

Full Length Research Paper

## Traditional knowledge on plant resources of Ashezai and Salarzai Valleys, District Buner, Pakistan

Zaman Sher<sup>1</sup>, Farrukh Hussain<sup>2</sup> and Muhammad Ibrar<sup>2</sup>

<sup>1</sup>Government Degree College, Lahor, District Swabi, Pakistan.

<sup>2</sup>Department of Botany, University of Peshawar, Pakistan.

Accepted 23 October, 2013

An ethnobotanical study was done in the Ashezai and Salarzai Valleys, District Buner, Pakistan. A total of 163 plant species belonging to 73 families were reported with the help of standardized questionnaires for their traditional, medicinal and economic uses. Out of these, 62 families were dicots; 8 monocots and two pteridophytes. Gymnosperms were represented by one family. Asteraceae had 16 spp. which was followed by Papilionaceae and Poaceae (each with 9 spp.); Lamiaceae, Moraceae and Rosaceae (each with 6 spp.); Apiaceae, Polygonaceae and Solanaceae (each with 5 spp.); Amaranthaceae, Brassicaceae, Chenopodiaceae and Euphorbiaceae (each with 4 species); Oleaceae and Salicaceae had 3 species each. The remaining families had less number of species. They included 110 medicinal plants, 51 fodder and forage species, 37 fuel wood species, 33 vegetable/pot-herb species, 22 fruit yielding species, 20 thatching/roofing species, 13 timber species, 18 ornamental species, 8 poisonous plants, 10 fencing/ hedges plants, 4 agricultural tools making species, 5 honeybee species. Deforestation, biotic interference and overgrazing are the responsible culprits for dwindling phytodiversity in the investigated area. This study might be helpful to ethnobotanists, conservationists, ecologist, pharmacologists, taxonomists, wild life and water shed managers as baseline data.

**Key words:** Ethnobotanical study, plant species, medicinal plants, traditional knowledge.

### INTRODUCTION

Ethnobotany can be defined as the "study of direct interrelations between humans and plants so the results from various investigations reveal important pharmacological activities of plants which may be used in developing novel therapeutic agents". Herbal medicines play an important role in health care programs worldwide, especially in developing countries, because there are no major side effects. The residents of the investigated area mostly depend on cattle rearing and their products and on forest resources. Overuse of forest resources has placed them under intense biotic pressure, which poses potential danger for wildlife habitat and medicinal plants. Mood (2008) reported some floristic and ethnobotanical

aspects of 37 families, 128 genera and 160 species in Birjand area near the Afghanistan border in eastern part of Iran. Ozturk et al. (2008) published some data on the toxic and fatal behavior of some poisonous plants widely distributed in Turkey and Northern Cyprus. Studies on ethnobotany have been conducted in India (Mustafa et al., 2000; Siddiqui et al., 2000). Many of such studies have also been done on the ethnobotany of various parts of District Swat (Sher et al., 2003, 2004; Hussain et al., 2004, 2005; Ibrar et al., 2007). In Pakistan, some ethnobotanical studies have also been carried out (Dastagir, 2001; Durrani et al., 2003; Gilani et al., 2003; Sher, 2005; Hussain et al., 2007; Ahmad and Husain, 2008; Usain

et al., 2008; Ilahi, 2008; Ali and Qaiser, 2009; Qureshi et al., 2009). Ethnobotanical studies (Sher et al., 2011) and biological spectrum (Sher and Khan, 2007) of the vegetation of Chagharzai Valley, District Buner has been worked out.

It is evident from the review of literature that no work on the ethnobotany of Ashezai and Salarzai Valleys District Buner has been done so far. The present study reports the traditional utilization of some plants of the area, which might be helpful for the future workers, ecologist, pharmacologists, taxonomists; wild life and water shed managers in their efforts to develop this area (Table 1).

## MATERIALS AND METHODS

District Buner lies between latitude 34°-11 to 34°-34 and longitude 72°-13 to 72°- 45. It is bounded by Swat and Shangla districts in the north, in the west by Malakand agency, in the south by Mardan and Swabi districts and in the east by Indus River. Vegetationally and climatically, the area can be classified as tropical, sub humid temperate with alpine glimpses at certain places. Elevation varies from 366 m in the south to 2911 m in the north. The geographical setting of the area provides habitat to rich diversity of plants especially medicinal and other economic species. A survey was conducted during June, 2009 to document the traditional uses of plants. Plant specimen were collected, dried and preserved properly. They were identified through available literature (Nasir and Ali, 1971-1992; Ali and Qaisar, 1992, 2009). The plants were classified according to their economic value (medicinal, fodder, vegetables, thatching, food, fuel wood) by interviewing and filling questionnaires from drug dealers, shopkeepers, timber dealers, fuel wood seller, local hakims and farmers but priority was given to local elderly people who were the real users and had a lot of information about the plants and their traditional uses. Literature survey and general observations provided more information. The plants were submitted to Botany Department, University of Peshawar, Khyber Pukhtunkhwa, Pakistan.

## RESULTS AND DISCUSSION

The people of the area depend on agriculture, fuel wood selling, timber wood selling, livestock and other natural resources of the area for a living. The ethnobotanical information revealed that 163 plants were used for various purposes in the investigated area. The reported vegetation comprised 25 trees, 33 shrubs, 100 herbs, 4 climbers and one parasite (Figure 1). There were 110 plant species used as medicine. Some of the plants were used individually, while others in mixture. A plant species had single or multiple medicinal uses. The findings agree with those of Sher et al. (2011), Iqbal et al. (2011), Hussain et al. (2004, 2005), Ahmad and Husain (2008), Husain et al. (2008), Ilahi (2008), Ali and Qaiser (2009) and Qureshi et al. (2009) with respect to medicinal uses. Among such plants, *Acacia modesta*, *Acorus calamus*, *Adiantum incisum*, *Ajuga bractiosa*, *Ammi visnaga*, *Berberis lycium*, *Calotropis procera*, *Coriandrum sativum*, *Cucumis prophetarum*, *Fumaria indica*, *Mentha longifolia*, *Mentha spicata*, *Morus alba*, *Morus indica*, *Oxalis*

*corniculata*, *Paeonia emodi*, *Plantago lanceolata*, *Punica granatum*, *Verbascum thapsus* and *Zizyphus* spp. were usually used against various ailments. Medicinal plants used in the local community were about 64% of the total reported species. Livestock rearing is an important traditional activity of the local people. Sher et al. (2011) reported that 33% of the total plant species are used as fodder in Chagharzai valley, District Buner. Aboriginals of the present investigated area showed milk, yogurt, butter and other traditional dairy products from livestock for their daily use. These products are taken with maize bread by all members of the family. Badshah and Hussain (2011) recorded that biotic pressure in the rangelands of district Tank is beyond the regeneration capacity of plant species because of free grazing. In the present investigated area, 51 (31%) plant species were used as fodder. The most commonly used plants were *A. modesta*, *Avena sativa*, *Brassica campestris*, *Bromus japonicus*, *Cymbopogon distans*, *Cynodon dactylon*, *Dichanthium annulatum*, *Medicago minima*, *Melia azedarach*, *M. alba*, *M. indica*, *Rubus ulmifolius*, *Sorghum helepense*, *Trifolium repens* and *Zizyphus* spp. Similar findings were also reported from other parts of Pakistan (Sher, 2005; Sher et al., 2003, 2004; Hussain et al., 2004, 2005; Gilani et al., 2003; Ibrar et al., 2007).

*Acacia*, *Ailanthus altissima*, *Dodonea viscosa*, *M. azedarach*, *Mallotus philippensis*, *Morus* spp., *Pinus roxburghii*, *Populus caspica* and *Olea ferruginea* are the most common plant species used as fuel wood in the investigated area. About twenty-two percent of the total recorded plant species are used as fuel wood. There is a high pressure on fuel wood species. Fuel consumption per home is often greater because of severe winters. Khan (2000) and Awan (2000) observed that the fuel wood is collected before the commencement of winter. Most of the economically important plants are reducing due to cutting. All these species which have high fuel value, are severely damaged. Sher et al. (2011) reported that timber species like *Melia* and even *Pinus roxburghii* are used as fuel wood in Chagharzai valley. Our findings agree with them. Hussain et al. (2004, 2005), Sher et al. (2003, 2004) and Ibrar et al. (2007) also reported the same findings for fuel wood species and this support our findings. Thirty-three species were used as vegetables and potherbs comprising about 20% of the total reported plants. These vegetables are collected by women and young girls and cooked for their own need only. *Allium cepa*, *A. sativum*, *Brassica campestris* and *Luffa cylindrica* are cultivated while the remaining plant species are wild. They include *Amaranthus viridis*, *Asparagus officinalis*, *Chenopodium album*, *Malva neglecta*, *Medicago polymorpha*, *Mentha longifolia*, *Portulaca olearaceae*. Sher (2005) and Gilani et al. (2003) also reported on many wild and cultivated vegetable plants and this agree with our findings.

There were 22 plant species (13%), yielding edible fruits. Among them species like *Berberis lycium*, *Celtis*

**Table 1.** Ethnobotanical uses of some plants of Ashezai and Salarzai Valleys, District Buner, Pakistan.

S/N	Plants and family	Local Name	Occurrence	Habit	Part used	Ethnobotanical uses
<b>A.</b>	<b>PTERIDOPHYTES</b>					
<b>1.</b>	<b>Family Adiantaceae</b>					
	1. <i>Adiantum incisum</i> Forsk.	Sumbal	W	H	Fronds	Medicinal
	2. <i>Adiantum venustum</i> D.Done	Sumbal	W	H	Fronds	Medicinal, ornamental
<b>2.</b>	<b>Family Equisetaceae</b>					
	3. <i>Equisetum arvense</i> L.	Bandakay	W	H	Shoot	Medicinal
<b>B.</b>	<b>GYMNOSPERMS</b>					
<b>3.</b>	<b>Family Pinaceae</b>					
	4. <i>Pinus roxburghii</i> Sargent	Nakhtar	W	T	Wood, branches, cones, Resins, leaves	Medicinal, fuel wood, TSR,
	5. <i>Pinus wallichiana</i> A.B.Jackson.	Pahoch	W	T	Wood, branches, cones, Resins, leaves	Fuel wood, TSR, timber
<b>C.</b>	<b>MONOCOTYLEDONS</b>					
<b>4.</b>	<b>Family Aceraceae</b>					
	6. <i>Acer cappadocicum</i> Gled.	Chinaranga	W	T	Wood	Fuel wood, ornamental
<b>5.</b>	<b>Family Alliaceae</b>					
	7. <i>Allium cepa</i> L.	Piyaz	C	H	Bulb	Medicinal, vegetables
	8. <i>Allium sativum</i> L.	Ooga	C	H	Bulb, leaves	Medicinal, vegetables
<b>6.</b>	<b>Family Amaryllidaceae</b>					
	9. <i>Narcissus tazetta</i> L.	Gul-e-nargis	W	H	Flowers	Medicinal, Ornamental, Honey bees spp.
<b>7.</b>	<b>Family Araceae</b>					
	10. <i>Acorus calamus</i> Linn.	Skha waja	W	H	Whole plant	Medicinal
<b>8.</b>	<b>Family Iridaceae</b>					
	11. <i>Iris ensata</i> Thunb.	Oogakai	W	H	Root	Medicinal
<b>9.</b>	<b>Family Liliaceae</b>					
	12. <i>Asparagus officinalis</i> L.	Tindoray	W	H	Shoot	Vegetables, ornamental
	13. <i>Asphodalus tenuifolius</i> Cavan	Oogakay	W	H	Leaves	Vegetables
<b>10.</b>	<b>Family Musaceae</b>					
	14. <i>Musa sapientum</i> L.	Keela	C	H	Fruit	Medicinal, fruit
<b>11.</b>	<b>Family Poaceae</b>					
	15. <i>Avena sativa</i> L.	Jamdar	W	H	Shoot	Fodder
	16. <i>Bromus japonicus</i> Thumb ex Murr.	Jokai	W	H	Shoot	Fodder
	17. <i>Cymbopogon distans</i> (Nees ex Steud.) Watson	Sargaray	W	H	Whole plant	Fodder
	18. <i>Cynodon dactylon</i> L.	Kabal	W	H	Whole plant	Fodder, ornamental
	19. <i>Dichanthium annulatum</i> Stapf.	Naram wakha	W	H	Shoot	Fodder

Table 1. Contd.

	20. <i>Poa annua</i> L.	Wakha	W	H	Shoot	Fodder
	21. <i>Saccharum bengalense</i> Ritz.	Kahay	W	H	Stem, flowering scape	TSR
	22. <i>Saccharum spontaneum</i> L.	Shurghashay	W	H	Stem, flowering scape	TSR
	23. <i>Sorghum helepense</i> (L.) Bern.	Dadum	W	H	Shoot	Fodder
<b>D.</b>	<b>DICOTYLEDONS</b>					
<b>12.</b>	<b>Family Acanthaceae</b>					
	24. <i>Justicia adhatoda</i> Linn.	Baikar	W	SH	Leaves, roots	Medicinal, TSR, honey bees spp.
<b>13.</b>	<b>Family Amaranthaceae</b>					
	25. <i>Achyranthus aspera</i> L.	Ghishkay	W	H	Whole plant	Medicinal
	26. <i>Amaranthus caudatus</i> L.	Chalwairay	W	H	Whole plant	Vegetables
	27. <i>Amaranthus spinosa</i> L.	Chalwairay	W	H	Whole plant	Medicinal, vegetables
	28. <i>Amaranthus viridis</i> Linn.	Gunhar	W	H	Shoot, Root	Medicinal, vegetables
<b>14.</b>	<b>Family Apiaceae</b>					
	29. <i>Ammi visnaga</i> (L.) Lam.	Spairkai	W	H	Dry fruit	Medicinal
	30. <i>Coriandrum sativum</i> L.	Dhanyal	C	H	Leaves, fruit	Medicinal, vegetables
	31. <i>Eryngium biebersteinianum</i> L.	Ali kanda	W	SH	Shoot	Medicinal, fodder
	32. <i>Foeniculum vulgare</i> Miler.	Kaga	C	H	Leaves, seeds	Medicinal
	33. <i>Lespedeza juncea</i> (L.F.) Persoon	Oormaray	W	H	Shoot, leaves	Medicinal, fodder
<b>15.</b>	<b>Family Apocynaceae</b>					
	34. <i>Caralluma edulis</i> Edgew.	Pamunkay	W	H	Whole plant	Medicinal, vegetables
	35. <i>Nerium indicum</i> Mill.	Gundairay	W	SH	Whole plant	TSR, ornamental, poisonous
<b>16.</b>	<b>Family Araliaceae</b>					
	36. <i>Hedera helix</i> L.	Prewatai	W	CI	Leaves	Fodder
<b>17.</b>	<b>Family Asclepiadaceae</b>					
	37. <i>Calotropis procera</i> (wild) R.Br.	Spalmay	W	SH	Whole plant, latex	Medicinal, poisonous
<b>18.</b>	<b>Family Asteraceae</b>					
	38. <i>Achillea millifolium</i> L.	Jarai	W	H	Whole plant	Medicinal, fodder
	39. <i>Artemisia maritima</i> L.	Juakay	W	H	Shoot	Medicinal
	40. <i>Artemisia scoparia</i> Walds & Kit.	Tarkha	W	H	Leaves	Medicinal
	41. <i>Artemisia vulgaris</i> L.	Tarkha	W	H	Leaves, shoot	Medicinal, Ornamental fodder,
	42. <i>Calendula arvensis</i> L.	Zair Gulae	W	H	Flowers, leaves	Medicinal
	43. <i>Calendula officinalis</i> L.	Zair Gulae	C	H	Flowers, shoot	Medicinal
	44. <i>Cichorium intybus</i> L.	Kasni	W	H	Whole plant	Medicinal
	45. <i>Lactuca serriola</i> L.	Salad	W	H	Whole plant	Medicinal
	46. <i>Launea procumbens</i> Roxb.	Shodapai	W	H	Shoot, leaves	Fodder

Table 1. Contd.

	47. <i>Onopordum acanthium</i> L.	Wrijakai	W	H	Shoot, seeds	Fodder
	48. <i>Sonchus arvensis</i> L.	Shodapai	W	H	Whole plant	Fodder
	49. <i>Sonchus asper</i> L.	Shodapai	W	H	Whole plant	Fodder
	50. <i>Sonchus auriculata</i> L.	Shodapai	W	H	Whole plant	Fodder
	51. <i>Tagetes minuta</i> L.	Hamisha	W	H	Flowers	Ornamental
	52. <i>Taraxacum officinale</i> Weber.	Zair gulai	W	H	Flowering, shoots	Medicinal
	53. <i>Xanthium strumarium</i> L.	Ghishkay	W	SH	Leaves	Medicinal
19.	<b>Family Balsaminaceae</b>					
	54. <i>Impatiens balsamina</i> L.	Gul-e-mehandi	W	H	Whole plant	Medicinal
20.	<b>Family Berberidaceae</b>					
	55. <i>Berberis lycium</i> Royle.	Kwaray	W	SH	Leaves, fruit Bark	Medicinal, fruit, fencing and hedging
21.	<b>Family Betulaceae</b>					
	56. <i>Alnus nitida</i> (Spach) E.	Gairay	W	T	Wood	Fuel wood, Agri. Tools
22.	<b>Family Brassicaceae</b>					
	57. <i>Brassica campestris</i> L.	Sharsham	C	H	Leaves, seeds Inflorescence	Fodder, Vegetables
	58. <i>Capsella bursa-pestoris</i> Medic.	Bambaisa	W	H	Seeds	Medicinal
	59. <i>Eruca sativa</i> L.	Jamama	W	H	Leaves, seeds	Medicinal, Vegetables
	60. <i>Nasturtium officinale</i> R.Br.	Talmeera	W	H	Shoot	Medicinal, Vegetables
23.	<b>Family Buxaceae</b>					
	61. <i>Buxus wallichiana</i> Baill.	Shamshad	W	SH	Whole plant	Medicinal, Fuel wood, TSR, Poisonous
24.	<b>Family Cactaceae</b>					
	62. <i>Opuntia dillenii</i> Haw.	Zaqoom	W	SH	Phylloclade, fruit	Medicinal, fruit, fencing and hedging
25.	<b>Family Caesalpinaceae</b>					
	63. <i>Bauhinia variegata</i> L.	Kulyar	W/C	T	Wood, bark Flower buds	Medicinal, fuel wood, vegetables, TSR, timber, ornamental
26.	<b>Family Canabanaceae</b>					
	64. <i>Cannabis sativa</i> L.	Bhang	W	SH	Leaves Flowers	Medicinal
27.	<b>Family Caryophyllaceae</b>					
	65. <i>Sielene conoidea</i> L.	Mangotay	W	H	Shoot, fruit Seed	Fodder, vegetables
	66. <i>Stellaria media</i> (L.) Cry.	----	W	H	Whole plant	Fodder

Table 1. Contd.

<b>28.</b>	<b>Family Celastraceae</b>					
	<i>67. Gymnosporia royleana</i> Wall ex Lawson	Soor Azghay	W	SH	Whole plant	Fodder, Fuel wood, Fencing & Hedging
<b>29.</b>	<b>Family Chenopodiaceae</b>					
	<i>68. Chenopodium album</i> L.	Sarmai	W	H	Leaves	Medicinal, Vegetables
	<i>69. Chenopodium ambrosioides</i> L.	Kharawa	W	H	Fruits, Leaves	Medicinal
	<i>70. Chenopodium botrys</i> L.	Skha, kharawa	W	H	Shoot	Medicinal
	<i>71. Chenopodium murale</i> L.	Chalwairay	W	H	Shoot	Fodder, Vegetables
<b>30.</b>	<b>Family Commelinaceae</b>					
	<i>72. Commelina albescens</i> Hassak	Pulpolakay	W	H	Whole plant	Medicinal
<b>31.</b>	<b>Family Convulvuaceae</b>					
	<i>73. Convolvulus arvensis</i> L.	Prewati	W	Cl	Whole plant, Root	Medicinal, Fodder
<b>32.</b>	<b>Family Cucurbitaceae</b>					
	<i>74. Cucumis prophetarum</i> L.	Kalkunday	W	H	Fruits	Medicinal, Poisonous
	<i>75. Luffa cylindrical</i> (L.) Roem.	Toorai	C	Cl	Fruits	Vegetables
<b>33.</b>	<b>Family Cuscutaceae</b>					
	<i>76. Cuscuta reflexa</i> Roxb.	Maraz bootay	W	P	Whole plant	Medicinal
<b>34.</b>	<b>Family Ebenaceae</b>					
	<i>77. Diospyrus kaki</i> L.	Toor Amluk	W /C	T	Wood, Fruit	Fodder, Fuel wood, Fruit
	<i>78. Diospyrus lotus</i> L.	Ziar Amluk	C	T	Wood, Fruit, Leaves	Fuel wood, Fruit
<b>35.</b>	<b>Family Elaeagnaceae</b>					
	<i>79. Elaeagnus umbellata</i> Thumb	Ghanamranga	W	SH	Wood, Fruit	Medicinal, Fuel wood, Fruit
<b>36.</b>	<b>Family Ericaceae</b>					
	<i>80. Rhododendron arborium</i> Smith.	Gul-e-nameer	W	T	Wood, Flower	Medicinal, Fuel wood, ornamental
<b>37.</b>	<b>Family Euphorbiaceae</b>					
	<i>81. Euphorbia helioscopia</i> Mewski.	Piryano doolai	W	H	-	Poisonous
	<i>82. Euphorbia prostrata</i> L.	Warmagha	W	H	Whole plant	Medicinal
	<i>83. Mallotus philippensis</i> Muell.	Kambeela	W	SH	Wood, fruits	Medicinal, fuel wood
	<i>84. Riccinis communis</i> L.		W	T	Fruits	Medicinal
<b>38.</b>	<b>Family Fumariaceae</b>					
	<i>85. Fumaria indica</i> (Hsskn) H.N.	Papra	W	H	Shoot	Medicinal
<b>39.</b>	<b>Family Juglandaceae</b>					
	<i>86. Juglans regia</i> L.	Ghuz	C	T	Nuts, Bark, leaves, Wood	Medicinal, fruit, timber

Table 1. Contd.

<b>40.</b>	<b>Family Lamiaceae</b>					
	87. <i>Ajuga bractiosa</i> Wall. Benth.	Khwaga bootei	W	H	Whole plant	Medicinal
	88. <i>Ajuga parviflora</i> Benth.	Tarkha bootei	W	H	Whole plant	Medicinal
	89. <i>Mentha longifolia</i> (L.) Huds	Velanai	W	H	Leaves, inflorescence	Medicinal, vegetables
	90. <i>Mentha spicata</i> L.	Poodina	W	H	Leaves, inflorescence	Medicinal, vegetables
	91. <i>Ocimum basilicum</i> L.	Kashmalu	W	H	Flowers, seeds	Medicinal
	92. <i>Otostegia limbata</i> Bth.	Pishkanar	W	SH	Whole plant	Fuel wood, fencing and hedging
<b>41.</b>	<b>Family Malvaceae</b>					
	93. <i>Malva neglecta</i> Waller.	Panaruk	W	H	Whole plant, leaves	Medicinal, vegetables
	94. <i>Malva officinalis</i> (L.) Schimp. & Spenn.	Panaruk	W	H	Whole plant	Medicinal, vegetables
<b>42.</b>	<b>Family Meliaceae</b>					
	95. <i>Cedrella serrata</i> Royle.	Meem	W	T	Bark, leaves	Medicinal, TSR
	96. <i>Melia azedarach</i> L.	Shandai	W/C	T	Wood, leaves, bark Fruit	Medicinal, fodder, fuel wood, TSR, timber
<b>43.</b>	<b>Family Menispermaceae</b>					
	97. <i>Tinospora cordifolia</i> (DC.) Meirs	Gilo	W	Cl	Stem	Medicinal, ornamental
<b>44.</b>	<b>Family Mimosaceae</b>					
	98. <i>Acacia modesta</i> Wall.	Palosa	W	T	Leaves, gum, branches flowers, wood, ashes	Medicinal, fodder, fuel wood, honey bees spp.
	99. <i>Acacia nilotica</i> (L.) Delile.	Kikar	W	T	Wood, leaves, gum	Medicinal, fodder, fuel wood, timber, agricultural tools
<b>45.</b>	<b>Family Moraceae</b>					
	100. <i>Ficus carica</i> L.	Baghi Inzar	W/C	T	Wood, leaves, fruit Latex	Medicinal, fodder, fuel wood, fruit
	101. <i>Ficus palmata</i> Forssk.	Inzar	W/C	T	Wood, leaves, fruit latex	Medicinal, fodder, fuel wood, fruit
	102. <i>Ficus recemosa</i> L.	Oormal	W/C	T	Wood, leaves, latex fruit	Medicinal, fuel wood, fruit
	103. <i>Ficus religiosa</i> Roxb.	Peepal	W	T	Wood, bark, fruit	Medicinal, fuel wood
	104. <i>Morus alba</i> L.	Spin Toot	W/C	T	Wood, leaves, fruit branches	Medicinal, fodder, fuel wood, fruit, TSR, timber
	105. <i>Morus indica</i> L.	Toor Toot	W/C	T	Wood, leaves, fruit branches	Medicinal, fodder, fuel wood, fruit, TSR, timber
<b>46.</b>	<b>Family Myrsinaceae</b>					
	106. <i>Myrsine africana</i> L.	Marorang	W	SH	Shoot	Fodder

Table 1. Contd.

47.	<b>Family Nyctaginaceae</b>					
	107. <i>Boerhaavia diffusa</i> L.	Ensut	W	H	Root	Medicinal
	108. <i>Mirabilis jalapa</i> L.	Gul-e-Nazak	C	H	Leaves	Medicinal, ornamental
48.	<b>Family Oleaceae</b>					
	109. <i>Jasminum humile</i> L.	Rambail chambail	W/C	SH	Flowers, root	Medicinal, ornamental
	110. <i>Jasminum officinale</i> L.	Rambail chambail	W/C	SH	Flowers, root	Medicinal, ornamental
	111. <i>Olea ferruginea</i> Royle.	Khoona	W/C	T	Wood, leaves, bark	Medicinal, fodder, fuel wood, agricultural tools
49.	<b>Family Oxalidaceae</b>					
	112. <i>Oxalis corniculata</i> L.	Tarookay	W	H	Leaves	Medicinal, vegetables
50.	<b>Family Paeoniaceae</b>					
	113. <i>Paeonia emodi</i> Wall. Hkf.	Mamekh	W	H	Rhizome, Roots	Medicinal
51.	<b>Family Papaveraceae</b>					
	114. <i>Argimone maxicana</i> L.	Wild poppy	W	H	Shoot, Flowers	Fodder, ornamental
	115. <i>Papaver nudicaule</i> L.	Zangali kashkash	W	H	Flowers, Capsule	Medicinal
52.	<b>Family Papilionaceae</b>					
	116. <i>Indigofera heterantha</i> L.	Kainta	W	SH	Leaves, wood, branches	Fodder, fuel wood, TSR
	117. <i>Lathyrus aphaca</i> L.	Kurkamanay	W	H	Shoot	Fodder, Vegetables
	118. <i>Lathyrus cicera</i> L.	Wara chilo	W	H	Shoot	Fodder, Vegetables
	119. <i>Lathyrus pratensis</i> L.	Chilo	W	H	Shoot	Fodder, Vegetables
	120. <i>Lathyrus sativus</i> L.	Ghata Chilo	W	H	Shoot	Fodder, Vegetables
	121. <i>Medicago minima</i> (L.) Grub.	Shpaishtay	W	H	Shoot	Fodder, Vegetables
	122. <i>Medicago polymorpha</i> L.	Shpaishtay	W	H	Shoot	Fodder, Vegetables
	123. <i>Vicia sativa</i> L.	Chilo	W	H	Whole plant	Fodder, Vegetables
	124. <i>Trifolium repens</i> L.	Shautal	W/C	H	Shoot, seeds	Medicinal, Fodder, Vegetables
	53.	<b>Family Plantaginaceae</b>				
125. <i>Plantago lanceolata</i> L.		Jabai	W	H	Leaves, seeds	Medicinal
	126. <i>Plantago major</i> L.	Jabai	W	H	Leaves, seeds	Medicinal
54.	<b>Family Plantinaceae</b>					
	127. <i>Platanus orientalis</i> L.	Chinar	W/C	T	Wood, bark	Medicinal, Fuel wood, TSR, Timber
55.	<b>Family Polygonaceae</b>					
	128. <i>Bistorta amplexicaulis</i> (D.Don) Green	Tarva panra	W	H	Shoot	Medicinal
	129. <i>Polygonum barbatum</i> L.	Polpulak	W	H	Whole plant	Poisonous
	130. <i>Polygonum serrulatum</i> Lagasca	Polpulak	W	H	Leaves	Medicinal



Table 1. Contd.

	131. <i>Rumex dentatus</i> L.	Shulkhay	W	H	Leaves	Medicinal, vegetables
	132. <i>Rumex hastatus</i> L.	Tarookay	W	H	Leaves	Medicinal
<b>56.</b>	<b>Family Portulacaceae</b>					
	133. <i>Portulaca olearaceae</i> L.	Warkharay	W/C	H	Shoot	Medicinal, vegetables, ornamental
<b>57.</b>	<b>Family Punicaceae</b>					
	134. <i>Punica granatum</i> L.	Anar	W/C	T	Fruit bark, leaves	Medicinal, fruit
<b>58.</b>	<b>Family Ranunculaceae</b>					
	135. <i>Caltha alba</i> Jacq ex Comb.	Makhanpath	W	H	Whole plant	Medicinal,
	136. <i>Ranunculus muricatus</i> L.	Jaghagha	W	H	Whole plant	Medicinal, poisonous
<b>59.</b>	<b>Family Rhamnaceae</b>					
	137. <i>Zizyphus jujuba</i> Mill.	Baira	W/C	T	Wood, leaves, fruit bark	Medicinal, fuel wood, fruit, honey bees spp.
	138. <i>Zizyphus nummularia</i> (Burm. F.) Wight	Karkunda	W	SH	Leaves, fruit	Medicinal, fodder, fruit, fencing and hedging, honey bees spp.
<b>60.</b>	<b>Family Rosaceae</b>					
	139. <i>Fragaria indica</i> Andrew	Da zamakay toot	W	H	Fruit	Medicinal, fruit
	140. <i>Potentilla nepalensis</i> Hook.	Da ghar shalkhay	W	H	Root	Medicinal
	141. <i>Pyrus pashia</i> Ham ex. D. Done	Tangai	W/C	T	Wood, fruit	Medicinal, fuel wood, fruit
	142. <i>Rosa webbiana</i> Wall. Ex. Royle	Palwari	W	SH	Flowers, branches	Ornamental, fencing and hedging, honey bees spp.
	143. <i>Rubus fruticosus</i> Hk none L.	Karwara	W	SH	Leaves, fruit	Medicinal, fodder, fruit, fencing and hedging
	144. <i>Rubus ulmifolius</i> Schott.	Goraj	W	SH	Leaves, fruit	Medicinal, fodder, fruit, fencing and hedging
<b>61.</b>	<b>Family Rubiaceae</b>					
	145. <i>Gallium aparine</i> L.	-	W	H	Whole plant	Fodder
<b>62.</b>	<b>Family Rutaceae</b>					
	146. <i>Zanthoxylum aromatum</i> D.C.	Dambara	W	SH	Wood, fruit	Medicinal, fuel wood, fruit, fencing and hedging
<b>63.</b>	<b>Family Salicaceae</b>					
	147. <i>Populus caspica</i> Bornm.	Spairdar	W/C	T	Wood, branches, leaves	Fodder, fuel wood, TSR, timber
	148. <i>Salix babylonica</i> L.	Wala	W/C	T	Wood	Fuel wood, TSR, timber
	149. <i>Salix tetrasperma</i> Roxb.	Wala	W/C	T	Wood	Fuel wood, TSR, timber

Table 1. Contd.

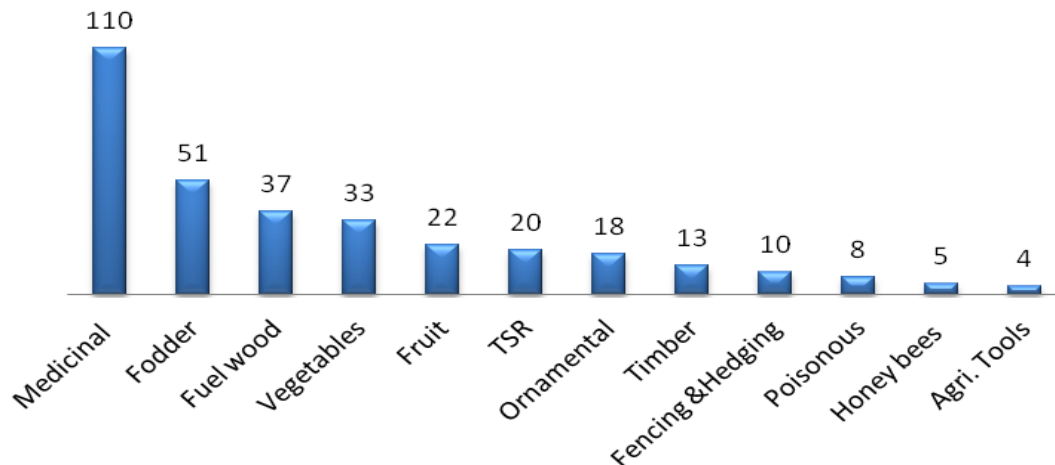
<b>64.</b>	<b>Family Sapindaceae</b>					
	150. <i>Dodonea viscosa</i> (L.) Jacq.	Ghwarskay	W	SH	Wood, bark	Medicinal, fuel wood, TSR, ornamental, fencing and hedging
<b>65.</b>	<b>Family Scrophulariaceae</b>					
	151. <i>Verbascum thapsus</i> L.	Khar ghaug	W	H	Leaves	Medicinal
<b>66.</b>	<b>Family Simarubaceae</b>					
	152. <i>Ailanthus altissima</i> (Mill) Swingle	Asli Bhikyanra	W/C	T	Wood, leaves, bark, gum resins	Medicinal, fodder, fuel wood, TSR, timber
<b>67.</b>	<b>Family Solanaceae</b>					
	153. <i>Atropa accuminata</i> Royle ex Mier	Barghak	W	H	Leaves	Medicinal
	154. <i>Datura innoxia</i> Mill.	Batora	W	H	Leaves, seeds	Medicinal, poisonous
	155. <i>Solanum nigrum</i> L.	Kamachoo	W	H	Shoot, leaves	Medicinal
	156. <i>Solanum surratense</i> Burm.f	Maraghony	W	H	Whole plant	Medicinal
	157. <i>Withania somnifera</i> (L.) Dunal.	Kutilal	W	SH	Leaves, fruits, roots	Medicinal
<b>68.</b>	<b>Family Thymeliaceae</b>					
	158. <i>Daphne oloides</i> Scurb.	Laighonay	W	SH	Wood, fruit	Medicinal, fuel wood, fruit
<b>69.</b>	<b>Family Tiliaceae</b>					
	159. <i>Grewia optiva</i> Drum.ex.Burret.	Pastawoonay	W	T	Leaves, bark, branches	Fodder
<b>70.</b>	<b>Family Ulmaceae</b>					
	160. <i>Celtis australis</i> L.	Tagha	W	T	Wood, leaves, fruits	Medicinal, fodder, fuel wood, fruit, agricultural tools
<b>71.</b>	<b>Family Urticaceae</b>					
	161. <i>Debrgesia salicifolia</i> D.Done.	Ajalai	W	SH	Wood, fruit	Fuel wood
<b>72.</b>	<b>Family Verbenaceae</b>					
	162. <i>Vitex negundo</i> L.	Marwandai	W	SH	Branches, leaves, flowers	Medicinal, fuel wood, TSR
<b>73.</b>	<b>Family Zygophyllaceae</b>					
	163. <i>Tribulus terrestris</i> L.	Markundai	W	H	Fruits, roots	Medicinal

TSR = Thatching, sheltering and roofing spp.; W = Wild; C = Cultivated; H = Herb; SH = Shrub; T = Tree; Cl = Climber; P = Parasite.

*australis*, *Rubus ulmifolius*, *Zizyphus nummularia*, *Ficus cairica*, *Ficus palmata*, *Fragaria indica* grow wild. Plant species like *Diospyrus kaki*, *Diospyrus lotus*, *Juglans regia*, *M. alba*, *Punica granatum*, *Pyrus pashia* and *Zizyphus jujuba* are cultivated.

Sher et al. (2011) reported the same species from their study area therefore our findings are in line with them. The locals use 20 (12%) plant species for thatching, sheltering and roofing. The leaves and branches of *Ailanthus altissima*, *Dodonea*

*viscosa*, *Indigofera heterantha*, *Justicia adhatoda*, *M. alba*, *M. indica*, *Saccharum spontaneum* and *Saccharum bengalense* are used for this purpose, thus supporting the studies of other workers (Hussain et al., 2004, 2005; Ibrar et al., 2007;



**Figure 1.** Percentage of plant species and their economic uses.

Sher et al., 2011). The plant species used as timber included *Ailanthus altissima*, *Juglans regia*, *Melia azedarach*, *Morus* spp. *Pinus roxburghii*, *Platanus orientalis* and *Salix* spp. comprising thirteen (7.9%) species of the total recorded plants. Sher et al. (2011) recorded that forests easily fulfill the requirements of the local people, but the activities of the timber mafia had greatly damaged the vegetation in Chaghazai Valley. Most of the timber species, in terms of density and frequency are decreasing due to illicit cutting. Our results also support their findings.

Some wild plant species like *Adiantum venustum*, *Artimisia vulgaris*, *Asparagus officinalis*, *Mirabilis jalapa*, *Narcissus tazetta*, *Jasminum humile* and *Rosa webbiana* are used as ornamental plants having the potential for commercialization. These species comprised 11% of the total plants. Similar findings were reported in a number of studies in other parts of Pakistan (Sher et al., 2011; Ibrar et al., 2007; Hussain et al., 2004). Eight plant species (4.9%) including *Nerium indicum*, *Calotropis procera*, *Buxus wallichiana*, *Datura innoxia*, *Cucumis prophetarum*, *Euphorbia helioscopia* and *Polygonum barbatum* were considered poisonous to man, livestock or fish. These poisonous plants can be exploited as source of medicines. Livestock grazing is an important practice in the area therefore the people protects their crop fields by planting thorny, bushy or spiny plants around their crop fields. There were ten plants used for the purpose of fencing and hedging in the area. It comprised 6.1% of the total plants reported. Some important plants used for this purpose were: *Berberis lycium*, *Gymnosporia royleana*, *Opuntia dilleni*, *Rosa webbiana*, *Rubus* spp., *Zanthoxylum aromatum* and *Zizyphus nummularia*. The study also recorded that four species (2.4%) were used for making agricultural tools including ploughs, sticks, sickle handles, axe handles, pullies, knife handles and other agricultural appliances. *Acacia nilotica*, *Celtis australis*, *Alnus nitida*, and *Olea*

*ferruginea* are important in this respect. Honeybees visit five species (3%). *A. modesta*, *J. adhatoda*, *Sarcococa saligna* and *Zizyphus* spp. are important. Honey obtained from *A. modesta* and *Zizyphus* is extensively used in the preparation of traditional medicines and sold at higher rates.

It is concluded that the area is under heavy biotic pressure in the form of deforestation and overgrazing, which has reduced regeneration of woody plants. Overgrazing, human population explosion, uprooting of medicinal plants by the local laypeople and other informal factors are responsible for habitat loss, soil erosion and proper functioning of ecosystems. There is dire need to conserve the biodiversity of the area in order to provide the resources and resource alternatives for the people's survival in future.

## ACKNOWLEDGEMENTS

This paper is a part of PhD studies. This research was conducted under indigenous PhD fellowship program from Higher Education Commission Islamabad, Pakistan, to the principal author. Therefore we are thankful for providing funds.

## REFERENCES

- Ahmad SS, Husain SZ (2008). Ethno medicinal survey of plants from salt range (Kallar Kahar) of Pakistan. Pak. J. Bot. 40(3):1005-1011.
- Ali H, Qaiser M (2009). The ethnobotany of Chitral valley, Pakistan with particular reference to medicinal plants. Pak. J. Bot. 41(4):2009-2041.
- Ali SI, Qaiser M (1995-2009). Flora of Pakistan. Department of Botany, University of Karachi.
- Awan A (2000). Fuel wood conservation in rural household of Tehsil Attok. Pak. J. For. 50:109-110.
- Badshah L, Hussain F (2011). Farmers' preferences and use of local fodder flora in Tank District, Pakistan. Afr. J. Biotechnol.10(32):6062-6071.

- Dastagir G (2001). Medicinal plants of Mai Dhani Hill, Muzafarabad, Azad Jammu and Kashmir. *Hamdard Medicus* 46:29-35.
- Durrani MJ, Malik AM, Hussain F (2003). Folk Medicinal plants of Nushki, District Chaghi, Pakistan. *J. Sci. Technol.* 27(1,2):45-52.
- Gilani SS, Abase SQ, Shinaware ZK, Hussain F, Nargis K (2003). Ethnobotanical studies of Kurram Agency Pakistan through rural community participation. *Pak. J. Biol. Sci.* 6:1369-1375.
- Husain SZ, Malik RN, Javaid M, Bibi S (2008). Ethnobotanical properties and uses of medicinal plants of Morgah biodiversity park, Rawalpindi. *Pak. J. Bot.* 40(5):1897-1911.
- Hussain F, Shah SM, Sher H (2007). Traditional resource evaluation of some plants of Mastuj, District Chitral, Pakistan. *Pak. J. Bot.* 39(2):339-354.
- Hussain F, Sher H, Ibrar M (2004). Ethnobotanical Profile of some plants of District Swat, Pakistan. *Pak. J. Pl. Sci.* 10:85-104.
- Hussain F, Sher H, Ibrar M, Durrani MJ (2005). Ethnobotanical uses of some plants of District Swat, Pakistan. *Pak. J. Pl. Sci.* 11(2):137-158.
- Ibrar M, Hussain F, Sultan A (2007). Ethnobotanical studies on plant resources of Ranyal Hills, District Shangla, Pakistan. *Pak. J. Bot.* 39(2):329-337.
- Ilahi I (2008). Ethnobotanical studies and problems associated with regeneration of herbals in Kohat Region. *Pak. J. Bot.* 40(4):1743-1753.
- Iqbal H, Sher Z, Khan ZU (2011). Medicinal plants from salt range Pind Dadan Khan, district Jhelum, Punjab, Pakistan. *J. Med. Plants Res.* 5(11):2157-2168.
- Khan A (2000). Household fuel wood energy consumption in Municipal area of Mingora, Swat. *Pak. J. For.* 50:112.
- Mood SG (2008). A contribution to some ethnobotanical aspects of Birjand flora (Iran). *Pak. J. Bot.* 40(4):1783-1791.
- Mustafa NM, Ali RM, Shaari K (2000). Evaluation of anti-inflammatory activity of some Malaysian plants using mouse ear oedema assay. *J. Trop. For. Prod.* 6:106-112.
- Nasir E, Ali SI (1971-1992). *Flora of Pakistan*. Pan Graphics (Pvt) Ltd., Islamabad.
- Ozturk M, Uysal I, Gücel S, Mert T, Akcicek E, Celik S (2008). Ethnoecology of poisonous plants of Turkey and Northern Cyprus. *Pak. J. Bot.* 40(4):1359-1386.
- Qureshi R, Waheed A, Arshad M, Umbreen T (2009). Medico-ethnobotanical inventory of Tehsil Chakwal, Pakistan. *Pak. J. Bot.* 41(2):529-538.
- Sher H, Hussain F, Mulk S, Ibrar M (2004). Ethnoveterinary plants of Shawar Valley, District Swat, Pakistan. *Pak. J. Pl. Sci.* 10(1):35-40.
- Sher H, Midrarullah, Khan AU, Hussain F, Ahmad S (2003). Medicinal Plants of Udhigram, District Swat, Pakistan. *Pak. J. For.* 53(1):65-74.
- Sher Z (2005). Ethnobotanical study of some plants of Chagharzai valley, Distract Buner, NWFP, Pakistan. M. Phil Thesis submitted to Department of Botany, GCU, Lahore, Punjab, Pakistan.
- Sher Z, Khan ZU (2007). Floristic composition, Life form and Leaf spectra of the Vegetation of Chagharzai valley, district Buner. *Pak. J. Pl. Sci.* 13(1):55-64.
- Sher Z, Khan ZU, Hussain F (2011). Ethnobotanical studies of some plants of Chagharzai Valley, District Buner, Pakistan. *Pak. J. Bot.* 43(3):1445-1452.
- Siddiqui TO, Javed K, Aslam MM (2000). Folk medicinal claims of western Uttar Pradesh, India. *Hamdard Medicus*, 43:59-60.