Natural Vegetation and Wildlife in the Punjab

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Beginning with the British administrative reports, we begin to have a detailed sense of the fauna and flora of Punjab. The references to this facet of Punjabi life, however, appear from the poetry of Baba Farid (d.1265) onward. Using this extensive literature, which includes the writings of the Sikh Gurus, Sufi poets and early European travellers this paper provides a comprehensive attempt at creating a vivid account of grasses, trees, plants and wildlife found in the different parts of Punjab. This acts as a useful reminder of the bio-diversity of the region which has come under increasing pressure due to forces of modernity. A glossary of vernacular terms used is appended at the end.

I

Systematic collection of information on the natural vegetation and wildlife of the Punjab could begin only after the rise of the modern sciences of botany and zoology. It is not surprising, therefore, that attempts at collection and classification of such information were made only after the annexation of the Kingdom of Lahore to the British Indian Empire in 1849. The district gazetteers of the third quarter of the nineteenth century contain detailed information on flora and fauna, indicating the changes that were coming about. In a comprehensive description of the Punjab, James Douie has given an account of sub-regional variations in the natural vegetation and wildlife in the Punjab. This does not mean, however, that the Punjabi writers or the early European travellers to the Punjab did not take any interest in the natural environment. They did and their information has its own interest and significance.

The earliest references to flora and fauna of the Punjab during the medieval period come from the creative writers of the region who wrote in the language spoken by the common people. Shaikh Farid, for example, refers to flowers and fruits in general, and to trees, thorns and the jungle. He refers specifically to flowers of *kasumbh* and *kaval*. He refers to birds in flight, gathered on ponds, drinking water with their beaks, picking up particles of stone in the jungle. He refers to the cranes, the tiger, the migratory birds, the swan, the falcon, the crow and the dog.[1] We know that Shaikh Farid lived mostly in Pakpattan on the bank of the Ravi, and he was familiar with the countryside around Pakpattan.

Writing in the familiar form of *Bara Maha* (Song of the Twelve Months), Guru Nanak (d. 1539) refers selectively to the natural vegetation and wildlife of the Punjab: the lark, the cuckoo, the hummingbee, the trees blossoming in forests, the mango groves, the twigs draped in new colours, the gnats wailing in

the forests, the crying frogs, the crawling serpents, the teasing mosquitoes, peacocks, the lush green twigs, the water reeds in bloom, the twigs shorn of their leaves and the grass of its green. Guru Nanak's purpose was to underscore that all the twelve months are auspicious, and all the days and nights, every hour, minute and second are happy if one is absorbed in the love of God.[2] Nevertheless, the seasonal round of twelve months brings the familiar features of the natural world into sharp focus. Guru Arjan (d. 1606), in his *Bara Maha*, refers only to the twig that withers without water and to forests and grasses in bloom.[3]

Shah Husain, a contemporary of Guru Arjan, is more concerned with flora and fauna. He talks of the jungle, *bela* and *jhall*, the trees and their branches, and the leaves of the *pipal* tree; he refers to *shisham, babul*, and thorns; he talks of *mehndi, chamba, marua* and flowers in general. He refers to the black buck, the lion, the cobra and the fish in deep water. He refers also to the winged creatures like the crane, the peacock, the crow, the hen, the bumble bee, and the common fly.[4] Living in Lahore, on the bank of the Ravi, Shah Husain was familiar mostly with the flora and fauna of the country around Lahore.

There is no systematic information on the natural environment even in the sixteenth-century Mughal document, *Ain-i Akbari*, which provides detailed information on many aspects of Indian life. The *Ain* refers to a forest near Khushab because of the interest of the Mughal emperors in hunting grounds.[5] That this was not the only forest in the Punjab is evident from the *Atlas of the Mughal Empire* which records the Lakhi Jungle below the confluence of the Satluj and the Beas where cheetahs were hunted; the *chhamb* of Kahnuwan where birds were shot, a jungle near Bhera (as well as Khushab), and a forest between Samana and Bhatinda, a haunt of the cheetahs. There was yet another area close to Hissar and Agroha which was preserved as the imperial hunting grounds.[6] Though not shown in the Atlas, there was a hunting ground near Sheikhupura where the Mughal emperor Jahangir constructed the Hiran Minar (Stag Tower).[7] The deer, like the tiger, was the preferred animal for hunting.

The European travellers of the Mughal times do not have much to say about the flora or fauna of the Punjab. William Finch, for example, refers to wild beasts, the deer and scorpions; he also refers to flowers of all sorts at Sirhind, which would not be wild.[8] Tavernier complains of mosquitoes.[9] Bernier refers to a peculiar kind of grass that was used as fodder for horses.[10] In the Sikh works of the seventeenth and eighteenth centuries, there is more detail but without reference to specific areas: In the *Vars* (ballads) of Bhai Gurdas (d. 1638), for example, there are references to flowers and trees such as *chameli, dhatura, dhrek, kamal, kikar, painju*. He talks of the *simmal* tree with its red flowers, and all trees and plants becoming green in the rainy season when the *akk* withers away. Similarly, he refers to the ants attracted by jaggery, the lark crying for rain, the heron standing on one leg to catch the fish, the rat called the *chakchundar* overpowering the snake, the partridge fascinated by the moon, the lark esmerized by the clouds, the peacock showing four eyes, the snake discarding its skin, and the snake with two heads. Then, there were the bat, the eagle, the jackal, the hare, the tortoise, the kite, the cuckoo, owl, the mouse, the

silkworm, the spider, among others.[11] In the *Kabitts* and *Savayyas* (short poems) of Bhai Gurdas, there are references to the leopard, the monkey, the fowl, the fish, the tortoise, the pigeon, the parrot as well as the peacock, the crow, the sparrow, the owl and the falcon. Apart from the trees in general, the banyan and *babul* are prominently mentioned. Some of the other trees and plants specifically mentioned are *arind, karir, palas, dhak* and *ban*. The grass is mentioned, and so is *kachur* or naturally growing *haldi*. Then, there are flowers and thorns.[12]

The *Janamsakhis*, the literature about the life of Guru Nanak, also refer incidentally to the flora and fauna of the region. An old *Janamsakhi* refers to forests and bushes, the *simmal* and the banyan trees, the *kaval*, the crane, the cock, the crow, the wolf, the lion, and the dog.[13] The *Miharban Janamsakhi* mentions forests and groves, bushes and grasses, the *simmal* tree, *akk, kaval*, the sunflower, the mango tree, the migration of birds, the lark, the eagle, the crane, the crow, the cuckoo, the migratory bird, the cock, the peacock, the sparrow, the bear, the cat, the deer, the dog, the frog, the jackal, the leopard, the lion, the monkey, the snake, and the wolf.[14] *The B-40 Janamsakhi* refers to wilderness, trees, birds, the love of the cuckoo for the mango tree, and the moaning sound of the *kunj*.[15] *The Bala Janamsakhi* refers to *akk, simmal* and *pipal*, and to the deer, the frog and the snake.[16] *The Gian Ratnavali* yields a longer list of trees, plants, flowers, animals and birds: *akk, beri, goolar* (a type of oak), *kikar/babul, palas, simmal*, grass, *chameli, kusum*, the lion, the deer, the rhino, and the crane.[17]

Writing in the second half of the eighteenth century, Varis Shah refers to a number of items. We may notice only some of them. There is *chibarh*, a miniature melon that is usually not sweet but sour. Among the medicinal plants are *itsit, bhakhra* and *kuar-gandal.* Among the grasses is *munj*, among the trees is *neem*, known for its bitter taste; among the bushes is *sar, sarkanda* or *kana*. Among the animals are the bear, the donkey, the pig, the monkey and the stud bull. Among the birds are the crowing cock, the falcon in flight, the lonely migratory bird separated from the flock, the (duck) the nightingale, the dancing peacock and the chirping sparrow. Among the insects are the jet black bumblebee and the honeybee. Among the reptiles is the cobra and over a score of other varieties of snakes. Then there are lizards on the trees and the alligator in water.[18]

The European travellers to the Punjab in the time of Sikh rule were more inquisitive about its flora and fauna than the travellers of the Mughal period. They notice the domesticated animals in detail but they also refer to the wild animals and birds, and to natural vegetation. Moorcroft, for example, refers to spotted axis, the stag, the hog deer, the wild cat, the black and grey partridge, the peafowl, the quail, the mulberry tree, the fig, the *pipal*, the *shisham* and *haldi*. He also refers to hemp and *dabb* grass.[19] Alexander Burnes noticed the cranes, ducks, falcons, hawks, pelicans, storks and teals, and also the crocodile, the *gharial* and the *tandua.* The hogs, the hare were important for hunting. Among the wild fruits were *peeloo, ber* and mango. Among the trees were cypresses, date trees, the weeping willow, and the *jand*. Apart from *dabb* grass there were the rosebush, the milkbush, and the *kari*.[20] Hugel refers to

nightingale, crows, dove, wild fowl, jackdaw, peacocks, squirrels, turtledove, white-headed eagle, the chattering parrot, and the soaring and singing skylark. He also refers to jackals, foxes, wolves and monkeys. The street dogs are described in detail. Among the trees are *kikar/babu*, cypresses, date trees, pines, and ziziphus.[21]

William Barr, who marched from Delhi to Kabul in 1839, gives more specific information in terms of location. Between Sonipat and Panipat there was a jungle abounding with game, and so was a *dhak* jungle near Nilokheri and Shahbad. There was another extensive jungle beyond Rajpura, broken at places by patches of cultivation and groves of large trees. Near Khanna, there was a pretty grove of *babul* trees with yellow-scented blossoms. Beyond Sonipat was a banyan tree of great dimensions. There was a jungle of *ber* trees beyond Hasan Abdal. Pretty groves of date trees were conspicuous near Gharaunda and in Lahore. Mango groves were extensive around Thanesar and Ambala. Mulberry trees were noticeable in Hasan Abdal and Naushahra across the Indus. There were handsome *pipal* trees near Karnal, Rajpura, and Hasan Abdal. The brushwood and trees around Patti provided an 'agreeable change from the increasing barrenness' south of the Satluj. On the hills around the Kuhan in the Sindh Sagar Doab, the bushes were stunted. Around Nilokheri and near Shahbad, there was long grass. In the swampy land beyond Lahore the grasses were ten feet tall. There was a long stretch of jungle with grass between Gujranwala and Wazirabad. Wild shrubs and brushwood filled the ravine in Rohtas in the Sindh Sagar Doab. There were wild and sweet smelling dandelions across the Indus.[22]

Barr's information on the animals and birds is also associated with places on his route. He saw black partridges near Ludhiana, blue pigeons and bats near Lahore and thousands of cyrus, a kind of crane, in regular battle array with some stragglers, across the Indus. He noticed alligators in the river Jhelam, antelopes near Markanda, tamed bears and monkeys across the Indus, huge dogs around Ambala, dusty grey lizards, about 18 inches long, beyond Lahore, porpoises in the Satluj, and four tigers put in a cage by Hari Singh Nalwa.[23] The information provided by Barr, though limited, is the most specific. The information from other sources comes in bits and pieces, generally without specific reference to places. Nevertheless, this information collectively provides the relevant background for the study of natural vegetation and wildlife in the Punjab.

II

James Douie takes notice of the vast level plains located between the rivers Yamuna and Indus, bounded in the north and northwest by the lofty Himalayas and in the south by the sandy deserts of Bahawalpur and Rajputana. This area had stretches of firm loam and tracts of sand and sandhills.[24] It was not uniform. Transversed by the Satluj, Beas, Ravi, Chanab, Jhelam and the Indus, and numerous small rivulets and streams, the Punjab plains had ample water in the northern parts and the river valleys. On the basis of differences in climate and physical appearance, this area could broadly be divided into four zones: the

submontane, covering the northern parts of the districts of Ambala, Hoshiarpur, Gurdaspur, Sialkot, Gujrat, Jhelam, Rawalpindi and Attock; the western plains, covering the lower areas of the Jhelam and Gujrat districts and the districts of Gujranwala, Lyallpur, Montgomery, Shahpur, Multan, Muzaffargarh and Mianwali; the central plains, covering Amritsar, Lahore, Jalandhar, Kapurthala, Ludhiana and Ferozepur; the south east plains, covering the Ambala, Karnal, Hissar, Rohtak and Gurgaon districts and the states of Patiala, Nabha, Jind, Faridkot, Malerkotla, Dujana and Loharu.

All the plains started to heat up by April and May, and June saw intense dry heat and duststorms. This was followed by the monsoons from July to September. By October and November temperatures lowered to about 30°C, and by December the winter set in with temperatures going down to 0°C, with some rain in January. The plains thus had an extreme climate, very hot summers and intensely cold winters. On the whole, the submontane areas had an equable climate and good rainfall of 30-40 inches per annum. The north-west areas had a longer and colder winter and less rain. In contrast, the central plains had a shorter winter and a heavier rainfall of 16-30 inches a year. The south- west and south-east parts were rather dry with only 5-15 inches of annual rain.[25]

Douie points out that, except in the extreme west and south western districts, this region was not a desert and yet its flora was predominantly of the desert type, being drought-resistant or xerophilous.[26] In the vegetation of the Punjab plains could be seen adaptations in the roots to tap the subsoil moisture, in leaves to check rapid evaporation, or even changes in internal tissues. The south-west and south-east areas were akin to the desert areas of Iran, Arabia and North Africa.[27] The soil and climate in the rest of the plain was suited to scrub jungle of drought resistant type which at one time covered large areas of the tract between the Yamuna and the Jhelam. The largest and truly indigenous trees of the Punjab plains according to Douie were the *farash* and the thorny *kikar,* which grew well in sandy soils and yielded wood for agricultural implements. Smaller thorny acacias like *nimbar* or *raunj, khair, pilchi* or *jhao,* and dwarf tamarisk were also common trees. The scrub jungle consisted of *jand, jal* or *van* and the *karil (karir)* having long roots, small feathery leaves and thorns. The *jand* was a useful tree, the *jal* gave a fruit called *peeloo,* popular in times of famine.[28] Among other plant families were the *khip, farid ki booti* and *jawasa* or camel thorn; cleomes, corchocus, and three mediterranean types of plants.[29] The sandier tracts had *akk, harmal* and colocynth gourd growing abundantly. Several weeds were also prevalent.[30] Among planted trees were the *shisham* or *tahli, kikar, siris, pipal, borh* along the roads.

The north-west plains east of the Jhelam had a distinctly mediterranean type of flora. Poppies, crucifers, diplotaxis and moricandia were Italian species. Some Asiatic plants like Borange and *paighambari phul* were also common along with the thorny acacias and *phalahi* and other xerophytes. The scrub forest in the north-west Punjab was covered with bamboo and in some parts with the dwarf palm. A scanty growth of *phalahi* and wild olive was also prevalent alongwith *jand, jal, karil* and *farash.* Between the Satluj and the Jhelam much of the scrub had disappeared with the advance of canal irrigation

by the early twentieth century.[31] This area had grasses too, and in good seasons formed a large grazing area.

The submontane areas of the plains, a broad belt along the Shivaliks, had a strong Indo-Malayan element in its flora. The *dhak, chichra, palah* and *palas* extended all over, and provided excellent firewood, good timber, valuable gums, dye, and leaves as fodder for buffaloes. A tree commonly planted was the *dhrek* and *bahera,* a larger Indo-Malayan tree. Shrubs like *marwan, bansa* or *bhekar,* also Indo Malayan, were usual. A curious cactus-like Euphorbia Royleana also grew abundantly and was used as a hedge.[32]

In the sub-Himalayan zone a strong infusion of Indo-Malayan flora were noticeable in the form of a large number of flowering trees - the *simmal* or silk cotton tree, the *amaltas,* and *dhawi* with bright red flowers.[33] Flowering shrubs included *sanatha* or *mendru, garna,* clematis, mimosa and the mediterranean types of flora like oleader. The wild pear, olive, *khair, tun, khaman* and species of figs were 'valuable' products of the lower hills. Bamboo also grew tall on stony hills. Herbs like milkwort and flowers such as balsam, impatiens, lily, ipomea, and gloriosa were found in the low hills.[34] An alpine flora of the Mediterranean type became more evident at higher altitudes.

The fauna of the Punjab plains, as noticed by Douie, was much depleted over time. The extension of cultivation and schemes of irrigation changed the very geography of the region and its animal life. Lions and tigers that once roamed the plains had virtually disappeared. Leopards from the hills, however, sometimes strayed into the plains. Wolves and jackals were commonly seen. In many sandy areas the black buck and *chinkara* were found, and sometimes the stag. The *parha* lived in the riverain tracts. In the submontane and the south-east districts abounded monkeys which damaged crops and were yet considered sacred. Hares and rabbits ran through the plains. In the eastern areas peafowl were especially prevalent, protected by Hindus. Several kinds of sand grouse and bustards were found in the sandy areas. The grey partridge, quail, parrot, crow and the vulture were found all over the plains.[36]

The partridge, several varieties of pheasants, and the monail were found in abundance in the submontane zone. The inner valleys had black can, and the lake were home to ducks and snipe as also to the fish like *rohu* and *mahseer.* The *magar* and *gharial* haunted the rivers and marshy areas. Poisonous snakes like cobra and viper intruded everywhere. Lizards and mongoose were unwelcome visitors. Insects like white ants destroyed timber and books; flies, mosquitoes and locusts were summer pests. The cultivation of cotton saw added insects in the cotton balls which created a new havoc for animal life.[37]

Writing in the early twentieth century, James Douie presents a broad overview of the natural environment of the Punjab plains and points out certain specific species found in particular areas. He also notices some changes in the flora and fauna with the passage of time and links these with the extension of colonial rule to the region in the mid-nineteenth century. Douie, thus, takes a comparatively keen interest in the natural world. However, he does not go into much detail or variations within each sub-region.

III

The gazetteers of the Punjab province and its districts add more information on its flora and fauna and enable us to appreciate the variation in the natural environment at the sub-regional level. The submontane areas were particularly rich in natural vegetation. There was abundance of *shisham* in the Shakargarh tehsil of Gurdaspur.[38] Common trees included *siris, phalahi, kikar, jaman, phagwara, rambal, borh, pipal, amb, tut, and ber.* The Pathankot area also had *simmal, chilla, kar, kokoa, putagan, khair, bil, kachnar, dhak or palah, amaltas, lasura, barna, palak, bahain, charr and bahera.* There were *neem, mohwa, sufeda* and date palms in moist places. Though rarely, *mava, puna, chamror, dhaman, kamela, kaho, gun, amla, pansora, dharidi, harar, arjan, retha, imli* and *jand* could also be seen. Fruit trees like *amb* and *tut* grew everywhere and in some areas *sangtara, mitha, khatta, nimbu, chakotra, alucha, loquat, aru, amrud, nashpati, kela* and *anar* were found. *Tut, jaman* and *shisham* were mostly known in canal plantation. Mulberry was common and considerably large but was not satisfactory as timber. *Shisham* was most useful and valuable timber as it was safe from white ants, and usually from goats. *Phalahi* and hill olive were not readily available; hard to work with, they were not popular as timber. *Siris* was used for oil presses but it was liable to be destroyed by goats, as were *phalahi, kikar* and *ber.* The *pipal* was depleted by camels.[39]

The Gurdaspur area was rich in grasses. The *dhub* or *dhubra* variety grew in fertile soils and the river banks were covered with the coarse *dab. Khair* or *jhar* was found everywhere. *Dodh* and *mahva,* growing everywhere in the Shakangarh tehsil, were used as fodder. *Kaserla,* bulrushes, reeds, *kandiairi, leh* and thatch grass grew in swamps. The *bughat* or wild leek emerged in spring. *Benku* grass, poisonous to cattle, also sprang up in some places. *Bhang* grew freely. Bushes like *mendu* or *sanatha, basati,* and *garna* were prominent as undergrowth. Cactus grew wild and was also used as hedges around fields. The Ambala district had a smaller variety of grases. *Sarkanda* and *kahi* were valuable in protecting the soil from erosion. They were useful for thatch and rope making too.[41] The low slopes in Hoshiarpur district were well covered with grass and brushwood, though not as luxuriantly as the Gurdaspur belt.[42]

The submontane in the Gujarat district was rather 'sterile and unproductive'. The colonial government kept it as a forest reserve marked by a growth of stunted vegetation, mainly *phalahi.* This forestation could check sudden floods and erosion.[43] The Jhelam district too was rather bare of vegetation in the Salt Range area, especially on the western side. The eastern parts had a fuller vegetation on the lower slopes with thick low brushwood, *bihekar, sunatha* and *phalahi* being common, along with wild olive. Real trees were rare since rainfall was rather scanty. Where the soil was good, *dhak* locally called *chichra,* was found. This tract, however, suffered from encroachment of mountain torrents.[44]

The submontane of the Rawalpindi district was covered with *kangar, khair* and *phalah,* and bushes like *sanatha* and *garanda.* Sanatha, bright green in color, was regarded as a luxuriant growth of the sub-Himalayan parts.[45] The Attock submontane had stunted *phalahi,* a few 'useless' shrubs, and poor and

scanty grasses. The northern areas had *kahu, sanatha and khair* along with *phalahi*.[46]

In the submontane zone as a whole we can notice that the eastern and western edges were somewhat barren, with scanty growth of trees and some shrubs and grasses. The central portions, that is, Gurdaspur and Sialkot, had luxuriant flora of wide variety - trees, shrubs and grasses of several varieties. Wild animal life was confined to the wooded areas and riverain tracts where jackals, foxes, wild cats, pigs, hares, wild cattle, black buck and wolves were occasionally found. The incursions of wild cattle damaged cultivation in these parts. Domestic animals included goats, camel and buffaloes.[47]

The western plains formed a parched region with a variety of soils which were not uniform in quality. Some were *maira,* a fertile loam, and others saline (*kallarathi).* The quality of soil determined the kind and density of vegetation. With the slightest of rain the area got covered with various grasses and forms of *lana*.[48] The arid western flora was represented by the *van* or *pilu, jand, kari, ber,* and *malha* as bushes.[49] The *van* was of no use as fuel, or for agriculture; *jand* was used as firewood and for making charcoal, while *kari* provided small rafters. The edible berry fruits of the *kari, ber* and *pilu* were used as medicine and food.[50] Some tracts away from the river valleys showed a startling transition to waste and jungle, where decrease of plant and animal life was obvious.[51]

In the *bar,* an inhospitable region due to absence of water, ample grasses sprang up after the rain and it became a pasture ground for immense herds.[52] Tree vegetation was limited to hardy varieties like *karil* or wild caper, *jand* and *pilu*. In riverine tracts and near bungalows *kikar* and *farash* were planted; sometimes a lone *shisham* and *sirus* could also be found.[53] The British administrators tried to promote the growth of 'useful' trees but only with partial success. The few trees could be counted on the finger and were found only around villages.[54]

Ganji Bar, the tract between the old banks of the Ravi and the Beas, had a scanty growth of *jand* and *jal* trees; it appeared to be a 'sterile waste'. However, the Ravi *bar* or Rawa had a fairly thick wooded part called the *jhangar* where the government had set apart reserved forests for production of firewood.[55]

The *thal,* that is the area south of the Salt Range beyond the influence of rivers between Khushab and Dera Ismail Khan, was an 'angry sea of sandhills'. Occasional stunted bushes like *phog, lana, bui, madar* and *harmal* were found while the *ber* was the only tree that survived these arid conditions. The vegetation of the *thal* was mainly low brushwood and grasses. Grass like *khabal, dhaman* and *chhimbar* were found but could not support as many cattle as the *bar*.[56] The *thal* towards the south-western edge was a desolate area, treeless and barren with scattered pasturage.[57]

The Salt Range tract had a somewhat different vegetation due to the presence of salt in the soil. The internal areas were well wooded and green, with bushes of bog myrtle and *bahekar* and hardy kinds of trees - wild olive or *kau, phalahi* or Indian mulberry and *kunger*. The *shisham,* though shorter in height, also thrived here. The outer area of the Salt Range, specially the southern face, was marked by stunted *phalahi* and *salsolas* as vegetation.[58]

Near the confluence of the rivers in the south-west corner of the Punjab, the riverain areas had thick jungles of reeds, tall *sar* grass and low tamarisk.[59] The river islands were often overgrown with dense *kanh* in Mianwali, and with *kan* and *munj* in the Muzzaffargarh district.[60] Some *tahli, ber* and occasional *sarinh* and *pipal* were also noted. The riverain tract had groves of date palms as well.[61] Scrub in the form of *lana, phog, bui* and a sprinkling of *khaggal, kari* and *jand* trees were also found. In the northern part of the district grasses like *chhember* and *sain* provided fodder for cattle after the rains.

For fauna, the *bar* had quail, partridge, sand, grouse, hare, bustard, antelope, wild duck or *kulan,* and wild geese. Snakes were common and rewards were given for their destruction.[62] The riverain areas with their tall grasses were the favourite cover for wild pig and hog deer. Much of the *thal* area, however, was a real desert, barren and lifeless and devoid of vegetation and bird and animals life.[63]

The central parts of the Punjab plains were an unbroken continuous level plain, sparsely wooded owing to extended cultivation in these fertile areas. The trees indigenous to the country and also planted by cultivators near ponds and wells, were *pipal, borh, dhrek, tut, bokain,* and acacia.[64] The Kapurthala area had *shisham, kikar, tut* and *ber* trees, as well as palm in the Sultanpur.[65] The *pipal* was revered and hardly ever cut down, though lopped as fodder by camel drivers. The *ber* was valued for its fruit and roofing capacities. It was a favourite tree near Muslim shrines. The *kikar* was the main timber tree and found all over since it grew in all kinds of soils. The *jand* was rapidly disappearing with the extention of cultivation. Other trees included the *karil, phula, ber, reru* and *dhak* or *chichena.* The *dhak* leaves were used as fodder for cattle and to wrap foodstuff; its scarlet flowers were used as a dye; its juice was used as gum and its wood as fuel. The *tahli* was a useful tree, though not indigeneous to this tract and rarely planted by cultivators. The *pharwan* was planted for shade and the *sirinh* as a roadside tree which suffered from the ravages of camels and goats. Closer to towns were orchards of mango, *loquat,* peach, pear, limes and *jaman* grown for fruit. Ornamental trees like *tun, neem, sohanjana* and *amaltas* were rather rare. The double rows of trees planted along canals and roads were well cared for.[66]

The riverain tracts had *sar, kahi* and *pilchi* grasses while the good lands had *dub,* a sweet fodder grass; *dab,* a coarse grass, grew on sandy soils; *chimbal, palwan* and *markana* were some other grasses. Common weeds were found all over, like *saroch, bughai, pohli* or thistle and *akk* or milk plant.[67] Large animals were rare in these well cultivated areas though wolves, the deer, the pig, the hare, and snakes and water fowl were found in the state forests reserved for shooting.[68]

The south-eastern plains, though dry and rather bare in terms of natural vegetation, did not have a uniform kind of flora. In the northern parts of this tract a variety of trees were somewhat common - *pipal, ber, neem, jand, kikar, nimbar, raunjh* - in Ambala, Rohtak, Karnal, Patiala and Kalsia.[69] A variety of trees were planted along the canals and roads - *shisham, siri, farash; amb* and *jaman* groves were common in these areas. In the Patiala areas *barota, dhak,*

khajur, jal, gugal, kair and *kaundri* were also found.[70] Grasses like *dubra, anjan, palwa, panvi,* and a brushwood called *jhao* were common in Karnal.[71] The Rohtak tract had *san, dub, dab, mota or motiya* and *makrah* and *deila* grasses as well as *ganda, pani* or *jhund* which grew near ponds and was used for brooms and thatch. Some lowly grains from *simwak, samal* and *bhurat* were used as fodder or even by humans in times of famine. The Gurgaon areas had grasses like *pula* and *jhao*.[72]

The southernmost parts of this region were rather bare of natural vegetation.[73] The *kikar* and *karil* were found near habitations, along with bushes like *khep, pala* and *babul. Akk* and *sar* plants were also to be found at places. This zone bordering the desert area was bare and barren. Wildlife in this tract included wolves, hyenas, jackals, foxes, stags, hare and porcupine.[74] Pigeons, partridges and peafowl were in abundance. Snakes hedgehogs and scorpions were found all over the area. The Faridkot parts had pigs, quail, herds of black buck and *chinkara* in addition to the above.[75] The scarcity of water, hot and dry climate, and minimal vegetation supported only diminished animal life.

On the whole, the picture of the natural vegetation of the plains that emerges from the gazetteers is one of marked variations. The submontane belt was one of abundant vegetation of several varieties - trees, shrubs, and grasses, but in its central parts only. The eastern and western edges of this belt were rather lacking in greenery and had arid type of vegetation, stunted bushes and scanty grasses. The central plains had a variety of trees - both evergreen and arid types, fruit trees and some shrubs and grasses. The western plains had limited desert type flora with few plantations of acacia and *shisham.* Grasses sprang up only after the rains and a few dwarf bushes survived. The inner Salt Range area broke this monotony with some greenery of the low hills kind. The south western and southern boundary of the Punjab plains was rather bare and desolate with respect to natural vegetation, having only few date palms in the south-west corner and some grasses. The south-east tract also had desert type trees and plants and scanty, dry grasses. The central parts of the Punjab plains thus, had a wider variety of vegetation; especially the belt bordering the Himalayas; the west and south eastern areas had a desert type of flora which began to disappear as one moved further south and south-west. The great need of the whole region was water, water and water.

Notes

1. *Slok te Shabad Farid ji Steek.* Ed. Sahib Singh Amritsar: Singh Brothers, 1995 (15th impression), pp. 11, 50, 52, 71, 73, 74, 76, 86, 87, 88, 90, 91, 92, 97, 103, 104, 105, 110, 114.
2. Gurbachan Singh Talib, *Sri Guru Granth Sahib in English Translation,* Patiala: Punjabi University, Vol. IV, 2001 (3rd ed.), pp. 2251-57.
3. Ibid, Vol. I, 1997, pp. 269-77.

4. Jit Singh Seetal, *Shah Husain: Jiwan te Rachna*, Patiala: Punjabi University, 1995, pp.56, 59, 60, 62, 67, 69, 73, 87, 88, 92, 93, 94, 95, 105, 106, 107.
5. Abul Fazl, *Ain-i Akbari*. Tr. H. Blochman, Calcutta; 1927, Vol. II, p. 326.
6. Irfan Habib, *An Atlas of the Mughal Empire*, Delhi: Oxford University. Press, 1982, Map 4B.
7. Ganesh Das Vadera, *Char Bagh-i Panjab*. Ed. Kirpal Singh, Amritsar, Khalsa College, 1965, p. 273. Jahangir gave the name of Jahangirabad to Sheikhupura and made it the headquarters of a *pargana*. Its Qanungos constructed a fort for the emperor, around which developed a town; a tank was dug and the Hiran Minar was raised at a distance of two *kos* from the town in the s*hikargah*, the imperial hunting ground.
8. William Finch, in *Early Travels in India 1583-1619.* Ed. William Foster, Delhi: S. Chand & Co., 1968 (reprint), pp. 155, 157, 158, 159, 163, 165.
9. Jean Baptiste Tavernier, *Travels in India.* Tr. V. Ball, New Delhi: Oriental Books Reprint Corporation, 1977, Vol. I, p. 83.
10. Bernier, *Travels in the Mogul Empire, 1656-1668*, Tr. A. Constable, West Minister, 1841 pp. 381-82.
11. *Varan Bhai Gurdas*, Ed. Sahib Singh, Amritsar: Khalsa Samachar 1951 (6th. ed.), pp. 18, 46, 66, 90, 91, 101, 117, 127, 128, 136, 154, 223, 224, 278, 318, 319, 351, 484, 493, 519, 597, 614, 617, 618, 619, 620, 621, 622, 626, 634, 635, 637, 638, 645, 648, 671, 674, 678, 684, 693, 695.
12. *Kabitt Savayye Bhai Gurdas*, pp. 54, 57, 82, 83, 91, 103, 110, 122, 126, 135, 137, 149, 152, 158, 161, 171, 195, 239, 246, 251, 279, 282, 310, 311, 317, 364, 371, 386.
13. *Puratan Janam Sakhi Shri Guru Nanak Dev Ji Ki*. Ed. Shamsher Singh Ashok. Amritsar: SGPC, 1967, pp. 40, 41, 50, 56, 58, 63, 70, 87, 88, 96, 117, 126, 158.
14. *Janam Sakhi Sri Guru Nanak Dev Ji*. Eds. Kirpal Singh and Shamsher Singh Ashok. Amritsar: Khalsa College, 1962, pp. 24, 56, 58, 101, 103, 104, 105, 107, 111, 112, 113, 124, 158, 159, 209, 213, 217, 218, 237, 251, 261, 276, 277, 333, 352, 380, 385, 510.
15. *Janam Sakhi Sri Guru Nanak Dev Ji* (India Office Panj B40). Ed. Piar Singh, Amritsar: Guru Nanak Dev University, 1974, pp. 37, 46, 47, 49, 50, 53, 56, 62, 73, 92, 93, 140.
16. *Bala Janam Sakhi*, pp. 177, 246, 267, 317, 371, 379, 383, 411.
17. *Gian Ratnavali, Janamsakhi Sri Guru Nanak Dev Ji.* Ed. Jasbir Singh Sabar, Amritsar: Guru Nanak Dev University, 1993, pp. 204, 238, 313, 320, 379, 595, 601, 615, 617, 623.
18. *Hir Waris.* Ed. Jit Singh Seetal, Delhi: Navyug Press, 1973 (reprint), pp. 11, 26, 28, 29, 30, 33, 34, 36, 39, 40, 41, 46, 48, 49, 52, 56, 57, 60, 61, 67, 71, 83, 92, 113, 116, 122, 128, 137, 139, 140, 141, 142, 158, 176, 181, 184.

19. William Moorcroft and George Trebeck, *Travels in the Himalyan Provinces and the Punjab,* London: 1837, pp. 1, 12, 30, 35, 40, 72, 81, 91, 96, 117, 118, 134.
20. Alexander Burnes, *Travels into Bokhara,* London: 1835, Vol. I, pp. 83, 105, 106, 108, 114, 115; Vol. II, pp. 9, 13, 16, 19, 21, 27, 36, 42, 105, 108.
21. Baron Charles Hugel, *Travels in Kashmir and the Punjab,* Patiala : Punjab Languages Department, 1970 (reprint), pp. 37, 50, 53, 62, 81, 210, 213, 215, 232, 320.
22. William Barr, *March from Delhi to Peshawar and from thence to Cabul*, Patiala: Punjab Languages Department, 1970 (reprint), pp. 5, 8, 9, 11, 12, 13, 15, 16, 20, 22, 25, 27, 35, 37, 46, 47, 61, 71, 72, 79, 94, 102, 103, 104, 119, 120.
23. Ibid. pp. 15, 17, 29, 31, 69, 72, 76, 87, 115, 120, 121, 122.
24. James Douie. *The Punjab, North West Frontier Province and Kashmir*, Delhi: Low Price Publications, 1994 (reprint, 1st published 1916), p. 3. The total area of the Punjab plain added upto 117,000 square miles: ibid, p. 2.
25. Ibid., pp. 65-70.
26. Ibid., p. 71.
27. Ibid., p. 73
28. Ibid., p. 74
29. These plants are noted as tribulus, zygophyllum, fagonia, solanus and withania.
30. The names of the weeds are mentioned by Douie, as fumania parviflora, silene coroidea, spergulas and argemone mexicana.
31. Ibid., p. 87.
32. Ibid., pp. 77, 78.
33. Ibid., p. 79.
34. Other plants like nerium oleandert, rhus cotinus, herbs such as viola patrinii, polygala abyssinica, and plan like vigna vexillata, Trichodesma Indicum, evolvulus alsinoides, were also found: Ibid, pp. 79-80.
35. Ibid., p.90.
36. Ibid., pp. 90-91.
37. Ibid, p. 91.
38. District Gazetteer Gurdaspur, *1914*, Vol. XXI A; Lahore: Government Press, 1915, p. 2 (cited hereafter as DG, Gurdaspur).
39. DG Gurdaspur, pp. 9-11.
40. Ibid., pp. 11-12.
41. DG Ambala 1923-24, Vol. VII, Part A, Lahore Government Press, 1926, p.5.
42. DG Hoshiarpur, 1904, Vol. XIIIA, Lahore: Government Press, 1905, p.2
43. DG Gujrat 1921, Vol. XXV-A, Lahori, Government Press, 1921, p.2.
44. DG Jhelam 1904, Vol. XXVII-A, Lahore: Government Press, pp. 5, 8.

45. DG Rawalpindi 1907, Lahore: Civil and Military Gazette Press, 1909, p.5.
46. DG Attock 1930, Vol. XXIX A, Lahore: Government Press, 1932, p.10.
47. DG Sialkot 1920, Vol. XXIII-A, Lahore: Government Press, 1921, p.8.
48. DG Chanab Colony 1904, Lahore: Civil and Military Gazette Press, 1905, p. 6.
49. DG Gujranwala 1935, Vol. XXIV-A, Lahore: Government Press, 1936, p. 4, DG Jhang 1929, Vol. XXXII, Lahore: Government Press, 1930, p.6.
50. DG Gujranwala, p.4.
51. DG Shahpur, p.2
52. Ibid. p.3.
53. DG Chanab Colony, p.6; DG Shahpur, p.3.
54. DG Shahpur, p.6.
55. DG Multan 1901-02, Lahore: Civil and Military Gazette Press, 1902, p.11.
56. DG Shahpur, pp. 6-7.
57. DG Mianwali 1915, Vol. XXXA, Lahore :Government Press, 1915, p.4.
58. DG Shahpur, p.5.
59. DG Mianwali, p.5.
60. DG Muzaffargarh 1929, Vol. XXXIV A, Lahore: Government Press, 1930, p.4.
61. DG Mianwali, p.6.
62. DG Shahpur, p.13. About 2250 snakes were killed in 1882.
63. DG Muzaffargarh, pp. 2,4.
64. DG Amritsar 1914, Vol. XX-A, Lahore: Civil and Military Gazette Press, 1914, p.6.
65. State Gazetteer Kapurthala, 1904, Vol. XIV-A. Lahore: Civil and Military Gazette Press, 1908, p.3.
66. DG Amritsar, p. 6, 7.
67. DG Amritsar, 7; State Gazetteer Kapurthala, 3.
68. State Gazetteer Kapurthala, 3.
69. DG Rohtak 1910, Vol. IIIA, Lahore: Civil and Military Gazette Press, 1911, p.5; State Gazetteer Phulkian States 1904, Vol. XVIIA; Lahore: Government Press, 1909, p.7; DG Karnal 1918, Vol. VIA, Lahore: Government Press, 1919, p.2; State Gazetteer, Kabia 1904; Vol. VIIA, Lahore: Civil and Military, Gazette Press, 1908; State Gazetteer Faridkot 1907, Vol. XVI A, Lahore: Civil and Military Gazette Press, 1909.
70. SG Phulkian States, p.7.
71. DG Karnal, p.2.
72. DG Rohtak, p.7.

73. State Gazetteer Dujana 1904, Vol. VIIA, Lahore: Civil and Military Gazette Press, 1908, p.2; DG Delhi 1912, Vol. VA, Lahore: Civil and Military Gazette Press, 1913, p.2.
74. State Gazetteer Loharu 1915, Vol. II-A, Lahore: Government Press, 1916, p.2.
75. SG Faridkot, p.2.

APPENDIX I

Trees of the Punjab Plains

Common Name (Local Name)	Botanical Name
alucha	prunus communis
amaltas (Indian laburnum/rayar/anjan rukh)	cassia fistula
amla	phyllanthus emblica
amrud	psidium guava
anar	punica granatum
arjan	terminalia chehula/arjana
aru	prunus persica
auwla	emblica officinalis
babul	acacia eburnea
bahera	terminalia balerica
bakain	melia azadarach
bamboo	dendrocalamus strictus
barna	cratoeva religiosa
barota	-
bel patta (bil)	aegle marmelos
ber (dier)	zizyphus jujuba
ber	ficus indica
beri (jharberi/jharpala/mallha)	zizyphus nummularia
bhani	populus euphratica
bhor	-
chakotra	citrus decumana
chamror	ehretia laevis
charindi	xylosma longifolium
charr	pongamia glabra
chilla	cascaria tormentosa
chinese tallow	excecaria sebifea
dhak (chichera)	butea frondosa
dhrek (drek)	azadirachta melia
dwarf palm (pattha)	chamocrops ritchiana
farash	tamarix indica
frans	-
gugal	-
guler	ficus cunia
gun	premna latifolia

harar	terminalia
hill olive (kan/kahu)	olea ferruginea/
hindok	-
hingo	balanites aegyptiaca
hinsa	capparis horrida
imli	antidesma diamdrum
indok	albizzia stipulata ailanthus excelsa, bischoffia, javanica diospyros motana litsaea sebiflora holopteria interifolia
jal	salvadora oleoidesjaman eugenia jambolana
jand (jhand)	prosopis spicigera
kachnar	bauhinia malabarica
kaho	olea cuspiata
kaim	stephygone parviflora
kaindu	diospyrus tomentosa
kamela (raini)	mallotus phillippinensis
kangar	-
kar	celtis australis
kasumbh	carthamus tinctorrus
kela	musa paradisiaca
khair	acacia katechu
khajur	longi folium
kharjal	salvadora persica
khatta	citrus medica
kikar	acacia arabica
kokoa	flaconsitia ramontaii
kungar	grewia betuloefolia
lasura	cordia myxa
loquat	-
loquat	eriobotrya japonica
mango (am)	mangifera indica
mava	bassia, latifolia
mitha	citrus limetta
mohwa colebrookiana	engelhardtia
mulberry (tut)	morus indica/laevigata
nashpati	pyrus communis
nim	melia indica
nimbar (reru/raunjh)	acacia/eucophlora
nimbu	citrus acida
palak	ficus infectoria
pansara	wenlandia excerta
Persian iliac (bokain)	melia sempervirens

phagwara	ficus carica
phalahi (phalahi/phula)	acacia modesta
pilkkhan	-
pipal	ficus religiosa
puna	ehretia acuminata
putagan	putrangiva roxbughii
rambal (gular)	ficus glomerata
retha	sapindas detergens
rohera	tecoma undulata
salsolas	-
sangtara	citrus aurantium
shisham (tali/tahli)	dalbergia sissu
simal	bombax malabaricum
simbal	bombax hepto phylla
sirin	albizzia speciosa
siris	albizzia lebbek
sirus	acacia speciosa
sohanjana (horse radish tree)	-
sufeda	populus alba
tamarisk (jhao/tuhla/kaggal/pharwan)	tamarix orientalis
tun	cedrela toona
van (pilu/peeloo)	acacia farnesiana
Wild caper(karil/kari)	capparis aphylla
willow	azadirachta indica

The common names of the following species of trees are not mentioned in the gazetteers:

ailanthus excelsa
albizzia bauhinia
albizzia stipulata
bischoffia javanica
diospyros montana
holopteria integrifolia
litsaea sebiflora

APPENDIX II

Shrubs, Plants and Weeds in the Punjab Plains

Common Name	**Botanical Name**
akk	calatropis procera
akoi	nithania coagulans
banna	tamarix gallica
bansa/bansuti	adhatoda vesica
barari	diploca aphylla

basati	
batua	chenopodium album
bhang	
bhuin	anabis multiflora
bui	panderia pilasa
garanda	adhatoda vassica
garna	
gora lana	salsola foetida
harmal	peganum hurmala
jhal	salvadora decidua
kair	-
kan/kana/kans	saccharum spontaneum
kanger	pistachia integerrima
khar/sajji	haloxylon recidiyum
kharsana	crotolaria burhia
khartva	chenopodium murale
khep	-
khip	orthanthera viminea
kip	crotalarin burhia
lai	tamarix dioica
lana	haloxylon salicorni
multiflorum	
lani/phisak lani	suaeda fructicosa
madar	calatropis gigantea
mendu/sanatha	diclomoea
mral/marelan	lycium europaeum
munj/sarkana	saccharum sana
pala	-
phog	calligonum polygonoides
piaza	asphodelus fistulosus
prickly pear/nagpan	cactus indicus
rassa	cuicus arvensis
rerka/bansa	tephrosia purpurea
sar	saccharum munja
shimalu	vitex regundo
viscosa/bog myrtle	

Grasses

anjan	
benku	-
bhurat	cenchrum echinatum
chemmbar	eleosine plagellifera
chimbal	
dab	eragrostis cynosuroides
dhaman	
dhub/dhubra/dubra	cynodon dactylon

dodh	
drath	-
gandra	-
kaserla	-
khabal	
lai	tamarix dioica
mahna	
makra	
markana	
mota/motiya	
palwa	
palwan	
pani/jhund	anatherum muricatum
panvi	
phit-sain	primisetum dichotomum
pula	
sain	elionurus hirsutus
sanwa	
sinjhi	
sinwak/sama/	panicum colonum

Weeds

bughat/leek weed/wild leek
convovlulus
jowasa
kandiari/thistle
lei/thistle
maina
poli/thistle
saroch
singi

APPENDIX III

Birds and Animals

Common Name	
bagh	tiger
babiha	lark
bagala	crane
barasinga	stag
bhaur	bumblebee
chakor	partridge
bulbul	nightingale
chital	spotted deer
chatrik	lark

koil	cuckoo
kunj	migratory bird
mayna	nightingale
mor	peacock
murghabi	duck
parha	hog-deer