CHAPTER 2

FLORA AND FAUNA IN JAMMU REGION

Wildlife is an important component of natural ecosystem and its role in the maintenance of ecological balance can never be undermined. Proper recording and documenting the richness of biodiversity is necessary, so an effort has been made to record the historical flora and fauna of Jammu region in this chapter.

Surrounded by the state of Punjab in the South and a high mountain range formation known as Pir Panjal towards North and East, the geographic and geomorphological characteristics made the Jammu region distinct from Kashmir region. Mountainous districts of Poonch, Rajouri, Doda, Ramban and Kishtwar though falling in Himalayan range represented different landscape and characteristics.¹

A great physiographic and climatic variation was observed in the Jammu region during the period under study. Sloppy mountains, vast plains and big rivers and lakes supported variety in the life forms in Jammu region. As a result of all these factors, the region of Jammu was rich in respect of its invaluable floral and faunal treasure which was comprised of wild and cultivated plants, vast lush green and beautiful forests with trees, herbs, shrubs, fruits, young shoots and different species of wild and domestic animals and birds. All these plants and animals of the region were utilized economically. Besides, this floral and faunal diversity attracted visitors and tourists, especially the sportsmen who loved hunting. The Jammu region, thus, served as natural home of magnificent floral wealth and a number of rare and loaded wildlife.
FLORA OF JAMMU REGION

The bio-diversity of Jammu region included types of vegetation like subtropical pine forests, lower Shivalik Chir (Pinus roxburghii), Pine forests, Sub-tropical dry evergreen forests, Himalayan moist temperature forests, Himalayan dry temperature forests, sub-alpine and moist-alpine forests. However, the vegetation of Jammu plains was of dry mixed deciduous type, which was a continuation of the vegetation of Punjab plains. The scrub-forest dominated the Sub-Mountain and Semi-Mountainous zones. Trees like Shisham (Dalbergia Sissoo) and Mango (Mangifera indica) were found commonly in these areas. In the Outer Hill, the flora was totally different from the Middle Mountains, Sub-Mountainous and Semi-Mountainous zones. Here the dominant tree species was Deodar (Cedrus Libani). The alpine meadows of these zones gave grass to the livestock of Gujjars and Bakarwals tribes and other inhibiting population. However, middle mountain zone was rich in vegetation with Chir and Deodar being important tree species.

Jammu region highlighted the vast agricultural potential with large diversity in physiographic features, cultural richness, agro-climatic variations, etc. According to the nature of cultivation, the Jammu region was divided into three divisions. The first division was the plains and Kandi hills including Kathua, Samba, Jammu proper, Akhnoor and Mirpur (Kotli). In most of these areas, the crops entirely depended upon rain because these areas were dry. But these areas were most cultivated areas if properly irrigated. River Chenab fertilized a tract called Bijwat, below Akhnur, where irrigation gave exceptional fertility.

At the end of kandi hills, there was a narrow belt of cool land lying in the valleys crossed by clear streams which carried the drainage of the middle hills on
the lower side. This tract forms the second division and consisted of Basohli, Ramnagar, Riasi, Naoshera, etc.

Places, where the depth of the soil was sufficient, produced excellent crop but on the slopes, cultivation was unstable because in these areas, the depth of the earth was small and limestone cropped upon the surface making the cultivation uncertain. However, because of the propinquity to the Himalayas, the rainfall in these areas was heavy and to some extent regular which minimizes the dependence on artificial irrigation for cultivation in this division. All the crops found in plains were also found in this division except bajra (Pennisetum glaucum), sugarcane (Saccharum officinarum) and turmeric (Curcuma Longa).

The third division of the Jammu region consisted of Bhadarwah, Kishtwar, Ramban, Rajouri, etc. These areas had cold climate and received snowfall in winter. The cultivators of these areas dealt in saffron (Crocus Sativus) and poppy (Papaver Somniferum). Saffron was cultivated in Kishtwar area whereas poppy was cultivated in Doda, Kishtwar and Bhadarwah.

In the Jammu region, there are usually two crops in a year, namely, the winter or rabi crop and the summer or the kharif crop. The winter crops consisting chiefly of wheat and barley which were sown from mid-September to mid-January depending upon the moisture in the fields. These were harvested in May and June in the low lying areas and in July and August at higher places. The summer crops rice, maize and millet were sown from mid-March to mid-July, according to the situation and character of the soil and harvested from mid-August to mid-November.

The flora of the Jammu region has been classified under following heads:

I] Agricultural Products

II] Horticulture
III] Forest Product

I] AGRICULTURAL PRODUCTS

Food crops

Rice (Oryza Sativa) also known as dhan in dogri and dhanya in other pahari dialects\(^8\) was grown in the alluvial soil where adequate water for irrigation was available. It’s a kharif crop. Hot and moist climate was required for the cultivation of rice; therefore it was sown in March-April and harvested in autumn. Sufficient water was required to cover the rice fields in order to prevent the growth of weeds in rice fields. Moreover, sufficient water helped to grow good quality of rice.

The land for the cultivation of rice crop was given two ploughing in the beginning of the spring. The field was leveled with a log of wood after it was given water. The rice field was then filled with water and the field was left for some times. Another ploughing was done before the seeds were sown. When the seeds germinated, these were broad cast in the fields.\(^9\)

The important rice growing areas were Kathua and lower slopes of Chenab at Udhampur, Kishtwar, Reasi, Bhadwarh and Akhnoor. But the rice produced by all these areas was of coarser varieties. The finest type of rice not only in the Jammu region, was produced in Ranbir Singh Pura. Rice was also grown in the Rajouri and Poonch but in small quantity.

Two main varieties of rice grown in Jammu region were red rice and white rice. The red rice was popular among the cultivators than white rice because the white rice plants were more delicate than the red rice plants and suffered more from changes in temperature. However, the white rice gave more produce than the red rice.\(^10\) Rice straw was used for feeding cattle and thatching the huts.
The total area under production of rice crop in Sub-montane and Semi-mountainous tract was 6.86 percent in 1911. However, the figure was raised to 10 percent in the year 1921. The annual yield of rice in the outer hills was 9.9 percent which increased to 17.4 percent in 1921. The rise in the production of rice was mainly due to good monsoons and irrigation facilities in form of canals, provided by the State to the peasants.

The State Government took initiatives to change the pattern of single crop cultivation by the introduction of quick maturing varieties of paddy. To achieve this objective, the State Department of Agriculture established Rice Research Scheme in 1941. This scheme proved successful as there had been considerable increase in the production of rice in the state.

Wheat (Triticum Aestivum) was another important crop which was grown in almost every part of Jammu region. It was rabi crop. In the beginning, its plant needed cool and to some extend moist climate. At the time of harvesting, it required warm and dry weather. The average rainfall required for the crop was from 50 to 70 cms at regular intervals.

The wheat crop was cultivated throughout the Jammu region in many patches of the alluvial lands and its straws were used as fodder for the animals.

The land meant for the cultivation of wheat was ploughed for eight to ten times before the seeds were sown but if there was moisture in the land after harvesting of kharif crop, the land was ploughed for four or five times only. In some parts of the Jammu Region, the land meant for wheat was neither weeded nor manure for the reason that the power of the kharif manure was considered sufficient for the wheat crop also.
The areas where wheat was cultivated in large volume were Ranbir Singh Pura, Akhnoor tehsil, and some parts of Kathua and Jammu tehsils. In Akhnoor tehsil, two types of wheat namely mond and sangari were grown.

The total area under wheat cultivation in Jammu region in the year 1935-36 was 4,15,766 acres which rose to 4,27,272 acres in 1936-37 and in 1937-38 it was 4,29,027 acres. The annual produce per acre of the crop was between six to seven maunds.

The annual production of wheat in the year 1911 in Sub-montane and Semi- mountainous Tract was 33.08 percent which rose to 44.2 percent in the year 1921. However, the annual production of wheat in the outer hills was 16.8 percent in 1911 and it rises to 20.6 percent in the year 1921. The production of wheat rose because of the irrigation provided by different canals.

Maize (Zea Mays) was the crop next in importance to rice. It constituted the staple food of the cultivators in some parts of Jammu region and especially of Gujjars and Bakarwals who inhabited in the higher valleys with their flocks and herbs. These roaming graziers take maize flour bread called todha instead of wheat flour or rice. It was grown almost in the whole region.

Hot and dry climate was required for the cultivation of maize crop. Rainfall required for maize varied from 75 cms to 125 cms. The field required for the cultivation of maize was given three ploughing and then leveled with a wooden harrow. After the last weeding was done, some earth was placed around at the roots of the plants in order to protect the plant from high winds. After harvesting, the stalks were kept in the fields for about a week so that they got dried. Once the stalks were dried, the crops were broken off from them and dried up for another fortnight. After the crops became dry, the grain was thrashed.
The total annual production of maize in the whole State was 27.2 percent in the year 1911 which falls down to 22.2 percent in the year 1921. Out of these figures, 10.3 percent was produced by the Sub-Montane and Semi- Mountainous tract in the year 1911 and 12.7 percent in 1921. The contribution of the Outer Hills in the production of maize crop in the State was the highest with 43.2 percent in 1911 which decreases to 33.3 percent in 1921. Every year this crop became victim of wild animals like pigs, monkey, nilgai, squirrel etc. As a result of developmental projects the forests were denuded, so these wild animals started visiting frequently to the villages and destroying crops of the peasants. This might be one of the reason for low production of Maize crop in the region.

There were three varieties of maize grown in Jammu region namely white, yellow and red. The people of plains liked the yellow variety of maize while people living in the higher areas liked white variety of maize. The yearly produce per acre of crop was between 7 and 9.5 maunds.

Barley (Hordeum Vulgare) was the principal crop in the Kandi belt where the soil was peculiarly suited for it. It was main stray of the agrarian population. It was mainly grown in Udhampur, Kathua and Jammu districts. The residents of these areas mixed the barley flour with wheat flour while cooking.

The production of barley in the Sub-montane and Semi- mountainous tract was 4.88 percent of the total production of barley in the whole State during 1911 which rose to 7.1 percent in the year 1921. On the other hand, the production of the crop in the Outer hills was 3.6 percent in the year 1911 and 4.2 percent in 1921.

The inhabitants of dry hilly tracts of the region cultivated Bajra crop. It was the chief kharif crop of the kandi area. The quantity of yearly produce per acre of the crop of millet was between 6 and 6.5 maunds. The land meant for
Bajra crop was ploughed twice when wheat was cut. Weeding in the fields of Bajra was done when the plants were about six inches high. The fields were given another ploughing before the crop was harvested.²⁷

Amarnath (Ganhar) was multicolored stalks and flowers. It was grown along cotton fields or on the borders of maize plots. Three or four ploughing was done before the sowing of Amarnath. The grain was first dried up, grounded and then consumed with milk or water. An alkaline substance was extracted from the burnt ashes of the stalks by the washer men.²⁸ It provided heat to the body and was used by the hindus during fasts.²⁹

Buck wheat (Fagopyrum Escentum) also known as trumba, was grown in the higher tract due to climatic suitability. This crop could be grown even late because it grew in any season and in every type of soil. Two varieties of this crop were found, one with white pinkish flowers and the other with yellow flowers. Wherever there was shortage of water for rice fields, the farmers sowed this crop.³⁰

Out of the total production of the crop in the entire State, the Outer Hills contributed 0.7 percent of the crop in 1911 which was reduced to 0.1 percent in the year 1921.³¹

Til (Sesamum Indicum) was cultivated throughout the Jammu region. It was a very common crop of this area.³² When it got ripened, blankets were spread under the plants at the harvest time to catch the seeds, when fall out of the pods with slightest movement. During the period of study, few people used to burn til oil to earthen lamps to light their dwellings.

Wild Bhang (Cannabis Sativa) was found throughout the State in abundance and as such was not cultivated by the people of the State. The people
used its fiber for manufacturing of rope and paper. Its leaves and flowering tops were used in the manufacture of some drugs.\textsuperscript{33}

*Kangni* (Celastrus Paniculatus) or *Shol* was considered as an extremely useful plant which was grown where there was scarcity of water. It served as cheap food stuff for the people living in *Kandi* areas.\textsuperscript{34}

Sugarcane (*Saccharum Officinarum*) was grown in plains of Jammu region. This crop required good irrigational facilities and very fertile land. The land for the cultivation of sugarcane was ploughed for seven to ten times and after each ploughing, the land was leveled with a log of wood. After this process, the seeds were sown. The weeding was done for four or five times. \textsuperscript{35} Once grown, it gave 3 to 4 annual harvests. Ranbir Singh Pura *tehsil* was the best grower of this crop.\textsuperscript{36}

There were three varieties of sugarcane grown in Jammu region namely *Katha, Dhalus* and *Ponda*. *Katha* and *Dhalus* were mainly grown in Ranbir Singh Pura and *Ponda* was grown in Nawabad and Kanachak.\textsuperscript{37} It was also grown in Jasmergarh and Kathua but the produce was of poor quality.\textsuperscript{38}

Oilseeds of rape (*Brassica Napus*), mustard (*Brassica Nigrakoch*) and linseed (*Linum Usitatissimum*) were generally cultivated all over the Jammu region with certain alluvial tracts in the higher altitudes of the Outer Plain.\textsuperscript{39} Oil obtained from rape seed was good for lighting and linseed for eating purposes. Mustard was also cultivated for obtaining oil.\textsuperscript{40}

Among pulses and grams, green grams [*mung*], black grams [*urad* (*Vigna Mungo*)] and brown grams [*moth*] were grown in Jammu region. *Moth* (*Lepidoptera*) was grown in the fields, consumed as pulses by poor and as fodder by rich for their livestocks. The land used for the cultivation of pulses were neither irrigated nor manured. Chillies (*Capsicum Annuam*) were also grown in
some parts of Jammu region. *Rajmah* (Phaseolus Vulgaris) were also cultivated in mountainous region of Jammu, but the best quality of *Rajmah* was cultivated in Badharwah.\(^{41}\)

The production of pulses in the entire State declined from 5.9 percent to 4.7 percent during the period from 1911 to 1921. The contribution of the Sub-montane and Semi-mountainous tract in the production of pulses was 10.8 percent in 1911 which was declined to 6.9 percent in 1921. The share of the Outer Hills in the production of pulses was 4.3 percent in 1911 which further rose to 4.9 percent in the year 1921.\(^{42}\)

It might be possible that decline in the production of pulses was because of the irrigation facilities provided by the State which led the people to take cultivation of main food crops like Wheat, Rice and Maize.

**Cash Crops**

Cotton (Gossypium Hirsutum) was considered as a minor crop, so it was grown in some parts of the Jammu Region as the people preferred to grow the grain staples.\(^{43}\) The land required for cultivation of cotton was ploughed thrice and leveled with a log of wood. The seeds of cotton were first magnate into cow dung for about two weeks so that they can be protected from dust. The three weedings were given.\(^{44}\)

In winter when the plants stops producing cotton, they were cut and used as fuel by the people. The roots of the plants again sprang up in summer, grew up and start producing cotton again but this time in a lesser quantity.\(^{45}\)

Saffron (Crocus Sativus) was cultivated only in Kishtwar area of the Jammu region. In Kishtwar tehsil, it was grown in Ponchhal, Malta and Hariyal areas. Because of its good fragrance and quality, Saffron produced in the
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Kishtwar area was considered superior to the saffron produced in Pampore area of Kashmir region.46

The method of cultivation of Saffron in Kishtwar area was different from that of Kashmir. In Kishtwar, the saffron was grown in flat fields and planted in rows. The saffron was cultivated in red loam soil which was lighter in texture having semi-pervious hard pan underneath.47

Saffron was used in the religious ceremonies connected with birth, marriage and death. It was often used as the traditional Tilak by the Hindu community48 especially the rajputs who considered saffron as symbol of valour and chivalry. Saffron had high medicinal value. It was used to give flavor and colour to food. During harvesting or plucking of flowers, the atmosphere must not be hot and this process was completed early in the morning.

Tobacco (Nicotiana Rustica) was grown in the outer hills of Jammu region on a very small scale. It was a source of revenue for the state but later it was exempted from revenue payment.49

Indigo (Indigofera Tinctoria) was cultivated in the areas of Jasrota and Manawar.

Tea was introduced by Dogra rulers in the State. Tea gardens were first raised in the Jammu region under Dogra rulers. It was raised in three wazarats of Jammu regions i.e. 80 ghumaon in Reasi wazarat, 10 ghumaon in Bhadu wazarat and 12 ghumaon in Udhampur wazarat. These 102 ghumaon tea gardens were spread over 13 places in the three districts. There were 18, 38,305 tea shrubs which produce 208 maunds of tea leaves during the year 1882-83. The State earned a revenue of rupees four thousand one hundred fifty four by selling tea leaf.50
Potatoes (Solanum Tuberosum) were produced in the hilly areas. At the time of sowing, one man guided the plough while the other scattered the seed by hands. When the plants grew about a foot, manure was heaped around the root of each plant. If the cultivator failed to do it because of the lack of man power, the manure was collected at a suitable place from where it was swept down into the fields by rain. At least two weedings were done and after the first weeding, rain for four or five days were required to save the plants from withering.

Vegetables

Opening of Ranbir canal, Basantar canal, Ujh canal helped in irrigating the arid land of Jammu which resulted in increasing the cultivation. Vegetables like cabbage (Brassica Oleracea Capitata), cauliflower (Brassica Oleracea Botrytis), pumpkin (Curcuma Longa), bringals (Solanum Melongena), ladyfingers (Abelmoschus Esculentus), spinach (Spinacia Oleracea), onion (Allium Cepa), tomato (Solanum Lycopersicum), carrot (Daucus Carota), radish (Raphanussativus), cucumber (Cucumis Sativus), were common vegetables found throughout Jammu region. Seed multiplication form was set up in Ranbir Singh Pura to help the farmers to increase the growth of vegetables. Each and every piece of land vacant within the periphery of house was utilized by the people of Jammu region for growing vegetables.

II] HORTICULTURE

The state was known for its juicy and savory fruits from early times. The natural environment, ecological and agro-climatic conditions contribute to the growth of fruit crops. Fruits differ from tract to tract because of the different natural environment. The development of roads facilitated the export of fruits outside the state which helped the state to earned handsome returns.
Fruits like sour pomegranate (Punica Granatum), peaches (Prunus Persica), apricots (Prunus Armeniaca), walnuts (Juglans Regia), pears (Pyrus), almonds (Prunus Dulcis), apples (Pyrus Malus) were grown in higher elevation of Doda and Poonch and also in some parts of Kathua, Udhampur and Rajouri districts.\(^{53}\) Walnut (Juglans Regia) was grown for exporting its oil.\(^{54}\)

Almost all important fruits grown in Kashmir valley were produced in the Bhadarwah area of Jammu region. Various varieties of fruits were grown in Jammu Region like Mango, Mulberry, Banana (Musa Acuminata), Dates (Phoenix Dactylifera L), Jamun (Syzgium Cumini), Ber (Ziziyphus jujube) etc. The Bananas and Dates, produced in this area were of inferior quality.\(^{55}\)

Plains of Jammu region were suitable for the cultivation of Ber (Ziziyphus jujuba), Jamuns (Syzgium Cumini), Lemons (Citrus Limonum), Mangoes (Mangifera Indica), Oranges (Artocarpus Altilis), Guavas (Psidium guajava), Grapes (Namily Vitaceae) etc. The Ber (Ziziyphus jujuba), were numerous in kandi area of Jammu region and were exported to the British territories. The poor people of some areas of the Kathua Tehsil take mangoes (Mangifera Indica) as food for almost two months in a year.\(^{56}\)

Temperate fruits like oranges (Artocarpus Altilis), apples (Pyrus Malus), peaches (Prunus Persica) plums, were grown in the middle mountainous zone.

The most significant development in relation to fruits growth was the setting up of the Horticulture Department in 1902. In Jammu region, the Government made several efforts to popularized horticulture among masses by opening of several nurseries in the State. Two nurseries were established in the state by the Royal Government in the Jammu region during 1935-36, one at Udheywala and other at Batote. Similarly in 1936-37, two more nurseries were started in Pauni and Reasi. In 1940, small nurseries were also started in Ramnagar and Kawa in Udhampur. By the year 1945, another nursery in the
tehsil of Mendhar had been established with 5000 trees of Apples (Pyrus Malus), Apricots (Prunus Armeniaca), Guava (Psidium guajava) and Limes (Citrus Aurantifolia).  

In 1941-42, fruit shows were organized in Ramnagar and Badarwah in which successful exhibitor was awarded cash prizes by the Government of the State. This was done to encourage the cultivators to grow more fruits trees.

III] FOREST PRODUCTS

Forests have a great significance for this State. Besides adding to charms and aesthetic beauty the trees extend many benefits to the populace. Jammu division had a good forest endowment. The forest played an important role in day to day life of the people. It was a source of timber for construction of houses, manufacturing of furniture and firewood. Besides, it provided medicinal herbs and torchwood for tanning. It fetched great income to the State. But this commercialization of forests of Jammu region had contributed significantly to the loss of biodiversity. Deforestation had threatened the ecological security and created situation of soil erosion due to flood.

Trees

The forests of the State were extensive and valuable. The Bhadarwah area, covering the area of about 2637 square miles, contained the finest quality of timber including Deodar, firs, pines and broad-leaved species.

Udhampur District, which was consisted of Kishtwar and Padar tehsils, covered a total of 198 square miles of Deodar, bearing tracts situated on the Chenab and its affluents. These forests were of very good class as it contained many fine trees some of which were 12 to 18 feet girth and the reproduction was also very good. The chir, forests were situated in Udhampur district were too far from the market that it was unprofitable to sell them in the market.
The Ramnagar tehsil consisted of a very small share of Deodar forest which was generally over worked. The Chir forest situated in the Ramnagar tehsil was rich in Chir trees but had been over felled.62

In Jasrota district, a small area situated on the right bank of the river Ravi in Basohli tehsil was covered with Deodar forest.63 On the river Ravi in Jasrota district, there was about 3200 acres of mixed forest which contained the so called male kind of Bamboos. This product was sold at a good price in the market. These forests were caused much harm by the Gujjar and Bakerwal tribes who scythe them for fodder for their cattles. The grass areas were mostly void inside the Deodar and other forests which were usually used as grazing grounds by the villagers.64

The largest area of about 220 square miles covered by the Chir forest was situated in the Kotli and Naoshera tehsils of Bhimber district. Some of the areas of these forests of very fine quality but they were not being worked.65

The important forest products of the forests of the State during the period under study were Deodar, Firs (Abies Pindrow), Pines (Vinus Sylvestris), Chir, etc.

Jammu division predominated in Deodar which is also called ‘tree of the Gods’.66 Deodar was the most valuable species among other tree of Jammu region. Deodar grown in the forests of Jammu division was of such a superior quality that it was generally known as the ‘teak of the north’.67 The best of all timbers produced in the State was supplied by Deodar. It was in great demand because of its strength, durability and resistance to the pests68 especially to the white ant.69 It was in much demand for the construction of houses, boats and bridges.70 The Deodar was used to make railway sleepers in North West India. From the Deodar roots, a resin was extracted which was used by the people as an ointment for buffaloes.71
Kail (Pinus Wallichian) occurred in pine forests and its wood was considered durable. The timber of kail is red in colour and light. The wood of Kail was used for construction purpose and making of railway sleepers.\textsuperscript{72}

Birch Bark (Betula Alleghaniensis) was found in Kishtwar Division. Fir grew in Doda, Kishtwar, Bhadarwah, Ramban, Reasi, Udhampur, Billawar and Rajouri and some parts of Jasrota. Its wood was susceptible to rot unless treated with preservatives.\textsuperscript{73} It was used for joists (supporting) as the wood is free from knots.\textsuperscript{74} Its wood was used to make bokes, door and window frames and for roof shingles.\textsuperscript{75} There was great demand of fir timber in India, so the State Government exported large number of fir timber to British India.\textsuperscript{76}

Chir was grown in Bhimber, Ramnagar, Ramban, Udhampur, Billawar of the Jammu division. Bhimber district of the Jammu region was rich in its growth.\textsuperscript{77} Its timber was not of superior quality but yet it fetched revenue to the State in form of resin. Chir bark also fetched small amounts to the State exchequer.\textsuperscript{78} The railway and cart roads made it possible to utilize the chir forests of Bhimber and Jammu region for the distillation of turpentine.\textsuperscript{79}

Chir trees was known in the State as ‘Blood Doner’ for the reason that it was believed that it donates blood to the man’s prosperity in the form of resin. Resin is also extracted from Chir trees\textsuperscript{80} and exported to Punjab resin factory at Jallu (near lahore).\textsuperscript{81} The collection of crude resin by tapping of Chir Pine trees was usually carried in the Reasi, Billawar and Mirpur.\textsuperscript{82} It was first started in the year 1938.\textsuperscript{83} However, great damage was done to this tree by red Monkey (Innuus Rhesus) in Chenab division.\textsuperscript{84}

Resin was also used as medicine to protect against the attack of water insects the black pitch got from Pine roots. It was applied on arms and legs by the paddy field workers while working in knee deep water.
**Kairu** (Pinus Excelsa) found extensively in the Jammu region and because of its durability, it was primarily used in house building. In spite of its durability, blue pine was placed next to *Deodar* in importance for the reason that it is not as long-lived as that of *Deodar*. This tree distilled white resin which was used by the people in applying on wounds. From the roots of blue pine, black pinch was extracted which was called *kilam* after distillation. This *kilam* was used by the people while working in paddy fields in order to protect themselves from water diseases.

*Kairu* forests were open forests. Being a high altitudinal forests, very few shrubs grew as undergrowth and only in rainy season the grasses appeared. The forest fires were common in pine forests because of the inflammable resin in these trees.

*Khair* (Acacia Catechu) was found in almost whole of Shivalik region beginning from Ravi to Rajouri and beyond. *Khair* grown in the bed of Ujh river was in State of deplorable owing to continuous lopping by camel men for fodder and villagers for hedges. It was also grown in Bhini *Nallas*. Its bark was used for tanning and gave red colour to the leather. This tree yielded gum. Its leaves were favourite food for sheep and goats.

Bamboos (*Dendrocalamus Strictus*) were extensively found in Jasrota forests, Dagar forests in Mirpur and on the banks of river Chenab. Its wood was used to make baskets, furniture, flute, hand fan and also to make big drums to store the grains, preparing stakes for nets in rivers, fences. Its fiber was used for making ropes and for paper making. Bamboos were subjected to injury from Gujjar tribe who hacked and lopped the bamboo tree for fodder for their cattle.

Besides these trees *Shisham, Neem* (Azadirachtaindica), *Babul* (Aacia Arabica), *Bohar* (Ficus Bengalensis) and *Peepal* (Ficus Religiosa) were other important trees which were commonly found throughout the Jammu region.
furniture of *Shisham* wood was in great demand in Jammu region. It was used for many other purposes like for the making of agricultural implements; tool handles, coach work, etc because of its ability of accepting any shape and bending after streaming suits. Kikar (*Acacia nilotica*) was common tree in Ranbir. Singh Pura. The farsighted zamindars took advantage of natural growth of this tree which grew mostly in low classes of soil. The land owners were much benefitted by its preservation, as it grew freely, and added to the profits of the lands reserved for grass.

*Peepal* and *Bohar* were grown in large number in *maidani* tract of Jammu tehsil. They were declared to be reserved trees under Land Revenue Regulation 1929.

Wild pomegranate (*Pinica Granatum*) commonly known as *Anardana* was found in hilly areas of Udhampur districts and in kandi belt, it was used in making dishes. *Anardana* from Udhampur district of Jammu region was also exported to the Indian territories.

*Mulberry* (*Morusalla*) tree was another important tree of the region. Besides providing fruits, it supplied wood which was used in the making of doors of shrine, ploughs and boat making. Its softness helped it in bending it and giving whatever shape necessary for furniture. Its leaves were given to used as fodder for sheeps and goats. The leaves of this tree were used for rearing silkworms.

Government took every possible means to improve the silk industry of the state which was revived by Maharaja Pratap Singh. Every year, sericulture department distributed thousands of mulberry seedlings from the government nurseries to the peasants to plant mulberry trees on their fields. Besides distributing the plants, the State Government took effective measures for the protection of the existing mulberry trees and the plantation of new ones throughout the state territory. The silk of Jammu and Kashmir was very much in
demand in Europe during second world war. The raw silk produced in the state was exported to Britain in large volume. The silk of the state was especially used in the manufacturing parachute which was in great demand during the war period.

**Wild herbs**

Opium (*Papaver Somniferum*) was cultivated only in some parts of Doda and Kishtwar *tehsils* of Jammu. During the reign of Maharaja Hari Singh, its cultivation was restricted to only Bhadarwarh and Ramban *tehsils* in order to avoid its misuse. It was an important source of income to the State and one had to obtain license for its cultivation. Dried capsules of opium or poppy were used in the manufacture of certain medicines.

The poppy seeds were sown in the month of December and its cultivation required sufficient water. If the shoots did not come out within ten to twelve days, the land was again sown and watered. Where the land dried up, it was broken manually so that it could not form a hard crust that obstructed the growth of the crop. At least three thinning were done to take out the weak and unhealthy plants. In the month of April when the plants flowered, the capsules were ready within a month.

*Kuth* (*Saussurea Lappa*) is the root of a plant which was found at an elevation from 8000 to 9000 feet. Another name by which *kuth* is also known is ‘Costus Root’. It was used to make perfumes and medicines. The consumption of *kuth* was considered useful to cure cough, asthma, fever and skin diseases. People often kept it in the wollen clothes to protect the clothes from the insects. The *kuth* root was exported to other parts of India and even China for the purpose of manufacturing of incense to be used in religious places. It was extracted from Kishtwar and Ramban *tehsils* of Udhampur district and Reasi *tehsil* of Reasi district.
Bunafsha (Viola Serpens) found in the Chenab valley and some parts of Kishtwar and Bhadarwah. It was used in old times as a local ointment. The wild form of Bunafsha was used by the people as a medicine to cure diaphoretic and coolent. Similarly, Bajar bhang (Hyoscyamus Niger) was considered to be very effective in treating various diseases. It was used as a remedy to cure cardiac and pulmonary asthma and several other afflictions. It was found in Chenab valley. Both of these medicinal plants were commonly found in forests of hilly areas.

**FAUNA OF JAMMU REGION**

Besides having rich flora, the Region of Jammu had a variety of wildlife. The dense-green forests and grass-carpeted mountain spurs and slopes, natural streams, lakes and rivers possessed plenty of mammals, birds, fishes and insects. The fauna has been discussed under following heading:

I]**Wild Animals**

II]**Domestic Animals**

III]**Aquatic animals**

I] **WILD ANIMALS**

**Mammals**

Mammals are the animals which have hairy coat and milk producing glands. Some of the mammals found throughout the Jammu Region were Common Leapord (Panther Pardus), Leapord Cat (Felis Bengalensis), Jungle Cat (Felis Chaus), Jackal (Canis aureus), Common Fox (Vulpes Bengalensis), Rhesus monkey (Innuus rhesus), Common Indian Hare (Lepus Nigriculis) and Mongoose (Herpestes Edwardsi).

Common Leapord (Panther Pardus) or Tendua is the most adaptable big cat found in the Indian Subcontinent. These Leapord managed to co-exist with
other carnivores by hunting small quarry and hauling the corpse up the trees. They made cattles, dogs and even children their victims.  

So far as Leapor Cat (Felis Bengalensis) commonly known as *Cheetah billi* in the area was one of the most adaptable wild cats found in the forests of Jammu region which was considered as adorable in nature and feels comfortable in water. This mammal lived with ease in variety of forests and was comfortable even when close to human habitation.  

Red fox was found throughout the plains of Jammu region in scrub and grasslands, dry boulder slopes of *kandi* areas. Mongoose was hunted by the people in forests as its hair was used for painting brushes.  

Mammals found in higher altitudes of Jammu region were Himalayan Bear, Brown as well as Black (Ursus Urctos), Wolf (Canis Lupus), Himalayan Lynx (Felis Lynx Isabellina), Ibex (Capra sibirica), Markhor (Capra falconeri), Musk deer (Moschus moschiferus)(Moschus), Snow leopard, Leopard, Serow, Common Langur, Himalayan Black Bear, Wild Dog, Marten, Himalayan Tahr (Hemitragus jemlachicus) and Red Fox (Vulpus Vulpus). Kishtwar had more Black bear (Ursus arctos) than anywhere else in the Himalayas.  

Himalayan Black Bear was heavier in shape and found in the bear open peaks high above the tree line. With the onset of winter this animal took shelter in cave. Himalayan bear was commonly found in Kishtwar. Black Bear caused much damage to crops of flocks within the village land in kishtwar. Black Bear also caused damage to *Deodar* (Cedrus Libani) forests.  

Musk deer (Moschus moschiferus) or *Kasturi mirg* is the only deer in the world which have a gall bladder, a musk gland and no facial glands. The males had long visible canines and also a gland or pod under the abdominal skin that
produces musk which was highly valued in the market for making of oriental medicines and to a limited extent, perfumes.¹⁰⁸

*Markhor* (Capra Falconeri) is the largest goat in the world. It was identified by the flowing beard and corkscrew horns. It was able to climb trees like goats.¹⁰⁹

Among the mammals found in the plains of Jammu region were Nilgai (Boselaphus Tragocamelus), Wild boar (Sus Scrofa), Fox (Vulpes Vulpes), Monkey (Innuus Rhesus), Jackal (Canis Aureus), Rhesus Monkey (Innuus rhesus) and the Barking deer (Muntiacus Muntjak) which were the animals commonly found in the Ramnagar tehsil of Jammu division.¹¹⁰ Indian Porcupine (Hystrix Indica), Samber (Cervus Unicolor), was also found in Ramnagar tehsil of Jammu region where as Barking Deer (Muntiacus Muntjak) and Spotted Deer (Axis Axis) were the animals commonly found throughout the plains of Jammu region. *Nilgai* (Boselaphus Tragocamelus) and wild cattle were considered to be very injurious to crops in plains of Jammu region.

Indian Muntjac or *Kakar* are the various names given to the Barking Deer (Muntiacus Muntjak) found in the forests of Jammu region. The animal could be identified by the V-shaped bony ridge over its forehead and short antlers. Its fore limbs were longer than the hind limbs. The animal was mostly found in the hilly and moist areas in thick deciduous and evergreen forests.¹¹¹ Animals like Leopard (Felis Bengalensis), Wild boar (Sus Scrofa), Spotted dear (Axis axis) Goral (Nemorhaedus Goral) and Grey langur were found in Jammu district.¹¹² Goral (Nemorhaedus Goral), Wild boar, Barking deer and Leopard were also found in Jammu District.¹¹³ Monkey (Innuus Rhesus) was commonly found in Jammu region. The Monkey being respected by hindus and protected by the laws, climbing over the walls and scampering across the chief open space of the Jammu town.¹¹⁴
Because of the varies reasons, common of which are, excessive shooting of big animals by the sportsmen visiting the State every year, killing of some animals by the local people for the heads and skins of the animals for sale and meat for consumption, the population of the mammals found in Jammu region started diminishing.\textsuperscript{115}

The Jammu region, during the period under study, was dotted over with game reserves which contained number of wild animals. These game reserves attracted the sportsmen who obtained the license from the State Government for shooting purposes.

**Reptiles**

Among the snakes found throughout the Jammu region, the most poisonous species were found in *kandi* belt of Jammu and Kathua namely *gunas* and *pohur* whose bite was considered fatal.\textsuperscript{116}

Apart from these reptiles mentioned above, some other species were also found in sub-tropics and plains of Jammu region were pit viper, Krait and Russel’s Viper.\textsuperscript{117}

The reptiles commonly found in the Jammu region were chameleon, cobra, monitor lizard, Garden lizard, Comman wall lizard and spiny-tailed lizard.\textsuperscript{118}

**Birds**

Birds commonly found throughout Jammu region were Sparrow Passer (Domesticus), Fowl Crow (Corvus Brachyrhynchos), Blue Heron (Ardea Cinerea) Parrot (Psittaciformes), Nightingle (Luscinia Magarhynchos), Vulture (Gypsibengalensis) and Eagle (Haliaeetus Leucocephalus).

Birds found in the plains were Pigeon (Columba Livia), Pheasant (Phasianus Colchicus), Peafowl (Pavo Cristatus), Red Jungle Fowl (Gallus
Gallus), Jungle Bush Quail (Perdicula Asiatica), Black Partridge (Francolinus Francolinus), Grey Partridge (Perdix Perdix), Green Pigeon (Treron Apicaudan), Blue Rock Pigeon (Columbalivia) and Common Myna (Acridotheres Tristis). 119

Birds of mountainous regions of Jammu were Himalayan Jungle Crow (Corvus Macrorhynchos), Griffon Vulture (Gypypfulvu), Bearded Vulture (Gypaetus Barbatus), Golden Oriole (Oriolus Oriolus Kundoo), Paradise Flycatcher (Diphyllodes Magnificus), White Cheeked Bulbul (Pycnonotus Leucogenys), Chir Pheasant (Catreus Wallichi), Chakor (Alectoris Chukar) 120, Ruby Throat (Calliope Pectoralis), Chemelari (Hirundo Rustica), Grey Tit (Parus Major), Dipper (Cinclus Cinclus), Taktola (Picus Squamatus), Tree Creeper (Certhia Himalayana), Neelkanth (Coracias Garrulous) and Neel (Lophophorus Impejanus). 121

Birds including Koklass (Pucrasia Macrolopha), Himalayan Monal (Lophophorus Impejanus) and Pheasants (Phasianus Colchicus), were found in Kishtwar Division. The Himalayan jungle crow (Corvus Macrorhynchoes), griffon vulture (Gyps Himalayensis), bearded vulture (Gypaetus Barbatus), golden oriole (Oriolus Oriolus Kundoo), paradise flycatcher (Terpsiphone Paradisi Leucogaster), white-cheeked bulbul (Pycnonotus Leucogenys Leucogenys) and Indian mynah (Acridotheres Tristis) were also found in this area. 122

The Pheasant (Phasianus colchicus), Peafowl (Pavo Cristatus), Red jungle fowl (Gallus Gallus) and Jungle bush quail (Perdicula Asiatica) resided in Jasrota Tehsil of Jammu District. Birds found less frequently in Jasrota Tehsil were Green pigeon (Treron Phoenicoptera), Blue rock pigeon (Columba Livia), Black partridge (Melanoperdix niger), Woodpecker (Melanerpes formicivorus), Waterfowl (Anatidae) and Babbler (Turdoides striata). 123

Indian mynah (Acridotheres tristis), Blue rock pigeon (Columbalivia), Peafowl (Pavo Cristatus), Red jungle fowl (Gallus Gallus), Chir pheasant (
Catreus Wallichi) and Chikor (Alectoris Chukar) were found in the forests of Jammu District. Among all these, Pheasants (Phasianus Colchicus) were the prevalent bird species found in these forests.\textsuperscript{124}

The Udhampur district was the abode of some of the species like Black partridge, Red jungle fowl, Peafowl, Grey partridge, Green pigeon, Blue rock pigeon and Rufus turtle dove (Stretopelia Orientalis Orientalis).\textsuperscript{125}

Besides these birds, butterflies and other small insects which were found throughout Jammu region were Small Copper (Lycaena Phlaeas), Pale Grass Blue (Pseudozizeeria Maha) Lemon Pansy (Junonia Lemonias), Baronet (Euthalia Nais), Tortoise Beetle (), Blister Beetle (Mylabris Sp.), Tiger Beetle (Calomera Angulata), Ladybird Beetle (Coccinella Septumpunctata), Pentatomid Bug, Grasshopper (Orthoptera Caelifera), Grasshopper (Orthoptera Caelifera), Dragon Fly (Anisoptera) etc.

Almost all the birds of Punjab were also found in Jammu region which included domestic Sparrow (Passer Domesticus), Crow, Pigeon, Parrot, Eagles, Owls (Strigiformes) and Vultures.\textsuperscript{126}

\textbf{II]  DOMESTIC ANIMALS}

\textbf{Livestock}

The livestock had been used for different agricultural proposes like ploughing the fields, lifting the water from wells and for transport purposes. Besides, proving as a useful source for agriculture purposes, it also acted as a source of income to those people who sell their milk, meat, wool, etc.

The main live stocks of the farmers of the Jammu region were Cow (Bostaurus), Buffaloes (Bison Bison), Sheep (Ovis Aries), Goat (Capra Hircus), Ducks (Anas Platyrhynchos), Geese (Branta Canadensis) and Ponies (Equus Ferus Caballus). Because of the dry winters followed by a hot summer and monsoon rains, cows and buffaloes were common in Kathua, Jammu and
Udhampur districts and Rajouri tehsil of Reasi district\textsuperscript{127} where as in Doda, Poonch, Rajouri and hilly areas of Kathua and Udhampur, Sheeps and Goat were found in large number.\textsuperscript{128}

Cattle (Colloquially Cows) of kandi areas were bigger in size and tougher than those of pahari areas who were small in size and lean in body. Mule proved an animal of extreme usefulness. The people used to rear Donkeys (Equus Asinus Asinus) of good breed for mule breeding purposes.\textsuperscript{129}

The female buffalo yielded more milk than the cow. This animal was considered hardier animal and less vulnerable to epidemic diseases than cow. The ghee taken out from buffalo milk was put in tins and exported to British India.\textsuperscript{130}

The ponies were small but wiry animals had great stamina. Although, every village had its own broad mares still no care was taken in the selection of sires.\textsuperscript{131}

Oxen were used for transport purposes and found especially with telis.\textsuperscript{132} Potters and oil pressers kept donkeys to be used in their day to day work. Goats and sheeps acted as a great source of livelihood of Bakarwals as they sell meat of goats and wool of sheeps besides providing manure. The best quality of goat was Kangan which was believed to be best mutton goat in India. The Beetal goat found in the outer plains of Jammu shiwaliks was the best milking goat.

The State Government took several steps to improve the breed of the animals. Various veterinary hospitals were established by the State Government with the accommodation for in-patient. Various veterinary dispensaries were also opened by the Government in cities and tehsil head quarters.\textsuperscript{133}

Besides, opening of the veterinary department, live stocks breeding centres like cattle breeding, horse and mule breeding and sheep breeding were opened by the state at various tehsils and live stocks shows were held in order to
provide incentives to people to improve the quality of their livestock.\textsuperscript{134} Likewise in the year 1927-1928, cattle and horse (Equus Caballus) shows were held in Jhirri and in Bhimber.\textsuperscript{135}

Moreover, the enactment of The Prevention of Cruelty to Animals Act of 1934 made the person liable for punishment, if he inflicted unnecessary pain on an animal in any manner. Also, the use of cow for dragging the plough and performance of the operation ‘Phuka’ upon a cow were declared punishable.\textsuperscript{136}

**Poultry**

The work assigned to the poultry farm was the improvement of local birds and introduction of foreign breeds. The State Government took several initiatives to teach the people how to bring improvement of the poultry breeding in the villages by opening poultry farms from where eggs and chicks were supplied. People in rural areas kept poultry bird, like Hen (Gallus Gallus Domesticus) and Cock (Gallus Gallus) for earning extra income.\textsuperscript{137}

**Bee Keeping**

The people living in villages at higher altitudes in Jammu region produced honey through primal methods. Two large clay plates were placed inside the wall of the cottage and this cottage was covered by an out plate with a small hole from where the bees entered into the cottage.\textsuperscript{138}

There were eighteen colonies for honey production in 1945-46 throughout Jammu region. The erstwhile Government shifted Bee (Apis) keeping centre from Kashmir to Udhampur and then to Katra of Jammu Region in 1938 because the climate of Katra was suitable for bee keeping as it was warmer than Udhampur. But soon the bee keeping Centre faced scarcity of flora during summers, so it was again shifted to Batote from Katra in 1940.
The State Government also made efforts for improving methods of honey production in the State by arranging demonstrations in the improved methods of honey production. With the State help, the apiculturists of Jammu region produced 1800 pounds of honey in 1939. The Government also trained students in rearing bees. In 1939-40, four students getting training from bee centre started their own apiaries. One of them was granted a loan for this purpose by the Government.  

The ayurvedic doctors and *hakims* during the period under study prescribed honey as a medicine for purifying blood, preventive against colds, coughs, fevers and curative for eye sores, ulcers and sore throats.

### III] AQUATIC ANIMALS

#### Fisheries

The region of Jammu had a great natural charm because of its sparkling rivers, silvery springs, natural streams, lakes and hilly torrents. Besides providing scenario beauty, it offered variety of fish species.

The Tawi river was famous for fishing under Dogra rule. The other places of the region that were good in fishing were Akhnoor and Ranbir Singh Pura.

The important species of fish found in Jammu region were Carp (*Cyprinus carpio*), Mahseers (*Cyprinus tor*), Rout, Brown Trout (*Salmo trutta*), Rainbow Trout (*Oncorhynchus mykiss*), Mirror Carp (*Salmo trutta*), Kalbose (*Labeo Calbasu*), Mirgal (*Cirrhinus mrigala*), Rohu (*Labeo Rohita*), Grass Crap (*Ctenopharyngodon Idella*), Silver Crap (*Hypopthalmichthyes Molitrix*) and Common Crap (*Cyprinus Carpio*).

The tradition species found in Jammu region were Channa (*Channa Punctatus*), Rasbora (*Trigonostigma Heteromorpha*), Rosy Barb (*Punctius Conchonius*) and Zebra fish (*Danio Rerio*).
Turtles

There were only two types of turtles found in Jammu region which were Indian Flapshell Turtle (*Lessemis Punctata*) and Softshell Turtle (*Trionyx Gangeticus* or *Nilssonia Gangetica*), they were especially found in Mansar and Suinsar lakes.\(^{141}\)

Jammu region had and has been bestowed with the blessings of god of nature with green gold in the form of forests and wide diversity of rare and wild animal realm. Sufficient forest cover was ecologically necessary to sustain cultivation on hilly areas. But owing to the exploitation in form of roads construction, mineral extraction etc, and with the increase in human and livestock population that resulted in urbanization and growth of agriculture, natural biodiversity had been subjected to various kinds of losses that were also reflected in the decline in number of various species. Human beings had disturbed the ecological balance by felling down the trees of the forests for the fodder and fuel. Over grazing of the pasture land by the livestock’s had hampered the green gold of the region as it resulted in deterioration of soil productivity as well as inhabiting natural regeneration of tree species. Also, the demand of forest products for export greatly increased during the era of Dogra rule in the state of Jammu and Kashmir as the utilization of timber increased with the continuing demand in British India.

Ibid.


Ibid.


Sharma, Manju, *op.cit*, p. 22.


Sharma, Manju, *op.cit*, p. 22.


* 1 maund = 37 kgs.


Ibid, pp. 220, 221.

Ibid, p.11.

Sharma, Manju, *op.cit*, p.22.


Kapoor., M.L, *op.cit*, p.11.

Ibid, p. 221.


Sharma, Manju, *op.cit*, p 23.


Sharma, Manju, *op.cit* p 23.


Ibid.

Ibid , p. 222.


39 Sooden, Surjit Singh, *op.cit*, p.196

40 Sharma, Manju, *op.cit*, p.23.


42 Kapoor, M.L, *op.cit*, p.11.


46 Sooden, Surjit Singh, *op.cit*, p.196.


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120 Dewan Parvez, *op.cit*, pp.517, 518.
121 Singh, S. Surjit, *op.cit*, p.211.
122 Dewan, Parvez, *op.cit*, p.517.
124 *Ibid*.
126 Kapoor, M.L, *op.cit*, p.16.
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131 Lawrence, Walter, *Kashmir And Jammu*, *op.cit*, p.64
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134 Chouhan, Amar Singh, *op.cit*, p.15.
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136 Wakhlu, Somnath, *op.cit*, p.78.
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