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DOCUMENTATION OF FLORISTIC DIVERSITY & TRADITIONAL KNOWLEDGE: A CASE STUDY OF BLOCK BHUNGA, DISTRICT HOSHIARPUR, PUNJAB (INDIA)

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The present study aimed to prepare Biodiversity Registers of two villages (Bassi Umar Khan and Atwarapur) in Bhunga block of District Hoshiarpur, Punjab. For the preparation of biodiversity registers, the vegetation of study area, local name, it's associated traditional knowledge, information about community or knowledge holders, conservation status, etc. were documented by using participatory rural appraisal exercise. A total of 294 plant species (including 288 Angiosperms, 3 Gymnosperms & 3 Pteridophytes) belonging to 232 genera and 79 families were recorded from the study area. Fabaceae was the most dominant family followed by Poaceae, Asteraceae, Cucurbitaceae, Solanaceae, etc. Out of 294 species, 142 were herbaceous, 66 trees, 52 shrubs and 34 climbers. Among 294 recorded plant species, only 78 plants were used traditionally in medicinal formulations.This accounted for 26.5% of total reported flora from the study area. Maximum number of herbs were used in different medicinal preparations followed by trees, shrubs and climbers. Maximum numbers of plants (25) were used to treat various gastrointestinal disorders and 16 plant species were found to be good to control diabetes. From the present study, it was concluded that, a rich floristic diversity and traditional knowledge is existing in the study area.

KEYWORDS: Bhunga, Biodiversity, Hoshiarpur, People Biodiversity Register, Traditional Knowledge

SHORT RUNNING TITLE: Floristic Diversity & Traditional Knowledge of Block Bhunga, District Hoshiarpur, Punjab (India)

INTRODUCTION

India is land of biological and cultural diversity and one of the17 mega-biodiverse countries in the world. It is also the home of large number of tribal groups, nomadic groups, farming and fishing communities. These communities have different kinds of nature-based livelihoods and therefore have traditional knowledge of varying degrees (NBA, 2013). In present times, the use of traditional knowledge (TK) is not restricted to the lives and livelihoods of these communities. Now a days, the demand of natural, herbal and organic products especially prepared by traditional methods is increasing globally. The industries of herbal medicine, cosmetics and personal care are the major users of these resources. This increased market demand of bio-resources and associated TK is offering new opportunities to the indigenous and local communities for generating benefits and enhancing incomes. On the contrary, cases of biopiracy and misappropriate use of traditional knowledge are becoming more common. The main reason for this misappropriation is to obtain traditional knowledge freely among the local communities and lack of proper documentation of this valuable knowledge (Pant, 2015). The Government of India introduced the "Biological Diversity Act 2002" to act on the objectives of Convention on Biological Diversity. This Act proposes the constitution of Biodiversity Management Committees (BMCs) at local level for the safeguarding and documentation of biodiversity and associated traditional knowledge within their area of jurisdiction in the form of People's Biodiversity Registers (PBRs). The Register contains information on availability and knowledge of local biological resources, their local names, medicinal or any other use, their present and past status or any other traditional knowledge associated with them. For the preparation of PBRs, involvement of large number of people who want to share their common as well as specialized knowledge is required (Saha & Bhattacharya, 2011). The PBR act as an important legal base document as evidence of prior knowledge and hence should

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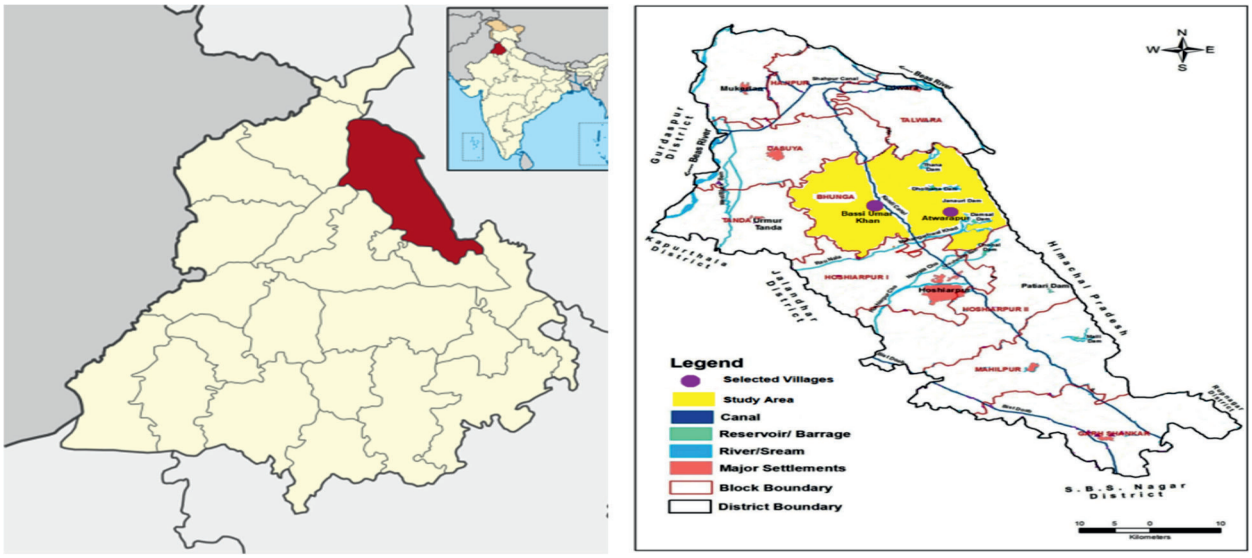
be carefully prepared. The documentation of bioresources in the form of PBRs is promoting knowledge-based sustainable management of agriculture, livestock, fish, forests and public health to enhance the quality of life of the community members (Gadgil. 2006). It also creates opportunities for locals to generate funds through imposition of collection fees for access to biodiversity resources and local traditional knowledge. Apart from these, documentation of biodiversity will also definitely reduce the cases of biopiracy and misappropriate use of traditional knowledge. Keeping these facts in mind, the present study was undertaken to prepare Biodiversity Registers for two villages (Bassi Umar Khan and Atwarapur) in Bhunga block of District Hoshiarpur, Punjab.

MATERIALS AND METHODS

Selection of Villages

Hoshiarpur is one of the oldest districts of Punjab, located in north-east part of the state. The district has three distinct geographical unitscalled Bet area (flooded plain), Kandi area (hilly area) and plain area. Bhunga block is situated in Kandi area of the district. This particular area is sub mountainous and is covered by the natural forests. It is located at the foot of shivalik hills. This area faces high incidence of soil erosion which is caused by the seasonal rivulets (Choes) passing through this region and are flooded during the rainy season. Wheat and maize are the two major crops of this region. For present study, two villages of Bhunga block have been selected namely Bassi Umar Khan and Atwarapur (Fig. 1). The criteria for selection of these villages is their rich biodiversity and unique landscapes.

Village Bassi Umar Khan is located at the latitude of 31° 38' 4.4448" N and longitude 75° 51' 43.596" E. A very old mango orchard (locally called "Inami Baag") is situated in this village. The site is spreading in 16 acres of land having 256 mango trees belonging to 43 native elite varieties (Singh et al 2012). Some area of this unique orchard has been lost due to the fragmentation caused by passing of 'Kandi canal', an irrigation channel, from the middle of the site. Thus, the site is under threat. In view of its importance as biodiverse area, Punjab Biodiversity Board has initiated actions to conserve it for in-situ preservation as Biodiversity Heritage Site.



Map of Punjab Highlighting District Hoshiarpur **(Wikipedia.org)**

Figure 1. Location map of the study area

Map of District Hoshiarpur Showing Study Area **(Sekhon et al., 2016)**

Village Atwarapur is located near Takhni Rehmanpur Wildlife Sanctuary with the GPS coordinates of 31°40'37.18" N and 075°53'38.15" E. It has an average elevation of 347 meters. Total geographical area of village is 673 hectares. Out of 673 hectares, only 55 hectares is under agriculture. Rest of the area of village is covered with moist deciduous forest. Besides this, a very old banyan tree spreading in an area of about 3-4 acres land is existing in this village.

Preparation of Biodiversity Registers

Present study was conducted in the financial year 2018-19. The preparation of People's Biodiversity Registers (PBRs) involved the active support and cooperation of large number of people including village BMC members, subject experts, farmers, knowledge holder individuals, etc. who were motivated to share their common as well as specialized knowledge. For the present survey, the standard methodology given by National Biodiversity Authority (NBA) has been adopted (NBA, 2013).The first step of PBR preparation was to organize preliminary meetings with BMC member sand village residents to explain the objectives and purpose of this study. In the second meeting, Participatory Rural Appraisal (PRA) activity was organized with the help of BMC members, in which panchayat members, BMC members, students, knowledgeable individuals and all those interested in the effort were gathered in common places of the village such as school, gurudwara sahib, community hall, panchayat hall, etc. During PRA activity, all formats of PBR including crop plants, weeds, ornamental plants, timber yielding plants, fruit plants, medicinal plants, aquatic plants and wild plants were used for discussion with locals. Different social groups in the village were identified for purpose of data collection. For example, farmers were contacted for agricultural information, timber plants, horticultural plants, women for medicinal plants used in their houses, spices, ornamental plants, etc. Local vaids or hakims were contacted for wild as well as cultivated medicinal plants. Special attention was given to the elderly persons who had sound information on the biodiversity which was available in the past but no longer seen at present.The information was also gathered from individuals through detailed questionnaire, focused group discussion with persons having knowledge and from published secondary data. For documentation of local biodiversity, each nook and corner of both villages were visited frequently in different seasons of the year. During field survey, botanical name of plants, local name, habit, habitat, other important field characters, uses, etc. were recorded in the field notebook. In biodiversity conservation point of view, collection of plant specimen was avoided, but their photographs were taken in their natural habitat.

For proper identification and updated information of documented plant species, local flora (Nair, 1978), e. floras (e. flora of China, Pakistan, North), online herbaria (The Janaki Ammal herbarium, Herbarium Kerala Forest Research Institute and ENVIS Centre on medicinal plants Digital Herbarium) and various internet sites (www.ars-grin.gov/cgi-bin/npgs/html; www.theplantlist.org; www.efloras.org; www.ipni.orgetc.) were consulted.

RESULTS AND DISCUSSIONS

Bhunga block is situated in the Kandi area of district Hoshiarpur, which has rich floral and faunal diversity. Present study was conducted in two villages of this block. The demographic information of these villages is given in Table 1. The villages were selected on the basis of their rich biodiversity and unique landscaping. Punjab Biodiversity Board has constituted Biodiversity Management Committeesin these two villages for documentation and conservation of the local biodiversity. The detail of village BMCs is given in Table 2.

Village Biodiversity

Floristic diversity of the study area consists of 294 species (including 288 species of Angiosperms, 3 species of Gymnosperms & 3 species of Pteridophytes) belonging to 232 genera and 79 families. Rawat et al, (2013) enlisted 176 wild plant species belonging to 133 genera and 57 families from Kandi area of District Hoshiarpur. Manhas et al, (2010) identified 206 species belonging to 159 genera and 59 families from the protected ecosystems of Kandi region of Punjab. These previous studies were more focused on the wild flora of Kandi area of Punjab but in present investigation, every nook and corner of the study area was visited to document every possible plant species. Some wood rot fungus was also recorded from the Mango orchards (*Ganoderma spp., Schizophyllum spp., Trametes spp.*). Similarly, Sharma et al, (2009) studied the floral diversity of Dholbaha Dam in Kandi region of District Hoshiarpur and recorded a total of 82 plant species including 15 algae, 6 pteridophytes, 1 gymnosperm and 60 angiosperms. The information was collected according to the formats given in people biodiversity registers i.e. agrobiodiversity, weeds, fruit plant, fodder, timber plants, medicinal plants, ornamental plants, wild plants etc. The comparative account of number of plant species reported from both villages is given in Table 3. A list of plant species with their families and habit were presented in Table 4. Out of 288 species of angiosperms, 44 species belonging to 36 genera and 12 families were monocots while the remaining species (244) belonging to 203 genera and 69 families were dicots.

The most dominant family of study area was Fabaceae (36) followed by Poaceae (23), Asteraceae (19), Cucurbitaceae (13), Solanaceae, Amaranthaceae (12 each), Moraceae (10), Euphorbiaceae, Brassicaceae, Convolvulaceae (9 each), etc. (Fig. 2).Whereas, in earlier studies, Poaceae was the most dominant family of Kandi area of Punjab with 28 species and 23 genera (Manhas et al 2010). Similarly, Rawat et al, (2013) also reported Poaceae as dominant family of Kandi region of District Hoshiarpur. In these studies, documentation of commercial crop plants was not included which can justify the dominance of family Fabaceae in present study.

The favorable genera which have maximum number of species includes *Ipomoea* (7), *Ficus* (6), *Acacia, Brassica, Cucumis, Euphorbia and Solanum* have 4 species each. Manhas et al, (2010) also recorded *Ipomoea* (7 species) as the most dominant genera among all the plant collected from Kandi region of Punjab. Amongst all species, 142 were herbs, 52 shrubs, 66 trees and 34 climbers (Fig. 3). Sequence of variation in growth habit is also similar to their findings.

Domesticated floristic diversity

Nearly 42 crop plant species (including fodder) and their varieties had been reported from both the villages. Among the prioritized crops, 7 varieties of wheat, 6 varieties of rice, 9 varieties of maize, 4 varieties of sugarcane and 2 varieties of potato were grown in the villages. These five crops were mainly grown for commercial purpose and the remaining crops were grown on small scale for their domestic uses only. During participatory rural appraisal activities, people also informed that high yielding hybrid varieties were preferred by local farmers, in place of traditional varieties. This practice can lead to loss of genetic diversity. Besides this, high application of chemical fertilizers and pesticides tend to reduce the fertility of soil and also destroy the micro biodiversity. People also had opinion that although the traditional varieties have low yield but are better in flavor and taste than the modern hybrid varieties. Mango and orange (kinnow) were the two major horticulture crops. Other fruit plants were *Psidium guajava, Syzygium cumini, Phyllanthus emblica, Prunus persica, Zizyphus jujuba,* etc. Many tree species were also grown for their

wood. *Populus, Acacia catechu* and *Eucalyptus* were profusely grown for their valuable timber. Village Atwarapur BMC members informed that more than 2000 *Acacia catechu* plants were grown in village panchayat land with the help of forest department, due to its high market value. Some plants were also cultivated due to their healing power to cure diseases like *Aloe vera, Ocimum, Mentha, Moringa, Datura, Azadirachta indica, Curcuma longa, Trigonella foenum-graecum, Zingiber officinale,* etc. Many medicinal plants were also collected from wild like *Murraya koenigii, Momordica dioica, Ficus palmata, Cuscuta reflexa, Justicia adhatoda, Achyranthes aspera,*etc. It was observed that village residents were very fond of growing ornamental plants in their houses, schools, community houses, public places, along roadside due to their aesthetic value.

Wild floristic diversity

During biodiversity assessment, a complete list of floristic diversity of the two villages was identified and documented. Their local name, uses, current status and trend over last 10 years have also been documented with the help of local people. Many wild plant species have been used by locals for food, fruit, fodder, medicine, timber etc. Most commonly used wild tree species were *Emblica officinalis, Flacourtia indica, Holoptelea integrifolia, Leucaena leucocephala, Morus alba, Albizia lebbeck*; wild shrubs were *Achyranthes aspera, Withania somnifera, Justicia adhatoda, Cannabis sativa, Carissa spinarum, Murraya koenigii,* wild herbs were *Solanum nigrum, Chenopodium album, Artemisia scoparia, Ocimum sp.* (Jangli tulsi*), Saccharum spontaneum* and climbers were *Tinospora cordifolia, Coccinia grandis, Cuscuta reflexa, Abrus precatorius, Boerhavia diffusa,* etc. Aquatic biodiversity was very rare because there is a scarcity of water in these areas. Level of ground water (drinking water) was about 200 feet's in these villages. Therefore, people were relying on water supply scheme initiated by state government and water canals. Some plants like *Ficus religiosa* (Peepal), *Ficus benghalensis* (Bohar) and *Ocimum sanctum* (Tulsi) were conserved by local people due to their religious beliefs associated with them. A very old large banyan tree (*Ficus benghalensis*) spreading in an area of about 3-4 acres land in the village Atwarapur is worshipped by local people. Apart from the significance of floral diversity, some plants have becoming a problem for the locals like *Lantana camara,* an invasive dense, spiny shrub, *Parthenium hysterophorus*, also an invasive plant causes skin allergy, *Mucuna purpurea*, has hairy fruits cause various kind of allergy. Many wood rotten fungal species were also destroying the horticultural plants.

Traditional uses of Medicinal plants

The data on medicinal uses of plants was collected from two villages of Bhunga block of District Hoshiarpur, Punjab. These plant species were used for the treatment of various human ailments as well as veterinary problems. There were 78 plant species belonging to 70 genera and 39 families. These accounted for 26.5% of total reported flora from the study area. Out of these 78 species, 61 species were only used to cure human ailments whereas six for veterinary problems. Similarly, 11 plant species were used for both human as well as veterinary diseases. Thus, a total of 17 plants were used in different veterinary diseases. Plant species with their vernacular name, part used and method of preparation for particular disease have been enlisted in Table 5. Amongst 39 families, the most widely utilized species belonged to Fabaceae (Eight species) followed by Cucurbitaceae, Moraceae, Solanaceae (Four species each). Amaranthaceae, Asteraceae, Brassicaceae, Combretaceae, Myrtaceae, Poaceae and Rutaceae were third largest families with three species each. Fabaceae has also emerged as medicinal plant rich family in previous studies which were conducted in different parts of the world (Amri & Kisangau,

2012; Bhandary & Chandrashekar, 2014; Samar et al, 2015). Maximum number of herbs (31 species) was used in different medicinal preparations followed by trees (27 species), shrubs (14) and climbers (6). The use of more herbs was also indicated by Tariq et al, (2015) and Silambarasan et al, (2017). The dosage of medicinal preparation varied with age and health of patients.

Numbers of plant species used for the treatment of various diseases have been given in Figure 4. Maximum numbers of species (25 species) were observed to treat various gastrointestinal disorders including diarrhea, dysentery, indigestion, constipation, vomiting, etc. *Coriandrum sativum*, *Foeniculum vulgare*, *Mentha arvensis*, *Rosa indica* were also used as condiments in many local dishes. *Artemisia scoparia*, *Cassia fistula*, *Foeniculum vulgare*, *Saccharum officinarum* were used in digestive disorders of both human as well as livestock. Use of maximum number of plants for gastrointestinal disorders also indicates the frequent occurrence of these health-related problems. In present study, 16 plant species were found to be used in management of diabetes. All the four species of family Cucurbitaceae were used by natives of study area for this purpose. Use of these plant species has also been indicated in other studies (Ocvirket al, 2013; Lal et al, 2018). For the treatment of various skin problems such as pimples, acne, blisters, rashes, skin boils, skin abscesses, etc., 15 plant species have been practiced. In India, plant species such as *Aloe vera*, *Azadirachta indica*, *Curcuma longa*, *Rosa indica* are also used in many cosmetic products. There were 11 plant species for the treatment of various musculoskeletal problems. These herbal preparations were either applied as massage oil or mixed with other ingredients and given orally. Fruit powder of *Tribulus terrestris* was used to make rural snacks called 'Panjiri' and considered beneficial for backache. For respiratory problems and circulatory problems, 10 plant species for each of them were used by natives of study area. *Achyranthes aspera* and *Justicia adhatoda* grows wildly and were used in asthma. *Curcuma longa* was used to control cholesterol. *Momordica charantia* and *Curcuma longa* were reported for their role in blood purification. Twigs of seven plant species were chewed to clean teeth whereas leaves of only one plant species i.e. *Syzygium cuminii* were used for this purpose. Similarly, seven plants were used to get relieve from fever. Only six plant species were used as cooling herbal drink to clear summer heat. During present study, 17 plant species were used to cure various health related problems of livestock among which digestive problems, cattle poisoning, less milk production were very common. Natives prefer to treat these common problems of their livestock with herbal remedies and consult medical practitioners only if required.

Different parts of the plants, only aerial parts and sometimes whole plant was used in different medicinal preparations. Fruits (43.6%) were most frequently used plant part followed by leaves (26.9%), twigs (10.25%), flowers and seed (8.9%), latex (5.1%), root, stem and whole plant (3.8%). Bark, bulbs, rhizome (2.5%), tuber, petals, leaf pulp, oil and aerial parts of some plants were also used. Fruits were preferred in various medicinal preparations for human and livestock ailments by natives of different regions (Baharvand-Ahmadiet et al, 2016; Pare et al, 2016; Ullah et al, 2017). Some of these remedies were taken as raw fruit, cooked as vegetables or used in small amount as pickle, chutney or sweet fruit preserve (murabba). Some preparations were also taken with milk, honey, candied sugar and even fried in oil or ghee. The medicinal preparations were not stored for long time. However, some of the herbs were stored in dry form to use in case fresh plants were not available nearby. Otherwise they prefer to prepare fresh formulation and consume them as soon as possible.

CONCLUSION

The present study revealed 294 species (including 288 Angiosperms, 3 Gymnosperms & 3 Pteridophytes) of higher plants belonging to 232 genera and 79 families and also the medicinal uses of 78 plant species. However, documentation of floristic diversity and medicinal uses of many plants could not be explored due to the lack of sufficient information. That may be due to less interest of young generation about the identification and medicinal importance of these plant species. Many wild plant species had been reported from the study area which are an integral part of traditional medicinal system. Moreover, the conservation of medicinal plant species in their natural wild habitats has become very important. Rapid urbanization has led to negative effect on biodiversity including plant species which are of medicinal use. Removal of bark and uprooting of medicinal plants for their rhizome or roots which are traded for various herbal formulations also effect their survival. Further the application of more fertilizers, weedicides and pesticides would seriously affect the local plant and animal diversity of the region. Documentation of local flora and its associated traditional knowledge in the form of PBRs is one of best approach to conserve these plant species and protect traditional knowledge from biopiracy. It also helps to understand the relationship of local communities with their surrounding biodiversity. Enlisting of plant species at village level will also help to compile district flora, then state flora and subsequently country flora. This also acts as source of information to researchers, pharmacologists and young generation.

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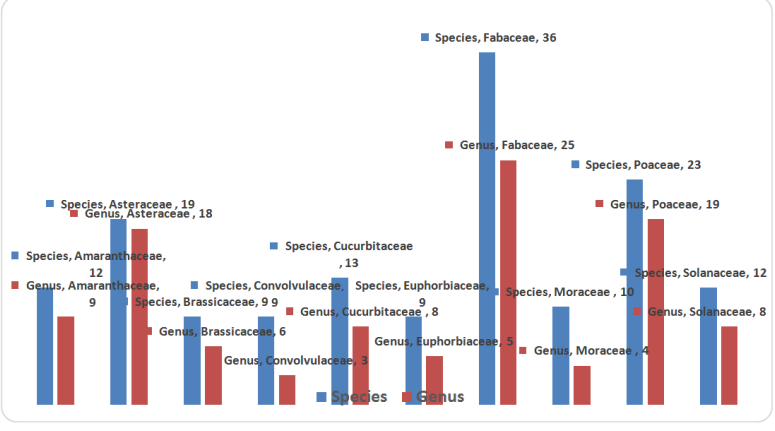

Figure 2. Dominant families with number of genera and species

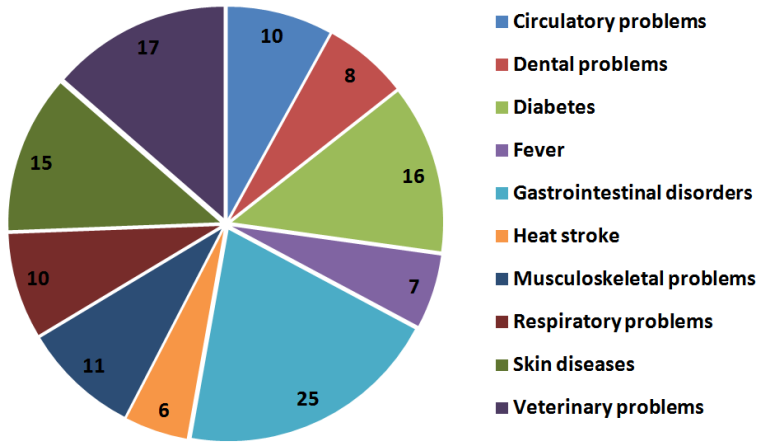

Figure 3. Different life forms of recorded species

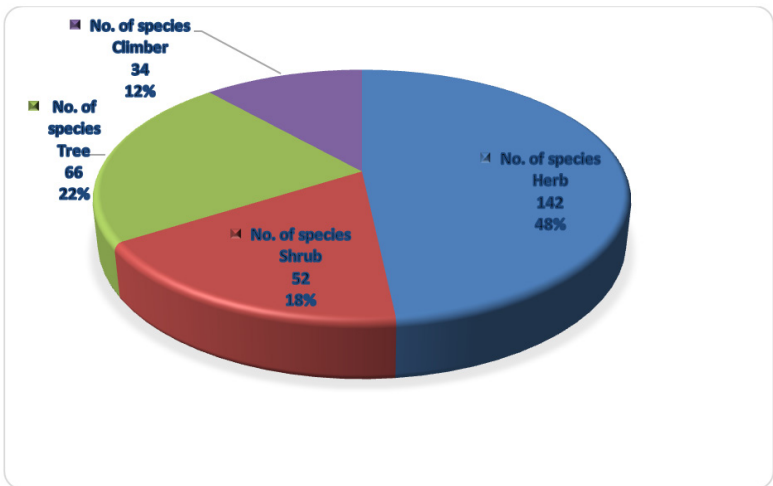

Figure 4: Number of plant species used to cure major diseases

Table 1. Demographics of Village Bassi Umar Khan and Atwarapur

Sr. No.	Features	Village Bassi Umar Khan	Village Atwarapur
1	Village total population	711	546
2	Total number of households	134	116
3	Female population	342	274
4	Male population	369	272
5	Average literacy rate	84.2%	74.0%
6	Average working population	28.5%	23.1%
7	Major occupations	Agriculture	Agriculture

(Source: Census of India (2011); Economic & Statistical Organization of Punjab)

Table 2. Detail of Biodiversity Management Committee (BMC) Members

Sr. No.	Designation	Village BMC Bassi Umar Khan	Village BMC Atwarapur
1	**Chairperson**	Sh. Balwaan Singh Rana	Sh. Mohan Singh
2	**Women member**	Smt. Narinder Kaur	Smt. Karamjit Kaur
3	**Women member**	Smt. Raj Kumari	Smt. Karamjit Kaur
4	**SC/ST member**	Sh. Dhanna Ram	Sh. Joginder Pal Singh
5	**Member**	Sh. Rashpal Singh	Sh. Amrik Singh
6	**Member**	Sh. Hari Ram	Sh. Parladh Kumar
7	**Secretary**	Sh. Gulshan Kumar	Sh. Jatinder Singh

Table 3. Floristic Diversity of Two Villages

Domesticated			**Wild**		
Plant Type	**Bassi Umar Khan**	**Atwarapur**	**Plant Type**	**Bassi Umar Khan**	**Atwarapur**
Crop Plants	33	30	Herbs	23	39
Fodder Plant	09	8	Shrubs	11	16
Fruit Plants	17	13	Trees	22	24
Ornamental Plants	32	14	Climbers	6	11
Timber trees	19	15			

Table 4. Floristic Diversity of Bhunga Block of District Hoshiarpur

Sr. No.	Scientific Name	Family	Habit
1	*Abelmoschus esculentus* (L.) Moench.	Malvaceae	Herb
2	*Abrus precatorius* L.	Fabaceae	Climber
3	*Abutilon indicum* (L.) Sweet.	Malvaceae	Shrub
4	*Acacia catechu* Willd.	Fabaceae	Tree
5	*Acacia modesta* Willd.	Fabaceae	Tree
6	*Acacia nilotica* (L.) Delile	Fabaceae	Tree
7	*Acacia leucophloea* (Roxb.) Willd.	Fabaceae	Tree
8	*Achyranthes aspera* L.	Amaranthaceae	Shrub
9	*Adiantum incisum* Forssk.	Pteridaceae	Herb
10	*Aegle marmelos* (L.) Corr. ex Roxb.	Rutaceae	Tree
11	*Aerva javanica* Juss. ex Schult.	Amaranthaceae	Herb
12	*Ageratum conyzoides* L.	Asteraceae	Herb
13	*Ailanthus excelsa* Roxb.	Simarubaceae	Tree
14	*Albizia lebbeck* Benth.	Fabaceae	Tree
15	*Albizia procera* (Roxb.) Benth.	Fabaceae	Tree
16	*Allium cepa* L.	Amaryllidaceae	Herb

17	*Allium sativum* L.	Amaryllidaceae	Herb
18	*Aloe vera* Tourn. ex Linn.	Xanthorrhoeaceae	Herb
19	*Alstonia scholaris* R. Br.	Apocynaceae	Tree
20	*Alternanthera philoxeroides* Griseb.	Amaranthaceae	Herb
21	*Amaranthus spinosus* L.	Amaranthaceae	Herb
22	*Amaranthus tricolor* L.	Amaranthaceae	Herb
23	*Amaranthus viridis* L.	Amaranthaceae	Herb
24	*Anagallis arvensis* L.	Primulaceae	Herb
25	*Anisomeles indica* L.	Lamiaceae	Herb
26	*Arachis hypogaea* L.	Fabaceae	Herb
27	*Araucaria heterophylla* (Salisb.) Franco	Araucariaceae	Tree
28	*Argemone mexicana* L.	Papaveraceae	Herb
29	*Argemone ochroleuca* Swet.	Papaveraceae	Shrub
30	*Artemisia scoparia* Waldst. & Kit.	Asteraceae	Herb
31	*Artocarpus lacucha* Buch. - Ham.	Moraceae	Tree
32	*Arundo donax* L.	Poaceae	Herb
33	*Asparagus racemosus* Willd.	Asparagaceae	Shrub
34	*Asphodelus tenuifolius* Cav.	Xanthorrhoeaceae	Herb
35	*Avena fatua* L.	Poaceae	Herb
36	*Avena sativa* L.	Poaceae	Herb
37	*Azadirachta indica* A. Juss.	Meliaceae	Tree
38	*Barleriacristata* L.	Acanthaceae	Shrub
39	*Basella alba* L.	Basellaceae	Climber
40	*Bauhinia variegata* L.	Fabaceae	Tree
41	*Bidens pilosa* L.	Asteraceae	Herb
42	*Boerhavia diffusa* L.	Nyctaginaceae	Herb
43	*Bougainvillea spectabilis* Willd.	Nyctaginaceae	Woody Climber
44	*Brassica napus* L.	Brassicaceae	Herb
45	*Brassica oleracea* var. *botrytis* (L.) Alef.	Brassicaceae	Herb
46	*Brassica oleracea* var. *capitata* (L.) Alef.	Brassicaceae	Herb
47	*Brassica rapa* L.	Brassicaceae	Herb
48	*Broussonetia papyrifera* Vent.	Moraceae	Tree
49	*Bryonopsis laciniosa* (L.) Naudin.	Cucurbitaceae	Climber
50	*Bryophyllum pinnatum* (Lam.) Kurz.	Crassulaceae	Herb
51	*Caesulia axillaris* Roxb.	Asteraceae	Herb
52	*Callistemon lanceolatus* DC.	Myrtaceae	Tree
53	*Calotropis procera* (Ait.) R. Br.	Apocynaceae	Shrub
54	*Canna indica* L.	Cannaceae	Herb

55	*Cannabis sativa* L.	Cannabaceae	Herb
56	*Capsicum annuum* L.	Solanaceae	Herb
57	*Carica papaya* L.	Caricaceae	Tree
58	*Caryota urens* L.	Arecaceae	Tree
59	*Cassia fistula* L.	Fabaceae	Tree
60	*Cassia glauca* Lam.	Fabaceae	Tree
61	*Catharanthus roseus* (L.) G. Don	Apocynaceae	Herb
62	*Cayratia trifolia* (L.) Domin	Vitaceae	Climber
63	*Cedrela toona* Roxb.	Meliaceae	Tree
64	*Celosia cristata* L.	Amaranthaceae	Herb
65	*Chenopodiastrum murale* (L.) S. Fuentes, Uotila & Borsch	Amaranthaceae	Herb
66	*Chenopodium album* L.	Chenopodiaceae	Herb
67	*Chrysanthemum indicum* L.	Asteraceae	Herb
68	*Chukrasia tabularis* A. Juss.	Meliaceae	Tree
69	*Cicer arietinum* L.	Fabaceae	Herb
70	*Cichorium intybus* L.	Asteraceae	Herb
71	*Cissampelos pareira* L.	Menispermaceae	Climber
72	*Citrus limon* (L.) Osbeck	Rutaceae	Shrub
73	*Citrus sinensis* (L.) Osbeck.	Rutaceae	Shrub
74	*Cleome viscosa* L.	Capparidaceae	Herb
75	*Clerodendrum inerme* (L.) Gaertn.	Verbenaceae	Shrub
76	*Cirsium arvense*(L.) Scop.	Asteraceae	Herb
77	*Coccinia grandis* (L.) Voigt	Cucurbitaceae	Climber
78	*Coix lacryma-jobi* L.	Poaceae	Herb
79	*Colocasia esculenta* (L.) Schott.	Araceae	Herb
80	*Commelina benghalensis* L.	Commelinaceae	Herb
81	*Commelina nudiflora* L.	Commelinaceae	Herb
82	*Consolida ajacis* (L.) Schur	Ranunculaceae	Herb
83	*Convolvulus arvensis* L.	Convolvulaceae	Climber
84	*Cordia dichotoma* G. Forst.	Boraginaceae	Tree
85	*Coriandrum sativum* L.	Apiaceae	Herb
86	*Coronopus didymus* (L.) Smith Fl. Brit.	Brassicaceae	Herb
87	*Crataeva religiosa* Hook.f. & Thoms.	Capparidaceae	Tree
88	*Croton bonplandianum* Baill.	Euphorbiaceae	Herb
89	*Cucumis callosus* (Rottl.) Cogn.	Cucurbitaceae	Climber
90	*Cucumis melo* L.	Cucurbitaceae	Climber
91	*Cucumis melo* var. *utilissimus* (Roxb.) Duthie & J. B. Fuller	Cucurbitaceae	Climber

92	*Cucurbita maxima* Duchesne.	Cucurbitaceae	Climber
93	*Cucurbita pepo* L.	Cucurbitaceae	Climber
94	*Curcuma longa* L.	Zingiberaceae	Herb
95	*Cuscuta reflexa* Roxb.	Convolvulaceae	Climber
96	*Cycas revoluta* Thunb.	Cycadaceae	Tree
97	*Cynodon dactylon* Pers.	Poaceae	Climber
98	*Cyperus difformis* L.	Cyperaceae	Herb
99	*Cyperus rotundus* L.	Cyperaceae	Herb
100	*Dahlia pinnata* Cav.	Asteraceae	Herb
101	*Dalbergia sissoo* Roxb.	Fabaceae	Tree
102	*Datura metel* L.	Solanaceae	Shrub
103	*Datura stramonium* L.	Solanaceae	Shrub
104	*Daucus carota* L.	Apiaceae	Herb
105	*Delonix regia* (Boj.) Raf.	Fabaceae	Tree
106	*Dicliptera roxburghiana* Nees.	Acanthaceae	Herb
107	*Digera muricata* (L.) Mart.	Amaranthaceae	Herb
108	*Dracaena marginata* Vand. Ex. L.	Asparagaceae	Shrub
109	*Duranta repens* L.	Verbenaceae	Shrub
110	*Dysphania ambrosioides* (L.) Mosyakin & Clemants	Amaranthaceae	Shrub
111	*Echinochloa colona* (L.) Link.	Poaceae	Herb
112	*Echinochloa crusgalli*	Poaceae	Herb
113	*Eclipta prostrata* (L.) L.	Asteraceae	Herb
114	*Epipremnum aureum* (L.) Engl.	Araceae	Climber
115	*Epipremnum pinnatum* (L.) Engl.	Araceae	Herb
116	*Equisetum debile* Roxb.	Equisetaceae	Herb
117	*Erigeron bonariensis* L.	Asteraceae	Herb
118	*Eriobotrya japonica* (Thunb.) Lindl.	Rosaceae	Tree
119	*Eruca sativa* Mill.	Brassicaceae	Herb
120	*Eucalyptus sp.*	Myrtaceae	Tree
121	*Euphorbia hirta* L.	Euphorbiaceae	Herb
122	*Euphorbia milii* var. *splendens* (Bojer ex Hook.)	Euphorbiaceae	Herb
123	*Euphorbia neriifolia* L.	Euphorbiaceae	Shrub
124	*Euphorbia prostrata* Ait.	Euphorbiaceae	Herb
125	*Ficus benghalensis* L.	Moraceae	Tree
126	*Ficus carica* L.	Moraceae	Tree
127	*Ficus elastica* Roxb.	Moraceae	Tree
128	*Ficus glomerata* Roxb.	Moraceae	Tree

129	*Ficus palmata* Forsk.	Moraceae	Shrub
130	*Ficus religiosa* L.	Moraceae	Tree
131	*Foeniculum vulgare* Mill.	Apiaceae	Herb
132	*Fumaria indica* Pugsl.	Fumariaceae	Herb
133	*Galium aparine* L.	Rubiaceae	Herb
134	*Gnaphalium indicum* L.	Asteraceae	Herb
135	*Gomphrena celosioides* Martius.	Amaranthaceae	Herb
136	*Grevillea robusta* A. Cunn.	Proteaceae	Tree
137	*Hibiscus rosa-sinensis* L.	Malvaceae	Shrub
138	*Holoptelea integrifolia* (Roxb.) Planch.	Ulmaceae	Tree
139	*Hordeum vulgare* L.	Poaceae	Herb
140	*Indigofera linifolia* (L.f.) Retz.	Fabaceae	Herb
141	*Indigofera tinctoria* L.	Fabaceae	Shrub
142	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	Creeping herb
143	*Ipomoea carnea* Jacq.	Convolvulaceae	Shrub
144	*Ipomoea nil* (L.) Roth.	Convolvulaceae	Climber
145	*Ipomoea pes-tigridis* L.	Convolvulaceae	Climber
146	*Ipomoea quamoclit* L.	Convolvulaceae	Climber
147	*Ipomoea triloba* L.	Convolvulaceae	Climber
148	*Ipomoea cairica* (L.) Sweet	Convolvulaceae	Climber
149	*Jacaranda mimosifolia* D. Don	Bignoniaceae	Tree
150	*Jasminum mesnyi* Hance	Oleaceae	Climber
151	*Jatropha curcas* L.	Euphorbiaceae	Shrub
152	*Jatropha integerrima* Jacq.	Euphorbiaceae	Shrub
153	*Justicia adhatoda* L.	Acanthaceae	Shrub
154	*Lablab purpureus* (L.) Sweet	Fabaceae	Climber
155	Lagenaria siceraria (Molina) Standl.	Cucurbitaceae	Climber
156	*Lamium amplexicaule* L.	Lamiaceae	Herb
157	*Lantana camara* L.	Verbenaceae	Shrub
158	*Lathyrus aphaca* L.	Fabaceae	Herb
159	*Launaea nudicaulis* (L.) Hook. f.	Asteraceae	Herb
160	*Lawsonia inermis* L.	Lythraceae	Shrub
161	*Lemna minor* L.	Lemnaceae	Herb
162	*Lens culinaris* Medik.	Fabaceae	Herb
163	*Lepidium sativum* L.	Brassicaceae	Herb
164	*Leucaena leucocephala* (Lamk.) de Wit.	Fabaceae	Tree
165	*Leucas cephalotes* Spreng.	Lamiaceae	Herb
166	*Lindenbergia macrostachya* Benth.	Scrophulariaceae	Herb
167	*Linum usitatissimum* L.	Linaceae	Herb

168	*Luffa acutangula* (L.) Roxb.	Cucurbitaceae	Climber
169	*Lycopersicon esculentum* Mill.	Solanaceae	Herb
170	*Malva rotundifolia* L.	Malvaceae	Herb
171	*Malvastrum coromandelianum* (L.) Garcke.	Malvaceae	Shrub
172	*Malvaviscus arboreus* Cav.	Malvaceae	Shrub
173	*Mangifera indica* L.	Anacardiaceae	Tree
174	*Marsilea minuta* L.	Marsileaceae	Herb
175	*Martynia annua* L.	Martyniaceae	Shrub
176	*Mazus pumilus* (Burm. f.) Steenis	Scrophulariaceae	Herb
177	*Medicago polymorpha* L.	Fabaceae	Herb
178	*Melia azedarach* L.	Meliaceae	Tree
179	*Melilotus albus* Medik.	Fabaceae	Herb
180	*Melilotus indicus* (L.) All.	Fabaceae	Herb
181	*Mentha arvensis* L.	Lamiaceae	Herb
182	*Mirabilis jalapa* L.	Nyctaginaceae	Herb
183	*Momordica charantia* L.	Cucurbitaceae	Climber
184	*Momordica dioica* Roxb. Ex Willd.	Cucurbitaceae	Climber
185	*Moringa oleifera* Lamk.	Moringaceae	Tree
186	*Morus alba* L.	Moraceae	Tree
187	*Morus indica* L.	Moraceae	Tree
188	*Mucuna pruriens*(L.) DC.	Fabaceae	Climber
189	*Mukia maderaspatana* (L.) M. Rome.	Cucurbitaceae	Climber
190	*Murraya koenigii* (L.) Spreng.	Rutaceae	Shrub
191	*Musa paradisiaca* L.	Musaceae	Herb
192	*Neolamarckiacadamba* (Roxb.) Bosser	Rubiaceae	Tree
193	*Nerium indicum* Mill.	Apocynaceae	Shrub
194	*Nicotiana plumbaginifolia* Viv.	Solanaceae	Herb
195	*Ocimum sanctum* L.	Lamiaceae	Herb
196	*Ocimum spp.*	Lamiaceae	Herb
197	*Opuntia dillenii* Haw.	Cactaceae	Shrub
198	*Oroxylum indicum* Vent.	Bignoniaceae	Tree
199	*Oryza sativa* L.	Poaceae	Herb
200	*Oxalis corniculata* L.	Oxalidaceae	Herb
201	*Oxalis debilis* var. *corymbosa* (DC.) Lourteig	Oxalidaceae	Herb
202	*Panicum virgatum* L.	Poaceae	Herb
203	*Parthenium hysterophorus* L.	Asteraceae	Herb
204	*Pennisetum typhoides* Rich.	Poaceae	Herb

205	*Peristrophe bicalyculata* (Retz.) Nees.	Acanthaceae	Herb
206	*Petunia hybrida* Vilm.	Solanaceae	Herb
207	*Phalaris minor* Retz.	Poaceae	Herb
208	*Phoenix dactylifera* L.	Arecaceae	Tree
209	*Phragmites karka* (Retz.) Trin. ex Steud	Poaceae	Herb
210	*Phyla nodiflora* (L.) Greene	Verbenaceae	Herb
211	*Phyllanthus emblica* L.	Phyllanthaceae	Tree
212	*Physalis minima* L.	Solanaceae	Herb
213	*Pisum sativum* L.	Fabaceae	Herb
214	*Plumeria alba* L.	Apocynaceae	Tree
215	*Poa annua* L.	Poaceae	Herb
216	*Polyalthia longifolia* (Sonn.) Thw.	Annonaceae	Tree
217	*Polygonum barbatum* Linn.	Polygonaceae	Shrub
218	*Pongamia pinnata* Pierre	Fabaceae	Tree
219	*Populus angustifolia* James	Salicaceae	Tree
220	*Portulaca grandiflora* Hook.	Portulacaceae	Herb
221	*Portulaca pilosa* L.	Portulacaceae	Herb
222	*Portulaca quadrifida* L.	Portulacaceae	Herb
223	*Prunus persica* Batsch.	Rosaceae	Tree
224	*Prunus bokhariensis* Royle ex C.K.Schneid	Rosaceae	Tree
225	*Psidium guajava* L.	Myrtaceae	Tree
226	*Punica granatum* L.	Punicaceae	Tree
227	*Putranjiva roxburghii* Wall.	Euphorbiaceae	Tree
228	*Ranunculus sceleratus* L.	Ranunculaceae	Herb
229	*Raphanus sativus* L.	Brassicaceae	Herb
230	*Ricinus communis* L.	Euphorbiaceae	Small tree
231	*Rosa indica* Hook. f.	Rosaceae	Shrub
232	*Roystonea regia* O. f. Cook.	Arecaceae	Tree
233	*Rumex dentatus* L.	Polygonaceae	Herb
234	*Saccharum bengalense* Retz.	Poaceae	Herb
235	*Saccharum officinarum* L.	Poaceae	Herb
236	*Saccharum spontaneum* L.	Poaceae	Herb
237	*Senna occidentalis* (L.) Link.	Fabaceae	Shrub
238	*Senna tora* (L.) Roxb.	Fabaceae	Shrub
239	*Setaria verticillata* (Linn.) P. Beauv	Poaceae	Herb
240	*Setaria viridis* (L.) P. Beauv.	Poaceae	Herb
241	*Sida acuta* Burm. f.	Malvaceae	Shrub
242	*Sisymbrium irio* L.	Brassicaceae	Herb

243	*Solanum melongena* L.	Solanaceae	Shrub
244	*Solanum nigrum* L.	Solanaceae	Herb
245	*Solanum tuberosum* L.	Solanaceae	Herb
246	*Solanum virginianum* L.	Solanaceae	Shrub
247	*Sonchus asper* Hill.	Asteraceae	Herb
248	*Sonchus oleraceus* L.	Asteraceae	Herb
249	*Sorghum halepense* (L.) Pers.	Poaceae	Herb
250	*Spergula arvensis* L.	Caryophyllaceae	Herb
251	*Spinacia oleracea* L.	Amaranthaceae	Herb
252	*Stellaria media* (L.) Vill.	Caryophyllaceae	Herb
253	*Syzygium cuminii* (L.) Skeels.	Myrtaceae	Tree
254	*Tabernaemontana divaricata* (L.) R. Br.	Apocynaceae	Shrub
255	*Tagetes erecta* L.	Asteraceae	Herb
256	*Tamarindus indica* L.	Fabaceae	Tree
257	*Tecoma capensis* Lindl.	Bignoniaceae	Climber
258	*Tecoma stans* (L.) H. B. & K.	Bignoniaceae	Tree
259	*Terminalia arjuna* (Roxb. ex DC.) Wt. & Arn.	Combretaceae	Tree
260	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Tree
261	*Themeda anathera* Hack.	Poaceae	Herb
262	*Thevetia peruviana* (Pers.) K. Schum.	Apocynaceae	Tree
263	*Thuja occidentalis* L.	Cupressaceae	shrub
264	*Tinospora cordifolia* (Wild.) Hook. f. et Thoms.	Menispermaceae	Climber
265	*Trianthema portulacastrum* L.	Aizoaceae	Herb
266	*Tribulus terrestris* L.	Zygophyllaceae	Herb
267	*Trichodesma indicum* R. Br.	Boraginaceae	Herb
268	*Tridex procumbens* L.	Asteraceae	Herb
269	*Trifolium alexandrinum* L.	Fabaceae	Herb
270	*Trigonella corniculata* (L.) L.	Fabaceae	Herb
271	*Trigonella foenum-graecum* L.	Fabaceae	Herb
272	*Triticum aestivum* L.	Poaceae	Herb
273	*Triumfetta tomentosa* Bojer.	Tiliaceae	Shrub
274	*Tropaeolum majus* L.	Tropaeolaceae	Climber
275	*Typha angustata* Bory & Chaub.	Typhaceae	Herb
276	*Urena lobata* L.	Malvaceae	Shrub
277	*Verbascum chinense* (L.) Santapau	Scrophulariaceae	Shrub
278	*Verbascum thapsus* L.	Scrophulariaceae	Shrub
279	*Vernonia cinerea* Less.	Asteraceae	Herb

280	*Veronica agrestis* L.	Scrophulariaceae	Herb
281	*Veronica anagallis-aquatica* L.	Scrophulariaceae	Herb
282	*Vicia faba* L.	Fabaceae	Herb
283	*Vicia sativa* L.	Fabaceae	Climber
284	*Vigna mungo* (L.) Hepper	Fabaceae	Herb
285	*Vigna radiata* (L.) R. Wilczek	Fabaceae	Herb
286	*Viola wittrockiana* Gams.	Violaceae	Herb
287	*Vitex negundo* L.	Verbenaceae	Tree
288	*Wendlandia heynei* Sant. & Merch.	Rubiaceae	Shrub
289	*Withania somnifera* Dunal.	Solanaceae	Shrub
290	*Xanthium strumarium* L.	Asteraceae	Shrub
291	*Zea mays* L.	Poaceae	Herb
292	*Zingiber officinale* Rosc.	Zingiberaceae	Herb
293	*Zizyphus mauritiana* Lam.	Rhamnaceae	Tree
294	*Zizyphus nummularia* (Burm. f.) Wt. & Arn.	Rhamnaceae	Shrub

Table 5. List of Traditional Medicinal Plants Used to Treat Human and Livestock Ailments in Bhunga Block, District Hoshiarpur

Sr. No.	Botanical Name	Family	Vernacular name	Part Used	Method of Preparation/ Diseases
1	*Acacia catechu* Willd.	Fabaceae	Khair	Stem, bark	Small pieces of wood are dipped in water overnight and drink in early morning is good to control diabetes. Useful in skin diseases, diarrhea, dysentery, foul ulcers.
2	*Acacia nilotica* (L.) Delile	Fabaceae	Kikar	Pod, young twigs	Young pod is used in herbal preparation for cough. Young twig is chewed as toothbrush to clean teeth.
3	*Achyranthes aspera* L.	Amaranthaceae	Puth kanda	Fruits	Fruit powder with honey is used to cure cough and asthma.

Sr. No.	Botanical Name	Family	Vernacular name	Part Used	Method of Preparation/ Diseases
4	*Aegle marmelos* (L.) Corr. ex Roxb.	Rutaceae	Bil	Fruits	Fruit is coolant, good against many digestive problems and as anti-diabetic.
5	*Albizia lebbeck* Benth.	Fabaceae	Shri	Leaves	Leaf extract is used for cattle eye problems.
6	*Allium cepa* L.	Amaryllidaceae	Piyaz	Bulb	Bulb juice acts as carminative & taken orally to control vomiting, diarrhea, indigestion, cholera and poison due to snake bite. It is dropped into ear for earache.
7	*Allium sativum* L.	Amaryllidaceae	Lasun	Bulb	Bulblet extract is poured into ear to get relief from earache. Raw bulblets are taken with water empty stomach in early morning is good for cardiovascular diseases, rheumatic pain and to control cholesterol.
8	*Aloe vera* Tourn. Ex Linn.	Xanthorrhoe-aceae	Kuwar	Leaf pulp	Leaf pulp is used to cure skin problems, joint pain and diabetes.
9	*Argemone mexicana* L.	Papaveraceae	Poli	Flowers	Used to treat reproductive problems in cattle.
10	*Artemisia scoparia* Waldst. & Kit.	Asteraceae	Jhau	Seeds	Seeds are used to cure digestive problems in both human as well as cattle.

Sr. No.	Botanical Name	Family	Vernacular name	Part Used	Method of Preparation/ Diseases
11	*Azadirachta indica* A. Juss.	Meliaceae	Neem	Leaves, fruits, twigs	Leaves and fruits are anti-bacterial and their decoction is used in skin disorders. Twigs are used in tooth problems as tooth brush
12	*Bauhinia variegata* L.	Fabaceae	Kachnar	Flowers, fruits	Flowers and fruits are used in skin disorders.
13	*Boerhavia diffusa* L.	Nyctaginaceae	Gadha vel	Whole plant	Whole plant decoction is good for typhoid fever.
14	*Brassica napus* L.	Brassicaceae	Sarho	Seed, seed oil	Seed oil is used anti-helminthic, analgesic, skin problems, earache, musculoskeletal problems.
15	*Brassica rapa* L.	Brassicaceae	Shalgum	Root	Raw roots and their vegetable are also useful to control blood pressure and constipation.
16	*Bryophyllum pinnatum* (Lam.) Kurz.	Crassulaceae	Pathar chat	Leaves	Warm leaves are tied on skin problems like blisters, rashes, skin boils, skin abscess etc.
17	*Calotropis procera* (Ait.) R. Br.	Apocynaceae	Akk	Leaves, latex, young flower	Young flowers are eaten to cure fever. Leaves placed under feet sole in shoes is said to be control diabetes. Warm leaves are tied on painful joints. Latex is applied on aching teeth and wasp sting. It is also applied on tail infection in cattle.

Sr. No.	Botanical Name	Family	Vernacular name	Part Used	Method of Preparation/ Diseases
18	*Cannabis sativa* L.	Cannabaceae	Bhang	Young leaves	Young leaves are given to cattle to treat loose motion. Leaves are eaten to get rid from snake poison. Leaves are also rubbed on wasp sting.
19	*Capsicum annuum* L.	Solanaceae	Mirchi	Fruit	Powder of fruit is applied topically on dog bitten area. Red chilly is fried in mustard oil and a drop of this oil is poured into ear to get rid from earache.
20	*Carica papaya* L.	Caricaceae	Papita	Fruit	Ripen fruit is anti-anemic, good for cardiac problems.
21	*Cassia fistula* L.	Fabaceae	Reefali	Fruit	Young fruits are used as laxative to cure constipation both in human as well as cattle.
22	*Catharanthus roseus* (L.) G. Don	Apocynaceae	Sadabahar	Leaves, flower	Young leaves and flower have antidiabetic property.
23	*Citrus limon* (L.) Osbeck	Rutaceae	Nimbu	Fruit	Fruit is diuretic, astringent, febrifuge and coolant. It is used to treat dermal problems.
24	*Coccinia grandis* (L.) Voigt	Cucurbitaceae	Jangli karela	Fruits	Vegetable of unripe fruits is good to control diabetes.

Sr. No.	Botanical Name	Family	Vernacular name	Part Used	Method of Preparation/ Diseases
25	*Coriandrum sativum* L.	Apiaceae	Dhania	Leaves, fruit,	Plant is antipyretic and diuretic. Green leaves act as coolant, so considered good for piles. Leaf extract is given in vomiting. Seeds and leaves are also good for gastrointestinal problems.
26	*Curcuma longa* L.	Zingiberaceae	Haldi	Rhizome	Powder of rhizome is used as blood purifier, pain reliever. It is beneficial in gynaecological problems. It is taken orally with hot milk to cure internal injury and cough/ cold. Powder is mixed with mustard oil and applied for many skin problems like wound, pimple, etc. It also has anti-cholesterol, anti-cancer and anti-diabetic properties.
27	*Cuscuta reflexa* Roxb.	Convolvulaceae	Akash bail	Whole plant	Plant smoke is given to cow to increase milk production. Decoction of plant is used to treat musculoskeletal problems.
28	*Cynodon dactylon* Pers.	Poaceae	Khabbal	Aerial parts	Good for cardiovascular problems and to improve eye sight.
29	*Dalbergia sissoo* Roxb.	Fabaceae	Tahli	Twigs, fruits	Twig is used as toothbrush to clean teeth; fruit extract is poured into nose during nose bleeding.

Sr. No.	Botanical Name	Family	Vernacular name	Part Used	Method of Preparation/ Diseases
30	*Dysphania ambrosioides* (L.) Mosyakin & Clemants	Amaranthaceae	Kodha bathu	Leaves	Leaves are mixed with salt and given to cattle for stomach-ache.
31	*Eucalyptus sp.*	Myrtaceae	Safeda	Twigs, Leaves	Leaves are used in respiratory problems. Twigs are used as tooth brush.
32	*Euphorbia neriifolia* L.	Euphorbiaceae	Thohar	Latex	Latex is applied on many skin disorders.
33	*Ficus benghalensis* L.	Moraceae	Bohar	Latex	Plant latex mixed with sugar candy (Ptasa) is used to treat infertility problems in women.
34	*Ficus palmata* Forsk.	Moraceae	Fagoora	Young twigs	Young twigs given to cattle to increase milk production.
35	*Ficus religiosa* L.	Moraceae	Peepal	Latex, leaves	Latex is applied on many skin problems. Leaves are used to treat constipation.
36	*Foeniculum vulgare* Mill.	Apiaceae	Saunf	Fruits	Fruits are used in fever, digestive disorders both in human & cattle.
37	*Ipomoea carnea* Jacq.	Convolvulaceae	Akhra	Leaves, flowers	Leaves are effective for joint pain. Its flowers are given to cattle in poisoning.
38	*Justicia adhatoda* L.	Acanthaceae	Basuti	Leaves & flowers	Decoction of leaves and flowers is used to cure old cough and asthma. It is also used to cure poisoning in cattle.

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39	Lagenaria siceraria (Molina) Standl.	Cucurbitaceae	Loki	Fruit	Fruit juice is good for diabetes, jaundice, epilepsy, obesity, constipation, cardiovascular problems.
40	*Lycopersicon esculentum* Mill.	Solanaceae	Tamatar	Fruit	Eating fruit in empty stomach acts as anthel-mintic.
41	*Mangifera indica* L.	Anacardiaceae	Amb	Fruit	Fruit & fruit juice is used as health tonic. Fruit pickle & chutney is used for indigestion.
42	*Martynia annua* L.	Martyniaceae	Kaan	Fruits	Fruits are used to prepare chaywanprash which is taken as body tonic.
43	*Melia azedarach* L.	Meliaceae	Darek, Bakain	Twigs, leaves, fruits	Twig is used as toothbrush. Decoction of leaves and fruits are used orally as well as dermally for the treatment of skin problems.
44	*Mentha arvensis* L.	Lamiaceae	Pudina	Leaves & oil	Leaves are coolant, so used to make chutney especially in summer season. It cures many digestive problems.
45	*Momordica charantia* L.	Cucurbitaceae	Karela	Fruit	Plant has anti-diabetic and anti-pyretic properties. Fruit juice and vegetable are used to control diabetes, blood pressure and as blood purifier.

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46	*Momordica dioica* Roxb. Ex Willd.	Cucurbitaceae	Jhar Karela	Fruits	Fruit vegetable or fruit juice is taken orally to control diabetes.
47	*Moringa oleifera* Lamk.	Moringaceae	Swanjna	Fruit, Gum	Pickle made from pods of moringa is good for indigestion. Gum is used for wound healing.
48	*Morus indica* L.	Moraceae	Toot	Fruits, twigs	Fruits are used to treat constipation.
49	*Murraya koenigii* (L.) Spreng.	Rutaceae	Curry Patta	Leaves	Leaves are eaten empty stomach to control uric acid and diabetes.
50	*Musa paradisiaca* L.	Musaceae	Kela	Fruits	Raw bananas are used as body tonic. It is also used to treat diarrhea.
51	*Ocimum sanctum* L.	Lamiaceae	Tulsi	Root, seed, Leaves	Plant parts have anti-malarial properties. Leaves juice is used in respiratory disorders.
52	*Opuntia dillenii* Haw.	Cactaceae	Gumia	Fruit	Fruits have anti-anemic property.
53	*Oxalis corniculata* L.	Oxalidaceae	Khati buti	Leaves	Leaf extract is used for eye problems, also used as antidote for snake bite.
54	*Phyllanthus emblica* L.	Phyllanthaceae	Amla	Fruit	Amla juice, murabba and raw fruit is used to cure many digestive, skin & hair problems. It is also eaten as body tonic.
55	*Pongamia pinnata* Pierre	Fabaceae	Sukhchan	Young twigs	Young twigs are chewed to make toothbrush to clean teeth.

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56	*Prunus persica* Batsch.	Rosaceae	Aru	Fruit	Eating ripen fruit in early morning has anthelmintic property.
57	*Psidium guajava* L.	Myrtaceae	Amrood	Fruit, leaves	Fruit is good for diabetic patients. Young leaves are chewed to cure mouth ulcers and cough.
58	*Punica granatum* L.	Punicaceae	Anaar	Fruit	Raw fruit and juice are used as anti-anemic. It is taken as body tonic, for cardiac problems and digestive disorders.
59	*Raphanus sativus* L.	Brassicaceae	Mooli	Root	It is coolant, carminative and good for indigestion. Radish juice is taken to cure jaundice.
60	*Ricinus communis* L.	Euphorbiaceae	Arind	Leaves	Warm leaves are tied on painful joints.
61	*Rosa indica* Hook. f.	Rosaceae	Gulab	Petals	Rose water (Gulabjal) is used as cosmetics. "Gulkand" made from rose petals is good for constipation & as an appetizer.

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62	*Saccharum officinarum* L.	Poaceae	Ganna	Stem	Juice from stem is good for jaundice, indigestion. It is taken as coolant. Jaggery is traditional Indian sweetener & used as alternative of sugar for diabetic patients. Decoction of "Gur" is good to treat constipation both in human and cattle.
63	*Solanum tuberosum* L.	Solanaceae	Aaloo	Tuber	Tuber extract is applied on face to get rid from hyperpigmentation. Boiled tubers are eaten for body building.
64	*Spinacia oleracea* L.	Amaranthaceae	Palak	Leaves	Leafy vegetable of spinach is rich source of iron and calcium and used as anti-anemic and purgative. It is good for eye sight.
65	*Syzygium cuminii* (L.) Skeels.	Myrtaceae	Jamun	Fruit, leaves	Fruits and seeds have anti-diabetic properties. Leaves are chewed to cure dental problems.
66	*Tagetes erecta* L.	Asteraceae	Ghuta	Flower	Flower extract used to treat ear & eye problems.
67	*Terminalia arjuna* (Roxb. ex DC.) Wt. & Arn.	Combretaceae	Arjun	Bark, fruit	Decoction of plant bark and fruits is used to cure cardiac disorders and diabetes.
68	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Baheda	Fruits	Fruit powder is used in cough and vomiting.

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69	*Terminalia chebula* Retz.	Combretaceae	Harad	Fruits	Fruits are good for digestive problems especially for constipation.
70	*Tinospora cordifolia* (Wild.) Hook. f. et Thoms.	Menispermaceae	Giloe	Stem	Used to treat musculoskeletal problems, typhoid fever, and diabetes.
71	*Tribulus terrestris* L.	Zygophyllaceae	Bakhra	Fruit	Fruit powder is used to make rural snacks called 'Panjiri' which is good for backache.
72	*Trigonella foenum-graecum* L.	Fabaceae	Methi	Seeds	Powder of seeds fry in ghee and taken orally for diabetes, rheumatic pain, body ache, gastric problems and as carminative.
73	*Triticum aestivum* L.	Poaceae	Kanak	Seed bran	Smoke of seed bran is applied on affected feet to cure fungal infection. It is also used to cure foot rot disease in cattle.
74	*Verbascum chinense* (L.) Santapau	Scrophulariaceae	Pahari Pootni	Whole plant	Whole plant is given to cattle in loose motion.
75	*Withania somnifera* Dunal.	Solanaceae	Aksin	Leaves, fruits	Leaves decoction is taken to cure cough/cold. Used to treat cattle poison.
76	*Xanthium strumarium* L.	Asteraceae	Joon	Fruits	Fruit powder is given to cattle for constipation

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77	*Zingiber officinale* Rosc.	Zingiberaceae	Adrak	Rhizome	Decoction is taken orally to cure respiratory disorders, body ache, back ache, gynaecological problems. The juice of rhizome with honey is taken orally to cure cough/cold.
78	*Zizyphus mauritiana* Lam.	Rhamnaceae	Ber	Leaves	Leaf decoction used to wash hairs to make them healthy.