TREES AND LIVELIHOOD OF GABRAL VALLEY, SWAT KOHISTAN, PAKISTAN

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Abstract

This study was carried out to analyze the folk knowledge of the inhabitants about the Tree species of the area. Twenty tree species belonging to eleven families and nineteen genera viz. *Abies pindrow, Acer caesium*, *Aesculus indica*, *Betula utilis*, *Cedrus deodara, Corylus colurna*, *Crataegus songarica*, *Ficus carica*, *Juglans regia*, *Malus pumila*, *Morus alba*, *Picea smithiana*, *Pinus wallichiana, Populus alba*, *Punica granatum*, *Prunus armeniaca*, *Prunus domestica*, *Pyrus communis, Quercus baloot*, *Salix turanica* were recorded. Among these 19(95%) were utilized as Timber, 18(90%) Fuel wood, 13(65%) Medicinal, 12(60%) Agro forestry, 12(60%) Agricultural tools, 10(50%) Fodder, 10(50%) Plants yielding fruits, 8(40%) Thatching/sheltering, 8(40%) Fencing, 3(15%) Condiment/spice, 8 (40%) Furniture, 7(35%) Ornamental, 6(30%) honey bee flora, 3(15%) Beverage, 1(5%) Bark used for writing, 1(5%) Bark used for huts/rooms, 1(5%) wool dye. Being a far flung area, the locals totally depend upon the Plant Natural Resources (PNR) for their livelihood. Biotic pressure and unsustainable utilization have caused tremendous loss to the biodiversity of the area. There is a need for the proper management and conservation, for which awareness campaign and alternative income resources should be encouraged for eliminating the poverty, improving the livelihood and ensure the sustainable utilization of the Plant Natural Resources.

Keywords: Trees, Livelihood, Gabral Valley, Swat Kohistan.

Introduction

Gabral Valley is located in the North most part of Swat Kohistan in Tehsil Kalam of District Swat about 145 km from Mingora. It lies between 35º 20´ to 35º, 48´ N latitude and 72º 12´ to 72º 32´E longitudes spread over an area of about 38733 ha. The Valley has Chitral District in the North, Utror Valley in the South and Southwest, Dir District in the West and Bhan and Mahodand valleys in the east. The altitude of the valley varies from 2580 m at Bela to over 5160 m at Kharkharay top (Anonymous, 1988). Precipitation occurs in the form of snow and rainfall; however, no metrological information is available for this Valley. The area receive very little of monsoon rains and precipitation is received in the winter and spring mostly in the form of snow. Snow depth varies from 3 feet at the bottom to 12 feet at the higher altitudes.

Population of the area is about 7300 living in 16 small villages. The locals of the valley belong to Kohistani and Gujar community and the area is popularly known as Gujar Gabral. During the winter season most of the people of the Valley migrate to the plains of the down country for 5 to 6 months.

The area is known for wild life species like Ibex, Black and Brown beer, Musk deer, Monal pheasant, Koklass pheasant, Indian fox, Wolf, Himalayan snow cock, Common leopard, sown leopard and Chukor. Dry temperate conifer, alpine and sub alpine are the main vegetation types of the Valley. Agriculture is the main occupation of

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the people of the Valley where yearly one crop is grown. The main crops of the area include potato, turnip and bean. Various fruit trees are cultivated as cash crop. These include apple, apricot, peach etc. while some fruit plants grow wild like *Juglans, Pyrus and Prunus* etc. Various animals such as sheep, goats, cows and other animals are domesticated for various purposes. Rapid increase in the population of the area has put pressure on the existing cropland. In order to meet the demands the locals have shifted the agricultural practices to the high mountains at the cost of valuable forests. This is resulting in the tremendous loss to the Biodiversity and disturbance to the natural ecosystem of the area.

Sporadic information on the local uses of the biodiversity has been reported in Swat Kohistan and joining areas (Hussain *et al*., 1995; Gul *et al*., 1999; Shinwari *et al*., 2000 a; Shinwari *et al*., 2000 b; Sher, 2002; Thomas and Shengji, 2003; Shinwari *et al*., 2003; Iqbal *et al*., 2003; Rashid and Asad, 2005; Ullah, *et al*., 2006 and Hussain *et al*., 2006) but non of them have reported the importance of the tree species of the area. The present studies will highlight the importance of the tree species in the area and will provide base line information for further scientific studies and future planning for conservation of the Plant Natural Resources and Folk Knowledge of the area.

Material and Method

Field studies trips were arranged during the summer season 2005-06. Ethnobotanical information, including local names and uses were collected form the local inhabitants by using questionnaire. About eighty locals ranging in age from 20-80 years were interviewed Plant specimens were collected from eight different sites viz. Jabba, Gabral, Shahi Bagh, Gazoor, Gabarsheen, Ghwayee Bela, Kharkharai Jheel and Keeshgar. The collected specimens were properly documented, preserved and identified with the help of available literature (R. R. Stewart, 1972; Ali and Nasir, 1971-1989; Polunin and Stainton, 1990; Nasir and Ali, 1991-1993 and Ali and Qaiser, 1993-2006). Plant specimens mounted on standard herbarium sheets were deposited in the Peshawar University Herbarium (PUP).

Results and Discussion

The inhabitants of the valley rely upon twenty tree species for different purposes (Table 1 & 2). The major utilization of these trees is seemed to be as timber, fuel, medicinal, agro forestry, agricultural tools, fodder, plants yielding fruits, thatching/ sheltering, fencing, furniture, ornamental, honey bee flora, condiment, beverages, used for writing, making huts, and drying wool.

Out of these twenty species about 18 tree species are used as fuel wood. As a far-flung area and no alternative energy resources; the locals are totally dependent upon the woody trees to fulfill their energy requirements. The intense cold in the winter due to heavy snowfall demands heating of room and livestock sheds. The tree which are used as fuel wood include *Abies pindrow, Acer caesium, Aesculus indica, Betula utilis, Cedrus deodara, Corylus colurna*, *Crataegus songarica, Ficus carica, Malus pumila, Morus alba, Papulus alba, Picea smithiana, Pinus wallichiana, Prunus armeniaca, P. domestica,*

Table 1. Showing the Different Aspects of Uses of Trees in Gabral Valley

S.No	Family	Botanical name	Use Classes*																
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Aceraceae	*Acer caesium* Wall. ex Brandis	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2	Corylaceae	*Corylus colurna* L.	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-
3	Betulaceae	*Betula utilis D.Don*	-	-	+	-	-	-	-	-	-	-	+	-	-	-	+	-	-
4	Fagaceae	*Quercus baloot* L.	-	+	+	-	-	-	-	+	-	-	+	-	-	-	-	-	-
5	Hippocastanaceae	*Aesculus indica* (Wall. Ex. Camb.) Hook. f.	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
6	Juglandaceae	*Juglans regia* L.	+	-	+	+	+	-	-	+	-	-	+	-	+	-	-	-	-
7	Moraceae	*Ficus carica* Forsk.	+	+	+	-	-	+	-	+	+	+	+	-	-	-	-	-	-
		Morus alba L.	+	+	+	+	-	+	-	+	+	+	+	-	+	-	-	-	-
8	Pinaceae	*Abies pindrow* Royle	+	-	+	+	-	+	-	-	+	+	+	-	+	-	-	-	-
		Cedrus deodara (Roxb. Ex Lamb) G. Don	+	-	+	+	-	+	-	-	+	+	+	-	+	-	-	-	-
		Picea smithiana (Wall.) Boiss	+	-	+	+	-	+	-	-	+	+	+	-	+	-	-	+	-
		Pinus wallichiana Zucc.	+	-	+	+	+	+	-	-	+	-	+	-	+	-	-	-	+
9	Punicaceae	*Punica granatum* L.	+	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-
10	Rosaceae	*Crataegus songarica* C. Koch	+	+	+	-	-	-	+	+	-	+	+	-	-	+	-	-	-
		Malus pumila Mill.	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	-
		Prunus armeniaca L.	+	+	+	+	+	+	+	+	-	-	+	+	+	+	-	-	-
		Prunus domestica L.	-	-	+	+	+	+	+	+	-	-	+	+	-	+	-	-	-
		Pyrus communis L.	+	-	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-
11	Salicaceae	*Populus alba* L.	-	+	+	+	+	+	-	-	+	+	+	-	+	-	-	-	-
		Salix turanica Nasarov	-	-	+	+	-	+	-	-	+	-	-	-	-	-	-	-	-

∗ Key to the use classes

A=Medicinal B=Fodder C=Fuel wood D=Agro forestry E=Ornamental F=Agricultural tools G=Honey bees flora
H=Plants yielding fruits I =Thatching/sheltering J=Fencing K=Timber L=Condiment/spice M=Furniture N=Beverage
O=Bark used for writing P=Bark used for huts/rooms Q=Wool dye.

Table 2. Showing the Medicinal Uses of Tree Species in the Valley

S.No	Botanical Name	Part Used	Medicinal Uses
1	*Aesculus indica* (Wall. Ex. Camb.) Hook. f.	Seeds	Seeds are anthelmintic, used for children and anthelmintic
2	*Ficus carica* Forsk.	Fruit	Fruits anti-spasmodic
3	***Morus alba*** L.	Thooth	Laxative and demulcent
4	*Abies pindrow* Royle	Leaves	Fresh leaves mixed with honey used for cold and cough
5	*Juglans regia* L.	Bark and fruit	Bark of shoots and roots and septic and fruit
6	*Cedrus deodara* (Roxb. Ex Lamb) G. Don	Stem	Oil of the plant for piles, ulcers, skin disorders and rheumatic pain
7	*Picea smithiana* (Wall.) Boiss	Whole Plant	Oleoresin applied on cracked heel
8	*Pinus wallichiana* Zucc.	Back	Decoction of bark id used for various purposes
9	*Punica granatum* L.	Fruit and bark	Fruit edible; bark vermifuge, used in diarrhea and dysentery
10	*Crataegus songarica* C. Koch	Fruit	Ritual, cardio tonic and hypotensive
11	*Malus pumila* Mill.	Fruit	Ritual purgative, a source of iron, as expectorant
12	*Prunus armeniaca* L.	Fruit	Ritual, analgesic, anthelmintic, anti-asthmatic, antipyretic, antiseptic, antispasmodic, demulcent, emetic, emollient, expectorant, laxative, ophthalmic, pectoral, sedative and tonic
13	*Pyrus communis* L.	Fruit	Fruit edible, laxative and source of iron

Pyrus communis, Quercus ballot, *Salix turanica.* and *Juglans regia.* The wood of some tree is preferred due to high heat value and less smoke i.e. *Quercus*, *Pinus etc.* Due to over exploitation, the oaks forests are almost eliminated in the area and this agrees with other workers who reported similar situation in the area (Hussain *et al.*, 1995 and Khan *et al.*, 2003). Deforestation of the woody species results in the overall ecosystem disturbance and has marked influence on the natural biodiversity. There is an urgent need to provide alternate energy resources. Natural gas, electricity and solar energy system should be provided to reduce the pressure on the local forests and conserve these for future

Livestock is the major part of the income of the people of the Valley. The leaves and tender shoots of many trees are used as fodder for the livestock. These include *Acer, Corylus colurna, Quercus ballot, Ficus carica, Malus pumila, Papulus alba and Salix turanica.* Due to lack of proper management system, the animals freely graze in the forests and result in the overgrazing and reduce the carrying capacity of these forests.

The people of the Valley are traditional and have strong belief in the traditional local uses of the plants for curing various diseases. Twelve different tree species are used for various diseases. These diseases include piles, ulcers, skin disorders, as vermifuge, cough, cold, diarrhea, dysentery. The plants are also used as ritual, analgesic, anthelmintic, anti-asthmatic, anti-pyretic, antiseptic, antispasmodic, demulcent, emetic, emollient, expectorant, laxative, ophthalmic, pectoral and sedative. The fruits of many are used as tonic. The fruits of *Crataegus songarica* are cardio tonic. The recipes prepared from these plants are either used singly or in combination with plants for single or many diseases. However, the plants are collected in unscientific way that not only decreases the medicinal value of the plant but also damages the plant. During the studies, it was noted that the elder people still have knowledge about the traditional uses but young generation have very low information about the plants regarding its medicinal values. Besides *Crataegus songarica,* other plants having medicinal values include *Abies pindrow, Aesculus indica, Cedrus deodara, Ficus carica, Juglans regia, Malus pumila, Morus alba, Picea smithiana, Pinus wallichiana, Prunus armeniaca* and *Punica granatum.*

About nine fruit tree species are known for fruit value out of which six are cultivated and three are wild. The cultivated plants include *Juglans regia, Malus pumila, Prunus armeniaca, P. domestica, Pyrus communis, Punica granatum* while the wild plants include *Crataegus songarica, Morus alba and Ficus carica.* These fruit trees are one of the major sources of income for the people and have marked influence in the livelihood of the people of the area. High yielding and disease resistance fruit verities; also proper training should be provided to the local to increase its yield.

Twelve trees species are used as timber i.e. *Abies pindrow, Acer caesium*, *Aesculus indica, Cedrus deodara, Ficus carica, Juglans regia, Malus pumila, Morus alba, Papulus alba, Picea smithiana, Pinus wallichiana, Prunus armeniaca, P. domestica, Pyrus communis, Quercus ballot* and *Salix turanica.* Out of these *Cedrus deodara* is the most valuable while *Pinus wallichiana* has second value. Over cutting of these is leading to low regeneration and decrease in population. Some of these like *Pinus wallichiana*, *Juglans regia* provide valuable furniture wood bear high market price.

Some of the trees like *Pinus wallichiana*, *Cedrus deodara*, *Quercus baloot* etc. are used for fencing and thatching around the agricultural land. Water channels, various agricultural tools and basketry are the other utilization of these trees. The seeds of the *Punica granatum* are dried and used as spice locally called "Anardana". Oleoresin obtained from *Cedrus deodara*, *Picea smithiana* and *Pinus wallichiana* is used for heeling cracks and wounds. The fruit of the *Aesculus indica* is used as anthelmintic in cattle specially horses. The oil obtained from *Cedrus deodara* is used for expelling insects, mites and ticks. Honeybees visit some of the trees, which result in the honey production.

Tree species has a marked role in the livelihood of the people of Gabral Valley. Therefore, proper management and utilization of these trees species is proposed in order to protect the valley from environmental degradation. Alternate energy resources, better varieties agricultural crops and livestock should be provided to the local for improving their life standard. Participation and educating the local communities is also very much important for the Conservation of the PRN and sustainability of the Ecosystem.

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