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Full Length Research Paper

Ethnobotany of some useful plants of Poonch Valley Azad Kashmir

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The ethnobotanical studies indicated that the inhabitants of Poonch Valley utilized 169 plant species for more than 30 domestic needs. The major usage include 68 medicinal plants, 35 fuel wood species, 35 fodder species, 24 vegetable and pot herbs, 10 veterinary medicinal plants, 24 fruit yielding plants, 14 spices and condiment species, 12 for construction and timber requirements, 13 ornamental species, 9 used as field fencing, 13 furniture making species, and 6 used as mouth wash (maswak). Other miscellaneous uses of plants included agricultural tools, thatching and roofing, basket making, cosmetics, dish cleaners, home decoration, narcotic, anti-snake and scorpion bite, soil binding, stick/handles, shade tree, utensil making and pillow filling. Results of the survey conducted revealed that 72% of folk medicinal knowledge comes from people above the age of 50 years, while 28% of it comes from people between the ages of 30 and 50. The survey also indicated that men especially old ones are more informative of traditional knowledge of medicinal plants than women in the area.

Key words: Ethnobotany, poonch, Himalayan region, fodder species, fuel wood species, enumeration.

INTRODUCTION

Azad Jammu and Kashmir is very rich in natural beauty. The people of Poonch valley are poor and the area is highly under developed. Local people are primarily farmers or tenants. They also rear livestock. The area, particularly, the foothills and plains, has an agricultural economy mainly dependent on rainfall. Maize, wheat, rice are the main crops and beans and peas are also cultivated in the area. Among fruits; apples, apricots, peaches, walnuts, plumbs, pears, and citrus are grown and are exported from the area. Some people collect medicinal plants and morels and sell it in local markets, thus earning their lively hood. The people also earn by selling handicrafts such as Namda, Gubba, Patto, Woolen shawls etc (Figure 1).

Tourism greatly improved the socio-economic conditions of the area by providing jobs opportunities to local people. Local people work in hotels and restaurants, as guides and jeep drivers while some has opened shops at tourist resorts. In Rawalakot, Bunjosa and Ghori Mar, the tourism department has constructed rest houses for tourists. Beside tourist rest houses, some good hotels and private guesthouses provide comfortable accommodation on reasonable rates in the valley.

Systematic explorations of traditional uses of plants are urgently required in Poonch valley of Azad Kashmir especially because of its geographical, historical reasons and hilly terrain (relatively isolated) and where modern development has not completely lead a complete decline of traditional knowledge in early 1950s up to 84% Pakistani population was dependent on traditional medicines for all or most of their medicinal uses (Hocking, 1958).

In Himalayan ranges at least 70% of medicinal plants and animals species in the region consists of wild species, 70 to 80% population depend on these traditional medicines for health care (Pie and Manandhar, 1987).

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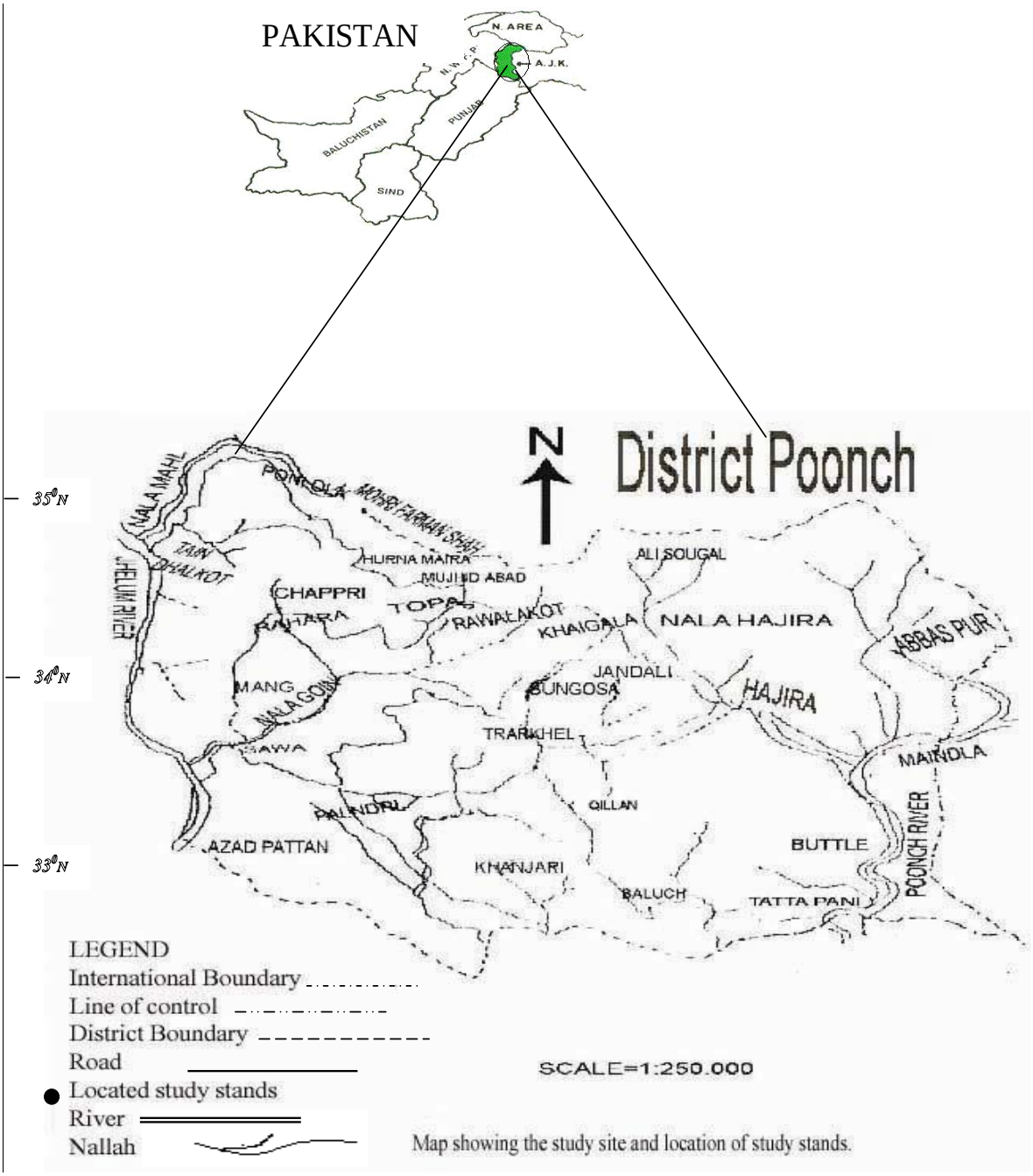

Figure 1. Map showing site and location of study area.

During winter season in hilly areas, all activities stop due to heavy snowfall. Local people travel to the lower comparatively warmer places like Kotli, Mirpur, Rawalpindi and even Karachi. Literacy rate is around 50.7% (District census, 1998). There are 25 high schools, 8 inter-colleges and four Degree-colleges in the valley. For girls, 15 high schools, 8 inter- colleges and 4 degree-colleges are present. Many schools and colleges are also functioning in the private sectors. Good economic conditions and traditional minds are also resulted in high literacy rate in the area. Urdu is the official language of Poonch valley. Pehari language is spoken in entire valley especially in Rawalakot, Bagh, Sudhnoti, and Hajira tehsil of district Poonch. Beside Pehari, Gojri, Hindko and Kashmiri languages spoken in different parts of the valley. Hindko is the predominant language of lower part of the valley. Traveling upward, one enters into Dothan area where pehari is the dominant language. Rawalakoti as the dominant language in the village of Chair, Damni, Bunback, Shaheed Gala, Singola, Hornamera, Barian,

Bosa Gala and Pacheott, further up pehari language replaces with moving. Finally one reaches to the boundary of Poonch district where hindko is the predominant language.

Kashur, the language of Kashmir, is spoken by Mir family residing in different parts of the valley as well as in Azad Kashmir. Most of the learned Kashmiries state that the Kashur vocabulary is a polyglot. Kashur has a grammar of its own (Walter, 1991).

Ethnobotanical status of the Poonch valley

Poonch valley is bestowed with a unique biodiversity, comprising of different climatic zones and wide range of plant species. The area has about 430 species of wild plants of which about 60 to 68 are considered to be medicinally important. In Poonch valley, no ethnobotanical work has been carried out before. The traditional practitioners (herbal doctors) are playing an important role in providing health care to 75% of the population in rural areas. A variety of herbal products have been used by the herbal doctors for the treatments of various diseases common in the area. The elder people of the area use local plant resources to cure many common diseases of children especially. The knowledge and experience of these elderly people (Men and Women) is a precious wealth of the area.

Owing to its system of mountain streams and nullahs and river Poonch valley possesses a large area of alluvial soil. The new alluvial, which is found in the deltas of the river Poonch has great fertility and every year it is renewed and enriched by the silt of the mountain streams. The old alluvial is less fertile but in years of good and timely rain and moderate tillage results excellent dry crops. Major crops of Poonch valley are *Oryza sativa, Zea mays, Triticum aestivum, Pisum sativum, Phaseolus vulgaris, Vicia falca, Papaver somniferum, Brassica campestris, Amaranthus viridis, Solanum melongena* and *Solanum tuberosum*. The most important staple diets of the Poonch valley are rice, maize, wheat and potato. The area is mostly hilly and there are no facilities for the cultivation of other different crops due to lack of water.

Fruit plants

Kashmir is the country of fruits, almost all types of fruits such as apple, pear, vine, mulberry, walnut, cherry, peach, apricot, raspberry and strawberry can be obtained without difficulty in most parts of the valley. Main fruit of the Poonch valley are *Malus pumila, Prunus persica, Prunus cerasus, Morus alba, Diospyros lotus, Ficus palmata, Pyrus communis, Rubus fruticosus, Vitis vinifera, Viburnum foetens* and *Punica granatum*. These fruits are great help to the people as a food and source of income.

Vegetables

Main vegetables of the Poonch valley are:

1. Underground vegetables: *Raphanus sativus, Solanum tuberosum, Brassica rapa, Daucus carota, Allium cepa, Allium sativum and Colocasia esculenta.*
2. Herbage vegetables: *Brassica compestris, Brassica oleracea, Trigonella foenum, Chenopodium album* and *Amaranthus viridis.*
3. Fruit vegetables: *Lycopersicon esculentum, Solanum melongena, Trichosanthes dioica, Capsicum frutescens, Cucurbita maxima, Cucurbita pepo, Lagenaria vulgaris, Luffa acutangula, Citrullus vulgaris, Momordica charantia, Cucumis sativus* and *Pisum sativum*.

Fodder species

The people of Poonch valley depend very much for their comfort on milk and wool and in winter plough and milk cattle and sheep penned in the byres which form the lower story of the Kashmiry house. The straw of rice and the stalk of maize furnish portion of the fodder required for the winter months, but this has to be supplemented by the leaves of various kinds of maimed trees bearing in their forks the fodder which has been cut for winter use. Of the trees use for fodder the chief are: *Salix alba, Olea ferruginea*, *Populus nigra, Persea duthiei, Morus alba, Pyrus pashia, Celtis australis and Ulmus wallichiana*. Kashmir is rich in grasses. In the high villages fields are set apart for hay (dry grasses) and the hay is made and stacked in particular fashion. The boundaries of the rice fields furnish a fine crop of hay every year. *Phragmites karka, Cymbopogon spp, Panicum colonum, Saccharum spontanum, Sorghum halepense, Imperata cylindrica and Dichanthium annulatum* are important hay grasses of the valley. *Cynodon dactylon* is very common and much prized as a fodder. *Trifolium alexandrinum, Trifolium resupinatum, Avena sativa, Panicum milliaceum* are cultivated fodders of the valley. Wood species of the Poonch valley, used as main source of fire wood consisted of *Pinus wallichiana, Pinus roxburghii, Morus alba, Quercus incana, Salix alba, Olea ferruginea, Pyrus pashia, Ulmus wallichiana, Celtis australis, Populus nigra* and *Betula utilis*.

MATERIALS AND METHODS

The plants of ethnobotanical importance were collected and classified on the basis of their utility in the area. Local people including plant collectors and others of different age groups were interviewed for ethnobotanical information of the area. The timings for fieldwork were selected according to the growth and collection season of the plants. Population size and its distribution, history of settlement, major social groups or classes, productive activities, subsistence crops etc. were also explored during the field work. The methods included three stages:

1. Field work.
i. Observations, and
ii. Interviews
2. Description.
3. Documentation.

Field work

The study trips were made from January to May and from July to December (twice a month) for three years. The field work was based on interviews, observations and guided field trips.

Description

In the descriptive stage, the field sites of the area was described by consulting secondary sources such as ethnographies, maps and geographical accounts to describe the land and conservation status of the region, the elements such as land, people, conservation status and phytosociology were also considered.

Documentation

The ethnobotanical data obtained was checked and compared with the existing literature and was analyzed both quantitatively and qualitatively. Hence, the indigenous knowledge about plant resources, religious and cultural aspects such as population diversity was also documented. For ethnobotanical inventory, four criteria's, who, what, how and when, were used. For example, who collects the plants? Who is responsible for their destruction? What are the uses of plant resources? What are destructive agencies? What type of benefits one obtained from natural resources to the local communities? How ethnobotanists and conservationist become successful knowing what is happening to the real picture of natural ecosystem? When flora is available in full grown state with root, stem, leaves and flowers? Ethnobotanical inventory consisted of botanical names, vernacular/local names; few needed synonyms, localities, its elevation and its ecological status.

Market assessment

Market assessment of medicinal plants available in the markets of Abbaspur, Hajira, Rawalakot and Trarkhel was carried out and marketing chain for medicinal plants collected and people involved in medicinal plants trade was investigated. A list of economic plants was prepared with emphasis on plant market availability status, collection methods and local prices of these plants.

RESULTS

Appendix shows the result of ethnobotanical survey of Poonch valley Azad Kashmir. The observations recorded during study showed that the inhabitants of the valley utilized 169 plant species belonging to 72 families. The plant species were assigned their respective families, botanical names, local names, common names, habit, part used and local traditional uses. These ethnobotanically important plants species include; Dicotyledons (135 species), Monocotyledonous (23 species), Gymnosperms (4 species), Pteridophytes (4 species) and Fungi (3 species). The dicotyledonous plants include 59 families of which Papilionaceae (12 species), Rosaceae (11 species), Asteraceae and Cucurbitaceae (7 species each), Lamiaceae, and Ranuculaceae (6 species each), Euphorbiaceae and Solanaceae (5 species each) and Acanthaceae, Moraceae, Rhamnaceae (4 species each) were the most represented families. The monocotyledons comprise 10 families; family Poaceae (15 species), Liliaceae (6 species), Araceae (2 species), Musaceae (1 species) and family Zingiberaceae (1species.). Pinaceae represented the Gymnosperms (4 species). Pteridophytes were represented by 3 families namely Pteridaceae (3 species), Schizaceae (1 species.) and Woodsiaceae (1 species). Fungi represented by the family Morchellaceae (1 species) and Sclerodermataceae (1 species). It was observed that these 169 plant species were utilized in the area for 30 different purposes based on their type of usage.

Most of these potential plant species exhibit multiple uses. The multiple purpose plants included *Melia azedarach* L. (7 uses), *Ficus palmata* Forssk, *Morus alba* L. and *Ulmus vilosa* Brandis ex Gamble (6 uses), *Dalbergia sissoo* Roxb, *P. roxburghii* Sargent, *Celtis australis* L., and *Juglans regia* L (5 uses), *Acacia modesta* Wall. *Abies pindrow* Royle, *Pinus wallichiana* A.B. Jackson, *Zanthoxylum alatum* Toxb, *Populus ciliata* Wall. ex Royle, *Ailanthus excelsa* Roxb. and *Buxus papilosa* C. K. Sehn. (4 uses), while *Quercus dilatata* Royle, *Cedrella toona* Roxb ex Rottl Wild, *Mentha sylvestris* L., *Salix alba* L. and *Dodonaea viscosa* (L) Jacq. showed 3 different local uses each.

DISCUSSION

Being an interdisciplinary science, related to natural resources ethnobotany has direct implication for several problems particularly those relating to food, health care and environment.

The impact of ethnobotany in conservation of natural resources is very direct. Ethnobotany contributes also in our war against hunger through: Improvement of edible plants, discovery of new uses of known plants or new economic plants and conservation of diversity in germplasm. Man has made improvements of useful plants, particularly food plants, by selection since ancient time.

Collection and trade of medicinal plants

Majority of the world population currently depends on tradition medicine for their primary health and needs. The world market for herbal products based on traditional knowledge it now estimated to be worth US $ 60 million (WHO, 2002). In study area 30 medicinal plants out of 68 had been found as the most commonly utilized plants which had been collected during different months of the year. Only 8 of them are traded in national market while

the rest are used locally. The collectors include 50% men folk, 21.26% women folk and 26.74% children. A survey conducted during present study show that the number of medicinal plants declined during the past 15 years. It was observed that commercial gatherers (Gypsy and local people) collect medicinal plants in large amount from remote areas of the valley. Such activity is causing a rapid depletion of medicinal plant resources in the area. Trade of medicinal plants in the valley could be promoted through selection of good quality and easily cultivated medicinal plants in large amount in local conditions of the area. Folk knowledge on medicinal plants would be helpful in this respect. In my opinion *B. ciliata, C. odorata, G. elegans*, *D. podocarpum, C. dalhousiae, A. pilosa, L. japonicum, D. papyracea, G. wallichianum* and *A. filicinus* plant species would prove to be useful if they have been brought into cultivation in this area.

Medicinal plant collectors in the Poonch valley (study area) are poor villagers. Plant collection is their part time activity besides farming and livestock rearing. Majority of medicinal plants collected are rhizomatous. These plants are primarily collected in summer and during this period the plants utilize the root chemistry and nutrition for the development of aerial parts and fruit yield. As a result the rhizomes collected are depleted of active chemical constituents. The ideal time for the collection of these plants is winter or early spring when the plants are dormant. During this period, the plants convert the nutritional chemistry of aerial parts into alkaloidal contents and store it in the underground parts. Beside this, the rhizome collection has resulted in a drastic decrease of these medicinal plants in the area.

Fuel wood consumption in Poonch valley

Fuel wood is one of the prime causes of forest destruction in study area (Poonch valley) because the winter season is long and very harsh. People need fuel for heating as well as cooking. Present study showed that about 0.1 million ones of valuable wood are used for cooking and warming houses annually. In Poonch *Q. dilatata, Q. incana, D. sissoo, P. wallichiana* and *P. roxburghii* are under immense fuel wood pressure as bulk of the population of the area use these five plants for their fuel wood requirements.

Similar study was conducted by Shinwari and Khan (1999) in Margalla Hills National Park they reported that *A. modesta, A. nilotica, B. papilosa* and *D. viscosa* are under fuel wood pressure. People of the area of Poonch are mainly dependent on forest wood for fuel consumption. The major composition of forest species that is, *Q. dilatata* and *P. roxburghii* are slow growing and continuous cultivation and periodic ban on some area of the forest should be inforced to decrease the pressure for fuel wood consumption from the study area.

The people are unaware about the conservation of the valuable and indigenous plants of the area. They generally harvest fuel wood from nearest forest. Sometimes, they cut whole tree for collecting only branches and twigs. Due to this indiscriminate cutting, not only the forest area is declining but valuable indigenous species are in danger and if this trend continues, the ultimate result would be the extinction of these species from the area.

Fodder and forage species

The area is very backward economically and the local communities depend on farming, livestock rearing, timber wood and medicinal plants/morels sales. The livestock include buffaloes, cows, sheep, goats, donkeys and horses. There are 35 plant species which are used as fodder and forage in the area. In summer season, the livestock is carried to the upper grazing lands where they remain throughout the summer season. The lush green pastures are thus subjected to intensive overgrazing and are converted to barren lands at the end of the season. During the winter season, the livestock is kept indoor due to heavy snow fall in upper mountainous areas. The local people face great difficulty due to fodder shortage. Most of the livestock face malnutrition during this harsh period of the year. Similar observations were reported by Rawat and Uniyal (1993) for the alpine meadows of Jammu and Kashmir, where overgrazing results in great loss to vegetation cover and wide occurance of unpalatable weedy species of *Viburnum, Stipa* and *Sambucus*.

Similarly, Khan (1994) reported that thorn forest area of Punjab is under decline due to overgrazing, felling, wind erosion, desertification, salinity and water logging. Jabeen (2006) conducted a comprehensive study on fodder situation in and around Ayubia National Park in moist temperate forest of Nathia gali. She also concluded that good quality palatable species are replaced by unpalatable weedy species due to overgrazing in the area. Rotatory grazing in the Poonch valley would be useful strategy to save palatable fodder species in the valley.

Timber wood species

The present study showed that 12 plant species are utilized by the local people for timber and construction purposes. Most of the houses in the Poonch valley are made up of stones and mud, with supporting wood inside. Wood is used lavishly in the construction of houses. Timber constitutes the most important components of biodiversity in a forest. In Poonch valley, Gymnosperm such as *P. wallichiana, P. roxburghii, C. deodara, D. sissoo, U. wallichiana, M. azedarach* and *Quercus spp.* are common timber plant species of the area. In Poonch valley timber mafia is active and involved in the illegal

trade and as a result timber species are also in decline in the valley.

Morel collection in Poonch valley

Morel collection is an important activity in the Poonch area during spring season. Present investigation confirmed that three species of morels were collected in the area. The villagers take keen interest in morel collection as it provides them an extra important source of income. Similar studies were conducted by Ali (2002) who reported that different types of morel are collected from the Hindu Kush Himalayan region of Sawat. In Pakistan, there are 56 edible species of mushrooms. These include 4 species from Baluchistan, 3 from Sindh, 5 from Punjab and 44 from NWFP and Azad Kashmir (Sultana et al., 1996).

Role of ethnoveterinary medicine

Plants are used as a prime source of veterinary medicine by people in different parts of the world long ago. Medicinal plants are an integral component of ethnoveterinary medicine for a long time. Farmers and pastoralists in several countries use medicinal plants in maintenance and conservation of the livestock health care. Intestinal disorder in cows in Mexico is treated with herbal extracts of *Polakowskia tacacco.* It is estimated that medicinal plant for several centuries have been widely used as a primary source of prevention and control of livestock diseases. Infect interest of such use in the veterinary sector has resulted primarily from the increasing cost of livestock maintenance and the introduction of new technology in the veterinary medicines and vaccines (Hoareau and Da silva, 1999). This study also shows that fruit plants play a role in the economy of the people living in Poonch. The people of Poonch also depend on plant resources for curing different diseases in their livestock. 10 plant species are known to be used by the people in the study area.

A similar ethnoveterinary study by Sudarsanam et al. (1995) in Andhra Pradesh revealed that 106 plants were used to cure veterinary disease. Similarly, reported ethnoveterinary uses of medicinal plants from Samahni valley District Bhimber Azad Kashmir. They reported that 54 plant species distributed in 31 families are used to treat various diseases of the domestic animals.

Miscellaneous uses of plants

The wild fruits are also used as herbal medicine, food and syrups. The leaves of *M. alba*, *F. palmata*, *F. glumerata and P pashia* are used as fodder. Similarly, wild fruits which are ancestors to some cultivated species are very important source of genetic diversity to be used in future. People of the valley are muslims and practice Islam. They use Maswak (local toothbrush) for cleaning their teeth. The maswak is made from the roots of *J. regia* and branches of O. *ferruginea, A. modesta* and *Z. alatum.* Women of the study area use bark and leave of *J. regia* for cleaning their teeth. The root bark of walnut (*Juglans regia)* is collected extensively in the area for this purpose. A study was carried out by Dastagir (2001) on the pharmacognosy of *A. nilotica* and *J. regia,* which are used as maswaks for teeth cleaning in various parts of Pakistan.

Other miscellaneous use of plants in the study area include vegetables and pot herbs, species and condiments, ornamental plant species, agricultural tools, basket making, cosmetics, dish cleaner, house decoration, feed, field fencing, furniture, narcotics, packing material, curing snake and scorpion bite, soil binder, sticks and handles, shade tree, herbal tea and for making utensils. Similar ethnobotanical projects were also reported by Hamayun (2003, 2005), Ahmad et al. (2004), Shinwari and Shah (1996). Similarly, Iqbal and Hamayun (2004) classified the plants of Malan Jabba into medicinal plants, agroforestry based plants, vegetable and pot herbs, ornamental, honey bee attractance, agricultural tool making, plants yielding edible fruits, thatching and sheltering, fencing and hedge plants, poisonous and timber yielding plants.

Conclusion

Poonch valley is one of the typical units of Himalaya's plant biodiversity rich area in Azad Kashmir. In total 169 plant species are used for various purposes. The major component of usage type includes 68 medicinal plants. The folk knowledge on medicinal plants from this area will contribute for the efforts as already being initiated for the documentation of ethnobotanical knowledge from all parts of Pakistan.

For sustainable and long term of the valley natural resources, there is a need to actively involve acquiescence of local people in maintenance of biodiversity monitoring and documentation of ethnobotanical knowledge. There is also a need to develop awareness among the people of the area that they should fulfill their requirements keeping in mind that biodiversity of the local area may not be exploited.

Sustainable use of natural resources is crucial for the well being of local communities. The resources are being exploited in a very unsustainable manner. In order to develop an effective strategy it is necessary to deal with the following points:

1. The transition to sustainable reforestation should be as rapid as possible to allow the conservation of natural old-growth forest which is very valuable for biodiversity.
2. Consumption of resources can be significantly reduced by improved efficiency of fuel-wood use and substitution with modern fuels like natural gas. Creation of a national

data base of the scattered information available on our biological resources.
3. Cultivation of threatened medicinal plants should be encouraged by the local community in order to relieve pressure on these plants.
4. Chemical analysis and screening of medicinal plants needs to be done to determine a co-relation between the chemical constituents and the disorders treated by the herbalists. This information is not available in the area.
5. Awareness programmes at grass root level should be introduced in the area to educate the local communities for the usage/selecting the fuel wood species.

Permanent pastures in the valley base should be improved by introducing new fodder crops in the area. Improvements are also possible to some extant through controlled grazing. All these measures on fodder improvement require enough understanding and adoption of appropriate management practices.

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Appendix

Enumeration

Dicliptera roxburghiana, **Acanthaceae, (Churu), 130.** The extract of roots is used to cure wounds.

Acer acuminatum **Wall. Aceraceae, (Jangli Chanar),** Field Maple. 05. The wood is useful as fuel.

Acer caesium **Wall. ex Brandis Aceraceae (Jangli chanar)** Field Maple.06. The wood is used as fuel. The leaves serve as fodder.

Amaranthus viridis **L. Amaranthaceae, (Gahnar),** Green amaranth. It is locally used as vegetables. It is considered good for obese persons. Antisnake and scorpion bite.

Celosia argentea **L. Amaranthaceae, (Dumbi)** Cock's comb. 77. It is used as an ornamental plant. Leaves used as vegetables also.

Carissa caranta **L. Apocynaceae, (Garanda). 73.** Root extract is used to cure Jaundice. Fruits are edible acidic berries.

Nerium indicum **Mill. Apocynaceae (Kanair). 244.** Oleander. A common pink flowered shrub near steams. Bark of root is used to cure arthritis. Stem branches used as mouthwash (Maswak). Leaves are extremely poisonous

Ilex dipyrena **Wall, Aquifoliaceae**
Bareen, Himalayan Holly.194. Wood is used as fuel. Branches and leaves used as thatching and roofing material.

Arisaema flavum **(Forssk) Schott, Araceae, Hathbis,** Cobra plant. 34. The rhizome is poisonous. The mixture of boiled rhizome and wheat flour is given to the cattles for increasing milk.

Calendula officinalis **L. Asteraceae Sadberga,** Marigold. It is cultivated in garden for beautiful flowers. The extract of young branches is used to relieve kidney pain and release of kidney stones.

Chrysanthemum indicum, **Asteraceae Gul-e-Daudi,** Painted Daisy Ornamental, cultivated in the garden.

Cichorium intybus **L. Asteraceae, Kasni.**
Chicory. 88. The roots are boiled in water and the extraction after cooling is used for curing fever and vomiting. The leaves are used as vegetable.

Helianthus annulus **L. Asteraceae Dainhphair.** Sunflower. An annual Garden herb. It is cultivated in the gardens for the beautiful gandy capitula, which are usually deep yellow.

Sonchus asper **(L) Hill. Asteraceae, Hundh**, Dodak.380. An annual weed (herb) with milky juice. In local areas leaves used as vegetable which is considered to be good for abdominal pain.

Impatiens balsamina **L. Balsminacecae**
Maindi. 195. A moisture loving herb. Extract of the fleshy stem is used as henna.

Berberis aristata **DC. Berberidaceae Sumbalu,** Berbery.51. Shruby plant of exposed places. Fruit is edible. It is a thorny bush and used for fencing the crop fields.

Betula utilis **D. Don., Betulaceae, Brain.** Birch. 54. Wood is used for making agricultural tools, utensils, fences and as fuel wood. Shoot used for thatching.

Brassica compestris **Prain, Brassicaceae, Sirian.** Mustard. Leaves and young branches are used as vegetable.

Lepidium sativum **L. Brassicaceae, Haleon.** Garden. Leaves used as vegetable. Seeds are used as eye cleaner.

Nasturtium officinale **R.Br Brassicaceae, Chou.** Water cress. 237. It is used, as vegetable is a good carminative.

Buxus papilosa **C.K.Schn. Buxaceae, Kangi**, Box. 63. Box wood is used for making sickle handles. Branches used as thatching and roofing material. The stem is used for toothbrush and is a remedy for toothache.

Chenopodium album **L, Chenopodiaceae Ghanari,** Foot hen plant and Goose foot plant.85. Leaves are used as pot herb

Ipomoea purpurea **(L) Roth, Convolvulaceae, Eird,** Morning glory. 202. Locally used as fodder and ornamental plant.

Citrullus vulgaris **Schrad,Cucurbitaceae, Tinda,** Round gourd. The fruits are used as vegetable.

Cucurbita moschata **Duch. Ex. Poir, Cucurbitaceae,** Squash The large fruits are used as vegetable and for making squash.

Cucurbita pepo **L. Schrad, Cucurbitaceae Dubbri, Safaid,** Pumpkin. The fruits are used as vegetable.

Luffa aegyptiaca **Miller ex.Hk.f, Cucurbitaceae, Tori,** Vegetable sponge. The fruits are used as vegetable. The fibrous material obtain from dried fruits is used as a

substitute for bath-sponges and
for washing dishes.

***Momordica charantia* L., Cucurbitaceae, Karella,** Bitter Gourd, Fruits. The fruits are used as vegetable. These are famous for their bitter taste.

***Trichosanthes anguina* Linn, Cucurbitaceae,** Snake gourd. The fruits are cooked as vegetable.

***Diospyros lotus* Linn, Ebenaceae, Amlock.** Black Ebony. 134. Fruits are used as purgative and laxative agent. The wood is used as fuel. The leaves serve as fodder.

***Elaegnus parvifolia* Wall, Elaeagnaceae**
Kankoli, Oleaster. 145. The fruits are edible and cardiac stimulant. Locally used as fuel wood. Fruit is considered as good for cancer patient. Leaves infusion is used as diuretic.

***Andrachne cordifolia* (Dene) Muell, Euphorbiaceae, Karukni. 23.** Vermifuge for cattles

***Euphorbia cognata* (Kl & Grache) Boiss, Euphorbiaceae, Dodali.** 157. Extract and paste of fresh stem and leaves used as an effective poultice to cure skin disease of goats.

***Mallotus philippensis* (Lam) Muell,**
Euphorbiaceae Kamilla. Rauni. 219.
Locally used as fuel wood. The red Powder obtained from surface of the fruits Used medicinally to remove the Threadworms and Ascaris. It is also use to cure mumps and measles in children.

***Quercus dilatata* Lindle.ex Royle, Fagaceae, Rianh. Moru.310.** Fuel wood species. Seeds are edible, astringent and diuretic, used in diarrhoea, indigestion and asthema. Due to its toughness, the wood isused in agricultural tools, handles of plough, axes, gun buts and walking sticks. Children use seeds as playing tops.

***Quercus baloot* Grift, Fagaceae, Rianh.**
Oak. 309. Timber, Fuel wood, wood is also used for making agricultural tools specially ploughs and handles.
Quercus floribunda Lindl ex, Fagaceae, Ban. 311. Silver oak. Fuel wood species. The wood is used for thatching and roofing.
***Quercus incana* Roxb, Fagaceae, Rianh Moru. 312.** Fuel wood species. Seeds are edible, astringent and diuretic, used in diarrhoea, indigestion and asthema. Due to its toughness, the wood is used in agricultural tools, handles of plough, axes, gun buts and walking stick. tools specially ploughs and handles.

***Aesculus indica* L., Hippocastanaceae,**
Bunkhor, Horse Chestnut. 13. Leaves are use as fodder. Nurs are colic, used for cure of chest diseases of horses, donkeys and mules. Nuts are also given to the cattles as stimulant. Wood is used in making furniture, agricultural appliances and gun buts. Wood is also used as fuel.

***Juglans regia* L., Juglandaceae, Khor**
Walnut. Wood is used in making furniture.
Nuts are edible and sex stimulant. Nuts are also used to cure hypertension. Bark (Dandasa) is used for cleaning and sparkling teeth. Particularly women also use leaves, as it imparts a pinkished color to the lips.

***Mentha sylvestris* L, Lamiaceae, Pudina,** Peppermint. 1Locally it is used in chutney and for the treatment of stomach pain.

***Mentha viridis* L. Lamiaceae, Pudina.**
Fieldmint. Leaves are used as carminative stimulant and refrigerant.

***Micromeria biflora (*Ham.) Bth.**
Lamiaceae, Bouti. 229. An aqueous extract of leaves is used to cure stone in kidney.

***Persea duthiei* L., Lauraceae, Breein, Avocado. 258.** The shoots are used as fresh fodder. Wood is used as fuel. Shoots are used as thatching and roofing material.

***Allium cepa* Linn. Liliaceae, Piaz**, Onion.
The bulb is used as vegetable and as flavor substance. The green leaves are also eaten. The plant possesses medicinal properties. This is stimulant, diuretic and expectorant.

***Allium sativum* Linn., Liliaceae, Thoom**
Garlic. The leaves are used as vegetables.
The bulbs are used as condiment and flavouring substance for meat and vegetables. Garlic powder is extensively used as a condiment and also serves as carminative and gastric stimulant. Fresh bulbs are eaten to cure hypertension.

***Bombax malabaricum* DC, Malvaceae, Simbal,** Bombax. Wood is used for making boards of shattering. The cotton fiber outside seeds is used for stuffing pillows etc.

***Hibiscus esculentus* Linn. Malvaceae Bindi.** Ocra. Green juicy fruits are used as vegetable. These are anti-purgative, stomachic and aphrodisiac.

***Cedrella toona* Roxb. ex. Rottle Willd.**
Meliaceae, Toon. 75. Redcedar.The wood is used for furniture and shuttles. Branches used for making picking sticks. The bark is used medicinally as astringent.

***Melia azedarach* Him. Meliaceae, Dharek,** Pride of India. 224. Wood is used as fuel. The wood is used for

Making furniture and agricultural tools specially bullocks. Roots are bitter and used as antihelmintic. A decoction of leaves is said to be astringent and stomachic. Leaves are]also used as seedbed for growing rice seeds.

***Acacia modesta* Wall. Mimosaceae. Plahi.** 02. Acacia.Wood used as fuel, branches used as toothbrushes

***Ficus glomerata* Roxb., Moraceae. Tohsi**.
wild fig.166. Fresh leaves are used as fodder for sheep's and goats. Fruits are edible.

***Ficus palmata* Forssk. Moraceae. Phagwara.** Wild fig. 168. Wood is used as fuel, thatching and fencing. Fruits are edible.

***Morus alba* L. Moraceae. Karoon**
Mulberry. 233. Wood is used in furniture and as fuel. Goats and sheep eat leaves. Leaves are used in rearing silkworms. Flexible branches used for baskets. Fruits are eaten both fresh and dry. They are laxative and purgative.

***Morchella esculenta* (Lim.) Pers. Morchelliaceae, Cofathu**, Morel.
Mushrooms are dried in Desi Ghee and eaten after meal.

***Verpa bispora* Linn. Morchelliaceae**,
Patgochi. Bell morel. Fresh mushrooms are cleaned and converted into pieces. These are roasted in Desi Ghee and used as]curry.

***Musa sapienum* Linn., Musaceae. Kela. Banana.** The edible fruits are rich in starch and vitamins. The juice of leaves and pseudostem is mixed with *Solanum nigrum* leaves, s extract and vinger and used as an effective remedy for liver inflammation. The large banana leaves are also used as dining plates on festive occasions.

***Myrsine africana* L. Myrsinaceae, Kathi.** Myrsine.235. The flexible branches used for making baskets.

***Callistemon lanceolatus* D. C. Myrtaceae Bottle – brush.** This is grown in the gardens as an ornamental plant.

***Jasminum humile* L., Oleacoae, Chamba zard,** Yellow Jasmine.203. A decoction of roots is said to be useful in curing ringworm. This is grown in the gardens as an ornamental plant.

***Jasminum officinale* L., Oleacoae, Cahamba suafid,** White Jasmine.204. This is grown in the garden as ornamental. The flowers are used as emollient and aromatic and flavouring agent.

***Olea ferruginea* Royle, Oleacoae, Kohu,**
Wild olive.247. The wood yield excellent timber, which is hard and durable and used for agricultural tools specially ploughs and handles. The branches used as washing sticks (Muswak). The decoction of leaves is used in toothache, astringent and antiseptic. Fresh leaves are chewed to cure stomachache.

***Dalbergia sissoo* Roxb, Papilionaceae, Tali,** Shisham. **141.** Timber, fuel wood. The wood is used for making furniture and agricultural tools. Branches used for thatching and fencing.

***Desmodium podocarpum* D.C. Papilionaceae, Sukhea –ni-Jari.** 125. The fresh herb is used as fodder .The extract of the roots used as tonic for the general weakness in the growing children.

***Lathyrus odoratus* Linn, Papilionaceae, Karak.** Sweet pea. This plant is cultivated in the garden as ornamental.

***Medicago denticulata* Willd, Papilionaceae, Sarri,** Toothed bur clover.The plant is used as vegetable as well as fodder.

***Medicago minima* L., Papilionaceae**
Chotisari., 222. It is used as fodder.

***Pisum sativum* L. Papilionaceae, Karab.**
Pea. The seeds and buds are eaten as vegetable.

***Trifolium pratense* L., Papilionaceae, Tire,** Red Clover. 400. It is used as fodder.

***Trifolium resupinatum* L., Papilionaceae Shatala,** *Persea*n clove. It is grown as fodder crop.

***Trigonella foenum graecum* L. Papilionaceae, Methray.** Methi. Leaves fragrant used as a pot herb and fodder .The seeds are used as spice and condiment. The seeds are also used medicinally as carminative and tonic.

***Abies pindrow* Royle, Pinaceae, Tung. 01.**
West Himalayan Silver Fir. Trunk, bark and cones. The plant provides useful timber for building purposes. Wood is used in furniture, bridges and beams. Branches used for burning purpose. Cones are used as fuel and for decoration. The powder of the inner red flashy bark is used to cure cough and asthema.

***Pinus roxburghii* Surgent, Pinaceae, Chir, 270.** Pine.Timber and fuel wood, used for house building, making bridges and beams. Cones are used as fuel.

***Pinus wallichiana* A. B. Jackson Pinaceae, Rair,** Blue.271. Whole tree. Valuable timber wood, used for making furniture, bridges and beams. Cones are used as ornamental.

***Arundo donax* Linn., Poaceae, Nard**
Grant reed**. 42.** The stems are used in the manufacture of basketsand for making thatches. The stems also used by children for making dip pens (kalams).

***Avena sativa* Linn. Poaceae, Kandial.** Oats. It is used in the area as fresh and dry fodder.

***Phragmites karka* (Retz) Trim.ex. Stead. Poaceae, Nari Gah,** Water grass.264. The leaves and soft branches used as fodder. The stems are used for making baskets.

***Adiantum venustum* D-Don, Pteridaceae Dilpattra. 12.** Maiden hair Fern, Rhizome is used as astringent, diuretic and stomachic.

***Aconitum heterophylum* Wall., Ranunculaceae, Atisb**. 09. The rhizome of this plant is used as astringent, tonic and in cough and diarrhea.

***Clematis gouriana* Roub. Ex.Dc., Ranunculaceae, Cochani.** 93. The shoot is used for wring leprosy. It is used for washing milk pot in the sense that it acts as a fermenter in converting raw milk into yogurt.

***Ranunculus arvensis* Linn., Ranunculaceae, Chochumba**. 315. It is used as a vegetable in the area.

***Thalictrum javanicum* Bl.Ranunculaceae Mamira,** Mamira. It yields “Mamira” for application to eye in opthalmia and other eye troubles.

***Rhamnus purpurea* Edgew, Ramnaceae, Dadralu.** Buckthom. 320. Fresh fruits and leaves are given to the cattle as anti helmintic.

***Zizyphus oxyphylla* Edge, Rhamnaceae Tukbari. 430.** Fruits are edible. Root bark is used in the area to cure hypertension.

***Zizyphus mauritiana* Lam., Rhamnaceae Ber.** Ber. 428. Fruits are edible. The plant is used for thatching the roof.

***Zizyphus nummularia* (Burm.t) Wight and Arn., Rhamnaceae, Brunhi** Unab. 429. Locally the fruits are used as emollient, bronchitis, expectorant and blood purifiers.

***Agrimonia pilosa* Linn., Rosaceae, Agrimony**. 14. The liquid extract of roots is used as astringent, tonic, diuretic and is very good for blood diseases.

***Prunus armeniaca* Linn. Rosaceae Khubani.** Apricot. Fruits and seeds are eaten both dry and fresh. It is laxative, fuel wood and honey bee species. Leaves Serves as fresh fodder.

***Prunus padus* Hk.f. (non. Linn.) Rosaceae, Jamana.** European bird cherry. Fruits are edible. Stem of the plant serve as fuel wood. Leaves used as fresh fodder.

***Prunus persica* (Linn.) Batsch, Rosaceae, Arwari.** Fruits edible, fuel wood, leaves serve as fodder.

***Malus pumila*. Linn., Rosaceae , Seb,** Apple. Valuable commercial fruit, purgative, source of iron, expectorant and good for heart. Wood is used as fuel, leaves serve as fodder.

***Pyrus pashia* Ham.ex D.Don, Rosaceae, Tungi**, wild pear. 308. Wood is used for burning; making walking sticks and tobacco pipes. Leaves are used as fresh fodder. Leaf extract is used as tonic for falling hair.

***Rosa indica* Linn., Rosaceae , Gulab** Edward rose. This plant is cultivated in the garden as ornamental for its fragrant flowers. It is also largely grown for rose water and “attar”. The petals of the rose have a purgative property and are used in the manufacture of “gulband” a laxative.

***Rubus ellipticus* smith, Rosaceae, Akhara.** Himalayan yellow raspberry 332. Evergreen shrub with stout stem covered with rufous bristles and recurved spine.The fruits are edible and laxative. The plant is used in fencing and hedges.

***Rubus fruticosa* Hk.f. non. Linn., Rosaceae , Bari,** Bramble. 333. The fruits are edible and laxative.

***Rubus hoffmeisterianus* Kunth and Bouche, Rosaceae** , Bari. Ceylon 334. Raspberry. The fruits are used as expectorant.

***Zanthoxylum alatum* Roxb, Rutaceae, Timber,** Kababe. 427. Locally seeds are used as spice and condiment and carminative the walking sticks are made from its warted stem. The branches are used as tooth brushes.

***Popululus ciliata* wall ex.Royle, Salicaceae, Sufaida,** Himalayan/poplar. 295. Fuel wood, ornamental, shade tree, used for making shelters. Leaves serve as fodder for goats and sheep.

***Salix alba* Linn., Salicaceae, Beesa,** Willow. 339. Fuel wood, planted along water courses to prevent soil erosion, used in making kitchen utensils, cricket bats and light furniture.

***Sapindus mukorossi* Gaertn.de Fruct. Sapindaceae, Raintha.,** Soap Nut. Fuel wood, used for making light

furniture. The pericarp of fruit is widely used as useful substitute for soap. Extract of fruit skin is used for the treatment of piles. Powder of the soap nut is used as aphrodisiac.

***Dodonaea viscosa* (Linn.) Jacq., Sapindaceae, Sanatha,** Dodoes.36. The leaves are used in wound healing and astringent. The plant is used for thatching the root, fuel, fencing and stem is used as tooth brushes and home cleaning brushes.

***Lygodium japonicum* (Thunb.) Sw., Schizaceae ,** Fern. 217.The plant is used as a decoration piece due to beautiful curly branches and fronds. The powder of the dry plant is sprinkled on the wounds for quick healing. The extract of root is taking for reducing body aches and swelling.

***Scleroderma cepa* (Vaill.) Pers,** Sclerodermataceae, Khakhun, Morel. The freshmushrooms are cleaned and the skin of the fluffy mass of mushroom removed and converted into pieces. These pieces are used for preparation of curry.

***Ailanthus excelsa* Roxb., Simarubaceae Punjabi Tun,** Tree of Heaven. The bunches of dry fruits are used as a decoration piece in the flower pot. Wood is used as fuel, fencing and thatching.

***Capsicum frutescens* (Linn.), Solanaceae Marchi,** Red pepper , chilly. The fruits are extremely pungent and condiment. It is also used in prickles.

***Cestrum nocturnum* Linn., Rat – ki – Rani, Night Jessamine.** Ornamental, grown in the garden for its fragrant flowers which are scented at night.

***Lycopersicon esculentum* Miller., Solanaceae, Chaigun,** Tomato. Flavoring agent, vegetable used as salad and chutney.

***Solanum melogena* Linn., Solanaceae Baigun.,** Brinjal. The fruits are eaten as vegetable and are also stomachic.

***Solanum tuberosum* Linn., Solanaceae Aalu.** Potato. The tubers are used as vegetable and are also the source of starch.

***Celtis australis* Linn., Ulmaceae Khirk,** Blackberry.78. The wood is used as fuel, fencing and thatching purposes.

***Ulmus vilosa* Brandis ex Gamble., Ulmaceae Kai Elm.** Wood is used for making furniture. Fresh leaves used as fodder.

***Ulmus wallichiana,* Planch. S. sp. xanthoderma Melville and Heybrock., Ulmaceae Munu. Elm.405.** Timber and fuel wood species. Wood is used for making furniture and agricultural tools. The branches are used for fencing and thatching. Fresh leaves used as fodder.

***Debregeasia salicifolia* (D.Don.) Rendle. Urticaceae, Sindari.124.** Debregeasia Fruits are edible, reductive. Leaves are given to the animals as a treatment of diarrhea and flatulence.

***Citharexylum spinosa.,* Verbenaceae, Ratanuath.90.** Leaves act as an intent poison if eaten by the animal in large amount. These are purgative for animals.

***Vitex negundo* Haussk., Verbenaceae, Banah.** Chinese charte tree ,Samaalu. Wood is used for burning, fencing and thatching of roots Stem is used as Meswak. Fresh leaves are used in gum diseases.

***Onoclea sensibilis* Linn., Woodsiaceae Bamchar** Fern.248. The aqueous extract of plant is a tonic and sedative.

***Curcuma longa*. Linn., Zingiberaceae Haldi.,** Turmeric. Rhizome is used as a condiment. It is used to flavor and color pickl. and foodstuff. It is one of the principle ingredients of curry.