

Non-Timber Forest Products: A Substitute for Livelihood of the Marginal Community in Kalash Valley, Northern Pakistan

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ABSTRACT

Kalash Valley is located in the remote south western part of District Chitral. The area is gifted with unique Cultural and biological diversity. The natural forest of the area mainly consists of Pine (*Pinus wallichiana*), Chilgoza (*Pinus gerardiana*) Deodar (*Cedrus deodara*) and broad leaf species like Oak (*Quercus incana*). The term Non-timber forest produce encompasses all biological material other than timber that are extracted from the forest for human welfare. Some of the important NTFPs in Kalash Valley Bomburet are Wild mushroom (*Morchella esculenta*, *M. Vulgaris*, *M. deliciosa*) Honey (*Apis cerana*) Medicinal Plant (*Ferula nartex* *Paeonia emodi*, *Inula racemosa*) Pine nut (*Pinus gerardiana*), silk cocoons and others valuable products. The people of this remote area rely on their indigenous knowledge for collection, packing and drying of these forest products. Most of the local people are depended on these produce for income generation. The present study aims to expose the situation of Non-timber forest produce and future guidelines for proper planning and management.

INTRODUCTION

Kalash valley is located about 36 Km from Chitral town (35-40N latitudes and 71-40 E longitude) in the Hindu-Kush Mountain range (DCR, 2002). The people are known as the last Kafirs, unbelievers, still practicing their own polytheistic religion in the midst of Islam. The valley falls in the dry temperate zone where summer are pleasant and winter are intensely cold characterized by heavy snow fall. The average rain fall is 250-400 mm per annum. The elevation of the valley ranges from approximately 1,800 m to 3,800 m above sea level (Aziz & Nadira 2003). Kalashi are mostly relying on their natural resources for their domestic and economic needs. Besides subsistence agricultural commodities, various forest products are also collected for different purposes. The most commonly planted crops in this area are maize, wheat, bean, potato and vegetables. The area is famous for fruit commodity both from wild as well as cultivated lands. The major fruit items are walnuts, chilgoza and almonds.

The forest of the whole Chitral district is estimated to be 41,949 hectares (including Kalash valley). Forest is mainly used for timber extraction. The natural forest is under the control of Forest Department Chitral however, the villagers have certain rights. The natural forest mainly consists of *Pinus wallichiana*, *Pinus gerardiana*, *Cedrus deodara*

and broad leaf species like *Quercus incana*. Annually about 25 to 25 thousands metric tones of forest wood is used as fuel wood. Almost 13% of the populations are related with the forest for generating their first hand money (Aziz & Nadira 2003). Additionally, 80% of the local people, in one way or the other, are dependent on the non-timber forest products. Since the timber extraction is more, therefore, the present study reveals the importance of NTFPs as source of income and alternative livelihood is phenomenal.

METHODOLOGY

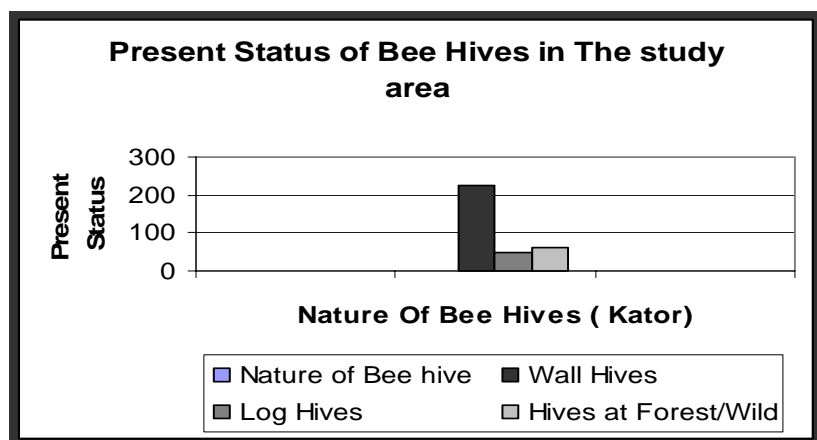
For primary data collection, personal observation, organized survey and community meetings were undertaken. For survey questionnaire was used to get baseline information. Stratified sampling technique was used for analyzing the area in terms of NTFPs. Random sampling techniques were used to interview the target groups. Secondary data was collected from various libraries and departments. The data collected was analyzed statistically.

NON TIMBER FOREST RESOURCES OF THE VALLEYS

A) Food Products

Honey

Honey is collected from traditional bee hives is an important source of nutrition and income for dweller of Kalash valley. Traditionally, bees are reared in wall hive (locally called Kator) fixed in the houses. The main species is the indigenous *Apis cerana*. According to Kalash mythology, the honey (*Ushniru*) means clean. In Kalash faith, the women can't touch the honey of their own hive. The women can touch and eat honey extracted from wild. The number of domestic bee hives is 334 and almost 200 household are involved with this profession. Total 1332 kg of honey is collected annually from domestic bee hives. A small quantity of 130 kg is also extracted from the forest. Since the local people use traditional ways to extract honey from these hives, therefore, the quantity of honey collected is decreasing day by day. The prices of honey depend on quality. The price ranged from Rs 400 to 600 per kg in the valley. About 50% of the production is consumed in the local market while 50% is traded to other national markets of Lahore and Peshawar.



Edible mushroom

Variety of mushrooms/morels is found in Kalash valley, are *Morchella esculenta*, *M. vulgaris*, *M. deliciosa* and other morels like Oyster. Their local names are *Quchi*, *Brangalu* and *Shunti* in Local language. A person that finds mushrooms is often referred to by the local people as "the Luckiest Person". Local people often hide the place from where they pluck mushroom. The Kalash community has their own indigenous knowledge for mushroom collection. For example it is belief that mushroom often appear under various trees, like *Juglans regia*, *Pinus wallichiana*.

Morels are collected in Kalash Valley for marketing purposes but sometimes, they are used as traditional medicine and flavoring agent. Morel collectors are usually poor villagers. Morel collection is their part time activity besides farming and livestock keeping. The collectors include 27% women, 33% men and 40% children. They collect morels during spring and early summer season which starts from March to July and sell it in the local market to earn their livelihood. Morel collection is a hectic job and requires a lot of physical exertion, devotion and passion. Some times the collectors spend days in the forest collecting morels. In most cases, the collectors sell morels in fresh form to the local Pathan dealers or in the markets of Chitral after drying the morels. The collectors sell it to local shopkeepers or in the markets of Chitral. *Morchella* fetch high prices and thus play an important role in the economy of Kalash Valley.

B) Wild Nuts and Fruits

Pine nut

Chilghoza (*Pinus gerardianana*) is found in the small patches of southern Chitral at elevation ranging from 1800 m to 3500 m associated with Deodar (*Cedrus deodara*) and Blue Pine (*Pinus willichiana*) at higher elevation and oak (*Qarecus ilex*) at lower elevation. (Sher et al, 2003). The seeds of *pinus gerardianana* are popular and commercially important dry fruit. A tree yields 20 to 40 kg of nuts (FAO, Pakistan Country report). seeds are collected from the still green cones by climbing the tree, some time the people remove all the cones from the tree as a result there is no natural regeneration of this species. There were no any trends found regarding the marketing of the nuts but were used within the families or gifted to friends and guests. The successful marketing of the nuts during the last five year has proved. It has reported that the local communities are the collector of the nut in general and Muhajirs and Pathans in rare cases. About 156 people are involved in collection of pine nut in Kalash valley. Thus this species also play a vital role in the economy of the Kalash Valley Total pine nut transported from the valley and revenue from the pine nut is given below.

Table 2. Takeout of Chilgoza nut from the valley and imported in the country (2004-06).

Year	Transport outside Valley (Kg)	Estimated Revenue at Local level	
		Price Rs/kg	Amount (Rs)
2004	7500	270	2025000
2005	7000	310	2170000
2006	8000	320	2560000

Walnut

Walnut (*Juglans regia*) kernels are a favorite dry fruit in Kalash valley. The total production is about 10 tones per year. The average wholesale price is Rs 40 per kilogram. The average number of walnut trees per household is 4 to 6 and average production per tree is 80 to 100 kilograms About 125 families are involved in walnut production. In order to improve the livelihood of Kalash people through walnut production, Redemption of mortgaged walnut trees project was launched in 1984-1995 under the Deputy Commissioner Chitral. After completion of the first phase, the second phase i.e. 1997-2003 of the project was re-launched .the project aimed at returning the ownership right of Kalash people over their ancestral walnut trees purchased by their Muslim neighbors. Under this project dialogue were held with all stakeholders and their representative to ascertain market value of the walnut trees. After proper assessment funds were made available by the government to give compensation to the Muslim buyers. Thus all walnut tree purchased by the Muslim in the passed were de- mortgaged and so far 1632 walnut tree has been returned to the successors of the original Kalash owners. It is one of the best practices, which gave confidence to the Kalash community and improve the economy of the valley.

Mulberry Fruits

Mulberry is a fast deciduous woody perennial plant. *Morus alba* and *Morus nigra* is the major mulberry species found in the valley. The fruit are collected for domestic uses as well commercial purposes. Mostly women and children collect the fruit often eat on the spot. The dried fruit sold in the local market Rs: 40 to 50 per kg *Morus alba* and 25 to30 per kg *Morus nigra*. The total mulberry dried fruit production in valley is estimated about 300 kg each year and 74 families are involved in the collection of mulberry fruit. Income to the community from these mulberries is estimated about Rs: 30000 annually. In illicit brewage is also prepared from the dry fruit of mulberry and sell @ Rs; 1000 to 1200 per bottle. The leaves are used as fodder and rearing silk worm. Locally mulberry wood is used for making agriculture tools etc. its wood is also used in furniture. But unfortunately due to less attention towards this important species mulberries are vanishing from the valley.

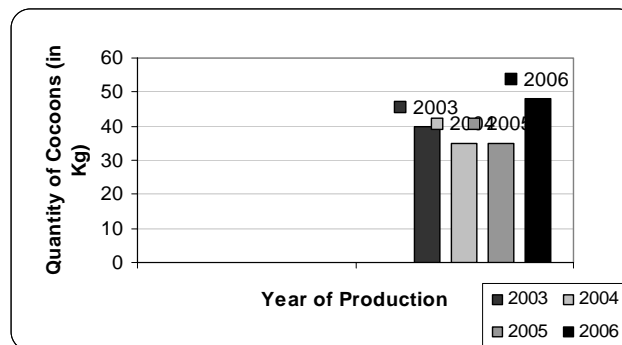
Russian olive

Eleagnus angustifolia is locally known as *Sinjoor*. It tree grows near the water channel and agriculture land. It fruit is collected by children for domestic uses, often eat on the spot. The plant flowering in May and fruit in October. Its flower have good aroma and locally used as air freshener. Trees yield about 15 to 20 kg of berries (Kitimi). The gum from this specie is locally known as *Zulchuk* which is used by the Kalash girls as shampoo. This is also a well known bee flora, and the honey from this plant is very popular and sold on good price. About 25 families are involved in the collection of Russian olive fruits and gum, mostly children and women. The marketing of these products is not common; all the production is consumed within the valley.

C) Animals Products:

Silk Cocoons

Kalash Valley is an ideal location for the promotion of sericulture; the women in the area have largely been involved in rearing of silk worm (*Bombox mori*), since time long through traditional means. Only one crop of silkworms is reared during the spring season. About 10 to 15 packets are distributed each year among silkworm rearers of the valley, by Sericulture wing of NWFP Forest Department. About 12 families are involved in silkworm rearing. Total production of dry cocoons in the valley is about 45 to 50 kg (Ajaz, 2003). Generating a total net income of Rs 18000 to 20000. To the silkworm rearers in the valley. Sericulture Wing of NWFP Forest Department has organized Sericulture promotion committees in the valley in order to improve the livelihoods of the local women in the area through Sericulture. Sericulture Wing of NWFP Forest Department providing marketing of cocoons and technical assistance to communities.



D. Medicinal Products

Medicinal plants continue to be extensively used as major source of drugs fro the treatment of many health disorders all over the world. Kalash valley is a host of many endemic and economically important medicinal plants. Traditional medicines have not lost its importance in Kalash valley. Medicinal plants from a valuable source of income for the local people. Various medicinal plants, which are commonly used locally and are commercially important, are listed in Table 3.

Table 3. Important Medicinal Plants of the valley.

S.#	Botanical name	Local name	Part used	Used For	Abundance level	Market / Price per kg
1	<i>Juglans regia</i>	Birmog	Fruit, brake & leaves	Tooth & Gum diseases	++	Rs: 55
2	<i>Ferula nartex</i>	Raw	Hing	Gastric problem	-	
3	<i>Mentha sylvestries</i>	Bhen	Leaves & Root	Indigestion	++	Rs:10
4	<i>Plantago major</i>	Brono achar	seed	Stabbing pain	++	Rs:30
	<i>Mentha arvensis</i>	Pudina	Young leaves & stems	Indigestion and as a Salaad	++	Rs: 25
6	<i>Morus alba</i>	Kitori	Fruit	Old age weakness	++	Rs:45
7	<i>Prunus enurnea</i>	Kandu	nut	Body pain as well cooking oil	++	Rs:50
8	<i>Cichorium intybus</i>	Kasti	Root	typhoid	+++	Rs:30
9	<i>Allium satium</i>	Weznu	Bulb	Fever, Cough	+++	Rs:50
10	<i>Sisymbrium irio</i>	Khelikheli	seed	Stabbing pain& removing pimples	+++	Rs:40
11	<i>Feoniculum vulgare</i>	Bodiyong	fruit	Used for curing urinary, and also used as carminative and laxative	++	Rs:175
12	<i>Paeonia emodi</i>	Mamekhy	Rhizome	Backache and general weakness	-	Rs:20
13	<i>Rehem emodi</i>	Ishpar	Whole plant	Spicy food	++	Rs:30
14	<i>Solanum nigram</i>	pirmilik	Leaves and fruit	Remove pimples	+++	Rs:12
15	<i>Viola odorata</i>	Banafsha	flower	Used for throat sore and carminative agent	++	Rs:230 dried
16	<i>Berberis vulgaris</i>	Chowenj	Leaves and	Blood purification	-	Rs:40

			fruits	and for chronic fever		
17	<i>Artimisia parviflora</i>	Kharkhalij	seed	Nappy rash/ hastily sleep	++	Rs:50
18	<i>Inula recemosa</i>	Shirisht	Leaves and flowers	Pain killer /abdominal pain	+	Rs:60
19	<i>Malva parviflora</i>	Sonchal	leaves	Constipation and as vegetables	+	Rs:25
20	<i>Ephedra geradiana</i>	Somani	Young branches	Backache, leg pain and used in snuff preparation	+	Rs:40
21	<i>Rosa webbiana</i>	Thorny	fruit	Pile treatment	+	Rs: 20
22	<i>Plantago lanceolata</i>	Aspaghool	seeds	Constipation	+	Rs: 30-40
23	<i>Cannabis sativa</i>	Bong	Leaves, floral bud and seeds	Abdominal swelling in animals especially in cow and bulls as poultry feed.	+++	Rs:20
24	<i>Euphorbia thomasoniana</i>	Cheernisk	Whole plant	Eczema and increase milk capacity of livestock	++	Rs:10-15
25	<i>Ficus carica</i>	koyet	fruit	Kidney stone removal	++	Rs:25

Key:Normal: ++ More: +++Scarce: -

Medicine from Wildlife:

Many traditional medicines use wildlife as ingredients. Kalash community, even other parts of Chitral, it is believed that the fats of bear (*Ursus sp*) can increase hairs growth. It is also famous in the area that the tail of fox repels evil spirits. Markhor is believed to have prescribed benefits, with cures claimed for ailment ranging from body pain to laziness.

E. Miscellaneous Products

Basketry

The Kalash are very professional in making of Vesku (a big basket, is use carrying of fire woods, walnuts and shifting of organic fertilizer from home to fields) from the young branches of wild almond (*Prunus amygdalus*) locally called Kandu it is prepared. Every household kept one or more Vesku in their houses as a part of their culture. The

local people from the willow prepare various types of products, like Baskets, Trays, grain bins and decoration products, which is attractive to domestic and international tourist. But the marketing of these products are not common in the valley, due to not advertisement of these products out side from the valley. Branches of *Tamarix dioica*, are used for making baskets. The branches are cut during July and August and stored for the rest of the year. An average household, consisting of 2 working members makes 30 baskets each year. The baskets are made without tools. The number of households involved has been estimated to be 25. Total annual production is estimated to 750 baskets, the baskets are transported to the nearby towns (Ayun & Chitral) where they are sold to the shopkeepers at an average price of Rs.15 each. This produces revenue of Rs.1125 each year.

Walnut bark

Particularly the women frequently use the stem bark of walnut in the valley as Muswak, as it imparts a pinkish color to the lips. Removal, however, injures the tree. In extreme cases (Iqbal.M 1991) it even kills them. Occasionally small amount of muswak appear in the local market for sell.

Torchwood extraction

Obtaining torchwood by hollowing the tree bottom, as observed in Hazara and other part of the province, is not practiced in Chitral. In Kalash Valley, the entire tree is felled and converted in to torchwood. The preferred species for torchwood are Chilghza pine and kail deodar are used for the purpose.

Wild Pomegranate:

Dried seeds of wild pomegranate (*Punica granatum*), locally known as "anar dana," are widely used in cooking to develop a sour taste in dishes. They also have medicinal properties. The tree grows naturally in sub-mountainous tracts of the country from 900 to 1 800 m. Flowers appear in April and May and the fruit is ready for harvesting in September and October. An average tree yields 15 to 25 kilograms of fresh fruit (Iqbal, 1991). Production of fresh pomegranate fruit is estimated at 7 to 9 kilograms per household. About 35 families collect wild pomegranate fruits. Total production of the fruit is about 200 to 300kg.

Zeera Siah

Carum carvi is a perennial herb with thick tuberous roots. It grows wild in dry temperate regions of the country. The plant is known locally as "Hojo" and is widely used to flavor bread, biscuits, cakes and cheese. It is also an ingredient of pickling spice. It is a stomach soothing medicine and is occasionally used for flatulent colic and as an adjunct or corrective for medicines. The fruit is collected before ripening. The plants are dried and fruits are thrashed, cleaned, and stored in bags. Total production is about 70 to 80kg of which 75% is consumed locally. Wholesale prices range from Rs.160 to 180 per kilogram.

Wild almond

Prunus amygdalus, locally known as *Kandu*, grows wild in chitral at an elevation ranging from 1,600 to 2,500 meter above mean sea level. The kernel of the wild almond is bitter and not edible but oil extracted from the kernel is tasteless as medicinal value. In

the valley it is used for cooling, massaging and as a hair oil. Leaves and gum of this species also used in various traditional medicine. Its young branches are use for making of baskets and agriculture tools etc.

CONCLUSION

Chitral in general and Kalash valley in particular are no strangers to poverty, with less income resources and forest resources, especially the non-timber forest produces are the only source of income and food for the local community. The potential of NTFPs has never been fully exploited in the study area, either for the development of the forest or for the betterment of the community. Extensive research on individual products is needed, to evaluate the feasibility of in situ cultivation of NTFPs on marginal lands of the area. Thus maximum benefit could be extracted from the available resources, following the goal of sustainable development.

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