

CULTURAL USES OF PLANTS AMONG BASIKHEL TRIBE OF DISTRICT TOR GHAR, KHYBER PAKHTUNKHWA, PAKISTAN

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Abstract

Relation between plants and cultures is indispensable. The link between culture and plant resources was explored first time for the Basikhel tribe of Tor Ghar District. This tribe is one of the largest tribe of District Tor Ghar. It has long established tribal culture. The study was conducted during the years 2012 and 2013. The information was gathered from 200 informants from 15 randomly selected villages. Data was obtained through semi structured interviews, group discussions and EPA. The local people use 250 species of the vascular plants belonging to 90 families for 23 different cultural uses such as food, fodder, timber, fuel wood, medicine, furniture and agricultural implements. The inhabitants of the area are highly dependent on local flora for their different cultural needs. Total of 150 species belonging to 50 families were documented for the medicinal uses. Informant consensus showed that wound healing and gastrointestinal treatment were ranked highest among all medicinal uses. For each plant its botanical name, family name, local names and conservation status was also recorded. Three species were found most threatened. This study is a part of an ongoing research project in which we will explore plant resources utilized by five different tribes of the District Tor Ghar in the near future.

Keywords: Vascular plants, Medicinal plants, Gastrointestinal treatment, Wound healing

Introduction

The interaction between people and plant biodiversity is as long as human beings existence on this planet. Plant biodiversity has long been serving human populations all over the world. People utilize plants resources differently for their cultural and bio-geographical needs. Plants as food and medicine have remained integral part of every society but with the passage of time man explored plants resources for a number of cultural needs. Cultures focus on the values, beliefs, and norms that a group of people share and which in turn have the influence on decision making about plant resources. According to Nelson *et al.*, (2006) culture conditions the individual's perceptions of the world, influences what human considers important, and suggests courses of action that are appropriate and in appropriate. The needs of culture are deeply entrenched in traditions and norms of the societies. Mountain communities contribute to ecosystem maintenance through their rich culture, religious and spiritual beliefs, which incorporate a knowledge that has evolved over generations (Sultan & Ozaydin 2013; Wagley *et al.*, 2006).

Indigenous people show an ideal case study for representing the link between culture and biodiversity because this link is likely to be more apparent than in non-indigenous societies, where management of natural resources for subsistence is less evident and often disrupted by consumerism. Plants biodiversity used by indigenous cultures for food, medicine, shelter, aesthetic values, recreation, and inspiration all over the world. More than 50,000 plants have been used for medicinal purposes all over the world (Schippman *et al.*, 2002) and as many as 80,000 edible wild plant species could be utilized by human. In Pakistan especially northern mountainous regions numerous research studies have been carried out to document the traditional knowledge related to plant

resources and can be seen in the literature cited (Khan *et al.*, 2015; Ahmad *et al.*, 2014; Badshah *et al.*, 2014; Khalil *et al.*, 2014; Akhtar *et al.*, 2013; Ijaz *et al.*, 2015; Ishtiaq *et al.*, 2013; Khan *et al.*, 2013a; Khan *et al.*, 2013b; Khan *et al.*, 2012; Awan *et al.*, 2011; Hazrat *et al.*, 2011; Saima, *et al.*, 2010; Ajab *et al.*, 2010; Abbasi *et al.*, 2010; Ahmad *et al.*, 2009; Ali & Qaiser 2009; Ibrar *et al.*, 2007; Shah, 2007; Ahmad, 2004; Gilani *et al.*, 2003; Martin *et al.*, 2001; Afridi, 1986; Shinwari & Khan 1998). According to Ali & Qaiser (1986) almost 80% of endemic species of plants are found in the northern and western mountains of Pakistan. Such studies have not been done before in Tor Ghar district which is being the part of western Himalayan province is rich of plant biodiversity. Therefore, present study was planned to focus on the interaction between culture and plant biodiversity of Basikhel tribe of district Torghar.

Materials and Method

Study area: The study area district Tor Ghar (Fig. 1) is the part of internationally recognized Western Himalayan province (Takhtajan, 1988). Administratively, it is the district of Hazara division of Khyber Pakhtunkhwa, Pakistan. Tor Ghar is a Pushto word which means Black Mountain. It lies between 34°-32' and 34°-50' N, and 72°-48' and 72°-58'E. It is a rugged, mountainous region of about 800Km². It has been upgraded to a district level on 28, January 2011 and named as Tor Ghar. District Tor Ghar can be divided in to four main agro ecological zones viz., subtropical low altitude (450-1000m) both Barani and irrigated areas; mid altitude (above 1,050-1,450m); transitional zone (from 1,500-1,800m); and mountain high altitude (above 1,800m). These zones are the subalpine pastures, evergreen forest and river valleys of the highlands (English, 1991). According to standard classification forest types of Pakistan the forests fall under the major type

montane temperate forests (Champion *et al.*, 1965). According to the Gazetteer of Hazara (Watson, 1907) five main tribes namely; Basi Khel, Akazai, Hasanzai, Mada Khel and Nusrat Khel residing this area. The biggest tribe is Basikhel that occupies 40% of the district and hence was selected for the present study.

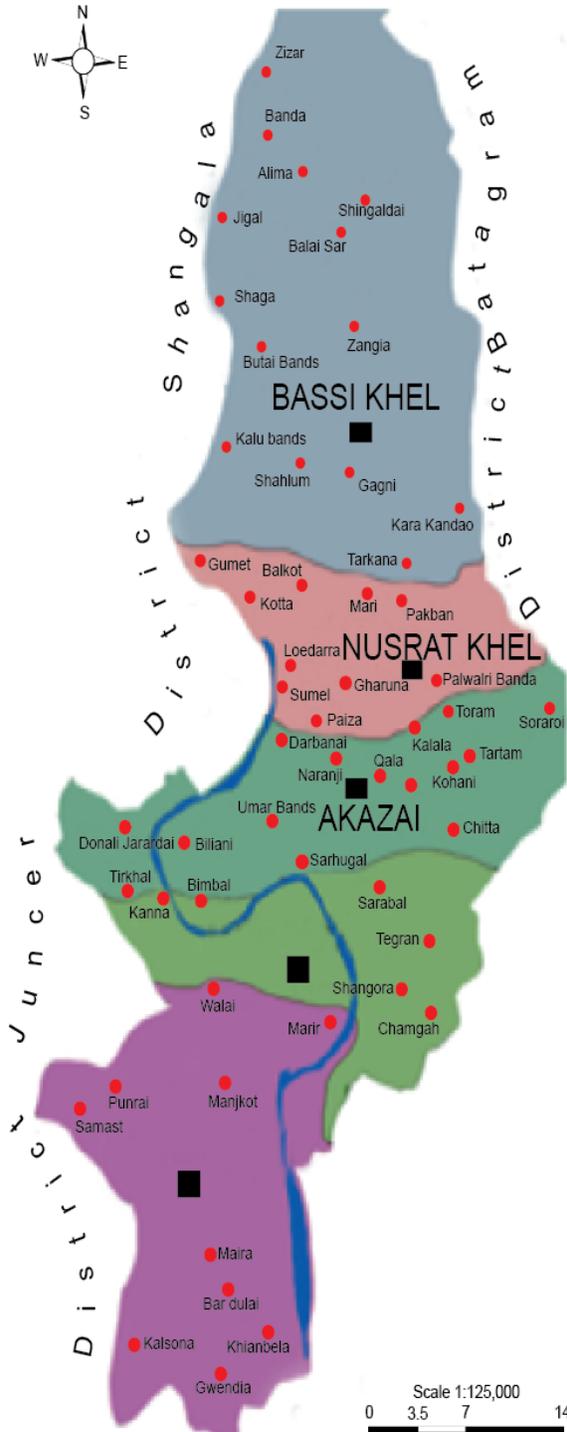


Fig. 1. Map of District Tor Ghar Showing five main tribes territories Basi khel, Nustrat khel, Akazai, Hassan zai and Mada khel.

Field visits and data collection: The area was visited frequently during the summers of 2012 and 2013. Fifteen villages were randomly selected by table number method. Each selected village was surveyed. Every third of the numbered house was selected if the dweller showed willingness voluntarily for interview. Two hundred informants including males and females of all age groups shared their local knowledge about 250 plant species. Each of them were interviewed mainly concerning their knowledge on food, medicine, fodder, timber, fuel, veterinary medicines, cosmetics from the plants and their parts, local names, with diverse uses. Field photographs were also taken during visits. A combination of qualitative and quantitative data collection methods were used to document the traditional knowledge of culturally significant plants and their services to the local communities (De Albuquerque, 2009, Da Cunha & De Albuquerque, 2006, Martin, 2004; Rossato *et al.*, 1999). Ethnobotanical participatory Appraisal (EPA) is a joint approach of Ethnobotany, which guides and evaluates the Ethnobotanical study of an area. The basic concept of EPA is that there must be direct participation of local tribal and rural people in the study and was thus adapted during data collection. A walk was arranged to each sort of habitat under the supervision of one or two volunteer informants to observe the species in its natural ecosystem.

A semi structured interview method was used for the study. Each volunteer was asked to share his/her knowledge about the cultural uses of five most important plants. The interview focused on basic questions about the informant's knowledge of the uses of local plants species. The most asked question was which local plants do you know and/or use? Depending on the response, more specific questions concerning the variety of uses were gradually formulated, on the basis of which a questionnaire was designed to get maximum information how the indigenous people of the area get benefits from local plant biodiversity. Questionnaire was developed in such a way to obtain information on all possible cultural uses of the vegetation. A second questionnaire was constructed for factors threatening the conservation of culturally significant plants. Interviewers were facilitated with the help of photos, specimens and local names of the plants. A direct and participant observation was applied to collect the information from the inhabitants of each locality. Participant observation was used to supplement the information gathered (Albuquerque & Lucena 2004 a,b).

The plants collected on the information of questionnaire were properly dried in shade, pressed, poisoned by using 3.5% mercuric chloride in ethyl alcohol, mounted on standard sized "Herbarium Sheets" and labeled. These plants identified with the help of different Herbaria such as Herbarium of Hazara University, National Herbarium Islamabad, QAU Herbarium, PMNH Herbarium and flora of Pakistan (Ali & Qaiser, 1998-2005). The properly preserved and identified specimens were deposited in the Herbarium of Hazara University, Mansehra for future studies.

Data analysis: Data analysis was based on locally known useful plants. Use value (UV) and Informant consensus factor (ICF) were determined. Use Value (UV) was calculated by applying the formula $UV = \sum U/n$, where U is the sum of the total number of use citations by all informants for a given species and divided by n the total number of informants. The technique of use-value depends upon the number of uses and the number of people that mention a given plant species. It gives the idea that which plant species considered most important by a particular population (Torre-Cuadros & Islebe 2003).

Conservation status: The use-value technique can be used to evaluate the conservation status of the plant species on the basis of hypothesis that the most important species will suffer the greatest harvesting pressure (Albuquerque & Lucena 2005). Keeping in view this hypothesis, the other factors assessing conservation status such as availability for the last ten years, conservation effort by locals, occurrence and regeneration potential were also recorded for evaluating threatened species in the region. Informant consensus factor (ICF) factor was determined by the relation:

$$ICF = \frac{(C^D - C^B)}{(C^{D-1})}$$

Where C^B is number of species for the ailment category, C^C is C^B divided by total number of species cited and C^D is number of citations for the ailment category (Moerman, 2007; Khan *et al.*, 2011). ICF values range from 0.00 to 1.00. High ICF values show when only one or a few species are recorded by a high proportion of informants for a particular disease category, whereas low ICF values indicate that informants disagree over which plant to use.

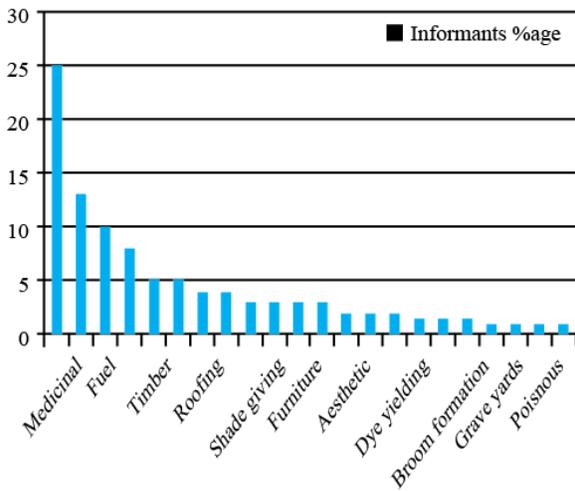


Fig. 2. Percentage of informants showing various cultural uses

Results

This is the first ethnobotanical exploration of district Tor Ghar. Two hundred and fifty vascular plant species belonging to 90 families used in various cultural practices were reported from the study area. Twenty three different cultural uses of plants were recorded as food, fodder, timber, fuel, aesthetic, medicinal, veterinary, shade, spiritual, cosmetic. List of all the documented plant species and their uses are presented (Table 1). The informants data revealed 91 species for single use and 159 species for multiple uses, out of which 61 for two uses, 41 for three uses, 25 for four uses, 17 for five uses, 9 for six uses, 3 for seven uses, 2 for eight uses and 1 species for ten uses. The highest number of citations was recorded for medicinal uses (25%), followed by fodder (12%), fuel (9%), food (8%), timber and veterinary (5% each), roofing and fencing (4% each), shade, honey bee and furniture (3% each), soil binding (2.5%), aesthetic, cosmetic and dye yielding (2% each), spiritual, broom formation and tooth brush (1.5% each), graveyards, detergents, poisonous and sticks formation (1% each) (Fig. 2). Out of 250 vascular plants 150 species belonging to 50 families were documented for medicinal uses, 104 for fodder, 76 for fuel, 57 for food, 29 for veterinary medicines, 25 for timber, 19 for shade giving, 17 for instruments and tools formation, 16 for honey bees, 10 for soil binding and furniture each, 9 for poison, 7 for cosmetic and dyes each, 6 for spiritual uses, sticks formation and detergent each, 5 for toothbrushes and aesthetic each, 4 for graveyards and broom formation each (Fig. 3). Medicinal plants were further grouped in to different ailments categories as wound healing, gastrointestinal disorders, skin diseases, respiratory tract diseases and urinary tract diseases. Informants consensus factor indicated that wound healing and gastrointestinal were ranked highest among all medicinal uses (Table 2). Use Value (UV) and conservation related data showed *Cedrus deodara*, *Skimmia laureola* and *Podophyllum emodi* the most threatening species of the area (Table 1).

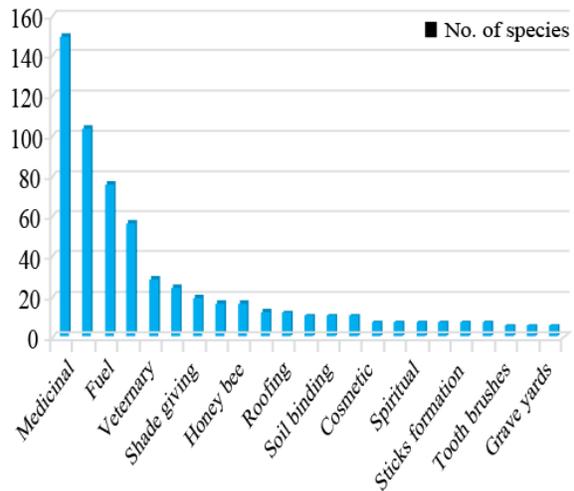


Fig. 3. Number of plant species showing various cultural uses

Table 1. Cultural uses and conservation related data for vascular plants of Basi-Khel area of District Tor Ghar

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
1	<i>Caesalpinia decapitata</i> (Roth) Alston	Jara	Shrub	Caesalpinaceae	Anti-pyretic, analgesic	Shoots	0.005	2	1	0
2	<i>Lepidium aucheri</i> Boiss.	Halam	Herb	Brassicaceae	Given to cattles for flatulence	Seeds	0.005	3	2	0
3	<i>Alliaria petiolata</i> (M.Bieb)Cavara & Grande	Gangli thom/ Balu	Herb	Brassicaceae	Fodder		0.01	3	2	0
4	<i>Erophila verna</i> L.		Herb	Brassicaceae	Gastrointestinal disorders	Roots	0.01	3	3	0
5	<i>Ranunculus muricatus</i> L.	Ziar guley	Herb	Ranunculaceae	purgative for livestock	Whole plant	0.01	3	3	0
6	<i>Ranunculus scleratus</i> L.	Jashaghai	Herb	Ranunculaceae	Antipyretic, asthma, purgative for livestock	Shoots	0.01	3	3	0
7	<i>Aethusa cynapium</i> L.		Herb	Apiaceae	poisonous plant	whole plant	0.015	3	2	0
8	<i>Anisomeles indica</i> (L.) O. Kuntze		Herb	Lamiaceae	Skin disease, fever		0.015	3	2	0
9	<i>Bistorta amplexicaulis</i> (D.Don) Greene	Rain	Herb	Polygonaceae	wild edible vegetable	Leaves	0.015	2	2	0
10	<i>Cardamine hirsuta</i> L.	Chargh butay	Herb	Brassicaceae	Laxative, purgative, increase eggs production	Shoots	0.015	3	2	0
11	<i>Coryza canadensis</i> (L.) Corgn.	Maloocheii	Herb	Asteraceae	Diuretic, astringent, diarrhea, dysentery, fodder	vegetative parts	0.015	3	3	0
12	<i>Cuscuta gigantea</i> Griff.	Ooloe	Herb	Cuscutaceae	Hair tonic, anti-poisonous agent	Shoots	0.015	3	2	0
13	<i>Daphne mucronata</i> Royle	Laighonai/ Kutilal	Shrub	Thymeliaceae	Poisonous plant flies repellent of dogs.	Roots, seeds	0.015	2	2	0
14	<i>Fumaria indica</i> (Hausskn) Pusley	Papra	Herb	Fumariaceae	Fodder	Shoots	0.015	3	2	0
15	<i>Impatiens bicolor</i> Royle	writh athrang	Herb	Balsaminaceae	Tonic, diuretic	Seeds	0.015	3	2	0
16	<i>Imperata cylindrical</i> (L.) P. Beauv		Herb	Poaceae	Fodder		0.015	3	2	0
17	<i>Jasminum nudiflorum</i> Lindl.	Zangli Chambeli	Shrub	Oleaceae	Aesthetic		0.015	3	2	0
18	<i>Ranunculus arvensis</i> L.	Chaghejekakai	Herb	Ranunculaceae	Fish poisoning, insecticide	Shoots	0.015	3	3	0
19	<i>Solanum incanum</i> L.		Herb	Solanaceae	Respiratory disorder	Whole plant	0.015	2	1	0
20	<i>Stellaria media</i> (L.) Vill.	Laroley	Herb	Caryophyllaceae	Fodder, weed, laxative, analgesic, arthritis	Whole plant	0.015	3	3	0
21	<i>Trichodesma indicum</i> (L.) R. Br.		Herb	Boraginaceae	Fodder	Shoot	0.015	3	2	0
22	<i>Tulipa clusiana</i> (Hook.) Regel	Gantul	Herb	Liliaceae	Flowers collected for ornamental purposes, fodder, edible bulbs	Whole plant	0.015	2	2	0
23	<i>Woodfordia fruticosa</i> (L.) S. Kurz	Thawi	Shrub	Lythraceae	Fodder, fuel	Flowers, branches	0.015	2	1	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
24	<i>Adiantum capillus-veneris</i> L.	Sumbel	Herb	Adiantaceae	Demulcent, diuretic, expectorant		0.02	3	2	0
25	<i>Ajuga reptans</i> L.	Guti	Herb	Lamiaceae	Tonic, blood purifier, anti-diabetics	Whole plant	0.02	3	2	0
26	<i>Aplata aristata</i> L.		Herb	Poaceae	Fodder	Shoots	0.02	3	2	0
27	<i>Artemisia scoparia</i> Waldst. & Kit	Gandi booti/Jaokae	Herb	Asteraceae	Antimalarial, broom formation, purgative, anthelmintic	whole plant	0.02	3	2	0
28	<i>Asplenium septentrionale</i> (L.aeus) Hoffmann,	Wakha rangae	Herb	Aspleniaceae	Cattles Oral cavity infection	Leaves	0.02	3	2	0
29	<i>Astragalus graveolens</i> Buch.-Ham.ex Benth.	Bitawach E Naqli/Azghakay	Herb	Papilionaceae	Vegetable, fodder	Roots, shoot	0.02	3	2	0
30	<i>Bupleurum falcatum</i> L.	Hare Ear	Herb	Apiaceae	Liver tonic, respiratory diseases	Root	0.02	3	3	0
31	<i>Cardiospermum halicacabum</i> L.	Khubara plt	Herb	Sapindaceae	Vegetable	Root, Shoot	0.02	2	2	0
32	<i>Chamaemelum nobile</i> (L.) All.		Herb	Asteraceae	Tonic, digestive disorder, antiseptic	Root	0.02	3	1	0
33	<i>Clematis montana</i> Buch. – Ham.		Herb	Ranunculaceae	Wound healing	Leaves	0.02	3	2	0
34	<i>Commelina poludosa</i> Blume	Kanjuna	Herb	Commelinaceae	Fodder, Skin diseases	Whole plant	0.02	3	2	0
35	<i>Convolvulus arvensis</i> L.	Pirwathai	Herb	Convolvulaceae	Cosmetic, fodder	Roots, shoots	0.02	3	2	0
36	<i>Cotoneaster bacillaris</i> Wall. ex Lindl	Looni	Shrub	Rosaceae	Fuel, Sticks	Whole plant	0.02	2	1	0
37	<i>Cuscuta reflexa</i> Roxb.	Zeara Zeelai	Herb	Cuscutaceae	Diuretic, anti-diabetics, blood purifier	Shoots	0.02	3	2	0
38	<i>Desmostachya bipinnata</i> (L) Stapf	Drab	Herb	Poaceae	Fodder	Shoots	0.02	3	3	0
39	<i>Euphorbia hirta</i> L.	Skha Botay	Herb	Euphorbiaceae	Wound healer, expectorant	Whole plant	0.02	3	2	0
40	<i>Gagea lutea</i> (L) Ker-Gawl	Qaimat Gulay	Herb	Liliaceae	Poisonous plant	Whole	0.02	2	1	0
41	<i>Impatiens edgeworthii</i> Hk. f.	Ziar athreng	Herb	Balsaminaceae	Urinary tract infections	whole plant	0.02	3	2	0
42	<i>Jasminum humile</i> L.	Konkoni	Shrub	Oleaceae	Ringworms cure, tonic, astringent, honey bee plant	Root, flowers	0.02	3	2	0
43	<i>Myrsine africana</i> L.	Khukhar	Shrub	Myrsinaceae	Fodder, fuel, soil binding	Branches, fruit	0.02	3	2	0
44	<i>Onosma hispida</i> Wall. ex G. Don	Kairry	Herb	Boraginaceae	Purgative, bronchitis, asthma	Flowers, leaves	0.02	3	2	0
45	<i>Plantago major</i> L.	Baltanga jabai	Herb	Plantaginaceae	Fodder, anti-diarrheal, anti-septic, tonic, dysentery	Whole plant	0.02	3	2	0
46	<i>Polystichum lonchitis</i> L.		Herb	Dryopteridaceae	Wound healing	Shoots	0.02	3	2	0
47	<i>Portulaca oleracea</i> L.	Warkharay	Herb	Portulacaceae	Vegetable, fodder	Shoots	0.02	2	2	0
48	<i>Pulicaria crispa</i> (Forsk.) Oliv.		Herb	Asteraceae	Wound healing, vegetable	whole plant	0.02	3	2	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
49	<i>Silene vulgaris</i> (Moench) Garcke	Matranga	Herb	Caryophyllaceae	Fodder, weed, stomach disorder	Shoots	0.02	3	3	0
50	<i>Verbascum thapsus</i> L.	Kharghwagh	Herb	Scrophulariaceae	Demulcent, emollient, stimulant, anthelmintic, anti-diarrheal for livestock	Leaves, flowers, seeds	0.02	3	3	0
51	<i>Yermonia Sinerea</i> (L.)Lees.	Tor Zeera	Herb	Asteraceae	Anti-hypertension, carminative, anti-diabetics	Fruit	0.02	3	3	0
52	<i>Arisaema jacquemontii</i> Blume	Marijaarei	Herb	Araceae	pain killer, stimulant	Rhizome	0.025	3	2	0
53	<i>Aristida depressa</i> Retz		Herb	Poaceae	Fodder	Shoots	0.025	3	2	0
54	<i>Astragalus amherstianus</i> Royle ex Benth.	Asli Batawach	Herb	Papilionaceae	Vegetable	Shoots	0.025	3	2	0
55	<i>Boeninghausenia albiflora</i> (Hook.) Reichb.	Pissu mar	Herb Shady forest	Rutaceae	Insecticide	Leaves	0.025	2	1	0
56	<i>Calendula arvensis</i> L.	Ziar Guley	Herb	Asteraceae	Tonic, anthelmintic, fodder, honey bee plant	Leaves, flowers	0.025	3	2	0
57	<i>Cannabis sativa</i> L.	Bhang	Herb	Cannabaceae	Anti-lice, Relished by horses& mules	Whole plant	0.025	1	3	0
58	<i>Capsella bursa-pestoris</i> L.	Bambaesa	Herb	Brassicaceae	Fodder, diuretic, astringent	Shoot, seeds	0.025	3	3	0
59	<i>Clematis grata</i> Wall.	Chenjan Wala	Herb	Ranunculaceae	Gastrointestinal disorders	Roots	0.025	3	2	0
60	<i>Cynoglossum lanceolatum</i> Forssk.	Pachy	Herb	Boraginaceae	Demulcent, anti-inflammatory, fodder	Branches, leaves	0.025	3	3	0
61	<i>Digitaria nodosa</i> Perl.	Wakhay	Herb	Poaceae	Fodder	Shoot	0.025	3	3	0
62	<i>Equisetum ramosissimum</i> Desf.	Bandakay	Herb	Equisetaceae	Anti-lice, tonic, diuretic, renal disorders	Shoot	0.025	2	2	0
63	<i>Eryngium</i> Sp.		Herb	Apiaceae	Diuretic, aphrodisiac, fodder	Root	0.025	3	3	0
64	<i>Euphorbia helioscopia</i> L.	Mandro	Herb	Euphorbiaceae	Wormifuge, laxative, fish poison	Roots, shoots, seeds	0.025	3	3	0
65	<i>Ficus carica</i> Forssk.	Inzar	Tree	Moraceae	Edible fruit, young leaves as vegetable, shade, fuel, fodder, latex used as adhesive material, laxative, tonic, demulcent	Stem, leaves fruit, latex	0.025	2	1	1
66	<i>Nepeta cataria</i> L.	Jalbang	Herb	Lamiaceae	Respiratory tract infections, stomach disorder	Shoot	0.025	3	2	0
67	<i>Nerium oleander</i> L.	Kaneer	Shrub	Apocynaceae	Skin diseases, snake bite, honey bee plant	Root, leaves, flowers	0.025	3	1	0
68	<i>Opuntia dillenii</i> Haw.	Zakoom	Herb	Cactaceae	Edible fruit, hedge plant	Whole plant	0.025	3	1	0
69	<i>Polygonatum Verticillatum</i>	Noor e Alam	Herb	Convallariaceae	Analgesic, aphrodisiac, increases milk production	Rhizome	0.025	32	2	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
70	<i>Polygonum aviculare</i> L.	Pal poluk	Herb	Polygonaceae	Fodder	Shoots	0.025	3	2	0
71	<i>Silene conidea</i> L.	Babrai	Herb	Caryophyllaceae	Fodder, weed, laxative, purgative, anthelmintic	Whole plant	0.025	3	3	0
72	<i>Silybum marianum</i> (L.) Gaertn	Karizaghena	Herb	Asteraceae	Respiratory tract infections	Leaves, seeds	0.025	3	3	0
73	<i>Solena amplexicaulis</i> (Lam.)Gandhi	Kakora	Herb	Cucurbitaceae	Antipyretic, milk production	Rhizome	0.025	2	1	0
74	<i>Taxus wallichiana</i> (Zucc.)Pilger	Bunya	Tree	Taxaceae	Timber wood, fuel wood, edible fruits	whole plant	0.025	2	1	0
75	<i>Thymus linearis</i> Benth.	Da Ghar sper kay	Herb	Lamiaceae	Anti-pyretic, sedative, toothache, stomach disorder, tea is also prepared	Leaves	0.025	3	2	0
76	<i>Urtica dioica</i> L.	Jelbung	Herb	Urticaceae	Fodder, increasing milk production, diuretic, anti-allergic	Roots, leaves	0.025	3	2	0
77	<i>Ajuga bracteosa</i> Wall., Benth.	Guti	Herb	Lamiaceae	Headache, earache, anti-malarial, hypertension, blood purifier, sore throat	Whole plant	0.03	3	2	0
78	<i>Artemisia absinthium</i> L	Tarkha	Herb	Asteraceae	Anthelmintic, urinary tract infection, broom formation	Whole plant	0.03	3	2	0
79	<i>Bombax ceiba</i> L.	Simble	Tree	Bombacaceae	Fuel wood	whole plant	0.03	2	2	1
80	<i>Butea monosperma</i> (Lam.) O. Kuntz	Balbadarh/ Benda	Tree	Papilionaceae	Fuel	Shoot	0.03	2	1	1
81	<i>Colebrookia oppositifolia</i> Smith	Wakhay	Shrub	Lamiaceae	Fuel	Shoots	0.03	3	3	0
82	<i>Dactyloctenium aegyptium</i> (L) P. Beauv	Zangly Mandaro	Herb	Poaceae	Fodder	Shoots	0.03	3	3	0
83	<i>Euphorbia Wallichii</i> Hk.	Korkamani	Herb	Euphorbiaceae	Poisonous plant, highly laxative, skin diseases, honey bee plant	Whole plant	0.03	2	2	0
84	<i>Lathyrus aphacha</i> L	Spin Toot	Herb	Papilionaceae	Fodder, wound healer	Shoots	0.03	3	3	0
85	<i>Morus alba</i> L.	NargisGulae	Tree	Moraceae	Edible fruit, fodder, baskets formation, fuel wood, tool for meat cutting, temporary ropes for tying grass and woods. laxative, purgative, anthelmintic	Whole plant	0.03	2	1	1
86	<i>Narcissus tazetta</i> L.	Gandirey	Herb	Amaryllidaceae	Graveyard plant, Honey bee, flowers are purgative and emetic	Flowers	0.03	1	2	1
87	<i>Nerium indicum</i> Mill.	Noor e Alam	Shrub	Apocynaceae	Diuretic, anthelmintic, toothbrush,	Root, leaves	0.03	3	1	0
88	<i>Polygonatum multiflorum</i> (L.) All.	Spera Botay	Herb	Convallariaceae	Tonic, antispasmodic, Respiratory diseases, fodder	Whole plant	0.03	3	2	0
89	<i>Stachys parviflora</i> Benth.		Herb	Lamiaceae	Leaves are used as bandage for wound healing	Leaves	0.03	3	2	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
90	<i>Swertia ciliata</i> (G. Don) <i>B.L. Burti</i>	Chirata/Momer a	Herb	Gentianaceae	Tonic, febrifuge, eye diseases	Shoots	0.03	2	2	0
91	<i>Valeriana jatamansi</i> Jones	Mushk bala	Herb	Valerianaceae	Given to cattles for milk production, root as insecticide used in clothes	whole plant	0.03	2	1	0
92	<i>Albezia procera</i> (Roxb.) Benth.		Tree	Mimosaceae	Fuel, Shade, Spiritual	Shoot	0.035	2	1	0
93	<i>Andrachne cordifolia</i> (Wall. ex Decne.) Muell.	Kurkun	Shrub	Euphorbiaceae	Poisonous, Vermifuge for cattle	Whole plant	0.035	3	2	0
94	<i>Arisaema flavum</i> (Forssk.) Schott.	Marjaarei	Herb	Araceae	Anti-pyretic, vermifuge, fruit poisonous	Rhizome	0.035	3	2	0
95	<i>Artemisia vulgaris</i> L.	Joakay	Herb	Asteraceae	applied on tumors	Inflorescence, leaves	0.035	3	2	0
96	<i>Asparagus capitatus</i> Baker	Tindoray	Herb	Asparagaceae	Antidiarrheal	whole plant	0.035	3	2	0
97	<i>Buxus wallichiana</i> Bill.		Shrub	Buxaceae	Poisonous	Whole plant	0.035	2	1	0
98	<i>Cedrella serrata</i> Royle	Daravi	Tree	Meliaceae	Liver tonic, furniture wood, fuel	Leaves, Stem	0.035	2	1	0
99	<i>Cichorium intybus</i> L.	Hanshamakey/ Kasny	Herb	Asteraceae	vegetable, abdominal pain	Young shoot, root	0.035	3	2	0
100	<i>Citrullus colocynthis</i> (L.) Schrad	Tumba / Manzil/ Markundai	Herb	Cucurbitaceae	Poisonous plant, fruits used for intestinal disorders of livestock	Fruit	0.035	2	1	0
101	<i>Cotoneaster nummularia</i> Fish & Mey	Mamana	Shrub	Rosaceae	Fodder, fuel	Shoots	0.035	2	1	0
102	<i>Dichanthium annulatum</i> (Forssk) Stapf.	Wakhay	Herb	Poaceae	Fodder	Shoots	0.035	3	2	0
103	<i>Dicliptera bupleuroides</i> Nees.		Herb	Acanthaceae	Wound healing, cough, skin diseases, fodder	whole plant	0.035	3	2	0
104	<i>Geranium wallichianum</i> D. Don ex Sweet	Sargtrai	Herb	Geraniaceae	Fodder, tonic for cattles	Roots, shoots	0.035	3	2	0
105	<i>Hedra nepalensis</i> K. Koch.	Parweta	shrub	Araliaceae	Removal of leaches from nasal cavities of cattles	Leaves	0.035	3	2	0
106	<i>Plantago lanceolata</i> L.	Shalet	Herb	Plantaginaceae	Fodder, anti-diarrheal, anti-septic	Seeds, leaves	0.035	3	3	0
107	<i>Rumex vesicarius</i> L.	Torokay	Herb	Polygonaceae	Fodder, Wound healing	Shoots	0.035	2	1	0
108	<i>Sisymbrium irrio</i> L.	Oorac	Herb	Brassicaceae	Fodder, carminative, flatulence of cattles	Shoots, seeds	0.035	3	3	0
109	<i>Sorghum halepense</i> (L.) Pers.	Dadam	Herb	Poaceae	Fodder	Shoots	0.035	3	3	0
110	<i>Albezia lebbeck</i> (L.) Benth.	Sriekh	Tree	Mimosaceae	Fuel, shade, astringent, anti-piles, anti- diarrheal, skin diseases	Stem, bark, flowers	0.04	3	1	1
111	<i>Arisaema utile</i> Hook. f. ex. Schott	Tora marjarai	Herb	Araceae	Toothache, backache	Rhizome	0.04	3	2	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
112	<i>Bambusa glaucescens</i> (Willd.) Sieb.	Bans	Shrub	Poaceae	Soil binding, ladder making, Roofing, Fencing, Spiritual	Whole plant	0.04	3	1	1
113	<i>Dioscorea deltoidea</i> Wall. ex Kunth	Konel	Herb	Dioscoraceae	Fish poison, Spiritually used as evil repellent	Tubers	0.04	3	2	0
114	<i>Isodon rugosus</i> (Wall. ex Benth.) Codd	Khangere/Salasta	Shrub	Lamiaceae	Honey bee flora, Washing utensils	Flowers, shoot	0.04	2	2	0
115	<i>Periploca aphylla</i> Dcne.	Bata/Barara	Herb	Asclepiadaceae	Purgative & milky juice is applied on tumors and swellings	Branches	0.04	3	2	0
116	<i>Platanus orientalis</i> L.	Chinar	Tree	Platanaceae	Shade tree, fuel and roofing.	Whole tree	0.04	2	1	0
117	<i>Rubus fruticosus</i> Hook. f	Karwara	Shrub	Rosaceae	Carminative, diarrhea, edible fruit, hedge for fields borders, fuel wood	Whole plant	0.04	3	3	0
118	<i>Xanthium strumarium</i> L.	Ghishkey	Herb	Asteraceae	Anti-malarial, demulcent, anti-cancer	Fruit, leaves, roots	0.04	3	3	0
119	<i>Ziziphus oxyphylla</i> Edgew.	Elanai	Shrub	Rhamnaceae	Edible fruit, fodder, fuel	Whole plant	0.04	3	2	0
120	<i>Agrostis stolonifera</i> L.		Herb	Poaceae	Fodder	Shoots	0.045	3	2	0
121	<i>Asparagusa adscandens</i> Roxb.	Spin tindoray	Herb	Asparagaceae	Aphrodisiac, antidiarrheal, antispasmodic, diuretic	Whole plant	0.045	3	2	0
122	<i>Centaurea iberica</i> Trevir & Spreng		Herb	Asteraceae	Blood disorder, honey bee plant	Shoots	0.045	3	2	0
123	<i>Hypericum perforatum</i> L.	Warmang Booty	Herb	Guttiferae / Hypericaceae	Fodder, carminative, stimulant	Leaves, flowers	0.045	2	2	0
124	<i>Ilex diplyrena</i> Wall.		Tree	Aquifoliaceae	fuel wood	Whole plant	0.045	3	1	0
125	<i>Rubus ellipticus</i> Smith.	Karwara	Shrub	Rosaceae	Edible fruits, antidiarrheal, cough, diuretic, fodder, fuel, hedge plant	Whole plant	0.045	3	2	0
126	<i>Salvia lanata</i> Roxb.	Khathriki	Herb	Lamiaceae	Wound healer, diaphoretic, antipyretic	Leaves	0.045	3	2	0
127	<i>Senesio chrysanthemoides</i> DC.	Ghoppa	Herb	Asteraceae	Diarrhea, abdominal pain, antipyretic, fodder, washing utensils	Leaves	0.045	3	2	0
128	<i>Adiantum incisum</i> Forssk.	sumber	Herb	Adiantaceae	skin diseases& utensils wash	Fronds	0.05	3	2	0
129	<i>Buddleja crispa</i> Bth.	Booe	Shrub	Buddlejaceae	Sticks, fuel	Whole plant	0.05	2	2	0
130	<i>Cornus macrophylla</i> Wall. ex Roxb.	Kandara	Tree	Cornaceae	Timber, fuel wood, fodder, shade giving plant	Whole plant	0.05	3	1	1
131	<i>Cydonia oblonga</i> Miller	Pub	Tree	Rosaceae	Edible fruit	fruits, galls, stem	0.05	2	1	1
132	<i>Gentiana kurroo</i> Royle	Nilkant	Herb	Gentianaceae	Hepatic disorders, tonic, anthelmintic, astringent	Roots	0.05	2	2	0
133	<i>Hypericum oblongifolium</i> L.	Shin Chai	Shrub	Guttiferae	Diuretic, analgesic, antiseptic	Shoots	0.05	2	2	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
134	<i>Lactuca serriola</i> L.		Herb	Asteraceae	Wound healing	Shoots	0.05	2	2	0
135	<i>Malva neglecta</i> Wall.	Panerak	Herb	Malvaceae	Vegetable, fodder, purgative for young cattle	Whole plant	0.05	3	3	0
136	<i>Agave sisalana</i> Perrine ex Engelm.		Herb	Agavaceae	Fibers used for making ropes	Shoot	0.055	2	1	0
137	<i>Chenopodium botrys</i> L.	Skha Khawra	Herb	Chenopodiaceae	Anthelmintic, laxative, jaundice, wound healer, vegetable, fodder	Whole plant	0.055	3	3	0
138	<i>Coronopus didymus</i> (L.) Sm.	Hazar dani	Herb	Brassicaceae	Wound healing	Shoot	0.055	3	3	0
139	<i>Datura stramonium</i> L.	Batoora	Herb	Solanaceae	Urinary disorders, softening boils, antispasmodic, anti-inflammatory, skin diseases	Whole plant	0.055	3	3	0
140	<i>Euclyptus</i> spp.	Leichi	Tree	Myrtaceae	Mosquitoes repellent, reclamation of waterlogged soil, furniture, fuel, roofing	Leaves, stem	0.055	1	2	1
141	<i>Maytenus royleanus</i> (Wall. ex Lawson) Cufodontis	Pataki / Azghakay	Shrub	Celastraceae	Handles of fans, sticks, hedge plant, fuel wood	Whole plant	0.055	3	2	0
142	<i>Sarcococca saligna</i> (D. Don) Muell.	Ladan	Shrub	Buxaceae	Joint pain, antiseptic, laxative, soil binder, fuel, honey bee plant	Shoots	0.055	2	2	0
143	<i>Viola odorata</i> L.	Banafsha	Herb	Violaceae	Flu, cough, jaundice	Whole plant	0.055	3	2	0
144	<i>Acacia nilotica</i> L.	Kikar	Tree	Mimosaceae	Furniture, sticks, tooth brush, fuel, cloth tanning, fodder	Whole plant	0.06	3	2	0
145	<i>Achillea millefolium</i> L.	Karkarah	Herb	Asteraceae	Wound healer, diaphoretic, antipyretic	whole plant	0.06	3	1	0
146	<i>Acorus calamus</i> L.	Skhawaja	Herb	Araceae	Stomach disorder	Rhizome	0.06	2	2	0
147	<i>Alnus nitida</i> (Spach) Endl.	Girae/ Sharol	Tree	Betulaceae	Fuel wood, shade giving, soil binding plant	whole plant	0.06	2	2	0
148	<i>Carthamus oxycantha</i> M. Bieb.	Kareza	Herb	Asteraceae	Fodder, edible seeds, antidiuretic, laxative, diaphoretic, hedge plant	whole plant	0.06	3	3	0
149	<i>Chenopodium murale</i> L.	Skha Botey	Herb	Chenopodiaceae	Fodder, laxative	Whole plant	0.06	3	3	0
150	<i>Marrubium vulgare</i> L.	Gandana	Herb	Lamiaceae	Gastrointestinal disorders	Roots	0.06	2	2	0
151	<i>Otostegia limbata</i> (Bth.) Boiss.	Spinaghzai	Shrub	Lamiaceae	Palatable for goats & sheep, wound healer, anti-jaundice, hedge plant, fuel, ash for snuff	Whole plant	0.06	3	2	0
152	<i>Oxalis corniculatus</i> L.	Threwakey	Herb	Oxalidaceae	Fodder, stomach disorder of cattles, honey bee plant	Whole plant	0.06	3	3	0
153	<i>Sapindus mukorossi</i> L. Gaertn.,	Ritha	Tree	Sapindaceae	Fruit used as soap	Fruit	0.06	2	1	0
154	<i>Trifolium repens</i> L.	Shaotal	Herb	Papilionaceae	Vegetable, fodder, honey bee, washing utensils, rotation crop	Shoots	0.06	3	3	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
155	<i>Viburnum cotinifolium</i> D. Don	Ghanpmzewa	Shrub	Caprifoliaceae	Edible fruits, tonic, fodder, fuel	Shoots, fruits	0.06	2	2	1
156	<i>Vitis vinifera</i> L.	Kwar	Shrub	Vitaceae	Edible fruit, plant sap is hair tonic	Fruit, sap	0.06	2	1	1
157	<i>Yucca aloifolia</i> L.		Shrub	Agavaceae	Ropes making, hedge plant	whole plant	0.06	2	1	0
158	<i>Calamagrostis decora</i> Hook. f.		Herb	Poaceae	Fodder	Shoots	0.065	3	2	0
159	<i>Caltha alba</i> Camb	Makhanr Path	Herb	Ranunculaceae	Wound healing	Shoots	0.065	2	1	0
160	<i>Colchicum luteum</i> Baker		Herb	Colchicaceae	Anti-inflammatory and analgesic ointment,	Corms	0.065	2	2	0
161	<i>Debregeasia salicifolia</i> (D. Don) Rendle	Chewr	Shrub	Urticaceae	Fodder, edible fruit, fuel wood, fencing & thatching	Branches, fruits	0.065	3	2	0
162	<i>Deschampsia caespitosa</i> L.	Wakhay	Herb	Poaceae	Fodder, Broom formation	Shoots	0.065	3	3	0
163	<i>Duchesnea indica</i> (Andr.) Focke	Mewa	Herb	Rosaceae	Edible fruits, fodder, astringent, refrigerant, mental disorders	Shoots, fruits	0.065	3	2	0
164	<i>Populus alba</i> L.	Watani sperdar	Tree	Salicaceae	Timber, fuel, furniture, sports goods, roofing, soil binder	Whole tree	0.065	1	2	1
165	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Karkanda	Shrub	Rhamnaceae	Edible fruit, fodder, fuel, hedge plant	Whole plant	0.065	3	2	0
166	<i>Malva sylvestris</i> L.	Samchal	Herb	Malvaceae	Vegetable, fodder	Shoot	0.07	3	3	0
167	<i>Ailanthus altissima</i> (Mill.) Swingle	Lagan	Tree	Simarubaceae	Fuel wood, fodder, timber, roofing	Stem, leaves	0.075	3	2	0
168	<i>Chenopodium ambrosioides</i> L.	Benakai	Herb	Chenopodiaceae	Stimulant, antihelmintic, anti-spasmodic, carminative	Whole plant	0.075	3	3	0
169	<i>Mallotus philippensis</i> (Lam.) Muess.	Kambella	Shrub	Euphorbiaceae	Anthelmintic, astringent, fuel	Shoots, fruits	0.075	3	3	0
170	<i>Poa bulbosa</i> L.	Wakhay	Herb	Poaceae	Fodder	Shoots	0.075	3	3	0
171	<i>Pyrus pashia</i> Ham. ex D. Don.	Tangai	Tree	Rosaceae	Edible fruits, fuel, fodder, fruits are refrigerant, laxative, tonic, honey bee tree, Siticks	Wood, fruits, leaves	0.075	2	2	1
172	<i>Salix tetrasperma</i> Roxb.	Walla	Tree	Salicaceae	Timber, fuel wood, sport goods, agricultural tools, baskets, tanning	Whole tree	0.075	2	2	0
173	<i>Salvia moorcroftiana</i> Wall. ex Benth.	Kali jarhi / Khar ghoagh	Herb	Lamiaceae	Edible peeled off branches, warmed oily leaves warped on boils, fodder, honey bee plant, refrigerant, anti-cough and cold	Whole plant	0.075	3	2	0
174	<i>Sonchus asper</i> (L.) Hill.	Shodapae	Herb	Asteraceae	Fodder, tonic, diuretic	Shoot, flowers	0.075	3	3	0
175	<i>Calotropis procera</i> (Ait.) Ait. f.	Spulmay	Shrub	Asclepiadaceae	Skin diseases, snake bite, dog bite, dysentery, dandruff remover, dye, tooth paste,	Leaves, latex	0.08	3	2	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
176	<i>Arundo donax</i> L.	Nara	Herb	Poaceae	Soil binding, Pen making, Fuel, roofing, broom formation, hedge plant, soil binder, tool handles, fish poison	Whole plant	0.085	3	2	1
177	<i>Dodonaea viscosa</i> (L.) Jacq.	Ghoraskai	Shrub	Sapindaceae	Carminative, brain tonic, edible, increases milk production	Whole plant	0.085	3	3	0
178	<i>Foeniculum vulgare</i> Mill.	Sounf	Herb	Apiaceae	Edible fruits, vegetable, fodder, wound healing, carminative, antidiarrheal, anti-piles	Seeds	0.085	1	2	0
179	<i>Solanum nigrum</i> L.	Karmacho	Herb	Solanaceae	Shade plant, fodder, furniture, sport goods, roofing, fuel, causes pollen allergy	Whole plant	0.085	3	3	0
180	<i>Broussonetia papyrifera</i> (L.) L' Herit ex Vent	Kaghazi toot	Tree	Moraceae	Vegetable, laxative, vermifuge	Stem, leaves	0.09	2	2	1
181	<i>Colocasia esculenta</i> (L.) Schott	Karchalo	Herb	Araceae	Edible fruits, fodder, antidiarrheal, dysentery, diuretic, astringent	Corn, leaves	0.09	3	2	0
182	<i>Fragaria nubicola</i> (Hook.f.) Lindl. ex Lacaita	Da zimakaytoot	Herb	Rosaceae	Carminative, anti-emetic, anti-septic, febrifuge	Leaves, fruits	0.09	3	3	0
183	<i>Mentha longifolia</i> (L.) Huds.	Vanaley	Herb	Lamiaceae	Vegetable, Diabetics, jaundice, fodder	Whole plant	0.09	3	2	0
184	<i>Taraxicum officinale</i> Webb.	Ziar gulley	Herb	Asteraceae	Edible fruit, fuel, fodder	Roots, shoots	0.09	2	2	0
185	<i>Ziziphus jujuba</i> Mill.	Sezen	Tree	Rhamnaceae	Timber, furniture & fuel wood, agricultural tools, carminative, tonic, antispasmodic, anti-asthma	Whole plant	0.09	2	1	1
186	<i>Abies pindrow</i> Royle	Achal	Tree	Pinaceae	Fodder	Stems, leaves, cones	0.095	2	1	0
187	<i>Avena fetua</i> L.	Jawdar	Herb	Poaceae	Fodder, vegetable, laxative	Whole plant	0.095	3	3	0
188	<i>Medicago polymorpha</i> L.	Shpeshtariy	Herb	Papilionaceae	Timber, furniture, fuel, tooth brush, antiseptic, toothache, skin diseases	Shoots	0.095	33	3	0
189	<i>Azadirachta indica</i> L.	Neem	Tree	Meliaceae	Antipyretic, Dyspepsia, bronchitis, colon cancer, wound healing, tonic, anti-ulcer, analgesic	Whole plant	0.1	2	1	1
190	<i>Bergenia ciliata</i> Sternb.	Koerat	Herb	Saxifragaceae	Vegetable, against rheumatism, against diabetics	Roots, Leaves	0.1	2	1	0
191	<i>Caralluma tuberculata</i> N.E. Brown	choung	Herb	Asclepiadaceae	Vegetable, fodder, Anthelmintic, laxative, diuretic, blood purifier, purgative, anti-jaundice, urinary tract infections, snake bite treatment,	Stem	0.1	2	1	1
192	<i>Chenopodium album</i> L.	Larmay Sarnea	Herb	Chenopodiaceae	Edible fruit, fuel, shade, astringent, carminative	Whole plant	0.1	3	3	0
193	<i>Ficus racemosa</i> L.	Armol	Tree	Moraceae		Stem, leaves, fruits	0.1	2	1	1

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
194	<i>Indigofera heterantha</i> Wall. ex Brand.	Ghoraja	Shrub	Papilionaceae	Roofing, hedges, baskets, birds cages, ropes, fodder, fuel, washing utensils, ash for snuff, honey bee plant, demulcent, anti-cancerous, diuretic, carminative, urinary diseases, brooms	Whole plant	0.1	1	3	0
195	<i>Melilotus officinalis</i> (L.) Desr.	Lewanay	Herb	Papilionaceae	Fodder, anti-coagulant, manure	Shoots	0.1	3	3	0
196	<i>Mentha arvensis</i> L.	Podina	Herb	Lamiaceae	Stomach disorders, febrifuge, anti-emetic, anti-spasmodic, stimulant, diuretic, aromatic, honey-bee sp.	Whole plant	0.1	3	2	0
197	<i>Phalaris minor</i> Retz	Nashpati	Herb	Poaceae	Fodder	Shoots	0.1	3	3	0
198	<i>Pyrus communis</i> L.	Nashpati	Tree	Rosaceae	Edible fruits, antipyretic, sedative, astringent, fuel, fodder	Wood, fruits, leaves	0.1	2	2	1
199	<i>Quercus incana</i> Roxb.	Spin banj	Tree	Fagaceae	Fuel, making utensils & agricultural tools, seeds are astringent, diuretic, anti-diarrheal, asthma, shade giving	Whole tree	0.1	2	2	0
200	<i>Ricinus communis</i> L.	Arharhanda	Herb	Euphorbiaceae	Wound healer, laxative, analgesic, oil is purgative and lubricant, manure, fuel, used laxative for cattles	Whole plant	0.1	1	3	0
201	<i>Rumex acetosa</i> L.	Tarokey	Herb	Polygonaceae	Vegetable, against rheumatism, against diabetics	Shoots	0.1	3	3	0
202	<i>Viburnum grandiflorum</i> Wall. ex DC.	Chamiaray	Shrub	Caprifoliaceae	Astringent, antispasmodic, fodder, fuel	Seeds	0.1	2	2	1
203	<i>Viola canescens</i> Wall. ex Roxb.		Herb	Violaceae	Throat infection, soothing effect, cough, cold, fever	Whole plant	0.1	2	2	0
204	<i>Carissa opaca</i> Stapf ex Haines	Granda	Shrub	Apocynaceae	Edible fruit, fuel wood	leaves, Stem, fruit	0.105	2	2	0
205	<i>Commelina benghalensis</i> L..	Kanchara	Herb	Commelinaceae	Fodder, Vegetable, Laxative	Whole plant	0.105	3	2	0
206	<i>Picea smithiana</i> (Wall.) Boiss.	Nakhtar	Tree	Pinaceae	Timber wood, furniture wood, fuel wood, rheumatism, abdominal pain and antiseptic	Wood	0.105	2	1	0
207	<i>Quercus leucotrichophora</i> A. Camus	Rin	Tree	Fagaceae	Timber, fuel, fodder, agricultural appliances	Whole plant	0.105	2	1	0
208	<i>Trifolium pratense</i> L..	long lvs	Herb	Papilionaceae	Fodder	Shoot	0.105	3	3	0
209	<i>Vitex negundo</i> L.	Marghondai	Shrub	Verbenaceae	Anti-septic, tooth brush, fuel wood, soil binding plant, pain reliever of chest, back and legs, graveyards plant	Whole plant	0.105	3	2	1

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
210	<i>Achyranthes bidentata</i> Blume	Geshay/Spay boty	Herb	Amaranthaceae	Toothache, abdominal pain, scorpion and snake bite, fodder	whole plant	0.11	3	2	0
211	<i>Acacia modesta</i> Wall.	Palosa	Tree	Mimosaceae	Fodder, fuel wood, gum used as tonic after delivery, toothbrush, honey bee plant	Stems, leaves, gum	0.115	3	3	0
212	<i>Ficus benghalensis</i> L.	Barh	Tree	Moraceae	Shade, fuel, Spiritual	Whole plant	0.12	2	1	1
213	<i>Pistacia integerrima</i> J.L.Stewart & Brandis	Shanae	Tree	Anacardiaceae	Tonic, expectorant, whooping cough and asthma, fuel wood	fruits, galls, stem	0.125	2	1	0
214	<i>Quercus floribunda</i> L.	Brungi	Tree	Fagaceae	Timber, fuel, fodder	Wood, leaves,	0.125	2	1	0
215	<i>Cynodon dactylon</i> (L.) Pers.	Kabal	Herb	Poaceae	Fodder, soil binder, washing utensils, astringent, diuretic, tonic, skin diseases, leprosy	Whole plant	0.135	3	3	0
216	<i>Mentha spicata</i> L.	Zangli Podina	Herb	Lamiaceae	Carminative, stimulant, toothache, mouth wash, refrigerant, used in salad	Leaves	0.135	3	2	0
217	<i>Prunus armeniaca</i> L.	Khubanai	Tree	Rosaceae	Edible fruits, fuel, fodder, fruits are refrigerant, laxative, tonic, honey bee tree	Whole plant	0.14	1	2	1
218	<i>Cyperus cyperoides</i> (L.) Kuntze	Della	Herb	Cyperaceae	Fodder, Tonic for cattles	Whole plant	0.145	3	3	0
219	<i>Delbergia sisso</i> Roxb.	Shaewa	Tree	Papilionaceae	Furniture, sticks, timber, sports goods, agricultural tools, fuel, soil binder, fodder, ash for snuff, stimulant, gonorrhea, astringent, anti-piles	Whole plant	0.145	3	2	0
220	<i>Rumex hastatus</i> D. Don	Tarokai	Herb	Polygonaceae	Fodder, occasionally fuel, carminative, purgative, diuretic, astringent, jaundice, antiseptic	Shoots	0.145	3	3	0
221	<i>Aesculus indica</i> (Wall. ex Camb.) Hk. f.	Ashanr	Tree	Hippocastanaceae	Timber, fuel, agriculture tools, fodder, furniture, anti-colic in horses & for stamina in cattle, used as shade giving tree	Whole plant	0.15	3	2	0
222	<i>Aloe vera</i> (L.) Burm.	Zaqam botay	Herb	Asphodelaceae	Latex is used for skin beauty	Latex, Leaves	0.15	3	2	0
223	<i>Punica granatum</i> L.	Narsaw-ay/ Anunghoray	Tree	Punicaceae	Edible fruit, spices, fuel wood, leaves are palatable for goats	whole plant	0.15	3	2	1
224	<i>Quercus dilatata</i> Lindl. ex Royle	Tor banj	Tree	Fagaceae	Timber wood, fuel, fodder, agricultural tools, shade giving, seeds are purgative & astringent. Children play with seeds	Whole plant	0.15	2	1	0
225	<i>Robinia pseudoacacia</i> L.	Toor kiker	Tree	Papilionaceae	Timber, furniture, fuel, fodder, shade giving, soil binder, honey bee attractant	Whole plant	0.15	3	3	0
226	<i>Rumex dentatus</i> L.	Shalkhay	Herb	Polygonaceae	Vegetable, fodder, diuretic, demulcent, laxative for cattles	Roots, leaves	0.15	3	3	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data			
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE
227	<i>Aerva javanica</i> (Burm.f) Juss.	Spin booti	Herb	Amaranthaceae	Anti-cancer, Treatment of joints inflammation of cattles	Whole plant	0.17	3	2	0
228	<i>Grewia optiva</i> Drummond .ex Burret	Pastaw-oney	Tree	Tiliaceae	Fodder, increasing milk production, fuel wood	Stem, leaves, bark	0.17	2	2	1
229	<i>Nasturtium officinale</i> R. Br.	Tarmera	Herb	Brassicaceae	Vegetable, fodder, diuretic, carminative, heart and kidney disorders	Shoots	0.18	3	2	0
230	<i>Achyranthus aspera</i> L.	Puth Kanda	Herb	Amaranthaceae	Diuretic, analgesic, antispasmodic, vegetable, fodder	whole plant	0.19	3	2	0
231	<i>Bauhinia variegata</i> L.	Kulhar	Tree	Caesalpiniaceae	Vegetable, fuel wood, fodder, tonic, carminative, tanning	Whole plant	0.195	2	1	1
232	<i>Amaranthus caudatus</i> L.	Chaleray	Herb	Amaranthaceae	Vegetable, fodder, blood purifier	whole plant	0.2	3	3	0
233	<i>Celtis australis</i> L.	Taghagaha / Batkar	Tree	Ulmaceae	Agricultural tools, fuel, fodder, edible fruit, shade giving	Stem, leaves ,fruits	0.2	2	1	0
234	<i>Diospyrus lotus</i> L.	Tor Amluk	Tree	Ebenaceae	Edible fruits, fodder, fuel, timber, agricultural tools, handles, furniture,	Fruit, bark, wood	0.2	3	2	1
235	<i>Cotinus coggyria</i> Scop.	Chamy-arlakhta / Paan	Shrub	Anacardiaceae	Basket, Fuel, Tooth brush, tanning	whole plant	0.215	3	2	0
236	<i>Amaranthus spinosus</i> L.	Karsusa	Herb	Amaranthaceae	Vegetable, fodder, expectorant, diuretic, rheumatism, snake bite	whole plant	0.225	3	2	0
237	<i>Justicia adhatoda</i> L.	Baikar	Shrub	Acanthaceae	Blood purifier, respiratory diseases, leaves used for ripening of bananas; fuel wood, honey bees plant, soil binding plant, fuel wood	whole plant	0.225	2	2	0
238	<i>Amaranthus viridis</i> L.	Ganhar	Herb	Amaranthaceae	Vegetable, fodder, edible seeds, leaves used curing boils	whole plant	0.25	3	2	0
239	<i>Berberis lycium</i> Royle	Kwaray	Shrub	Berberidaceae	Edible fruit, fodder, fuel wood, skin diseases, wound healer, blood purifier, sore throat, anti-cancer, fencing of crops	whole plant	0.25	2	2	0
240	<i>Ficus palmata</i> Forssk.	Inzar	Tree	Moraceae	Edible fruit, young leaves as vegetable, shade, fuel, utensils, fodder, latex used to remove thorns from body, laxative, tonic, demulcent.	Wood, leaves, fruits, latex	0.25	3	3	1
241	<i>Pinus roxburghii</i> Sargent	Nakhtar	Tree	Pinaceae	Timber, fuel, furniture, dye leather, edible seeds, roofing, fencing	Whole plant, resin	0.25	2	2	0
242	<i>Zanthoxylum armatum</i> DC.	Dambara	Shrub	Rutaceae	Stomachache, toothache, carminative, stimulant, spices, tooth brushes, Sticks, fodder, fuel	Shoots, fruits	0.25	3	2	0

Table 1. (Cont'd).

S.No.	Botanical Name	Cultural Use data					Conservation related data				
		Local Name	Habit	Family	Uses	Part used	Use Value	Av	Oc	CE	
243	<i>Morus nigra</i> L.	Tor toot	Tree	Moraceae	Edible fruit, fodder, baskets formation, fuel wood, tool for meat cutting, laxative, anti-throat infection; temporary ropes for tying grass and woods	Whole plant	0.275	3	3	1	
244	<i>Pinus wallichiana</i> A. B. Jackson	Pewach	Tree	Pinaceae	Timber wood, fuel wood	whole plant	0.28	2	2	0	
245	<i>Juglans regia</i> L.	Ghuz	Tree	Juglandaceae	Edible nuts, furniture wood, bark and leaves as cosmetics, anthelmintic, tanning and dyeing, fuel, handles of knives	Wood, bark, nuts, leaves	0.3	2	2	1	
246	<i>Melia azedarach</i> L.	Bakaina/Lagan	Tree	Meliaceae	Timber, furniture & fuel wood, fodder, insecticide, fruits carminative for goats, leaves are used in rice paddies, anthelmintic, anti-lice, tonic, anti-diabetics, antidote for scorpion bite, blood purifier, anti-pyretic, rheumatism, hypertension, shade	Whole plant	0.315	2	2	1	
247	<i>Cedrus deodara</i> (Roxb. ex D. Don) G. Don	Lamb. / Ranzhra	Tree	Pinaceae	Timber wood, furniture wood, fuel wood, fencing, astringent, diaphoretic, antiseptic, diuretic, anti-leprosy, skin diseases, anti-fever, anti-pyretic	Bark, wood, oil	0.335	2	1	0	
248	<i>Olea ferruginea</i> Royle	Khoona	Tree	Oleaceae	Fuel, fodder, shade, toothbrush, roofing, sticks, agricultural appliances, sports goods, astringent, antiseptic, diuretic, toothache, sore throat, pothorb; grave yard plant	Whole plant	0.34	3	2	1	
249	<i>Podophyllum emodi</i> Wall. ex Royle	Ban kakri / Banwangun	Herb	Podophyllaceae	Hepatic stimulant, pain killer, emetic	Rhizome	0.345	2	1	0	
250	<i>Skimmia lauroleola</i> (DC.) Steb. & Zucc. ex Walp.	Nameer/ Nazar pana	Shrub	Rutaceae	Aromatic, dried leaves are burnt for evils repel, clean nasal route, febrifuge, carminative, antispasmodic, toothache	Leaves	0.35	2	1	0	

UV = $\sum U/n$

U = No of citations; n = Total informants

Key

Availability (Av) for the last ten years :

Increased = 1

Decreased = 2

Persistent = 3

Occurrence (Oc)

Rare = 1

Moderate = 2

Abundant = 3

Conservation Effort (CE) by locals

Nil = 0

Yes = 1

Discussion

The results showed that Basikhel tribe has a rich cultural heritage of plants lore. The area is remote and deprived of modern facilities of life. In the absence of consumer culture or access to market base economy, people are totally dependent upon plants resources. The degree of ethnobotanical richness in the area is mainly attributed to its diverse flora. The local wisdom explored various cultural uses of plants in terms of medicine, fodder, fuel, timber, food, furniture, cosmetics, spiritual and making of sticks, instruments, brooms, toothbrushes, roofing and fencing. A large number of studies documented different cultural uses of plants in Pakistan. Haider & Qaiser (2007) recorded 83 plant species for local uses in Chitral valley especially medicinal plants. Awan *et al.*, (2011) reported 102 plants for medicinal and economic uses from Kaghan valley. Khan *et al.*, (2012) and (2013a & b) enlisted 183 plant species providing services in the form of timber, fuel, food, fodder, medicines, grazing and aesthetics in the Naran Valley. Ahmed *et al.*, (2014) identified ethnobotanical uses of important medicinal plants of Chail valley, Swat. The results of these studies showed highest use of medicinal plants as compare to other cultural uses. However, study of Khan *et al.*, (2012) represented highest use of fodder plants and then medicinal plants. Results of our study also showed highest use of medicinal plants. 25 % respondents recorded 150 (60% of the total species) used for ethnomedicines. The main reason for the use of medicinal plants by the locals is the unavailability of allopathic medicines, poverty and strong belief of curing diseases with herbal medicines. ICF values 0.495 and 0.464 (Table-2) showing wound healing and gastrointestinal disorders are highest among all ailment categories (Table

2). ICF values indicated disease profile of the study area that will serve a baseline for health care programmes. According to Mussarat *et al.*, (2014) this will sort out the potential medicinal plant species for pharmacognostic studies. Conservation status of the plants species was assessed on the basis of use values and conservation related data that is availability for the last ten years, occurrence and conservation efforts by locals (Table 3). The most threatened plants species showing 0.3 to 0.35 UV values (Table 1). In this category *Juglans regia* (0.3), *Melia azedarach* (0.315), *Cedrus deodara* (0.335), *Olea ferruginea* (0.34), *Podophyllum emodi* (0.345) and *Skimmia laureola* (0.35). When this category was analyzed keeping in view the other conservation factors, the three species *Skimmia laureola*, *Podophyllum emodi* and *Cedrus deodara* were found most threatened. Haq *et al.*, (2011) also pointed out their over exploitation and alarming decrease. Their availability for the last ten years decreased, occurrence is rare and there is no conservation effort by locals. These are the most cited taxa and their over exploitation and absence of conservation measures are the main threats. Ahmed *et al.*, (2014) also mentioned *Skimmia laureola* in the category of most cited taxa. *Olea ferruginea* in spite of showing UV 0.34 is excluded from most threatened species category because its occurrence is moderate; availability for the last ten years remained persistent and protected in graveyards. Being the most cited taxon it is also protected from fire by making small circular stony wall around the tree. This conservatory measure was first time observed. Similarly, *Juglans regia* (0.3) and *Melia azedarach* (0.315) are not considered most threatened because these are protected and cultivated by locals. Their availability and occurrence data do not support to include them in most threatened category of plants.

Table 2. Informants consensus Factor for different ailment categories.

	C ^A	C ^B	C ^C	C ^D	C ^E	ICF
1 Wound healing		56	37.333	110	55	0.495
2 Gastrointestinal disorders		54	36	100	50	0.464
3 Skin diseases		13	8.666	17	8.5	0.25
4 Respiratory tract diseases		23	15.333	40	20	0.435
5 Urinary tract diseases		32	21.333	50	25	0.367
6 Aphrodisiac		3	2	4	2	0.333
7 Blood disorders		11	7.333	13	6.5	0.1666
8 Demulcent		7	4.666	9	4.5	0.25
9 Analgesic		26	17.333	36	18	0.285
10 Antispasmodic		8	5.333	13	6.5	0.4166
11 Anticancer		4	2.666	5	2.5	0.25
12 Cure of boils		4	2.666	6	3	0.4
13 Emetic		5	3.333	7	3.5	0.333
14 Tonic		23	15.333	30	15	0.241
15 Vermifuge		15	10	26	13	0.44
16 Antipyretic		16	10.666	16	8	0
17 Stimulant		13	8.666	15	7.5	0.142
18 Astringent		13	8.666	17	8.5	0.25
19 Antidiabetics		7	4.666	8	4	0.142
20 Treatment of jaundice		7	4.666	9	4.5	0.25
21 Total		150		N(200)	100	

C^A = Disease category, C^B = Number of species for ailment category, C^C = C^B / Number of total species cited (150)
 C^D = Number of citations for ailment category, C^E = C^D / Total number of citations (200), ICF = (C^D · C^B) / (C^{D-1})

References

- Abbasi, A. M., M.A. Khan, M. Ahmad, R. Quershi, M. Arshad, S. Jahan, M. Zafar and S. Sultana. 2010. Ethnobotanical study of wound healing herbs among the tribal communities in Northern Himalaya Ranges District Abbottabad, Pakistan. *Pak. J. Bot.*, 42(6): 3747-3753.
- Abbasi, A.M., S.M. Khan, M. Ahmad, M.A. Khan, C.L. Quave, A. Pieroni. 2013. Botanical ethnoveterinary therapies in three districts of the Lesser Himalayas of Pakistan. *J. Ethnobiol. & Ethnomed.*, 9: 84.
- Afridi, S.K. 1986. *Medicinal Plants of Khyber Agency*. M.Sc Thesis. Department of Botany, University of Peshwar.
- Ahmad, H., S.M. Khan, S. Ghafoor and N. Ali, 2009. Ethnobotanical study of upper Siran. *J. Herbs, Spices & Med. Plants*, 15: 86-97.
- Ahmad, H. 2004. People and plants-Pakistan: Capacity building in ethnobotany applied to conservation and sustainable use of plant resources. WWF-P Islamabad, Pakistan pp 76.
- Ahmad, M., S. Sultana, S.F. Hadi, T.B. Hadda, S. Rashid, M. Zafar, M.A. Khan, M.P.Z. Khan and G. Yaseen. 2014. An ethnobotanical study of medicinal plants in high mountainous region of Chail valley (District Swat-Pakistan). *J. Ethnobiol. & Ethnomed.*, 10: 36.
- Ajab, M., Z.D. Khan, N. Khan and M. Wahab. 2010. Ethnobotanical studies on useful shrubs of District Kotli, Azad Jammu & Kashmir, Pakistan. *Pak. J. Bot.*, 42(3): 1407-1415.
- Akhtar, N., A. Rashid, W. Murad and E. Bergmeier. 2013. Diversity and use of ethno-medicinal plants in the region of Swat, North Pakistan. *J. Ethnobiol. Ethnomed.*, 9: 25.
- Albuquerque, U.P. and R.F.P. Lucena. 2004a. Seleccion e escolha dos informants. In: *Metodos e tecnicas na pesquisa etnobotanica, org.* (Eds.): U.P. Albuquerque & R.F.P. Lucena. Nupeea, Recife. pp. 1935.
- Albuquerque, U.P. and R.F.P. Lucena. 2004b. Metodos e tecnicas para a coleta de dados. In: *Metodas extecnicas na pesquisa etnobotanica, org.* (Eds.): U.P. Albuquerque & R.F.P. Lucena. Nupeea, Recife. pp. 37-62.
- Albuquerque, U.P. and R.F.P. Lucena. 2005. Can appetency affect the use of plants by local people in the tropical forests? *Interciencia*, 30: 506-511.
- Ali, H. and M. Qaiser. 2009. The ethnobotany of Chitral valley, Pakistan with particular reference to medicinal plants. *Pak. J. Bot.*, 41(4): 2009-2041.
- Ali, S.I. and M. Qaiser. 1986. A phyto-Geographical analysis of the Phenerogams of Pakistan and Kashmir. Proceedings of Royal Society Edinburgh. 89: 89-101.
- Ali, S.I. and M. Qaiser. 1998-2005. *Flora of Pakistan*. Department of Botany, University of Karachi.
- Awan, M.R., Z. Iqbal, S.M. Shah, Z. Jamal, G. Jan, M. Afzal, A. Majid and A. Gul. 2011. Studies on traditional knowledge of economically important plants of Kaghan Valley, Mansehra District, Pakistan. *J. Med. Plants Res.*, 5(16): 3058-3067.
- Badshah, L., F. Hussain, Z. Sher and T. Burni. 2014. Harvesting and consumption of fuel and timber wood in rural area of district Tank, Pakistan. *Pak. J. Bot.*, 46(5): 1719-1724.
- Champion, H.G., K. Seth and G.M. Khattak. 1965. *Forest Types of Pakistan*. PFI. Peshawar. Peshawar Bulletin, (7).
- Da Cunha, L.V.F.C. and U.P. De Albuquerque. 2006. Quantitative ethnobotany in an Atlantic Forest fragment of Northeastern Brazil- Implications to conservation. *Environ. Monit. Assess.*, 114(1-3): 1-25.
- De Albuquerque, U.P. 2009. Quantitative ethnobotany or quantification in ethnobotany? *Ethnobot. Res. & App.*, 7: 1-4.
- English, R. 1991. Kala Dhaka Area Development Project: Interim Report. (J. Greenham and R.L. Schmidt). Report prepared for the Rural Development Division, USAID/Islamabad.
- Gilani, S.S., S.O. Abbas, Z.K. Shinwari, F. Hussain and K. Nargis. 2003. Ethnobotanical studies of Kurram Agency, Pakistan through rural community participation. *Pak. J. Biol. Sci.*, 6: 1368-1375.
- Haider, A. and M. Qaiser. 2009. The Ethnobotany of Chitral Valley, Pakistan with particular references to medicinal plants. *Pak. J. Bot.*, 41(4): 2009-2041
- Hazrat, A., M. Nasir, J. Shah and S. Ahmad. 2011. Ethnobotanical study of some elite plants belonging to Dir, Kohistan Valley, Khyber Pukhtunkhwa, Pakistan. *Pak. J. Bot.*, 43(2): 787-795.
- Ibrar, M., F. Hussain and A. Sultan. 2007. Ethnobotanical studies on plant resources of Ranyal hills, District Shangla, Pakistan. *Pak. J. Bot.*, 39(2): 329-337.
- Ijaz, F., Z. Iqbal, J. Alam, S.M. Khan, A. Afzal, I.U. Rahman, M. Afzal, M. Islam and Sohail. 2015. Ethno Medicinal Study upon Folk Recipes Against Various Human Diseases in Sarban Hills, Abbottabad, Pakistan. *World J. Zoo.*, 10 (1): 41-46.
- Ishtiaq, M., M. Maqbool, T. Hussain, and A. Shah. 2013. Role of indigenous knowledge in biodiversity conservation of an area: A case study on tree ethnobotany of Soona Valley, District Bhimber Azad Kashmir, Pakistan. *Pak. J. Bot.*, 45: 157-164.
- Khalil, A.T., Z.K. Shinwari, M. Qaiser, and K.B. Marwat. 2014. Phyto-therapeutic claims about euphorbiaceous plants belonging to Pakistan; an ethnomedicinal review. *Pak. J. Bot.*, 46(3): 1137-1144.
- Khan, S.M., N. Ud. Din, M. Ilyas, Sohail, I. Ur. Rahman, F. Ijaz, Z. Iqbal and N. Ali, 2015. Ethnobotanical study of some medicinal plants of Tehsil Kabal, District Swat, KP. *Pak. J. Med. & Arom. Plants.*, 3: 4.
- Khan, S.M. and H. Ahmad, 2014a. Role of Indigenous Arqiyat Distillery in conservation of Rosa species. *International Journal of Phytomedicine*, 6(2): 162-164.
- Khan, S.M., S. Page, H. Ahmad and D.M. Harper, 2014b. Ethno-ecological importance of plant biodiversity in mountain ecosystems with special emphasis on indicator species; a case study of the Naran Valley in the Northern Pakistan. *J. Ecol. Indicators.*, 37(Part A): 175-185.
- Khan, S.M., S. Page, H. Ahmad and D.M. Harper. 2013a. Sustainable Utilization and Conservation of Plant Biodiversity in Montane Ecosystems; using the Western Himalayas as a Case Study. *Ann. Bot.*, 112(3): 479-501.
- Khan, S.M., S. Page, H. Ahmad, H. Shaheen, Zahidullah, M. Ahmad and D.M. Harper. 2013b. Medicinal flora and ethnoecological knowledge in the Naran valley, Western Himalaya, Pakistan. *J. Ethnob. & Ethnom.*, 9: 4.
- Khan, S.M., S. Page, H. Ahmed and D.M. Harper. 2012. Anthropogenic influences on the natural ecosystem of the Naran Valley in the Western Himalayas. *Pak. J. Bot.*, 44: 231-238.
- Khan, S. M., D. M. Harper, S. Page and H. Ahmad, 2011. Residual Value Analyses of the medicinal flora of the western Himalaya; The Naran Valley Pakistan. *Pak. J. Bot.*, 43(SI): 97-104.
- Martin, G.J. 2004. *Ethnobotany; A methods manual*. WWF and HED, Earth scans Camden London. pp. 267.

- Martin, A., M.A. Khan, M. Ashraf and R.A. Quershi. 2001. Traditional use of herbs, shrubs and trees of Shogran valley, Mansehra, Pakistan. *Pak. J. Bot.*, 4(9): 1101-1107.
- Moerman, D. 2007. Agreement and meaning: Rethinking consensus analysis. *J. Ethnopharmacology.*, 112: 451-460.
- Mussarat, S., N.M.A. Salam, A. Tariq, S.M. Wazir, R. Ullah and M. Adnan. 2014. Use of ethnomedicinal plants by the people living around Indus River. *Evidence- Based Complementary and Alternative Medicine*, 2014: 5.
- Nelson, G.C., E. Bennett, A.A. Berhe, K. Cassman, R. DeFries, T. Dietz, A. Dobermann, A. Dobermann, A. Dobson, A. Janetos, M. Levy, D. Marco, N. Nakicenovic, B.O' Neill, R. Norgaard, G.P. Held, D. Ojima, P. Pingall, R. Watson and M. Zurek. 2006. Anthropogenic drivers of ecosystem change: an overview. *Ecol. & Soc.*, 11(2): 29.
- Rossato, S.C., H.D.F. Leitao-Filho and A. Begossi. 1999. Ethnobotany of Caicas of the Atlantic Forest coast (Brazil). *Econ. Bot.*, 53(4): 387-395.
- Saima, S., A.A. Dasti, Q. Abbas and F. Hussain. 2010. Floristic diversity during monsoon in Ayubia National Park, District Abbottabad, Pakistan. *Pak. J. Pl. Sci.*, 16(1): 43-50.
- Saltan, F.Z. and O. Ozaydin. 2013. Ethnobotany of Eskisehir and its environs. *Pak. J. Bot.*, 45(1): 207-214.
- Shah, G.M. 2007. *Plant and plant resources of Siran Valley, Mansehra, N.W.F.P., Pakistan*. PhD Thesis. Department of Plant Sciences, Quaid-i-Azam University Islamabad.
- Shinwari, M.I. and M.A. Khan. 1998. Indigineous use of medicinal trees and shrubs of Margilla Hills National Park, Islambad. *Pak. J. For.*, 48(1-4): 63-90.
- Takhtajan, A. 1986. *Floristic regions of the world*. (Translated by T.J. Crovello & A. Cronquist) University of California press, Berkeley.
- Torre-Cuadros, M.A. and G.A. Isleba. 2003. Traditional ecological knowledge and use of vegetation in southeastern Mexico: a case study from Solferino, Quintana Roo. *Biodiver. & Conserv.*, 12: 2455-2476.
- Wagley, M.P., N. Poudel, T.M. Maskey, C.P. Gurung, A. Manandhar, S. Khaling, Y. Lama, G. Thapa, S. Thapa, E. Wikramanayake, E. Sharma, N. Chettri and B. Peniston. 2006. The sacred Himmalayan Landscape: Conceptualizing, visioning and planning for conservation of Biodiversity, Cultures and Livlihoods in the Eastern Himalayas. Conservation Biology in Asia.
- Watson, D.H. 1907. Gazetteer of the Hazara District, Directorate of Archives, Govt. of NWFP, 1988.

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