Ethnobotany of Non-timber Forest Products of Chittagong Hill Tracts

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Introduction

Chittagong Hill Tracts is rich in non-timber forest products (NTFP) both in respect of floral diversity and abundance. A number of factors including the way of living of the tribal people have contributed to this richness. Much information on the NTFP for Chittagong Hill Tracts is available. This covers species composition, phenology of species, distribution, habits, habitats and status of different resources. But literature on how local people interact with these natural resources is scanty. Studies on various aspects of ethnobotany are lacking. Most the available literature related to the ethnobotany of NTFP is based on rapid ethnobotanical inventory. Long -term research studies are lacking for a sound basis in this field.

Attempts have been made in this paper to highlight some important NTFP viz., medicinal plant, rattan, bamboo, sungrass, edible fruit, wild food and mushroom along with their uses by the tribal people of Chittagong Hill Tracts. Relationship between these resources and tribal people has been discussed. The paper is based on literature review, personal observations and interview with the people belonging to Chakma, Marma and Tripura tribes .

Non timber forest products

Medicinal plants : Compared to other NTFP, medicinal plants have been investigated with greater attention from view point of ethnobotanical survey. Studies in this direction were undertaken in Bandarban, Kaptai, Rangamati and Khagrachari of Chittagong Hill Tracts. Alam (1992) reported use of medicinal plants for different ailments by the Marma tribe. He presented ethnobotanical data for 76 species. Most of them were shrubs, herbs and a few trees. Roots of these plants were mainly used. Rahman and Yusuf (1996) dealt with the family Zingiberacae and found that about 16 species had medicinal properties and used by the tribal people Sylhet, Chittagong and Chittagong Hill Tracts. Rahman (1997) recorded 52 species of plants that are used in the same areas. Ara *et al.* (1990) mentioned phenology, distribution and habits of the 220 species of medicinal plants. Many of them occur in Chittagong Hill Tracts. Status, distribution and habits of 160 species have been discussed by Rashid *et al.* (1988). Nursery techniques for 20 important medicinal plants have been developed (Rashid *et al.* 1990).

A few decades back, the tribal people were greatly dependent on herbal medicine. With the availability of modern medical facilities, people are inclined to modern system of treatment for recovery of ailment. Still they have much dependence on indigenous medical practitioner, called *Baidhya*. The *Baidhyas* prepare medicine from the plants and also act as doctors. Treatment for jaundice, insanity and bone fracture by indigenous method with herbal drug is quite popular. However, local people believe that indigenous system is getting neglected due to lack of renowned *Baidhyas* and good quality drug.

The *Baidhyas* use large number plant species for the preparation of drugs. Many of these plants are unidentified or undocumented. Drugs are prepared from locally available plants of Chittagong Hill Tracts. The *Baidhyas* do not have to depend on imported material. The *Baidhyas* do not like to disclose the method of drug preparation. In recent years, there has been depletion of plant resources. Medicinal plants mostly occur in dense forests. Destruction of forests and cutting of trees have affected the abundance of the medicinal plants.

Some attention has been paid recently to conserve the indigenous knowledge medical treatment and herbal plants. A Herbal Medicine Centre has been established in Rangamati. A conservation plot for medicinal plants has been established. A book on the indigenous medical treatment for the Chakmas is available (Khisa 1996). Animal products used for the preparation of drug are also included in the book.

Rattan: Rattans are represented by five species in Chittagong Hill Tracts namely, kadam bet (*Calamus erectus*), budum bet (*C. latifolius*), jai bet (*C. tenuis*), kerak bet (*C. viminalis var. fasciculatus*) and gollah bet (*Daemonorops jenkinsiana*). Rattans are harvested from the forests and exported out of Chittagong Hill Tracts. All the species except *C. viminalis* have declined in stocking due to over-exploitation. Clumps with long stems are not frequently seen (Alam 1990).

Tribal people use rattans for making furniture, box, busket etc. and as binding material. They take young shoots of *D. jenkinsiana* and *C. tenuis* as vegetables. Rattans were not cultivated. Considering their importance, rattans are now planted in the villages. People prefer to raise clumps of *D. jenkinsiana* and *C. tenuis*. They use wildings for the propagation of rattans.

Bamboo: Bamboo is possibly the most important forest resource for the indigenous people. Seven species of bamboos occur in Chittagong Hill Tracts (Alam 1982, Banik 1990, Das 1990). These are muli (*Melocanna baccifera*), orah (*Dendrocalamus longispathus*), pecha (*D. hamiltonii*), dolu (*Schizostachyum dullooa*), mitinga (*Bambusa tulda*), betua (*Bambusa polymorpha*) and lata (*Melocalamus compactiflorus*). Additionally, there is cultivated baijja (*B. vulgaris*) which is used as house post. Bamboos are greatly used for house construction and agricultural implement. Young shoots, locally known as *bans korol* of *M. baccifera* and *B. tulda* are cooked as vegetables.

Due to over-exploitation, bamboo resource seems to have declined. Even extensive use of bamboo shoots might affect the resource. Due to higher price of bamboo, some earth made houses are now constructed by the Chakmas. *B. tulda* and *D. longispathus* are found to be cultivated by the villagers.

Sungrass : Next to bamboo, sungrass (*Imperata cylindrica*) is the most important material for house construction. It is used for thatching roof of the huts. Mainly women are engaged in collecting sungrass during the dry season. They meet their own requirements and also sell sungrass in the market. They annually harvest sungrass from the wild, specially from slash burnt areas. There is increasing stress on this resource. No cultivation of sungrass is done by the tribal people.

Edible fruits : Many of the forest plants particularly wood species produce edible fruits. In Chittagong Hill Tracts, 32 species of trees, 6 species of shrubs and 3 species of climbers have been listed which produce edible fruits (Das 1987). Many edible fruit plants are endangered due to unplanned harvesting of forests. Therefore, conservation of edible fruits and their cultivation need attention.

Wild food : Yam (*Dioscorea* sp.), a climber locally known as *jungli alu,* is used by the tribal people as food. Sometimes, local people have to depend on *Dioscorea* sp. at the time of food scarcity. Modified root of this species is cooked as vegetables. This plant is fairly common in Chittagong Hill Tracts. It is collected from the wild. Decline of this resource is reported. However, some species of Yam are sporadically grown in the home garden (Alam Pers. Com).

Vegetables : Tribal people like vegetables as food. In addition to tender shoots of bamboos and rattans, they take many naturally occurring plants including fern as vegetable. Most of these plants are not on the record.

Edible fungus (mushroom): Mushrooms are consumed by the tribal people as food. In 1985, a market survey was conducted at Rangamati. It was reported that Chakma people consume mainly three species of mushrooms namely *Lepiota* sp., *Pleurotus* sp. and *Volvariella volvacea* (Shayasta Pers. Com.). These mushrooms are collected in the rainy season from the wild. No cultivation of mushroom is locally done. Contrary to plain land people, mushroom is a popular food for the tribal people. Mushrooms are sold in the market, but in a small quantity. This indicates that utilization of mushrooms by the people may not be sustainable. People think that this resource will always be available in the nature.

Conclusion

Non-timber Forest Product is an inseparable part of tribal life. Once this resource was plentiful. The tribal people utilized and maintained the resource by their indigenous way of living. Due to development of communication system, rural infrastructure and pressure of the increasing population, this indigenous knowledge is getting lost. This knowledge that helped sustainable maintenance of NTFP needs to be documented. This will be helpful to develop a sound plan for the management of NTFP. Besides, there is need to motivate the people to conserve the natural resource. Long-term ethnobotanical studies are required to explore and document the indigenous knowledge of the tribal people on the non-timber forest produces.

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Ethnobotanical and Cultural Background of Ethnic Communities in Forest Resource Management in Chittagong Hill Tracts

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Introduction

Ethnic communities in Chittagong Hill Tracts (CHT), for centuries, have lived from shifting cultivation (*jhum*), fishing, hunting and harvesting forest products. Even now-a-days, they are still dependent on forest resources for their food, medicine and shelter etc. Forests and trees were venerated and worshipped and in some cases still are central to traditional societies as their primary source of food, shelter, medicine and other products and services (Ahmed and Gaby 1996). To indigenous peoples on every continent, mountains were the places where Gods dwelled. They make up one-fifth of the world's landscape and are home to at least one-tenth of the world's people. An additional two billion people depend on mountains for much of their food, hydro-electricity, timber and mineral resources (Denniston 1995). The mountain people are ethnic minorities all over the world and they face increasing cultural assimilation, debilitating poverty and political disempowerment (Denniston 1995). Traditionally, indigenous/ethnic communities world wide are knowledgeable about local plants and other natural resources, on which they are so immediately and intimately dependent. Knowledge of the medicinal properties of plants probably predates agriculture and it is thought to have begun when human beings were still hunters and gatherers, inhabiting the primary forests and their associated savannahs (Ahmed and Gaby 1996).

CHT and its ethnic/indigenous communities : The **CHT** region with an area of 13191 sq. km., located to the south east corner of Bangladesh, situated between 21°25∫ and 23°45∫ north latitude and between 91°45∫ and 92°50∫ east longitude, comprises of three hill districts-Rangamati, Khagrachari and Bandarban having a present population of 1.1 million. The main characteristic of the region is that it is the abode of at least ten ethnic communities, viz. *Chakama (including Tanchangya), Marma,Tripura (including Riang), Chak, Lushai, Bhom, Bonzogi, Panko, Khyang and Murong (Mro)* possessing distinct culture and lifestyle of their own. The region constitutes 76 per cent of the total hilly region of the century of which, 90 per cent of the area is hilly, 4 per cent covers villages, rivers, and marshes and 6 per cent is only suitable for intensive agriculture (Khisa 1997). The ethnic communities of CHT were broadly classified into two heads; *Taungtha (children of the hills)- Lushai, Kuki and Tripura; Khyongtha (Children of the rivers) - Chakmas* including **Tanchangyas** and the *Marmas* (Lewin 1869).

CHT's general features and vegetation: The general feature of CHT in late 18th and early 19th century was mass of hills, rivers and cliffs covered with dense bamboo breaks, tall trees and creepers. The valleys were covered with thick forests interspersed with small water courses and swamps of all sizes and descriptions (Hutchinson 1906, Lewin 1869). Salt-licks

are found at many places and people of some ethnic communities (**Lushai**) used to utilize them as sources of local salt supply by boiling down the water in conical earthen pots.

The natural vegetation climax throughout most of CHT is considered to be mixed tropical evergreen and deciduous forest occurring in association with each other and with bamboos. Over 100 tree species alone have been recognised in addition to numerous bushes, shrubs, canes, lianas and ferns. But the vegetation climax now exists only in the reserved forests and as a few scattered remnants outside them (SRDI 1986).

Major river systems and catchment areas: The region is divided into fourteen hill ranges with nine valleys and watershed areas formed by the Feni, the Karnafuli, the Sangu and the Matamuhuri rivers and their tributaries and is marked out by the chains of hills running from the south in a north-westerly directions. The three major rivers the Karnafuli, the Sangu and the Matamuhuri along with their tributaries form the major drainage of the region with a total catchment area of these rivers is approx. 1400 sq. km (Ishaq 1971). The Feni river leaves the region at Ramgarh at the north-western boundary. But the drainage of the Karnafuli river has been greatly affected by the construction of the dam at Kaptai for hydro-electricity generation submerging an area of 922 sq. km. and converting it into an artificial lake. A good number of rivers with their large affluence and hill streams make the water supply perennial in this region.

A natural lake of great beauty- the Rainkyongkine at a considerable elevation and of great depth is located on the east side of the Ramakri Taung about 10 km. south of Polite and to the east of Ramu. The lake is about 1.6 km. in length and a quarter about 1.6 km in breadth and is well stocked with fish. Its water is clear and good. Another small lake is the Bogakhine with a shape of parallelogram of such exactness that one could almost believe it as the work of human hands. The lake water is quite fit for drinking purpose, but no fish can live in it nor is there any weed growth (Ishaq 1971).

Ethnic people's lifestyle and socio-economy: The life of the ethnic people and their socio-economic activities in CHT are centred around the hills and their resources with which they lived in a symbiotic relationship for centuries. Each and every ethnic community has its own methods to meet the basic needs which are conditioned by natural and socio-economic factors as well as by the level of technology and knowledge available and in practice. The economy of the tribal people is primarily created to the satisfaction of their basic subsistence and may be broadly categorised as "production-consumption economy".

Since most of the ethnic people are forest dwellers and hill farmers, their economy is basically forest based which operates on simple traditional technology. Their economic activities are therefore, conditioned by the utilisation of forest resources for their subsistence. Ninety per cent of the people of this region depend upon subsistence agriculture and the majority of them are involved in shifting agriculture (*jhum* cultivation) and until 1818 A. D. it was the only form of agriculture practised by the tribal people. Besides *jhum* cultivation, other forest based activities include food plant gathering, collection of bamboo, timber, fuel wood and sungrass, making baskets from bamboo, brewing all,rearing animals etc.

Until, early 1960s, land use in the CHT was appropriate for the hill ecology. Most of its land was covered and protected by forest. The economic gap among the *jhumias* is rather narrow. Misery,

malnourishment and starvation was unknown in the hills until the early sixties. To the *jhumias*, land was the common property. The village community and the kinship groups were considered the ultimate owner of the land and as such they did not wish to possess land document or lease deeds as many were ignorant about the concept of private property or the commercial value of land.

Due to cross cultural contacts, the basic economic structure and functions of the jhumias have changed. Recently new occupations have been adopted which among others, include clean cultivation of annual monocrops, homestead agriculture and agroforestry practices in the hill slopes, small trade and wage labour.

Life of the tribal people is quite simple in the sense that their subsistence activities are technologically not advanced. However, even at the low level of technology, there exists some kind of specialization of different activities. Job specifications for certain activities are observed among men, women and children. In general, women do all kinds of household works. Men's job are related to hard manual works. However, women also perform hard manual works like cutting sungrass, firewood and carrying them home on their head or back.

Production activities in the area of agriculture are done by both men and women. Men are responsible for site selection for *jhum*, cutting jungles, felling trees, etc., while women participate with men in dibbling and sowing seeds, weeding, harvesting, threshing and carrying. Food plant gathering is basically the women's job, so is weaving and brewing while basket making is basically the men's job. Children are engaged in grazing livestock and helping mother in the household works. Ethnic men and women share equal responsibilities for subsistence activities.

Ethnobotany : It is the knowledge of interaction and use of the plant resources by the ethnic people. Ethnobotany helps identify and focus the Indigenous Technology/ Knowledge (ITK) and vice versa. The ethnic communities in CHT rely on wild-collected plants from the surrounding forests for food, construction materials, fuel wood, medicine and many other purposes (**Table1**). It is an easy matter for them to procure from the forests as they are very acquainted and adapted to the forest environment. The forefathers of the ethnic communities, for generations, recognised the uses of plant resources for the treatment of their various diseases. For example, the barks of *Oroxylum indicum* (**Khona**) and the roots of *Roulfia serpentina* (**Sursan**) were used to treat jaundice and stomach pain respectively. There are fifty or more species of trees of which fruits are edible and in many cases exceedingly sweet to the taste. Among them are wild mango (*Mangifera sylvatica*), *Kamkui* (*Bridelia retusa*) with an excellent edible fruit and the leaves of which are an excellent fodder, **Bortagula** the wild litchi and **Rogosko** a creeper with blood red fruit, very sweet and about the size of a lime. There are several varieties of wild banana the fruits of which when ripen is very sweet though full of seed. The inside of the wild banana flower makes excellent vegetables. The white core of the banana pseudostems cooked with rice is used to eke out rice in days of scarcity and the same chopped with bran makes an excellent fodder for pigs and cattle. As vegetables, there are a dozen varieties of yams procurable all the year round. Numerous varieties of culinary herbs (shag) are found of which the young fronds of the male fern known as "Dhengi shag" and the stalks/tendrils of a creeper that grows in the moist places and wild mango are used as leafy vegetables. The young shoots of different bamboo species (*Bansshorl*) and of the cane (*Golak aga*)

make a first class vegetable curry. They are gathered when the young shoots force their way through the ground and appear in the cone shape about 30 cm in height. Even now a days, because of low productivity of *jhum*, ethnic people live on yams and bamboo shoots during winter and rainy season.

There are also several varieties of edible fungi growing on decaying wood (e.g. *Lentinus, Shizophyllum* and Jew's ear etc.) and mushrooms appears from the soil/straw (e.g. *Lepiota, Volvariella* etc.). As such, famine, in the strict sense of the word, is unknown to the local communities. The ethnic minorities lived for centuries in this hilly region without any adverse affect to the forest environment and its watershed. They made an easy living from sustainable harvesting of forest products, fishing, hunting and *jhumming*. But unfortunately, today, there is often a decrease in the availability of wild plant resources, related to increased human/animal population (population forces) and the effects of competition with other forms of land use (market forces).

ITK of *Jhum* culture : *Jhum* variously termed as shifting/slash and burn/rotational bush fallow agriculture is the indigenous technology knowledge of forest farming practised by the ethnic communities in the hills/mountains of humid tropics. Over 200 million people, thinly scattered over 14 million square miles of tropic, obtain bulk of their food from *jhum*. They form a little under 10 per cent of the world's population and are spread over more than 30 per cent of its exploitable soils (Nye and Greenland 1960). This form of land use has survived up to the present as a viable practice itself suggests that the system is essentially based on sound scientific principles (Ramakrishnan 1984).

It is also claimed that soil fertility and the protection of the natural resource base were secured through the natural process of shifting cultivation, bush fallowing and composting. Genetic conservation was once part of the *jhum* farming system. *Jhumias* maintained genetic diversity by borrowing or exchanging seeds and even today they are very generous with their seeds. They used to harvest forest products and cultivate *jhum* according to their needs only without having any greed for being rich and possessing luxury items and as such, they did very little harm to the forest ecosystem and its watershed as it provided them the means of survival. Centuries ago or even thirty years back, the life and culture of the ethnic people was so simple, greed did not develop in their minds. So they did not think of exploiting and exhausting the natural resources beyond their necessities. They lived in harmony with their surrounding nature having a symbiotic relationship.

All the ethnic communities practice *jhum* culture and it used to be the centre-piece of their life and culture. Their songs, dances and all other festivities are based on *jhums*. Cotton, sesame and rice were the main source of cash and food for them.

A first class *jhum* used to produce as much as 3 tons of paddy in return for about 40 kgs sown when good watershed condition prevailed. Later it came down to 1-1.5 tons and now it is producing only 0.4 to 0.6 tons. The traditional *jhum* was known to be not harmful to the hill watershed and ecosystem. Previously *jhum* lands were selected in a very small patches of a suitable site preferably in bamboo forest with a practice of long rotation. Each and every family in the community used to share *jhum* products in case of scarcity. If, they at all, had to select a patch of land from the forest with trees, they used to cut only the small bushes and only the branches of the big trees were lopped. *Jhumias* never cultivate *jhum* close to the river or stream. In *jhum* culture, soil work was minimum as planting was done by

dibbling of seeds of different varieties of crops which also give good cover to the ground. Indigenous *jhum* was also highly diversified; rice, cotton, sesame, corn, melon, cucumber, pumpkin, yam and as many as about 30 varieties of crops including some flowers required for their festive occasions were planted in *Jhum* fields.

The cultural practice is that farmers mix seeds of all crops together in a basket and make a small hole in the ground and start dropping the seeds, untill the whole *jhum* is sown. The seeds grow up in due course and are reaped in their respective seasons. The first crop is corn that ripens around mid July, then comes the vegetables followed by paddy in September and October and cotton in November, thus brings the *jhum* harvest to a close. Up to a century or so ago shifting cultivation had no very serious effect on the farmland of the tropics, since the soil and vegetation were given adequate time to regenerate after a period of cropping (Nye and Greenland 1960).

Jhum cultivation was practiced only in small patches and continued only for one or two years. Then the land was left fallow before being cleared for cultivation again. During the fallow period, the old jhumed plot again become covered by natural vegetation which shaded out weeds and builts up fertility in the top soil again. This natural system of soil fertility management broke down as the fallow period was reduced to 3-5 years due to population pressure and non-availability of suitable land for *jhum*. The reduced fallow period encouraged the growth of grasses and bamboos and this change greatly increased the fire hazard, thus preventing the regeneration of woody vegetation.

Jhumming in the middle slopes leaving the upper hill tops and the lower slopes with vegetative cover is no longer a common practice. Moreover, the *jhumias* used to keep standing trees of leguminous species like Koroi (*Albizia* spp.). If they had felled the trees, they cut them at breast height or above, to allow the trees to coppice again. Cultivation pressure on the hills had greatly increased when the Kaptai dam reservoir displaced an estimated 100,000 people from the flood plains; valley bottom lands and low hills where they had been able to practice more intensive forms of crops production.

Hutchinson (1906) put forward his views in favour of *jhum* in this way - "the natural feature of CHT was such that *jhum* culture must be the principal method of cultivation". He argued that if the system of *jhumming* was abandoned, the hill ranges would be entirely useless. The absence of stone, light nature of the soil and the steepness of the hillside make cultivation by terrace an impossibility and the hills of the interior would be idle instead of at present supplying food and valuable produce for barter to the inhabitants as will bring a source of considerable revenue to the government (Hutchinson 1906, Lewin 1869).

The life of ethnic people is simple and so is their implement of *jhum* culture. The only implements traditionally used by the ethnic people is the *dao* (a country knife) and the axe. The *dao* is a possession of great pride to them and is literally the bread winner. He cultivates his *jhum* and builds his houses with it and without which the most ordinary operation of the ethnic life can not be performed. It is with his *dao* that he fashions the womens' weaving tools; fines off his boat, notches a star in the hillside leading to *jhum*. But later spade came in possession of ethnic life which is very harmful to *jhum* culture because of introduction of soil exhausting cash crops like turmeric, zinger and taro etc.

When community ownership of land has begun to change, they used to manage the

fallow period of *jhum* by practicing agroforestry with banana, papaya and in some cases, planting trees like Gamar (*Gmelina arborea)* and Koroi (*Albizia* spp.). This used to be a proof of claim of individual ownership. Traditional use of leguminous standing trees in *jhum* farm is closely tied to the concept of land and resource conservation. This powerful cultural legacy has its strategies in indigenous knowledge of trees and their value in the system.

Ethnic people who have religious faith in Buddhism believe that the plants have got life and feelings. They plant trees, particularly banyan trees and bamboos around their pagodas. Shoots and leaves of banyan/mango trees are used to disperse water (used for prayer) to human beings, all around homes and villages. They have also beliefs and taboos that the big trees have spirits and as such they do not cut them and some communities place flowers and offer sacrifices at the foot of big trees. Some ethnic communities perform *"Thammana/gang puja"* by sacrificing animals- to streams/rivers to get blessing from them in order to keep them healthy and free from the diseases. They prefer to drink and use clean water from the seepage source/water falls of the mountains and streams. They do not pollute rather keep them clean. These beliefs and cultures of the ethnic communities of CHT helped in the sustainable use and management of forest resources and watersheds in the earlier days.

Indigenous technology and knowledge of *jhum* culture have little harm to hill ecology. Increased population pressure and shortage of appropriate land for *jhumming* have changed the situation. Changed situations have gradually eroded the ecology and land use of the hills. Pressures from external factors, particularly infrastructure development like construction of roads, installation of paper and rayon mills at Chandraghona, building of Kaptai dam for hydroelectricity, generation and influx of settlers from the plains etc. have also contributed to the change of the biological and cultural diversity in the region. Now, neither the traditional nor the adopted system of land use practices are able to produce enough food for the ethnic people. So, the adoption of improved tree fallows resulting from the selective enrichment planting of perennial species should be encouraged. The best alternative to *jhum* is now known to be the improved simultaneous fallowing through multiple cropping systems involving wide range of leguminous plants, trees, hedges and tuber plants grown with food crops in a deliberate configuration i.e agroforestry.

Conclusions and recommendations

Forests in CHT supply a wide range of wood and non-wood products to the ethnic communities. Knowledge of the species, various products and their use pattern represent an important knowledge system. These are now much neglected. There is an urgent need to save this neglected ethnobotanical knowledge and recognise its potential importance for CHT development.

Local knowledge of flora, fauna and ecology is now rapidly being recognised as significant for scientific research, biodiversity conservation and the development of alternate economic options (Martin 1995). Ethno-botany and ITK are now widely accepted as a science of ethnic peoples knowledge/interactions with plant resources and ecosystems.

Ethno-botany and ITK have important roles to play in the forest resource and watershed management as well as the conservation of biodiversity and traditional cultural diversity. Native and popular knowledge, long tested and adjusted to local conditions, should be

sought and used to the benefit of our development activities. Native knowledge and approaches might be of special value to increase production sustainability and to maintain environmental quality (Dubois 1996). Convention on biodiversity calls for the wider use and application of community know-how, the knowledge, innovations and practices of indigenous/ ethnic and local communities. If convention on biodiversity is to be successful, it will have to ensure protection of the ITK and biogenetic resources of indigenous/ ethnic and local community. It also raises the questions of access to and benefit-sharing from ethnobotanical knowledge or indigenous technology/knowledge including production of indigenous medicine, pesticides, forest management, agriculture, watershed conservation etc. (Colchester 1996). Unfortunately, the importance of ethnobotany and ITK is not yet recognised nor even supported by the national institutions in the country. Much of the wealth of ethnobotany and ITK is today becoming lost as traditional cultures become eroded.

Ethnobotanists can play very useful roles in rescuing disappearing ITK and returning it to ethnic communities. In this way, ethnobotany and ITK can be conserved as part of living cultural-ecological systems. This will help in maintaining a sense of pride in cultural knowledge and practices and reinforcing links between communities and the environment, so essential for conservation. Support for increased local access to and control of forest resources for indigenous groups and local communities, thus legitimizing their role as responsible forest managers, has proved to be a constructive strategy to achieve sustainable forest and watershed management (Colchester 1996).

There is an urgent need to develop collaborative efforts with local community to conserve biological and cultural diversity as there is inextricable link between them. But even our best intentions and efforts will not succeed if we do not take necessary actions to guarantee the rights due to local community.

Local communities must benefit directly from protected areas before new ones are established and they should be consulted in all the programmes affecting them, their resources and environments.

The declaration of Belem : The First International Congress on Ethnobiology held in 1988 calls for just compensation and legal defence of indigenous people's knowledge (Martin 1995). In line with the declaration, efforts aimed at ethnobotanical and other ITKs' inventory, conservation and management may be undertaken. Conservationists need to develop means of accountability to ensure that indigenous peoples' needs and rights are respected (Colchester 1996). The ethnic people should also be made aware of the global value of their knowledge resources.

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Table 1: Some wood and non-wood forest species used by the *Chakmas* and other ethnic communities of CHT.

Local name	Botanical name	Habit	Main uses	Remarks/ beliefs
Gere Am	*Mangifera sylvatica*	Medium tree	Fruit is edible	
Kamkui	*Bridelia retusa*	Medium tree	Fruit is edible	
Jarul	*Lagerstroemia speciosa*	Medium tree	Timber is used for furniture and house post. Bark is used for making dye. Water boiled with bark is used for bathing of women after delivery	Women after giving child birth are believed to re-gain strength after having bath with boiled water with jarul bark.
Garjan	*Dipterocarpus* spp.	Large tree	Timber is used for building boat. Oil is used as fuel and for bird trap.	
Ulu	*Dillenia indica*	Medium tree	Fruit is used as vegetable. Slippery juice of fruits and seeds is used as ingredient in healing bone fracture.	Evil spirit rests in the tree
Champaphul	*Michelia champaca*	Large tree	Wood for house post and furniture	Evil spirit rests in the tree
Chamnigula	*Artocarpus chama*	Large tree	Fruit is edible. Timber is used for boat building	
Gutgutya	*Bursera serrata*	Medium tree	Fruit is edible, timber is used as house post and firewood.	
Semaigash	*Bombax insigne*	Large tree	Seed fibre is used for filling pillows and mattress. Flowers are used as vegetables. Spines used in preparing medicine.	
Uttayal	*Terminalia chebula*	Large tree	House post, fruit quenches thirst and is used in preparation of medicine.	
Bortagula	*Artocarpus lacucha*	Medium tree	Fruit is edible.	
Boragula	*Terminalia bellerica*	Large tree	Fruit is used in medicine.	
Kadamola	*Emblica officinalis*	Medium tree	Fruit is used in medicine.	
Kadamful	*Anthocephalus cadamba*	Medium tree	Timber is used as house post.	
Udalgach	*Sterculia villosa*	Medium tree	Bark is used for making rope.	
Arjungash	*Terminalia arjuna*	Medium tree	Bark is used in medicine	
Gabgulagach		Medium tree	Fruit is edible. Bark is used in making dye.	
Ramkola		*Large tree*	Fruit is edible.	
Kusumgula		*Medium tree*	Fruit is edible, timber is good for house post as resistant to pest.	
Nolam		Climber	Fruit is edible.	
Rogosko		Climber	Fruit is edible.	Orange like fruit
Kapurgach		Large tree	Wood is used in medicine.	

Table 1 Contd.

Local name	Botanical name	Habit	Main uses	Remarks/ beliefs
Pairaggach		Medium tree	Wood is used in medicine.	
Agargach	*Aquilaria agallocha*	Medium tree	Wood is used in medicine and scent.	
Koroigach	*Albizia procera*	Medium tree	Bark is used in making dye (brick red dye). Young leaves are used as vegetables and good for treatment of worms.	
Uzyanggach	*Bischofia javanica*	Large tree	Bark is used in making dye (blue).	
Momagach		Climber	Fruit is edible and used in medicine.	
Chandangach		Medium tree.	Wood is used in medicine	
Korodipata		Small tree	Leaves are used for thatching. Young shoot is used as vegetables.	
Kurukpata	*Licula peltata*	Shrub.	Leaves are used as thatching materials.	
Shon	*Imperata cylindrica*	Herb.	Used as thatching material.	
Malgach	*Sepium sp.*	Small tree	Malgach *Sepium* sp. Small tree. Bark is used as fish poison. Bark is used as fish position.	
Mashamaludi	*Derris cunefolia*	Climber	Root bark is used as fish poison.	
Chagach		Small tree	Wood is used as weaving instrument. Young shoots are edible.	
Hona	*Oroxylum indica*	Small tree	Bark is used in the treatment of jaundice. Fruit is used as vegetables.	
Bha-gach		Small tree	Leaves used as thatching material. Young shoots edible	
Gila	*Entada scandens*	Woody climber	Fruit is used in medicine	
Keret/Gola/ Betagi	*Calamus spp. . Dacmonorops jenkinsianus,*	Climber	Young shoots are edible. Stem is used in furniture and basket making.	
Panlodi	*Piper* sp.	Climber	Used in medicine	
Egojya bansh	*Melocanna baccifera*	Bamboo	Young shoots are edible. Leaves are used as thatching materials.	Life blood of all ethnic people
Tara/Chenge tara	*Coustus speciasa ; Alpinia nigra*	Tall herb	Pith is taken as vegetables.	

Table 1 Contd.

Local name	Botanical name	Habit	Main uses	Remarks/ beliefs
Kedogi		Shrub	Vegetables.	
Ketrangshag	*Caesalpinia occidentalis*	Shrub	Vegetables.	
Tidakachu	*Colocasia* sp.	Herb	Vegetables	
Andoloti	*Vitis* sp.	Climber	Provides water .and quences thirst.	
Lodibansh	*Melocalamus compactiflorus*	Climber	Provides water and quenches thirst; and is used to make fans.	
Pokgula		Climber	Seeds used in the treatment of renal calculus.	
Tankadana	*Anisomelis ovata*	Shrub	Seeds are used for treatment of gastric troubles.	
Moha pittunggula	*Melastoma malabatricum*	Shrub	Fruit is edible and used in medicine.	
Kirichaludi		Climber	Young is shoot used as vegetables.	
Pittapada	*Phrynium* sp.	Shrub.	Leaves are used as thatching and wrapping material.	
Lelompada	*Premna esculenta*	Shrub.	Leaves are cooked as vegetables. Medicinal, used for worms.	
Dengishag	*Dryopteris* sp.	Herb.	Young fronds are used as vegetables.	
Ozoneshag	*Spilanthes clava*	Herb.	Leafy vegetables.	
Jangalyashag	*Sarcochlamys pulcherrima*	Herb	Leafy vegetables.	
Ambojshag	*Blumea lacera*	Herb	Leafy vegetables.	
Meyashag		Herb	Leafy vegetables.	
Paranga-aga		Climber	Leafy vegetables.	
Mormujya amila		Herb	Leafy vegetables, used for the treatment of jaundice.	
Mingoni		Herb	Leafy vegetables, used for the treatment of dysentery.	
Sursan	*Roulfia serpentina*	Shrub	Roots used for the treatment of stomach paind and blood pressure	
Chigonshag		Shrub	Used as vegetable.	
Kedaboksashag		Climber	Leafy vegetables, used for the treatment of Chicken-pox.	
Munimujyakher	*Blumea* sp.	Herb	Used for batching for the treatment of boils/ carbuncles and gives sound sleep.	
Pushi		Herb	Used as spice in cooking.	
Sabereng	*Ocimum* sp.	Herb	Used as spice in cooking.	
OL (Grutta/ Undurokan/ Kokyengkappo/ Shadi/Gobar/ Shamu/ Thentheni)		Wood fungi and mushrooms	Used as vegetable	

Indigenous Folk Herbal Medicines of Bangladesh

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Introduction

The history of use of plants against various diseases can be traced back to remote past. The earliest mention of its use is found in the "Rigveda" which is one of the oldest repositories of human knowledge. "Ayurveda" a later reproduction is in all its aspect has been the source of all systems of medical science. It developed so much in vaidic period that effectiveness of its use is still a legend to the people of the country. But unfortunately "Ayurveda" lost today all its past glory and status due to vicissitude the country had to pass through during the last few decades.

In early period "Ayurveda" was the only remedy for the people and incourse of time it became a part of culture and heritage of the people of this sub-continent. Majority of the rural people depend on herbal treatment and till today this is the mainstay of the therapeutic arsenal for them. Thus it deserves attention of scientist for the revival of past glory and heritage.

A good number of indgenous folk medicines have been in use across the country from time immemorial. People inherited the knowledge of use of those medicines from their predecessors and transmitted to the successors and in that way it is being propagated through generations. Folk formularies and ethnomedicobotany from Bangladesh are not much documented. Alam (1992) documented the ethnomedicobotany of *Marma* tribe. Khisa (1996) compiled a book on the traditional medicine of *Chakma* tribe. There are few records on folk formularies (Alam *et al.* 1996, Chowdhury *et al.* 1996). In this paper information on some indigenous folk medicines have been incorporated. This may inspire the interest of scientist and other social workers who may serve the ailing rural people by improving the same through further research and imporvement. Collected information has been reproduced in original form as I had collected during a survey work. Based on the survey and available information this paper deals with 50 herbal preparation of medicinal plants along with their uses.

Medicinal plants and their uses

(1) Debarked *harhjura* (*Vitis quadrangularis*) stem with equal quantity of *maskalai* (*Vigna mungo*) is finely ground and small tablets are made out of it and dried. This tablets if taken after roasting in sesame oil relieve gas of the stomach.

(2) One or two pieces of garlic (*Allium sativum*) with 1-2 tea- spoonfuls of green *amlaki* (*Emblica officinalis*) juice if regularly taken keep youth long-lasting. One or two pieces of garlic fried in pure ghee (butter oil) helps in regaining lost youth.

(3) One or two picces of garlic if taken with pure milk increases intelligence and memory.

(4) Half a piece of garlic if taken with "curd" and rice makes children with bare skin and bones healthy and fatty.

(5) Drink of powdered onion (*Allium cepa*) seeds induces sound sleep. Seeds of onion is supposed to be more effective in this case.

(6) Raw onion with common salt is useful in scurvy and gastric pain.

(7) Use of bruised onion cures wound of the heels (surface splitting due to dryness)

(8) Onion juice mixed with coconut or sesame oil thickens and prolongs hair.

(9) Roots of *karabi* (*Nerium indicum*) is used as abortive. If adverse effect occurs due to application of *karabi* roots, pure *ghee* should immediately be taken to counter the poisoning effect.

(10) Pulvirised *karabi* roots if inhaled removes sinus trouble.

(11) Drops of young karabi leaf juice cures opthalmia.

(12) Sumiul (*Bombax ceiba*) bark is approdisiac. Gum of the tree is effective in blood dysentery, blood vomitting and pthysis.

(13) Stomach pain due to indigestion subsides readily if fresh ginger is eaten with common salt. It is also used for increasing appetite.

(14) Warm extract of ginger is useful in asthma, heart disease and palpitation

(15) Ginger juice with honey is useful in cough and asthma.

(16) Juice of *kalamegh* (*Andrographis paniculata*) leaves removes various stomach complain specially in children. The whole plant is also used as substitute of *Swertia chirata* which is good stomachic.

(17) Juice of tulsi (*Ocimum sanctum*) mixed with honey is useful in stomach pain, cough and lever troubles of children.

(18) *Tulsi* extract with lemon juice acts as anthelmentic.

(19) Five to six tea spooonfuls of *thankuni* (*Centella asiatica*) juice in a cup of milk stops falling of hair due to malnutrition.

(20) One teaspoonful of warm and cooled *thankuni* juice in a cup of cold milk with 20-25 drops of honey helps babies to talk who can not speak in proper age.

(21) If 20 gms of *thankuni* juice is taken regularly for sometime, the complexion of boys and girls becomes fair and lovely.

(22) Breathing troubles, bronchitis and lungs disease are cured by compress (hot) of oiled betel leaf (*Piper betle*) on chest. It also cures stomach pain, breast inflamation and headache when applied as compress on infected parts.

(23) Roots of betel leaf if taken make woman completely strile

(24) Juice of betel leaf is also used as lice killer.

(25) Five to six teaspoonfuls of *tela kucha* (*Coccinea cordifolia*) helps in vomitting out undesirable things of the stomach.

(26) Juice of *tela kucha* with sugar if taken for several days helps children to stop making water in bed during sleep.

(27) If two roasted leaves of *tela kucha* are taken for a long period after every meals helps to cure diabetic disease.

(28) Extract of *lazzaboti* (*Mimosa pudica*) with sugar is useful in dysentery and diarrhoea. It is also effective in kidney stone and other blood dysentery. kidney troubles. It is wonderful blood purifier and thus have use in plegue.

(29) Lazzabati is sex-stimulant. It acts as deodorent and anti- perspirant in arm-pit sweating.

(30) Regular use of *lazzabati* roots act as contraceptive and is generally used in rural areas for the purpose.

(31) Seeds of *kuchila* (*Strychnos nuxvomica*) is effective remedy in hydrophobia. Besides, seeds of *kuchila* is used in paralysis, diarrhoea, general debelity, dysentery, non- remetting fever, dispepsia biles and epilepsy.

(32) Gums of *akand* (*Calotropis gigantea*) cures ring worm.

(33) Smoke of pulvirised *akand* leaf is effective in piles.

(34) Use of pillow made of flosses of *akand* fruit helps in normalizing the deshaped heads of new born babies.

(35) Five to six grains of pulvirised roots of *akand* cure blood dysentery.

(36) Brushing of teeth with *akand* roots make gum and teeth stronger. Gum of *akand* when applied relieves tooth-ache.

(37) *Alkusi* (*Mucana pruriens*) juice if taken for several days cures gout which makes one unable to raise hands up-ward.

(38) Seeds of *alkusi* is a wonderful medicine for sexually weak people. Decoated and water soaked seeds are to be ground and fried in pure *ghee*. Two tea-spoonfuls of this fried material is to be taken with sugar every morning and evening for several days. One cup of pure milk is also to be taken each time with the medicine. Within few days it will turn incumbant sexually very strong.

(39) Soaked cloth with *alkusi* extract if applied on female organ extended due to child-birth or other reasons brings it back to normal size.

(40) Seeds of *bichuti* (*Tragia involuctara*) beaten in little water and then rubbed in bald head promote growing of new hair.

(41) Five gms of *bichuti* in two cups of water is to be boiled to one cup of water, then filtered and taken. It stops palpitation of heart for non-specific reasons and also cures lumbago.

(42) One gm of pulvirised roots of *bichuti* if taken with warm water cures asthma due to cold allergy.

(43) Hot compress with *bichuti* root paste cures mums.

(44) Extract of *ghritakumari* (*Aloe vera*) is energetic and increases semen.

(45) Dried extract of *ghritakumari* is known as 'Musabbwar' which is wonderful body stimulant.

(46) *Ghritakumai* extract mixed with honey if applied on the tongue of new born baby helps motion of bowel in constipation and removes the reluctance of the babies in sucking mothers milk.

(47) Bark *of arjun* (*Terminalia arjuna*) is used against heart disease. The medicine is prepared asfollows:

350 gms water, 125 gms cow milk and 25 gms of *arjun* bark are boiled till the mixture reduces to 125 gms. Then the mixture is filtered and taken every morning in empty stomach. Long use even for a year completely cures heart disease.

(48) *Keshraj* (*Eclipta alba*) juice blackens and lengthens hair. It is generally used with coconut or til oil.

(49) One tea spoonful of fresh juice of *keshraj* if taken for several days cures jaundice.

(50) Bark of *khona* (*Oroxylum indicum*) is useful in jaundice.

Conclusions

The above folk medicines are so well and widely known to rural people that they often take it without seeking advice of trained healers. This indigenous knowledge about the use of plants calls for further research in order to establish their efficacy and refinement of their preparation and application. Traditional use of herbal medicines may thus be made more scientific. It will also help growth of rural economy and at the same time go a long way in making the Government programme "Health for every body by the year 2000", a success. Efforts are also to be directed towards conserving and extension of these plants to save them from extinction. This endeavor will thus also enrich biodiversity of plants which is need of the time.

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