of area with following main programmes:

(i) conservation of important flora and fauna for ecosystem

(ii) increasing forest area through afforestation programmes like social forestry, agro forestry etc

(iii) fulfilling the needs of fuel wood, fodder, timber and minor forest products

(iv) maintaining balance between forestry programmes and welfare of tribals dependent on forests

(v) laying emphasis on forestry research, forestry education, and forestry training, and

(vi) seeking people's participation for forestry development under JFM (Joint Forest Management) Scheme.

5.2.8 During the Eighth Five Year Plan an outlay of Rs. 525 crore was provided for forestry development under Central Sector. The programmes included:

(i) rehabilitation of degraded forests,

(ii) soil and moisture conservation,

(iii) farm forestry,

(iv) roadside and canal bank plantation,

(v) creation of wind-breaks, and

(vi) wood lots on community land and pasture development.

Under these programmes besides social forestry scheme, rural fuel wood plantation has been introduced in 101 districts of the country which are chronically deficient in fuel wood and fodder resources.

5.2.9 The Ninth Five Year Plan came after 50 years of Indian Independence. It focused on environmental stability through social mobilization and participation of people.

5.2.10 An outlay of Rs 5,945 crores was fixed for the forestry sector in the 10th Five Year Plan. As the National Forest Policy stipulated that 1/3rd geographical area of the country should be brought under forest/tree cover, the imperative was echoed in the 10th FYP, which stated that the country will bring 25% area under forest/tree cover by the end of 10th Plan period and 33% by the end of 11th FYP.

5.2.11 The outlays for the 11th FYP for forestry and Wildlife was Rs. 6,213.99 crores and the budget outlay (with 20% increase for the 12th FYP (2012-13 to 2016-17) was 8577 crores.

5.3 Planning for Foresty Sector in the State of Jammu and Kashmir

5.3.1 In the State of J&K, funds have regularly been allocated to the forestry sector since the 1st First Five year Plan. Forests cover a large extent of the land of the J&K state. With the passage of time, fund outlay for forestry sector has increased progressively in the state. The detail of year wise allocation to the J&K Forest Department is given in the table as follows:

Table 5.1
Plan Allocation to forestry sector in J&K State since 1951-56

S. No	Plan	Period	Sector	Outlay (Lakh Rs)	Expenditure (Lakh Rs)
1	1st FYP	1951-56	Forest & Soil Conservation	16.77	14.91
2	2nd YP	1956-61	-do-	66.50	75.32

S. No	Plan	Period	Sector	Outlay (Lakh Rs)	Expenditure (Lakh Rs)
3	3rd FYP	1961-66	-do-	175.00	132.10
4	Inter Plan Period	1966- 69	-do-	179.00	119.68
5	4th FYP	1969-74	-do-	575.00	302.64
6	5th FYP	1974-79	-do-	498.76	348.30
7	Annual Plan	1978-79		152.00	145.32
8	Annual Plan	1979-80	Forest & Soil Conservation	173.92	144.18
9	6th FYP	1980-85	-do-	1250.00	1910.93
10	7th FYP	1985-90	All Wings of Forest Deptt.	4922.00	5200.91
11	Annual Plan	1990-91	-do-	2180.86	2108.33
12	Annual Plan	1991-92	-do-	2371	2701.35
13	8th FYP	1992-97	-do-	15990.00	17891.01
14	9th FYP	1997-02	-do-	49700.00	43547.95
15	10th FYP	2002-07	-do-	66598.92	48717.66
16	11th FYP	2007-12	-do-	88292.14	-
17	Annual Plan	2012-13	-do-	3643.69	-
18	Annual Plan	2013-14	-do-	4841.95	-
19	Annual Plan	2014-15	-do-	4760.23	
20	Annual Plan	2015-16	-do-	3351.20	

Source: J&K Planning Deptt.

5.4 Achievements of Kathua Forest Division during Five Year Plans

5.4.1 The year wise achievements under area treated and plantation by Kathua Forest Division and the total expenditure incurred in various development works is given year-wise in the following table:

Table 5.2

Achievements of Kathua FD under Plan schemes since 2010-11

S. No.	Year	Scheme	Range	Financial (Lakh Rs)	Plantation (Number)	Area treated (Hectares)
1	2010-11	RDF District Plan	Kathua	2.92	6,000	20
			Samba	6.92	12,000	35
			SC	2.82	0	0
		RDF State Plan	Kathua	0.14	5000	20
			Samba	3.08	0	0
			Jasrota	0.07	5000	15
			SC	3.03	0	0
		Soil Conservation	Kathua	0.87	5,000	15
			Jasrota	0.47	0	0
		Forest Protection	Kathua	0.75	0	0
			Samba	0.87	0	0
		IFM	Samba	0.19	0	0
			Jasrota	0.97	0	0
2	2011-12	RDF District Plan	Kathua	3.91	5,000	20
			Samba	7.77	18,000	25
			Jasrota	0.24	0	0
			SC	2.87	7,000	15
		RDF State Plan	Samba	3.58	8,000	15

S. No.	Year	Scheme	Range	Financial (Lakh Rs)	Plantation (Number)	Area treated (Hectares)
			Jasrota	0.03	0	0
			SC	2.59	5,000	15
		13th FC	Kathua	3.50	0	0
			Samba	2.00	0	0
		IFM	Kathua	0.50	0	0
			Samba	0.40	0	Fire line
			Jasrota	0.60	0	Fire line
		NBM	Kathua	1.42	30,000 (Raising only)	
			Jasrota	0.95	20,000(Raising only)	
3	2012-13	RDF District Plan	Kathua	2.99	19,000	10
			Samba	6.90	24,000	25
		RDF State Plan	Kathua	0.35	-	-
			Samba	3.91	21,000	15
		Forest Protection	Kathua	0.75	0	0
			Samba	0.87	0	0
		IFM	Kathua	8.00	0	0
4	2013-14	District Plan	Kathua	5.83	11,000	22
		Forest Protection	Kathua	0.47	0	0
		IFM	Kathua	24.40	0	0
		NBM	Kathua	5.52	15,000	35
		RDF	Kathua	9.97	0	0
		FDA	Kathua	3.84	28,670	183
5	2014-15	RDF District Plan	Kathua	4.76	7,000	20
			Samba	5.17	9,000	18
		Forest Protection	Kathua	1.06	0	0
		RDF State Plan	Kathua	6.85	12,000	22
		NBM	Kathua	8.20	22,500	50
		13th FC	Kathua	31.15	0	0
		IFM	Samba	1.00	0	Fire line
6	2015-16	RDF District Plan	Kathua	5.83	5,000	20
			Samba	1.55	0	0
		RDF State Plan	Kathua	8.33	16,000	30
		IFM	Kathua	3.53	0	Fire line

5.4.2 As can be observed from perusal of the above table, the allocations under various schemes to the Division are very meagre. It is an unfortunate aspect of planning that forests, the resource which is the basis of the agricultural development, climate change mitigation and water security is being neglected as far as fund allocation is concerned. The targets specified are not thought out in detail, nor are schemes planned with any concerted long-term action plan in mind. Forests grow slowly, they give returns slowly, and they also absorb changes unleashed by unsustainable development slowly. In the case of planning for our forest wealth, we should also slow the pace down, while expanding the duration of the planning activity.

CHAPTER-VI

Staff And Labour Supply

6.1 Staff

6.1.1 As compared to the previous plan period there has been no significant increase in the staff strength. The existing sanctioned strength is sufficient to carry out the management and protection work. However, it is noted with concern that as in other Divisions, sufficient executive staff is not posted. The number of staff posted as Foresters and Forest guards is less than the sanctioned strength by 77% and 28% respectively. Also, in connection with the field staff, it must be said that technically qualified and trained forest officers who understand the ecological interconnections and are well versed with new developments are required to be posted to Divisions if the management of forests is to be done on scientific lines. The existing staff strength of Kathua Forest division is shown in Table 6.1 as follows:

Table 6.1
Sanctioned strength and actual working strength in Kathua FD in 2015-16

S.No	Designation	Sanctioned Strength	Actually Working
A. EXECUTIVE			
01	Deputy Conservator of Forests	1	0
02	Assistant Conservator of Forests	1	1
03	Range Officers-I	2	1
04	Range Officers-II	3	1
05	Foresters	35	8
06	Deputy Foresters	10	11
07	Forest Guards	121	87
08	Mali	10	6
09	CPK	2	0
10	Chowkidar	2	3
11	Watchers	0	33
12	Helper	0	5
13	Class-IV	0	5
B. MINISTERIAL			
01	Accountant	0	0
02	Senior Assistant	1	0
03	Junior Assistant	6	7
04	Orderlies	5	12
05	Driver	1	0
06	Cleaner	1	0
07	Frash	0	2
	Total	**201**	**182**

6.2 Labour Supply

Both skilled and unskilled labour is available in the tract easily. Local as well as outside labourers are available in plenty for any work.

CHAPTER-VII
Past Systems Of Management

7.1 General History of the Forests and Forest Division

7.1.1 The ancient history of this area is obscure. It is said that the name "Kathua" derives from the Dogri "Thuan" meaning scorpions. During medieval times the Kathua tract was a part of Jasrota principality with capital at Jasrota town founded by Raja Jas Dev in the early eleventh century. Jasrota remained independent of Jammu through the succeeding centuries. In 1594, the ruler of Jasrota joined a rebellion of some chieftains against the Mughal Emperor Akbar, and the event is recorded in the Mughal text *Maasir ul Umara*. It is said that Raja Ajab Dev commissioned the construction of the Jasmergarh Fort near the present town of Hiranagar during his reign from 1790 to 1800. There is not much information on the rulers or the principality from the time of the rebellion against Akbar to its final annexation under the Sikh rule. The last independent ruler of Jasrota was Randhir Singh who reigned from 1805 to 1820. Maharaja Ranjit Singh annexed the principality in 1834. The area was converted into a jagir and gifted to Hira Singh, the nephew of Gulab Singh and son of Dhian Singh, who was the Dogra prime minister at Lahore court.

7.1.2 It was Hira Singh who built the old Fort of Jasrota although the foundations had been constructed somewhere during the time of the Dev rulers who had developed Jasrota town with several palaces, buildings, baradaris and water tanks in the twelfth and thirteenth centuries. The fort, however, was razed by the Sikh Army in 1845 and the rulers abandoned the fort and left for Khanpur in Nagrota. The old Fort is now completely in ruins. It stands in Compartment 2 of Jasrota Range in the Jasrota Wildlife Sanctuary. Two big tanks built during the earlier time are present near the ruins of the Fort.

7.1.3 After the Treaty of Amritsar was signed as a result of the Anglo-Sikh war of 1845-46, Gulab Singh was declared the ruler of all the lands between the Ravi and Indus. Jasrota thus became part of the state of Jammu and Kashmir and formed one of the five districts of Jammu Province. The headquarters of the district were shifted from Jasrota to Kathua between 1921 and 1931 and the district came to be called Kathua.

7.1.4 Another small principality related to this division is that of Samba. This town is said to have been founded around 1400 CE. The area had no rulers but was inhabited by a tribe called Ghotars under the chief of that tribe. The grandson of the ruler of Lakhanpur, Malh Dev, after his marriage in Ghotar family defeated the tribal chief and founded the Samba principality with Samba as its capital. The Fort came under the control of Jammu during Raja Dhruv Dev's time who ruled from 1705 to 1725 CE. It was subsumed in the Sikh empire by 1808 when Jammu was completely annexed. In 1822, Raja Suchet Singh, the brother of Gulab Singh, was

announced ruler of Ramnagar, Samba and Bandralta. In 1846 Samba became a part of the state of Jammu & Kashmir under Maharaja Gulab Singh.

7.2 Past Working Plans for Kathua Forests

7.2.1 Prior to 1891 CE, the forests in J&K were exploited unscientifically with the sole purpose to generate maximum revenue. Scientific forest management in Jammu and Kashmir started in 1891 CE with the appointment of JC McDonell as Conservator of Forests. During this period the feud between Raja Amar Singh and Maharaja Pratap Singh over the rich jagir forests of Bhaderwah gave an opportunity to the British to enforce the scientific principles of forest management as per the policy of Government of India. The first Working Plan in the State was prepared by Mayers in 1902 CE for Bhaderwah Forest Division. The first management plan for Kathua Forest tract was prepared in 1910-11 by SW Steane.

7.2.2 For examination of past systems of management of Kathua Forests especially prior to 1981, the Working Plans of both Jammu and Billawar Forest Divisions are considered. The first working Plan for these areas was prepared by SW Steane. The period of the plan was 15 years from 1910-11 to 1925-26 but was extended up to 1930-31. In this Plan only improvement fellings were prescribed with 5 years felling cycle for important species like Deodar.

7.2.3 Working Plan for Billawar Forest Division (1941-42 to 1956-5 7) by SD Dhar

7.2.3.1 The following three Working Circles were constituted.

i. Deodar Working Circle.

ii. Fir Working Circle.

iii. Un-regulated Working Circle.

7.2.3.2 Out of these only Unregulated working circle is relevant to Kathua Forests. Poorly stocked and inaccessible demarcated forests were allotted to this working circle. Only improvement fellings were prescribed and the output from this operation was to fulfill the requirement of the concessionists.

7.2.4 Working Plan for Billawar Forest Division (1957-58 to 1973 to 74) by AN Fotedar

7.2.4.1 The same three Working Circles as proposed by SD Dhar were proposed in this Working Plan also. No fellings were recommended in Unregulated Working Circle mainly because the exploitation in the poorly stocked areas was considered uneconomical.

7.2.5 Working Plan for Soil Conservation Division, Jammu (1971-72 to 1981-82 by MS Jamwal

7.2.5.1 The Soil Conservation Division Jammu came into existence in 1974. The compartmentation of the forest area took place in 1960s. The first regular Working Plan for the Soil Conservation Division, Jammu was prepared by MS Jamwal for the period of 1971-72 to 1981-82. This Working Plan is discussed as it is related to the Bahu Range of Jammu Forest division, a part of which was later transferred to Kathua Forest Division.

7.2.5.2 The following six Working Circles were constituted.

i. Chir Selection Working Circle.

ii. Protection-cum-lmprovement Working Circle.

iii. Grazing Working Circle (Partly overlapping)

iv. Wildlife Working Circle.

v. Khair (Overlapping) Working Circle.

vi. Soil and Water Conservation (Overlapping) Working Circle.

i. Chir Selection Working Circle

For management of Chir forests of the division the Selection system was proposed with exploitable diameter of 60 cm DBH and a rotation of 120 years. A felling cycle of 30 years was proposed. The system mainly aimed at improvement of the crop and was conservative in nature.

A detailed survey was conducted on resin tapping and prescriptions were given.

ii. Protection-cum-Improvement Working Circle

This Working Circle involved poorly stocked and erosion prone areas. The main objective was to maintain the forest crop as a protective cover for soil and water conservation. Growing of shrubs, grasses, fire protection, protection from grazing and plantation of trees species were recommended.

iii. Grazing Working Circle (Partly overlapping)

The area used by the nomadic grazers was kept under this Working Circle. Rotational closures for grazing, introduction of better varieties of grasses, fodder tree planting, contour bunding and bench terracing were prescribed as treatment for these areas.

iv. Wildlife Working Circle

Areas were proposed for creation of Game sanctuaries and Zoological parks. In wildlife areas construction of watch towers, observation strips, water holes, salt licks, inspection paths and introduction of wildlife were proposed.

v. Khair (Overlapping) Working Circle

Pure and mixed Khair areas were included in this Working Circle. Selection cum thinning were proposed with exploitable diameter of 20 cm breast height and a felling cycle of 10 years.

vi. Soil and Water Conservation (Overlapping) Working Circle

The areas which were highly prone to erosion were included in this Working Circle. Afforestation of blanks, management of grass lands, construction of check dams, nallah training and land slide stabilization works were proposed.

7.2.6 Although the Kathua Forest Division was created in 1981, upto 1991-92 no regular Working Plan was prepared for this division. Therefore the division during this period was administered without a plan. The extension of Jamwal's Plan for Billawar Forest Division (1974-75 to 1983-84) can be considered for this period.

7.2.7 Working Plan for Billawar Forest Division (1974-75 to 1983-84) by MS Jamwal

The following six working circles were proposed in this Working Plan.

i. Deodar-Kail Working Circle.

ii. Chir Interim Working Circle.

iii. Fir Selection Working Circle.

iv. Protection-cum-Improvement Working Circle.

v. Khair Overlapping Working Circle.

vi. Bamboo Working Circle.

Among these the Chir Protection cum Improvement, Khair (Overlapping) and Bamboo Working Circles are relavant to Kathua Forest Division.

i. Khair Overlapping Working Circle

The compartments where Khair is predominant along with mixed Khair areas were included in this Working Circle. Selection cum thinning system was recommended with an exploitable DBH of 20 cm. A single felling series was recommended.

ii. Bamboo Working Circle

All the Bamboo areas of Kathua and Jasrota Ranges were included in this Working Circle. Coppice with standards system was proposed with a felling cycle of 5-6 years. Yield was regulated by area and only one felling series was proposed.

iii. Chir Interim Working Circle

The well stocked Chir forests amounting to 22,449 hectare were allotted to this circle. Only malformed, over matured and diseased trees were to be removed.

Selection system was recommended with 120 years rotation with an exploitable DBH of 60 cm.

iv. Protection cum improvement Working Circle

It covered all the poorly stocked forests on the precipitous grounds and covered an area of 64,124 ha.

7.2.8 Working Plan for Kathua Forest Division (1991-92 to 2001-02) by AK Gupta

After the formation of Kathua Forest division in 1981-82 this is the first regular working plan for the division. In this plan the following working circles were constituted:

i. Chir Rehabilitation Working Circle.

ii. Miscellaneous Plantation Working Circle.

iii. Bamboo Rehabilitation Working Circle.

i. Chir Rehabilitation Working Circle:

The Chir bearing compartments varying in composition from 10 to 50 per cent were put under this Working Circle. As the stocking was low (20.93 cum/ha) and quality poor, no silvicultural system was proposed but improvement fellings were prescribed.

Fencing, patch sowing, soil working, transplanting and soil conservation measures were suggested. Resin tapping was not recommended and only dry fallen trees were to be removed.

ii. Miscellaneous Plantation Working Circle:

All the areas excluding Chir and Bamboo were allotted to this Working Circle. This Working Circle includes both broadleaf and scrub forests.

No yield was prescribed but dry fallen trees were to be granted to concessionists. Fencing, planting and patch sowing of Chir were recommended for an area of 3,000 ha. For the remaining area, live hedge fencing and plantation of broad leaved species were recommended. The blank areas were to be treated with planting of quality grasses and fodder trees with soil conservation works.

iii. Bamboo Working Circle:

An area of around 2,760 ha was allotted to this working circle. A system called “Improvement System” was prescribed for working of Bamboo clumps. Artificial planting of Bamboo and tending of associates were recommended. A felling cycle of five years with no yield specification was prescribed. The output was to be used for meeting local demands.

7.2.9 Working Plan for Kathua Forest Division (2002-03 to 2012-13) by Dr TS Ashok Kumar

The current plan is a revision of the working plan written by Dr TS Ashok Kumar for the division. In this plan the following working circles were constituted:

i. Chir Improvement Working Circle.

ii. Bamboo Improvement Working Circle.

iii. Khair Improvement Working Circle.

iv. Grazing Working Circle.

v. Biodiversity Conservation Working Circle.

vi. Plantation Working Circle.

vii. NTFP (Overlapping) Working Circle.

i. Chir Improvement Working Circle:

The Chir bearing compartments and the compartments deemed to have "Chir Potential" were put under this Working Circle in this Plan. Out of a total of 16,395 Ha under this Circle, such areas composed 11,407 Ha. As the condition of the forests was not satisfactory, no silvicultural system was proposed but improvement fellings were prescribed for Chir Bearing areas and the Chir Potential areas were to be separately treated by Artificial Regeneration.

Resin tapping was not recommended and only dry fallen trees were to be removed. The financial cost of rehabilitation was worked out in two scenarios *viz.*, with or without Joint Forest Management approach.

ii. Bamboo Improvement Working Circle:

All the areas bearing Bamboo were allotted to this Working Circle. It included "Bamboo areas" were the crop was occurring currently as well as "Bamboo potential areas" which were those that were traditionally known to bear Bamboo but now were overrun with other species.

The potential growth and yield from Bamboo if properly rehabilitated were calculated based on data from Bamboo plantations. The entire plan of rehabilitation and treatment based on Culm Selection cum Clump Improvement System was worked out and recommended.

iii. Khair Improvement Working Circle:

The compartments bearing high frequency of Khair and those traditionally known to bear the crop were included in this Working Circle and around 2,760 ha was allotted to it. Selection system with exploitable diameter of 20 cm DBH (OB) and a felling cycle of 25 years was fixed. Only one felling series identical with the constitution of the Working Circle was proposed.

iv. Grazing Working Circle:

Although grazing Working Circles are generally constituted in overlapping fashion, in this Division, the compartments traditionally being allotted to nomadic grazers for grazing constituted the Grazing Working Circle. It was pointedly noted by the WPO that no compartments should be allotted to nomadic grazers by name for either grazing or for establishing behaks, and lifting of fodder should be strictly done under departmental supervision.

Management of grazing practices was described thoroughly in the Working Plan. This was done as it was felt that a measure of protection for the forests that fall under this Working Circle should be incorporated in the Working Plan itself. A total of 8,460 Ha were allotted to this Working Circle. Measures for Range Management and Fodder production were given in the Plan.

v. Biodiversity Conservation Working Circle:

This was a new Working Circle proposed by Dr TS Ashok Kumar. It was constituted of compartments typical of the Kandi belt showcasing the broadleaved species and subtropical biodiversity. The area allotted to this Circle amounted to a total of 2,526 Ha. It also included the compartments under the Jasrota Wildlife Sanctuary along with a few compartments which were at that time proposed to be included in the sanctuary in the future.

An attempt was made to incorporate new methods for encouraging biodiversity conservation by proposing *in situ* methods like Wildlife Sanctuaries and Sacred Groves as well as *ex situ* methods like a Divisional Biodiversity Center comprising of Botanical Garden and Sacred Tree Garden. Tree Improvement techniques and germplasm conservation using gene banks were also recommended.

vi. Plantation Working Circle:

A Plantation Working Circle with an area of 7,165 Ha was constituted for plantation activities involving commercially important broadleaved species and forest fruit trees, fuelwood and medicinal plants. Detailed guidelines for road, railway and canal plantations were also provided. In this Working Circle, compartments identified as ecologically degraded were proposed for reafforestation.

7.3 Discussions on Past Systems of Management

7.3.1 Till 1910-11 the Kathua forest tract like many other Forest Divisions in the State did not have any management plan. The first two plans (by SW Steane and SD Dhar) gave importance only to high quality conifer forests and the Chir and Broadleaf forests were ignored. These forests were not considered economically profitable and put under Unregulated Working Circle in SD Dhar's plan. In all

these plans only the species generating high revenue received attention as the guiding principle of the day was to generate maximum revenue.

7.3.2 It was only in 1957-58 that independent Working Circles were formulated for Chir and Khair crops in AN Fotedar's Plan. Soil and water conservation, grazing and wildlife were also discussed under separate Working Circles in this Plan. As far as the other important crop of this division namely Bamboo is concerned, it had to wait till 1974-75 to receive sufficient importance to be put under an independent working circle (MS Jamwal's Plan). In AK Gupta's plan a separate working circle for plantation was constituted which was continued in Dr TS Ashok Kumar's Plan.

7.3.3 Thus over a period of 80 years of management history the focus of the plans changed from exploiting a few high value species for generating maximum revenue for the state to the concept of holistic forest management wherein multiple species received attention along with issues of ecological importance like soil and water conservation. In recent plans the issues of wildlife protection, grazing problem, plantation concepts and participatory forest management also received importance.

7.4 Implementation of Plans

7.4.1 As far as the forests of Kathua are concerned the recommendations of the plans regarding the resin tapping and Khair extractions were implemented. But the sustainable management of these crops could not be achieved as evidenced by complete abandoning of Resin tapping since 1991-92 and stoppage of Khair markings a little later. The deteriorated Chir crop and dwindling growing stock of Khair warranted such measures.

7.4.2 In Dr TS Ashok Kumar's Working Plan some major issues like watershed concept, biodiversity, and involvement of people (JFM) were touched upon, but unfortunately the condition of the crop on the ground is discouraging. An effort was made to initiate holistic forest management incorporating forest-based industries, commercial plantations, watershed management principles, joint forest management etc. but the observation on the ground is that these concepts were not implemented in the Division.

7.4.3 The Broadleaf forest areas and Scrub forests had been brought under the Biodiversity Working Circle but the condition of these compartments is in a degraded state now.

7.4.4 The volume estimation of the crop was not done for the broadleaved species. Hence, there is no hard data to fall back on for comparison of the status of forest crop over the years.

7.5 Execution of the Plan

7.5.1 The plan was prepared for the period 2002-2003 to 2012-13 AD. Resin tapping had already been abandoned in the division by 1993. The Bamboo areas have not

been worked resulting in increased fire hazard besides deterioration of the condition of the crop. The repeated fires have occurred not only in Bamboo compartments but also all over the Division. The only developmental work carried out in the division is establishment of plantations/closures. Some soil conservation work was also carried out in some pockets, but works like identifying and cutting major fire lines, constructing inspection paths and bridle paths and building inspection huts within forests have not been carried out.

7.5.2 Resin Extraction and Management

Prior to 1987 the Cup and Lip method of resin extraction was adopted. One Channel was prescribed for trees with girth between 100 cm and 180 cm and two channels were recommended for trees above 180 cm girth. This method *per se* may not have resulted in weakening of the trees to expose them to serious wind and fire damage. However, the fixing of exploitable diameter at 101 cm level and poor supervision lead to over exploitation of these trees and may have been the contributing factor in damaging the forests to such an extent that they have still not been able to rehabilitate themselves even after so many years of rest from resin tapping and commercial exploitation.

7.5.3 Management of Khair

7.5.3.1 To fulfill the contractual obligations with private contractors, the Khair trees above 20 cm diameter were removed and supplied at nominal prices to M/s B.K. Katha Industries, Jammu. This felling was of course in accordance with the recommendations of the Working Plan but the operations for proper care after felling were not implemented resulting in poor regeneration. No efforts were made to create assets of Khair plantations in the division nor were any special silvicultural practices tried to improve the natural regeneration and aid the establishment of Khair trees in the division. Similarly there is no evidence of any efforts to increase the growing stock of Khair in private forests.

7.5.3.2 After 1990-91 Khair extraction had to be abandoned due to dwindling growing stock and guidelines from the Hon'ble Supreme Court of India.

7.5.4 Bamboo Management

7.5.4.1 In earlier plans Bamboo was not considered an important crop and it was always included under Unregulated Working Circle. No specific prescriptions were made to attain sustainable yield of Bamboo. The Plans of AK Gupta and Dr TS Ashok Kumar have prescribed a separate Working Circle for Bamboo and the latter suggested working of Bamboo by Selection System, but there are no indications that these prescriptions were implemented. As a result the Bamboo forests are in highly degraded condition, completely over-run at several places by invasive weeds like *Lantana* and replaced with other broadleaved species and shrubs.

7.5.5 Plantation Activities

7.5.5.1 Many agencies have carried out plantations in the Division. However, the records do not show that there has been any concerted effort to identify the areas requiring plantations nor does there seem to be a planned scheme for afforestation of the area taking into consideration its soil, climate and forest conditions. The quantum of plantations is fluctuating widely from year to year. Most of these plantations are widely scattered all over the division.

7.5.5.2 Also, the plantations/closures do not have a management system whereby these plantations and their associated attributes could be recorded and maintained for monitoring in the future. Further, there is no management plan for these closures.

7.5.6 Forest Protection

7.5.6.1 Since the division has the last check post of the state on NH 44, forest protection acquires a special significance here. The Division is also a very good habitat for Khair which is in high demand in the market and frequent smuggling of this species has been observed. Frequent fires are also common in the division due to the type of vegetation and climate prevailing here.

7.5.6.2 Table 7.1 shows the number of forest offences recorded and disposed in the Division from 2000-01 to 2012-13. Forest damage cases are a basic indicator of the biotic pressure on forests as also of the efficiency of forest administration. The disposal of cases, either departmental, police cases or court cases has been observed to be intermittent in pace in this Division. Regular disposal of cases is necessary for good administration of forest divisions.

Table 7.1.

Details of forest damage cases in Kathua FD

S.No.	Year	Type	OB	Current	Total	Disposed	Balance
1	2001-02	Dept	223	28	251	138	113
		Police	133	0	133	133	0
		Court	39	0	39	39	0
		Total	395	28	423	310	113
2	2002-03	Dept	113	251	364	25	339
		Police	0	133	133	0	133
		Court	0	42	42	0	42
		Total	113	426	539	25	514
3	2003-04	Dept	339	64	403	29	374
		Police	133	0	133	0	133
		Court	42	1	43	0	43
		Total	514	65	579	29	550
4	2004-05	Dept	374	50	424	84	340
		Police	133	0	133	0	133

S.No.	Year	Type	OB	Current	Total	Disposed	Balance
		Court	43	0	43	0	43
		Total	550	50	600	84	516
5	2005-06	Dept	340	22	362	8	354
		Police	133	0	133	0	133
		Court	43	2	45	0	45
		Total	516	24	540	8	532
6	2006-07	Dept	354	15	369	5	364
		Police	133	0	133	0	133
		Court	45	0	45	0	45
		Total	532	15	547	5	542
7	2007-08	Dept	362	26	388	10	378
		Police	133	1	134	0	134
		Court	46	0	46	0	46
		Total	541	27	568	10	558
8	2008-09	Dept	378	36	414	6	408
		Police	134	0	134	0	134
		Court	46	0	46	0	46
		Total	558	36	594	6	588
9	2009-10	Dept	408	12	420	21	399
		Police	134	0	134	0	134
		Court	46	0	46	0	46
		Total	588	12	600	21	579
10	2010-11	Dept	399	7	406	19	387
		Police	134	1	135	0	135
		Court	46	1	47	2	45
		Total	579	9	588	0	567
11	2011-12	Dept	387	4	391	61	330
		Police	135	0	135	0	135
		Court	45	0	45	0	45
		Total	567	4	571	61	510
12	2012-13	Dept	200	25	225	3	222
		Police	135	0	135	0	135
		Court	45	0	45	0	45
		Total	**380**	**25**	**405**	**3**	**402**

7.5.6.3 Fire incidents have occurred frequently in the division (Table 7.2) but the measures taken to control it have been negligible mainly due to shortage of funds and lack of a comprehensive fire protection plan. It must be noted here that there are always conventional procedures that have been traditionally followed in the management of forests in the country. Fire protection work can be assisted by the adoption of technology whereby forest fire alerts are generated through satellite observation and relayed through mobile and internet communication technology. But the idea that these measures can improve the actual work of protection are misconceived to the extent that these can replace or somehow work better than

regular patrolling in the beat by forest officers and having a good intelligence system in the forests and villages.

7.5.6.4 In all instances where forest protection work is involved, it is the sincerity and the efficiency of the human resources that provide the best results. In this regard, it is imperative that the general inertia that is observed among field staff is removed and a positive attitude towards work is inculcated through regular trainings and orientation. Inculcation of discipline by means of administrative actions of Middle-management officers are an effective measure for imbibing a professional attitude in the field staff. For such an approach to succeed, there should be accountability and transparency in the working of the Forest Department at all levels.

Table 7.2

Range-wise Forest area burnt (in hectares) due to fire in Kathua Forest Division from 2004-05 to 2014-15

S. No.	Year	Kathua Range	Jasrota Range	Samba Range	Total
1	2004-05	10.12	10.46	3.84	24.42
2	2005-06	0	2.12	8.3	10.42
3	2006-07	15.4	4.35	4.8	24.55
4	2007-08	0	7.4	0	7.4
5	2008-09	1.9	1.1	1.8	4.8
6	2009-10	5.15	180.41	13.4	198.96
7	2010-11	7.5	5.4	0	12.9
8	2011-12	0	0.1	0	0.1
9	2012-13	5.8	0.79	10	16.59
10	2013-14	1.1	4.42	0.55	6.07
11	2014-15	30	2.45	0.5	32.95
	Total	**76.97**	**219**	**43.19**	**339.16**

CHAPTER-VIII
Statistics Of Growth And Yield

8.1 Methodology Adopted for Assessment of Growing Stock

8.1.1 For the assessment of growing stock, the plot sampling technique was adopted. The sampling unit was a random sample plot. To determine the number of plots to be taken up for each stratum of desired accuracy, a pilot survey was conducted. This gave the number of sample plots required in each stratum after analyzing the field data and coefficient of variation. To determine the variance of growing stock in each stratum, 10 sample plots of 0.1 ha were laid down randomly and species-wise total enumeration was carried out. The variance of the parameters was calculated and the number of samples to be drawn in each stratum was determined by the following formula:

$$N = t^2 CV^2 / (AE\%)^2$$

Where

N = No of Sample plots in a canopy spectrum

t = Constant available in t^2 table

CV = Coefficient of Variation of sample plot volumes.

AE = Allowable error percentage (20% in the present design for 80 % accuracy)

8.1.2 The sample plots were laid in the study area by using GIS software. The center of the plot is marked by the software in the strata and the geo coordinates (which serve as the center of the 0.1 ha plot) are communicated to the field team for collection of data. Further calculations were done by using the standard principles and formulae.

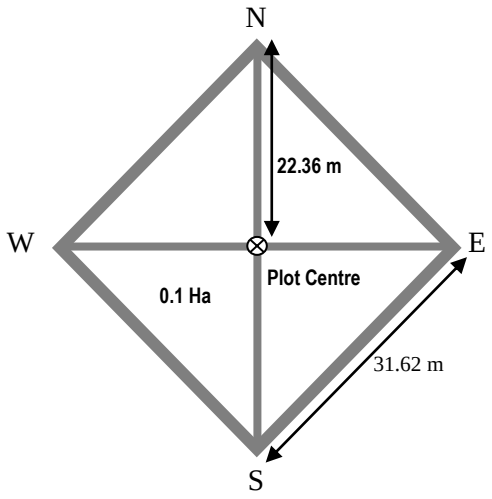

Fig 8.1 Details of Sample Plot used for data collection in field exercise

8.2 Volume Table

8.2.1 For Chir, the Kullu Volume table was used for estimation of volume. For broadleaved species, the volume equations derived by Forest Survey of India and published in "Volume Equations for India, Nepal and Bhutan" were used for estimation of volume of the species.

Table 8.1
Kullu Volume table used for Chir growing in the Division

Species-wise volume (m^3) for each diameter-class								
Dia-class (cm)	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**	**70-80**	**80-90**
Chir Volume (m^3)	0.13	0.13	0.48	1.13	2.21	3.54	4.87	6.2

Table 8.2

Diameter-class-wise volume derived using volume equations for broadleaf species growing in the Division

Diameter class (cm)	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**	**70-80**
Khair (m^3)	0.19	0.4	0.69	1.06	1.5	2.02	2.62
L. coromandelica (m^3)	0.26	0.59	1.05	1.65	2.38	3.24	4.23
A. modesta (m^3)	0.28	0.64	1.19	1.94	2.89	4.04	5.38
Other (m^3)	0.28	0.64	1.19	1.94	2.89	4.04	5.38

8.3 Quality Class

8.3.1 The quality class of Chir found in this area is generally III to III/IV.