

I. General introduction to applied ethnobotany

**Historical Development of Ethnobotany and Potential Contribution to Sustainable Management of Plant Resources**

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**Historical development of ethnobotany**

A hundred years ago, in 1895, the American botanist John W. Harshberger first applied the term *ethnobotany*, to the study of plants used by primitive and aboriginal people. Later, Volney H. Jones (1941) and Richard I. Ford (1978) redefined ethnobotany using modern ecology terms, from which ethnobotany was described as "the study of direct interaction between human and plant population through its culture each human population classifies plants, develops attitudes and beliefs and learns the use of plants, while human behaviour has a direct impact on the plant communities with which they interact, the plants themselves also impose limitations on humans, these mixture interactions are the focus of ethnobotany" (Ford 1978).

Definition of Ethnobotany used in various publications are as following:\*

1895 J. W. HARSHBERGER: "ABORIGINAL BOTANY, STUDY OF PLANTS USED BY PRIMITIVE AND ABORIGINAL PEOPLE"

1941 V.H.JONES: "STUDY OF DIRECT INTERACTION BETWEEN HUMAN AND PLANT POPULATION THROUGH ITS CULTURE"

Today, ethnobotany is widely accepted as a science of human interactions with plants and its ecosystems. Recent development of ethnobotany in China, India, Nepal and Pakistan of the HKH Region has been strongly oriented to traditional herbal medicine, indigenous managed plant resources; traditional agroecosystems; cultural interpretation of plant world and ethnobotany of minorities and ethnobotany for rural development and biodiversity conservation with a strong applied approaches in the field.

Ethnobotany by nature is a multi-disciplinary science of botany, ecology, and anthropology. The fundamental structure of ethnobotanical research is to examine the dynamic relationships between human populations, cultural values, and plants; recognising that plants permeate materially, symbolically, and metaphorically many aspects of culture, and that nature is by no means passive to human action but interacted with each other. Thus, ethnobotany is more than simply a study of plants useful to people, for it is devoted to understanding the limitations and behavioural consequences of human population's action on their plant environment. To accomplish these objectives, the principles of classification of the plant world are used, and beliefs about

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\* Source : R. I. Ford, 1978 : The Nature of Status of Ethnobotany, Museum of Anthropology, Anthropological paper No.67. Ann Arbor, University of Michigan, U. S. A.

plants as specific expressions of more generalised native ideas of world views are studied. Views are pursued to determine how plants structure relations with human and the composition of plants communities themselves. At the same time, plants impose limitations on human actions and underlie many aspects of human beliefs and actions. The genetics, phenology, chemistry and productivity of specific plants and populations are but a few of the factors examined in order to understand botanical restrictions and flexibility that affect these interactions (Ford 1978).

### **From basic research to applied research is the current trend of ethnobotany development**

The importance of ethnobotany, however, is not limited to hard science but has an important role to play in conservation of nature and culture, and, in particular, the biological diversity and the diversity of traditional human cultures in the world. In fact, conservation of biodiversity and cultural diversity is linked with each other. For instance, traditional medicine and food culture use of edible plants differ from one region to another and one ethnic group to another. Traditional knowledge systems are hundreds or even thousands of years old and involve not only knowledge of plants for medicine and food but also involve strategies of protection for sustainable utilisation of plant resources. In these respects, ethnobotany has played, and will play an even more important role in the future, to document and describe traditional knowledge on medicinal and edible plants, and other uses, in different ecological zones and human societies in the world.

It is important to note the new development of ethnobotany to the conservation and community development, as ethnobotany has been recognised as a research tool and a viable approach for

studying sustainable use of natural resources. WWF, UNESCO and the Royal Botanical Gardens, Kew joined together to establish an International Project on People and Plants Initiatives; Ethnobotany and the Sustainable Use of Plant Resources, which was started in July 1992 to promote and support community based ethnobotanical work in the humid tropics. This project has made significant contribution to the sustainable and equitable use of plant resources in different parts of the world. The initiative stems from the recognition that people in many rural communities have expert knowledge of the properties and ecology of locally occurring plants, and rely on them for much, sometimes all, of their foods, medicines, fuel building materials and other products. Much of this knowledge is being lost with the transformation of local ecosystems and local cultures. Over-harvesting of non-cultivated plants is increasingly common, linked to loss of habitat, increase in local use and growing demands of trade. Long-term conservation of plant resources and the knowledge associated with them is needed for the benefit of the local people and for their potential use by communities in other places (Martin 1995). More recently, some regional projects on ethnobotany have been established through UNESCO and WWF funding. Such as The African Ethnobotany Programme, The Malaysia-Kinabalu Ethnobotany Program and the UNESCO-ICIMOD Himalayan Ethnobotany programme are the follow-up action projects of the People and Plants Initiative. It is important to point out here that for the development of mountain areas in the Hindu Kush-Himalayan Region, ethnobotany has an important role to play.

**Potential contribution to sustainable management of plant resources in the mountain development of Hindu Kush-Himalayas**

Mountain ecosystems in the Himalayas have long been neglected by the rest of the world because of their inaccessibility and poverty. Understanding how mountain people conceptualise their ecosystem is particularly useful when combined with studies of resource use patterns appropriation systems decision making etc. Basically the mountain economy in the region is characterised by self-sufficient and self-reliant subsistence systems which is an agro-forestry - range lands based with extremely diversified land use, bio-resources, and human cultures. Over the past two decades the environmental, and cultural changes and economic development in the mountain region have accelerated, creating a serious impact on its natural resources. As the fundamental building blocks for development, biological resources provide the basis for subsistence of mountain people and potentials for development of mountain economies. As regenerative resources, however, biological resources have been maintained by the indigenous people in the mountain regions since ancient time for agriculture, horticulture, animal husbandry, forest products, herbal medicine, hunting, rituals, cultural needs and almost all of their subsistence needs. Mountain people use a wide variety of species rather than a few species only; mountain communities manage the environment as a whole, integrated system rather than as separate ecosystems. For them, the mountain habitat provides a means of survival not just an area from which resources can be exploited for short term benefits. From such perceptions and practices over time, mountain people have constructed a system of use and maintenance of natural resources, - this is referred as an informal knowledge system or indigenous knowledge system. Modern systems of resources utilisation and methods of economic development are often divided into separate disciplines which compete for

resources from the natural environment by using modern technology. Operations under these systems concentrate on exploiting a specific bio-species with higher economic value for marketing. Ignorance of the systematic functions of biological resources and equity of sharing resources utilisation among the mountain societies have resulted in degradation of the mountain environment and its resources (Pei 1986).

Ethnobotany as an interdisciplinary science is therefore in a position to contribute to mountain development, the wealth of traditional knowledge that the indigenous people possess concerning their natural systems and environment, including their knowledge on utilisation and maintenance of different type of plant resources on a long-term basis without damaging or destroying their habitats. Hence maximum efforts should be made to document and integrate indigenous knowledge on land-use, vegetation and forest management, non-wood forest products, agroforestry, home-garden, swidden agriculture and biodiversity while planning for natural resources development by establishing close dialogue and communication with indigenous people using ethnobotanical approaches. This will also ensure local people's participation in future management and avoid adverse impact on local people and the environment that might be caused otherwise.

**More specifically potential conservation of application of ethnobotany to the sustainable management of plant resources can be summarised into following points:**

- \* To assess historical and modern changes and its dynamic impacts on the patterns of plant resources use by ethnobotanic methods (both qualitatively and quantitatively).
- \* A better understanding of the direct interactions between people and biotic elements in an environment

can be achieved through ethnobotanical studies which will help resources management at local level.

- \* To transfer replicable indigenous technologies practices and knowledge into other areas of the same bio-region for resource management. (Niche-transfer concept).
- \* Facilitate local people's participation in the collection, documentation, analysis, assessment of indigenous knowledge through ethnobotanical studies.
- \* Contribute to participatory approaches of resources management planning for rural development (PRA, RRA, PBA).

### Highlights of methods for ethnobotanical studies

Stages and methods of ethnobotanical studies can be outlined as following:

1. *Descriptive Stage involves re search activities of*
  - Documentation of indigenous knowledge on plants used by community people.
  - Inventory of indigenous useful plants in a study-site area.

By using four "Helpers".

- WHO use the plants?
- WHAT plants are used?
- HOW plants are used?
- WHEN plants are used?

2. *Field Methods involves methods used in:*
  - Site selection for field studies.
  - Interview for data and information collection
  - Questionnaires for further data and information from informants.
  - Vernacular name are recorded along with the voucher specimens collected from the site area.
3. *Explanation Stage involves methods for understanding dynamic process of human interactions with plants and environments and consequences to both human societies and ecosystems.*

By using six "Helpers" that are:

- WHO use the plants (specify social group, gender and age)
- WHAT plants are used?
- HOW plants are used?
- WHEN plants are used?
- BY WHOM plants are prepared and used?
- WHY the plant is used? (Reasons of the plant is used and managed)

Major methods for the studies in this context are:

- field rapid inventory
- market survey on plant products
- quantitative studies
- analysis including nutrient, chemical function analysis and assessment of values of plants used to human society and impact on natural environments.

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Note : PRA : Participatory Rapid Appraisal, RRA : Rapid Rural Appraisal, PBA: Participatory Biodiversity Assessment

4. Applied Phase can be summarised into following six points for further discussions:

- \* DEVELOPMENT OF NEW PRODUCTS FROM INDIGENOUS USEFUL PLANTS
- \* DISCOVERING NEW MEDICINE FROM TRADITIONAL HERB MEDICINE
- \* PARTICIPATORY NATURAL RESOURCE MANAGEMENT
- \* CONSERVATION OF BIODIVERSITY AND CULTURAL TRADITIONS
- \* PARTICIPATORY VILLAGE/COMMUNITY DEVELOPMENT
- \* FARMER TO FARMER EXCHANGE ON SITE TRAINING

### Conclusion

Ethnobotany is by its very nature an interdisciplinary subject, demanding a holistic approach which integrates techniques from botany, anthropology, ecology, nomenclatures, linguistic and many others. As a new field of science applied ethnobotany, is still in the process of formulation synthesising and development.

It is therefore, more contribution is needed from scientists concerned, development workers, and environmentalists around world in particular those who are working in rural communities and at grass-root levels, to improved methods of studies, quality of research and integration of multi-disciplinary approaches.

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# Forest-The Super Store :

## A Case Study of Rural People's Dependence on Forest Resources in West-Central Bhutan

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### Introduction

Bhutan, with 72.5 per cent of its geographical territory under forest cover, is in every sense a forest country. Forests, therefore, remain the most important and the largest renewable natural resources base for the nation.

Due to late start and a deliberate policy of cautious economic development programme, and a small population size, much of the country's forests are in an excellent state of preservation in comparison to Himalayan areas in North West India, Nepal and Sikkim (Grierson and Long 1983). Besides the great scientific value to botanists and ecologist around the world, Bhutan's national economy and the well-being of its largely rural based population are heavily dependent upon the forest resources.

### Study area

Nahi is one of the 15 gewogs<sup>1</sup> under the Wangdue Phodrang dzongkhag<sup>2</sup>, in west-central Bhutan. The gewog constitutes six villages, with a total of 103 household in dotted settlements. The total forest area is 6675 ha which is 87 per cent of the gewog area. This gives per household 65 ha of forest land.

1. A group of villages looked by an elected headman
2. Administrative district

The nearest motorable road is the Wangdue-Chirang Road, which is about three walking hours from the school which is centrally located. There is a management plan, for the forest area. This was prepared in 1993 but pending implementation due to the high cost of an approach road to the forest which would go through the villages. We conducted the study, during November 1995 to February 1996, was undertaken to understand the pattern and intimacy of local people's dependence on the surrounding forest resources. This knowledge could be used in the preparation of operational forest management plan.

### Method

The study method employed was a Rapid Rural Appraisal (RRA) by an interdisciplinary team of 14 members with backgrounds in agriculture, livestock and forestry. There was also a woman member. All the members were natives wearing same dress and speaking or understanding the local dialect.

RRA, with its creative approach to information collection, its challenge to prevailing biases and perceptions about rural people's knowledge and problems (IIED 1995) and its ability to generate useful information in a relatively short period of time (Chambers 1998) was thought the most appropriate research method for the case study.

Field methods of semi-structured interviews, group interviews, and direct observations were used to collect the primary data for the study. The primary data for the study was from 50 interviews out of 103 households, two village meetings, interviews with key informants and direct observations.

We undertook our field visits to the study area for one to seven days, totalling 14 days all together. The first time was the familiarisation tour; second, the pre-test; the third, the main exercise, and the fourth, verification visit. Except for the main exercise, the full team of 14 members was not possible in all the exercises due to individual's engagement in his or her prior works. Only the principal author was present in all the field visits.

## Results

The following are the main categories of forest resource uses that the people depend upon:

*House construction:* The general farm house is made from wood and mud. The poorer farmers in the gewog live in huts made from bamboo and mud. Farmers pay a minimal royalty of Nu.11 (US \$ 0.28) per tree for use as timber for house construction. The common construction species are *Pinus wallichiana* and *Pinus roxburghii* depending upon the forest types in which the village is located.

Wooden shingles are the common roofing materials. The more wealthy farmers use corrugated aluminium sheets which are more durable. The shingles can be made from many tree species (Table 1), and the choice of species is dependent upon the forest type in which the household or village is located.

*Fuelwood:* Fuelwood is the only source of energy for cooking in the village. On a normal day, the hearth fire burns for a total of eleven hours, and on special

occasions such as religious ceremonies, social gatherings and heavy work days, the fire hour could go up to 14 hours. The cooking includes both human and animal (cattle, horse and pig) food. All the farmers rank fuel wood as the most important need from the forests.

Though fuel wood is in plentiful supply, its frequent and extensive use is a heavy demand on the household man-power.

*Animal grazing ground and fodder:* Agriculture and animal husbandry are integral parts of subsistence mountain farming system. Cattle graze freely in the surrounding forests. People identified many trees as a good source of fodder for the cattle (Table 2).

*Farm utility items:* Nearly all farm utility items from plough to household containers are plant products (Table 3).

*Medicinal plants:* The nearest hospital is at a distance of three walking hours. To cope with certain small ailments, people depend upon a number of plants for relieve of pain and treatment. Sadly, this local knowledge of traditional medicine is disappearing as more and more people rely on the modern pharmaceutical medicine. A list of some important medicinal plants occurring in the local forests is given in Table 4.

*Household diet:* To understand the share of forest plants and animals in the total household diet, four sources of household diet were categorised as follows:

- a. Home Produce (agriculture and livestock)
- b. Forest plants
- c. Forest animals
- d. Market food items

Individual farmers were requested to give a relative crude percentage of these four sources of their household diet. Different techniques such as breaking a circle into relative size of importance, sticks and

stones were used. There was a great variation among individuals in the relative proportion of these sources, and this was largely correlated with income levels.

On average, the home produce accounted for roughly 52 per cent, forest plants for 21 per cent, forest animals for 3 per cent and market food items for 24 per cent of the total household diet. The food plants as identified by the farmers are given in Table 5.

*Household income:* To understand the crude share of forest resources to the total household income, four sources of income were categorised as follows:

- a. Home produce (agriculture and livestock);
- b. Wage (labour hired out);
- c. Forest resources (non-timber forest products);
- d. Outside (remittance; money received from members working outside the village).

The analysis of the result showed a great variation in the relative proportion of these sources, and this was largely correlated with income levels. The home produce share was roughly 70 per cent for high and middle income groups while it was around 45 per cent for the low income group. On the other hand, income from wage was 30 per cent for the low income group while it was not a source of income for the high and middle income levels.

Interestingly, the cash income from sale of non-timber forest products was 21 per cent for high income group, 19 per cent for the middle and 17 per cent for the low income group. Relative cash income from non-timber forest products is not correlated with income levels but with household man-power. The low income group members hire out their labour in agriculture works to higher income households and have less time available for collection of non-timber forest products.

On average, home produce accounted for 65 per cent, forest resources 19 per cent, wage 9 per cent, and remittance 7 per cent of the total household income.

The important non-timber forest products which are sold in the district market are given in Table 6.

### Discussion

Resource flows from the forest are critical for the sustenance and development of mountain farming systems. A wide variety of simple rural needs which keep a farmer going are obtained from the forests. The forest is a super store for the rural people.

*"Forests are everything to us! For us farmers, there is nothing we don't need. Our working tools and tool handles, they are all from forests. Our cows graze in the forests, and our construction timber and fuelwood are also from forests...Basically we meet all our needs from the forests..."* Mr. Sangay Tenzin, Village Headman.

People's dependence on forest resources is wide ranging and intimate, from use of timber for construction of houses and cattle sheds to use of plants as medicine and beverages. Fuel wood is the only energy source for cooking both human and cattle food. Throughout the year, there is always a forest plant in the diet. Many forest plants are sold in the local market allowing the people to earn cash.

There is a general agreement among the forestry planners that sustainable forest management plan should include forest-related needs of local communities in managing forests (Wiersum 1997). Current knowledge of people-forest interactions is limited. To improve the understanding of the local people's dependence on forest resources and to incorporate these needs and aspirations in the forest management planning process, there is an urgent need for a comprehensive

research programme into the following three areas (Gunatilleke *et al* 1993).

- a) *Socio-economic information:* Information is required on the types of plant and animal species harvested from the forests, quantities extracted, seasonality in harvesting, time allocated for harvesting, processing and marketing of NTFPs and the relationship of these activities to land tenure, proximity to the forest, family size, age group, over all income and literacy level.
- b) *Biological information:* Information on the distribution, abundance, habitat characteristics, productivity, reproduction, and regeneration of NTFP species and population behaviour is important.
- c) *Silvicultural Information:* Silvicultural treatment should take into consideration the different ecological needs of different species, such as pioneer species and the species representative of building and climax phase.

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Table 1. Shingle species

Local name	Scientific name	Status	Remarks
Ba shing	<i>Tsuga dumosa</i>	***	Far away, on mountain ridges. Not common
Dungshing	<i>Abies densa</i>	***	- do -
Seh shing	<i>Picea spinulosa</i>	***	- do -
Sisi	<i>Quercus griffithii</i>	***	It is said that it lasts life time, but rare to get individual which is possible to split. Not common roofing material.
Sokey	<i>Castanopsis hystrix</i>	**	Common roofing material, lasts for 5 to 6 years, difficult to get straight grain trees.
Thaedok	<i>Pinus roxburghii</i>	*	Not good, Use it out of no choice, problem with pin borers, Not common.
Thindok	<i>Pinus wallichiana</i>	**	Common roofing material, last for 3 to 4 years, easy to split.
Tsenden	<i>Cupressus corneyana</i>	***	Durable, lasts life time. Expensive and rare. Not common.

\*\*\* Very important    \*\* Important    \* Less important

Table 2. Fodder species

Local name	Scientific name
Bamburu	<i>Coix lachryma-jobi</i>
Bamcha	<i>Aconogonum molle</i>
Kam shing	<i>Prunus cerasoides</i>
Kashisang shing	<i>Acer oblongum</i>
Omshing	<i>Ficus prostata</i>
Omshing chungwa	<i>Ficus microcarpa</i>
Rhobji	<i>Schefflera venulosa</i>
Shenam	<i>Casaria glomerata</i>
Siman	<i>Sauraria nepalensis</i>
Tai shing	<i>Ficus subulata</i>
Yosershing	<i>Morus australis</i>
Zagagudu	<i>Nicandra physaloides</i>
Zhushing	<i>Bambusa tulda</i>

Table 3. Farm utilities

Local name	Scientific name	Uses	Remarks
Adhurubji	<i>Holboellia latifolia</i>	cord	Climber, tying fence and scaffolds.
Aeto meto	<i>Rhododendron arboreum</i>	incence	
Cha sae sing	<i>Erythrina</i> sp.	<i>Jasum</i> & <i>Waa</i>	Grows wild, used also as live fence, easy to propagate. <i>Jasum</i> (tea churner) and <i>Waa</i> (animal feed containers) is made from it, it is easy to work with.
Chakchel rubji	?	cord	Climber, tying fence and scaffolds.
Chalam	<i>Acer sikkimensis</i>	wooden cups	Phob and dhapa (wooden cups and containers).
Eubay	<i>Girardinia diversifolia</i>	cord	Carriage ropes, stronger than <i>Euli</i> .
Euli (rock grass)	<i>Erioscripus comosus</i>	cord	Ranked as the most important NTFP by the lower valley, grows in the steep slopes and rocky outcrops, cord used as tying cattle, usually not durable but easy to work with.
Hikchu (small bamboo)	<i>Drepanostachyum khasianum</i>	cord	Important NTFP for the upper valley where it is found in plenty, cord very durable, used as carriage rope and tying bulls.
Joomu		incence	
Khenpa	<i>Artemisia vulgaris</i>	incence	
Mukchi	<i>Onosma hookeri</i>	red dye	Dye used to colour red <i>torma</i> (religious cakes), Thimphu market rate Nu.100/kg. But, people in Nahi do not collect. Par used is root tuber.
Tabshing	<i>Betula</i> sp.	Boxes	
Tongphu	<i>Pinus wallichiana</i>	incence	
Zocha (stinging nettle)	<i>Laportea teminalis</i>	cord	Important NTFP for the upper valley, not as durable as <i>hikchu</i> but stronger than <i>Euli</i> .

**Table 4. Medicinal plants**

Local name	Scientific name	Ailments/Remarks
Chaema chaelu	<i>Rubus</i> ?	Cold and cough
Chuda		scabies, blood
Dokap		gastric
Keybi tsang	<i>Berberis asiatica</i>	
Khenpa	<i>Artemisia vulgaris</i>	cough, cold, cut
Mentsha		headache, neckpain
Pangphe	<i>Ligularia</i> sp.	eye sore
Usila	<i>Mentha arvensis</i>	good for blood

**Table 5. Food plants**

Local name	Scientific name	Remarks
Bamcha	<i>Aconogonum molle</i>	
Bashika meto	<i>Justica adatoda</i>	Flowers eaten, bitter, a delicacy, sometimes sold in market.
Domkey	?	Size bigger than either <i>Nakey</i> or <i>Pangkey</i> , grows in higher altitude than the two, not as palatable as the two.
Kayte kaywa (Yam)	<i>Dioscorea bulbifera</i>	Two varieties are reported. One easy to dig and one difficult to dig.
Nakey (fern)	<i>Diplazium polypodioides</i>	Abundant, low cash value, high volume, sold in Wangdi market, found in high forest in the upper valley.
Ngakhachu	<i>Asparagus racemosa</i>	Good cash value, usually sold in Wangdi market by young children. Resource declining from increase in tree and bush cover.
Olachotok (orchid)	<i>Cymbidium hookerianum</i>	A high novelty as present to <i>dashoes</i> , good cash value, rare not so abundant, grown in gardens from wild stock, govt. Ban on the sale of it.
Pagsiwa	<i>Ardisia macrocarpa</i>	
Pangchi	<i>Symplocos paniculata</i>	Growing in paddy fields, supplementary source of edible oil, trees are owned.
Pangkey	?	A variety of <i>Nakey</i> , grows in the open ground in agricultural fields, less value than <i>Nakey</i> , sold in market.
Shamu (mushroom)		Twenty spp. identified by people, high value, transport and storage problem, sold in the market.
Siman	<i>Sauraria nepallensis</i>	
Thingngey/ Zhungthing	<i>Xanthoxylum bungeanum</i>	An important spice in Bhutanese diet, sold in market, grows wild and is cultivated or taken care in home gardens, a characteristic 'vibration' feeling in the mouth on eating; if not familiar, should not eat raw; could get choked to death.
Chemam	<i>Osyris lanceolata</i>	local tea
Jabo shing	<i>Wendlandia puberrula</i>	It is important source of tea for people in Hali.
Yoyenten dem	<i>Schima wallichii</i>	local tea
Amla	<i>Phyllanthus emblica</i>	Abundant in the lower valleys, sometimes sold in the market, rich in vitamin C.
Dezam	<i>Myrica esculenta</i>	
Phaytse	<i>Benthamedia capitata</i>	
Taago	<i>Juglan regia</i>	Cash value, a requirement in religious offerings, abundant in the upper valley.
Tong	<i>Docynia indica</i>	Sometimes referred to it as 'wild apple', sour, used as mordant in dyeing in E. Bhutan.

Table 6. Non-Timber Forest Products

Local name	Scientific name	Remarks
Changma chushi		Ornamental, loose hanging pot plant.
Chaphey		Fruit ( <i>Ficus</i> sp.)
Jahoen Guenhoen		Ornamental. Common forest product in Thimphu market. Its foliage is placed in water at the chapel and stays green for a considerable period of time. Literal meaning 'summer green winter green'.
Nakey	<i>Diplazium polydioides</i>	High volume, low value
Namda		
Nashey		
Ngakhachu	<i>Asparagus racemosa</i>	Important NTFP for young children
Olachotok	<i>Cymbidium hookerianum</i>	Rare but high value, a great delicacy.
Rushing	<i>Ficus pubigera</i>	Few households in the gewog dependent on collection and sale of ru shing. It is chewed with betel nut. Plant part used is bark. A climber.
Shamu		20 spp. identified.
Taago	<i>Juglan regia</i>	Cash value, abundant, no storage problem

# Prospects of Ethnobotany and Ethnobotanical Research in Bangladesh

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## Introduction

The term 'ethnobotany' (ethnos=race) was first coined by Harshberger, one of the fathers of American Economic Botany, in 1896. It is defined as the study of relationship which exists between people of primitive societies and their plant environment (Schultes 1962). It is multidisciplinary comprising many interesting and useful aspects of plant science, history, anthropology, culture, literature, sociology, medicine and economic botany. It brings to light numerous little known uses of plants. Some of which may have potential of wider usage. The intimacy of man with plants in the wild for thousands of years has given rise to the accumulation of knowledge and laid foundation to the discipline of ethnobotany. Ethnobotany is often regarded as synonymous to Economic Botany but the latter word means the study of use of processed, improved or otherwise modified plant products and their commerce by man. Similarly, Ethnobotany and Traditional medicine cannot be same as the latter discipline incorporates several well-organized, distinct systems of diagnosis and cure, e.g. *Ayurveda*, *Unani*.

## Ethnic communities of Bangladesh

Visits to ethnic areas mostly of Chittagong Hill Tracts and Garo areas were made and field research done by a few foreign anthropologist in the middle of the nineteenth and the first quarter of the twentieth centuries although observations on the inhabitants of Garo hills adjacent to

the north of Bangladesh were made in the latter part of eighteenth century (Eliot 1794). The latest record of ethnic groups in Bangladesh gives the number as 21 distributed in the various regions of Bangladesh (Khaleque 1995).

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|---------------------------|----------------------|
| 1. Baum                   | 12. Mroo             |
| 2. Chama                  | 13. Mrong            |
| 3. Garo                   | 14. Munda            |
| 4. Hajong                 | 15. Urang            |
| 5. Khami (Khumi)          | 16. Paharia          |
| 6. Khasia                 | 17. Pankhu           |
| 7. Koch                   | 18. Rajbanshi        |
| 8. Lushai<br>(Kuki, Mizo) | (Rajbongshi)         |
| 9. Mahat                  | 19. Sak              |
| 10. Manipuri              | 20. Santal (Saontal) |
| 11. Marma                 | 21. Tipra            |

The previous census reports show that there are ethnic people in all the 64 districts of Bangladesh but concentrated in north and north eastern borders, north-central region and the entire area of greater Chittagong Hill Tracts. There are scattered ethnic communities also in Barisal, Comilla, Dhaka, Faridpur, Khulna and Patuakhali districts. These ethnic communities are now struggling for their identity as indigenous inhabitants and trying to retain their cultural and agricultural practices. With the forest resources shrinking, the indigenous values and cultures have also been severely threatened. The most valuable things in danger of being lost is the ethnobotanical knowledge that has been transferred by indigenous communities from generation to generation for thousands of years.

## Sources for ethnobotanical studies

An offshoot of ethnobotany is ethnopharmacology which has been recently defined as observations, identification, description and experimental investigation of the ingredients and effects of indigenous drugs. These two sister disciplines constitute a scientific backbone in the development of active therapeutics based on traditional knowledge of various ethnic groups, and have ushered in an era of search for potential new therapeutic agents for modern medicine. The sources of knowledge for these two disciplines are a) *literature*, b) *archaeological remains*, c) *herbaria and musea*, d) *ethnologies*, e) *travel documents*, f) *works on indigenous medicine*, and g) *folk songs, tales and proverbs*.

- a) Literature: Ancient Hindu literature, e.g. Rigveda (c. 4500-1600 B.C.), Atharveda (c. 2000-1000 B.C.); Greek system of medicine translated into Arabic by early Muslim scholars, e.g. Unani system (*Unan* = Greece).
- b) Archaeological remains: Sculptures, cave paintings. Stupas, Buddhist Art of Ganghara give indications of various plants and their utilities in ancient civilizations.
- c) Herbaria and musea: The field data on the labels of herbarium and museum specimens provide information on plant users and the definite localities.
- d) Ethnologies: Ethnology is the study on the origin, distinctive characteristics, customs and distribution of ethnic groups. The study would provide information on the properties of plants acquired by ethnic people over millennia by trial and error.
- e) Travel documents: Diaries and journals of famous travellers provide valuable information, e.g. Ibn-e-Batuta, Thomas Cook, Columbus, Hooker.

- f) Folk songs, tales and proverbs of Bangladesh have profuse references to plants, flowers and fruits, and their use in ritual or religious practices.

## Field Work on Ethnobotany

- i) *Selection of informants* who are knowledgeable and reliable for collecting data on plant parts used, their collection, processing and preparation of the drugs, its dosage and administration. Many of the tribal beliefs forbid to unravel the medicinal virtues of the plants they use to the outside world. But concerted efforts have been successful to document their knowledge through careful ethnobotanical surveys. There must be a guarantee that the informant will share in the benefits that might accrue from the development of any product.
- ii) For authentication of information and future reference, *voucher specimens* have to be preserved recording their local names which sometimes give indication of characters of morphological characters, habitat or uses of plants.
- iii) *Repeated verification* of the data collected at one spot from different informants and in different areas is essential to bring out precise and reliable information not only on the source of drug but also on the dosage, preparation and manners of administration. Long stay in one region enhances the chances of ethnobotanical discovery through communication with the natives, building up familiarity with their language and intimate knowledge of the flora.

## Ethnobotanical Research so far done in Bangladesh

Field work on this discipline in Bangladesh is only 2 decades old. Surveys

were made in 1978 to collect data on plants known to be employed in human fertility control by the scientists of Bangladesh National Herbarium followed by chemical investigations in pharmacological labs to confirm the activity in *Marsdenia tinctoria* and *M. thyrsoflora*. The first paper on the series, "Ethnobotanical records in Bangladesh" was on plants used in healing fractured bones (Hassan and Khan 1986) followed by a preliminary ethnobotanical survey in Jointapur, Tamabil and Jafflong area in Jointapur upazilla of Sylhet district (Mia and Huq 1988). Preliminary ethnomedicinal studies on Sandwip island were completed and the findings were published (Mia and Rahman 1990). A book in Bangla on herbal medicine by Hassan in 1988 and data on medicinal ethnobotany of Marma tribe were recorded (Alam 1992). Choudhury, Alam and Hassan (1996) reported 143 traditional folk formularies against 53 common diseases. As a follow up the field studies on the natural antibiotics used in the villages. Hoque and others (1986) demonstrated experimentally the antibacterial activity of five species of *Persicaria* (*Polygonum*). Literature survey and data collected through questionnaire forms in the various districts of Bangladesh by the Bangladesh National Herbarium in collaboration with BIRDEM resulted in a preliminary inventory of about 70 plants known to be of hypoglycaemic activity. A manuscript on an account of 200 plants with figures was submitted to ICDDRDB on the plants known to be effective in combating diarrhoeal diseases. Survey was in progress on Garo tribes inhabiting Madhupur and Haluaghat in the districts of Tangail and Mymensingh.

#### Future prospects

Ethnobotanical studies can be aimed for three purposes.

viz. i) on certain geographical regions,

- ii) on certain selected ethnic groups,
- iii) on certain plant groups or individual plant species, and
- iv) on use of plant in specific disease or group of diseases.

Herbaria should play collaborative role and also build up an ethnobotanical musea.

A good ethnobotanist should have the following requirements:

- a) Enthusiasm for field work.
- b) willingness to live for long periods with a minimum subsistence level.
- c) familiarity with the flora of the region.
- d) a keen eye for ethnography, and
- e) a sincere desire to be helpful in the economic uplift and welfare of target society.

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