

**BIODIVERSITY AND MEDICINAL VALUES OF VASCULAR PLANTS
FOR SUSTAINABLE LIVELIHOOD SECURITY OF MALAM JABBA
VALLEY, HINDUKUSH RANGE SWAT, PAKISTAN**



PhD THESIS

BY

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**CENTRE OF PLANT BIODIVERSITY
UNIVERSITY OF PESHAWAR
2011-2012**

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**A THESIS SUBMITTED TO THE CENTRE OF PLANT BIODIVERSITY,
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PLANT BIODIVERSITY AND CONSERVATION

BY

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SUPERVISED

BY

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**CENTRE OF PLANT BIODIVERSITY
UNIVERSITY OF PESHAWAR
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OPENING

In the name of



The most merciful

And

The most beneficent

Al-quran

And He it is Who sends down water from the cloud, then We bring forth with it buds of all (plants), then We bring forth from it green (foliage) from which we produce grain piled up (in the ear); and of the palm-tree, of the sheaths of it, come forth clusters (of dates) within reach, and gardens of grapes and olives and pomegranates, alike and unlike; behold the fruit of it when it yields the fruit and the ripening of it; most surely there are signs in this for a people who believe.

(Surah Al An'aam 6 : 99)

DEDICATION

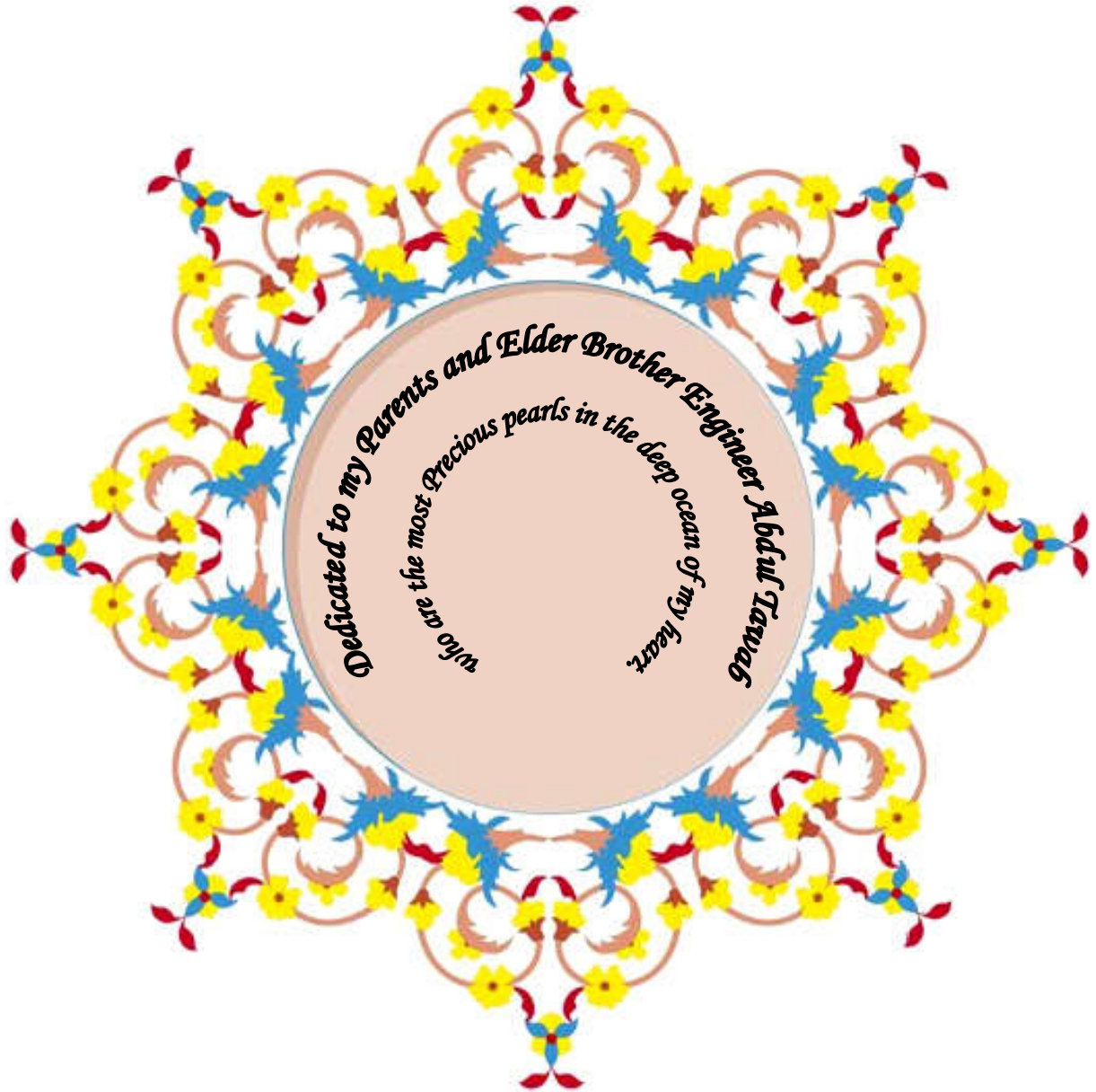


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ABSTRACT

(A) TAXONOMIC STUDIES (VASCULAR PLANT BIODIVERSITY)

The Malam Jabba Valley, district Swat has a diverse flora with the spectacular scenic beauty that attracts tourists across the globe and makes the valley a paradise for the nature lovers and adventure seekers. Floristically the area is located in Hindukush Range, dominated by Sino-Japanese type of vegetation.

A detailed investigation was carried out during 2013-2017 in order to explore and determine the vascular plant biodiversity and their conservation value based on native, naturalized, cultivated/alien species for sustainable livelihood security of Malam Jabba Valley, Hindukush Range, District Swat, Pakistan. The study documented 476 taxa of vascular plants taxonomically segregated into 334 genera and 112 families.

Pteridophytes were represented by 26 species classified among 14 genera and 10 families. Gymnosperms consisted of 11 species in 9 genera belonging to 4 families. Angiosperms were represented by 98 families, of these; 86 species of 69 genera in 16 families were monocots while 353 species distributed within 242 genera in 82 families were dicots. The number of plant species per family varies from 1 to 51.

Athyraceae with 5 species and 3 genera was recognized as leading family in Pteridophyta followed by Adiantaceae, Aspleniaceae, Dryopteridaceae and Pteridaceae with 4 species each while the remaining five families, Dennstaedtiaceae, Equisetaceae, Marsileaceae, Selaginellaceae, Thelypteridaceae were monospecific that contributes one species and one genus each.

Pinaceae was prominent family in term of species diversity having 6 species and 4 genera followed by Cupressaceae with 3 species and 3 genera, Ephedraceae and Taxaceae comprising of two genera and each genus with single species.

In monocots, the leading family was Poaceae with 51 species and 43 genera followed by Cyperaceae with 9 species and 5 genera, Araceae 5 species and 3 genera, Alliaceae, Asparagaceae and Liliaceae 3 species each, Alismataceae, Amaryllidaceae and Iridaceae 2 species each. Seven families (single species each) are represented by Asphodelaceae, Colchicaceae, Commelinaceae, Dioscoreaceae, Hyacinthaceae, Juncaceae and Smilacaceae.

Asteraceae with 41 species and 32 genera was the key prominent family in term of species diversity in dicots followed by Rosaceae with 29 species and 15 genera; Papilionaceae 21 species and 13 genera; Lamiaceae 20 species and 15 genera; Brassicaceae 17 species and 13

genera; Ranunculaceae 15 species and 8 genera; Solanaceae 12 species and 8 genera; Apiaceae 11 species and 10 genera; Euphorbiaceae 9 species and 4 genera; Polygonaceae 8 species and 5 genera. Four families Moraceae, Scrophulariaceae, Boraginaceae and Cucurbitaceae are represented by 7 species each. Geraniaceae are represented by 6 species and 2 genera followed by Gentianaceae, Rutaceae and Urticaceae with 5 species each. Eight families are represented by Amaranthaceae, Balsaminaceae, Chenopodiaceae, Crassulaceae, Myrtaceae, Primulaceae, Rhamnaceae and Salicaceae which contribute 4 species each. Nine families viz. Acanthaceae, Asclepiadaceae, Caryophyllaceae, Fagaceae, Malvaceae, Oleaceae, Papaveraceae, Rubiaceae and Violaceae are identified with 3 species each. Fifteen families Aizoaceae, Anacardiaceae, Buxaceae, Campanulaceae, Caprifoliaceae, Convolvulaceae, Ebenaceae, Guttiferae, Mimosaceae, Onagraceae, Plantaginaceae, Thymelaeaceae, Verbenaceae, Vitaceae and Zygophyllaceae are represented by 2 species each while the remaining 32 families were monogeneric and monospecific which contribute only one genus and one species each. These families were represented by Apocynaceae, Araliaceae, Berberidaceae, Betulaceae, Buddlejaceae, Caesalpiniaceae, Canabinaceae, Celastraceae, Cuscutaceae, Elaeagnaceae, Fumariaceae, Hamamelidaceae, Hippocastinaceae, Juglandaceae, Meliaceae, Myrsinaceae, Nyctaginaceae, Oxalidaceae, Paeoniaceae, Plantanaceae, Plumbaginaceae, Podophyllaceae, Polemoniaceae, Polygalaceae, Punicaceae, Sambucaceae, Sapindaceae, Sapotaceae, Saxifragaceae, Simaroubaceae, Ulmaceae and Valerianaceae.

The most important and leading taxonomic groups in term of species percentage are Dicots with a share of (74%), followed by Monocots (18.0%), Pteridophytes (6%) and Gymnosperms (2%).

Herbaceous layer (286 species) was found to be the most used life form followed by shrubs (64 species), trees (58 species), grasses (51 species), climbers (16 species) and parasitic herb (01 species) in descending order. Four hundred and thirty plant taxa (90 %) of the total flora in the area are wild while the remaining 46 taxa (10 %) are cultivated or exotic species.

(B) CONSERVATION STUDIES

A detailed investigation was carried out during 2013-2017 in order to determine conservation status of vascular plant biodiversity for sustainable livelihood security of Malam Jabba Valley (MJV), Hindukush Range, District Swat, Pakistan. The conservation status of 430 vascular plants from 306 genera and 110 families were determined. The criteria used were those recommended by the “International Union for the Conservation of Nature” at regional and national levels (IUCN 2003, 2012a). The assessment was based on their status within MJV. Thirty species were assessed as Critically Endangered (CR), 34 species Endangered (EN), 46 species Vulnerable (VU), 78 species Near Threatened (NT), 200 species Least Concern (LC) and 42 species Data Deficient (DD). Among threatened species, the leading taxonomic groups in term of species percentage were Dicots with a share of (78%) followed by Monocots (13 %), Gymnosperms (08%) and Pteridophytes (01%).

A major decline in plant biodiversity is due to some ecological factors such as habitat degradation, habitat loss, ruthless deforestation, high consumption of plant resources for fuel wood, timber and medicinal purposes, unscientific extraction of plants, influx of excessive tourism, introduced/alien species, attack of pathogens, environmental related natural disaster and hazards, developmental works, population explosion and their anthropogenic activities. Poverty, ignorance, lack of scientific knowledge, overharvesting and deforestation also create biotic pressure on the woody plant resources and result is degradation of environment. Some of the highly valuable indigenous trees like *Cedrus deodara*, *Abies pendrow*, *Picea smithiana* and *Taxus wallichiana* are in danger of local extinction if proper conservation measurements are not taken in the near future. Conservation measures are needed on urgent basis to protect threatened and economically important trees from local extinction.

Awareness program about the importance of the indigenous flora, environmental education regarding sustainable harvesting, conservation practices and long term management of important and globally rich plant resources are very crucial for the sustainable livelihood security of the local community for present and future generation. There is also a need to protect the vascular plant biodiversity for the sustainable livelihood security of the research area.

(C) ETHNOMEDICINAL STUDIES

Malam Jabba is a lush green valley strewn with an amazing variety of plants which supports spectacular medicinal plant biodiversity of promising economic values.

A detailed study was carried out from 2013 to 2017 in order to elucidate ethnomedicinal and conservation values of medicinal plant biodiversity for the sustainable livelihood security of the Malam Jabba Valley, Hindu Kush Range, Swat, Pakistan.

A total of 476 plant species have been documented and explored from the area. Local people were found to use 188 species belonging to 146 genera and 83 families for treatment of human and livestock ailments. Fifty five diseases/health groups of human and twenty four of livestock were recorded during the course of study being cured with ethno-medicinal and ethno-veterinary plants.

Pteridaceae with 4 species and one genus was the leading family in Pteridophytes. In Gymnosperms, Pinaceae was largest family in term of species diversity having 6 species under 4 genera. In monocots, the largest number of species was contributed by Alliaceae with 3 species and single genus.

The most important and leading families in term of species diversity in dicots were Lamiaceae and Rosaceae with (12 species each), Asteraceae (11 species), Solanaceae (8 species each), Cucurbitaceae and Euphorbiaceae (6 species each), Polygonaceae and Ranunculaceae (5 species each), Brassicaceae, Moraceae and Rhamnaceae (4 species each) while the rest of families had species with range of 1-3.

Leaves (31%) were the most frequently used plant parts in the preparation of ethno medicinal recipes for the health care diseases followed by fruit (19%), whole plant (10%), roots (09%), seeds (09%), flower (05%), fronds (04%), shoots (04%), Bark (03%), rhizome (02%), bulbs (02%), latex (01) and resins (01%). The crude drug and folk recipes are mostly prepared in the form of decoctions, paste and powder drug. Mostly a single medicinal plant species was used and taken orally. Study also revealed that some plants have multiple medicinal values where as others were used for only one disease.

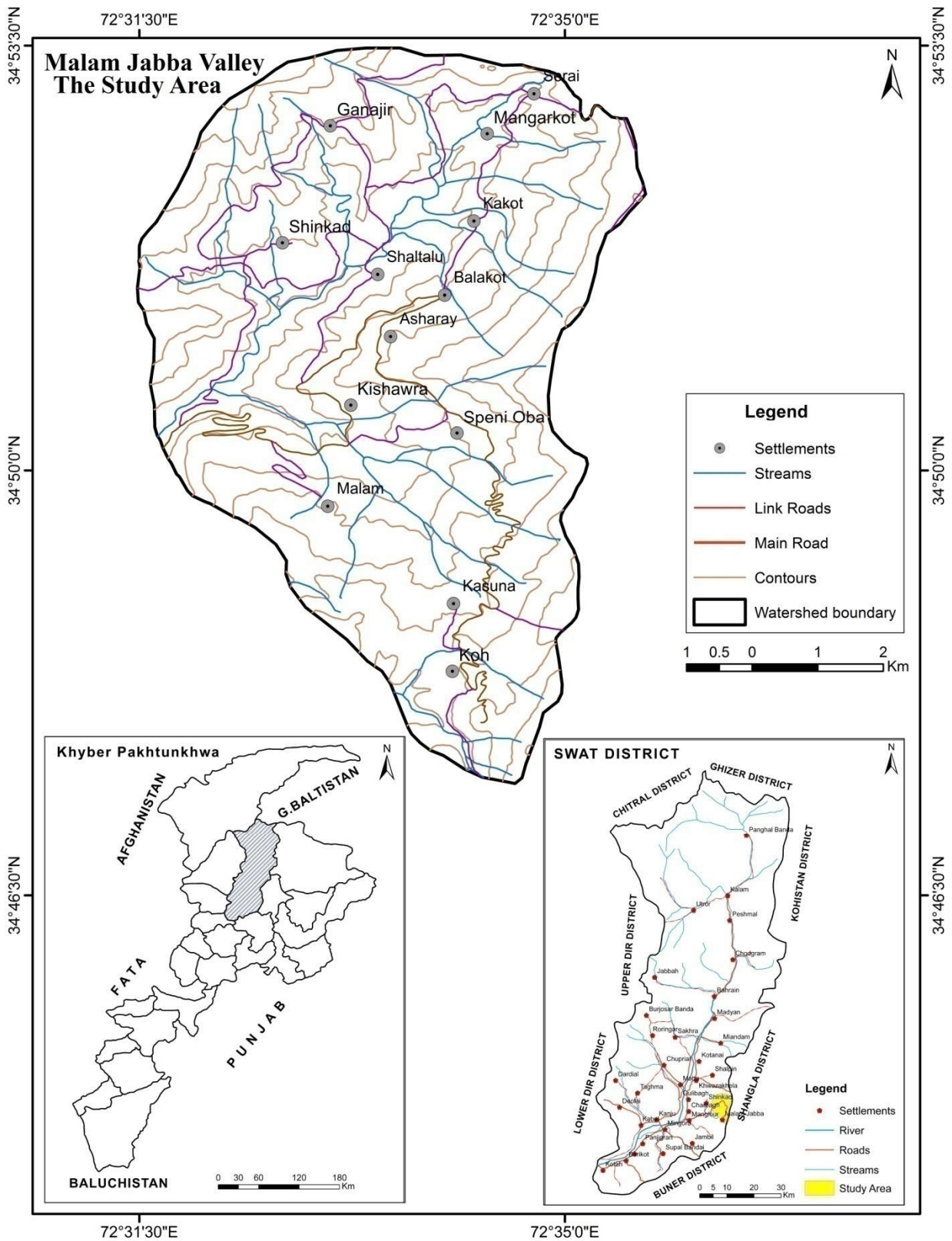
IUCN Red List Categories and Criteria (2001,2012b) Version 3.1, Appendix VII, following Guidelines for Application of IUCN Red List Criteria at Regional and National Levels (IUCN 2003 Version 3.0 & 2012a Version 4.0) were used for detailed investigation of conservation issues. Of the 188 species, 30 species were recorded Critically Endangered (CR), 30 species Endangered (EN), 27 species Vulnerable (VU), 35 species Near Threatened (NT), 41 species Least Concern (LC), 04 species Data Deficient (DD) and 21 species Cultivated /Alien.

The Valley is highly rich spot of medicinal plant biodiversity and local community utilized plant sources for their livelihood security but unsustainable harvesting of plant resources has threaten a significant portion of wild species in the area, resulting in a major decline in plant biodiversity and associated indigenous knowledge that support sustainable livelihoods, nutrition, local food security, medicine and health care.

Most of the medicinal plant biodiversity are severely threatened in the area due to habitat loss, habitat degradation, deforestation, overgrazing, overharvesting of threatened, rare, endemic medicinal plants for various ailments, over exploitation of plant species for timber, fuel wood collection, ecotourism, population explosion, construction activities, introduction of invasive species and other environmental related disaster and hazards.

Some globally important and endangered medicinal plants of the area are *Berberis lycium*, *Colchicum luteum*, *Bistorta amplexicaulis*, *Podopyllum emodi*, *Juglans regia*, *Paeonia emodi*, *Polygonatum verticillatum*, *Primula denticulata*, *Geranium wallichianum*, *Rheum australe*, *Saussurea lappa*, *Skimmia laureola*, *Valeriana jatamansi*, *Viola betonicifolia*, *Viola canescens*, *Viola pilosa*, etc. Non-sustainable and over harvesting of these medicinal plants faces a great threat to the flora of the Malam Jabba Valley. It may face a local extinction in near future if constantly being exploited at such commercial rate. Conservation measures are needed on urgent basis to protect threatened and critically endangered medicinal plant biodiversity from extinction in near future.

It was recommended that public awareness about importance of wild medicinal flora, conservation practices, sustainable harvesting, utilization and cultivation of highly rich medicinal plant species is strongly desirable for sustainable livelihood security of the area. It was also recommended to protect rare, threaten and globally important plants by involvement of local community in their native habitats and identify factors affecting indigenous knowledge of medicinal plant biodiversity in the area.



Chapter –I

INTRODUCTION TO THE AREA

A. Swat Valley

The valley of Swat, popularly known as the Switzerland of the east with its pristine scenic grandeur is highly popular among the tourists for its lavish display of natural majesty and scenery. The area consists of 5337 Km² of land and can be traced between 34° 30' to 35° 55' N latitude and 71° 45' to 72° 50' E longitude. (Anonymous, 1998). Swat is the main point of Hindu Kush Himalayan region of Pakistan and occupies a dominant position in the Trans-Hindukush Himalaya. It is known for its natural majesty, beauty and some of the planet's concerned biodiversity resources.

When Buddhist Civilization was at the peak of its glory, Swat valley was known as “Udyana” which means park or garden. As the name suggests, Swat is a tourist, paradise and has always been a center for the visitor from all over the world. During era of Alexander the Great, Historians identified Swat valley with Swat River, this was famous as “Suwastu”. The name Swat has been derived from an old Sanskrit word “Suwastu” word means white; a name given to the Swat river as its water is crystal clear. The great Mughal emperor Baber mentioned Swat as “SWAD” in “Tuzak-e-Babari” which later became Swat. (Anonymous, 1998).

i. Topography

Swat is located in Hindu Kush Himalayan Range and bounded at all side by the lofty Hindu Raj Mountain with altitudinal variations ranging approximately from 600 m in the southern plains to 6261 m in the northern higher altitude while the highest peak is Falaksair with 6261 m. The area is mostly hilly and rugged with a wide range of altitudinal variations, ranging from mild relief in the southern parts to very steep slope and high altitudes in the northern parts (Jan & Mian 1971). Floristically the area is located in Hindukush Range, dominated by Sino-Japanese type of vegetation. (Ali & Qaiser, 1986).

ii. Geography

Swat valley is situated in HKH Range and North West corner of Pakistan. The valley is bounded on the east by District Chitral and Ghizer District of Northern areas, on the north by District Shangla and Kohistan, on the South by Buner and Malakand protected area and on the west by District lower and upper Dir. The district is central part of Malakand Division. The twin

cities of Mingora and Saidu Sharif are district as well as the divisional headquarters. (Anonymous, 1998)

iii. Physiography

Drainage basin of river swat and its tributaries define the Valley. The Valley is mountainous with mostly uneven and rugged ground surface. Mountains with considerable height surround the whole valley on all side. The broad physiographic units on the basis of drainage are as follows.

a. Swat Kohistan

It consists of rocky, rugged and mountainous lands. Mountains are having great heights, in which we have perpetual snow and high glacier peaks. Two principal tributaries of Swat River define the limit of this region these are “Utror River” and “Ushu River”, in the west and east respectively. They join near kalam village, which low towards the south.

b. Swat Basin

It is the main drainage basin of Swat River and its tributaries. It starts from madyan, where the swat river leaves the gorge of swat Kohistan and ends in kalamgary; in the Malakand agency, where it joins the Panjkora River of Dir. district. The total length of the valley is 112.65 kilometers. The Swat River flows in the center of the valley and more or less divides it into two equal halves. This comprises western portion of swat district, southeast portion of Dir district and eastern part of Malakand agency. The major portion falls within the swat valley. The elevation of Swat River varies from 579 meters to the highest point at Falakser with 6261 meters above sea level.

iv. Origin of Swat Valley

Swat valley originates into the following two types.

a. Tectonic or Original Valley

This type of valley is the result of tectonic movements. These movements are; folding, faulting and formation of synclines etc. this type of valley is of very rare occurrence and has been modified by lateral erosion. e.g. valley of Kashmir and Baluchistan.

b. The Erosion Valleys

They have been formed due to the erosion activities of the river or streams. Basically the Swat valley is an erosional valley, formed by the erosional work of river Swat, and its tributaries.

The river Swat flows through this valley from Northeast to southwest. The shape of the valley is a broadened “V”; this width is determined by the climatic factor, this means that in the areas with high Rainfalls the “V” shaped valley will become wide with gentle slopes. Soil and vegetation also play an important role in changing the shape of the valley from “V” to broadened “V” and “U” etc.

v. Flora of Swat

Floristic diversity of Swat is broadly divided into native, introduced/domesticated and endemic types. The cultivated or introduced floristic diversity includes different agriculture crops. More than sixty six species with wide range of genetic diversity in each are cultivated in the area. The flora of Swat is very diverse and very unique as the area is a mixture of 3 mountain ranges namely Himalayas, Hindu Kush and Karakoram. Plant biodiversity of District Swat is represented by 1550 flowering plant taxa and 55 Pteridophyte. The area is hot centre of medicinal plant biodiversity that varies from 55 to 345 species (Ahmad & Sirajuddin, 1996).

vi. Climate

The relief features influence the climatic conditions in Swat valley. The Swat valley has three meteorological observations located at Malam Jaba, Kalam and Saidu Sharif. This shows that the rain fall increases, when one goes from south towards north. July is the hottest month with average temperature of 27⁰C while December and January are the coldest months with mean temperature of about 4⁰C. In December and January the temperature is below freezing point at the higher altitude and a desirable portion of the winter precipitation occurs in the form of snow. The Swat Kohistan has warm dry summers and cold moist winter. Precipitation falls mainly in the winter and early spring and 66% of rainfalls occur from December to April with mean annual precipitation of about 445 mm. The whole of winter precipitation is in the form of snow and the accumulated snow at Kalam may reach upto 4.268 meters. Small amounts of monsoon rains fall to the north of Bahrain in summer. Southern parts receive greater amount of rainfall from monsoon in summer in winter and spring the western disturbances, which come from Mediterranean Sea, between December and April produces greater amounts of rainfall in the northern parts of the valley. However, the area is climatically not a uniform one,

physiographic feature, especially altitude and exposure greatly modifies climatic condition within the area.

On the basis of climate the area can be divided into the following climatic zones. (G.M. Khattak, 1965).

a. Sub Humid-Subtropical Zone

It covers mostly the southern and southwestern parts of the area. Below Mingora and South-western limits, about 1500 meters altitude, annual precipitation ranges from 625-1000 mm. Mean monthly temperature remain above 10 °C for more than eight months of the year.

b. Humid-Subtropical Zone

It covers central part of the area, comprising Behrain and Beha valleys and the adjoining low hills below 1500 meters altitude. Annual precipitation ranges from 1000-1250 mm. The mean monthly temperature remain above 10 °C for more than eight month of the year.

c. Sub humid-Temperate Zone

It covers high mountainous region between 1500-3200 meters elevation, occupying mainly northeast part of the area. Average annual precipitation ranges from 500-1000 mm received mainly in the form of snow in winter and as rain in summer. Mean monthly temperature remain below 10 °C for six months of the year.

d. Humid-Temperate Zone

It covers central mountainous part of the area, between 1500-3200 meters elevation. Average annual precipitation ranges from 1000-1250 mm received in the form of snow in winter and rain in summer. Mean monthly temperature for six months remain below 10 °C. This zone is under coniferous forests.

e. Sub Humid-Boreal Zone

It covers the northern part of the area, comprising high mountainous region above 3200 meters elevation. Average –annual precipitation ranges from 500-1000 mm mostly received in the form, of snow. Mean monthly temperature for seven months remain below 10 °C (G.M. Khattak, 1965).

Table 1: Meteorological Data Recorded at Swat Valley. (Ahmad *et al.*, 2015).

Months	Maximum	Minimum	Rain fall in (mm)	Snow fall (In inch)	R.Humidity (%)
January	4.8	-0.6	52.0	25.0	53
February	3.3	-1.7	346.8	86.0	67
March	6.1	-0.1	275.1	35.0	69
April	14.2	6.1	219.0	-----	55
May	16.9	8.1	131.9	2.5	48
June	24.2	14.5	64.4	-----	46
July	21.7	14.2	190.6	-----	82
August	21.2	13.2	232.5	-----	81
September	18.8	11.5	98.7	-----	75
October	15.9	7.7	13.8	-----	45
November	9.0	2.7	113.8	17.0	57
December	5.1	-0.5	58.4	40.0	68
Annual	13.43	6.26	149.68	17.2	62.17

vii. Agro-climatic Zone

Agro-climatically Swat River Catchment is divided into following Agro ecological zones (Ahmad *et al.*, 2015).

- a. Sub Humid Tropical b. Sub Tropical c. Humid Temperate**
- d. Cool temperate e. Cold Temperate f. Dry Temperate Zone**
- g. Sub-Alpine h. Alpine i. Cold Desert**
- a. Sub Humid Tropical Zone**

The valley has altitudinal variation ranging approximately from 600 m in the plains of lower Swat upto 800 m in the North. Monsoon rainfall occurs in this zone and characterized by mild winter and hot summer. Woody plant biodiversity are represented by *Phoenix sylvestris* (Date palm), *Nannorophs ritchiana* (Mazri) and *Reptonia buxifolia*. Tropical fruits of the area are citrus, mango and banana. Tobacco, tomato and onion are also cultivated in this zone. Land use pattern are associated with double cropping system in the form of rice-maiz or rice-clover crops. Wetland reclamation and foothills were denuded which threatened associated flora and fauna.

b. Sub Tropical Zone

The valley has altitudinal variation ranging approximately from 800 m in the South to 1000 m in the North of upper Swat. Monsoon rainfall occurs in this zone and characterized by mild winter with very little to no snowfall in the winter. Summer is generally hot. Woody plant biodiversity are represented by *Acacia modesta* and *Olea ferruginea*. Common fruits of the area are Peaches and plums. Land use pattern are associated with double cropping system in the form of rice-Maiz. Foothills denuded and arable lands are some factors which threatened associated flora and fauna.

c. Humid Temperate

The valley has altitudinal variation ranging approximately from 1000 m in the South to 1500 m in the North. This zone is characterized by heavy summer rainfall and also receives some snowfall in winter. Haronai valley in Upper Swat and the Swat River plain upto Fatehpur comes under this category. Woody plant biodiversity are represented by *Pinus roxberghii* (Chir pine) *Quercus incana* (White Oak) and *Pistacia integerrima*. Common temperate fruits of the area are apples, peaches and plums. Land use pattern are associated with double cropping system, with wheat, turnip and lentils are the major Rabi crops while the maize, rice, green gram, soya been, and sunflower are the major Kharif crops. Rearing livestock especially buffaloes, cows and goats herding is important component of this ecosystem. Irrational pesticide use and loss of endemic species are some major threats to the area. Summer is generally warm and humid.

d. Cool Temperate

The valley has altitudinal variation ranging approximately from 1500 m in the South to 1900 m in the North. It can be observed in Miadam, Malam Jabba , Chail and Doughalgai areas. This zone is characterized by considerable amount of snowfall in winter and heavy monsoon summer rainfall. Woody plant biodiversity are represented by *Pinus wallichiana* (Blue Pine) and *Quercus dilatata* (Black Oak). Common fruits of the area are local Land races of temperate fruits. It can generally be traced upto an altitude associated with double cropping system in the form of maize, potato and rice. Rearing livestock like buffaloes, cows. Goats and sheep herding is important component of this ecosystem Terrace cultivation, soil erosion and fertility losses are some major threats in the area.

e. Cold Temperate

This area has altitudinal variation ranging approximately from 1900 m in the South to 2300 m in the North forming dense forest. It can be traced in the areas of Sham Sar, Daral, Sedgai, and Ladoo areas. Woody plant biodiversity are represented by *Prunus cornuta*, *Aesculus indica* and *Taxus wallichiana*. Agriculture lands are associated with Monocropping system in the form of potato and maize. Forest products and grazing animals are the local practices observed in this agro ecosystem. Terrace cultivation, uprooting of plants, burning, irrational extraction of plants-habitat loss, degradation are some major threats in the area.

f. Dry Temperate Zone

Basically cold temperate in nature but prevail in most part of the area under Swat Kohistan. This zone is characterized by snow winter and short mild summer. It is characterized by mono cropping system. Maize or potatoes are intermixed with gourds and beans are the main crops. Livestock especially buffaloes, cows, sheep, goats and poultry rearing is important component of this ecosystem.

g. Sub-Alpine Zone

The valley has altitudinal variation ranging approximately from 2300 m in the South to 3600 m in the North. It retains snow for 5–6 months annually. Woody plant biodiversity are represented by *Abies pindrow*, *Picea smithiana* and *Quercus semecarpifolia*. Forest products and rearing livestock are the main economic activities of this farming system. Land use pattern are associated overgrazing, lumbering, irrational extraction of plants degradation are some major threats in the area.

h. Alpine Zone

The valley has altitudinal variation ranging approximately from 3600 m in the South to 4600 m in the North. Woody plant biodiversity are represented *Juniperus communis*, *Sibbaldia, cuneata*, *Primula* and *Aconitum* sps. Land use pattern are associated with rearing of Livestock grazing pastures and harvesting of medicinal plants. Overgrazing and irrational extraction of natural resources are some major threats in the area.

i. Cold Desert

The valley has altitudinal variation ranging approximately from 4600 m in the South to 6000 m in the North. Almost there is no vegetation cover and it is considered permanent source of the river Swat. Climatic changes are one of the key factors in the area.

B. MALAM JABBA VALLEY (RESEARCH AREA)

The Malam Jabba Valley of the district Swat is home to a wealth of diverse flora with the spectacular scenic beauty that attracts tourists across the globe and makes the valley a paradise for the nature and adventure lovers. Malam Jabba is located between the Himalayan & the Hindu Kush foothills of Khyber Pakhtunkwa (KP), Pakistan. Saidu Sharif is Capital of District Swat located 52 km away from the research area with estimated population of 40,000. It is bounded by the District Buner in south-west, by the District Shangla in the North-East and by the main Swat River in the West. The area is traced between 35°20' to 35°53' North latitude and 72°31' to 72°36' East longitudes. The lower part of Malam Jabba valley consists of different villages such as Talegram, Ser, Shagai present at northeast and mostly narrow at structure. The dominant and main villages at the lower part of the valley are Ilanae, Shinkat, Shaltalu, Kishora, Malam, Spino obo, Kuh and Shager Ser having an altitude of 1270 m, 1500 m, 1660 m, 1600 m, 1800 m, 1900 m, 2300 and 3200 m respectively. Manglaur, Talegram and Ser are main Villages found at the entrance of the Valley. The valley has altitudinal variation ranging approximately from 950 m in the South at Manglaur (Valley entrance) to more than 3200 m in the North (Valley highest top) while Shagar Sar is the highest peak of the area. (Anonymous, 1998).

Malam Jabba valley is a lush green valley and one of the hot tourist spot, covered with various kinds of flowers and plants which have no match anywhere in the World. Phytogeographically research area is situated on the western edge of Himalayas, dominated by Sino-Japanes type of vegetation. Local communities are very poor and primarily dependent on the plant natural resources, agriculture, agro forestry, horticulture, livestock rearing and ecotourism. They utilized & harvested plant resources for indigenous system of medicine, fodder, fuel wood and timber.

The area is occupied by distinct ethnic groups i.e., Yousafzai Pathans, Kohistans, Mians, Gujars, Ajars and Pirachas are inhabiting in different parts of the valley, exploiting and sharing the plant resources symbiotically. The local community of the Malam Jabba valley has been using plant biodiversity for treatment of human and animal health care. In the upper part of the valley the medical facilities like government hospital, private clinics, and pharmacies are not easily accessible so the utilization of plants resources for medicinal folk recipes is very common and frequent But it is infrequent in lower part of the valley like Manglaur, Telegram and Ser villages where hospitals and other health facilities are easily accessible to local inhabitants.

Some important medicinal plants of the area are *Aconitum chasmanthum*, *Aconitum heterophyllum*, *Acorus calamus*, *Aesculus indica*, *Berberis lycium*, *Bergenia ciliata*, *Bistorta amplexicaulis*, *Caralluma edulis*, *Colchicum luteum*, *Cotinus coggia*, *Dioscorea deltoidea*, *Elaeagnus umbellata*, *Geranium wallichianum*, *Juglans regia*, *Olea ferruginea*, *Paeonia emodi*, *Pistacia chinensis* subsp. *integerrima*, *Podophyllum hexandrum*, *Polygonatum verticillatum*, *Primula denticulata*, *Saussurea lappa*, *Skimmia laureola*, *Thymus linearis*, *Valeriana jatamansi*, *Viola canescens*, *Viola betonicifolia* and *Viola pilosa*.

The Chir pine and *Quercus incana* occupying the lower altitude ranging from 1000-1600 m whereas blue dominates the higher elevation and mostly found at altitude of 1600-3000m. Fir and spruce dominates the shady places while *Cedrus deodara* and *Pinus gerardiana* found on exposed and dry rocks of the area. *Pinus willichiana*, *Pinus gerardiana*, *Abies pendrow*, *Picea smithiana* and *Cedrus deodara* are evergreen species where as *Quercus dilatata*, *Juglans regia*, *Aesculus indica*, *Prunus* sp and *Viburnum grandiflorum* are the broad and deciduous species of the area (Anonymous, 1998).

Indiscriminate deforestation severely disturbed the whole ecosystem and natural beauty of the area which are the dominant source of income in the form of ecotourism for sustainable livelihood security of the area. Forest of valley is not only regional but also global ecological importance.

Livestock rearing is a significant part of most livelihoods in the area and the traditional valley lifestyle involves keeping & rearing cattle like buffalos, cows, goat, and sheep for milk and other dairy products. These are the source of food and income for the livelihood security in most part of the valley.

Horticulture is commonly practiced in lower part of valley. Some important wild fruit plants of the area are *Diospyros Kaki*, *Diospyros lotus*, *Prunus domestica*, *Prunus armeniaca*, *Prunus persica*, *Pyrus communis*, *Pyrus pashia*, *Vitis Jacquemontii*, *Vitis vinefera*, *Eriobotrya japonica*, *Juglans regia*, *Elaeagnus umbellata*, *Ziziphus jujuba*, *Ziziphus nummularia*, *Ziziphus mauritiana* var. *spontanea* which plays a tremendous role for the livelihood security of the area. Some fast growing tree species like *Albizia altissima*, *Eucalyptus camadulensis* and *Populus nigra* are planted in the valley for fuel purposes but it gradually replacing the natural flora and has adverse affect on native vegetation of ecosystem.

Majority of the local inhabitants also depend upon agriculture. Wheat and maize is commonly cultivated but rice cultivation is not common in the area. Maize is the major kharif

crop while wheat is the major rabbi crop of the area. Important crops of the area are cabbage potato, onion, beans, cucumber, turnip etc.

The area is surrounded by a series of high altitude covered with snow for most part of the year. June and July are the hottest month while December and January are the coldest months. During the winter the climate is very cold and snowy in the upper part of the Valley and generally remains below the freezing point in the month of December, January and February. Snowfall generally starts by the mid of November on the high peaks of valley and descend downwards as the temperature falls. The climate is cool and refreshing during summer in the upper part of the Valley while mild hot in the lower part and temperature may goes as high as 40 C° in the month of July and August. (G.M. Khattak, 1965).

INTRODUCTION TO THE TOPIC

A. Plant Biodiversity

Biodiversity defined as diversity and variation and inter-relationship among the organisms. Taxonomy is the study of classification included its basic principles, procedures and rules. Taxonomy is the world taxonomy derived from two Greek words, “taxis” means arrangement or order order and “nomos” means law or science so taxonomy deals with the laws governing the arrangement or classification of plants. Taxonomy composed of taxonomist units known as taxa (singular taxon) or kind of things that are arranged frequently in a hierarchical order. The word taxonomy first coined by A. P. de Candolle) is often used for Theory and Practice rather than its final product (a system of classification). Now days another term used in literature is systematic but in a broader sense. In a true sense the two terms i.e. Taxonomy and systematics are nowadays used synonymously and are so treated. The aim of systematic botany is to bring out clearly resemblances and differences by naming, describing and arrangement of the plants in such manner that their relationship with regard to their decent from a common ancestry is clearly indicated. It is the science which deals with

- a) Identification
- b) Naming (Nomenclature)
- c) Classification

Identification of plants is possible with the help of available literature, Flora of a region and monographs. By matching unidentified plants with already existent identified plants is one of the quick and easier method , the wide range of material and voucher specimens from different geographical areas in a herbarium allow a comparatively a good method of identification which is not possible by other means

Function of nomenclature is to find out the correct name. It is a process in which correct name is given to the plant and the identified specimen must be given correct name – a name by which these plants can be known internationally. Carole Linnaeus was the first to introduced the binomial nomenclature in his book *Species Plantarum* published on 1st May 1753, the starting point of plant nomenclature in which every type of plant shall have a specific name in Latin and consist of two parts, first part indicates the genus while the second part indicate the species

It is an orderly application of names for which certain rules are to be followed. These rules are listed in International Code of Botanical nomenclature (ICBN). Correct naming is very

significant as if wrong name is given to the plant then all our efforts shall be wasted. We will not only be wasting our time but also creating duplication and misguiding the world.

Classification, Once the plant is identified, correctly named it should be properly classified. It is an arrangement of plants into recognized groups.

However, most of the workers do not differentiate in both the terms and these are now treated as synonymous

It should however be realized that some authors prefer to differentiate between them, in which case systematics has more or less the broad definition given above, and taxonomy is restricted to the study of classification. Taxonomy is a unique science it depend upon other branches of Science such as Morphology, Anatomy, Cytology, Ecology, Chemistry, Biochemistry, Pollen morphology etc.

B. Importance of Plant Biodiversity

Plant biodiversity is a major pre requisite for healthy ecosystem that sustains all the life on the earth. Plants are the primary producers of the ecosystem and the basic unit of life. Plants provide us with wide range of useful products such as wood, peat, charcoal, fuel wood, building materials, food, fiber, clothing, shelter, aromatic and medicinal compounds for human beings and their animals. Plants are natural custodian of chemical compounds or also known as natural industries of chemical compounds. These compounds are used in pharmaceuticals, flavors, fragrance, colors & insecticide industries. Plants biodiversity provide natural protection for soil against erosion and also known as green lung of the earth that purify the air and water, mitigate floods, modern storm surges and stabilize landscapes. Plant biodiversity under pin all these services for sustainable livelihoods security of billion's people either directly or indirectly, through provision of foods, medicine, aromatic oil, fibers and many other materials essential for their daily lives. It has been reported that livelihoods security of some 1.6 billion people depend heavily on forest resources, while eighty percent of our planet's population rely on indigenous medicines-largely based on plant biodiversity- for their primary healthcare. Human welfare is thus ultimately linked with plant diversity thus essential for the sustainable livelihoods security and safety of any region. (Walters & Hamilton, 1993).

Documentation and exploration of plant biodiversity was the first sixteen targets for 2010 adopted by the 6th Conference of the Parties to the CBD, (Callmanderet *al.*, 2005). All the vascular plants (Tracheophytes) are divided into two major groups: the Lycophytes and Euphyllophytes. The latter is further divided into spermatophytes and Monilophytes (fern and

their allies), (Judd *et al.*, 2002). More than 270,000 taxa of vascular plants have been reported from different ecosystems (Walters and Gillet, 1997) but latest data show that the total number of identified vascular plant taxa is estimated to be between 310,000 (Prance *et al.*, 2000) and 420,000 (Bramwellet *al.*, 2002).

There are 1572 documented genera and 5521 named species of flowering Plants in Pakistan (Ali, 2008). On the other hand all the mountainous areas not still properly explored for the vascular plant biodiversity and there is over ride need for botanical documentation and exploration in the rich plant resources of Mountainous Valleys (Ali, 2010). Approximately 80% of the endemic flowering plants of the country are restricted and found to the western and northern hilly areas of Pakistan (Ali and Qaiser, 1986). Similarly the remote and hard Valleys are not still properly explored (Alam, 2010). Stewart 1967 botanically explored the Swat Valley and documented 1550 plant species but he collected plant specimen mostly from plain and lower areas of the Valley and remote areas like Malam Jabba has thoroughly been visited for vascular plant biodiversity.

Malam Jabba valley is one of the most remote Valleys in Swat District and there is no even a single authenticated plant specimen available in any of the Herbaria in the country. The Valley was virgin and unexplored, hence a detail investigation of the vascular plant biodiversity was planned to document the plant natural resources, their conservation status and traditional knowledge of local community about medicinal plants.

AIMS AND OBJECTIVES OF THE STUDY

The proposed study were conducted to fulfill the objectives mentioned below

1. Collection, documentation and exploration of vascular plants with special emphasis on endangered, rare, endemic and globally important plant taxa.
2. To identify species concerned with different taxonomic tools and prepare a comprehensive inventory of the Vascular Plant Biodiversity in the research valley
3. Documentation and exploration of ethnoveterinary and ethnomedicinal plants used in indigenous system of medicine for the livelihood security of the area.
4. To evaluate/establish conservation value of Vascular Plant Biodiversity in the research area.
5. To identify threats, prepare strategies and recommendations for conservation of the threatened plant taxa in the research area.
6. Deposition of authentic Herbarium specimens in Herbarium of CPB, University of Peshawar.

REVIEW OF LITERATURE

Much work has been carried out on the Plant systematic, Taxonomy, Phytogeography and vascular plant biodiversity of the Himalayas and Pakistan while many workers have been contributed to the flora of the Pakistan. Prominent among them are as.

Kashyap (1936) documented the flora of Lahore District..

Parker (1956) collected information about the forest flora of Punjab, Ghat, and Dehli.

Stewart (1957) reported 127 ferns for the first time from West Pakistan i.e. *Cystopteris dickieana* R. Sim, *Actiniopteris australis* and *Equisetum palustre* L.

Jafri (1958) worked on the flora of Karachi and reported 158 species.

Stewart (1958) worked on the flora of Rawalpindi District, Pakistan.

Rendle (1959) described the flowering plants and classified angiosperms and Gymnosperms separately.

Gupta (1962) worked on the description of 340 species collected from the area of Muzaffernagar.

Khan (1964) described 80 plant species distributed in 50 genera of family Asteraceae from different areas including Peshawar, Swat, Mardan, Malakand, Khyber and Mohmand Agencies.

Qureshi and Khan (1965) worked on the flora of Peshawar and Khyber Agency.

Stewart (1967) prepared checklist of the plants of Swat.

Hedge (1968) studied eleven genera of family Labiatae from Afghanistan-Pakistan area.

Sultan (1969) described the flora of Lyallpur (Faisalabad) and adjacent areas.

Nasir and Ali (1970) are working on the flora of Pakistan, under the joint supervision/editorship from Botany Department, University of Karachi. They are adding excellent information to the flora of Pakistan and about 221 families have been published whereas some large families like Asteraceae and Rosaceae etc. are going to be published in next few years.

Stewart (1972) prepared annotated and comprehensive catalogue on the flora of Pakistan, which almost covers the flora West of Pakistan

Hutchinson (1973) classified angiosperms according to their stems, fruits, seeds, and flowers.

Bentham and Hooker (1976) classified and described and characterized both Angiosperms and Gymnosperms.

Sultan (1980) worked on more than three plant species of the flora of Punjab.

Cope (1982) worked on the grasses of Pakistan and contributed Poaceae to the flora of Pakistan (Poaceae). He described 492 species of 158 genera distributed within in 26 tribes and divided Poaceae in to five sub families.

Polunin and Stainton (1985) described the taxonomic characteristics of the herbs, shrubs and trees of Himalayan area including Pakistan, India, Kashmir, Bhutan, Nepal in a logic-appealing manner, with colored and scanned photographs.

Tareen (1986) reported about 157 species of plants from Quetta District and described its ecological and taxonomical features.

Joesph and Kharkongor (1990) recorded 100 plants of ethnobotanical importance, used by the tribal community of khasi and Jaintia hills for various purposes like medicines, food and shelters.

Chaudhry and Qureshi (1991) documented information on vascular flora of Pakistan and explored 709 taxa, of which 1/10 of vascular plant biodiversity are in danger of being gradually wiped out or exterminated altogether.

Nakike and Malik (1992) published a total of 68 taxa of pteridophytes collected from Pakistan in 1990.

Pie, (1992) reported that the total number of plant species in the Hindu Kush Himalaya is estimated to be as many as 25,000 or 10 percent of the world of which about 10,000 species or 2/3 are useful.

Saleem *et al.*, (1994) find that the biological activity of 59 native plant taxa used as insecticides. It was recommended that more and more emphasis should be put on the use of insecticides of natural origin having specific action against insect only. It was also found that some of plant species having great potential for acute use.

Ahmed (1997) described and explored the family Lamiaceae from District Swat.

Sheikh (2000) carried out a study and differentiated the trees of Pakistan according to their habitat, reproduction, and distribution and ecology throughout Pakistan with special reference to their local and international uses.

Bhatti *et al.*, (2001) explored the vegetation composition of the Nara Thar and reported a total 149 species distributed within 110 genera and 42 families.

Akhtar and Malik (2002) explored flora of Leepa Valley (Muzaffarabad) and recorded about 620 plant taxa classified among 94 families of angiosperms. It was classified into herbs, shrubs, trees, climbers, and epiphytes.

Gillani *et al.*, (2003) recorded a new subspecies of *Digitaria sanguinus* and identified it as *pakistanica*. It has been identified that new subspecies has “spines only on the upper half margins of nerves of lower lemma and glabrous on lower half margin whereas other subspecies *stewartii* has spines on the whole lower lemma.

Matin *et al.*, (2002) conducted an utilitarian study on Shogran valley, District Mansehra (Hazara), Pakistan. They determined 12 taxa of shrubs and 18 taxa of trees with special reference to their medicinal and ethnobotanical use by the local population of the valley.

Badshah *et al.*, (2004) collected data on plant biodiversity from Waziristan and recorded 187 plant taxa. Out of these, 82 plant species were identified as ethnomedicinal plants.

Khatoon and Parveen (2003) recorded a new species Genus *Cleome* and identified species as *Cleome pakistanica* of family *Capparidaceae* from Nuskhi, Baluchistan.

Habib and Khan (2004) documented information on Conservation and Sustainable utilization of MAP (Medicinal and Aromatic Plants of Pakistan).

Hussain *et al.*, (2004) collected ethnobotanical information on timber wood from South Waziristan. The study found that *Populus afghanica*, *Cedrus deodara*, *Olea ferruginea*, *Quercus baloot*, *Morus alba*, *Salix alba*, *Pinus wallichiana*, *Abies pindrow* and *Ailanthus altissima* were used as the timber wood.

Ali, (2008) documented a total of 1572 genera belonging to 5521 species have been identified

Shah and Hussain (2008) collected information on the medicinal plant biodiversity of Mount Elum, District Bunir. A total of 76 plant species were collected which include 47% medicinal, 21% fuel wood, 9% fruit, 19% honeybee, 20% timber yielding and 4% poisonous plant species .

Ali *et al.*, (2009) screen out & analyzed medicinal plants in Chitral Valley, Pakistan. A total of 83 plant species are enlisted, used locally in various primary health care diseases. Most of the herbal recipes are prepared in the form decoction. Root is the major part of medicinal plant used in most of the folk recipes

Fazal et al., (2010) carried out taxonomic studies during 2004-2008 in order to explore information on floristic composition of District Haripur. A total of 211 species distributed within 177 and 66 families were recorded. Of which, Gymnosperms are contributed by 5 species distributed within 5 genera and 4 families followed by Monocots with 26 species classified among 24 genera under 11 families while the last 55 are dicots with 180 species belonging to 141 genera.

Haq *et al.*, (2010) conducted a detailed study on Nandiar Valley Westren Himalaya, Pakistan. A total of 402 taxa classified among 110 families of vascular plants, out of which 237 were herbs, 71 shrubs, 68 trees, 06 climbing shrubs, 18 climbers and 03 epiphytes in descending order.

Qureshi *et al.*, (2011) recorded a total of 130 plant species belonging to 105 genera and 37 families from Pir Mehr Ali Shah Arid Agriculture University research farm at Koont and its adjoining areas. Out of which, 97 species were dicots and 33 monocots

Saqib *et al.*, (2011) collected information on the altitudinal distribution in Palas Valley, Pakistan. A total of 545 species were recorded, out of which 170 plant species were found to be used by local community. The greatest numbers of plants was used for medicinal purposes (89), followed by food (59 species), & fodder (22 species). There were 18 medicinal plants with commercial value & 10 species were used as fuel wood.

Shinwari & Qaiser (2011) address the issues “why plant diversity declines and when plant species with weedy characteristics become more abundant” Local communities of Pakistan play a key role in conservation of medicinal plants. Intentionally or unintentionally, peoples find out strategies for doing so in the form of beliefs, rituals and taboos but our aim to recover & records local indigenous knowledge and wisdom about plants beyond our efforts towards providing food security, nutrition and health care to the tribal people.

Noor *et al.*, (2013) collected information on vegetation pattern and soil characteristics of Astore valley, Pakistan at various altitudes (1250m-4200m) and habitats. It was observed that herbaceous plant species were prominent in the natural habitat, particularly in the alpine and sub-alpine zones, followed by xerophytic and halophytic at lower altitude. A total 668 plant taxa were recorded. Out of these 635 species belonging to naturalized vascular plants, including to 293 genera and 78 families, while 33 cultivated species belonging to 30 genera and 17 families.

Mulk *et al.*, (2013) record the existing flora of Santh Saroola, Kotli Sattian, Pakistan & determined 186 plants taxa distributed in 148 genera and 63 families. The leading family was

Poaceae with 24 followed by Asteraceae 20 species, Fabaceae 16 species,. Euphorbiaceae 8 species, Lamiaceae & Solanaceae 7 species each and Brassicaceae 6 species while the last families had species with range of 1-5 with reference to life forms.

Jamshed *et al.*, (2014) documented 106 trees species belonging to 83 genera and 43 families from Hayatabad and also mentioned that majority of species are alien/exotic whereas some are native to the research area

Karakus and Turkmen (2014) explored the floristic composition of the gardens and road sides in Adana, Turkey. A total 337 vascular plant species belonging to 259 genera and 93 families were identified. Asteraceae is greatest family with 35 species followed by Fabaceae 30 specie, Poaceae 20 species, Rosaceae 11 species and Lamiaceae 10 species.

Shaheen *et al.*, (2014) carried out floristic survey of the Thal desert, Punjab, Pakistan. They recorded a total of 248 species classified among genera under 38 families. These plants species are used for timber, fodder, medicines and as vegetables.

Shaheen *et al.*, (2014) recorded the existing flora of Santh Saroola, Kotli Sattian, Pakistan & determined 186 plants taxa distributed in 148 genera and 63 families.

Ali *et al.*, (2016) documented information on floristic diversity and reported 463 plant taxa belonging to 104 families from Chail Valley, District Swat. The largest families were Astercaeae and Poaceae with 42 and 35 species respectively.

Islam *et al.*, 2016 recorded 4 new species viz., *Pyrus pashia*, *P. calleryana*, *P. bretschneideri* and *P. pyrifolia* of Genus *Pyrus* from Nothern Pakistan and Azad Kashmir.

The study also reports a total of 110 plan taxa from research areas.

Walikhan *et al.*, (2016) conducted a detailed investigation on plant biodiversity and record a total of 232 species belonging to 106 genera and 34 families of flowering plants from Alpine region at Haramosh and Bagrote Valleys District Gilgit, Pakistan.

A survey was undertaken to document edible wild vegetables & their ethnomedicinal utility by the inhabitants of Harnai District, Baluchistan, Pakistan. A total of 59 wild vegetables species belonging to 41 genera and 20 families are explored used in vegetables, salads as well as for treatment of various ailments. The greatest number of species was used to as remedy for gastrointestinal disease. The most prominent parts of the plant taxa used as vegetable and medicine are their leaves followed by whole plant. (Tareen *et al.*, 2016)..

Gul *et al.*, (2017) analyzed diversity and nature of distribution of the Pteridophyte flora of Pakistan based on published literature and current field studies by the authors. An updated

checklist assessed that there are 202 species distributed in 62 genera and 19 families. Dryopteridaceae was the leading family with 47 taxa, followed by Pteridaceae 41 taxa, and Woodsiaceae 21 taxa. *Dryopteris* was the predominant genus that contributed genus 23 species followed by *Asplenium* L. and *Polystichum* Roth with 18 species each.

Ishaq *et al.*, (2017) explored the floristic diversity of Aquatic & Marshland Angiosperms in Zhob District, Baluchistan, Pakistan. A total of 40 plant taxa belonging to 18 families were recorded. Cyperaceae was the leading family with 08 species followed by Poaceae 07 species & Polygonaceae 03 species.

Shinwari *et al.*, (2017) explored 61 medicinal plants of 49 genera and 34 families. Lamiaceae was the dominant used family consisting 7 species & 6 genera.

Aziz and Adnan *et al.*, (2018) identified a total of 64 plant taxa classified among 60 genera and 41 families from Mohmand Agency, Fata, Pakistan. Dominant families were Lamiaceae with 8 species followed by Asteraceae 7 species, Apocynaceae and Brassicaceae 4 species each.

Jamshed and Ullah *et al.*, (2018) identified and described one generic and two new species from Peshawar, Pakistan.

MATERIALS AND METHODS

Study Area

Malam Jabba is a lush green valley strewn with an amazing variety of plants that supports spectacular medicinal plant biodiversity of promising economic values.

A. Eco-Geographic Surveys:

A detailed investigation of ecological & Phyto-geographical survey was undertaken in the Malam Jabba valley, Hindu Kush Range, Swat, Pakistan. The first step was to collect baseline information on taxonomy, occurrence, abundance & distribution on plant species by reviewing literature, examining herbarium specimen, pictures & monograph.

Different habitats were identified regarding their altitudinal range, topography, population size, vegetation cover, richness and severity of different kinds of the study area. The base line information was used to make a draft of preliminary distribution of these plant species as well as to plan time table & routes for field studies.

B. Field Explorations & Observations

Botanical field explorations were carried out during May 2013-June 2017 in order to explore & determine the vascular plant biodiversity & their conservation value based on native, naturalized, exotic, alien species for sustainable livelihood security of Malam Jabba Valley, Hindu Kush range, District Swat, Pakistan.

Study tripss were made to the different areas of Malam Jabba valley during the flowering season to collect the field data about various plants. The main exploration spots in the valley were Manglaur, Talegram, Ser, Shinkat, Ganajir, Shaltalu, Kashora, Malam, Spin obo, Kuh, Malam Jabba and Shagar Sar having an altitude of about 950, 1050, 1100, 1500 m, 1660 m, 1700, 1600 m, 1800 m, 1900 m, 2300 m, 2800 m and 3200 m respectively.

The field explorations include surveys, guided field walks/transect walks and direct field observations. Study area was divided into twelve sites and each site was surveyed three times for collection, documentation and exploration of vascular plant and their conservation value.

Direct field observations were made during the extensive field trips in the area, keeping several parameters in considerations in order to determine the potential & actual level of threats to the Plant biodiversity. Various factors & threats like habitat loss, degradation and habitat fragmentation, extent of occurrence, area of occupancy, population size, habitat degradation, overharvesting, over harvesting, unscientific extraction of plants, overgrazing, excessive tourism,

deforestation, land use change and agriculture expansion, land sliding, natural disasters, development works like roads, building, population explosion, human interference, abundance, distribution and invasion of alien plants were recorded. The species were then categorized in accordance with IUCN Red List Criteria.

C. Data Collection & Documentation

Data collection & documentation of vascular plants were carried out during May 2013-June 2017 in order to explore/investigate biodiversity & conservation values of vascular plants based on wild, native, naturalized, exotic and cultivated species growing in the research area. Each field trips were consisted of two to three weeks depends upon the availability & abundance of species in different localities & sub localities of the areas. Collection & observations were made from different habitats in all seasons of the year, i.e. spring to winter but frequent trips were arranged in the spring & summer as maximum availability & abundance of species. Special visits were arranged in winter season to document seasonal variation & collect winter blooming plants of the area.

The field equipments like GPS, Digital Camera, field note book, Pencil, polythene bags, news papers, small knife or small trowel for digging of plants were taken to the study area. Latitude, longitude and altitude were determined with the help of GPS. Plant specimens were collected from each and every habitat in the study area. At the time of collection, the field numbers were assigned to the specimens. In case of herbs complete specimens having shoots, flowers and roots while small flowering shoots from shrubs, trees and climbers were collected from different localities in the area of investigation. Plant species were photographed in the field with help of digital camera. The plants were tagged with signified data, localities and other characteristics about the plants like vegetation cover, altitude, habitat, soil type, topography, plant associate, flower, color, fruits, scent, size and nature of habit. Nature of habitat were determined by considering over grazing impact, soil erosion, deforestation, over exploitation of natural resources, invasion of invasive plant species, over population, expansion of agriculture land, land sliding, construction/development activities, environmental degradation, habitat loss and some other anthropogenic impacts. Seeds of some endangered and highly targeted medicinal plants were collected and stored in the seed Bank and Herbarium of Centre of Plant Biodiversity (CPB), University of Peshawar.

D. Plant Preservation and Identification

Preserved plant specimen provides significant information about plant diversity & distribution of any range and serves as evidence of plant's existence in any time and space therefore the plants were carefully preserved with all aspects.

All the possible plant species were collected from various locations in proper way and the specimens were dried in newspapers. The specimens were pressed in a presser with blotting papers between the adjacent specimens. The blotting papers and newspapers were changed from time to time depending upon the weather and succulence of plants to avoid spoilage, fungal attack & rotting. Dried specimens were preserved by cold treatment and phenapthalene balls to avoid insect & pest attack. The plants were treated with 2% solution of Mercuric Chloride in Ethyl alcohol to protect them from fungal & insect attacks. Mounting of specimens was made on standard herbarium sheets of size 41.25 cm x 28.75 cm.

Plants were identified with the help of flora of Pakistan & other available literature Quraishi and Khan, 1965-69, 1971; Nasir and Rafiq 1995; Stewart, 1967, 1972; Nasir and Ali, 1970-89; Jafri, 1966; Beg and Khan, 1977; Kitamura, 1977; Ali and Nasir, 1989-1991; Ali and Qaiser, 1993-2016. Nomenclatural information was incorporated following Index Kewensis, recent taxonomic publications (Flora of America, Flora of China, Flora of North America Editorial Committee, 1993–2014; Wu *et al.*, 1995–2013; and the nomenclatural databases of IPNI (2008) and TROPICOS. Plant specimens were also matched with images available on the website of different International Herbaria. Plant specimens were also compared with relevant Voucher Herbarium specimens preserved in the National & international Herbaria like herbarium of the UC Davis Center for Plant Diversity, herbarium of Quid-e-Azam University, Islamabad, Karachi University Herbarium, herbarium of Botany, University of Peshawar. Some unidentified specimens were also identified through consulting the experts.

For taxonomic studies, families and genera of Pteridophytes have been placed first according to the classification system of Ching (1977), with minor modification from Christenhusz *et al.*, (2013) followed by Gymnosperms with classification of system of Christenhusz *et al.*, (2011) whereas, the angiosperm families have been arranged following the advanced phylogenetic system of classification, APG (Angiosperm Phylogeny Group) (Judd *et al.*, 2002). The genera & species under each family have been arranged alphabetically. The completely identified and determined voucher specimens were deposited at Herbarium, Centre of

Plant Biodiversity (HCPB), University of Peshawar and Herbarium, UC Davis Center for Plant Diversity, USA.

E. Seed Collection and Preservation

Seeds of targeted endangered and globally important plant species were collected from research area as well as from local market to ensure their maximum availability. These seeds were dried, thrashed, graded, packed and stored.

EXPLORATION OF VASCULAR PLANT BIODIVERSITY (TAXONOMIC STUDIES)

Table-I. Family Wise Checklist of (Major Taxonomic Category) Vascular Plant Biodiversity of Malam Jabba Valley, Hindu Kush Range

S. No	Family	Species
A. Inventory of Pteridophytic Flora (Pteridophyta)		
1.	Adiantaceae Newman	<i>Adiantum capillus-veneris</i> L.
		<i>Adiantum incisum</i> Forssk.
		<i>Adiantum pedatum</i> L.
		<i>Adiantum venustum</i> D. Don.
2.	Aspleniaceae Newman	<i>Asplenium adiantum-nigrum</i> L.
		<i>Asplenium ceterach</i> L. Syn. <i>Ceterach officinarum</i> Willd.
		<i>Asplenium trichomanes</i> L.
		<i>Asplenium dalhousiae</i> Hook. Syn. <i>Ceterach dalhousiae</i> (Hook.) C. Chr
3.	Athyriaceae Alston	<i>Allantodia Aspera</i> (Blume) Ching. Syn. <i>Diplazium polypodioides</i> Blume
		<i>Athyrium filix-femina</i> (L.) Roth
		<i>Athyrium mackinnoni</i> (C. Hope) C. Chr.
		<i>Athyrium rupicola</i> (Edgew. ex. C. Hope) C. Chr.
		<i>Cystopteris fragilis</i> (L.) Bernh.
4.	Dennstaedtiaceae Lotsy	<i>Pteridium aquilinum</i> (L.) Kuhn
5.	Dryopteridaceae Link.	<i>Dryopteris blanfordii</i> (C. Hope) C. Christ.
		<i>Dryopteris filix-mas</i> (L.) Schott
		<i>Dryopteris juxtaopposita</i> Chr.
		<i>Dryopteris ramosa</i> (C. Hope) C. Chr.
6.	Equisetaceae Michx.	<i>Equisetum arvense</i> L.
7.	Marsileaceae Kaulf.	<i>Marsilea minuta</i> L.
8.	Pteridaceae E.D.M. Kirschn.	<i>Cheilanthes farinosa</i> (Forssk.) Kaulf.
		<i>Onychium Japonicum</i> (Thunb.) Kunze Syn. <i>Onychium cryptogrammoides</i> Christ
		<i>Pteris cretica</i> L.
		<i>Pteris vittata</i> L.
9.	Selaginellaceae Willk.	<i>Selaginella jacquemontii</i> Spring

10.	Thelypteridaceae	<i>Cyclosorus dentatus</i> (Forssk.) Ching
B. Inventory of Gymnospermic Flora (Seed Plants)		
11.	Ephedraceae Dumort.	<i>Ephedra gerardiana</i> Wall.ex Stapf
12.	Pinaceae Spreng. Ex F. Rudolphi	<i>Abies pindrow</i> Royle
		<i>Cedrus deodara</i> (Roxb. ex Lamb) G. Don
		<i>Picea smithiana</i> (Wall.) Boiss
		<i>Pinus gerardiana</i> Wall.
		<i>Pinus roxburghii</i> Sargent
		<i>Pinus wallichiana</i> A.B. Jackson
13.	Cupressaceae Link	<i>Cupressus sempervirens</i> L.
		<i>Juniperus communis</i> L.
		<i>Thuja orientalis</i> L.
14.	Taxaceae Gray	<i>Taxus wallichiana</i> Zucc.
C. Inventory of Monocots (Liliopsida)		
15.	Araceae Juss.	<i>Acorus calamus</i> L.
		<i>Arisaema flavum</i> (Forsk.) Schott
		<i>A. jacquemontii</i> Blume
		<i>A. utile</i> Hook. f. ex Schott
		<i>Colocasia esculenta</i> (Linn.) Schott
16.	Alismataceae Vent	<i>Alisma plantago-aquatica</i> L.
		<i>Sagittaria trifolia</i> L.
17.	Dioscoreaceae R. Br.	<i>Dioscorea deltoidea</i> Wall. ex Kunth
18.	Colchicaceae DC.	<i>Colchicum luteum</i> Baker
19.	Smilacaceae Vent.	<i>Smilax elegans</i> Wall. ex Kunth (Syn. <i>Smilax glaucophylla</i> Klotzch)
20.	Iridaceae Juss.	<i>Iris germanica</i> L.
		<i>Iris hookeriana</i> Foster
21.	Asphodelaceae Juss.	<i>Asphodelus tenuifolius</i> Cav.
22.	Liliaceae Juss.	<i>Fritillaria cirrhosa</i> Subsp. <i>Roylei</i> (Hook.) Ali, Syn. <i>Fritillaria roylei</i> Hook.
		<i>Notholirion thomsonianum</i> (D.Don) Stapf
		<i>Tulipa clusiana</i> DC.

23.	Amaryllidaceae J. St.-Hil.	<i>Ixiolirion tataricum</i> (Pall.) Schult. & Schult.f.
		<i>Narcissus tazetta</i> L.
24.	Alliaceae Borkh.	<i>Allium cepa</i> L.
		<i>Allium humile</i> Kunth.
		<i>Allium sativum</i> L.
25.	Asparagaceae Juss.	<i>Asparagus capitatus</i> subsp. <i>gracilis</i> Browicz (Syn. <i>Asparagus gracilis</i> Royle)
		<i>Asparagus officinalis</i> L.
		<i>Polygonatum verticillatum</i> (L.) All.
26.	Hyacinthaceae Batsch ex Borkh.	<i>Scilla griffithii</i> Hochr.
27.	Commelinaceae Mirb.	<i>Commelina benghalensis</i> L.
28.	Juncaceae Juss.	<i>Juncus inflexus</i> L.
29.	Cyperaceae Juss.	<i>Carex acutiformis</i> Ehrh.
		<i>Carex fedia</i> Nees
		<i>Cyperus brevifolious</i> Rottb.
		<i>Cyperus compressus</i> L.
		<i>Cyperus niveus</i> Retz.
		<i>Cyperus rotundus</i> L.
		<i>Eleocharis palustris</i> (L.) Roem. & Schult.
		<i>Erioscirpus comosus</i> (Wall.) Palla
		<i>Fimbristylis dichotoma</i> (L.) Vahl
30.	Poaceae Barnhart	<i>Acrachne racemosa</i> (B.Heyne ex Roth) Ohwi
		<i>Agrostis stolonifera</i> L.
		<i>Polypogon viridis</i> (Gouan) Breistr. (Syn. <i>Agrostis viridis</i> Gouan)
		<i>Alopecurus myosuroides</i> Huds.
		<i>Apluda mutica</i> L.
		<i>Aristida adscensionis</i> L.
		<i>Aristida cyanantha</i> Nees ex Steud.
		<i>Arthraxon prionodes</i> (Steud.) Dandy.
		<i>Arundo donax</i> L.
		<i>Avena fatua</i> L.

	<i>Brachiaria ramosa</i> (L.) Stapf
	<i>Brachypodium distachyon</i> (L.) Beauv
	<i>Bromus japonicus</i> Thunb. ex Murr.
	<i>Catabrosa aquatica</i> (L.) P. Beauv.
	<i>Cenchrus ciliaris</i> L.
	<i>Chrysopogon serrulatus</i> Trin.
	<i>Cynodon dactylon</i> (L.) Pers.
	<i>Dactylis glomerata</i> L.
	<i>Dactyloctenium aegyptium</i> (L.) Willd.
	<i>Dichanthium annulatum</i> (Forssk.) Stapf
	<i>Digitaria ciliaris</i> (Retz.) Koeler
	<i>Diplachne fusca</i> (L.) P. Beauv. ex Roem. & Schult.
	<i>Echinochloa crus-galli</i> (L.) P. Beauv.
	<i>Echinochloa colona</i> (L.) Link.
	<i>Eleusine indica</i> (L.) Gaertn.
	<i>Eragrostis ciliaris</i> (L.) R.Br.
	<i>Eragrostis papposa</i> (Desf. ex Roem. & Schult.) Steud.
	<i>Festuca gigantea</i> (Linn.) Vill.
	<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.
	<i>Hordeum murinum</i> L.
	<i>Hordeum vulgare</i> L.
	<i>Imperata cylindrica</i> (L.) Raeusch.
	<i>Lamarckia aurea</i> (L.) Moench.
	<i>Leptochloa panicea</i> (Retz.) Ohwi
	<i>Panicum miliaceum</i> L.
	<i>Paspalum dilatatum</i> Poir.
	<i>Pennisetum orientale</i> Rich.
	<i>Phalaris minor</i> Retz

		<i>Phleum alpinum</i> L.
		<i>Phragmites karka</i> (Retz.) Trin.ex Steud.
		<i>Polypogon fugax</i> Ness ex Steud.
		<i>Polypogon monspeliensis</i> (L.) Desf.
		<i>Saccharum spontaneum</i> L.
		<i>Setaria viridis</i> (L.) P. Beauv.
		<i>Setaria verticillata</i> (L.) P. Beauv.
		<i>Sorghum halepense</i> (L.) Pers.
		<i>Stipa sibirica</i> (L.) Lam
		<i>Themedaan anathera</i> (Nees ex Steud.) Hack.
		<i>Triticum aestivum</i> L.
		<i>Zea mays</i> L.

D. Chicklist of Dicotyledons (Magnoliopsida)

i. Inventory of Eudicots		
25.	Papaveraceae Juss.	<i>Papaver dubium</i> L. <i>Papaver pavoninum</i> Schrenk <i>Papaver somniferum</i> L.
26.	Fumariaceae Marquis	<i>Fumaria indica</i> (Hausskn.) Pugsley
27.	Berberidaceae Juss.	<i>Berberis lycium</i> Royle
28.	Podophyllaceae	<i>Podophyllum emodi</i> Wall. ex Royle
29.	Ranunculaceae Juss ex Bercht & J.Presl	<i>Aconitum chasmanthum</i> Stapf ex Holmes <i>Aconitum heterophyllum</i> Wall. ex Royle <i>Adonis aestivalis</i> L. <i>Aquilegia pubiflora</i> Wall.ex Royle <i>Caltha alba</i> Camb. <i>Clematis connata</i> DC. <i>Clematis grata</i> Wall. <i>Delphinium denudatum</i> Wall. ex Hook. f. & Thoms. <i>Ranunculus aquatilis</i> L. <i>Ranunculus arvensis</i> L.

		<i>Ranunculus laetus</i> Wall .ex Hook .f. & J.W. Thomson
		<i>Ranunculus muricatus</i> L.
		<i>Ranunculus sceleratus</i> L.
		<i>Thalictrum foliolosum</i> DC.
		<i>Thalictrum pedunculatum</i> Edgew.
30.	Plantanaceae T.Lestib.	<i>Platanus orientalis</i> L.
31.	Buxaceae Dumort.	<i>Buxus wallichiana</i> Baill
		<i>Sarcococca saligna</i> (Don) Muell.
ii. Inventory of Core Eudicots		
32.	Paeoniaceae Raf.	<i>Paeonia emodi</i> Wall.ex Royle
33.	HamamelidaceeR.Br.	<i>Parrotiopsis jacquemontiana</i> (Dcne.) Rehder.
34.	Saxifragaceae Juss.	<i>Bergenia ciliata</i> (Haw.) Sternb.
35.	Crassulaceae J.St.-Hil.	<i>Hylotelephium ewersii</i> (Ledeb.) H. Ohba
		<i>Rhodiola himalensis</i> (D. Don) S. H. Fu
		<i>Rosularia adenotricha</i> (Wall. ex Edgew.) Jansson & Rech
		<i>Sedum hispanicum</i> L.
36.	Vitaceae Juss.	<i>Vitis jacquemontii</i> Parker
		<i>Vitis vinifera</i> L.
37.	Zygophyllaceae R. Br.	<i>Peganum harmala</i> L.
		<i>Tribulus terrestris</i> L.
14.	Papilionaceae	<i>Astragalis graveolens</i> Benth.
		<i>Astragalis pyrrotrichous</i> Boiss.
		<i>Desmodium elegans</i> DC.
		<i>Indigofera heterantha</i> Well. ex Brandis
		<i>Lathyrus aphaca</i> L.
		<i>Lathyrus cicera</i> L.
		<i>Lathyrus sativus</i> L
		<i>Lathyrus sphaericus</i> Retz.
		<i>Lespedeza juncea</i> (Linn.f.)Pers.

		<i>Lotus corniculatus</i> L.
		<i>Medicago laciniata</i> (L.) Mill
		<i>Medicago lupulina</i> L.
		<i>Medicago minima</i> (L.) Grufb
		<i>Medicago polymorpha</i> L.
		<i>Oxytropis chiliophylla</i> Royle ex Benth.
		<i>Robinia pseudo-acacia</i> L.
		<i>Trifolium repens</i> L.
		<i>Trigonella monantha</i> C. A. Meyer
		<i>Vicia hirsuta</i> (L.) S. F. Gray
		<i>Vicia sativa</i> L.
		<i>Pisum sativum</i> L.
15	Mimosaceae R. Br.	<i>Acacia modesta</i> Wall.
		<i>Acacia nilotica</i> (Linn.) Delile
16.	Caesalpinaceae R. Br.	<i>Caesalpinia decapetala</i> (Roth) Alston
17.	Polygalaceae Hoffmannns. & Link	<i>Polygala abyssinica</i> R.Br. ex Fresen.
18.	Rosaceae Juss.	<i>Agrimonia eupatoria</i> L.
		<i>Cotoneaster microphyllus</i> Wall. ex Lindl.
		<i>Cotoneaster nummularia</i> Fisch. & Mey.
		<i>Crataegus songarica</i> K. Koch.
		<i>Duchesnea indica</i> (Andre.) Focke
		<i>Eriobotrya japonica</i> (Thunb.) Lindl.
		<i>Fragaria nubicola</i> (Lindl. ex Hook.f.) Lacaita
		<i>Malus pumila</i> Mill.
		<i>Potentilla nepalensis</i> Hook.f.
		<i>Prunus armeniaca</i> L.
		<i>Prunus cornuta</i> (Wall. ex Royle) Steud
		<i>Prunus dulcis</i> (Mill.) D.A.Webb Syn. <i>Prunus amygdalus</i> Stokes
		<i>Prunus domestica</i> L.

		<i>Prunus persica</i> (L.)Batsch
		<i>Pyrus bretschneideri</i> Rehder
		<i>Pyrus communis</i> L.
		<i>Pyrus pashia</i> Buch.-Ham. ex D.Don
		<i>Pyrus pyrifolia</i> (Burm. f.) Nakai
		<i>Pyrus sinkiangensis</i> T. T. Yu
		<i>Rosa banksiae</i> W. T. Ait.
		<i>Rosa macrophylla</i> Lindl.
		<i>Rosa moschata</i> Herrm.
		<i>Rosa webbiana</i> Wall. ex Royle
		<i>Rubus ellipticus</i> Smith.
		<i>Rubus fruticosus</i> L.
		<i>Rubus ulmifolius</i> Schott.
		<i>Sorbaria tomentosa</i> (Lindl.) Rehder
		<i>Spiraea nervosa</i> Franch & Sav.
		<i>Sibbaldia procumbens</i> L.
19.	Elaeagnaceae Juss.	<i>Elaeagnus umbellata</i> Thunb.
20.	Rhamnaceae Juss.	<i>Ziziphus jujuba</i> Mill.
		<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.
		<i>Ziziphus mauritiana</i> var. <i>spontanea</i> (Edgew.) R.R Stewart ex Qaiser & Nazim.
		<i>Ziziphus oxyphylla</i> Edgew.
21.	Ulmaceae Mirb.	<i>Celtis australis</i> L.
22.	Canabinaceae Martinov.	<i>Cannabis sativa</i> L.
23.	Moraceae Gaudich	<i>Broussonetia papyrifera</i> (L.) L’Herit. ex Vent.
		<i>Ficus benjamina</i> L.
		<i>Ficus carica</i> L.
		<i>Ficus palmata</i> Forsk.
		<i>Ficus pumila</i> L.
		<i>Morus alba</i> L.

		<i>Morus nigra</i> L.
24.	Urticaceae Juss.	<i>Debregeassia salcifolia</i> (D.Don) Rendl.
		<i>Girardinia palmata</i> (Forssk.) Gaudich.
		<i>Pilea umbrosa</i> Blume
		<i>Urtica dioica</i> L.
		<i>Urtica pilulifera</i> L.
25.	Fagaceae Dumort.	<i>Quercus dilatata</i> Royle
		<i>Quercus incana</i> Roxb.
		<i>Quercus semecarpifolia</i> Sm.
26.	Juglandaceae DC. ex Perleb	<i>Juglans regia</i> L.
27.	Betulaceae Gray	<i>Alnus nitida</i> (Spach) Endl.
28.	Cucurbitaceae Juss.	<i>Citrullus colocynthis</i> (L.) Shard.
		<i>Cucumis sativus</i> L.
		<i>Cucurbita maxima</i> Duch. ex Lam.,
		<i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poir.
		<i>Lagenaria siceraria</i> (Molina) Standl.
		<i>Luffa cylindrica</i> (L.) Roem.
		<i>Momordica charantia</i> L.
29.	Celastraceae R. Br.	<i>Maytenus royleanus</i> (Wall. ex Lawson) Cufodontis Syn. <i>Gymnosporia royleana</i> Wall. ex M.A.Lawson
30.	Oxalidaceae R. Br.	<i>Oxalis corniculata</i> L.
31.	Guttiferae Juss.	<i>Hypericum oblongifolium</i> Choisy
		<i>Hypericum perforatum</i> L.
32.	Violaceae Batsch	<i>Viola betonicifolia</i> Sm.
		<i>Viola piolsa</i> Blume
		<i>Viola canescens</i> Wall. ex Roxb.
33.	Salicaceae Mirb.	<i>Populus alba</i> L.
		<i>Populus nigra</i> L.
		<i>Salix babylonica</i> L.
34.	Euphorbiaceae R. Br.	<i>Andrachne cordifolia</i> (Wall.ex Decne.) Muell.

		<i>Chrozophora tinctoria</i> (L.) Raf.
		<i>Ricinus communis</i> L.
		<i>Euphorbia falcata</i> L.
		<i>Euphorbia helioscopia</i> L.
		<i>Euphorbia hirta</i> L.
		<i>Euphorbia indica</i> Lam.
		<i>Euphorbia prostrata</i> Ait.
		<i>Euphorbia wallichii</i> Hook.f.
35.	Geraniaceae Juss.	<i>Erodium cicutarium</i> (L.)L'Hér.
		<i>Geranium collinum</i> Steph .ex Wild.
		<i>Geranium nepalense</i> Sweet, Geran.
		<i>Geranium ocellatum</i> Camb.
		<i>Geranium rotundifolium</i> L.
		<i>Geranium wallichianum</i> D.Don ex Sweet
36.	Onagraceae Juss.	<i>Epilobium laxum</i> Royle
		<i>Oenothera rosea</i> L.
37.	Myrtaceae Juss.	<i>Callistemon lanceolatus</i> (Sm.) Sweet
		<i>Eucalyptus camaldulensis</i> Dehnh.
		<i>Eucalyptus globulus</i> Labill.
		<i>Myrtus communis</i> L.
38.	Punicaceae	<i>Punica granatum</i> L.
39.	Anacardiaceae R. Br.	<i>Cotinus coggyria</i> Scop.
		<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f.
40.	Sapindaceae Juss.	<i>Dodonaea viscosa</i> (L.) Jacq.
41.	Hippocastinaceae	<i>Aesculus indica</i> (Wall.ex. Camb.) Hook.f.
42.	Rutaceae Juss.	<i>Citrus limon</i> (L.) Osbeck
		<i>Citrus media</i> L.
		<i>Citrus sinensis</i> (L.) Osbeck
		<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp.

		<i>Zanthoxylum armatum</i> DC.
43.	Simaroubaceae DC.	<i>Ailanthus altissima</i> (Mill) Swingle
44.	Meliaceae Juss.	<i>Melia azedarach</i> L.
45.	Malvaceae Juss.	<i>Abelmoschus esculentus</i> (L.) Moench.
		<i>Malva neglecta</i> Wall.
		<i>Malva parviflora</i> L.
46.	Thymelaeaceae Juss	<i>Daphne mucronata</i> Royle
		<i>Wikstroemia canescens</i> Wall. ex Meisn.
47.	Brassicacaceae Burnett	<i>Arabis amplexicaulis</i> Edgew
		<i>Alliaria petiolata</i> (M. Bieb) Cavara
		<i>Brassica oleraceae</i> Var. <i>botrytis</i> L.
		<i>Brassica rapa</i> subsp. <i>campestris</i> (L.) Clapham
		<i>Brassica rapa</i> subsp. <i>Rapa</i>
		<i>Capsella bursa pastoris</i> (L.) Medik.
		<i>Cardamine flexuosa</i> With.
		<i>Coronopus didymus</i> (L.) Smith
		<i>Descurainia sophia</i> (L.) Webb & Berth.
		<i>Lepidium apetalum</i> Willd.
		<i>Lepidium sativum</i> L.
		<i>Nasturtium officinale</i> R. Br.
		<i>Neslia apiculata</i> Fisch., C.A. Mey. & Ave
		<i>Raphanus sativus</i> L.
		<i>Sisymbrium irio</i> L.
48.	Polygonaceae Juss.	<i>Thlaspi arvense</i> L.
		<i>Thlaspi griffithianum</i> (Boiss.) Boiss.
48.	Plumbaginaceae Juss.	<i>Limonium gilesii</i> (Hemsl.) Rech. f.
49.	Polygonaceae Juss.	<i>Bistorta amplexicaulis</i> (D. Don) Green
		<i>Persicaria barbata</i> (L.) Hara
		<i>Polygonum arenastrum</i> boreau

		<i>Polygonum aviculare</i> L.
		<i>Polygonum plebejum</i> R. Br.
		<i>Rheum australe</i> D. Don
		<i>Rumex dentatus</i> L.
		<i>Rumex hastatus</i> D. Don.
50.	Caryophyllaceae Juss.	<i>Silene conoidea</i> L.
		<i>Silene vulgaris</i> (Moench) Garcke
		<i>Stellaria media</i> (L.) Cyr.
51.	Amaranthaceae Juss.	<i>Achyranthes aspera</i> L.
		<i>Alternanthera pungens</i> Kunth
		<i>Amaranthus spinosus</i> L.
		<i>Amaranthus viridis</i> L.
52.	Chenopodiaceae Vent.	<i>Chenopodium album</i> L.
		<i>Chenopodium ambrosioides</i> L.
		<i>Chenopodium botrys</i> L.
		<i>Chenopodium murale</i> Linn.
53.	Aizoaceae Martinov	<i>Portulaca oleracea</i> L.
		<i>Trianthema portulacastrum</i> L.
54.	Nyctaginaceae Juss.	<i>Mirabilis jalapa</i> L.
55.	Balsaminaceae A. Rich.	<i>Impatiens bicolor</i> Royle
		<i>Impatiens brachycentra</i> Kar. & Kir.
		<i>Impatiens edgeworthii</i> Hook.f.
		<i>Impatiens glandulifera</i> Royle
56.	Polemoniaceae Juss.	<i>Polemonium caeruleum</i> L.
57.	Sapotaceae R. Br.	<i>Monothea buxifolia</i> (Falc.) A. DC
58.	Ebenaceae Gürke	<i>Diospyros kaki</i> L.
		<i>Diospyros lotus</i> L.
59.	Myrsinaceae Juss	<i>Myrsine africana</i> L.

60.	Primulaceae Batsch ex Borkh.	<i>Anagalis arvensis</i> Linn.
		<i>Androsace rotundifolia</i> Hardw.
		<i>Primula denticulata</i> Sm.
		<i>Primula macrophylla</i> D.Don.
61.	Rubiaceae Juss.	<i>Galium aparine</i> L.
		<i>Galium tetraphyllum</i> Nazim. & Ehrend
		<i>Himalrandia tetrasperma</i> (Roxb.) Yamazaki
62.	Gentianaceae Juss.	<i>Gentiana kurroo</i> Royle.
		<i>Gentianodes argentea</i> (Royle ex D.Don) Omer
		<i>Swertia alata</i> (D. Don) C. B Clarke.
		<i>Swertia cordata</i> (G. Don) Clarke
		<i>Swertia petiolata</i> D.Don
63.	Apocynaceae Juss.	<i>Nerium oleander</i> L.
64.	Asclepiadaceae Borkh.	<i>Calotropis procera</i> (Ait.) Ait. f.
		<i>Caralluma edulis</i> (Edgew.) Benth. ex Hook.f.
		<i>Periploca aphylla</i> Decne.
65.	Boraginaceae Juss.	<i>Arnebia linearifolia</i> A.DC.
		<i>Buglossoides arvensis</i> (L.) Johnston.
		<i>Cynoglossum glochidiatum</i> Wall. ex Benth.
		<i>Cynoglossum lanceolatum</i> Forsk.
		<i>Ehretia obtusifolia</i> Hochst. ex DC.
		<i>Heliotropium eurapeum</i> L.
66.	Convolvulaceae Juss.	<i>Convolvulus arvensis</i> L.
		<i>Ipomoea purpurea</i> (L) Roth.
67.	Cuscutaceae	<i>Cuscuta reflexa</i> Roxb.
68.	Solanaceae Juss.	<i>Capsicum annum</i> L.
		<i>Datura innoxia</i> Mill.
		<i>Datura stramonium</i> Linn.
		<i>Hyoscyamus niger</i> L.
		<i>Lycopersicon esculentum</i> Mill.

		<i>Nicotiana tabacum</i> L.
		<i>Physalis divaricata</i> D. Don.
		<i>Solanum nigrum</i> L.
		<i>Solanum pseudo-capsicum</i> L.
		<i>Solanum Surattense</i> Burm.f.
		<i>Solanum tuberosum</i> L.
		<i>Withania somnifera</i> (L.) Dunal
69.	Oleaceae Hoffmannns. & Link	<i>Jasminum humile</i> L.
		<i>Jasminum officinale</i> L.
		<i>Olea ferruginea</i> Wall. ex Aitch. Syn. <i>Olea cupidata</i> Wall ex G. Don
70.	Plantaginaceae Juss.	<i>Plantago lanceolata</i> L.
		<i>Plantago major</i> L.
71.	Scrophulariaceae Juss.	<i>Euphrasia himalayica</i> Wettst.
		<i>Pedicularis bicornuta</i> Kl.
		<i>Verbascum thapsus</i> L.
		<i>Veronica anagallis-aquatic</i> L.
		<i>Veronica laxa</i> Benth.
		<i>Veronica polita</i> Fr.
		<i>Wulfenia amherstiana</i> Bth.
72.	Acanthaceae Juss.	<i>Dicliptra bupleorides</i> Nees.
		<i>Justicia adhatoda</i> L.
		<i>Strobilanthes urticifolia</i> Wall. ex Kuntze
73.	Buddlejaceae	<i>Buddleja crispa</i> Benth.
74.	Verbenaceae J.St.-Hil.	<i>Verbena officinalis</i> L.
		<i>Vitex negundo</i> L.
75.	Lamiaceae Martinov	<i>Ajuga bracteosa</i> Wall.ex Benth
		<i>Ajuga parviflora</i> Benth.
		<i>Isodon rugosus</i> (Wall. Ex Bth.) Codd
		<i>Lamium amplexicaule</i> L.

		<i>Mentha longifolia</i> (L.) Huds.
		<i>Mentha spicata</i> L.
		<i>Micromeria biflora</i> Buch.
		<i>Nepeta govaniana</i> (Buch.-Ham. ex D. Don) Benth.
		<i>Nepeta laevigata</i> (D. Don) Hand.
		<i>Ocimum basilicum</i> L.
		<i>Origanum vulgare</i> L.
		<i>Otostegia limbata</i> (Benth.) Boiss.
		<i>Phlomis bracteosa</i> Royle .ex Benth.
		<i>Prunella vulgaris</i> L.
		<i>Salvia lanata</i> Roxb.
		<i>Salvia moocroftiana</i> wall ex Bth.
		<i>Salvia nubicola</i> Will ex. Sweet
		<i>Stachys parviflora</i> Benth
		<i>Teucrium stocksianum</i> Boiss.
		<i>Thymus linearis</i> Benth.
76.	Campanulaceae Juss.	<i>Campanula pallida</i> Wall.
		<i>Campanula tenuisssima</i> Dunn
77.	Asteraceae Bercht. & J. Presl	<i>Achillea millefolium</i> L
		<i>Anaphalis triplinervis</i> (Slims) C. B. Clarke
		<i>Anthemis cotula</i> L.
		<i>Artemisia dubia</i> Wall.
		<i>Artemisia maritima</i> L.
		<i>Artemisia santolinifolia</i> Turcz. ex Krasch
		<i>Artemisia scoparia</i> Waldst Kitam.
		<i>Artemisia vulgaris</i> L.
		<i>Bidens cernua</i> L.
		<i>Calendula arvensis</i> L.
		<i>Calendula officinale</i> L.

	<i>Carpesium cernuum</i> L.
	<i>Carthamus lanatus</i> L.
	<i>Carthamus oxycantha</i> M. Bieb
	<i>Centaurea iberica</i> Trev. ex. Spreng.
	<i>Cichorium intybus</i> L.
	<i>Cirsium falconeri</i> (Hook. f.) Petrak.
	<i>Cirsium arvense</i> (L.) Scop.
	<i>Crepis multicaulis</i> Leded.
	<i>Echinops griffithianus</i> Boiss.
	<i>Eclipta prostrata</i> (L.) L.
	<i>Erigeron bonariensis</i> L. (Syn. <i>Conyza bonariensis</i> (L.) Cronquist.)
	<i>Erigeron canadensis</i> L. (Syn. <i>Conyza canadensis</i> (L.) Cronquist.)
	<i>Galinsoga parviflora</i> Cav.
	<i>Helianthus annuus</i> L.
	<i>Lactuca serriola</i> L.
	<i>Launea procumbens</i> (Roxb.) Ramayya & Rajagopal
	<i>Leontopodium himalayanum</i> DC.
	<i>Onopordum acanthium</i> L.
	<i>Phagnalon niveum</i> Edgew.
	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke)
	<i>Senecio chrysanthemoides</i> DC.
	<i>Serratula pallida</i> DC.
	<i>Silybum marianum</i> (L.) Gaertn.
	<i>Sonchus asper</i> (L.) Hill.
	<i>Sonchus oleraceus</i> L.
	<i>Tagetes minuta</i> L.
	<i>Taraxacum officinale</i> F. H. Wiggers
	<i>Tragopogon gracilis</i> D. Don

		<i>Tussilago farfara</i> L.
		<i>Xanthium strumarium</i> L.
78.	Caprifoliaceae Juss.	<i>Viburnum cotinifolium</i> D.Don.
		<i>Viburnum grandiflorum</i> Wall. ex DC.
79.	Sambucaceae	<i>Sambucus wightiana</i> Wall ex Wight. & Arn.
80.	Araliaceae Juss.	<i>Hedera nepalensis</i> K. Koch.
81.	Valerianaceae Batsch.	<i>Valeriana jatamansi</i> Jones
82.	Apiaceae Lindl.	<i>Bunium persicum</i> (Boiss) Fedtsch.
		<i>Bupleurum falcatum</i> L.
		<i>Chaerophyllum villosum</i> Wall ex. DC.
		<i>Clinopodium umbrosum</i> (M.Bieb.) C. Koch (<i>Calamentha umbrosa</i> (M. Bieb.) Fisch. & Meyer)
		<i>Coriandrum sativum</i> L.
		<i>Eryngium coeruleum</i> M-Bieb
		<i>Foeniculum vulgare</i> Mill.
		<i>Pimpinella acuminata</i> (Edgew.) C.B. Clarke
		<i>Pimpinella diversifolia</i> DC.
		<i>Scandix pecten-veneris</i> Linn.
		<i>Seseli libanotis</i> (L) W. Koch

**Table-II. Species Wise Enumeration of Vascular Plant Biodiversity at Malam Jabba
Valley, Hindu Kush Range Swat**

S.#	Species	Genus	Family	Habit	Voucher No.
1.	<i>Abelmoschus esculentus</i> (L.) Moench.	<i>Abelmoschus</i> Medic.	Malvaceae	Herb	A. Razzaq 305
2.	<i>Abies pindrow</i> Royle	<i>Abies</i> Mill.	Pinaceae	Tree	A. Razzaq 31
3.	<i>Acacia modesta</i> Wall.	<i>Acacia</i> Mill.	Mimosaceae	Tree	A. Razzaq 309
4.	<i>Acacia nilotica</i> (Linn.) Delile	<i>Acacia</i> Mill.	Mimosaceae	Shrub	A. Razzaq 310
5.	<i>Achillea millefolium</i> L.	<i>Achillea</i> L.	Asteraceae	Herb	A. Razzaq 151
6.	<i>Achyranthes aspera</i> L.	<i>Achyranthes</i> L.	Amaranthaceae	Herb	A. Razzaq 129
7.	<i>Aconitum chasmanthum</i> Stapf ex Holmes	<i>Aconitum</i> L.	Ranunculaceae	Herb	A. Razzaq 375
8.	<i>Aconitum heterophyllum</i> Wall. ex Royle	<i>Aconitum</i> L.	Ranunculaceae	Herb	A. Razzaq 376
9.	<i>Acorus calamus</i> L.	<i>Acorus</i> L.	Araceae	Herb	A. Razzaq 45
10.	<i>Acrachne racemosa</i> (B. Heyne ex Roth) Ohwi	<i>Acrachne</i> Chiov.	Poaceae	Herb	A. Razzaq 73
11.	<i>Adiantum capillus-veneris</i> L.	<i>Adiantum</i> L.	Adiantaceae	Herb	A. Razzaq 1
12.	<i>Adiantum incisum</i> Forssk.	<i>Adiantum</i> L.	Adiantaceae	Herb	A. Razzaq 2
13.	<i>Adiantum pedatum</i> L.	<i>Adiantum</i> L.	Adiantaceae	Herb	A. Razzaq 3
14.	<i>Adiantum venustum</i> D. Don.	<i>Adiantum</i> L.	Adiantaceae	Herb	A. Razzaq 4
15.	<i>Adonis aestivalis</i> L.	<i>Adonis</i> L.	Ranunculaceae	Herb	A. Razzaq 377
16.	<i>Aesculus indica</i> (Wall. ex. Camb.) Hook. f.	<i>Aesculus</i> L.	Hippocastinaceae	Tree	A. Razzaq 283
17.	<i>Agrimonia eupatoria</i> L.	<i>Agrimonia</i> L.	Rosaceae	Herb	A. Razzaq 394
18.	<i>Agrostis stolonifera</i> L.	<i>Agrostis</i> L.	Poaceae	Herb	A. Razzaq 74
19.	<i>Ailanthus altissima</i> (Mill) Swingle	<i>Ailanthus</i> Desf.	Simaroubaceae	Tree	A. Razzaq 446
20.	<i>Ajuga bracteosa</i> Wall. ex Benth	<i>Ajuga</i> L.	Lamiaceae	Herb	A. Razzaq 285
21.	<i>Ajuga parviflora</i> Benth.	<i>Ajuga</i> L.	Lamiaceae	Herb	A. Razzaq 286
22.	<i>Alisma plantago-aquatica</i> L.	<i>Alisma</i> L.	Alismataceae	Herb	A. Razzaq 38
23.	<i>Allantodia Aspera</i> (Blume) Ching. Syn. <i>Diplazium polypodioides</i> Blume	<i>Allantodia</i> R. Br.	Athyriaceae	Herb	A. Razzaq 9
24.	<i>Alliaria petiolata</i> (M. Bieb) Cavara	<i>Alliaria</i> Scop.	Brassicaceae	Herb	A. Razzaq 206

25.	<i>Allium cepa</i> L.	<i>Allium</i> L.	Alliaceae	Herb	A.Razzaq 40
26.	<i>Allium humile</i> Kunth.	<i>Allium</i> Kunth.	Alliaceae	Herb	A.Razzaq 41
27.	<i>Allium sativum</i> L.	<i>Allium</i> L.	Alliaceae	Herb	A.Razzaq 42
28.	<i>Alnus nitida</i> (Spach) Endl.	<i>Alnu</i> Mill.	Betulaceae	Tree	A. Razzaq 197
29.	<i>Alopecurus myosuroides</i> Huds.	<i>Alopecurus</i> L.	Poaceae	Herb	A.Razzaq 76
30.	<i>Alternanthera pungens</i> Kunth	<i>Alternanthera</i> Forssk.	Amaranthaceae	Herb	A. Razzaq 130
31.	<i>Amaranthus spinosus</i> L.	<i>Amaranthus</i> L.	Amaranthaceae	Herb	A. Razzaq 131
32.	<i>Amaranthus viridis</i> L.	<i>Amaranthus</i> L.	Amaranthaceae	Herb	A. Razzaq 132
33.	<i>Anagalis arvensis</i> Linn.	<i>Anagallis</i> L.	Primulaceae	Herb	A. Razzaq 370
34.	<i>Anaphalis triplinervis</i> (Slims) C. B. Clarke	<i>Anaphalis</i> DC.	Asteraceae	Herb	A. Razzaq 152
35.	<i>Andrachne cordifolia</i> (Wall.ex Decne.) Muell.	<i>Andrachne</i> L.	Euphorbiaceae	Shrub	A. Razzaq 256
36.	<i>Androsace rotundifolia</i> Hardw.	<i>Androsace</i> L.	Primulaceae	Herb	A. Razzaq 371
37.	<i>Anthemis cotula</i> L.	<i>Anthemis</i> L.	Asteraceae	Herb	A. Razzaq 153
38.	<i>Apluda mutica</i> L.	<i>Apluda</i> L.	Poaceae	Herb	A.Razzaq 77
39.	<i>Aquilegia pubiflora</i> Wall.ex Royle	<i>Aquilegia</i> L.	Ranunculaceae	Herb	A. Razzaq 378
40.	<i>Arabis amplexicaulis</i> Edgew	<i>Arabis</i> L.	Brassicacaceae	Herb	A. Razzaq 205
41.	<i>Arisaema flavum</i> (Forsk.) Schott	<i>Arisaema</i> Mart.	Araceae	Herb	A.Razzaq 46
42.	<i>Arisaema jacquemontii</i> Blume	<i>Arisaema</i> Mart.	Araceae	Herb	A.Razzaq 47
43.	<i>Arisaema utile</i> Hook. f. ex Schott	<i>Arisaema</i> Mart.	Araceae	Herb	A.Razzaq 48
44.	<i>Aristida adscensionis</i> L.	<i>Aristida</i> L.	Poaceae	Herb	A.Razzaq 78
45.	<i>Aristida cyanantha</i> Nees ex Steud.	<i>Aristida</i> L.	Poaceae	Herb	A.Razzaq 79
46.	<i>Arnebia linearifolia</i> A.DC.	<i>Arnebia</i> Clarke	Boraginaceae	Herb	A. Razzaq 198
47.	<i>Artemisia dubia</i> Wall.	<i>Artemisia</i> L.	Asteraceae	Shrub	A. Razzaq 154
48.	<i>Artemisia maritima</i> L.	<i>Artemisia</i> L.	Asteraceae	Shrub	A. Razzaq 155
49.	<i>Artemisia santolinifolia</i> Turcz. ex Krasch	<i>Artemisia</i> L.	Asteraceae	Shrub	A. Razzaq 156
50.	<i>Artemisia scoparia</i> Waldst Kitam.	<i>Artemisia</i> L.	Asteraceae	Shrub	A. Razzaq 157
51.	<i>Artemisia vulgaris</i> L.	<i>Artemisia</i> L.	Asteraceae	Shrub	A. Razzaq 158
52.	<i>Arthraxon prionodes</i> (Steud.) Dandy.	<i>Arthraxon</i> P. Beauv.	Poaceae	Herb	A.Razzaq 80

53.	<i>Arundo donax</i> L.	<i>Arundo</i> L.	Poaceae	Herb	A.Razzaq 81
54.	<i>Asparagus capitatus</i> subsp. <i>gracilis</i> Browicz (Syn. <i>Asparagus gracilis</i> Royle)	<i>Asparagus</i> L.	Asparagaceae	Shrub	A.Razzaq 50
55.	<i>Asparagus officinalis</i> L.	<i>Asparagus</i> L.	Asparagaceae	Shrub	A.Razzaq 51
56.	<i>Asphodelus tenuifolius</i> Cav.	<i>Asphodelus</i> L.	Asphodelaceae	Herb	A.Razzaq 53
57.	<i>Asplenium adiantum-nigrum</i> L.	<i>Asplenium</i> L.	Aspleniaceae	Herb	A.Razzaq 5
58.	<i>Asplenium ceterach</i> L. Syn. <i>Ceterach officinarum</i> Willd.	<i>Asplenium</i> L.	Aspleniaceae	Herb	A.Razzaq 6
59.	<i>Asplenium dalhousiae</i> Hook. Syn. <i>Ceterach dalhousiae</i> (Hook.) C. Chr	<i>Asplenium</i> L.	Aspleniaceae	Herb	A.Razzaq 8
60.	<i>Asplenium trichomanes</i> L.	<i>Asplenium</i> L.	Aspleniaceae	Herb	A.Razzaq 7
61.	<i>Astragalus graveolens</i> Benth.	<i>Astragalus</i> L.	Papilionaceae	Herb	A. Razzaq 334
62.	<i>Astragalus pyrrotrichous</i> Boiss.	<i>Astragalus</i> L.	Papilionaceae	Herb	A. Razzaq 335
63.	<i>Athyrium filix-femina</i> (L.) Roth	<i>Athyrium</i> Roth	Athyraceae	Herb	A.Razzaq 10
64.	<i>Athyrium mackinnoni</i> (C. Hope) C. Chr.	<i>Athyrium</i> Roth	Athyraceae	Herb	A.Razzaq 11
65.	<i>Athyrium rupicola</i> (Edgew. ex. C. Hope) C. Chr.	<i>Athyrium</i> Roth	Athyraceae	Herb	A.Razzaq 12
66.	<i>Avena fatua</i> L.	<i>Avena</i> L.	Poaceae	Herb	A.Razzaq 82
67.	<i>Berberis lycium</i> Royle	<i>Berberis</i> L.	Berberidaceae	Shrub	A. Razzaq 196
68.	<i>Bergenia ciliata</i> (Haw.) Sternb.	<i>Bergenia</i> Moench.	Saxifragaceae	Herb	A. Razzaq 438
69.	<i>Bidens cernua</i> L.	<i>Bidens</i> L.	Asteraceae	Herb	A. Razzaq 159
70.	<i>Bistorta amplexicaulis</i> (D. Don) Green	<i>Bistorta</i> Adans	Polygonaceae	Herb	A. Razzaq 362
71.	<i>Brachiaria ramosa</i> (L.) Stapf	<i>Brachiaria</i> (Trin.) Griseb.	Poaceae	Herb	A.Razzaq 83
72.	<i>Brachypodium distachyon</i> (L.) Beauv	<i>Brachypodium</i> P.Beauv	Poaceae	Herb	A.Razzaq 84
73.	<i>Brassica oleraceae</i> Var. <i>botrytis</i> L.	<i>Brassica</i> L.	Brassicaceae	Herb	A. Razzaq 207
74.	<i>Brassica rapa</i> subsp. <i>campestris</i> (L.) Clapham	<i>Brassica</i> L.	Brassicaceae	Herb	A. Razzaq 208
75.	<i>Brassica rapa</i> subsp. <i>Rapa</i>	<i>Brassica</i> L.	Brassicaceae	Herb	A. Razzaq 209
76.	<i>Bromus japonicus</i> Thunb. ex Murr.	<i>Bromus</i> L.	Poaceae	Herb	A.Razzaq 85

77.	<i>Broussonetia papyrifera</i> (L.) L'Herit. ex Vent.	<i>Broussonetia</i> (L.) L'Herit. ex Vent.	Moraceae	Tree	A. Razzaq 311
78.	<i>Buddleja crispa</i> Benth.	<i>Buddleja</i> L.	Buddlejaceae	Shrub	A. Razzaq 222
79.	<i>Buglossoides arvensis</i> (L.) Johnston.	<i>Buglossoides</i> Moench.	Boraginaceae	Herb	A. Razzaq 199
80.	<i>Bunium persicum</i> (Boiss) Fedtsch.	<i>Bunium</i> L.	Apiaceae	Herb	A. Razzaq 135
81.	<i>Bupleurum falcatum</i> L.	<i>Bupleurum</i> L.	Apiaceae	Herb	A. Razzaq 136
82.	<i>Buxus wallichiana</i> Baill	<i>Buxus</i> L.	Buxaceae	Shrub	A. Razzaq 223
83.	<i>Caesalpinia decapetala</i> (Roth) Alston	<i>Caesalpinia</i> L.	Caesalpinaceae	Shrub	A. Razzaq 225
84.	<i>Calendula arvensis</i> L.	<i>Calendula</i> L.	Asteraceae	Herb	A. Razzaq 160
85.	<i>Calendula officinale</i> L.	<i>Calendula</i> L.	Asteraceae	Herb	A. Razzaq 161
86.	<i>Callistemon lanceolatus</i> (Sm.) Sweet	<i>Callistemon</i> R.Br.	Myrtaceae	Tree	A. Razzaq 319
87.	<i>Calotropis procera</i> (Ait.) Ait. f.	<i>Calotropis</i> R. Br.	Asclepiadaceae	Shrub	A. Razzaq 148
88.	<i>Caltha alba</i> Camb.	<i>Caltha</i> L.	Ranunculaceae	Herb	A. Razzaq 379
89.	<i>Campanula pallida</i> Wall.	<i>Campanula</i> L.	Campanulaceae	Herb	A. Razzaq 226
90.	<i>Campanula tenuississima</i> Dunn	<i>Campanula</i> L.	Campanulaceae	Herb	A. Razzaq 227
91.	<i>Cannabis sativa</i> L.	<i>Cannabis</i> L.	Canabinaceae	Shrub	A. Razzaq 228
92.	<i>Capsella bursa pastoris</i> (L.) Medik.	<i>Capsella</i> Medik.	Brassicaceae	Herb	A. Razzaq 210
93.	<i>Capsicum annum</i> L.	<i>Capsicum</i> L.	Solanaceae	Herb	A. Razzaq 447
94.	<i>Caralluma edulis</i> (Edgew.) Benth. ex Hook.f.	<i>Caralluma</i> R. Brown.	Asclepiadaceae	Herb	A. Razzaq 149
95.	<i>Cardamine flexuosa</i> With.	<i>Cardamine</i> L.	Brassicaceae	Herb	A. Razzaq 211
96.	<i>Carex acutiformis</i> Ehrh.	<i>Carex</i> L.	Cyperaceae	Herb	A. Razzaq 56
97.	<i>Carex fedia</i> Nees	<i>Carex fedia</i> L.	Cyperaceae	Herb	A. Razzaq 57
98.	<i>Carpesium cernuum</i> L.	<i>Carpesium</i> L.	Asteraceae	Herb	A. Razzaq 162
99.	<i>Carthamus lanatus</i> L.	<i>Carthamus</i> L.	Asteraceae	Herb	A. Razzaq 163
100.	<i>Carthamus oxycantha</i> M. Bieb	<i>Carthamus</i> L.	Asteraceae	Herb	A. Razzaq 164
101.	<i>Catabrosa aquatica</i> (L.) P. Beauv.	<i>Catabrosa</i> P. Beauv.	Poaceae	Herb	A. Razzaq 86

102.	<i>Cedrus deodara</i> (Roxb. ex D. Don) G. Don	<i>Cedrus</i> Trew	Pinaceae	Tree	A. Razzaq 32
103.	<i>Celtis australis</i> L.	<i>Celtis</i> L.	Ulmaceae	Tree	A. Razzaq 461
104.	<i>Cenchrus ciliaris</i> L.	<i>Cenchrus</i> L.	Poaceae	Herb	A. Razzaq 87
105.	<i>Centaurea iberica</i> Trev. ex. Spreng.	<i>Centaurea</i> L.	Asteraceae	Herb	A. Razzaq 165
106.	<i>Chaeorphyllum villosum</i> Wall ex. DC.	<i>Chaeorphyllum</i> L.	Apiaceae	Herb	A. Razzaq 137
107.	<i>Cheilanthes farinosa</i> (Forssk.) Kaulf.	<i>Cheilanthes</i> Swartz	Pteridaceae	Herb	A. Razzaq 21
108.	<i>Chenopodium album</i> L.	<i>Chenopodium</i> L.	Chenopodiaceae	Herb	A. Razzaq 235
109.	<i>Chenopodium ambrosioides</i> L.	<i>Chenopodium</i> L.	Chenopodiaceae	Herb	A. Razzaq 236
110.	<i>Chenopodium botrys</i> L.	<i>Chenopodium</i> L.	Chenopodiaceae	Herb	A. Razzaq 237
111.	<i>Chenopodium murale</i> Linn.	<i>Chenopodium</i> L.	Chenopodiaceae	Herb	A. Razzaq 238
112.	<i>Chrozophora tinctoria</i> (L.) Raf.	<i>Chrozophora</i> Neck. ex A. Juss	Euphorbiaceae	Herb	A. Razzaq 257
113.	<i>Chrysopogon serrulatus</i> Trin.	<i>Chrysopogon</i> Trin.	Poaceae	Herb	A. Razzaq 88
114.	<i>Cichorium intybus</i> L.	<i>Cichorium</i> L.	Asteraceae	Herb	A. Razzaq 166
115.	<i>Cirsium falconeri</i> (Hook. f.) Petrak.	<i>Cirsium</i> Mill.	Asteraceae	Herb	A. Razzaq 167
116.	<i>Cirsium arvense</i> (L.) Scop.	<i>Cirsium</i> Mill.	Asteraceae	Herb	A. Razzaq 168
117.	<i>Citrullus colocynthis</i> (L.) Shard.	<i>Citrullus</i> Schrad. ex Eckl.	Cucurbitaceae	Herb	A. Razzaq 245
118.	<i>Citrus limon</i> (L.) Osbeck	<i>Citrus limon</i> L.	Rutaceae	Shrub	A. Razzaq 426
119.	<i>Citrus media</i> L.	<i>Citrus</i> L.	Rutaceae	Small tree	A. Razzaq 427
120.	<i>Citrus sinensis</i> (L.) Osbeck	<i>Citrus</i> L.	Rutaceae	Tree	A. Razzaq 428
121.	<i>Clematis connata</i> DC.	<i>Clematis</i> L.	Ranunculaceae	Climber	A. Razzaq 380
122.	<i>Clematis grata</i> Wall.	<i>Clematis</i> L.	Ranunculaceae	Climber	A. Razzaq 381
123.	<i>Clinopodium umbrosum</i> (M. Bieb.) C. Koch (<i>Calamentha umbrosa</i> (M. Bieb.) Fisch. & Meyer)	<i>Clinopodium</i> L.	Apiaceae	Herb	A. Razzaq 138
124.	<i>Colchicum luteum</i> Baker	<i>Colchicum</i> L.	Colchicaceae	Herb	A. Razzaq 54

125.	<i>Colocasia esculenta</i> (L.) Schott	<i>Colocasia</i> Schott	Araceae	Herb	A.Razzaq 49
126.	<i>Commelina benghalensis</i> L.	<i>Commelina</i> L.	Commelinaceae	Herb	A.Razzaq 55
127.	<i>Convolvulus arvensis</i> L.	<i>Convolvulus</i> L.	Convolvulaceae	Climber	A. Razzaq 239
128.	<i>Coriandrum sativum</i> L.	<i>Coriandrum</i> L.	Apiaceae	Herb	A. Razzaq 139
129.	<i>Coronopus didymus</i> (L.) Smith	<i>Coronopus</i> J.G.Zinn	Brassicaceae	Herb	A. Razzaq 212
130.	<i>Cotinus coggyria</i> Scop.	<i>Cotinus</i> Mill.	Anacardiaceae	Shrub	A. Razzaq 133
131.	<i>Cotoneaster microphyllus</i> Wall. ex Lindl.	<i>Cotoneaster</i> Medikus	Rosaceae	Shrub	A. Razzaq 395
132.	<i>Cotoneaster nummularia</i> Fisch. & Mey.	<i>Cotoneaster</i> Medikus	Rosaceae	Shrub	A. Razzaq 396
133.	<i>Crataegus songarica</i> K. Koch.	<i>Crataegus</i> L.	Rosaceae	Tree	A. Razzaq 397
134.	<i>Crepis multicaulis</i> Ledeb.	<i>Crepis</i> L.	Asteraceae	Herb	A. Razzaq 169
135.	<i>Cucumis sativus</i> L.	<i>Cucumis</i> L.	Cucurbitaceae	Climber	A. Razzaq 246
136.	<i>Cucurbita maxima</i> Duch. ex Lam.,	<i>Cucurbita</i> L.	Cucurbitaceae	Climber (Herb)	A. Razzaq 247
137.	<i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poir.	<i>Cucurbita</i> L.	Cucurbitaceae	Climber (Herb)	A. Razzaq 248
138.	<i>Cupressus sempervirens</i> L.	<i>Cupressus</i> L.	Cupressaceae	Tree	A.Razzaq 27
139.	<i>Cuscuta reflexa</i> Roxb.	<i>Cuscuta</i> L.	Cuscutaceae	Parasitic herb	A. Razzaq 252
140.	<i>Cyclosorus dentatus</i> (Forssk.) Ching	<i>Cyclosorus</i> Link	Thelypteridaceae	Herb	A.Razzaq 26
141.	<i>Cynodon dactylon</i> (L.) Pers.	<i>Cynodon</i> Rich.	Poaceae	Herb	A.Razzaq 89
142.	<i>Cynoglossum glochidiatum</i> Wall. ex Benth.	<i>Cynoglossum</i> L.	Boraginaceae	Herb	A. Razzaq 200
143.	<i>Cynoglossum lanceolatum</i> Forsk.	<i>Cynoglossum</i> L.	Boraginaceae	Herb	A. Razzaq 201
144.	<i>Cyperus brevifolius</i> Rottb.	<i>Cyperus</i> L.	Cyperaceae	Herb	A.Razzaq 58
145.	<i>Cyperus compressus</i> L.	<i>Cyperus</i> L.	Cyperaceae	Herb	A.Razzaq 59
146.	<i>Cyperus niveus</i> Retz.	<i>Cyperus</i> L.	Cyperaceae	Herb	A.Razzaq 60
147.	<i>Cyperus rotundus</i> L.	<i>Cyperus</i> L.	Cyperaceae	Herb	A.Razzaq 61
148.	<i>Cystopteris fragilis</i> (L.) Bernh.	<i>Cystopteris</i> Bernh.	Athyriaceae	Herb	A.Razzaq 13
149.	<i>Dactylis glomerata</i> L.	<i>Dactylis</i> L.	Poaceae	Herb	A.Razzaq 90
150.	<i>Dactyloctenium aegyptium</i> (L.) Willd.	<i>Dactyloctenium</i> Willd.	Poaceae	Herb	A.Razzaq 91

151.	<i>Daphne mucronata</i> Royle	<i>Daphne</i> L.	Thymelaeaceae	Shrub	A. Razzaq 459
152.	<i>Datura innoxia</i> Mill.	<i>Datura</i> L.	Solanaceae	Herb	A. Razzaq 448
153.	<i>Datura stramonium</i> Linn.	<i>Datura</i> L.	Solanaceae	Herb	A. Razzaq 449
154.	<i>Debregeassia salcifolia</i> (D.Don) Rendl.	<i>Debregeasia</i> Gaudich	Urticaceae	Shrub	A. Razzaq 462
155.	<i>Delphinium denudatum</i> Wall. ex Hook. f. & Thoms.	<i>Delphinium</i> L.	Ranunculaceae	Herb	A. Razzaq 382
156.	<i>Descurainia sophia</i> (L.) Webb & Berth.	<i>Descurainia</i> Webb & Berth.	Brassicaceae	Herb	A. Razzaq 213
157.	<i>Desmodium elegans</i> DC.	<i>Desmodium</i> Desv.	Papilionaceae	Shrub	A. Razzaq 336
158.	<i>Dichanthium annulatum</i> (Forssk.) Stapf	<i>Dichanthium</i> Will.	Poaceae	Herb	A. Razzaq 92
159.	<i>Dicliptera bupleorides</i> Nees.	<i>Dicliptera</i> Juss.	Acanthaceae	Herb	A. Razzaq 124
160.	<i>Digitaria ciliaris</i> (Retz.) Koeler	<i>Digitaria</i> Haller	Poaceae	Herb	A. Razzaq 93
161.	<i>Dioscorea deltoidea</i> Wall. ex Kunth	<i>Dioscorea</i> L.	Dioscoreaceae	Climber	A. Razzaq 65
162.	<i>Diospyros kaki</i> L.	<i>Diospyros</i> L.	Ebenaceae	Tree	A. Razzaq 253
163.	<i>Diospyros lotus</i> L.	<i>Diospyros</i> L.	Ebenaceae	Tree	A. Razzaq 254
164.	<i>Diplachne fusca</i> (L.) P. Beauv. ex Roem. & Schult.	<i>Diplachne</i> P. Beauv.	Poaceae	Herb	A. Razzaq 94
165.	<i>Dodonaea viscosa</i> (L.) Jacq.	<i>Dodonaea</i> L.	Sapindaceae	Shrub	A. Razzaq 436
166.	<i>Dryopteris blanfordii</i> (C. Hope) C. Christ.	<i>Dryopteris</i> Adonson	Dryopteridaceae	Herb	A. Razzaq 15
167.	<i>Dryopteris filix-mas</i> (L.) Schott	<i>Dryopteris</i> Adonson	Dryopteridaceae	Herb	A. Razzaq 16
168.	<i>Dryopteris juxtaposita</i> Chr.	<i>Dryopteris</i> Adonson	Dryopteridaceae	Herb	A. Razzaq 17
169.	<i>Dryopteris ramosa</i> (C. Hope) C. Chr.	<i>Dryopteris</i> Adonson	Dryopteridaceae	Herb	A. Razzaq 18
170.	<i>Duchesnea indica</i> (Andrews) Focke	<i>Duchesnea</i> Sm.	Rosaceae	Herb	A. Razzaq 398
171.	<i>Echinochloa crus-galli</i> (L.) P. Beauv.	<i>Echinochloa</i> P. Beauv.	Poaceae	Herb	A. Razzaq 95
172.	<i>Echinochloa colona</i> (L.) Link.	<i>Echinochloa</i> P. Beauv.	Poaceae	Herb	A. Razzaq 96
173.	<i>Echinops griffithianus</i> Boiss.	<i>Echinops</i> L.	Asteraceae	Herb	A. Razzaq 170
174.	<i>Eclipta prostrata</i> (L.) L.	<i>Eclipta</i> L.	Asteraceae	Herb	A. Razzaq 171

175.	<i>Ehretia obtusifolia</i> Hochst. ex DC.	<i>Ehretia</i> L.	Boraginaceae	Tree	A. Razzaq 202
176.	<i>Elaeagnus umbellata</i> Thunb.	<i>Elaeagnus</i> L.	Elaeagnaceae	Shrub	A. Razzaq 255
177.	<i>Eleocharis palustris</i> (L.) Roem. & Schult.	<i>Eleocharis</i> R. Brown	Cyperaceae	Herb	A. Razzaq 62
178.	<i>Eleusine indica</i> (L.) Gaertn.	<i>Eleusine</i> Gaertn.	Poaceae	Herb	A. Razzaq 97
179.	<i>Ephedra gerardiana</i> Wall. ex Stapf	<i>Ephedra</i> L.	Ephedraceae	Shrub	A. Razzaq 30
180.	<i>Epilobium laxum</i> Royle	<i>Epilobium</i> L.	Onagraceae	Herb	A. Razzaq 327
181.	<i>Equisetum arvense</i> L.	<i>Equisetum</i> L.	Equisetaceae	Herb	A. Razzaq 19
182.	<i>Eragrostis ciliaris</i> (L.) R.Br.	<i>Eragrostis</i> Wolf	Poaceae	Herb	A. Razzaq 98
183.	<i>Eragrostis papposa</i> (Desf. ex Roem. & Schult.) Steud.	<i>Eragrostis papposa</i> (Desf. ex Roem. & Schult.) Steud.	Poaceae	Herb	A. Razzaq 99
184.	<i>Erigeron bonariensis</i> L. (Syn. <i>Conyza bonariensis</i> (L.) Cronquist.)	<i>Erigeron</i> L. Syn. <i>Conyza</i> Lessing	Asteraceae	Herb	A. Razzaq 172
185.	<i>Erigeron canadensis</i> L. (Syn. <i>Conyza canadensis</i> (L.) Cronquist.)	<i>Erigeron</i> L. Syn. <i>Conyza</i> Lessing	Asteraceae	Herb	A. Razzaq 173
186.	<i>Eriobotrya japonica</i> (Thunb.) Lindl.	<i>Eriobotrya</i> Lindl.	Rosaceae	Tree	A. Razzaq 399
187.	<i>Erioscirpus comosus</i> (Wall.) Palla	<i>Erioscirpus</i> Palla	Cyperaceae	Herb	A. Razzaq 63
188.	<i>Erodium cicutarium</i> (L.) L'Hér.	<i>Erodium</i> (L.) L'Hér..	Geraniaceae	Herb	A. Razzaq 274
189.	<i>Eryngium coeruleum</i> M-Bieb	<i>Eryngium</i> L.	Apiaceae	Herb	A. Razzaq 140
190.	<i>Eucalyptus camaldulensis</i> Dehnh.	<i>Eucalyptus</i> L'Herit.	Myrtaceae	Tree	A. Razzaq 320
191.	<i>Eucalyptus globulus</i> Labill.	<i>Eucalyptus</i> L'Herit.	Myrtaceae	Tree	A. Razzaq 321
192.	<i>Euphorbia falcata</i> L.	<i>Euphorbia</i> L.	Euphorbiaceae	Herb	A. Razzaq 258
193.	<i>Euphorbia helioscopia</i> L.	<i>Euphorbia</i> L.	Euphorbiaceae	Herb	A. Razzaq 259
194.	<i>Euphorbia hirta</i> L.	<i>Euphorbia</i> L.	Euphorbiaceae	Herb	A. Razzaq 260
195.	<i>Euphorbia indica</i> Lam.	<i>Euphorbia</i> L.	Euphorbiaceae	Herb	A. Razzaq 261
196.	<i>Euphorbia prostrata</i> Ait.	<i>Euphorbia</i> L.	Euphorbiaceae	Herb	A. Razzaq 262
197.	<i>Euphorbia wallichii</i> Hook.f.	<i>Euphorbia</i> L.	Euphorbiaceae	Herb	A. Razzaq 263

198.	<i>Euphrasia himalayica</i> Wettst.	<i>Euphrasia</i> L.	Scrophulariaceae	Herb	A. Razzaq 439
199.	<i>Festuca gigantea</i> (Linn.) Vill.	<i>Festuca</i> L.	Poaceae	Herb	A. Razzaq 100
200.	<i>Ficus benamina</i> L.	<i>Ficus</i> L.	Moraceae	Tree	A. Razzaq 312
201.	<i>Ficus carica</i> L.	<i>Ficus</i> L.	Moraceae	Tree	A. Razzaq 313
202.	<i>Ficus palmata</i> Forsk.	<i>Ficus</i> L.	Moraceae	Tree	A. Razzaq 314
203.	<i>Ficus pumila</i> L.	<i>Ficus</i> L.	Moraceae	Climber	A. Razzaq 315
204.	<i>Fimbristylis dichotoma</i> (L.) Vahl	<i>Fimbristylis</i> Vahl	Cyperaceae	Herb	A. Razzaq 64
205.	<i>Foeniculum vulgare</i> Mill.	<i>Foeniculum</i> Mill	Apiaceae	Herb	A. Razzaq 141
206.	<i>Fragaria nubicola</i> (Lindl. ex Hook.f.) Lacaita	<i>Fragaria</i> L.	Rosaceae	Herb	A. Razzaq 400
207.	<i>Fritillaria cirrhosa</i> Subsp. <i>Roylei</i> (Hook.) Ali, Syn. <i>Fritillaria roylei</i> Hook.	<i>Fritillaria</i> L.	Liliaceae	Herb	A. Razzaq 70
208.	<i>Fumaria indica</i> (Hauskn.) Pugsley	<i>Fumaria</i> L.	Fumariaceae	Herb	A. Razzaq 268
209.	<i>Galinsoga parviflora</i> Cav.	<i>Galinsoga</i> Ruiz & Pavon	Asteraceae	Herb	A. Razzaq 174
210.	<i>Galium aparine</i> L.	<i>Galium</i> L.	Rubiaceae	Herb	A. Razzaq 423
211.	<i>Galium tetraphyllum</i> Nazim. & Ehrend	<i>Galium</i> L.	Rubiaceae	Climber	A. Razzaq 424
212.	<i>Gentiana kurroo</i> Royle.	<i>Gentiana</i> L.	Gentianaceae	Herb	A. Razzaq 269
213.	<i>Gentiana argentea</i> (Royle ex D. Don) Omer	<i>Gentiana</i> L.	Gentianaceae	Herb	A. Razzaq 270
214.	<i>Geranium collinum</i> Steph. ex Wild.	<i>Geranium</i> L.	Geraniaceae	Herb	A. Razzaq 275
215.	<i>Geranium nepalense</i> Sweet, Geran.	<i>Geranium</i> L.	Geraniaceae	Herb	A. Razzaq 276
216.	<i>Geranium ocellatum</i> Camb.	<i>Geranium</i> L.	Geraniaceae	Herb	A. Razzaq 277
217.	<i>Geranium rotundifolium</i> L.	<i>Geranium</i> L.	Geraniaceae	Herb	A. Razzaq 278
218.	<i>Geranium wallichianum</i> D. Don ex Sweet	<i>Geranium</i> L.	Geraniaceae	Herb	A. Razzaq 279
219.	<i>Girardinia palmata</i> (Forssk.) Gaudich.	<i>Girardinia</i> Gaudich.	Urticaceae	Herb	A. Razzaq 463
220.	<i>Hedera nepalensis</i> K. Koch.	<i>Hedera</i> L.	Araliaceae	Woody climber	A. Razzaq 147
221.	<i>Helianthus annuus</i> L.	<i>Helianthus</i> L.	Asteraceae	Herb	A. Razzaq 175
222.	<i>Heliotropium eurapeum</i> L.	<i>Heliotropium</i> L.	Boraginaceae	Herb	A. Razzaq 203

223.	<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.	<i>Heteropogon</i> Pers	Poaceae	Herb	A.Razzaq 101
224.	<i>Himalrandia tetrasperma</i> (Roxb.) Yamazaki	<i>Himalrandia Yamazaki</i>	Rubiaceae	Shrub	A. Razzaq 425
225.	<i>Hordeum murinum</i> L.	<i>Hordeum murinum</i> L.	Poaceae	Herb	A.Razzaq 102
226.	<i>Hordeum vulgare</i> L.	<i>Hordeum</i> L.	Poaceae	Herb	A.Razzaq 103
227.	<i>Hylotelephium ewersii</i> (Ledeb.) H. Ohba	<i>Hylotelephium</i> H. Ohba	Crassulaceae	Herb	A. Razzaq 241
228.	<i>Hyoscyamus niger</i> L.	<i>Hyoscyamus</i> L.	Solanaceae	Herb	A. Razzaq 450
229.	<i>Hypericum oblongifolium</i> Choisy	<i>Hypericum</i> L.	Guttiferae	Shrub	A. Razzaq 280
230.	<i>Hypericum perforatum</i> L	<i>Hypericum</i> L	Guttiferae	Herb	A. Razzaq 281
231.	<i>Impatiens bicolor</i> Royle	<i>Impatiens</i> L.	Balsaminaceae	Herb	A. Razzaq 192
232.	<i>Impatiens brachycentra</i> Kar. & Kir.	<i>Impatiens</i> L.	Balsaminaceae	Herb	A. Razzaq 193
233.	<i>Impatiens edgeworthii</i> Hook.f.	<i>Impatiens</i> L.	Balsaminaceae	Herb	A. Razzaq 194
234.	<i>Impatiens glandulifera</i> Royle	<i>Impatiens</i> L.	Balsaminaceae	Herb	A. Razzaq 195
235.	<i>Imperata cylindrica</i> (L.) Raeusch.	<i>Imperata</i> Cyr	Poaceae	Herb	A.Razzaq 104
236.	<i>Indigofera heterantha</i> Well. ex Brandis	<i>Indigofera</i> L.	Papilionaceae	Shrub	A. Razzaq 337
237.	<i>Ipomoea purpurea</i> (L) Roth.	<i>Ipomoea</i> L.	Convolvulaceae	Herb	A. Razzaq 240
238.	<i>Iris germanica</i> L.	<i>Iris</i> L.	Iridaceae	Herb	A.Razzaq 67
239.	<i>Iris hookeriana</i> Foster	<i>Iris</i> L.	Iridaceae	Herb	A.Razzaq 68
240.	<i>Isodon rugosus</i> (Wall. ex Bth.) Codd	<i>Isodon</i> (Schrader ex Benth.) Spach	Lamiaceae	Shrub	A. Razzaq 287
241.	<i>Ixiolirion tataricum</i> (Pall.) Schult. & Schult.f.	<i>Ixiolirion</i> Fischer ex Herbert	Amoryllidaceae	Herb	A.Razzaq 43
242.	<i>Jasminum humile</i> L.	<i>Jasminum</i> L.	Oleaceae	Shrub	A. Razzaq 324
243.	<i>Jasminum officinale</i> L.	<i>Jasminum</i> L.	Oleaceae	Shrub	A. Razzaq 325
244.	<i>Juglans regia</i> L.	<i>Juglans</i> L.	Juglandaceae	Tree	A. Razzaq 284
245.	<i>Juncus inflexus</i> L.	<i>Juncus</i> L.	Juncaceae	Herb	A.Razzaq 69
246.	<i>Juniperus communis</i> L.	<i>Juniperus</i> L.	Cupressaceae	Shrub	A.Razzaq 28
247.	<i>Justicia adhatoda</i> L.	<i>Justicia</i> L.	Acanthaceae	Shrub	A. Razzaq 125
248.	<i>Lactuca serriola</i> L.	<i>Lactuca</i> L.	Asteraceae	Herb	A. Razzaq 176
249.	<i>Lagenaria siceraria</i> (Molina)	<i>Lagenaria</i> Ser. in	Cucurbitaceae	Climber	A. Razzaq 249

	Standl.	Mem			
250.	<i>Lamarckia aurea</i> (L.) Moench.	<i>Lamarckia</i> Moench.	Poaceae	Herb	A. Razzaq 105
251.	<i>Lamium amplexicaule</i> L.	<i>Lamium</i> L.	Lamiaceae	Herb	A. Razzaq 288
252.	<i>Lathyrus aphaca</i> L.	<i>Lathyrus</i> L.	Papilionaceae	Herb	A. Razzaq 338
253.	<i>Lathyrus cicera</i> L.	<i>Lathyrus</i> L.	Papilionaceae	Herb	A. Razzaq 339
254.	<i>Lathyrus sativus</i> L	<i>Lathyrus</i> L	Papilionaceae	Herb	A. Razzaq 340
255.	<i>Lathyrus sphaericus</i> Retz.	<i>Lathyrus</i> L.	Papilionaceae	Herb	A. Razzaq 341
256.	<i>Launea procumbens</i> (Roxb.) Ramayya & Rajagopal	<i>Launea</i> Cassini	Asteraceae	Herb	A. Razzaq 177
257.	<i>Leontopodium himalayanum</i> DC.	<i>Leontopodium</i> R. Brown ex Cassini	Asteraceae	Herb	A. Razzaq 178
258.	<i>Lepidium apetalum</i> Willd.	<i>Lepidium</i> L.	Brassicaceae	Herb	A. Razzaq 214
259.	<i>Lepidium sativum</i> L.	<i>Lepidium</i> L.	Brassicaceae	Herb	A. Razzaq 215
260.	<i>Leptochloa panicea</i> (Retz.) Ohwi	<i>Leptochloa</i> P.Beauv	Poaceae	Herb	A. Razzaq 106
261.	<i>Lespedeza juncea</i> (Linn.f.) Pers.	<i>Lespedeza</i> Mich	Papilionaceae	Shrub	A. Razzaq 342
262.	<i>Limonium gilesii</i> (Hemsl.) Rech. f.	<i>Limonium</i> Mill.	Plumbaginaceae	Herb	A. Razzaq 358
263.	<i>Lindelofia anchusoides</i> (Lindl.) Lehm.	<i>Lindelofia</i> S. Lehm.	Boraginaceae	Herb	A. Razzaq 204
264.	<i>Lotus corniculatus</i> L.	<i>Lotus</i> L.	Papilionaceae	Herb	A. Razzaq 343
265.	<i>Luffa cylindrica</i> (L.) Roem.	<i>Luffa</i> Mill.	Cucurbitaceae	Annual climber	A. Razzaq 250
266.	<i>Lycopersicon esculentum</i> Mill.	<i>Lycopersicon</i> Mill.	Solanaceae	Herb	A. Razzaq 451
267.	<i>Malus pumila</i> Mill.	<i>Malus</i> Mill.	Rosaceae	Tree	A. Razzaq 401
268.	<i>Malva neglecta</i> Wall.	<i>Malva</i> L.	Malvaceae	Herb	A. Razzaq 306
269.	<i>Malva parviflora</i> L.	<i>Malva</i> L.	Malvaceae	Herb	A. Razzaq 307
270.	<i>Marsilea minuta</i> L.	<i>Marsilea</i> L.	Marsileaceae	Herb	A. Razzaq 20
271.	<i>Maytenus royleanus</i> (Wall. ex Lawson) Cufodontis Syn. <i>Gymnosporia royleana</i> Wall. ex M.A. Lawson	<i>Maytenus</i> Molina	Celastraceae	Shrub	A. Razzaq 234

272.	<i>Medicago laciniata</i> (L.) Mill	<i>Medicago</i> L.	Papilionaceae	Herb	A. Razzaq 344
273.	<i>Medicago lupulina</i> L.	<i>Medicago</i> L.	Papilionaceae	Herb	A. Razzaq 345
274.	<i>Medicago minima</i> (L.) Grufb	<i>Medicago</i> L.	Papilionaceae	Herb	A. Razzaq 346
275.	<i>Medicago polymorpha</i> L.	<i>Medicago</i> L.	Papilionaceae	Herb	A. Razzaq 347
276.	<i>Melia azedarach</i> L.	<i>Melia</i> L.	Meliaceae	Tree	A. Razzaq 308
277.	<i>Mentha longifolia</i> (L.) Huds.	<i>Mentha</i> L.	Lamiaceae	Herb	A. Razzaq 289
278.	<i>Mentha spicata</i> L.	<i>Mentha</i> L.	Lamiaceae	Herb	A. Razzaq 290
279.	<i>Micromeria biflora</i> Buch.	<i>Micromeria</i> Benth.	Lamiaceae	Herb	A. Razzaq 291
280.	<i>Mirabilis jalapa</i> L.	<i>Mirabilis</i> L.	Nyctaginaceae	Herb	A. Razzaq 323
281.	<i>Momordica charantia</i> L.	<i>Momordica</i> L.	Cucurbitaceae	Climber	A. Razzaq 251
282.	<i>Monothea buxifolia</i> (Falc.) A. DC	<i>Monothea</i> A. DC	Sapotaceae	Tree	A. Razzaq 437
283.	<i>Morus alba</i> L.	<i>Morus</i> L.	Moraceae	Tree	A. Razzaq 316
284.	<i>Morus nigra</i> L.	<i>Morus</i> L.	Moraceae	Tree	A. Razzaq 317
285.	<i>Myrsine africana</i> L.	<i>Myrsine</i> L.	Myrsinaceae	Shrub	A. Razzaq 318
286.	<i>Myrtus communis</i> L.	<i>Myrtus</i> L.	Myrtaceae	Shrub	A. Razzaq 322
287.	<i>Narcissus tazetta</i> L.	<i>Narcissus</i> L.	Amaryllidaceae	Herb	A. Razzaq 44
288.	<i>Nasturtium officinale</i> R. Br.	<i>Nasturtium</i> R. Br.	Brassicaceae	Herb	A. Razzaq 216
289.	<i>Nepeta govaniana</i> (Buch.-Ham. ex D. Don) Benth.	<i>Nepeta</i> L.	Lamiaceae	Herb	A. Razzaq 292
290.	<i>Nepeta laevigata</i> (D. Don) Hand.	<i>Nepeta</i> L.	Lamiaceae	Herb	A. Razzaq 293
291.	<i>Nerium oleander</i> L.	<i>Nerium</i> L.	Apocynaceae	Shrub	A. Razzaq 146
292.	<i>Neslia apiculata</i> Fisch., C.A. Mey. & Ave	<i>Neslia</i> Desv.	Brassicaceae	Herb	A. Razzaq 217
293.	<i>Nicotiana tabacum</i> L.	<i>Nicotiana</i> L.	Solanaceae	Herb	A. Razzaq 452
294.	<i>Notholirion thomsonianum</i> (D. Don) Stapf	<i>Notholirion</i> Wall ex Boiss.	Liliaceae	Herb	A. Razzaq 71
295.	<i>Ocimum basilicum</i> L.	<i>Ocimum</i> L.	Lamiaceae	Herb	A. Razzaq 294
296.	<i>Oenothera rosea</i> L.	<i>Oenothera</i> L.	Onagraceae	Herb	A. Razzaq 328
297.	<i>Olea ferruginea</i> Wall. ex Aitch. Syn. <i>Olea cupidata</i> Wall ex G. Don	<i>Olea</i> L.	Oleaceae	Tree	A. Razzaq 326

298.	<i>Onopordum acanthium</i> L.	<i>Onopordum</i> L.	Asteraceae	Shrub	A. Razzaq 179
299.	<i>Onychium Japonicum</i> (Thunb.) Kunze Syn. <i>Onychium cryptogrammoides</i> Christ	<i>Onychium</i> Kaulfuss	Pteridaceae	Herb	A. Razzaq 22
300.	<i>Origanum vulgare</i> L.	<i>Origanum</i> L.	Lamiaceae	Herb	A. Razzaq 295
301.	<i>Otostegia limbata</i> (Benth.) Boiss.	<i>Otostegia</i> Benth.	Lamiaceae	Shrub	A. Razzaq 296
302.	<i>Oxalis corniculata</i> L.	<i>Oxalis</i> L.	Oxalidaceae	Herb	A. Razzaq 329
303.	<i>Oxytropis chiliophylla</i> Royle ex Benth.	<i>Oxytropis</i> DC.	Papilionaceae	Herb	A. Razzaq 348
304.	<i>Paeonia emodi</i> Wall. ex Royle	<i>Paeonia</i> L.	Paeoniaceae	Herb	A. Razzaq 330
305.	<i>Panicum miliaceum</i> L.	<i>Panicum</i> L.	Poaceae	Herb	A. Razzaq 107
306.	<i>Papaver dubium</i> L.	<i>Papaver</i> L.	Papaveraceae	Herb	A. Razzaq 331
307.	<i>Papaver pavoninum</i> Schrenk	<i>Papaver</i> L.	Papaveraceae	Herb	A. Razzaq 332
308.	<i>Papaver somniferum</i> L.	<i>Papaver</i> L.	Papaveraceae	Herb	A. Razzaq 333
309.	<i>Parrotiopsis jacquemontiana</i> (Dcne.) Rehder.	<i>Parrotiopsis</i> III. Handb.	Hamamelidaceae	Shrub	A. Razzaq 282
310.	<i>Paspalum dilatatum</i> Poir.	<i>Paspalum</i> L.	Poaceae	Herb	A. Razzaq 108
311.	<i>Pedicularis bicornuta</i> Kl.	<i>Pedicularis</i> L.	Scrophulariaceae	Herb	A. Razzaq 440
312.	<i>Peganum harmala</i> L.	<i>Peganum</i> L.	Zygophyllaceae	Herb	A. Razzaq 475
313.	<i>Pennisetum orientale</i> Rich.	<i>Pennisetum</i> L.C. Rich.	Poaceae	Herb	A. Razzaq 109
314.	<i>Periploca aphylla</i> Decne.	<i>Periploca</i> L.	Asclepiadaceae	Shrub	A. Razzaq 150
315.	<i>Persicaria barbata</i> (L.) Hara	<i>Persicaria</i> L.	Polygonaceae	Herb	A. Razzaq 363
316.	<i>Phagnalon niveum</i> Edgew.	<i>Phagnalon</i> Cass.	Asteraceae	Herb	A. Razzaq 180
317.	<i>Phalaris minor</i> Retz	<i>Phalaris</i> L.	Poaceae	Herb	A. Razzaq 110
318.	<i>Phleum alpinum</i> L.	<i>Phleum</i> L.	Poaceae	Herb	A. Razzaq 111
319.	<i>Phlomis bracteosa</i> Royle ex Benth.	<i>Phlomis</i> L.	Lamiaceae	Herb	A. Razzaq 297
320.	<i>Phragmites karka</i> (Retz.) Trin. ex Steud.	<i>Phragmites</i> Adans.	Poaceae	Herb	A. Razzaq 112
321.	<i>Physalis divaricata</i> D. Don.	<i>Physalis</i> L.	Solanaceae	Herb	A. Razzaq 453
322.	<i>Picea smithiana</i> (Wall.) Boiss	<i>Picea</i> Dietr	Pinaceae	Tree	A. Razzaq 33
323.	<i>Pilea umbrosa</i> Blume	<i>Pilea</i> Lindl.	Urticaceae	Herb	A. Razzaq 464

324.	<i>Pimpinella acuminata</i> (Edgew.) C.B. Clarke	<i>Pimpinella</i> L.	Apiaceae	Herb	A. Razzaq 142
325.	<i>Pimpinella diversifolia</i> DC.	<i>Pimpinella</i> L.	Apiaceae	Herb	A. Razzaq 143
326.	<i>Pinus gerardiana</i> Wall.	<i>Pinus</i> L.	Pinaceae	Tree	A. Razzaq 34
327.	<i>Pinus roxburghii</i> Sargent	<i>Pinus</i> L.	Pinaceae	Tree	A. Razzaq 35
328.	<i>Pinus wallichiana</i> A.B. Jackson	<i>Pinus</i> L.	Pinaceae	Tree	A. Razzaq 36
329.	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f.	<i>Pistacia</i> L.	Anacardiaceae	Tree	A. Razzaq 134
330.	<i>Pisum sativum</i> L.	<i>Pisum</i> L.	Papilionaceae	Herb	A. Razzaq 354
331.	<i>Plantago lanceolata</i> L.	<i>Plantago</i> L.	Plantaginaceae	Herb	A. Razzaq 355
332.	<i>Plantago major</i> L.	<i>Plantago</i> L.	Plantaginaceae	Herb	A. Razzaq 356
333.	<i>Platanus orientalis</i> L.	<i>Platanus</i> L.	Plantanaceae	Tree	A. Razzaq 357
334.	<i>Podophyllum emodi</i> Wall. ex Royle	<i>Podophyllum</i> L.	Podophyllaceae	Herb	A. Razzaq 359
335.	<i>Polemonium caeruleum</i> L.	<i>Polemonium</i> L.	Polemoniaceae	Herb	A. Razzaq 360
336.	<i>Polygala abyssinica</i> R.Br. ex Fresen.	<i>Polygala</i> L.	Polygalaceae	Herb	A. Razzaq 361
337.	<i>Polygonatum verticillatum</i> (L.) All.	<i>Polygonatum</i> Mill.	Asparagaceae	Herb	A. Razzaq 52
338.	<i>Polygonum arenastrum</i> Boreau	<i>Polygonum</i> L.	Polygonaceae	Herb	A. Razzaq 364
339.	<i>Polygonum aviculare</i> L.	<i>Polygonum</i> L.	Polygonaceae	Herb	A. Razzaq 365
340.	<i>Polygonum plebejum</i> R. Br.	<i>Polygonum</i> L.	Polygonaceae	Herb	A. Razzaq 366
341.	<i>Polypogon fugax</i> Ness ex Steud.	<i>Polypogon</i> Desf.	Poaceae	Herb	A. Razzaq 113
342.	<i>Polypogon monspeliensis</i> (L.) Desf.	<i>Polypogon</i> Desf.	Poaceae	Herb	A. Razzaq 114
343.	<i>Polypogon viridis</i> (Gouan) Breistr. (Syn. <i>Agrostis viridis</i> Gouan)	<i>Agrostis</i> L.	Poaceae	Herb	A. Razzaq 75
344.	<i>Populus alba</i> L.	<i>Populus</i> L.	Salicaceae	Tree	A. Razzaq 431
345.	<i>Populus nigra</i> L.	<i>Populus</i> L.	Salicaceae	Tree	A. Razzaq 432
346.	<i>Portulaca oleracea</i> L.	<i>Portulaca</i> L.	Aizoaceae	Herb	A. Razzaq 127
347.	<i>Potentilla nepalensis</i> Hook. f.	<i>Potentilla</i> L.	Rosaceae	Herb	A. Razzaq 402
348.	<i>Primula denticulata</i> Sm.	<i>Primula</i> L.	Primulaceae	Herb	A. Razzaq 372

349.	<i>Primula macrophylla</i> D.Don.	<i>Primula</i> L.	Primulaceae	Herb	A. Razzaq 373
350.	<i>Prunella vulgaris</i> L.	<i>Prunella</i> L.	Lamiaceae	Herb	A. Razzaq 298
351.	<i>Prunus armeniaca</i> L.	<i>Prunus</i> L.	Rosaceae	Tree	A. Razzaq 403
352.	<i>Prunus cornuta</i> (Wall. ex Royle) Steud	<i>Prunus</i> L.	Rosaceae	Tree	A. Razzaq 404
353.	<i>Prunus domestica</i> L.	<i>Prunus</i> L.	Rosaceae	Tree	A. Razzaq 405
354.	<i>Prunus dulcis</i> (Mill.) D.A. Webb Syn. <i>Prunus amygdalus</i> Stokes	<i>Prunus</i> L.	Rosaceae	Tree	A. Razzaq 422
355.	<i>Prunus persica</i> (L.) Batsch	<i>Prunus</i> L.	Rosaceae	Tree	A. Razzaq 406
356.	<i>Pteridium aquilinum</i> (L.) Kuhn	<i>Pteridium</i> L.	Dennstaedtiaceae	Herb	A. Razzaq 14
357.	<i>Pteris cretica</i> L.	<i>Pteris</i> L.	Pteridaceae	Herb	A. Razzaq 23
358.	<i>Pteris vittata</i> L.	<i>Pteris</i> L.	Pteridaceae	Herb	A. Razzaq 24
359.	<i>Punica granatum</i> L.	<i>Punica</i> L.	Punicaceae	Tree	A. Razzaq 374
360.	<i>Pyrus bretschneideri</i> Rehder	<i>Pyrus</i> Rehder	Rosaceae	Tree	A. Razzaq 407
361.	<i>Pyrus communis</i> L.	<i>Pyrus</i> L.	Rosaceae	Tree	A. Razzaq 408
362.	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	<i>Pyrus</i> L.	Rosaceae	Tree	A. Razzaq 409
363.	<i>Pyrus pyrifolia</i> (Burm. f.) Nakai	<i>Pyrus</i> L.	Rosaceae	Tree	A. Razzaq 410
364.	<i>Pyrus sinkiangensis</i> T. T. Yu	<i>Pyrus</i> L.	Rosaceae	Tree	A. Razzaq 411
365.	<i>Quercus dilatata</i> Royle	<i>Quercus</i> L.	Fagaceae	Tree	A. Razzaq 265
366.	<i>Quercus incana</i> Roxb.	<i>Quercus</i> L.	Fagaceae	Tree	A. Razzaq 266
367.	<i>Quercus semecarpifolia</i> Sm.	<i>Quercus</i> L.	Fagaceae	Tree	A. Razzaq 267
368.	<i>Ranunculus aquatilis</i> L.	<i>Ranunculus</i> L.	Ranunculaceae	Herb	A. Razzaq 383
369.	<i>Ranunculus arvensis</i> L.	<i>Ranunculus</i> L.	Ranunculaceae	Herb	A. Razzaq 384
370.	<i>Ranunculus laetus</i> Wall. ex Hook f. & J.W. Thomson	<i>Ranunculus</i> L.	Ranunculaceae	Herb	A. Razzaq 385
371.	<i>Ranunculus muricatus</i> L.	<i>Ranunculus</i> L.	Ranunculaceae	Herb	A. Razzaq 386
372.	<i>Ranunculus sceleratus</i> L.	<i>Ranunculus</i> L.	Ranunculaceae	Herb	A. Razzaq 387
373.	<i>Raphanus sativus</i> L.	<i>Raphanus</i> L.	Brassicaceae	Herb	A. Razzaq 218
374.	<i>Rheum australe</i> D. Don	<i>Rheum</i> L.	Polygonaceae	Herb	A. Razzaq 367
375.	<i>Rhodiola himalensis</i> (D. Don) S. H. Fu	<i>Rhodiola</i> L.	Crassulaceae	Herb	A. Razzaq 242
376.	<i>Ricinus communis</i> L.	<i>Ricinus</i> L.	Euphorbiaceae	Shrub	A. Razzaq 264

377.	<i>Robinia pseudo-acacia</i> L.	<i>Robinia</i> L.	Papilionaceae	Tree	A. Razzaq 349
378.	<i>Rosa banksiae</i> W. T. Ait.	<i>Rosa</i> L.	Rosaceae	Shrub	A. Razzaq 412
379.	<i>Rosa macrophylla</i> Lindl.	<i>Rosa</i> L.	Rosaceae	Shrub	A. Razzaq 413
380.	<i>Rosa moschata</i> Herrm.	<i>Rosa</i> L.	Rosaceae	Shrub	A. Razzaq 414
381.	<i>Rosa webbiana</i> Wall. ex Royle	<i>Rosa</i> L.	Rosaceae	Shrub	A. Razzaq 415
382.	<i>Rosularia adenotricha</i> (Wall. ex Edgew.) Jansson & Rech	<i>Rosularia</i> (DC.) Stapf	Crassulaceae	Herb	A. Razzaq 243
383.	<i>Rubus ellipticus</i> Smith.	<i>Rubus</i> L.	Rosaceae	Shrub	A. Razzaq 416
384.	<i>Rubus fruticosus</i> L.	<i>Rubus</i> L.	Rosaceae	Shrub	A. Razzaq 417
385.	<i>Rubus ulmifolius</i> Schott.	<i>Rubus</i> L.	Rosaceae	Shrub	A. Razzaq 418
386.	<i>Rumex dentatus</i> L.	<i>Rumex</i> L.	Polygonaceae	Herb	A. Razzaq 368
387.	<i>Rumex hastatus</i> D. Don.	<i>Rumex</i> L.	Polygonaceae	Herb	A. Razzaq 369
388.	<i>Saccharum spontaneum</i> L.	<i>Saccharum</i> L.	Poaceae	Herb	A. Razzaq 115
389.	<i>Sagittaria trifolia</i> L.	<i>Sagittaria</i> L.	Alismataceae	Herb	A. Razzaq 39
390.	<i>Salix babylonica</i> L.	<i>Salix</i> L.	Salicaceae	Tree	A. Razzaq 433
391.	<i>Salix tetrasperma</i> Roxb.	<i>Salix</i> L.	Salicaceae	Tree	A. Razzaq 434
392.	<i>Salvia lanata</i> Roxb.	<i>Salvia</i> L.	Lamiaceae	Herb	A. Razzaq 299
393.	<i>Salvia moocroftiana</i> wall ex Bth.	<i>Salvia</i> L.	Lamiaceae	Herb	A. Razzaq 300
394.	<i>Salvia nubicola</i> Wll ex. Sweet	<i>Salvia</i> L.	Lamiaceae	Herb	A. Razzaq 301
395.	<i>Sambucus wightiana</i> Wall ex Wight. & Arn.	<i>Sambucus</i> L.	Sambucaceae	Herb	A. Razzaq 435
396.	<i>Sarcococca saligna</i> (Don) Muell.	<i>Sarcococca</i> Lindl.	Buxaceae	Shrub	A. Razzaq 224
397.	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke)	<i>Saussurea</i> Candolle	Asteraceae	Herb	A. Razzaq 181
398.	<i>Scandix pecten-veneris</i> Linn.	<i>Scandix</i> L.	Apiaceae	Herb	A. Razzaq 144
399.	<i>Scilla griffithii</i> Hochr.	<i>Scilla</i> L.	Hyacinthaceae	Herb	A. Razzaq 66
400.	<i>Sedum hispanicum</i> L.	<i>Sedum</i> L.	Crassulaceae	Herb	A. Razzaq 244
401.	<i>Selaginella jacquemontii</i> Spring	<i>Selaginella</i> P. Beauv.	Selaginellaceae	Herb	A. Razzaq 25
402.	<i>Senecio chrysanthemoides</i> DC.	<i>Senecio</i> L.	Asteraceae	Herb	A. Razzaq 182
403.	<i>Serratula pallida</i> DC.	<i>Serratula</i> L.	Asteraceae	Herb	A. Razzaq 183
404.	<i>Seseli libanotis</i> (L) W. Koch	<i>Seseli</i> L.	Apiaceae	Herb	A. Razzaq 145

405.	<i>Setaria viridis</i> (L.) P. Beauv.	<i>Setaria</i> (L.) P. Beauv.	Poaceae	Herb	A.Razzaq 116
406.	<i>Setaria verticillata</i> (L.) P. Beauv.	<i>Setaria</i> (L.) P. Beauv.	Poaceae	Herb	A.Razzaq 117
407.	<i>Sibbaldia procumbens</i> L.	<i>Sibbaldia</i> L.	Rosaceae	Herb	A. Razzaq 421
408.	<i>Silene conoidea</i> L.	<i>Silene</i> L.	Caryophyllaceae	Herb	A. Razzaq 231
409.	<i>Silene vulgaris</i> (Moench) Garcke	<i>Silene</i> L.	Caryophyllaceae	Herb	A. Razzaq 232
410.	<i>Silybum marianum</i> (L.) Gaertn.	<i>Silybum</i> Adans.	Asteraceae	Herb	A. Razzaq 184
411.	<i>Sisymbrium irio</i> L.	<i>Sisymbrium</i> L.	Brassicaceae	Herb	A. Razzaq 219
412.	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp.	<i>Skimmia</i> Thunb	Rutaceae	Shrub	A. Razzaq 429
413.	<i>Smilax elegans</i> Wall. ex Kunth (Syn. <i>Smilax glaucophylla</i> Klotzch)	<i>Smilax</i> L.	Smilacaceae	Climber	A.Razzaq 123
414.	<i>Solanum nigrum</i> L.	<i>Solanum</i> L.	Solanaceae	Herb	A. Razzaq 454
415.	<i>Solanum pseudo-capsicum</i> L.	<i>Solanum</i> L.	Solanaceae	Herb	A. Razzaq 455
416.	<i>Solanum Surattense</i> Burm.f.	<i>Solanum</i> L.	Solanaceae	Herb	A. Razzaq 456
417.	<i>Solanum tuberosum</i> L.	<i>Solanum</i> L.	Solanaceae	Herb	A. Razzaq 457
418.	<i>asper</i> (L.) Hill.	<i>Sonchus</i> L.	Asteraceae	Herb	A. Razzaq 185
419.	<i>Sonchus oleraceus</i> L.	<i>Sonchus</i> L.	Asteraceae	Herb	A. Razzaq 186
420.	<i>Sorbaria tomentosa</i> (Lindl.) Rehder	<i>Sorbaria</i> (Seringe) A. Braun	Rosaceae	Shrub	A. Razzaq 419
421.	<i>Sorghum halepense</i> (L.) Pers.	<i>Sorghum</i> Moench	Poaceae	Herb	A.Razzaq 118
422.	<i>Spiraea nervosa</i> Franch & Sav.	<i>Spiraea</i> L.	Rosaceae	Shrub	A. Razzaq 420
423.	<i>Stachys parviflora</i> Benth.	<i>Stachys</i> Benth.	Lamiaceae	Herb	A. Razzaq 302
424.	<i>Stellaria media</i> (L.) Cyr.	<i>Stellaria</i> L.	Caryophyllaceae	Herb	A. Razzaq 233
425.	<i>Stipa sibirica</i> (Linn.) Lam	<i>Stipa</i> L.	Poaceae	Herb	A.Razzaq 119
426.	<i>Strobilanthes urticifolia</i> Wall. ex Kuntze	<i>Strobilianthus</i> Blume	Acanthaceae	Shrub	A. Razzaq 126
427.	<i>Swertia alata</i> (D. Don) C. B Clarke.	<i>Swertia</i> L.	Gentianaceae	Herb	A. Razzaq 271
428.	<i>Swertia cordata</i> (G. Don) Clarke	<i>Swertia</i> L.	Gentianaceae	Herb	A. Razzaq 272
429.	<i>Swertia petiolata</i> D.Don	<i>Swertia</i> L.	Gentianaceae	Herb	A. Razzaq 273

430.	<i>Tagetes minuta</i> L.	<i>Tagetes</i> L.	Asteraceae	Shrub	A. Razzaq 187
431.	<i>Taraxacum officinale</i> F. H. Wigg.	<i>Taraxacum</i> F. H. Wiggers	Asteraceae	Herb	A. Razzaq 188
432.	<i>Taxus wallichiana</i> Zucc.	<i>Taxus</i> L.	Taxaceae	Tree	A. Razzaq 37
433.	<i>Teucrium stocksianum</i> Boiss.	<i>Teucrium</i> L.	Lamiaceae	Herb	A. Razzaq 303
434.	<i>Thalictrum foliolosum</i> DC.	<i>Thalictrum</i> L.	Ranunculaceae	Herb	A. Razzaq 388
435.	<i>Thalictrum pedunculatum</i> Edgew.	<i>Thalictrum</i> L.	Ranunculaceae	Herb	A. Razzaq 389
436.	<i>Themeda anathera</i> (Nees ex Steud.) Hack.	<i>Themeda</i> Forssk	Poaceae	Herb	A. Razzaq 120
437.	<i>Thlaspi arvense</i> L.	<i>Thlaspi</i> L.	Brassicaceae	Herb	A. Razzaq 220
438.	<i>Thlaspi griffithianum</i> (Boiss.) Boiss.	<i>Thlaspi</i> L.	Brassicaceae	Herb	A. Razzaq 221
439.	<i>Thuja orientalis</i> L.	<i>Thuja</i> L.	Cupressaceae	Tree	A. Razzaq 29
440.	<i>Thymus linearis</i> Benth.	<i>Thymus</i> L.	Lamiaceae	Herb	A. Razzaq 304
441.	<i>Tragopogon gracilis</i> D. Don	<i>Tragopogon</i> L.	Asteraceae	Herb	A. Razzaq 189
442.	<i>Trianthema portulacastrum</i> L.	<i>Trianthema</i> L.	Aizoaceae	Herb	A. Razzaq 128
443.	<i>Tribulus terrestris</i> L.	<i>Tribulus</i> L.	Zygophyllaceae	Herb	A. Razzaq 476
444.	<i>Trifolium repens</i> L.	<i>Trifolium</i> L.	Papilionaceae	Herb	A. Razzaq 350
445.	<i>Trigonella monantha</i> C. A. Meyer	<i>Trigonella</i> L.	Papilionaceae	Herb	A. Razzaq 351
446.	<i>Triticum aestivum</i> L.	<i>Triticum</i> L.	Poaceae	Herb	A. Razzaq 121
447.	<i>Tulipa clusiana</i> DC.	<i>Tulipa</i> L.	Liliaceae	Herb	A. Razzaq 72
448.	<i>Tussilago farfara</i> L.	<i>Tussilago</i> L.	Asteraceae	Herb	A. Razzaq 190
449.	<i>Urtica dioica</i> L.	<i>Urtica</i> L.	Urticaceae	Herb	A. Razzaq 465
450.	<i>Urtica pilulifera</i> L.	<i>Urtica</i> L.	Urticaceae	Herb	A. Razzaq 466
451.	<i>Valeriana jatamansi</i> Jones	<i>Valeriana</i> L.	Valerianaceae	Herb	A. Razzaq 467
452.	<i>Verbascum thapsus</i> L.	<i>Verbascum</i> L.	Scrophulariaceae	Herb	A. Razzaq 441
453.	<i>Verbena officinalis</i> L.	<i>Verbena</i> L.	Verbenaceae	Herb	A. Razzaq 468
454.	<i>Veronica anagallis-aquatica</i> L.	<i>Veronica</i> L.	Scrophulariaceae	Herb	A. Razzaq 442
455.	<i>Veronica laxa</i> Benth.	<i>Veronica</i> L.	Scrophulariaceae	Herb	A. Razzaq 443
456.	<i>Veronica polita</i> Fr.	<i>Veronica</i> L.	Scrophulariaceae	Herb	A. Razzaq 444
457.	<i>Viburnum cotinifolium</i> D. Don.	<i>Viburnum</i> L.	Caprifoliaceae	Shrub	A. Razzaq 229

458.	<i>Viburnum grandiflorum</i> Wall. ex DC.	<i>Viburnum</i> L.	Caprifoliaceae	Shrub	A. Razzaq 230
459.	<i>Vicia hirsuta</i> (L.) S. F. Gray	<i>Vicia</i> L.	Papilionaceae	Herb	A. Razzaq 352
460.	<i>Vicia sativa</i> L.	<i>Vicia</i> L.	Papilionaceae	Herb	A. Razzaq 353
461.	<i>Viola betonicifolia</i> Sm.	<i>Viola</i> L.	Violaceae	Herb	A. Razzaq 470
462.	<i>Viola canescens</i> Wall. ex Roxb.	<i>Viola</i> L.	Violaceae	Herb	A. Razzaq 471
463.	<i>Viola pilosa</i> Blume	<i>Viola</i> L.	Violaceae	Herb	A. Razzaq 472
464.	<i>Vitex negundo</i> L.	<i>Vitex</i> L.	Verbenaceae	Shrub	A. Razzaq 469
465.	<i>Vitis jacquemontii</i> Parker	<i>Vitis</i> L.	Vitaceae	Woody Climber	A. Razzaq 473
466.	<i>Vitis vinifera</i> L.	<i>Vitis</i> L.	Vitaceae	Woody Climber	A. Razzaq 474
467.	<i>Wikstroemia canescens</i> Wall. ex Meisn.	<i>Wikstroemia</i> Endl.	Thymelaeaceae	Shrub	A. Razzaq 460
468.	<i>Withania somnifera</i> (L.) Dunal	<i>Withania</i> Pauquy	Solanaceae	Shrub	A. Razzaq 458
469.	<i>Wulfenia amherstiana</i> Bth.	<i>Wulfenia</i> Jack.	Scrophulariaceae	Herb	A. Razzaq 445
470.	<i>Xanthium strumarium</i> L.	<i>Xanthium</i> L.	Asteraceae	Herb	A. Razzaq 191
471.	<i>Zanthoxylum armatum</i> DC.	<i>Zanthoxylum</i> L.	Rutaceae	Shrub	A. Razzaq 430
472.	<i>Zea mays</i> L.	<i>Zea</i> L.	Poaceae	Herb	A. Razzaq 122
473.	<i>Ziziphus jujuba</i> Mill.	<i>Ziziphus</i> L.	Rhamnaceae	Tree	A. Razzaq 390
474.	<i>Ziziphus mauritiana</i> var. <i>spontanea</i> (Edgew.) R.R Stewart ex Qaiser & Nazim.	<i>Ziziphus</i> L.	Rhamnaceae	Tree	A. Razzaq 392
475.	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	<i>Ziziphus</i> L.	Rhamnaceae	Shrub	A. Razzaq 391
476.	<i>Ziziphus oxyphylla</i> Edgew.	<i>Ziziphus</i> L.	Rhamnaceae	Shrub	A. Razzaq 393

Table-III. Number & Percentage of species/genera distributed within different Families of Vascular Plant Biodiversity of Malam Jabba Valley, Hindu Kush Range Swat

S.No	Family name	No. of species	%age of species	No. of genera	%age of genera
Pteridopyta					
1.	Adiantaceae	4	0.84	1	0.29
2.	Aspleniaceae	4	0.84	1	0.29
3.	Dryopteridaceae	4	0.84	1	0.29
4.	Pteridaceae	4	0.84	3	0.89
5.	Athyraceae	5	1.0	3	0.89
6.	Dennstaedtiaceae	1	0.21	1	0.29
7.	Equisetaceae	1	0.21	1	0.29
8.	Marsileaceae,	1	0.21	1	0.29
9.	Selaginellaceae	1	0.21	1	0.29
10.	Thelypteridaceae	1	0.21	1	0.29
Gymnosperms					
11.	Pinaceae	6	1.26	4	1.19
12.	Cupressaceae	3	0.63	3	0.89
13.	Ephedraceae	1	0.21	1	0.29
14.	Taxaceae	1	0.21	1	0.29
Monocots					
15.	Alismataceae	2	0.42	2	0.59
16.	Alliaceae	3	0.63	1	0.29
17.	Amaryllidaceae	2	0.42	2	0.59
18.	Araceae	5	1.0	3	0.89
19.	Asparagaceae	3	0.63	2	0.59
20.	Asphodelaceae	1	0.21	1	0.29
21.	Colchicaceae	1	0.21	1	0.29
22.	Commelinaceae	1	0.21	1	0.29
23.	Cyperaceae	9	1.89	5	1.49
24.	Dioscoreaceae	1	0.21	1	0.29
25.	Hyacinthaceae	1	0.21	1	0.29
26.	Iridaceae	2	0.42	1	0.29
27.	Juncaceae	1	0.21	1	0.29
28.	Liliaceae	3	0.63	3	0.89
29.	Poaceae	51	10.71	43	12.87
30.	Smilacaceae	1	0.21	1	0.29
Dicots (Eudicots & Coreudicots)					
31.	Apocynaceae	1	0.21	1	0.29
32.	Araliaceae	1	0.2	1	0.29
33.	Berberidaceae	1	0.21	1	0.29
34.	Betulaceae	1	0.21	1	0.29
35.	Buddlejaceae	1	0.21	1	0.29
36.	Caesalpiniaceae	1	0.21	1	0.29
37.	Canabinaceae	1	0.21	1	0.29
38.	Celastraceae	1	0.21	1	0.29

39.	Cuscutaceae	1	0.21	1	0.29
40.	Elaeagnaceae	1	0.21	1	0.29
41.	Fumariaceae	1	0.21	1	0.29
42.	Hamamelidaceae	1	0.21	1	0.29
43.	Hippocastinaceae	1	0.21	1	0.29
44.	Juglandaceae	1	0.21	1	0.29
45.	Meliaceae	1	0.21	1	0.29
46.	Myrsinaceae	1	0.21	1	0.29
47.	Nyctaginaceae	1	0.21	1	0.29
48.	Oxalidaceae	1	0.21	1	0.29
49.	Paeoniaceae	1	0.21	1	0.29
50.	Plantanaceae	1	0.21	1	0.29
51.	Plumbaginaceae	1	0.21	1	0.29
52.	Podophyllaceae	1	0.21	1	0.29
53.	Polemoniaceae	1	0.21	1	0.29
54.	Polygalaceae	1	0.21	1	0.29
55.	Punicaceae	1	0.21	1	0.29
56.	Sambucaceae	1	0.21	1	0.29
57.	Sapindaceae	1	0.21	1	0.29
58.	Sapotaceae	1	0.21	1	0.29
59.	Saxifragaceae	1	0.21	1	0.29
60.	Simaroubaceae	1	0.21	1	0.29
61.	Ulmaceae	1	0.21	1	0.29
62.	Valerianaceae	1	0.21	1	0.29
63.	Aizoaceae	2	0.42	2	0.59
64.	Buxaceae	2	0.42	2	0.59
65.	Anacardiaceae	2	0.42	2	0.59
66.	Onagraceae	2	0.42	2	0.59
67.	Convolvulaceae	2	0.42	2	0.59
68.	Plantaginaceae	2	0.42	2	0.59
69.	Thymelaeaceae	2	0.42	2	0.59
70.	Verbenaceae	2	0.42	2	0.59
71.	Zygophyllaceae	2	0.42	2	0.59
72.	Campanulaceae	2	0.42	1	0.29
73.	Caprifoliaceae	2	0.42	1	0.29
74.	Vitaceae	2	0.42	1	0.29
75.	Ebenaceae	2	0.42	1	0.29
76.	Guttiferae	2	0.42	1	0.29
77.	Mimosaceae	2	0.42	1	0.29
78.	Acanthaceae	3	0.63	3	0.89
79.	Asclepiadaceae	3	0.63	2	0.59
80.	Caryophyllaceae	3	0.63	2	0.59
81.	Fagaceae	3	0.63	1	0.29
82.	Malvaceae	3	0.63	2	0.59
83.	Oleaceae	3	0.63	2	0.59
84.	Papaveraceae	3	0.63	1	0.30

85.	Rubiaceae	3	0.63	2	0.59
86.	Violaceae	3	0.63	1	0.29
87.	Amaranthaceae,	4	0.84	3	0.89
88.	Balsaminaceae	4	0.84	1	0.29
89.	Chenopodiaceae	4	0.84	1	0.29
90.	Crassulaceae	4	0.84	4	1.19
91.	Myrtaceae	4	0.84	3	0.89
92.	Primulaceae,	4	0.84	3	0.89
93.	Rhamnaceae,	4	0.84	1	0.29
94.	Salicaceae	4	0.84	2	0.59
95.	Gentianaceae	5	1.05	2	0.59
96.	Urticaceae	5	1.05	3	0.89
97.	Rutaceae	5	1.05	4	1.19
98.	Geraniaceae	6	1.26	2	0.61
99.	Moraceae	7	1.47	3	0.89
100.	Scrophulariaceae	7	1.47	5	1.49
101.	Boraginaceae	7	1.47	6	1.79
102.	Cucurbitaceae	7	1.47	6	1.79
103.	Polygonaceae	8	1.68	5	1.49
104.	Euphorbiaceae	9	1.89	4	1.19
105.	Apiaceae	11	2.31	10	3.0
106.	Solanaceae	12	2.52	8	2.39
107.	Ranunculaceae	15	3.15	8	2.39
108.	Brassicaceae	17	3.57	13	3.89
109.	Lamiaceae	20	4.20	15	4.49
110.	Papilionaceae	21	4.41	13	3.89
111.	Rosaceae	29	6.09	15	4.49
112.	Asteraceae	41	8.61	32	9.58

Table-IV. A Numerical Summary of Plant Biodiversity in Malam Jabba valley, Hindu Kush Range

1.	Taxonomic Catogory	Species	Genera	Families
2.	Pteridophyta	26	14	10
3.	Gymnosperms	11	09	04
4.	Monocots	86	69	16
5.	Dicots	353	242	82
	Total	476	334	112

RESULTS AND DISCUSSION

The Malam Jabba Valley, district Swat has a diverse flora with the spectacular scenic beauty that attracts tourists across the globe and makes the valley a paradise for the nature and adventure lovers. Floristically the area is located in Hindu Kush Range, dominated by Sino-Japanese type of vegetation.

A detailed investigation was carried out during 2013-17 in order to explore & determine the vascular plant biodiversity & their conservation value based on native, naturalized, cultivated/alien species for sustainable livelihood security of Malam Jabba Valley, Hindu Kush range, District Swat, Pakistan. The study documented 476 taxa of vascular plants taxonomically segregated into three hundred thirty four genera and one hundred twelve families. (Table-IV).

Botanical exploration on the flora of Malam Jabba Valley indicates that there are 476 plant taxa classified among 334 genera and 112 families. With regard to presentation by different taxonomic category in term of species diversity Pteridophyta constitute 26 species classified among 14 genera, under 10 families. Gymnosperms consisted of 11 species in 9 genera belonging to 4 families. Angiosperms were represented by 82 families, of these; 86 species of 69 genera in 16 families were monocots while 353 species distributed within 242 genera in 82 families were eudicots/coredicots. (Table I-IV). In term of percentage, the Eudicots/Coredicots indicate (74%), of the total vascular plant biodiversity followed by Monocots with a share of (18.0%), Pteridophyta (6%) while Gymnosperms are represented by (2%). (Table-IV).

Pteridophytes were represented by twenty six species and fourteen genera, belonging to ten families. Athyraceae with five species and three genera was a largest family in Pteridophyta followed by Adiantaceae, Aspleniaceae and Dryopteridaceae with four species and single genus each, Pteridaceae with four species and three genera while the remaining families, Dennstaedtiaceae Equisetaceae Marsileaceae, Selaginellaceae, Thelypteridaceae are monogeneric that contributes one species each.

Gymnosperms consisted of eleven species belonging to nine genera under four families. Pinaceae was leading family in term of species diversity having six species and four genera followed by Cupressaceae with three species and three genera each; Ephedraceae & Taxaceae comprising of two genera and each genus with single species.

Angiosperms were represented by 98 families, of these; 353 species of 242 genera in 82 families were eudicots and coredicots while 86 species of 69 genera in 16 families were monocots.

Angiosperms were represented by ninety eight families, of these; eighty six species classified among sixty nine genera in sixteen families were monocotyledons while three hundred fifty three species distributed within two hundred forty two genera in eighty two families were dicotyledons.

In monocots, Poaceae was the predominant family consisting of fifty one species and forty three genera followed by Cyperaceae with nine species and five genera, Araceae five species and three genera. Alliaceae, Asparagaceae and Liliaceae were represented by three species each under one, two and three genera, respectively. Alismataceae and Amaryllidaceae with two species and two genera each, Iridaceae two species and one genus each, Seven families are monophyletic (Single species each) which are represented by Asphodelaceae, Colchicaceae, Commelinaceae, Dioscoreaceae, Hyacinthaceae, Juncaceae & Smilacaceae.

Asteraceae with 41 taxa and thirty two genera was a key prominent family in term of species diversity in diocots followed by Rosaceae with twenty nine taxa distributed within fifteen genera; Papilionaceae with a share of twenty one species of thirteen genera; Lamiaceae with twenty taxa in fifteen genera; Brassicaceae seventeen taxa under thirteen genera; Ranunculaceae fifteen taxa and eight genera, Solanaceae twelve taxa under eight genera; Apiaceae with eleven taxa of ten genera; Euphorbiaceae with nine taxa and four genera and Polygonaceae eight taxa distributed in five genera. Four families Moraceae, Scrophulariaceae, Boraginaceae and Cucurbitaceae are represented by seven species each classified among three, five, six and six genera, respectively. Geraniaceae are represented by six species and two genera followed by Gentianaceae, Rutaceae and Urticaceae with five species each distributed within two, three and four genera respectively. Eight families are represented by Amaranthaceae, Balsaminaceae, Chenopodiaceae, Crassulaceae, Myrtaceae, Primulaceae, Rhamnaceae and Salicaceae which contributes 4 species each distributed within three, one, one, four, three, three, one and two genera, respectively. Nine families Acanthaceae, Asclepiadaceae, Caryophyllaceae, Fagaceae, Malvaceae, Oleaceae, Papaveraceae, Rubiaceae and Violacea are contributed by 3 species each under three, two, two, one, two, two, one, two and one genera, respectively. Fifteen families Aizoaceae, Anacardiaceae, Buxaceae. Campanulaceae, Caprifoliaceae, Convolvulaceae, Ebenaceae, Guttiferae, Mimosaceae, Onagraceae, Plantaginaceae, Thymelaeaceae, Verbenaceae, Vitaceae and Zygophyllaceae are represented by two species each, distributed within two, two, two, one, one, two, one, one, one, two, one, two, two, one and two genera respectively while the last thirty two families are monogeneric & monospecific which contribute only one genus & one

species each. These monophyletic families are represented by Apocynaceae, Araliaceae, Berberidaceae, Betulaceae, Buddlejaceae, Caesalpiniaceae, Canabinaceae, Celastraceae, Cuscutaceae, Elaeagnaceae, Fumariaceae, Hamamelidaceae, Hippocastinaceae, Juglandaceae, Meliaceae, Myrsinaceae, Nyctaginaceae, Oxalidaceae, Paeoniaceae, Plantanaceae, Plumbaginaceae, Podophyllaceae, Polemoniaceae, Polygalaceae, Punicaceae, Sambucaceae, Sapindaceae, Sapotaceae, Saxifragaceae, Simaroubaceae, Ulmaceae and Valerianaceae.

Herbaceous layer (286 species) were found to be the most used life forms followed by trees, (64 species), shrubs (58 species), grasses (51 species), climbers (16 species) & parasite (01 species) in descending order.

Four hundred thirty plant taxa (90 %) of the total flora in the research area is indigenous while the remaining 46 taxa (10 %) are exotic or cultivated species.

Plant biodiversity is a major pre requisite for healthy ecosystem that sustains all the life on the earth. Plant biodiversity are the vital component of our planet and important natural resource for livelihood security and human well being (Gadgil, 1996). Plants are the primary producers of the ecosystem and the basic unit of life. Plants provide us with wide range of useful products such as, peat, charcoal, fuel, timber wood, building materials, food, fiber, clothing, shelter, aromatic and medicinal compounds for human beings and their animals. Besides sustenance, the plant biodiversity have been used as therapeutic aid for treatment of various human diseases (Sullivan & Shealy, 1997). Plants are natural custodian of chemical compounds or also known as natural industries of chemical compounds. These compounds are used in pharmaceuticals, flavors, fragrance, colors & insecticide industries. Plants biodiversity provide natural protection for soil against erosion and also known as green lung of the earth that purify the air and water, mitigate floods, modern storm surges and stabilize landscapes. Plant biodiversity under pin all these services for sustainable livelihoods security of billion's people either directly or indirectly, through provision of foods, medicine, aromatic oil, fibers and many other materials essential for their daily lives. Livelihoods security of some 1.6 billion people depend heavily on forest resources, while 80% of the world's population rely on traditional medicines-largely based on plant biodiversity for their primary healthcare. Human welfare is thus ultimately linked with plant diversity thus essential for the sustainable livelihoods security and safety of any region. (Walters & Hamilton, 1993).

Documentation and exploration of plant biodiversity was the first sixteen targets for 2010 adopted by the 6th Conference of the Parties to the CBD, (Callmanderet *al.*, 2005). All the

vascular plants (Tracheophytes) are divided into two major groups, the Lycophytes and Euphyllophytes. The latter is further divided into spermatophytes and Monilophytes (fern and their allies), (Judd *et al.*, 2002). More than 270,000 taxa of vascular plants have been reported from different ecosystems (Walters and Gillet, 1997) but latest data show that the total number of identified vascular plant taxa is estimated to be between 310,000 (Prance *et al.*, 2000) and 420,000 (Bramwellet *al.*, 2002).

There are 1572 documented genera and 5521 named species of flowering Plants in Pakistan (Ali, 2008). On the other hand all the mountainous areas not still properly explored for the vascular plant biodiversity and there is over ride need for botanical documentation and exploration in the rich plant resources of mountainous valleys (Ali, 2010). Approximately 80% of the endemic flowering plants of the country are restricted and found to the western and northern hilly areas of Pakistan (Ali and Qaiser 1986). Similarly the remote and hard Valleys are not still properly explored (Alam, 2010). Stewart 1967 botanically explored the Swat Valley and documented 1550 plant species but he collected plant specimen mostly from plain and lower areas of the Valley and remote areas like Malam Jabba has thoroughly been visited for vascular plant biodiversity.

Malam Jabba valley is one of the most remote Valleys in Swat District and there is no even a single authenticated plant specimen available in any of the Herbaria in the country. The Valley is virgin and unexplored, Therefore a detailed study was scheduled to explore vascular plant biodiversity and their conservation value with special reference to the ethno-medicinal and ethno-veterinary medicinal plants for sustainable livelihood security Malam Jabba Valley, HKR, Swat.

The taxonomic knowledge is the key foundation stone for advanced studies in every aspect of biological science (Khushoo, 1995). This inventory is an attempt to explore all vascular plant biodiversity and their conservation value currently occurring in valley, therefore updating the authenticated taxonomic overview and indigenous knowledge with special reference to of vascular plant biodiversity in the Malam Jabba valley, Swat. Present study was also very useful to record changes in the floristic composition of the area with special reference to the introduction of exotic species and loss of some critically endangered as a result different ecological threats and anthropogenic activities.

Chapter –II

CONSERVATION STUDIES

CONSERVATION ISSUES

Plant biodiversity of our planet is slumping at an alarming rate resulting in soil erosion, habitat loss and degradation; drying, desertification and flooding that adversely damage the health of our ecosystem.

More than 270,000 taxa of vascular plants have been reported from different ecosystems on the planet (Walters and Gillet, 1997) but latest data show that the total number of identified vascular plant taxa is estimated to be between 310,000 (Prance *et al.*, 2000) and 420,000 (Bramwell *et al.*, 2002). Due to unwise of local communities, urbanization, fragmentation of habitat and over exploitation of natural resources, the natural flora is rapidly disappearing (Alam and Ali, 2008).

The unsustainable and non-judicial use of plant resources has threaded the plant diversity. Extinction of biodiversity especially plants has become one of the key problems occurring throughout the world. This situation is even more worsening in the developing countries (Rahbel & Colwell., 011; Tedesco et al., 2014). Conservation & preservation of the threatened plant species is one of common interest for conservationists & biodiversity specialists. current biological extinction is considered to be caused as a result of anthropogenic activities and is grater in magnitude as compared to the earliest ones (Pimm *et al.*, 1995). The rate of plants extinction is one species per day (Hilton-Taylor 2000) and if this trends continues 60,000 to 100,000 plant species would become extinct in the next 50 years (Bramwell, 2002). This mass extinction is caused as a result of habitat loss forced by habitat alteration, fragmentation and destruction and is considers as the primary cause of species extirpation (Barbosa & Maquet, 2002).

Pakistan is very rich in plant diversity. More than 6000 species of vascular plants are recognized as established here (Ahmad, 2003). Pakistan is under tremendous ecological pressure due to its population explosion, unplanned urbanization, deforestation, and overexploitation of natural resources. Very little critical work has been done on threatened plants of Pakistan (Alam and Ali, 2009). According to Nasir (1991), 580 flowering plant species are deemed to be “threatened”. In contrast, Walter and Gillet 1998 have listed only 14 flowering plant species as threatened from Pakistan. In the “Red list book” 2008, 19 flowering plant species are listed from

Pakistan (IUCN, 2008), however according to Ali and Qaiser, 21 flowering plant species are threatened from Pakistan (Ali and Qaiser, 2010).

The Pakistan is also facing serious problems of over exploitation, unsustainable use of natural resources and habitat loss, ecosystem/habitat degradation, drying, desertification, flooding has led to extreme declines in plant natural resources. In order to cope up with verse situation of plant biodiversity, various conservation issues and assessment needs to be addressed and accelerated. But unfortunately no such data is available and very little and sporadic work has been done on the conservation status of plant biodiversity. A few research papers are available on the conservation status threatened and endemic plants of northern parts of Pakistan i.e. Alam and Ali, 2010; Ali and Qaiser, 2010; Abbas *et al* 2010 and Ali *et al.*, 2012.

The plant biodiversity of Pakistan needs and deserves our immediate attention because little information is available on the threatened plants of our country. Malam Jabba valley is one of the most remote valleys in Swat District and there is no even a single authenticated plant specimen available in any of the Herbaria in the country. The valley is virgin and unexplored therefore a detailed study was designed to document the conservation status, major threats and extinction risk to the flora of our area in near future.

MATERIALS AND METHODS

IUCN Red List Categories and Criteria were used to evaluate conservation status of vascular plant biodiversity. IUCN Red List Categories and Criteria (2001, 2012b) Version 3.1, Appendix VII, following Guidelines for Using the IUCN Red List Categories and Criteria” (2010, Version 8.1 and 2014, Version 11) and Guidelines for Application of IUCN Red List Criteria at Regional and National Levels (IUCN 2003 Version 3.0 & 2012a Version 4.0) were used for detailed investigation of conservation issues. An enclosed IUCN Red list Categories and Criteria (Appendix VII & VIII) was attached for conservation Assessment.

The International Union for Conservation of Nature (IUCN) has established different categories for evaluating the taxon at regional/national levels. These categories are

- | | | |
|--------------------------------|-------------------------------------|--|
| i. Extinct (EX) | ii. Extinct in the wild (EW) | iii. Critically Endangered (CR) |
| iv. Endangered (EN) | v. Vulnerable (VU) | vi. Near threatened (NT) |
| vii. Least Concern (LC) | viii. Data Deficient (DD) | ix. Not Evaluated (NE) |

IUCN has established five basic criteria from A-E (Annexure I) for evaluating the taxon at regional/national levels. To enlist a particular taxon in any of the categories of threats, only one of the criteria, A, B, C, D or E need to met. However a taxon should be assessed against as many criteria as available data permit and the listing should be annotated by as many criteria as are applicable for a specific category of threat (2010, Version 8.1 and 2014, Version 11).

The five criteria are:

- A.** Declining population (past, present and/or projected)
- B.** Geographic range size, and fragmentation, decline or fluctuations
- C.** Small population size and fragmentation, decline or fluctuations
- D.** Very small population or very restricted distribution
- E.** Probability of extinction/Quantitative analysis of extinction risk (e.g., Population Viability Analysis)

Table-V. Conservation Value of Vascular Plant Biodiversity at Malam Jabba Valley, HKR, Swat

S.#	Family	Botanical name	Habit	Conservation status
Critically Endangered (CR) 30				
1.	Ranunculaceae	<i>Aconitum chasmanthum</i> Stapf ex Holmes	Herb	Critically Endangered
2.	Hippocastinaceae	<i>Aesculus indica</i> (Wall.ex. Camb.) Hook.f.	Tree	Critically Endangered
3.	Alliaceae	<i>Allium humile</i> Kunth.	Herb	Critically Endangered
4.	Berberidaceae	<i>Berberis lycium</i> Royle	Shrub	Critically Endangered
5.	Buxaceae	<i>Buxus wallichiana</i> Baill	Shrub	Critically Endangered
6.	Ranunculaceae	<i>Caltha alba</i> Camb.	Herb	Critically Endangered
7.	Pinaceae	<i>Cedrus deodara</i> (Roxb. ex D.Don) G. Don	Tree	Critically Endangered
8.	Ulmaceae	<i>Celtis australis</i> L.	Tree	Critically Endangered
9.	Colchicaceae	<i>Colchicum luteum</i> Baker	Herb	Critically Endangered
10.	Rosaceae	<i>Crataegus songarica</i> K. Koch.	Tree	Critically Endangered
11.	Liliaceae	<i>Fritillaria cirrhosa</i> Subsp. <i>Roylei</i> (Hook.) Ali, Syn. <i>Fritillaria roylei</i> Hook.	Herb	Critically Endangered
12.	Juglandaceae	<i>Juglans regia</i> L.	Tree	Critically Endangered
13.	Oleaceae	<i>Olea ferruginea</i> Wall. ex Aitch. Syn. <i>Olea cupidata</i> Wall ex G. Don	Tree	Critically Endangered
14.	Paeoniaceae	<i>Paeonia emodi</i> Wall.ex Royle	Herb	Critically Endangered
15.	Pinaceae	<i>Picea smithiana</i> (Wall.) Boiss	Tree	Critically Endangered
16.	Pinaceae	<i>Pinus gerardiana</i> Wall.	Tree	Critically endangered
17.	Anacardiaceae	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f.	Tree	Critically Endangered
18.	Podophyllaceae	<i>Podophyllum emodi</i> Wall. ex Royle	Herb	Critically Endangered
19.	Convallariaceae	<i>Polygonatum verticillatum</i> (L.) All.	Herb	Critically Endangered
20.	Rosaceae	<i>Prunus cornuta</i> (Wall. ex Royle) Steud	Tree	Critically Endangered
21.	Fagaceae	<i>Quercus semecarpifolia</i> Sm.	Tree	Critically Endangered
22.	Polygonaceae	<i>Rheum australe</i> D. Don	Herb	Critically Endangered
23.	Asteraceae	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke)	Herb	Critically Endangered
24.	Rutaceae	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp.	Shrub	Critically Endangered
25.	Taxaceae	<i>Taxus wallichiana</i> Zucc.	Tree	Critically Endangered

26.	Valerianaceae	<i>Valeriana jatamansi</i> Jones	Herb	Critically Endangered
27.	Caprifoliaceae	<i>Viburnum cotinifolium</i> D.Don.	Shrub	Critically Endangered
28.	Violaceae	<i>Viola betonicifolia</i> Sm.	Herb	Critically Endangered
29.	Violaceae	<i>Viola pilosa</i> Blume	Herb	Critically Endangered
30.	Vitaceae	<i>Vitis jacquemontii</i> Parker	Woody Climber	Critically Endangered
Endangered (EN) 34				
31.	Pinaceae	<i>Abies pindrow</i> Royle	Tree	Endangered
32.	Ranunculaceae	<i>Aconitum heterophyllum</i> Wall. ex Royle	Herb	Endangered
33.	Araceae	<i>Acorus calamus</i> L.	Herb	Endangered
34.	Betulaceae	<i>Alnus nitida</i> (Spach) Endl.	Tree	Endangered
35.	Asparagaceae	<i>Asparagus officinalis</i> L.	Shrub	Endangered
36.	Saxifragaceae	<i>Bergenia ciliata</i> (Haw.) Sternb.	Herb	Endangered
37.	Polygonaceae	<i>Bistorta amplexicaulis</i> (D. Don) Green	Herb	Endangered
38.	Dioscoreaceae	<i>Dioscorea deltoidea</i> Wall. ex Kunth	Climber	Endangered
39.	Ebenaceae	<i>Diospyros lotus</i> L.	Tree	Endangered
40.	Boraginaceae	<i>Ehretia obtusifolia</i> Hochst. ex DC.	Tree	Endangered
41.	Elaeagnaceae	<i>Elaeagnus umbellata</i> Thunb.	Shrub	Endangered
42.	Ephedraceae	<i>Ephedra gerardiana</i> Wall.ex Stapf	Shrub	Endangered
43.	Geraniaceae	<i>Geranium wallichianum</i> D.Don ex Sweet	Herb	Endangered
44.	Solanaceae	<i>Hyoscyamus niger</i> L.	Herb	Endangered
45.	Papilionaceae	<i>Indigofera heterantha</i> Well. ex Brandis	Shrub	Endangered
46.	Iridaceae	<i>Iris hookeriana</i> Foster	Herb	Endangered
47.	Sapotaceae	<i>Monothea buxifolia</i> (Falc.) A. DC	Tree	Endangered
48.	Moraceae	<i>Morus alba</i> L.	Tree	Endangered
49.	Myrsinaceae	<i>Myrsine africana</i> L.	Shrub	Endangered
50.	Lamiaceae	<i>Otostegia limbata</i> (Benth.) Boiss.	Shrub	Endangered
51.	Hamamelidaceae	<i>Parrotiopsis jacquemontiana</i> (Dcne.) Rehder.	Shrub	Endangered
52.	Pinaceae	<i>Pinus roxburghii</i> Sargent	Tree	Endangered
53.	Pinaceae	<i>Pinus wallichiana</i> A.B. Jackson	Tree	Endangered

54.	Salicaceae	<i>Populus alba</i> L.	Tree	Endangered
55.	Primulaceae	<i>Primula denticulata</i> Sm.	Herb	Endangered
56.	Fagaceae	<i>Quercus dilatata</i> Royle	Tree	Endangered
57.	Fagaceae	<i>Quercus incana</i> Roxb.	Tree	Endangered
58.	Rosaceae	<i>Rosa webbiana</i> Wall. ex Royle	Shrub	Endangered
59.	Salicaceae	<i>Salix babylonica</i> L.	Tree	Endangered
60.	Lamiaceae	<i>Thymus linearis</i> Benth.	Herb	Endangered
61.	Caprifoliaceae	<i>Viburnum grandiflorum</i> Wall. ex DC.	Shrub	Endangered
62.	Violaceae	<i>Viola canescens</i> Wall. ex Roxb.	Herb	Endangered
63.	Solanaceae	<i>Withania somnifera</i> (L.) Dunal	Shrub	Endangered
64.	Rhamnaceae	<i>Ziziphus jujuba</i> Mill.	Tree	Endangered
Vulnerable (VU) 46				
65.	Mimosaceae	<i>Acacia modesta</i> Wall.	Tree	Vulnerable
66.	Euphorbiaceae	<i>Andrachne cordifolia</i> (Wall. ex Decne.) Muell.	Shrub	Vulnerable
67.	Araceae	<i>Arisaema utile</i> Hook. f. ex Schott	Herb	Vulnerable
68.	Araceae	<i>Arisaema flavum</i> (Forsk.) Schott	Herb	Vulnerable
69.	Asteraceae	<i>Artemisia maritima</i> L.	Shrub	Vulnerable
70.	Asteraceae	<i>Artemisia scoparia</i> Waldst Kitam.	Shrub	Vulnerable
71.	Asparagaceae	<i>Asparagus capitatus</i> subsp. <i>gracilis</i> Browicz (Syn. <i>Asparagus gracilis</i> Royle)	Shrub	Vulnerable
72.	Papilionaceae	<i>Astragalus graveolens</i> Benth.	Herb	Vulnerable
73.	Apiaceae	<i>Bunium persicum</i> (Boiss) Fedtsch.	Herb	Vulnerable
74.	Asclepiadaceae	<i>Caralluma edulis</i> (Edgew.) Benth. ex Hook.f.	Herb	Vulnerable
75.	Anacardiaceae	<i>Cotinus coggia</i> Scop.	Shrub	Vulnerable
76.	Ranunculaceae	<i>Clematis connata</i> DC.	Climber	Vulnerable
77.	Thymelaeaceae	<i>Daphne mucronata</i> Royle	Shrub	Vulnerable
78.	Solanaceae	<i>Datura stramonium</i> Linn.	Herb	Vulnerable
79.	Papilionaceae	<i>Desmodium elegans</i> DC.	Shrub	Vulnerable
80.	Sapindaceae	<i>Dodonaea viscosa</i> (L.) Jacq.	Shrub	Vulnerable
81.	Dryopteridaceae	<i>Dryopteris juxtaopposita</i> Chr.	Herb	Vulnerable
82.	Euphorbiaceae	<i>Euphorbia wallichii</i> Hook.f.	Herb	Vulnerable

83.	Moraceae	<i>Ficus carica</i> L.	Tree	Vulnerable
84.	Moraceae	<i>Ficus palmata</i> Forsk.	Tree	Vulnerable
85.	Gentianaceae	<i>Gentiana kurroo</i> Royle.	Herb	Vulnerable
86.	Gentianaceae	<i>Gentiana argentea</i> (Royle ex D.Don) Omer	Herb	Vulnerable
87.	Poaceae	<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.	Herb	Vulnerable
88.	Guttiferae	<i>Hypericum perforatum</i> L	Herb	Vulnerable
89.	Lamiaceae	<i>Isodon rugosus</i> (Wall. ex Bth.) Codd	Shrub	Vulnerable
90.	Cupressaceae	<i>Juniperus communis</i> L.	Shrub	Vulnerable
91.	Acanthaceae	<i>Justicia adhatoda</i> L.	Shrub	Vulnerable
92.	Myrtaceae	<i>Myrtus communis</i> L.	Shrub	Vulnerable
93.	Apocynaceae	<i>Nerium oleander</i> L.	Shrub	Vulnerable
94.	Liliaceae	<i>Notholirion thomsonianum</i> (D.Don) Stapf	Herb	Vulnerable
95.	Solanaceae	<i>Physalis divaricata</i> D. Don.	Herb	Vulnerable
96.	Primulaceae	<i>Primula macrophylla</i> D.Don.	Herb	Vulnerable
97.	Rosaceae	<i>Prunus armeniaca</i> L.	Tree	Vulnerable
98.	Plantanaceae	<i>Platanus orientalis</i> L.	Tree	Vulnerable
99.	Rosaceae	<i>Prunus persica</i> (L.) Batsch	Tree	Vulnerable
100.	Punicaceae	<i>Punica granatum</i> L.	Tree	Vulnerable
101.	Rosaceae	<i>Pyrus pashia</i> Buch.-Ham. ex D.Don	Tree	Vulnerabe
102.	Rosaceae	<i>Pyrus sinkiangensis</i> T. T. Yu	Tree	Vulnerable
103.	Salicaceae	<i>Salix tetrasperma</i> Roxb.	Tree	Vulnerable
104.	Lamiaceae	<i>Salvia lanata</i> Roxb.	Herb	Vulnerable
105.	Buxaceae	<i>Sarcococca saligna</i> (Don) Muell.	Shrub	Vulnerable
106.	Hyacinthaceae	<i>Scilla griffithii</i> Hochr.	Herb	Vulnerable
107.	Asteraceae	<i>Tussilago farfara</i> L.	Herb	Vulnerable
108.	Rutaceae	<i>Zanthoxylum armatum</i> DC.	Shrub	Vulnerable
109.	Rhamnaceae	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Shrub	Vulnerable
110.	Rhamnaceae	<i>Ziziphus oxyphylla</i> Edgew.	Shrub	Vulnerable

Near Threatened (NT) 78				
111.	Asteraceae	<i>Achillea millefolium</i> L	Herb	Near Threatened
112.	Adiantaceae	<i>Adiantum incisum</i> L.	Herb	Near Threatened
113.	Adiantaceae	<i>Adiantum pedatum</i> L.	Herb	Near Threatened
114.	Rosaceae	<i>Agrimonia eupatoria</i> L.	Herb	Near Threatened
115.	Lamiaceae	<i>Ajuga bracteosa</i> Wall.ex Benth	Herb	Near Threatened
116.	Lamiaceae	<i>Ajuga parviflora</i> Benth.	Herb	Near Threatened
117.	Primulaceae	<i>Anagalis arvensis</i> Linn.	Herb	Near Threatened
118.	Araceae	<i>Arisaema jacquemontii</i> Blume	Herb	Near Threatened
119.	Boraginaceae	<i>Arnebia linearifolia</i> A.DC.	Herb	Near Threatened
120.	Asphodelaceae	<i>Asphodelus tenuifolius</i> Cav.	Herb	Near Threatened
121.	Aspleniaceae	<i>Asplenium ceterach</i> L. Syn. <i>Ceterach officinarum</i> Willd.	Herb	Near Threatened
122.	Aspleniaceae	<i>Asplenium trichomanes</i> L.	Herb	Near Threatened
123.	Buddlejaceae	<i>Buddleja crispa</i> Benth.	Shrub	Near Threatened
124.	Canabinaceae	<i>Cannabis sativa</i> L.	Shrub	Near threatened
125.	Apiaceae	<i>Chaeorphyllum villosum</i> Wall ex. DC.	Herb	Near Threatened
126.	Asteraceae	<i>Cichorium intybus</i> L.	Herb	Near Threatened
127.	Cucurbitaceae	<i>Citrullus colocynthis</i> (L.) Shard.	Herb	Near Threatened
128.	Ranunculaceae	<i>Clematis grata</i> Wall.	Climber	Near Threatened
129.	Rosaceae	<i>Cotoneaster microphyllus</i> Wall. ex Lindl.	Shrub	Near Threatened
130.	Rosaceae	<i>Cotoneaster nummularia</i> Fisch. & Mey.	Shrub	Near Threatened
131.	Cuscutaceae	<i>Cuscuta reflexa</i> Roxb.	Parasitic herb	Near Threatened
132.	Solanaceae	<i>Datura innoxia</i> Mill.	Herb	Near Threatened
133.	Ranunculaceae	<i>Delphinium denudatum</i> Wall. ex Hook. f. & Thoms.	Herb	Near Threatened
134.	Dryopteridaceae	<i>Dryopteris filix-mas</i> (L.) Schott	Herb	Near Threatened
135.	Rosaceae	<i>Duchesnea indica</i> (Andrews) Focke	Herb	Near Threatened
136.	Asteraceae	<i>Echinops griffithianus</i> Boiss.	Herb	Near Threatened
137.	Apiaceae	<i>Foeniculum vulgare</i> Mill.	Herb	Near Threatened

138.	Geraniaceae	<i>Geranium rotundifolium</i> L.	Herb	Near Threatened
139.	Rubiaceae	<i>Himalrandia tetrasperma</i> (Roxb.) Yamazaki	Shrub	Near Threatened
140.	Crassulaceae	<i>Hylotelephium ewersii</i> (Ledeb.) H. Ohba	Herb	Near Threatened
141.	Guttiferae	<i>Hypericum oblongifolium</i> Choisy	Shrub	Near Threatened
142.	Balsaminaceae	<i>Impatiens brachycentra</i> Kar. & Kir.	Herb	Near Threatened
143.	Amaryllidaceae	<i>Ixiolirion tataricum</i> (Pall.) Schult. & Schult.f.	Herb	Near Threatened
144.	Oleaceae	<i>Jasminum humile</i> L.	Shrub	Near Threatened
145.	Oleaceae	<i>Jasminum officinale</i> L.	Shrub	Near Threatened
146.	Papilionaceae	<i>Lathyrus aphaca</i> L.	Herb	Near Threatened
147.	Papilionaceae	<i>Lathyrus sativus</i> L	Herb	Near Threatened
148.	Papilionaceae	<i>Lathyrus sphaericus</i> Retz.	Herb	Near Threatened
149.	Asteraceae	<i>Leontopodium himalayanum</i> DC.	Herb	Near Threatened
150.	Papilionaceae	<i>Lespedeza juncea</i> (Linn.f.)Pers.	Shrub	Near Threatened
151.	Rosaceae	<i>Malus pumila</i> Mill.	Tree	Near Threatened
152.	Marsileaceae	<i>Marsilea minuta</i> L.	Herb	Near Threatened
153.	Meliaceae	<i>Melia azedarach</i> L.	Tree	Near Threatened
154.	Moraceae	<i>Morus nigra</i> L.	Tree	Near Threatened
155.	Amaryllidaceae	<i>Narcissus tazetta</i> L.	Herb	Near Threatened
156.	Brassicaceae	<i>Neslia apiculata</i> Fisch., C.A. Mey. & Ave	Herb	Near Threatened
157.	Lamiaceae	<i>Phlomis bracteosa</i> Royle .ex Benth.	Herb	Near Threatened
158.	Asclepiadaceae	<i>Periploca aphylla</i> Decne.	Shrub	Near Threatened
159.	Urticaceae	<i>Pilea umbrosa</i> Blume	Herb	Near Threatened
160.	Rosaceae	<i>Prunus domestica</i> L.	Tree	Near threatened
161.	Dennstaedtiaceae	<i>Pteridium aquilinum</i> (L.) Kuhn	Herb	Near Threatened
162.	Rosaceae	<i>Pyrus bretschneideri</i> Rehder	Tree	Near Threatened
163.	Rosaceae	<i>Pyrus communis</i> L.	Tree	Near threatened
164.	Rosaceae	<i>Pyrus pyrifolia</i> (Burm. f.) Nakai	Tree	Near threatened
165.	Crassulaceae	<i>Rhodiola himalensis</i> (D. Don) S. H. Fu	Herb	Near Threatened
166.	Rosaceae	<i>Rosa macrophylla</i> Lindl.	Shrub	Near Threatened

167.	Rosaceae	<i>Rosa moschata</i> Herrm. (Syn. <i>Rosa brunonii</i> Lindl.)	Shrub	Near Threatened
168.	Rosaceae	<i>Rubus ellipticus</i> Smith.	Shrub	Near Threatened
169.	Rosaceae	<i>Rubus fruticosus</i> L.	Shrub	Near Threatened
170.	Rosaceae	<i>Rubus ulmifolius</i> Schott.	Shrub	Near Threatened
171.	Lamiaceae	<i>Salvia moocroftiana</i> wall ex Bth.	Herb	Near Threatened
172.	Asteraceae	<i>Senecio chrysanthemoides</i> DC.	Herb	Near Threatened
173.	Smilacaceae	<i>Smilax elegans</i> Wall. ex Kunth (Syn. <i>Smilax glaucophylla</i> Klotzch)	Climber	Near Threatened
174.	Solanaceae	<i>Solanum nigrum</i> L.	Herb	Near Threatened
175.	Solanaceae	<i>Solanum Surattense</i> Burm.f.	Herb	Near Threatened
176.	Rosaceae	<i>Spiraea nervosa</i> Franch & Sav.	Shrub	Near Threatened
177.	Lamiaceae	<i>Stachys parviflora</i> Benth	Herb	Near Threatened
178.	Gentianaceae	<i>Swertia alata</i> (D. Don) C. B Clarke.	Herb	Near Threatened
179.	Lamiaceae	<i>Teucrium stocksianum</i> Boiss.	Herb	Near Threatened
180.	Ranunculaceae	<i>Thalictrum foliolosum</i> DC.	Herb	Near Threatened
181.	Zygophyllaceae	<i>Tribulus terrestris</i> L.	Herb	Near Threatened
182.	Papilionaceae	<i>Trigonella monantha</i> C. A. Meyer	Herb	Near Threatened
183.	Urticaceae	<i>Urtica dioica</i> L.	Herb	Near Threatened
184.	Urticaceae	<i>Urtica pilulifera</i> L.	Herb	Near Threatened
185.	Verbenaceae	<i>Verbena officinalis</i> L.	Herb	Near Threatened
186.	Verbenaceae	<i>Vitex negundo</i> L.	Shrub	Near Threatened
187.	Thymelaeaceae	<i>Wikstroemia canescens</i> Wall. ex Meisn.	Shrub	Near Threatened
188.	Rhamnaceae	<i>Ziziphus mauritiana</i> var. <i>spontanea</i> (Edgew.) R.R Stewart ex Qaiser & Nazim.	Tree	Near Threatened

Least Concern (LC) 200

189.	Amaranthaceae	<i>Achyranthes aspera</i> L.	Herb	Least Concerned
190.	Poaceae	<i>Acrachne racemosa</i> (B.Heyne ex Roth) Ohwi	Herb	Least Concerned
191.	Adiantaceae	<i>Adiantum capillus-veneris</i> L.	Herb	Least Concerned
192.	Adiantaceae	<i>Adiantum venustum</i> D. Don.	Herb	Least Concerned
193.	Poaceae	<i>Agrostis stolonifera</i> L.	Herb	Least Concerned
194.	Brassicaceae	<i>Alliaria petiolata</i> (M. Bieb) Cavara	Herb	Least Concerned

195.	Poaceae	<i>Alopecurus myosuroides</i> Huds.	Herb	Least Concerned
196.	Amaranthaceae	<i>Alternanthera pungens</i> Kunth	Herb	Least Concerned
197.	Amaranthaceae	<i>Amaranthus spinosus</i> L.	Herb	Least Concerned
198.	Amaranthaceae	<i>Amaranthus viridis</i> L.	Herb	Least Concerned
199.	Asteraceae	<i>Anaphalis triplinervis</i> (Slims) C. B. Clarke	Herb	Least Concerned
200.	Primulaceae	<i>Androsace rotundifolia</i> Hardw.	Herb	Least Concerned
201.	Asteraceae	<i>Anthemis cotula</i> L.	Herb	Least Concerned
202.	Poaceae	<i>Apluda mutica</i> L.	Herb	Least Concerned
203.	Ranunculaceae	<i>Aquilegia pubiflora</i> Wall. ex Royle	Herb	Least Concerned
204.	Brassicaceae	<i>Arabis amplexicaulis</i> Edgew	Herb	Least Concerned
205.	Poaceae	<i>Aristida adscensionis</i> L.	Herb	Least Concerned
206.	Poaceae	<i>Aristida cyanantha</i> Nees ex Steud.	Herb	Least Concerned
207.	Asteraceae	<i>Artemisia dubia</i> Wall.	Shrub	Least Concerned
208.	Asteraceae	<i>Artemisia santolinifolia</i> Turcz. ex Krasch	Shrub	Least Concerned
209.	Asteraceae	<i>Artemisia vulgaris</i> L.	Shrub	Least Concerned
210.	Poaceae	<i>Arthraxon prionodes</i> (Steud.) Dandy.	Herb	Least Concerned
211.	Poaceae	<i>Arundo donax</i> L.	Herb	Least Concerned
212.	Aspleniaceae	<i>Asplenium adiantum-nigrum</i> L.	Herb	Least Concerned
213.	Papilionaceae	<i>Astragalus pyrrotrichous</i> Boiss.	Herb	Least Concerned
214.	Athyraceae	<i>Athyrium filix-femina</i> (L.) Roth ex Mertens	Herb	Least Concerned
215.	Poaceae	<i>Avena fatua</i> L.	Herb	Least Concerned
216.	Asteraceae	<i>Bidens cernua</i> L.	Herb	Least Concerned
217.	Poaceae	<i>Brachiaria ramosa</i> (L.) Stapf	Herb	Least Concerned
218.	Poaceae	<i>Brachypodium distachyon</i> (L.) Beauv	Herb	Least Concerned
219.	Brassicaceae	<i>Brassica rapa</i> subsp. <i>campestris</i> (L.) Clapham	Herb	Least Concerned
220.	Poaceae	<i>Bromus japonicus</i> Thunb. ex Murr.	Herb	Least Concerned
221.	Boraginaceae	<i>Buglossoides arvensis</i> (L.) Johnston.	Herb	Least Concerned
222.	Apiaceae	<i>Bupleurum falcatum</i> L.	Herb	Least Concerned
223.	Caesalpiniaceae	<i>Caesalpinia decapetala</i> (Roth) Alston	Shrub	Least Concerned

224.	Asteraceae	<i>Calendula arvensis</i> L.	Herb	Least Concerned
225.	Asclepiadaceae	<i>Calotropis procera</i> (Ait.) Ait. f.	Shrub	Least Concerned
226.	Campanulaceae	<i>Campanula pallida</i> Wall.	Herb	Least Concerned
227.	Campanulaceae	<i>Campanula tenuissisma</i> Dunn	Herb	Least Concerned
228.	Brassicaceae	<i>Capsella bursa pastoris</i> (L.) Medik.	Herb	Least Concerned
229.	Brassicaceae	<i>Cardamine flexuosa</i> With.	Herb	Least Concerned
230.	Cyperaceae	<i>Carex acutiformis</i> Ehrh.	Herb	Least Concerned
231.	Cyperaceae	<i>Carex fedia</i> Nees	Herb	Least Concerned
232.	Asteraceae	<i>Carthamus oxycantha</i> M. Bieb	Herb	Least Concerned
233.	Poaceae	<i>Cenchrus ciliaris</i> L.	Herb	Least Concerned
234.	Asteraceae	<i>Centaurea iberica</i> Trev. ex. Spreng.	Herb	Least Concerned
235.	Chenopodiaceae	<i>Chenopodium album</i> L.	Herb	Least Concerned
236.	Chenopodiaceae	<i>Chenopodium ambrosioides</i> L.	Herb	Least Concerned
237.	Chenopodiaceae	<i>Chenopodium botrys</i> L.	Herb	Least Concerned
238.	Chenopodiaceae	<i>Chenopodium murale</i> Linn.	Herb	Least Concerned
239.	Euphorbiaceae	<i>Chrozophora tinctoria</i> (L.) Raf.	Herb	Least Concerned
240.	Poaceae	<i>Chrysopogon serrulatus</i> Trin.	Herb	Least Concerned
241.	Asteraceae	<i>Cirsium falconeri</i> (Hook. f.) Petrak.	Herb	Least Concerned
242.	Asteraceae	<i>Cirsium arvense</i> (L.) Scop.	Herb	Least Concerned
243.	Convolvulaceae	<i>Convolvulus arvensis</i> L.	Herbaceous climber	Least Concerned
244.	Brassicaceae	<i>Coronopus didymus</i> (L.) Smith	Herb	Least Concerned
245.	Thelypteridaceae	<i>Cyclosorus dentatus</i> (Forssk.) Ching	Herb	Least Concerned
246.	Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	Herb	Least Concerned
247.	Boraginaceae	<i>Cynoglossum glochidiatum</i> Wall. ex Benth.	Herb	Least Concerned
248.	Boraginaceae	<i>Cynoglossum lanceolatum</i> Forsk.	Herb	Least Concerned
249.	Cyperaceae	<i>Cyperus brevifolious</i> Rottb.	Herb	Least Concerned
250.	Cyperaceae	<i>Cyperus compressus</i> L.	Herb	Least Concerned
251.	Cyperaceae	<i>Cyperus niveus</i> Retz.	Herb	Least Concerned

252.	Cyperaceae	<i>Cyperus rotundus</i> L.	Herb	Least Concerned
253.	Thelypteridaceae	<i>Cystopteris fragilis</i> (L.) Bernh.	Herb	Least Concerned
254.	Poaceae	<i>Dactylis glomerata</i> L.	Herb	Least Concerned
255.	Poaceae	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Herb	Least Concerned
256.	Urticaceae	<i>Debregeassia salcifolia</i> (D.Don) Rendl.	Shrub	Least Concerned
257.	Brassicaceae	<i>Descurainia sophia</i> (L.) Webb & Berth.	Herb	Least Concerned
258.	Poaceae	<i>Dichanthium annulatum</i> (Forssk.) Stapf	Herb	Least Concerned
259.	Acanthaceae	<i>Dicliptra bupleorides</i> Nees.	Herb	Least Concerned
260.	Poaceae	<i>Digitaria ciliaris</i> (Retz.) Koeler	Herb	Least Concerned
261.	Poaceae	<i>Diplachne fusca</i> (L.) P. Beauv. ex Roem. & Schult.	Herb	Least Concerned
262.	Athyriaceae	<i>Allantodia Aspera</i> (Blume) Ching. Syn. <i>Diplazium polypodioides</i> Blume	Herb	Least Concerned
263.	Dryopteridaceae	<i>Dryopteris blanfordii</i> (C. Hope) C. Christ.	Herb	Least Concerned
264.	Dryopteridaceae	<i>Dryopteris ramosa</i> (C. Hope) C. Chr.	Herb	Least Concerned
265.	Poaceae	<i>Echinochloa crus- galli</i> (L.) P. Beauv.	Herb	Least Concerned
266.	Poaceae	<i>Echinochloa colona</i> (L.) Link.	Herb	Least Concerned
267.	Asteraceae	<i>Eclipta prostrata</i> (L.) L.	Herb	Least Concerned
268.	Cyperaceae	<i>Eleocharis palustris</i> (L.) Roem. & Schult.	Herb	Least Concerned
269.	Poaceae	<i>Eleusine indica</i> (L.) Gaertn.	Herb	Least Concerned
270.	Onagraceae	<i>Epilobium laxum</i> Royle	Herb	Least Concerned
271.	Equisetaceae	<i>Equisetum arvense</i> L.	Herb	Least Concerned
272.	Poaceae	<i>Eragrostis ciliaris</i> (L.) R.Br.	Herb	Least Concerned
273.	Poaceae	<i>Eragrostis papposa</i> (Desf. ex Roem. & Schult.) Steud.	Herb	Least Concerned
274.	Asteraceae	<i>Erigeron bonariensis</i> L. (Syn. <i>Conyza bonariensis</i> (L.) Cronquist.)	Herb	Least Concerned
275.	Asteraceae	<i>Erigeron canadensis</i> L. (Syn. <i>Conyza canadensis</i> (L.) Cronquist.)	Herb	Least Concerned
276.	Cyperaceae	<i>Erioscirpus comosus</i> (Wall.) Palla	Herb	Least Concerned
277.	Geraniaceae	<i>Erodium cicutarium</i> (L.) L'Hér.	Herb	Least Concerned
278.	Euphorbiaceae	<i>Euphorbia falcata</i> L.	Herb	Least Concerned

279.	Euphorbiaceae	<i>Euphorbia helioscopia</i> L.	Herb	Least Concerned
280.	Euphorbiaceae	<i>Euphorbia hirta</i> L.	Herb	Least Concerned
281.	Euphorbiaceae	<i>Euphorbia indica</i> Lam.	Herb	Least Concerned
282.	Euphorbiaceae	<i>Euphorbia prostrata</i> Ait.	Herb	Least Concerned
283.	Cyperaceae	<i>Fimbristylis dichotoma</i> (L.) Vahl	Herb	Least Concerned
284.	Rosaceae	<i>Fragaria nubicola</i> (Lindl. ex Hook.f.) Lacaita	Herb	Least Concerned
285.	Fumariaceae	<i>Fumaria indica</i> (Hauskn.) Pugsley	Herb	Least Concerned
286.	Asteraceae	<i>Galinsoga parviflora</i> Cav.	Herb	Least Concerned
287.	Rubiaceae	<i>Galium aparine</i> L.	Herb	Least Concerned
288.	Rubiaceae	<i>Galium tetraphyllum</i> Nazim. & Ehrend	Climber	Least Concerned
289.	Geraniaceae	<i>Geranium collinum</i> Steph .ex Wild.	Herb	Least Concerned
290.	Geraniaceae	<i>Geranium nepalense</i> Sweet, Geran.	Herb	Least Concerned
291.	Geraniaceae	<i>Geranium ocellatum</i> Camb.	Herb	Least Concerned
292.	Urticaceae	<i>Girardinia palmata</i> (Forssk.) Gaudich.	Herb	Least Concerned
293.	Araliaceae	<i>Hedera nepalensis</i> K. Koch.	Woody climber	Least Concerned
294.	Asteraceae	<i>Helianthus annuus</i> L.	Herb	Least Concerned
295.	Boraginaceae	<i>Heliotropium eurapeum</i> L.	Herb	Least Concerned
296.	Poaceae	<i>Hordeum murinum</i> L.	Herb	Least Concerned
297.	Balsaminaceae	<i>Impatiens edgeworthii</i> Hook.f.	Herb	Least Concerned
298.	Poaceae	<i>Imperata cylindrica</i> (L.) Raeusch.	Herb	Least Concerned
299.	Convolvulaceae	<i>Ipomoea purpurea</i> (L) Roth.	Herb	Least Concerned
300.	Juncaceae	<i>Juncus inflexus</i> L.	Herb	Least Concerned
301.	Asteraceae	<i>Lactuca serriola</i> L.	Herb	Least Concerned
302.	Lamiaceae	<i>Lamium amplexicaule</i> L.	Herb	Least Concerned
303.	Papilionaceae	<i>Lathyrus cicera</i> L.	Herb	Least Concerned
304.	Asteraceae	<i>Launea procumbens</i> (Roxb.) Ramayya & Rajagopal	Herb	Least Concerned
305.	Brassicaceae	<i>Lepidium apetalum</i> Willd.	Herb	Least Concerned

306.	Brassicaceae	<i>Lepidium sativum</i> L.	Herb	Least Concerned
307.	Poaceae	<i>Leptochloa panicea</i> (Retz.) Ohwi	Herb	Least Concerned
308.	Boraginaceae	<i>Lindelofia anchusoides</i> (Lindl.) Lehm.	Herb	Least Concerned
309.	Papilionaceae	<i>Lotus corniculatus</i> L.	Herb	Least Concerned
310.	Malvaceae	<i>Malva neglecta</i> Wall.	Herb	Least Concerned
311.	Malvaceae	<i>Malva parviflora</i> L.	Herb	Least Concerned
312.	Papilionaceae	<i>Medicago laciniata</i> (L.) Mill	Herb	Least Concerned
313.	Papilionaceae	<i>Medicago minima</i> (L.) Grufb	Herb	Least Concerned
314.	Papilionaceae	<i>Medicago polymorpha</i> L.	Herb	Least Concerned
315.	Lamiaceae	<i>Mentha longifolia</i> (L.) Huds.	Herb	Least Concerned
316.	Lamiaceae	<i>Micromeria biflora</i> Buch.	Herb	Least Concerned
317.	Nyctaginaceae	<i>Mirabilis jalapa</i> L.	Herb	Least Concerned
318.	Brassicaceae	<i>Nasturtium officinale</i> R. Br.	Herb	Least Concerned
319.	Onagraceae	<i>Oenothera rosea</i> L.	Herb	Least Concerned
320.	Pteridaceae	<i>Onychium Japonicum</i> (Thunb.) Kunze Syn. <i>Onychium cryptogrammoides</i> Christ	Herb	Least Concerned
321.	Asteraceae	<i>Onopordum acanthium</i> L.	Shrub	Least Concerned
322.	Lamiaceae	<i>Origanum vulgare</i> L.	Herb	Least Concerned
323.	Oxalidaceae	<i>Oxalis corniculata</i> L.	Herb	Least Concerned
324.	Papilionaceae	<i>Oxytropis chiliophylla</i> Royle ex Benth.	Herb	Least Concerned
325.	Poaceae	<i>Panicum miliaceum</i> L.	Herb	Least Concerned
326.	Papaveraceae	<i>Papaver dubium</i> L.	Herb	Least Concerned
327.	Papaveraceae	<i>Papaver pavoninum</i> Schrenk	Herb	Least Concerned
328.	Poaceae	<i>Paspalum dilatatum</i> Poir.	Herb	Least Concerned
329.	Scrophulariaceae	<i>Pedicularis bicornuta</i> Kl.	Herb	Least Concerned
330.	Zygophyllaceae	<i>Peganum harmala</i> L.	Herb	Least Concerned
331.	Poaceae	<i>Pennisetum orientale</i> Rich.	Herb	Least Concerned
332.	Polygonaceae	<i>Persicaria barbata</i> (L.) Hara	Herb	Least Concerned
333.	Poaceae	<i>Phalaris minor</i> Retz	Herb	Least Concerned
334.	Poaceae	<i>Phleum alpinum</i> L.	Herb	Least Concerned

335.	Apiaceae	<i>Pimpinella diversifolia</i> DC.	Herb	Least Concerned
336.	Plantaginaceae	<i>Plantago lanceolata</i> L.	Herb	Least Concerned
337.	Plantaginaceae	<i>Plantago major</i> L.	Herb	Least Concerned
338.	Poaceae	<i>Phragmites karka</i> (Retz.) Trin.ex Steud.	Herb	Least Concerned
339.	Polygonaceae	<i>Polygonum arenastrum</i> boreau	Herb	Least Concerned
340.	Polygonaceae	<i>Polygonum aviculare</i> L.	Herb	Least Concerned
341.	Polygonaceae	<i>Polygonum plebejum</i> R. Br.	Herb	Least Concerned
342.	Poaceae	<i>Polypogon fugax</i> Ness ex Steud.	Herb	Least Concerned
343.	Poaceae	<i>Polypogon monspeliensis</i> (L.) Desf.	Herb	Least Concerned
344.	Poaceae	<i>Polypogon viridis</i> (Gouan) Breistr. (Syn. <i>Agrostis viridis</i> Gouan)	Herb	Least Concerned
345.	Rosaceae	<i>Potentilla nepalensis</i> Hook.f.	Herb	Least Concerned
346.	Lamiaceae	<i>Prunella vulgaris</i> L.	Herb	Least Concerned
347.	Pteridaceae	<i>Pteris cretica</i> L.	Herb	Least Concerned
348.	Pteridaceae	<i>Pteris vittata</i> L.	Herb	Least Concerned
349.	Ranunculaceae	<i>Ranunculus aquatilis</i> L.	Herb	Least Concerned
350.	Ranunculaceae	<i>Ranunculus arvensis</i> L.	Herb	Least Concerned
351.	Ranunculaceae	<i>Ranunculus laetus</i> Wall .ex Hook .f. & J.W. Thomson	Herb	Least Concerned
352.	Ranunculaceae	<i>Ranunculus muricatus</i> L.	Herb	Least Concerned
353.	Ranunculaceae	<i>Ranunculus sceleratus</i> L.	Herb	Least Concerned
354.	Polygonaceae	<i>Rumex dentatus</i> L.	Herb	Least Concerned
355.	Polygonaceae	<i>Rumex hastatus</i> D. Don.	Herb	Least Concerned
356.	Poaceae	<i>Saccharum spontaneum</i> L.	Herb	Least Concerned
357.	Sambucaceae	<i>Sambucus wightiana</i> Wall ex Wight. & Arn.	Herb	Least Concerned
358.	Apiaceae	<i>Scandix pecten-veneris</i> Linn.	Herb	Least Concerned
359.	Selaginellaceae	<i>Selaginella jacquemontii</i> Spring.	Herb	Least Concerned
360.	Poaceae	<i>Setaria viridis</i> (L.) P. Beauv.	Herb	Least Concerned
361.	Poaceae	<i>Setaria verticillata</i> (L.) P. Beauv.	Herb	Least Concerned
362.	Rosaceaea	<i>Sibbaldia procumbens</i> L.	Herb	Least Concerned
363.	Caryophyllaceae	<i>Silene conoidea</i> L.	Herb	Least Concerned

364.	Caryophyllaceae	<i>Silene vulgaris</i> (Moench) Garcke	Herb	Least Concerned
365.	Asteraceae	<i>Silybum marianum</i> (L.) Gaertn.	Herb	Least Concerned
366.	Brassicaceae	<i>Sisymbrium irio</i> L.	Herb	Least Concerned
367.	Solanaceae	<i>Solanum pseudo-capsicum</i> L.	Herb	Least Concerned
368.	Asteraceae	<i>Sonchus asper</i> (L.) Hill.	Herb	Least Concerned
369.	Asteraceae	<i>Sonchus oleraceus</i> L.	Herb	Least Concerned
370.	Rosaceae	<i>Sorbaria tomentosa</i> (Lindl.) Rehder	Shrub	Least Concerned
371.	Poaceae	<i>Sorghum halepense</i> (L.) Pers.	Herb	Least Concerned
372.	Caryophyllaceae	<i>Stellaria media</i> (L.) Cyr.	Herb	Least Concerned
373.	Poaceae	<i>Stipa sibirica</i> (Linn.) Lam	Herb	Least Concerned
374.	Gentianaceae	<i>Swertia cordata</i> (G. Don) Clarke	Herb	Least Concerned
375.	Asteraceae	<i>Taraxacum officinale</i> F. H. Wigg.	Herb	Least Concerned
376.	Ranunculaceae	<i>Thalictrum pedunculatum</i> Edgew.	Herb	Least Concerned
377.	Brassicaceae	<i>Thlaspi arvense</i> L.	Herb	Least Concerned
378.	Poaceae	<i>Themeda anathera</i> (Nees ex Steud.) Hack.	Herb	Least Concerned
379.	Aizoaceae	<i>Trianthema portulacastrum</i> L.	Herb	Least Concerned
380.	Papilionaceae	<i>Trifolium repens</i> L.	Herb	Least Concerned
381.	Liliaceae	<i>Tulipa clusiana</i> DC.	Herb	Least Concerned
382.	Scrophulariaceae	<i>Verbascum thapsus</i> L.	Herb	Least Concerned
383.	Scrophulariaceae	<i>Veronica anagallis-aquatica</i> L.	Herb	Least Concerned
384.	Scrophulariaceae	<i>Veronica laxa</i> Benth.	Herb	Least Concerned
385.	Scrophulariaceae	<i>Veronica polita</i> Fr.	Herb	Least Concerned
386.	Papilionaceae	<i>Vicia hirsuta</i> (L.) S. F. Gray	Herb	Least Concerned
387.	Papilionaceae	<i>Vicia sativa</i> L.	Herb	Least Concerned
388.	Scrophulariaceae	<i>Wulfenia amherstiana</i> Bth.	Herb	Least Concerned
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389.	Ranunculaceae	<i>Adonis aestivalis</i> L.	Herb	Data Deficient
390.	Alismataceae	<i>Alisma plantago-aquatica</i> L.	Herb	Data Deficient
391.	Aspleniaceae	<i>Asplenium dalhousiae</i> Hook. Syn. <i>Ceterach dalhousiae</i> (Hook.) C. Chr	Herb	Data Deficient

392.	Athyriaceae	<i>Athyrium mackinnoni</i> (C. Hope) C. Chr.	Herb	Data Deficient
393.	Athyriaceae	<i>Athyrium rupicola</i> (Hope) C. Chr.	Herb	Data Deficient
394.	Asteraceae	<i>Carpesium cernuum</i> L.	Herb	Data deficient
395.	Asteraceae	<i>Carthamus lanatus</i> L.	Herb	Data Deficient
396.	Poaceae	<i>Catabrosa aquatica</i> (L.) P. Beauv.	Herb	Data deficient
397.	Pteridaceae	<i>Cheilanthes farinose</i> (Forssk.) Kaulf.	Herb	Data Deficient
398.	Apiaceae	<i>Clinopodium umbrosum</i> (M.Bieb.) C. Koch (<i>Calamentha umbrosa</i> (M. Bieb.) Fisch. & Meyer)	Herb	Data deficient
399.	Commelinaceae	<i>Commelina benghalensis</i> L.	Herb	Data Decficient
400.	Asteraceae	<i>Crepis multicaulis</i> Ledeb.	Herb	Data Deficient
401.	Apiaceae	<i>Eryngium coeruleum</i> M-Bieb	Herb	Data Deficient
402.	Scrophulariaceae	<i>Euphrasia himalayica</i> Wettst.	Herb	Data Deficient
403.	Poaceae	<i>Festuca gigantea</i> (Linn.) Vill.	Herb	Data Deficient
404.	Moraceae	<i>Ficus pumila</i> L.	Climber	Data Deficient
405.	Balsaminaceae	<i>Impatiens bicolor</i> Royle	Herb	Data Deficient
406.	Balsaminaceae	<i>Impatiens glandulifera</i> Royle	Herb	Data Deficient
407.	Poaceae	<i>Lamarckia aurea</i> (L.) Moench.	Herb	Data Deficient
408.	Plumbaginaceae	<i>Limonium gilesii</i> (Hemsl.) Rech. f.	Herb	Data Deficient
409.	Celastraceae	<i>Maytenus royleanus</i> (Wall. ex Lawson) Cufodontis Syn. <i>Gymnosporia royleana</i> Wall. ex M.A.Lawson	Shrub	Data Deficient
410.	Papilionaceae	<i>Medicago lupulina</i> L.	Herb	Data Deficient
411.	Lamiaceae	<i>Mentha spicata</i> L.	Herb	Data Deficient
412.	Lamiaceae	<i>Nepeta govaniana</i> (Buch.-Ham. ex D. Don) Benth.	Herb	Data Deficient
413.	Lamiaceae	<i>Nepeta laevigata</i> (D. Don) Hand.	Herb	Data Deficient
414.	Asteraceae	<i>Phagnalon niveum</i> Edgew.	Herb	Data Deficient
415.	Apiaceae	<i>Pimpinella acuminata</i> (Edgew.) C.B. Clarke	Herb	Data Deficient

416.	Polemoniaceae	<i>Polemonium caeruleum</i> L.	Herb	Data Deficient
417.	Polygalaceae	<i>Polygala abyssinica</i> R.Br. ex Fresen.	Herb	Data Deficient
418.	Aizoaceae	<i>Portulaca oleracea</i> L.	Herb	Data Deficient
419.	Rosaceae	<i>Prunus dulcis</i> (Mill.) D.A. Webb Syn. <i>Prunus amygdalus</i> Stokes	Tree	Data Deficient
420.	Crassulaceae	<i>Rosularia adenotricha</i> (Wall. ex Edgew.) Jansson & Rech	Herb	Data deficient
421.	Alismataceae	<i>Sagittaria trifolia</i> L.	Herb	Data Deficient
422.	Lamiaceae	<i>Salvia nubicola</i> Will ex. Sweet	Herb	Data Deficient
423.	Crassulaceae	<i>Sedum hispanicum</i> L.	Herb	Data Deficient
424.	Asteraceae	<i>Serratula pallida</i> DC.	Herb	Data Deficient
425.	Apiaceae	<i>Seseli libanotis</i> (L) W. Koch	Herb	Data Deficient
426.	Acanthaceae	<i>Strobilanthes urticifolia</i> Wall. ex Kuntze	Shrub	Data Deficient
427.	Gentianaceae	<i>Swertia petiolata</i> D. Don	Herb	Data Deficient
428.	Brassicaceae	<i>Thlaspi griffithianum</i> (Boiss.) Boiss.	Herb	Data Deficient
429.	Asteraceae	<i>Tragopogon gracilis</i> D. Don	Herb	Data Deficient
430.	Asteraceae	<i>Xanthium strumarium</i> L.	Herb	Data Deficient
Cultivated/Introduced (NE) 36				
431.	Malvaceae	<i>Abelmoschus esculentus</i> (L.) Moench.	Herb	Cultivated
432.	Alliaceae	<i>Allium cepa</i> L.	Herb	Cultivated
433.	Alliaceae	<i>Allium sativum</i> L.	Herb	Cultivated
434.	Brassicaceae	<i>Brassica oleracea</i> Var. <i>botrytis</i> L.	Herb	Cultivated
435.	Brassicaceae	<i>Brassica rapa</i> subsp. <i>Rapa</i>	Herb	Cultivated
436.	Asteraceae	<i>Calendula officinale</i> L.	Herb	Cultivated
437.	Solanaceae	<i>Capsicum annum</i> L.	Herb	Cultivated
438.	Rutaceae	<i>Citrus limon</i> (L.) Osbeck	Shrub	Cultivated
439.	Rutaceae	<i>Citrus media</i> L.	Small tree	Cultivated
440.	Rutaceae	<i>Citrus sinensis</i> (L.) Osbeck	Tree	Cultivated
441.	Araceae	<i>Colocasia esculenta</i> (Linn.) Schott	Herb	Cultivated
442.	Apiaceae	<i>Coriandrum sativum</i> L.	Herb	Cultivated
443.	Cucurbitaceae	<i>Cucumis sativus</i> L.	Climber	Cultivated

444.	Cucurbitaceae	<i>Cucurbita maxima</i> Duch. ex Lam.,	Herbaceous climber	Cultivated
445.	Cucurbitaceae	<i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poir.	Herbaceous climber	Cultivated
446.	Cupressaceae	<i>Cupressus sempervirens</i> L.	Tree	Cultivated
447.	Ebenaceae	<i>Diospyros kaki</i> L.	Tree	Cultivated
448.	Rosaceae	<i>Eriobotrya japonica</i> (Thunb.) Lindl.	Tree	Cultivated
449.	Poaceae	<i>Hordeum vulgare</i> L.	Herb	Cultivated
450.	Iridaceae	<i>Iris germanica</i> L.	Herb	Cultivated
451.	Cucurbitaceae	<i>Lagenaria siceraria</i> (Molina) Standl.	Climber	Cultivated
452.	Cucurbitaceae	<i>Luffa cylindrica</i> (L.) Roem.	Annual climber	Cultivated
453.	Solanaceae	<i>Lycopersicon esculentum</i> Mill.	Herb	Cultivated
454.	Cucurbitaceae	<i>Momordica charantia</i> L.	Climber	Cultivated
455.	Solanaceae	<i>Nicotiana tabacum</i> L.	Herb	Cultivated
456.	Lamiaceae	<i>Ocimum basilicum</i> L.	Herb	Cultivated
457.	Papaveraceae	<i>Papaver somniferum</i> L.	Herb	Cultivated
458.	Papilionaceae	<i>Pisum sativum</i> L.	Herb	Cultivated
459.	Salicaceae	<i>Populus nigra</i> L.	Tree	Cultivated
460.	Brassicaceae	<i>Raphanus sativus</i> L.	Herb	Cultivated
461.	Rosaceae	<i>Rosa banksiae</i> W. T. Ait.	Shrub	Cultivated
462.	Solanaceae	<i>Solanum tuberosum</i> L.	Herb	Cultivated
463.	Cupressaceae	<i>Thuja orientalis</i> L.	Tree	Cultivated
464.	Poaceae	<i>Triticum aestivum</i> L.	Herb	Cultivated
465.	Vitaceae	<i>Vitis vinifera</i> L.	Woody Climber	Cultivated
466.	Poaceae	<i>Zea mays</i> L.	Herb	Cultivated
Alien/Exotic (NE) 10				
467.	Mimosaceae	<i>Acacia nilotica</i> (Linn.) Delile	Shrub	Alien / Exotic
468.	Simaroubaceae	<i>Ailanthus altissima</i> (Mill) Swingle	Tree	Alien / Exotic
469.	Moraceae	<i>Broussonetia papyrifera</i> (L.) L'Herit. ex Vent.	Tree	Alien/Exotic

470.	Myrtaceae	<i>Callistemon lanceolatus</i> (Sm.) Sweet	Tree	Alien/Exotic
471.	Myrtaceae	<i>Eucalyptus camaldulensis</i> Dehnh.	Tree	Alien/Exotic
472.	Myrtaceae	<i>Eucalyptus globulus</i> Labill.	Tree	Alien / Exotic
473.	Moraceae	<i>Ficus benamina</i> L.	Tree	Alien / Exotic
474.	Euphorbiaceae	<i>Ricinus communis</i> L.	Shrub	Alien / Exotic
475.	Papilionaceae	<i>Robinia pseudo-acacia</i> L.	Tree	Alien / Exotic
476.	Asteraceae	<i>Tagetes minuta</i> L.	Shrub	Alien / Exotic

Fact Sheets of Threatened Vascular Plant biodiversity in Malam Jabba Valley, Swat

A. Critically Endangered (CR)

1. *Aconitum chasmanthum* Stapf ex Holmes

Critically Endangered (CR), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv)

Family:	Ranunculaceae
Habit:	Herb
Habitat:	Mostly growing at higher altitude in sub alpine meadow
Local/Eng. Name:	Ghra Zahar/ Aconite
Regional Distribution:	From Himalayas to Pakistan, Kashmir, Nepal and India
Local Distribution:	Swat, Chitral, Lowari pass, Hazara, Kohistan, Dir, Baltistan, Kashmir,
Altitudinal Elevation:	2300-4300 m
No. of Locations:	Few, fragmented
Decline in Population size:	83%
No. of Mature individuals:	Lack of sufficient information
Data Quality:	Direct field observation, interview, indirect field information, literature review
Local Population:	Reduction observed in the area of distribution
Major Threats:	Loss of quality habitat, Overharvesting for medicine, habitat fragmentation, alteration, Human activities, trampling effects by sheep & domestic trade
Trade:	Local, national & international market
IUCN Red List Criteria:	Critically Endangered (CR), Endemic to the Himalayas
Criteria Based	
A2, a, c, d:	Observed population reduction as a result of decline in the area of occupancy, extent of occurrence, quality of habitat and due to actual potential levels of exploitation. It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as total population size has been reduced by 83% in last fifty years.

B2a, b(i,ii,iii,iv):	Restricted distribution, few fragmented locations. Continuing decline observed in area of occupancy, extent of occurrence, quality of habitat & number of locations. Under IUCN Red List Criteria of Geographical range B2a,b(i,ii,iii,iv) it is critically endangered due to restricted distribution/few fragmented locations and area of occupancy less than 10 km² in last fifty years. <i>Aconitum chasmanthum</i> was reported from altitude range between 2800-32000 m at the subalpine meadow of the area. The tubers of plant are mostly collected for medicinal purposes & in most cases whole plant is uprooted which severely threatened the species. Decline in population size is due to loss of quality habitat, habitat alteration, uprooting & overharvesting for medicinal purpose, trampling effects of sheep, human influences & trade.
CITES Status:	No
IUCN & Endemic Status	Critically endangered globally
Recommendations:	There is override need of community awareness, conservation practices, sustainable use & habitat management for sustainable livelihood security & safety of the area.

2. *Aesculus indica* (Wall.ex. Camb.) Hook. f.

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv.v)

Family:	Hippocastinaceae
Habit:	A large deciduous
Local/Eng. Name:	Jawaz/Horse chestnut
Habitat:	Mostly found in temperate forest of the valley
Regional Distribution:	Afghanistan, Pakistan, India West Himalaya from Kashmir, Nepal and India
Local Distribution:	Baluchistan, KP, Loralai, Swat, Chitral, Kohistan, Dir, Shangla, Hazara, Battagram, Muree hills & Kashmir
Altitudinal Elevation:	1500 -3300 m

No. of Locations:	Few, fragmented
No. of Mature individuals:	Lack of sufficient information
Decline in Population size:	85%
Local Population:	Continuous decline observed in local population
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat due to degradation, habitat alteration, over exploitation, over harvesting for medicine, timber & furniture wood, Human activities, due to population explosion & domestic trade
Trade:	Local, Domestic
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2(a, b, c, d)	Due to over exploitation, overharvesting for medicine, furniture wood, it is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a,b,c, d) as reduction in total population size has been recorded by 85% in last fifty years.
B2, a, b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2, a, b (i,ii,iii,iv,v) it is critically endangered due to restricted distributions, fragmented locations & area of occupancy less than 10 km ² .. <i>Aesculus indica</i> was reported from altitudinal range between 1800-2900 m. The plant was mostly harvested for medicinal, fuel & timber wood purposes. Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over exploitation, over harvesting for medicinal, fuel, furniture wood, Human activities, due to population explosion & domestic trade
CITES Status:	No
IUCN & Endemic Status	Not assessed globally

Recommendations: Conservation practices, community awareness, habitat management & sustainable utilization are highly desirable for livelihood security & safety of the area.

3. *Allium humile* Kunth.

Critically Endangered (CR), Criteria: A2(a, b c, d), B2, a,b(i,ii,iii,iv)

Family:	Alliaceae
Habit:	Herb
Local/Eng. Name:	Ghra Pyaz/ Small Alpine onion
Habitat:	Mostly found at higher altitude hill slopes near subalpine
Regional Distribution:	Mostly alpine & Himalayan areas of Pakistan & India.
Local Distribution:	From Himalayas to Swat, Chitral lowari Pass, Kohistan, Hazara, Dir, Naran, Saiful Malook Lake, Kashmir
Altitudinal Elevation:	2900-4500 m.
No. of Locations:	Few, fragmented
Decline in Population size:	81%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Rapid decline in its restricted area of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, harvesting for medicine, overgrazing, Loss of habitat, sheep trampling by mountain goats/sheep & Trade
Trade:	Local & Domestic
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	It is Critically Endangered under IUCN Red List Criteria of Population Reduction, A2 (a,b,c,d,) as reduction in total population size has been recorded as 81% in last fifty years.
B2, a, b(i,ii,iii,iv):	Under IUCN Red List Criteria of Geographical range, B2 a,b(i, ii, iii, iv) it is critically endangered locally due to

restricted distribution/few fragmented locations & area of occupancy less than 10 km².

Allium humile is mostly growing in higher altitude & found at altitudinal range between 2600-3200 m. The plant is overharvested for medicinal purposes. Decline in population size is due to habitat loss due to degradation, alteration, over harvesting for medicine, trampling by mountain goats & sheep, Human activities, & domestic trade

CITES Status:	No
IUCN & Endemic Status	Not evaluated globally/Endemic to the Himalayas
Recommendations:	Further investigation, conservation practices, community awareness, habitat management & sustainable is highly desirable

4. Berberis lycium Royle

Critically Endangered (CR), Criteria: A2(a, b, c, d)

Family:	Berberidaceae
Habit:	Shrub
Local/Eng. Name:	Kware/ Barberry
Habitat:	Mostly found in exposed sunny area & along road side
Regional Distribution:	North West Himalayas, Kashmir, Pakistan, India, Nepal
Local Distribution:	KP, Swat, Dir, Buner, Shangla, Chitral, Hazara, Battagram, Murree, Gilgit, Baluchistan, Kashmir
Altitudinal Elevation:	850-3500 m.
No. of Locations:	Many, fragmented
Decline in Population size:	86%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction observed in its area of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss & degradation, over exploitation, harvest for medicine, fuel wood, uprooting of plants for medicinal

	purpose, human influences, domestic & commercial trade of parts (Root & bark)
Trade:	Local, national & commercial trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Observed population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential of exploitation. <i>Berberis lycium</i> is reported in different parts of the valley with altitude range between 1000-3000 m. The plant species is mostly collected for medicinal purposes. It is Critically Endangered under IUCN Red List Criteria A2 & Sub Criteria a, b, c, d as total population size has been reduced by 86% in last ten years. Decline in number of population and size is due to loss of quality habitat, overharvesting for medicinal & fuel purpose and uprooting of plant for root & its bark.
CITES Status:	No
IUCN & Endemic Status	Not evaluated/assessed globally
Recommendations:	There is dire need of Community awareness, conservation practices, habitat management & sustainable use of this threatened plant for sustainable livelihood security of the and safety of the area.

5. *Buxus wallichiana* Baill

Critically Endangered (CR), Criteria, A2(a, b, c, d)

Family:	Buxaceae
Habit:	Shrub
Local/Eng. Name:	Shamshad/ Himalayan Boxwood.
Habitat:	Moist & temperate hilly areas of the valley
Regional Distribution:	Moist hill of Afghanistan, Pakistan, India, Nepal & Bhutan.
Local Distribution:	North Himalayas to Swat, Buner, Shangla, Hazara, Kaghan valley, Kashmir, Poonch District

Altitudinal Elevation:	1000-3000 m.
No. of Locations:	Few, fragmented
Decline in Population size:	83%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Declining in population size recorded
Data Quality:	Direct field observation, interview, indirect field information,
Major Threats:	Loss of quality habitat due to degradation, fragmentation, overharvesting for medicine, fuel wood, wooden utensils, human influences
Trade:	Local, domestic market
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Plant taxon was recorded from altitude range between 1800-2600 m. The plant species is mostly collected for fuel, wooden utensils & medicinal purposes. It is Critically Endangered under IUCN Red List Criteria A2 & Sub Criteria a, b, c, d as reduction in total population size has been recorded by 83% in last 10 years. Decline observed/recorded in area of occupancy; extent of occurrence; quality of habitat and number of locations. Population size is declining due to loss of quality habitat, harvesting for medicine, fuel wood & human activities
CITES Status:	No
IUCN & Endemic Status	Not evaluated/Endemic to Himalayas & Hindu Kush
Recommendations:	Conservation practices, community awareness, habitat management, sustainable use & further analysis.

6. *Caltha alba* var. *alba*

Critically Endangered (CR), Criteria: A2(a, c, d), B2a.b (i,iii,iv)

Family:	Ranunculaceae
Habit:	Herb
Local/Eng. Name:	Makan pat/Horse chestnut

Habitat:	Usually found in sub alpine area near water bodies
Regional Distribution:	Afghanistan, Himalaya region of Kashmir & Pakistan, Myanmar, Bhutan
Local Distribution:	Mostly in west Himalayas, Chitral, Dir, Swat, Kaghan, Kohistan, Kashmir, Gilgit, Baltistan
Altitudinal Elevation:	2700-4300 m
No. of Locations:	Few, fragmented
Decline in Population size:	81%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in its population size & distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Harvest for medicine; food & packing; loss of loss of habitat, trampling by mountain goats & sheep, human activities, domestic trade
Trade:	Local & Domestic
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, c, d:	It is Critically Endangered under IUCN Red List Criteria A2, a, c, d, as reduction in total population size was recorded as 81% in last ten years
B2, a,b(i,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i, iii, iv) it is critically endangered locally due to fragmented locations & area of occupancy of less than 10 Km ² . <i>Caltha alba</i> is reported from altitude range between 2700-2900 m. The plant taxon is mostly collected for medicinal, food & packing material purposes. Decline in population size is due to loss of quality habitat, over exploitation, overharvesting for medicinal, food & packing materials, human influences, trampling by mountain goats & sheep, human activities,

CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	Conservation practices, community awareness, habitat management & sustainable use of plant is highly desirable in the research area.

7. *Cedrus deodara* (Roxb. ex D. Don) G. Don

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,c (i,ii,iii,iv)

Family:	Pinaceae
Habit:	Tree
Local/Eng. Name:	Ranzra, Diyar/Himalayan Cedar
Habitat:	Mostly found at higher altitude & dry steep slopes
Regional Distribution:	Afghanistan, Pakistan, Kashmir, Nepal and India
Local Distribution:	Mostly in west Himalayas, Swat, Dir Kohistan, Khyber agency, Hazara, Kohistan, Shangla, Dir, Chitral, Murree hills, Kashmir
Altitudinal Elevation:	1700-3300 m
No. of Locations:	Few, fragmented
Decline in Population size:	90%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Continuous declining in population & distribution range.
Data Quality:	Direct field observation, interview, indirect field information.
Major Threats:	Loss of quality habitat, degradation, fragmentation, over logging, harvest for medicine; construction, intensive logging & deforestation for timber & fuel wood, clearing of land for agriculture purpose, human influences, timber mafia, domestic trade
Trade:	Local, domestic trade
IUCN Red List Criteria:	Critically Endangered (CR)

Criteria Based**A2, a, b, c, d:**

It is Critically Endangered under IUCN Red List Criteria A2 & Sub Criteria 2a, b, c, d as total population has been reduced by 90% in last ten years.

B2, a,c(i,ii,iii,iv)

Restricted distribution, extreme fluctuation in area of occupancy; extent of occurrence & number of individuals.

Under IUCN Red List Criteria of Geographical range B2, a,c(i,ii,iii,iv) it is critically endangered due to restricted distribution, extreme fluctuation in area of occupancy, extent of occurrence, number of locations & number of individuals.

Cedrus deodara was reported from altitude range between 1800-2900 m. The plant taxon is mostly harvested for medicinal, fuel, construction & timber wood purpose. Decline in population size is due to loss of quality habitat, degradation, fragmentation, indiscriminate deforestation, harvesting for medicinal, fuel & timber wood, conversion of forestland for agriculture purpose & large scale illegal trading.

CITES Status:

No

IUCN & Endemic Status

Least Concern/Endemic to Himalayas & Hindu Kush & also national tree of Pakistan

Recommendations:

Community awareness, effective check on deforestation & timber mafia, in situ conservation practices, habitat management & sustainable use of this valuable tree is very crucial to conserve it from extinction & also for improved livelihood security of the area

8. Celtis australis L.**Critically Endangered (CR), Criteria: A2(a, b, c, d)****Family:**

Ulmaceae

Habit:

Tree

Local/Eng. Name:

Tagha/ Nettle tree, European hackberry

Habitat:	Mostly found in dry rocky soil & prefer sunny area
Regional Distribution:	Iran, Afghanistan, Pakistan, India, Kashmir & Nepal.
Local Distribution:	Baluchistan, KP, Swat, Hazara, Kohistan, Shangla, Dir, Chitral, Murree, Kashmir
Altitudinal Elevation:	900-2250 m
No. of Locations:	Many, fragmented
Decline in Population size:	86%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Continous declinining in population size
Data Quality:	Direct field observation, interview, indirect field information.
Major Threats:	Habitat loss & degradation, over exploitation, overharvesting for timber, fuel wood, agriculture tools, human influences
Trade:	Local
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Plant was sparsely reported from different parts of the valley between altitudinal range 1000-2300 m. it was mostly collected for fuel, timber wood & their utilization in agriculture tools. It is Critically Endangered under IUCN Red List Criteria A2 & Sub Criteria 2a, b, c, d as total population size has been reduced 86% in last ten years. Decline in population size is due to loss of quality habitat, degradation, human activities, overharvesting for fuel wood, timber wood & their frequent used in agriculture tools.
CITES Status:	No
IUCN & Endemic Status	Least Concern
Recommendations:	Community awareness, conservation practices, habitat management & sustainable utilization is desirable in the research area.

9. *Colchicum luteum* Baker

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Alliaceae
Habit:	Herb
Local/Eng. Name:	Suranjan-e-Talkh/ Yellow Colchicum
Habitat:	Mostly found in sunny, open area, prefer clay soil & give flowering soon after snow melts.
Regional Distribution:	Afghanistan, Himalayan region of Pakistan & India.
Local Distribution:	KP, Hindu Kush range, Dir, Swat Hazara, Kohistan, Abbotabad, Murre hills, Kashmir
Altitudinal Elevation:	1500-3000 m.
No. of Locations:	One
Decline in Population size:	88%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Continuing decline in its restricted area of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, loss of quality habitat due to degradation, harvest for medicine; local & commercial trade of parts, (Corm & seeds)
Trade:	Local, domestic & commercial
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	It is Critically Endangered under IUCN Red List Criteria of Restricted Distribution range A2 & Sub Criteria 2 a, b, c, d due to area of occupancy less than 10 Km ² .
B2, a,b(i,ii,iii,iv):	It is Critically Endangered under IUCN Red List Criteria of Population Reduction B2, a,b(i,ii,iii,iv) as total population size has been reduced by 88% in last 10 years. Plant is locally collected for medicinal purposes due to its high medicinal value. Population of <i>Colchicum luteum</i> is

confined to Malam Jabba between elevation ranges of 1700-2500 m covering an area of less than 10 Km²

Decline in population size is due to loss of quality habitat, habitat degradation, overharvesting for medicinal purpose, anthropogenic activities, trampling & commercial trade.

CITES Status:

No

IUCN & Endemic Status

Not assessed globally. Endangered species of Pakistan

Recommendations:

Further analysis, investigation, community awareness, habitat management, sustainable use & cultivation is urgently needed for improved livelihood security.

10. *Crataegus songarica* K. Koch.

Critically Endangered (CR), Criteria: A2(a, c, d), D1

Family:

Rosaceae

Habit:

Tree

Local/Eng. Name:

Changa/ Hawthorn

Habitat:

Mostly grow on hilly slope along roadsides

Regional Distribution:

China, Afghanistan, Iran, Kazakhstan, Pakistan, Kashmir

Local Distribution:

Mostly Himalayan region of Swat, Dir, Chitral, Hazara, Kohistan, Shangla, Murree hills, Kurram, Gilgit, Astor, Kashmir

Altitudinal Elevation:

1300-2700 m

No. of Locations:

Few

Decline in Population size:

84%

No. of Mature individuals:

Less than 50

Local Population:

Continuous declining in population & distribution range.

Data Quality:

Direct field observation, interview, indirect field information.

Major Threats:

Habitat destruction & degradation, overharvesting for medicine, fuel wood and human influences

Trade:

Local

IUCN Red List Criteria:

Critically Endangered (CR)

Criteria Based**A2, a, c, d:**

Observed population reduction as a result of decline in area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation.

Crataegus songarica was mostly found at altitude range between 1600-2300 m. Plant was mostly collected for medicinal & fuel wood purposes. It is Critically Endangered under IUCN Red List Criteria of Population Reduction, A2 & Sub Criteria 2a, c, d as total population has been reduced by 84% in last ten years. Decline in population size is due to loss of quality habitat, degradation, and harvesting for fuel wood purpose.

Criteria Based D1:

Number of mature individuals is less than 50 and thinly scattered in the research area. Plant species is Critically Endangered under IUCN Red List Category of Very Small or Restricted Distribution, Criteria D2 as the population size is fewer than 50 mature individuals and the population having very restricted area of occupancy less than 20 km².

CITES Status:

No

IUCN & Endemic Status

Least Concern

Recommendations:

Community awareness, conservation practices, habitat management & sustainable use of plant is very crucial for sustainable livelihood security & safety of the area

11. *Fritillaria cirrhosa* subsp. *roylei* (Hook.) Ali

Critically Endangered (CR), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv,v)

Family:

Liliaceae

Habit:

Herb

Local/Eng. Name:

Chor/Himalayan Fritillary

Habitat:

Mostly in Sub Alpine meadows & grassy slopes

Regional Distribution:

Afghanistan, Pakistan, Kashmir, India & Nepal

Local Distribution:

KP. Swat, Chitral, Kurram agency, Parachinar, Hazara, Kaghan, Naran, Gilgit Kashmir

Altitudinal Elevation:	3000-3500 m
No. of Locations:	Few, fragmented
Decline in Population size:	86%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Rapid Continuous declining in population numbers
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss/degradation, harvest for medicine, over exploitation, trampling effect, human activities & trade
Trade:	Local & Domestic trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, c, d:	Observed population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation. It is declared as Critically Endangered under IUCN Red List Category A2 & Criteria 2a, c, d as total population has been reduced by 86% in last ten years.
B2, a,b(i,ii,iii,iv,v):	Restricted distribution/fragmented locations; continuing decline observed in area of occupancy; extent of occurrence and quality of habitat; number of locations and number of mature individuals. Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv,v) it is critically endangered locally due to highly fragmented locations & area of occupancy less than 10 km Plant has narrow & restricted distribution & confined to the upper part of the valley at altitude range between 2800-3200 m. Local community utilized the plant species for medicinal purposes. Decline in population size is due to habitat destruction/degradation, over exploitation, Human activities & overharvesting for medicinal purposes.
CITES Status:	No

IUCN & Endemic Status	Critically Endangered species of Pakistan & endemic to Himalaya & Hindu Kush range
Recommendations:	Community awareness, conservation practices, habitat management & sustainable use of the plant taxon is very crucial for sustainable livelihood security of the area.

12. Juglans regia L.

Critically Endangered (CR), Criteria: A2(a, b, c, d)

Family:	Juglandaceae
Habit:	Tree
Local/Eng. Name:	Ghuz/ Walnut
Habitat:	Mostly found in mountain slope of the valley
Regional Distribution:	Iran, Afghanistan, Himalayan region of Pakistan & India, Nepal & Burma.
Local Distribution:	Mostly Himalayan region of Swat, Dir, Chitral, Buner, Kohistan, Shangla. Hazara, Kurram, Gilgit, Kashmir
Altitudinal Elevation:	1000-3300 m.
No. of Locations:	Many, fragmented
Decline in Population size:	87%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in population size and restricted area
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat destruction, degradation & fragmentation, human influences, over exploitation, harvest for medicine, furniture & fuel wood, & trade of parts (Fruits & root's bark)
Trade:	Local, Domestic & international trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Observed population reduction as a result of reduction in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation.

Juglans regia is locally harvested for medicinal, furniture & timber wood purposes. One of the severe threats is the collection of root's bark, locally known as "Dandasa" severely threaten the plant species. It is mostly found in upper part of valley between elevation ranges of 1100-2800 m. It is Critically Endangered under IUCN Red List Criteria Population as reduction in total population size has been recorded as 87% in last 10 years. Decline in population size is due to habitat destruction, degradation, human activities, over exploitation, harvest for medicine, harvest for medicine, furniture & timber wood, local & commercial trade of parts (Fruits & roots)

CITES Status:

No

IUCN & Endemic Status

Near Threatened globally & Vulnerable species of Pakistan

Recommendations:

There is urgent need for sustainable utilization, community awareness, conservation practices & habitat management of this plant species for improved sustainable livelihood security of the area

13. *Olea ferruginea* Wall. ex Aitch. Syn. *Olea cupidata* Wall ex G. Don

Critically Endangered (CR), Criteria: A2(a, c, d)

Family:

Oleaceae

Habit:

Tree

Local/Eng. Name:

Khona/ Olive

Habitat:

Mostly in lower foothills & confined to the graveyards

Regional Distribution:

Afghanistan, Pakistan, India, Kashmir, Nepal

Local Distribution:

Himalaya, Swat, Chitral, Dir, Buner, Kohistan, Shangla. Hazara, Mansehra, Kurram, Kashmir

Altitudinal Elevation:

600-2500 m.

No. of Locations:

Many, fragmented

Decline in Population size:

82%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Continuing decline in population size & its distribution

Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	habitat destruction, degradation, human activities, over exploitation, harvest for medicine, furniture & fuel wood, local trade
Trade:	Local trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, c, d:	Observed population reduction as a as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation.. <i>Olea ferruginea</i> is sparsely found in different areas especially in graveyard between elevation ranges of 900-2100 m. It is mostly harvested for medicine, furniture & fuel wood, local trade. It was Critically Endangered under IUCN Red List Criteria of Population Reduction A2, a, c, d as total population has been reduced by 82% in last 10 years. Decline in population size & its distribution range is due to habitat destruction, degradation & fragmentation, human activities, over exploitation, harvest for medicine, furniture & fuel wood, local & domestic trade.
CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	Conservation practices, community awareness, habitat management & sustainable use are highly recommended.

14. *Paeonia emodi* Wall ex Royle

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Paeoniaceae
Habit:	Herb
Habitat:	Found at the higher altitude & prefer sunny places
Local/Eng. Name:	Mamekh/ Himalayan Peony
Regional Distribution:	E. Afghanistan, Pakistan, Kashmir, Nepal and India

Local Distribution:	Mostly growing in Himalayas region of Swat, Dir, Chitral, Shangla, Hazara, Kohistan, Battagram, Kaghan, Kashmir
Altitudinal Elevation:	2200-3200 m
No. of Locations:	Few, fragmented
Decline in Population size:	90%
No. of Mature individuals:	Not known//insufficient Information
Local Population:	Decline in population & its area of occupancy
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss due to degradation & fragmentation, over exploitation, overharvesting for medicine, Human activities, trampling effects by sheep/goat & commercial trade
Trade:	Local, national & commercial
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2, a, b,c, d as total population size has been reduced to 90 % in last ten years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2, B2,a,b(i,ii,iii,iv,v) it is critically endangered due to restricted & fragmented distribution & observed area of occupancy less than 10 Km ² . Plant taxon is very rare & growing at higher elevation of Malam Jabba from altitude range between 2300-2800 m. It is heavily harvested for medicinal purposes. Decline in population size is due to loss of quality habitat, degradation & fragmentation, overharvesting for medicine, Human activities, sheep trampling effects & commercial trade
CITES Status:	Appendix II
IUCN & Endemic Status	Vulnerable species of Pakistan & Endemic to Himalaya & Hindu Kush Range

Recommendations: Conservation practices, community awareness, habitat management, cultivation & sustainable use of the plant taxa is very crucial for sustainable livelihood security of the area

15. *Picea smithiana* (Wall.) Boiss

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family: Pinaceae

Habit: Tree

Habitat: Commonly found mixed with blue pine & fir forest

Local/Eng. Name: Mangazay/ West Himalayan Spruce

Regional Distribution: Afghanistan, China, Pakistan, Pinus gerardiana India, Kashmir & Nepal

Local Distribution: Mostly in Himalayas, Swat, Chitral, Dir, Shangla, Hazara, Kohistan, Battagram, Kurram, Kashmir

Altitudinal Elevation: 2300-3600 m

No. of Locations: Few, fragmented

Decline in Population size: 84%

No. of Mature individuals: Lack of sufficient Information

Local Population: Decline in population & quality of habitat observed

Data Quality: Direct field observation/ study, Interview, indirect field information.

Major Threats: Habitat destruction due to degradation & fragmentation, heavy deforestation, heavy logging, conversion of land for agriculture purpose, overharvesting for medicine, fuel wood, timber wood, Human activities & trade

Trade: Local & domestic

IUCN Red List Criteria: Critically Endangered (CR)

Criteria Based

A2, a, b, c, d: It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2, a, b, c, d as total population size has been reduced to 84% in last ten years.

B2, a,b(i,ii,iii,iv,v):	Under IUCN Red List Criteria of Geographical range B2 a, b(i, ii, iii, iv, v) it is critically endangered locally due to extremely restricted area of distribution & fragmented locations & area of occupancy less than 10 km. Plant species is reported at higher elevation of Malam Jabba from altitude range between 2300-2900 m. It is over harvested for fuel, timber wood & medicinal purposes. Decline in population size is due to loss of quality habitat, loss of quality habitat, overharvesting for fuel wood, timber & medicinal purpose, Human activities & logging without adequate natural regeneration poses the greatest threat
CITES Status:	No
IUCN & Endemic Status	Least concern globally. Endemic to Himalaya, Hindu Kush Range & Karakoram
Recommendations:	Insitu Conservation practices, community awareness, habitat management & sustainable use of the plant species are very crucial for sustainable livelihood security & to protect it from extinction in near future.

16. Pinus gerardiana Wall. ex. Lamb.

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v), D1)

Family:	Pinaceae
Habit:	Tree
Habitat:	Inner dry areas & rocky slopes of the valley
Local/Eng. Name:	Chilghoza/ Chilghoza Pine
Regional Distribution:	Inner dry tract of NW Himalayas, Afghanistan, China, Pakistan, Kashmir & India
Local Distribution:	Baluchistan, KP, Swat, Chitral, Dir, Buner, Shangla, Hazara, Gilgit, Astor, Kashmir
Altitudinal Elevation:	1600-2700 m
No. of Locations:	Few, fragmented
Decline in Population size:	95%
No. of Mature individuals:	Lack of sufficient information

Local Population:	Population severely fragmented & decline of mature individuals
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat destruction due to degradation & fragmentation, overharvesting for fuel wood, timber wood, illegal logging, Human activities, local trade, clearing of pine forests for agriculture purpose, overharvesting for cone & seeds (locally know as chilghoza seeds) also contributes to poor regeneration.
Trade:	Local/domestic
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2, a, b, c, d as total population size has been reduced to 95% in last ten years.
B2, a,b(i,ii,iii,iv,v):	Under IUCN Red List Criteria of Geographical range B2 a, b(i, ii,iii,iv,v) it is critically endangered locally due to extremely restricted area of distribution & fragmented locations & area of occupancy less than 10 km.
Criteria Based D1:	Number of mature individuals is less than 50 and thinly scattered in the research area. Plant species is Critically Endangered under IUCN Red List Category of Very Small or Restricted Distribution, CriteriaD2 as the population size is fever than 50 mature individuals. Plant species is reported from Malam Jabba at altitude range between 1600-1800 m. It was heavily harvested for fuel wood, timber wood & edible seeds. Decline in population size is due to loss of quality habitat, habitat degradation & fragmentation, heavy deforestation & illegal logging, overharvesting for fuel wood, timber & seeds, Human activities & heavy pressure of increased population

CITES Status:	No
IUCN & Endemic Status	Near threatened globally
Recommendations:	In situ & ex situ conservation practices, community awareness, habitat management & sustainable use of the plant species is very crucial to protect it from extinction in near future.

17. *Pistacia chinensis* subsp. *integerrima* (J. L. Stewart ex Brandis) Rech. f.

Critically Endangered (CR), Criteria: A2(a, c, d), C1

Family:	Anacardiaceae
Habit:	Tree
Habitat:	Mostly on exposed mountainous slopes & along roadside
Local/Eng. Name:	Shnai/ Chinese Pistache
Regional Distribution:	Northwest & West Himalayas, Afghanistan, China, Pakistan & Kashmir
Local Distribution:	KP, Swat, Dir, Buner, Shangla, Hazara, Kohistan, Battagram, Kurram Agency, Kashmir
Altitudinal Elevation:	500-2000 m
No. of Locations:	Many, fragmented
Decline in Population size:	86%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Decline reported in number of mature individuals
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss & degradation, overharvesting for medicine, fuel wood, human activities & trade
Trade:	Local, national & international
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, c, d:	Observed population reduction as a result in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation.

C1:	Small population size & decline: Numbers of population less than 2500 in terms of mature individuals & an estimated decline of at least 20% in next 5 years or 2 generations in number of mature individuals. (Upto a maximum of 100 years in future.) It is Critically Endangered under IUCN Red List category of Small population size & decline as total number of mature individuals is less than 2500 species & an estimated decline in number of mature individuals will be 20% in next 5 years or 2 generations. <i>Pistacia chinensis</i> is very rare species & sparsely found in different parts of Malam Jabba from altitude range between 1100-1800 m. It is heavily harvested for fuel/timber wood & medicinal purposes. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2, a, c, d as total population size has been reduced to 86% in last ten years. Decline in population size is due to loss of quality habitat, degradation, overharvesting for fuel wood & medicinal purpose, Human activities & heavy biotic pressure for fuel wood
CITES Status:	No
IUCN & Endemic Status	Not evaluated/Assessed
Recommendations:	Habitat management conservation practices, community awareness, & sustainable use of this plant taxon is very crucial to protect it from extinction in near future & also for sustainable livelihood security of the valley.

18. Podophyllum emodi Wall. ex Royle

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Podophyllaceae
Habit:	Herb
Habitat:	A shade loving plant mostly growing in Sub alpine area
Local/Eng. Name:	Kakora/ Himalayan Mayapple

Regional Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Nepal
Local Distribution:	KP, Swat, Chitral, Shangla, Hazara, Kohistan, Shogran, Kurram, Murree, Gilgit, Kashmir
Altitudinal Elevation:	2300-4500 m
No. of Locations:	Few, fragmented
Decline in Population size:	88%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Decline of mature individuals & its distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss due to degradation & fragmentation, overharvesting for medicine, human activities & commercial trade
Trade:	Local, national & commercial
IUCN Global Status:	Not assessed
IUCN Red List Criteria:	Critically Endangered (CR)
A2, a, b, c, d:	It was Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 88% in last ten years.
B2, a,b(i,ii,iii,iv,v):	Under IUCN Red List Criteria of Geographical range B2 a, b(i, ii, iii, iv, v) it is critically endangered locally due to extremely restricted area of distribution & fragmented locations & area of occupancy less than 10 km. Plant species is very rare species, found at higher altitude & lower boarder of alpine region from 2300-3200 m. It is heavily harvested for medicinal purposes. Continuous decline observed in area of occupancy, extent of occurrence, quality of habitat & number of locations. Decline in population size is due to loss of quality habitat, fragmentation, over exploitation, harvest for medicine, commercial trade, and Human activities
CITES Status:	Appendix II

IUCN & Endemic Status	Endemic to Himalayas, Hindu Kush & Kararkurram
Recommendations:	Insitu & Exsitu conservation practices, community awareness, habitat management, sustainable utilization & cultivation of the plant taxa is very crucial for improved & sustainable livelihood security of the area. Cultivation of plant taxon as income generating plant is highly recommended for improved livelihood security

19. *Polygonatum verticillatum* (L.) All.

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Podophyllaceae
Habit:	Herb
Habitat:	Mostly growing in grassy slopes of sub alpine areas
Local/Eng. Name:	Noor e alam/Whorled Solomon's seal
Regional Distribution:	Afghanistan, China, India, Pakistan, Nepal & Bhutan
Local Distribution:	In alpine & sub alpine regions of Himalayas from Dir, Swat, Chitral, Hazara, Kohistan Kaghan, Murree hills, Gilgit, Kashmir
Altitudinal Elevation:	2600-4000 m
No. of Locations:	Few, fragmented
Decline in Population size:	92%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Rapid decline in population size
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, overharvesting for medicine, loss of habitat due to degradation, habitat alteration, trampling by goats & sheep, human activities & commercial trade
Trade:	Local, national & commercial
IUCN Red List Criteria:	Critically Endangered (CR)

Criteria Based**A2, a, b, c, d:**

It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 92% in last ten years.

B2a,b(i,ii,iii,iv,v):

Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv,v) it is critically endangered locally due to fragmented locations & area of occupancy less than 10 km².

Plant species is found at higher altitude and mostly restricted to upper part of Malam Jabba from 2600-3200 m. Plant is over harvested for medicinal purposes. Decline in population size is due to loss of quality habitat, degradation, fragmentation, over exploitation, harvest for medicine, international trade, and human influences

CITES Status:

No

IUCN & Endemic Status

Not assessed globally, vulnerable species of Pakistan

Recommendations:

Community awareness, ex situ & insitu conservation practices, cultivation, habitat management & sustainable utilization of the plant species is very highly recommended for sustainable livelihood security & also to protect it from extinction in near future

20. *Prunus cornuta* (Wall. ex Royle) Steud.**Critically Endangered (CR), Criteria: A2(a, c, d), C1****Family:**

Rosaceae

Habit:

Tree

Habitat:

Mostly growing at higher altitude & sloppy places

Local/Eng. Name:

Changa/Himalayan Bird cherry

Regional Distribution:

Afghanistan to Pakistan, India & Nepal

Local Distribution:

Himalayas, Hindu Kush, KP, Swat, Dir, Chitral, Hazara, Kohistan, Kaghan, Kurram Agency, Kashmir

Altitudinal Elevation:

2300-3300 m

No. of Locations:

Few, fragmented

Decline in Population size:	85%
No. of Mature individuals:	Not known/observed/Insufficient Information
Local Population:	Decline in population size & range of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat destruction, degradation, habitat alteration, overharvesting for fuel wood, fences & Human activities
Trade:	No
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, c, d:	Observed population reduction as a result of decline in area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation.
C1:	Small population size & decline: Number of population less than 2500 in terms of mature individuals & an estimated decline of at least 20% in next 5 years or 2 generations in number of mature individuals. (Upto a maximum of 100 years in future.) It is Critically Endangered under IUCN Red List category of Small population size & decline as total number of mature individuals is less than 2500 species & an estimated decline in number of mature individuals will be 20% in next 5 years or 2 generations. Plant species is sparsely distributed in upper part of valley at altitudinal range between 2400-2900 m. Plant is harvested for fuel wood, fences & dry fruits. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, c, d as reduction in total population size has been reduced by 85% in last ten years. Decline in population size is due to loss of quality habitat, habitat destruction, degradation, habitat alteration, harvest for fuel wood & human activities

CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	Conservation practices, community awareness, habitat management & sustainable use are highly desirable to protect plant from extinction in near future.

21. Quercus semecarpifolia Sm.

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Fagaceae
Habit:	Tree
Habitat:	Usually found in higher altitude of temperate forest & at the upper tree limit closer to sub alpine zone
Local/Eng. Name:	Mer/Brown Oak
Regional Distribution:	Afghanistan, China, India, Pakistan, Nepal, & Bhutan
Local Distribution:	From Himalayas to Swat, Dir, Hazara, Battagram, Khyber agency, Kurran Agency Parachinar, Kashmir
Altitudinal Elevation:	2600-4000 m
No. of Locations:	Few, fragmented
Decline in Population size:	84%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Continuing decline in population size & its range of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat destruction due to degradation, fragmentation. habitat alteration, over exploitation, overharvesting for fuel & timber wood, & Human activities, trade
Trade:	Local trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 84% in last ten years.

B2, a,b(i,ii,iii,iv,v):	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv,v) it is critically endangered locally due to extremely restricted area of distribution, fragmented locations & area of occupancy less than 10 km. Plant is mostly confined at the upper tree limit of Malam Jabba & found in altitudinal range between 2750-3100 m. Plant is over harvested for fuel wood, timber wood & medicinal purposes. Decline in population size is due to loss of quality habitat/fragmentation, over exploitation, harvest for medicine fuel & timber wood, local trade, and human influences,
CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	There is override need of conservation practices, community awareness, habitat management & sustainable use of the plant for livelihood security & also to conserve it from extinction in near future

22. Rheum australe D. Don

Critically Endangered (CR), Criteria:A2(a, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Polygonaceae
Habit:	Herb
Habitat:	Usually growing in grassy slopes of the higher altitude
Local/Eng. Name:	Chotial/Himalayan Rhubarb
Regional Distribution:	China, India, Pakistan, Nepal, & Myanmar
Local Distribution:	From Hindu Kush to Swat, Dir, Chitral, Hazara, Kohistan, Gilgit, Baltistan, Astor, Kashmir
Altitudinal Elevation:	2800-43000 m
No. of Locations:	Few, fragmented
Decline in Population size:	83%
No. of Mature individuals: I	nsufficient Information
Local Population:	Decline in population size & distribution range observed
Data Quality:	Direct field observation, interview, literature

Major Threats:	Over exploitation, overharvesting for medicine, loss of habitat, degradation, habitat alteration, trampling effect of goats & sheep, Human activities, trade
Trade:	Local & national trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, c, d:	Under IUCN Red List Criteria of Geographical range A2 Sub Criteria, a, c, d it is Critically Endangered as total population size has been reduced by 83% in last ten years.
B2, a,b(i,ii,iii,iv,v):	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii iii,iv,v) it is critically endangered locally due to extremely restricted area of distribution, fragmented locations & area of occupancy less than 10 km. <i>Rheum australe</i> is a very rare plant species in the area and found at the higher altitude range between 2800-3000 m. Plant is mainly collected for medicinal purposes. Decline in population size is due to loss of quality habitat, fragmentation, human influences, over exploitation, harvest for medicine local & commercial trade
CITES Status:	No
IUCN & Endemic Status	Endemic to Himalaya, Hindu Kush Range & Karakoram. Vulnerable species of Pakistan.
Recommendations:	Sustainable use, conservation practices, community awareness & habitat management is highly desirable for sustainable livelihood security & safety of the area.

23. Saussurea costus (Falc.) Lipsch.

Critically Endangered (CR), Criteria:A2(a, b, c, d)

Family:	Asteraceae
Habit:	Herb
Habitat:	Found in higher altitude of temperate forest
Local/Eng. Name:	Kuth/Costus
Regional Distribution:	From Himalayas to NW India, NE Pakistan & Kashmir

Local Distribution:	Hindu Kush range, KP, Swat, Chitral, Dir, Hazara, Kohistan, Kashmir, Baltistan
Altitudinal Elevation:	2000-3800 m
No. of Locations:	Few, fragmented
Decline in Population size:	87%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Rapid decline in population size
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, overharvesting roots of plants for medicine, uprooting of whole plants, loss of habitat due to degradation, habitat alteration, Human activities, local, national & commercial trade
Trade:	Local, national & commercial trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Plant is very rare & growing found in restricted parts of the Malam Jabba valley from altitudinal range between 2400-3100 m. Roots of plant is overharvested for medicinal purposes & during collection whole plant is uprooted. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 87% in last ten years. Decline in population size is due to loss of quality habitat, degradation, over exploitation, over harvesting for medicine, uprooting of whole plants, commercial trade, and Human activities
CITES:	Appendix I
IUCN Global Status	Critically endangered globally,
Recommendations:	Community awareness, conservation practices, habitat management, controlled trade, sustainable collection & utilization, cultivation practices is highly recommended.

Conservation efforts & cultivation of this highly valuable & globally important medicinal plant is very crucial to protect it from extinction & also for sustainable livelihood security of the area.

24. *Skimmia laureola* (D.C.) Sieb. & Zucc. ex Walp.

Critically Endangered (CR), Criteria: A2(a, b, c, d)

Family:	Rutaceae
Habit:	Evergreen shrub
Habitat:	Found in shady places of temperate forest
Local/Eng. Name:	Nazar Pana/Japanes Skimmia
Regional Distribution:	From Himalayas to China, India, Pakistan, Kashmir, Bhutan, Nepal & Myanmar
Local Distribution:	Hidu Kush range, Swat, Dir, Chitral, Shangla, Battagram, Hazara, Murree, Kashmir
Altitudinal Elevation:	2400-2900 m
No. of Locations:	Few, fragmented
Decline in Population size:	85%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Restricted distribution and decline in population size
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Overharvesting, loss of habitat due to degradation, fragmentation, habitat alteration, overharvesting for medicine, Human activities, local trade
Trade:	Local /domestic trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation. <i>Skimmia laureola</i> is very rare & found in restricted parts of the Malam Jabba valley from altitudinal range between

2500-2850 m. Plant is over harvested for medicinal purposes. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 85% in last ten years. Decline in population size is due to loss of quality habitat, fragmentation, over exploitation, harvest for medicine, local trade and human influences

CITES Status:

No

IUCN & Endemic Status

Not assessed globally

Recommendations:

Conservation practices, community awareness, habitat management & sustainable use of the plant taxon is strongly desirable for sustainable livelihood security of the area.

25. *Taxus wallichiana* Zucc.

Critically Endangered (CR), Criteria: A2(a, b, c, d), B2a,c(i,ii,iii,iv,v)

Family:

Taxaceae

Habit:

Evergreen tree

Habitat:

Found at higher altitude /open slope of temperate forest

Local/Eng. Name:

Banya/East Himalayan Yew

Regional Distribution:

From Himalayas to Afghanistan, China, NW India, Burma, Pakistan, Kashmir, Bhutan, Vietnam & Myanmar

Local Distribution:

Hindu Kush range, KP, Swat, Dir, Chitral, Hazara, Battagram, Kohistan, Kaghan, Khyber Agency, Murree, Kashmir

Altitudinal Elevation:

1800-3500 m

No. of Locations:

Few, fragmented

Decline in Population size:

89%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Decline in population size, number of mature individual & area of occupancy which is still continuing

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:	Indiscriminate deforestation, overharvesting for fuel wood, timber wood, medicine, loss of habitat due to degradation, habitat fragmentation & habitat alteration, conversion of land for agriculture, Human activities, international trade
Trade:	Local, domestic/commercial
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 89% in last ten years.
B2, a,c(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2, a,c(i,ii,iii,iv) it is critically endangered due to restricted distribution extreme fluctuation in area of occupancy, extent of occurrence, number of locations & number of individuals. Plant species is very rare in the area & thinly scattered in restricted parts of the Malam Jabba valley from altitudinal range between 2600-2950 m. Plant is over harvested for timber wood, fuel wood & medicinal purposes. Decline in population size is due to loss of quality habitat, fragmentation, over exploitation, harvest for fuel wood, timber wood, medicine, domestic/commercial trade and Human activities
CITES:	Appendix II
IUCN Global Status	Endangered globally.Vulnerable species of Pakistan.
Recommendations:	Community awareness, ex situ & insitu conservation practices, habitat management & sustainable use of the plant species is highly recommended to protect it from extinction in near future & also for sustainable livelihood security of the area.

26. *Valeriana jatamansi* Jones

Critically Endangered (CR), Criteria: A2(a, b, c, d)

Family:	Valerianaceae
Habit:	Herb
Habitat:	Mostly found in grassy & slope places of mountain in temperate forest
Local/Eng. Name:	Mushk-e-Bala/Indian Valerian
Regional Distribution:	Himalayas to Afghanistan, China, India, Pakistan, Kashmir
Local Distribution:	KP, Swat, Dir, Chitral, Shangla, Kohistan, Battagram, Hazara, Kurram Agency, Muree hills, Gilgit, Kashmir
Altitudinal Elevation:	1300-3200 m
No. of Locations:	Few, fragmented
Decline in Population size:	86%
No. of Mature individuals:	Insufficient Information
Local Population:	Rapid decline in population & distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature
Major Threats:	Over exploitation, loss of habitat due to degradation, habitat alteration, human influences, harvest for medicine, domestic & commercial trade
Trade:	Local, national & commercial trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation. It is a rare species & restricted to the upper parts of the Malam Jabba valley from altitudinal range between 1650-2750 m. Plant is over harvested for medicinal purposes. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 86% in last ten years.

Decline in population size is due to loss of habitat due to degradation, habitat alteration, harvest for medicine, domestic/commercial trade and human activities

CITES:

No

IUCN Global Status

Not assessed globally. Endangered species of Pakistan

Recommendations:

There is dire need of community awareness, Conservation practices, habitat management, sustainable use for sustainable livelihood security & safety of the area.

27. *Viburnum cotinifolium* D.Don.

Critically Endangered (CR), Criteria: A2(a, c, d)

Family:

Caprifoliaceae

Habit:

Shrub

Habitat:

Mostly found mixed with fir & broadleaves forest & prefer open sunny places

Local/Eng. Name:

Zangali Chamyarai /Himalayan Viburnum

Regional Distribution:

Himalayas, Afghanistan, China, India, Bhutan, Kashmir. Nepal

Local Distribution:

Hindu Kush range, Swat, Dir, Chitral, Hazara, Battagram, Kohistan, Kurram Agency, Islamabad, Muree hills, Kashmir

Altitudinal Elevation:

900-3500 m

No. of Locations:

May, fragmented

Decline in Population size:

82%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Rapid decline in population size & distribution range

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:

Loss of quality habitat, degradation, habitat alteration over exploitation, overharvesting for fuel wood, human activities

Trade:

Local

IUCN Red List Criteria:

Critically Endangered (CR)

Criteria Based

A2, a, c, d:

Population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation.

Viburnum cotonifolium is a rare species & found in very restricted localities of the Malam Jabba valley from altitudinal range between 1500-2500 m. Fruit of plant is collected for medicinal purpose where as branches are collected for fuel wood. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, c, d as decrease in total population size has been observed as 82% in last ten years. Decline in population size is due to loss of quality habitat, fragmentation, over exploitation, harvest for fuel wood, human activities

CITES:

No

IUCN Global Status

Not assessed globally, Endemic to Himalaya Pakistan

Recommendations:

Conservation practices, sustainable use, community awareness, & habitat management is highly desirable for sustainable livelihood security of the area.

28. *Viola betonicifolia* Sm.

Critically Endangered (CR), Criteria: A2(a, b, c, d)

Family:

Violaceae

Habit:

Herb

Habitat:

Mostly found in grassy slope & margins of temperate forest

Local/Eng. Name:

Banafsha/Himalayan violet

Regional Distribution:

Himalayas to Afghanistan, Pakistan, Kashmir, India, Nepal, Bhutan, Sri Lanka, Myanmar

Local Distribution:

Hindu Kush range, KP, Swat, Chitral, Dir, Shangla, Hazara, Kohistan, Kurram, Muree hills, Baltistan, Kashmir

Altitudinal Elevation:

1200-3000 m

No. of Locations:

Few, fragmented

Decline in Population size:	86%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Rapid declining in population & its distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat, habitat destruction due to degradation & fragmentation, over exploitation, harvest for medicine, human activities, trade
Trade:	Local, national & commercial trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Observed population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation. <i>Viola betonicifolia</i> is rare species & growing in few localities of the Malam Jabba valley & found at altitudinal range between 1700-2450 m. Plant is harvested for medicinal purposes. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as decline in total population size has been documented as 86% in last ten years. Decline in population size is due to loss of quality habitat, habitat destruction due to degradation & fragmentation over exploitation, harvesting for medicine, Human activities
CITES:	No
IUCN Global Status	Not assessed globally. Vulnerable species of Pakistan
Recommendations:	Sustainable use, community awareness, conservation practices & habitat management is very crucial to conserve this endangered plant taxa for sustainable livelihood security of the area.

29. *Viola pilosa* Blume

Critically Endangered (CR), Criteria: A2(a, b, c, d)

Family:	Violaceae
Habit:	Herb
Habitat:	Mostly found in grassy area of temperate forest
Local/Eng. Name:	Banafsha/Arrow Violet
Regional Distribution:	From Himalayas to Afghanistan, China, India, Pakistan, Kashmir, Nepal and Sri Lanka
Local Distribution:	Hindu Kush range, KP, Swat, Dir, Shangla, Chitral, Kohistan, Hazara, Kaghan, Waziristan, Kurram, Murree hills, Kashmir
Altitudinal Elevation:	1200-3000 m
No. of Locations:	Few, fragmented
Decline in Population size:	88%
No. of Mature individuals:	Insufficient Information
Local Population:	Rapid decline in its distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of habitat due to degradation, habitat alteration, over exploitation, overharvesting for medicine, human activities & commercial trade
Trade:	Local, national & commercial trade
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d:	Population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation. <i>Viola pilosa</i> is rare species, reported from restricted parts of the Malam Jabba valley & growing in shady & grassy area of temperate forest between altitudinal ranges 1600-2800 m. Plant is collected for medicinal purposes. It is Critically

Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as total population size has been reduced by 88% in last ten years. Decline in population size is due to loss of quality habitat due to degradation, habitat alteration, over exploitation, overharvesting for medicine, Human activities & commercial trade

CITES:

No

IUCN Global Status

Not assessed globally

Recommendations:

Habitat management, sustainable use, community awareness, conservation efforts is very crucial to protect threatened plant taxa for sustainable livelihood security of the area.

30. *Vitis jacquemontii* Parker

Critically Endangered (CR), Criteria: A2(a, c, d), C1

Family:

Vitaceae

Habit:

Tree

Habitat:

A woody climber, growing on the other trees & usually found in mountainous area of the valley

Local/Eng. Name:

Geedar kwar/wild grape

Regional Distribution:

Sub Himalayan tracts of Pakistan, Kashmir, & India

Local Distribution:

Foot hills of Himalaya, Sind, KP. Swat, Dir, Buner, Shangla, Kohistan, Hazara, Battagram, Kashmir

Altitudinal Elevation:

900-24000 m

No. of Locations:

Few, fragmented

Decline in Population size:

82%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Decline in population size observed

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:	Loss of quality habitat due to degradation, habitat alteration, overharvesting of their host species for fuel & timber wood, fragmentation, Human activities
Trade:	Local market
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, c, d:	Population reduction as a result of decline in the area of occupancy; extent of occurrence; quality of habitat and due to actual potential levels of exploitation.
C1:	It is Critically Endangered under IUCN Red List category of Small population size & decline as total number of mature individuals is less than 2500 species & an estimated decline in number of mature individuals will be 20% in next 5 years or 2 generations. It is a rare species & reported from few parts of the Malam Jabba valley & found at altitudinal range between 1500-2200 m. Plant is mostly harvested for their delicious fruit. It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, c, d as total population size has been reduced by 82 % in last ten years. Decline in population size is due to loss of quality habitat, habitat destruction due to degradation, fragmentation, Human activities.
CITES:	No
IUCN Global Status	Not assessed globally
Recommendations:	community awareness, sustainable use, conservation practices & habitat management is very crucial to conserve endangered plant taxa for sustainable livelihood security of the area.

B. Endangered (EN)

1. *Abies pindrow* Royle

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Pinaceae
Habit:	Tree
Local/Eng. Name:	Achar/ West Himalayan fir
Habitat:	Mostly in higher altitude & north side of temperate forest
Regional Distribution:	Afghanistan, Pakistan, West Himalaya, Kashmir & Nepal
Local Distribution:	KP, Swat, Chitral, Kohistan, Battagram, Dir, Shangla, Rawalpindi, Hazara, Muree hills, Khyber agency, Kashmir
Altitudinal Elevation:	2000-3300 m
No. of Locations:	Few, fragmented
Decline in Population size:	78%
No. of Mature individuals:	Insufficient Information
Local Population:	Continous declininig in population size
Data Quality:	Direct field observation, interview, indirect field information & literature review
Major Threats:	Loss of quality habitat due to degradation, fragmentation, habitat alteration, over exploitation, over harvesting for timber, fuel wood, indiscriminate deforestation, clearing of forest land for agriculture purpose, human activities, due to population explosion, developmental programs & trade
Trade:	Local, Domestic market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size was recorded 78% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii iii,iv,v) <i>Abies pindrow</i> is critically endangered locally

due to fragmented locations & area of occupancy less than 50 km². Reduction observed in the area of occupancy; extent of occurrence; quality of habitat and number of mature individuals.

It is reported from altitudinal range between 1900-3100 m. The plant species is mostly harvested for medicinal, fuel and timber wood. Decline in population size is due to loss of quality habitat, degradation, fragmentation, habitat alteration, over harvesting for medicinal, fuel & timber wood, indiscriminate deforestation, population explosion, conversion of land for agriculture purpose, Human activities, & domestic trade

CITES Status:

No

IUCN & Endemic Status

Least Concern globally

Recommendations:

There is override need for conservation practices, community awareness, habitat management & sustainable utilization for livelihood security.

2. *Aconitum heterophyllum* Wall. ex Royle

(Endangered (EN), Criteria: A2 (a, b, c, d), B2a,b(i,ii,iii, iv)

Family:

Ranunculaceae

Habit:

Herb

Local/Eng. Name:

Serba zela/ Indian aconite

Habitat:

Mostly in higher altitude & subalpine area

Regional Distribution:

Pakistan, N. W Himalaya, Kashmir, India & Nepal

Local Distribution:

KP, Swat, Chitral, Kohistan, Dir, Hazara, Kaghan, Gilgit, Baltistan, Kashmir

Altitudinal Elevation:

2400–4500 m

No. of Locations:

Few, Fragmented

Decline in Population size:

75%

No. of Mature individuals:

More than 400-500

Local Population:

Continuous decline in the area of occupancy

Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat due to degradation, habitat alteration, over exploitation, over harvesting & uprooting of whole plant for medicinal purpose, trampling by mountain goats & sheep, population explosion, conversion of land for agriculture purpose, Human activities, & national trade
Trade:	Local, national & International market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size was recorded 75% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Category of Geographical range, Criteria, B2 a,b(i,ii,iii,iv) it fall critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . <i>Aconitum heterophyllum</i> is found in altitudinal range between 2800-3000 m. The tubers of plant are overharvesting & in some case whole plant is uprooted for medicinal purposes. Decline in population size due to habitat destruction due to degradation, fragmentation, habitat alteration, over harvesting for medicinal, fuel & timber wood, indiscriminate deforestation, trampling by mountain goats & sheep, population explosion, conversion of land for agriculture purpose, Human activities, & commercial trade
CITES Status:	No
IUCN & Endemic Status	Endangered globally, vulnerable species of Pakistan. Endemic to Himalayas & Hindu Kush Range

Recommendations: Conservation practices, community awareness, habitat management & sustainable use is highly desirable for livelihood security & safety of the area

3. *Acorus calamus* L.

Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv)

Family:	Araceae
Habit:	Herb
Local/Eng. Name:	Skhawaja/ Sweet flag/Calamus
Habitat:	Mostly found in, standing water, marshy places & along water courses in the research valley
Regional Distribution:	Afghanistan, China, Pakistan, Bangladesh, Kashmir, India, Bhutan, Sri Lanka & Nepal
Local Distribution:	KP, Swat, Chitral Drosh, Battagram, Dir, Shangla, Hazara, Peshawar District & Kashmir, Poonch
Altitudinal Elevation:	1000-2000 m
No. of Locations:	Few, Fragmented
Decline in Population size:	68%
No. of Mature individuals:	Few, 20-30 per location
Local Population:	Gradual decline observed in population size
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of habitat, degradation, over exploitation, harvest for medicine, Human activities, national & international trade
Trade:	Local, National & International market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as total population size has been reduced by 68% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv) <i>Acorus calamus</i> is critically endangered locally

due to few fragmented locations & area of occupancy less than 500 km².

It is mostly spotted in marshy places and reported from altitudinal range between 1200-1600 m in the research area. The plant is mostly collected for medicine purposes. Decline in population size is due to loss of quality habitat, degradation, overharvesting for medicine, human activities, domestic & commercial trade

CITES Status:

No

IUCN & Endemic Status

Data Deficient

Recommendations:

Further investigation Conservation practices, community awareness, habitat management & sustainable use of the plant is highly recommended for livelihood security & safety of the area.

4. *Alnus nitida* (Spach) Endl.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:

Betulaceae

Habit:

Tree

Local/Eng. Name:

Geiray/ West Himalayan Alder

Habitat:

Commonly found near water bodies, along stream banks & road side

Regional Distribution:

Pakistan, Himalaya, Kashmir, India & Nepal

Local Distribution:

Temperate Himalaya, Swat, Battagram, Dir, Shangla, Hazara, Kurram, Kashmir, Muzaffarabad

Altitudinal Elevation:

1000-3000 m

No. of Locations:

Many, Fragmented

Decline in Population size:

77%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Continuous declining in population size

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:	Loss of quality habitat, degradation, over exploitation, over harvesting for timber, fuel wood & furniture, human activities & local trade
Trade:	Local
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size was recorded 77% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii iii,iv,v) plant is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is a rare species, thinly scattered along the stream banks, water course & road side of the valley & found in altitudinal range between 1100-2300 m. The plant taxa is mostly harvested/collected for medicine, agriculture appliances, fuel and timber wood. Decline in population size is due to habitat destruction, over harvesting for fuel & timber wood, construction, human influences, & local trade
CITES Status:	No
IUCN & Endemic Status	Least Concern globally
Recommendations:	Sustainable use, conservation practices, community awareness & habitat management is very crucial for livelihood security & safety of the area.

5. *Asparagus officinalis* L.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Asparagaceae
Habit:	Herb
Local/Eng. Name:	Tendorai/Garden asparagus/asperge
Habitat:	Commonly found in temperate grasslands

Regional Distribution:	From Himalaya to Afghanistan, China, Pakistan, India, Nepal & Taiwan
Local Distribution:	KP, Swat, Chitral Drosh, Battagram, Dir, Shangla, Hazara, Rawalpindi, Parachinar & Kashmir
Altitudinal Elevation:	Up to 2500 m
No. of Locations:	Few, fragmented
Decline in Population size:	71%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Decline in its distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat, degradation, over exploitation over harvesting for medicinal, vegetable purpose, human activities, national & International trade
Trade:	Local, National & International market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size was recorded 71% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv) plant is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is commonly found in grassy places of temperate forest and traced from altitudinal range between 1900-2300 m in the area. The plant is mostly harvested for medicinal & vegetable purpose. Decline in population size is due to habitat destruction, fragmentation degradation, habitat alteration, over harvesting for medicinal purpose, human influences, & commercial trade

CITES Status:	No
IUCN & Endemic Status	Least Concern globally
Recommendations:	There is urgent need for conservation practices, community awareness, habitat management & sustainable use for livelihood security & safety of the area.

6. *Bergenia ciliata* (Haw.) Sternb.

Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iv)

Family:	Saxifragaceae
Habit:	Herb
Local/Eng. Name:	Makanpath, Ghatpanra/Rock begonia, bergenia
Habitat:	Commonly found in on stony & crevices of rocks in the temperate forest
Regional Distribution:	E. Afghanistan, from temperate Himalaya to Kashmir, India, Bhutan, Nepal & Asam
Local Distribution:	Kp, Swat, Chitral, Hazara, Kaghan, Battagram, Kohistan, Dir, Shangla, Hazara, Muree, Kurram & Kashmir
Altitudinal Elevation:	2000-3500 m
No. of Locations:	Few, fragmented
Decline in Population size:	64%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Continous decline in observed
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, over harvesting for medicinal purpose, human activities, national & international trade
Trade:	Local, National & International market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as reduction in total population size was recorded 64% in last fifty years.

B2, a,b(i,ii,iv)

Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iv) plant is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km². Continuing decline observed in area of occupancy; extent of occurrence; quality of habitat & number of locations.

It is commonly found in shady rocks of temperate forest and traced from altitudinal range between 2400-2800 m in the area. The plant species is mostly collected for medicinal & vegetable purpose. Decline in population size is due to over exploitation, over harvesting for medicinal purpose, human activities & trade

CITES Status:

No

IUCN & Endemic Status

Endemic to Himalayan region

Recommendations:

There is override need for conservation practices, community awareness, habitat management, sustainable use & cultivation of this plant for improved livelihood security & safety of the area.

7. Bistorta amplexicaulis (D. Don) Green**Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)****Family:**

Polygonaceae

Habit:

Herb

Local/Eng. Name:

Tarwa pnara, Anjabar/Mountain fleece

Habitat:

Commonly found in wet & shady places of temperate forest

Regional I Distribution:

Afghanistan, Pakistan, India Kashmir & Nepal

Local Distribution:

Ziarat, KP, Swat, Chitral, Dir, Battagram, Kohistan, Dir, Shangla, Hazara, Muree hills, Kurram & Kashmir

Altitudinal Elevation:

1200 to 4000 m

No. of Locations:

Many, fragmented

Decline in Population size:

75%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Decline in population size and area of occupancy reported

Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat, degradation, over exploitation, over harvesting for medicinal, human activities & commercial trade
Trade:	Local, National & commercial market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size was recorded 75% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv) plant is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is commonly found in shady places of temperate forest and traced from altitudinal range between 1700-2700 m in the area. The plant species is globally important & commonly collected for medicinal purposes. Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for medicinal purpose, human influences, domestic & international trade
CITES Status:	No
IUCN & Endemic Status	Endangered species of Pakistan & Endemic to Himalaya & Hindu Kush Range
Recommendations:	There is urgent need for conservation practices, community awareness, habitat management & sustainable use of the plant species for livelihood security & safety of the area.

8. Dioscorea deltoidea Wall. ex Kunth

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Dioscoreaceae
Habit:	Herb
Local/Eng. Name:	Qanees/Yam
Habitat:	A perennial twining herb of temperate forest
Regional Distribution:	From Himalaya to Afghanistan, China, Pakistan, Nepal, Bhutan, Myanmar & Kashmir
Local Distribution:	Himalayas, Dir, Swat, Hazara, Kohistan, Battagram, Kaghan, Shangla, Chitral, Murree hills & Kashmir
Altitudinal Elevation:	1500-2700 m
No. of Locations:	Few, fragmented
Decline in Population size:	70%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Decline in population size recorded
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat, degradation, over exploitation, deforestation, over harvesting for medicinal, human activities & commercial trade
Trade:	Local, National & International market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size was recorded 70% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv) plant is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² .

It is a perennial twinning herb of temperate forest and found in altitudinal range between 2100-2700 m in the area. The plant species is mostly harvest for medicine, Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for medicinal purpose, human influences, & commercial trade

CITES Status: Appendix II

IUCN & Endemic Status

Vulnerable species of Pakistan

Recommendations:

Conservation practices, community awareness, habitat management & sustainable use of the plant are very crucial for livelihood security & safety of the area.

9. *Diospyros lotus* L.

Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv,v)

Family: Ebenaceae

Habit: Tree

Local/Eng. Name: Tor amlook/Date plum

Habitat: Mostly found in sloppy a & roadside area of the valley

Regional Distribution: Afghanistan, China, Japan, Pakistan, India & Kashmir

Local Distribution: Throughout Himalayas, Swat, Shangla, Chitral, Dir, Buner, Hazara, Kohistan, Kurram Parachinar & Kashmir

Altitudinal Elevation: 1000-2500 m

No. of Locations: Many, fragmented

Decline in Population size: 66%

No. of Mature individuals: Lack of sufficient information

Local Population: Decline in population size

Data Quality: Direct field observation, interview, indirect field information, literature review

Major Threats: Loss of quality habitat, degradation, over exploitation, harvesting for fuel wood, furniture, human activities & trade

Trade: Local, National & International market

IUCN Red List Criteria: Endangered (EN)

Criteria Based:**A2, (a, c, d)**

It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as reduction in total population size was recorded 66% in last fifty years.

B2, a,b(i,ii,iii,iv,v)

Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv,v) plant is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km².

It is mostly found in mountainous slope & along road side of temperate forest with altitudinal range between 1100-2500 m. The plant species is mostly harvest for medicine, fuel wood and furniture. Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for fuel wood, furniture, human influences, & local trade

CITES Status:

No

IUCN & Endemic Status

Not evaluated/assessed globally

Recommendations:

There is override need of sustainable utilization, conservation practices, community awareness, habitat management for the sustainable livelihood security & safety of the area.

10. Ehretia obtusifolia Hochst. ex DC.**Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv)****Family:**

Boraginaceae

Habit:

Deciduous shrub or small tree

Local/Eng. Name:

Ghada bootay/Stamper wood

Habitat:

Mostly found in dry area of the valley

Regional Distribution:

Afghanistan, Pakistan & India

Local Distribution:

Baluchistan, dry Himalayan areas of KP, Swat, Malakand Agency, Kohat Pass, Rawalpindi, Islamabad,, Kashmir

Altitudinal Elevation:

700 to 1500 m

No. of Locations:	Many, fragmented
Decline in Population size:	56%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Declining in population size recorded
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat, degradation, over exploitation, harvesting for fuel wood, fodder, furniture, human activities & trade
Trade:	Local
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as reduction in total population size was recorded 56% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii,iii,iv) plant is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is mostly found in dry & lower areas of the valley at altitudinal range between 1100-1500 m. Plant taxa is mostly harvested for medicine, furniture & fuel wood and its leaves serve as fodder for livestock. Decline in population size is due to loss of quality habitat, degradation, over harvesting for fuel wood, furniture & fodder, human influences & local trade
CITES Status:	No
IUCN & Endemic Status	Not evaluated/assessed
Recommendations:	Community awareness, conservation practices, habitat management & sustainable use of the plant species is

recommended for sustainable livelihood security & safety of the area.

11. *Elaeagnus umbellata* Thunb.

Endangered (EN), Criteria: A2, (a, c, d), B2a,b(i,ii,iii,iv)

Family:	Elaeagnaceae
Habit:	Small deciduous shrub
Local/Eng. Name:	Ghanam ranga/ Autumn Olive
Habitat:	Commonly growing in dry exposed & sunny places
Regional Distribution:	China, Assam, from Himalaya to Afghanistan, Pakistan, Kashmir India & Bhutan
Local Distribution:	Himalayan areas of KP, Swat, Dir, Chitral, Shangla, Buner, Kurram, Hazara, Kaghan, Muree, Gilgit, Battagram, Kashmir
Altitudinal Elevation:	1000 to 3300 m
No. of Locations:	Many, fragmented
Decline in Population size:	57%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Decline in its range of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat due to degradation, over exploitation, harvesting for fuel wood, human activities
Trade:	No
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as reduction in total population size has been documented as 57% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i, ii,iii,iv) plant is critically endangered locally due to few

fragmented locations & area of occupancy less than 500 km².

It is commonly found in dry exposed areas with altitudinal range between 1000-2000 m in the area. The plant species harvested for medicine & fuel wood. Decline in population. Size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for fuel wood, human influences

CITES Status:

No

IUCN & Endemic Status

Not evaluated/assessed

Recommendations:

Community awareness, conservation practices, habitat management & sustainable use is recommended for livelihood security & safety of the area.

12. *Ephedra gerardiana* Wall.ex Stapf

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:

Ehedraceae

Habit:

Shrub

Local/Eng. Name:

Asmani booti/ Ephedra

Habitat:

Usually growing in dry rocky slopes of higher altitude

Regional Distribution:

Afghanistan, S.W China, Pakistan, Kashmir India, Bhutan

Local Distribution:

Baluchistan Ziarat, Himalayan areas of KP, Swat, Dir, Chitral, Kohistan, Hazara, Kaghan, Baltistan, Kashmir

Altitudinal Elevation:

2800 to 4000 m

No. of Locations:

Few, fragmented

Decline in Population size:

60%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Decline in population size and area of occupancy observed

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:

Loss of quality habitat due to degradation, over exploitation, overgrazing, harvesting for medicine, human activities & national trade

Trade:	Domestic & National market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size has been documented as 60% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b(i, ii, iii, iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is commonly found in dry rocky slopes of higher altitude between 2800-3100 m in the research valley. The plant species is mostly collected for medicinal & fuel wood purposes. Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for medicine, fuel wood and human influence
CITES Status:	No
IUCN & Endemic Status	Vulnerable species of Pakistan.
Recommendations:	There is dire need for conservation practices, community awareness, habitat management & sustainable use of the plant to for livelihood security & safety of the area.

13. Geranium wallichianum D.Don ex Sweet

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Geraniaceae
Habit:	Perennial Herb
Local/Eng. Name:	Sra zeal, Rathanjot/ Cranesbill
Habitat:	Usually found in temperate forest & commonly as forest undergrowth
Regional Distribution:	North West Himalayan, Pakistan, Kashmir, India, Nepal

Local Distribution:	Himalayan region of KP, Swat, Dir, Chitral, Kohistan, Shangla, Kurram, Parachinar, Khyber Agency, Hazara, Balakot, Shogran, Muree, Kashmir
Altitudinal Elevation:	1600 to 3300 m
No. of Locations:	Many, fragmented
Decline in Population size:	54%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Continuous Decline population size and distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Loss of quality habitat due to degradation, over exploitation, overgrazing, harvesting for medicine, human activities, national & international trade
Trade:	Local, National & International market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as decline in total population size has been recorded as 54% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is a rare species, usually found in temperate forest as undergrowth between altitudinal ranges 1700-3000 m. The plant species is mostly collected for medicinal uses. Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for medicine, trampling effects, human influence & trade
CITES Status:	No

IUCN & Endemic Status	Endangered species of Pakistan. Endemic to Himalayan & Hindu Kush Range
Recommendations:	There is dire need of sustainable collection, utilization, Conservation practices, community awareness & habitat management for livelihood security & safety of the area.

14. Hyoscyamus niger L.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Solanaceae
Habit:	Perennial Herb
Local/Eng. Name:	Dewana bhang/Henbane
Habitat:	Mostly prefer slopes and rich humus soil
Regional Distribution:	Afghanistan, China, Mostly in temperate Himalayas from Pakistan, Kashmir, India to Nepal
Local Distribution:	Temperate forest of KP, Swat, Shangla, Chitral, Hazara, Kaghan, Kurram, Khyber Agency, Gilgit, Baltistan, Astor, Kashmir
Altitudinal Elevation:	1800 to 3100 m
No. of Locations:	Few, fragmented
Decline in Population size:	60%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Decline in its distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, Loss of quality habitat due to degradation, overgrazing, harvesting for medicine, human activities & domestic trade
Trade:	Local & domestic market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as decline in

	total population size has been recorded as 60% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is a rare species, mostly growing in hilly places and prefers rich humus soil at higher elevation between altitudinal ranges 2400-2900 m. The plant species is mostly collected for medicinal. Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for medicine, trampling effects, human influence & trade
CITES Status:	No
IUCN & Endemic Status	Not assessed globally, Near Threatened species of Pakistan
Recommendations:	Sustainable utilization, conservation practices, community awareness & habitat management is highly recommended for livelihood security & safety of the area.

15. Indigofera heterantha Well. ex Brandis

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Papilionaceae
Habit:	Shrub
Local/Eng. Name:	Ghwareja /Himalayan Indigo
Habitat:	Mostly growing on sandy rocks, along roadside & prefer exposed places of the valley
Regional Distribution:	Afghanistan, China, Pakistan, Kashmir, India, Nepal,
Local Distribution:	Punjab, KP, Swat, Buner, Shangla, Dir, Kohistan, Battagram, Hazara, Kashmir
Altitudinal Elevation:	600 to 3300 m
No. of Locations:	Many, fragmented
Decline in Population size:	69%
No. of Mature individuals:	Lack of sufficient information

Local Population:	Declining in population size and area of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	loss of quality habitat, degradation, habitat alteration, over exploitation, overgrazing, overharvesting for fuel wood, thatching, fencing, booming, human activities & local trade
Trade:	Local
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as decline in total population size has been recorded as 69% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is commonly found in different parts of the valley between altitudinal ranges 1200-2600 m. The plant harvested is for fuel wood, thatching, fencing, booming & medicinal purposes. Decline in population size is due to loss of quality habitat, degradation, habitat alteration, over harvesting for medicine, overgrazing, human influence & trade
CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	Community awareness, sustainable utilization, conservation practices, & habitat management is highly recommended for livelihood security & safety of the area.

16. *Iris hookeriana* Foster.

Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Iridaceae
Habit:	Herb
Habitat:	Usually found on open slopes & subalpine meadows Reported from over grazed pasture, open slope in alpine meadows shift this sentence to lower
Local/Eng. Name:	Blue Iris
Regional Distribution:	From Himalayas to India, Pakistan & Kashmir
Local Distribution:	Northern Pakistan, Swat, Chitral, Hazara, Kohistan, Kaghan valley, Gilgit, Kashmir
Altitudinal Elevation:	2700-3500 m
No. of Locations:	Few, fragmented
Decline in Population size:	55%
No. of Mature individuals:	Insufficient Information
Local Population:	Gradual declining in population size observed
Data Quality:	Direct field observation, interview, indirect field information, literature
Major Threats:	Loss of quality habitat, habitat destruction due to degradation & fragmentation, clearance of pastureland for agriculture purpose, trampling effect by sheep/goats & Human activities
Trade:	Not known/observed
IUCN Red List Criteria:	Endangered (EN)
Criteria Based	
A2, a, c, d:	It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, c, d as decline in total population size has been observed as 55% in last ten years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2, B2, a,b(i,ii,iii,iv,v) it is critically endangered due to

restricted & fragmented distribution l& observed area of occupancy less than 500 Km².

Iris hookeriana reported in few parts of the Malam Jabba valley & found at altitudinal range between 2800-3100 m. Plant is harvested for medicinal purposes. Decline in population size is due to loss of quality habitat, habitat destruction due to degradation & fragmentation, clearance of pastureland for agriculture purpose & Human activities

CITES Status:

No

IUCN & Endemic Status

Not assessed globally, vulnerable species of Pakistan, Endemic to Himalayas & Hindu Kush Range.

Recommendations:

Community awareness, conservation practices & habitat management is very crucial to conserve endangered plant taxa for sustainable livelihood security of the area.

17. *Monothea buxifolia* (Falc.) A. DC

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:

Sapotaceae

Habit:

Small spiny shrub

Local/Eng. Name:

Gur gwara/Buxifolia

Habitat:

Mostly found in dry habitat & dry rocky hills of the area

Regional Distribution:

Afghanistan, Pakistan, Kashmir, India, Bhutan, Nepal,

Local Distribution:

Punjab, KP, Karak, Kohat, D.I. Khan, Tribal areas, Mohammad Agency, Swat, Lower Dir, Chitral,

Altitudinal Elevation:

1200 to 2400 m

No. of Locations:

Few, fragmented

Decline in Population size:

60%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Decline in its distribution range recorded

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:	loss of quality habitat, degradation, over exploitation, overharvesting for fuel wood, agriculture tools, human activities & local trade in parts
Trade:	Local
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as decline in total population size has been recorded as 60% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is a rare plant in the valley & found in dry rocky hills between altitudinal ranges of 1500-1900 m. The plant species is mostly harvested/collected for fuel wood, agriculture tools & fruit. Decline in population size is due to loss of quality habitat, degradation, over harvesting for fuel wood, agriculture tools, medicine, human influence & trade
CITES Status:	No
IUCN & Endemic Status	Not assessed globally. Near Threatened species of Pakistan
Recommendations:	Sustainable utilization, Conservation practices, community awareness & habitat management is highly recommended for livelihood security & safety of the area.

18. Morus alba L.

Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Moraceae
Habit:	A deciduous Tree
Local/Eng. Name:	Spin Toot/White mulbery

Habitat:	Mostly found along roadside, agriculture field, forest edges & undisturbed area of the valley
Regional Distribution:	Afghanistan, Pakistan, Kashmir, India, Nepal,
Local Distribution:	Punjab, Baluchestan, KP, Swat, Chitral, Lower & Upper Dir, Hazara, Battagram, Shangla, Buner, Kashmir
Altitudinal Elevation:	Upto 3000 m
No. of Locations:	Many, fragmented
Decline in Population size:	54%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Continuing decline in population size recorded
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	loss of quality habitat, degradation, over exploitation, overharvesting for fuel wood, agriculture tools, house construction, furniture, human activities & local trade
Trade:	Local & domestic market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as decline in total population size has been recorded as 54% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is a rare plant species in the valley & found along roadside, agriculture field, forest edges & undisturbed area of the valley between altitudinal ranges of 1000-3000 m. The plant species is mostly fuel wood, agriculture tools, house construction, and furniture & also as fruit plants. Decline in population size is due to loss of quality habitat,

degradation, over harvesting for medicine for fuel wood, timber wood, agriculture tools, house construction, and furniture, human influence & trade

CITES Status:

No

IUCN & Endemic Status

Not assessed globally.

Recommendations:

Sustainable utilization, conservation practices, community awareness & habitat management is highly recommended for livelihood security & safety of the area

19. *Myrsine africana* L.

Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv)

Family:

Myrsinaceae

Habit:

An evergreen shrub

Local/Eng. Name:

Marurang /African Boxwood, Cape myrtle,

Habitat:

Mostly found along roadside, open hilly slope & sunny places of the valley

Regional Distribution:

Afghanistan, China, Pakistan, Kashmir, India, Nepal,

Local Distribution:

Baluchistan, KP, Salt range, Swat, Chitral, Dir, Hazara, Battagram, Shangla, Kashmir

Altitudinal Elevation:

1000-3600 m

No. of Locations:

Many, fragmented

Decline in Population size:

52%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Continuing decline in population and are of occupancy

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:

Habitat loss, degradation, over exploitation, overharvesting for fuel wood, thatching, overgrazing, human activities

Trade:

Local & domestic

IUCN Red List Criteria:

Endangered (EN)

Criteria Based:

A2, (a, b, c, d)

It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as decline

	in total population size has been recorded as 52% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . Plant species is found along roadside, open hilly slope & sunny places of the valley between altitudinal ranges of 1100-2100 m. The plant species is mostly collected for fuel wood, thatching, fodder for goat & sheep. Decline in population size is due to loss of quality habitat, degradation, over harvesting for fuel wood, thatching, overgrazing & human influence
CITES Status:	No
IUCN & Endemic Status	Not assessed globally.
Recommendations:	Conservation practices, sustainable utilization, community awareness & habitat management is highly recommended for livelihood security & safety of the area.

20. Otostegia limbata (Benth.) Boiss.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Lamiaceae
Habit:	Shrub
Local/Eng. Name:	Spin Azghay/Otostegia
Habitat:	Mostly found in dry rocky slopes & exposed area
Regional Distribution:	Pakistan, Kashmir (India)
Local Distribution:	Punjab, KP. Swat, Dir, Malakand, Chitral, Hazara, Shangla, Battagram, Kohat, Bannu, Parachinar, Salt range, Murree hill, Kashmir
Altitudinal Elevation:	650-1900 m
No. of Locations:	Many, fragmented
Decline in Population size:	58%
No. of Mature individuals:	Lack of sufficient information

Local Population:	Decline in population size observed
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, loss of quality habitat, degradation, overharvesting for medicine, fuel wood, human activities
Trade:	Local market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as decline in total population size has been recorded as 58% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . <i>Otostegia limbata</i> is found in exposed rocky slopes & sunny places of the valley between altitudinal ranges of 900-1600 m. The plant species is mostly harvested for medicinal and fuel wood but it is also browsed by goat & sheep for fodder. Decline in population size is due to loss of quality habitat, degradation, overharvesting for medicinal & fuel wood, human influence
CITES Status:	No
IUCN & Endemic Status	Not assessed globally. Endemic to Pakistan, Kashmir
Recommendations:	Community awareness, conservation practices, sustainable utilization & habitat management is desirable for livelihood security & safety of the area.

21. *Parrotiopsis jacquemontiana* (Dcne.) Rehder.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv)

Family:	Hamamelidaceae
Habit:	Shrub
Local/Eng. Name:	Berang/Himalayan Hazel
Habitat:	Mostly growing gregariously in hilly areas
Regional Distribution:	Mostly found in west Himalayas of Pakistan, Kashmir, India
Local Distribution:	Hindu Kush range, KP, Swat, Dir, Chitral, Hazara, Natia gali, Shogran, Kurram, Murree hills, Kashmir
Altitudinal Elevation:	1200-2800 m
No. of Locations:	Many, fragmented
Decline in Population size:	63%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Decline in population size reported
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, loss of quality habitat, degradation, overharvesting for fuel wood, agriculture tools, sheltering in mud made house & walking sticks, overgrazing, human activities
Trade:	Local market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as total population size has been reduced by 63% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² .

It is mostly found in open mountainous area & sunny places of the valley between altitudinal ranges of 2100-2800 m. The plant taxa are mostly collected for species is mostly collected for agriculture tools, fuel wood, sheltering in mud made house, walking sticks & also as fodder. Decline in population size is due to loss of quality habitat, degradation, overharvesting for fuel wood, handle of plough, Axes, walking sticks, fodder, and human influence

CITES Status:	No
IUCN & Endemic Status	Not assessed globally. Endemic to Western Himalayan
Recommendations:	Community awareness, Conservation practices, sustainable utilization & habitat management is desirable for livelihood security & safety of the area.

22. *Pinus roxburghii* Sargent

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Pinaceae
Habit:	An evergreen tree
Local/Eng. Name:	Nakhter/Chir Pine
Habitat:	Mostly growing in rocky hills but at higher altitude it found association with <i>Pinus wallichiana</i> tree
Regional Distribution:	Afghanistan, Foot hills & outer valleys of Himalayan region of Pakistan, Kashmir, India, Nepal,
Local Distribution:	Hindu Kush range, KP, Swat, Lower Dir, Chitral, Hazara, Buner, Shangla, Battagram, Natia gali, Murree hills, Kashmir
Altitudinal Elevation:	400-2500 m
No. of Locations:	Many, severely fragmented
Decline in Population size:	68%
No. of Mature individuals:	Not known/observed
Local Population:	Reduction in area of occupancy& numbers of mature trees

Data Quality:	Direct field observation, interview, indirect field information & literature review
Major Threats:	Over exploitation, deforestation, loss of quality habitat, degradation, fragmentation, overharvesting for fuel wood, timber wood, furniture, extraction of resins, medicine, human influence
Trade:	Local & domestic trade
IUCN Red List Criteria:	Endangered (EN
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as total population size has been reduced by 68% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is mostly growing in rocky mountainous areas but in higher altitude it is found in association with <i>Cedrus deodara</i> & <i>Pinus wallichiana</i> between altitudinal ranges 1200-1800 m. The plant species is mostly harvested for timber wood, fuel wood, furniture & medicinal uses. Decline in population size is due to loss of quality habitat, degradation, fragmentation, overharvesting for fuel wood, timber wood, furniture, extraction of resins, medicine & Human activities
CITES Status:	No
IUCN & Endemic Status	Least Concern globally. Endemic to Himalayas & Hindu Kush & Karakoram Range
Recommendations:	Community awareness, conservation practices, sustainable utilization & habitat management is very crucial for livelihood security & safety of the area.

23. *Pinus wallichiana* A.B. Jackson

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Pinaceae
Habit:	Tree
Local/Eng. Name:	Peuch/ Himalayan white pine, Bhutan Pine
Habitat:	Mostly growing at higher altitude, often mixed with <i>Abies</i> , <i>Picea</i> & <i>Quercus</i> in temperate forest
Regional Distribution:	Afghanistan, China, Pakistan, Himalaya, Kashmir, Nepal, Myanmar, Bhutan
Local Distribution:	KP, Swat, Chitral, Kohistan, Battagram, Dir, Buner, Hazara, Bara Gali, Muree hills, Islamabad & Kashmir
Altitudinal Elevation:	1600-3400 m
No. of Locations:	Many, Fragmented
Decline in Population size:	67%
No. of Mature individuals:	Lack of sufficient Information
Local Population:	Continous declinining in number of mature individuasls
Data Quality:	Direct field observation, interview, indirect field information & literature review
Major Threats:	Loss of quality habitat due to degradation, fragmentation, habitat alteration, over exploitation, over harvesting for timber, fuel wood, indiscriminate deforestation, clearing of forest land for agriculture purpose, Human activities, due to population explosion, developmental programs & trade
Trade:	Local & domestic trade
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It was Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as reduction in total population size was recorded 67% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b(i,ii iii,iv,v) <i>Abies pindrow</i> is critically endangered locally

due to fragmented locations & area of occupancy less than 500 km².

Pinus wallichiana are the dominant forest, mostly growing at higher altitude, mixed with *Abies pindrow*, *Picea smithiana*, *Quercus incana*, *Quercus dilatata* between altitudinal ranges 1700-2900 m. The plant species is one of the key sources for building construction in the valley and mostly collected for fuel wood, timber wood & medicinal purposes. Decline in population size is due to loss of quality habitat due to degradation, fragmentation, habitat alteration, over harvesting for medicinal, fuel & timber wood, indiscriminate deforestation, population explosion, conversion of land for agriculture purpose, Human activities, & domestic trade

CITES Status:

No

IUCN & Endemic Status

Least Concern globally. Endemic to Himalayas & Hindu Kush & Karakoram Range

Recommendations:

There is override need for habitat management, conservation practices, community awareness & sustainable use of the plant species for sustainable livelihood security & also to protect it from extinction in near future.

24. Populus alba L.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v), C1:

Family:

Salicaceae

Habit:

A deciduous Tree

Local/Eng. Name:

Sperdad, Sufaída/Silver poplar, white poplar

Habitat:

Mostly growing in the field & forest edges of the valley

Regional Distribution:

South West & Western Central Asia Pakistan, Kashmir, India

Local Distribution:

Baluchestan, KP, Swat, Dir, Hazara, Buner, Abbotabad, Battagram, Kurram valley, Murree hills, Baltistan, Kashmir

Altitudinal Elevation:	1500-2300 m
No. of Locations:	Few, fragmented
Decline in Population size:	65%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Declining in population size recorded
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, loss of quality habitat, degradation, fragmentation, overharvesting for fuel wood, human influence
Trade:	Local market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as total population size has been reduced by 65% in last fifty years.
B2, a,b(i,ii,iii,iv,v):	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² .
C1:	Small population size & decline: Number of population less than 2500 in terms of mature individuals & an estimated decline of at least twenty percent in next five years or two generations in number of mature individuals. (Upto a maximum of 100 years in future.) It is Critically Endangered under IUCN Red List category of Small population size & decline as total number of mature individuals is less than 2500 species & an estimated decline in number of mature individuals will be 20% in next 5 years or 2 generations. It is mostly growing in open areas, field & forest edges of the valley between altitudinal ranges 1500-2200 m. It is

mostly collected for fuel wood where as leaves are harvested for goats & sheep as fodder. Decline in population size is due to loss of quality habitat, degradation, overharvesting for fuel wood, fodder for goats/sheep & Human activities

CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	Sustainable utilization, community awareness, Conservation practices & habitat management is very crucial for livelihood security & safety of the area.

25. *Primula denticulata* Sm.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Primulaceae
Habit:	Herb
Local/Eng. Name:	Asli Mamera/Drum stick/Primrose
Habitat:	Mostly growing in open sunny areas & deep meadow in subalpine zone
Regional Distribution:	Afghanistan & throughout the temperate Himalayas from Pakistan to Kashmir, India, Nepal, Assam
Local Distribution:	Baluchestan, KP, Swat, Dir, Chitral, Hazara, Kohistan, Battagram, Baltistan, Kashmir
Altitudinal Elevation:	1300-4300 m
No. of Locations:	Few, fragmented
Decline in Population size:	60%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in population size
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, loss of quality habitat, degradation, fragmentation, overharvesting for medicine, trampling by mountain goats & sheep, human influence
Trade:	Local, domestic market

IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as total population size has been reduced by 60% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is mostly growing in open, sunny areas, deep meadow & subalpine zone between altitudinal ranges 2600-3050 m. The plant species is mostly collected for medicinal purposes. Decline in population size is due to loss of quality habitat, degradation, overharvesting for medicine, trampling by mountain goats & sheep, Human activities
CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	Conservation practices, sustainable utilization Community awareness & habitat management is highly recommended for livelihood security & safety of the area.

26. *Quercus dilatata* Royle

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Betulaceae
Habit:	Tree
Local/Eng. Name:	Tor banj/Holly Oak
Habitat:	Mostly growing in rocky slopes of the valley
Regional Distribution:	Afghanistan & temperate Himalayas from Pakistan to Kashmir, Nepal
Local Distribution:	KP, Swat, Dir, Chitral, Hazara, Battagram, Kaghan, Balakot, Khyber agency, Murree hills, Kashmir
Altitudinal Elevation:	1600-2900 m
No. of Locations:	Many, fragmented

Decline in Population size:	65%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in numbers & area of occupancy
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, Habitat loss, degradation, fragmentation, deforestation, illegal logging, overharvesting for fuel wood, charcoal, timber wood & agriculture tools, human influence
Trade:	Local & domestic trade
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b,c, d) as total population size has been reduced by 65% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . It is mostly growing in rocky slopes of the valley but thinly scattered between altitudinal ranges 1700-2700 m. The plant species is mostly harvested for charcoal, fuel wood, timber wood, agriculture tools, medicine & its leaves for fodder purpose. Decline in population size is due to loss of quality habitat, degradation, deforestation, overharvesting for fuel wood, charcoal, timber wood, Human activities
CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	There is override need of Conservation practices, sustainable utilization Community awareness, & habitat management for livelihood security & safety of the area.

27. *Quercus incana* Roxb.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Betulaceae
Habit:	Tree
Local/Eng. Name:	Tor banj/Black Oak
Habitat:	Mostly growing in southern slope of the valley
Regional Distribution:	Outer & temperate N.W Himalayas from Pakistan to Kashmir, Nepal, Upper Burma
Local Distribution:	KP, Swat, Dir, Chitral, Hazara, Battagram, Shangla, Abbotabad, Murree hills, Kashmir
Altitudinal Elevation:	1000-2700 m
No. of Locations:	Few, fragmented
Decline in Population size:	67%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in numbers and area of distribution
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss, degradation, fragmentation, ruthless deforestation, illegal logging, over exploitation, overharvesting for fuel wood, charcoal, timber wood, building construction, human influence & local trade
Trade:	Local & domestic trade
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as total population size has been reduced by 67% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . Plant species is severely fragmented & mostly

growing between altitudinal ranges of about 1300-2500 m. The plant species is mostly collected for fuel wood, charcoal, timber wood, medicine & its leaves for fodder purposes. Decline in population size is due to loss of quality habitat, degradation, illegal logging, overharvesting for fuel wood, charcoal, timber wood, Human activities

CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	Conservation practices, sustainable utilization Community awareness & habitat management is highly recommended for livelihood security & safety of the area.

28. *Rosa webbiana* Wall. ex Royle

Endangered (EN), Criteria: A2(a, c, d), B2a,b(i,ii,iii,iv)

Family:	Rosaceae
Habit:	Tree
Local/Eng. Name:	Zangali Gulab/Wild Rose
Habitat:	Mostly growing in slopes, grassy & exposed places of the of temperate forest of the valley
Regional Distribution:	Afghanistan, S.W. China, Pakistan to Kashmir, India, W. Nepal
Local Distribution:	Hindu Kush Range, KP, Swat, Dir, Chitral, Hazara, Kohistan, Hunza, Astor, Gilgit, Baltistan, Kashmir
Altitudinal Elevation:	2000-4500 m
No. of Locations:	Few, fragmented
Decline in Population size:	58%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in population size observed
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss, degradation, fragmentation, over exploitation, overharvesting for fence & medicine, human influence
Trade:	Local trade

IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as total reduction in population size has been recorded as 58% in last fifty years.
B2, a,b(i,ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . Plant species is thinly scattered, fragmented & mostly growing in slopes & grassy places between altitudinal ranges of 1900-2800 m. It is mostly collected for medicinal & also for hedge/fence purposes. Decline in population size is due to loss of quality habitat, degradation, fragmentation, overharvesting for hedge & medicinal purposes, Human activities
CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	There is dire need of conservation practices, sustainable utilization Community awareness & habitat management for livelihood security & safety of the area.

29. *Salix babylonica* L.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:	Salicaceae
Habit:	A deciduous Tree
Local/Eng. Name:	Wala/Weeping willow
Habitat:	Mostly growing along water courses
Regional Distribution:	China, Pakistan to Kashmir, India, Nepal
Local Distribution:	Hindu Kush Range, KP, Swat, Dir, Chitral, Shangla, Hazara, Battagram, Abbotabad, Kashmir
Altitudinal Elevation:	400-2500 m

No. of Locations:	Many, fragmented
Decline in Population size:	69%
No. of Mature individuals:	Not known/observed
Local Population:	Reduction in population size & area of occupancy
Data Quality:	Direct field observation, interview, indirect field information & literature review
Major Threats:	Habitat loss, degradation, fragmentation, over exploitation, overharvesting for fuel wood, light furniture, cricket bats & fodder purposes, Human activities
Trade:	Local market
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as total reduction in population size has been recorded as 69% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . Plant species is mostly growing along water courses between altitudinal ranges of 1000-2500 m. It is mostly collected for fuel wood, light furniture, making cricket bats & sticks. Its branches are also collected for fodder purposes. Decline in population size is due to loss of habitat loss due to degradation, fragmentation, overharvesting for fuel wood, light furniture, cricket bats & fodder purposes, Human activities
CITES Status:	No
IUCN & Endemic Status	Not assessed globally

Recommendations: Conservation practices, sustainable utilization Community awareness & habitat management is highly recommended for livelihood security & safety of the area.

30. *Thymus linearis* Benth.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family: Lamiaceae

Habit: A perennial Herb

Local/Eng. Name: Ghra Chai, Zangali Sperkay /Himalayan Thyme

Habitat: Mostly growing in open, sunny & rocky places near subalpine zone

Regional Distribution: NE Afghanistan, China, Pakistan, Kashmir, India, Nepal

Local Distribution: KP, Swat, Dir, Chitral, Shangla, Hazara, Kohistan, Battagram, Kaghan valley, Kurram, Gilgit, Kashmir

Altitudinal Elevation: 1800-4200 m

No. of Locations: Few, fragmented

Decline in Population size: 55%

No. of Mature individuals: Lack of sufficient information/not known

Local Population: Reduction in population size & distribution range

Data Quality: Direct field observation, interview, indirect field information & literature review

Major Threats: Over exploitation, Habitat loss, alteration, fragmentation, overharvesting for medicine, Human activities & trade

Trade: Local & national market

IUCN Red List Criteria: Endangered (EN)

Criteria Based:

A2, (a, b, c, d) It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as total reduction in population size has been recorded as 55% in last fifty years.

B2, a,b(i,ii,iii,iv,v) Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv,v) it is critically endangered locally due to few

fragmented locations & area of occupancy less than 500 km².

Plant species is highly restricted & confined to the higher altitude & subalpine zone between altitudinal ranges of 2600-3200 m. It is mostly collected for medicinal purposes. Decline in population size is due to over exploitation, habitat loss, alteration, fragmentation, overharvesting for medicine, human activities & trade

CITES Status:

No

IUCN & Endemic Status

Not assessed globally. Rare species of Pakistan

Recommendations:

Sustainable utilization, conservation practices, community awareness & habitat management is highly recommended for livelihood security & safety of the area.

31. *Viburnum grandiflorum* Wall. ex DC.

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(i,ii,iii,iv,v)

Family:

Caprifoliaceae

Habit:

Shrub

Local/Eng. Name:

Ghaz Meva /Himalayan Viburnum

Habitat:

Mostly growing in open areas of temperate forest

Regional Distribution:

China, Pakistan, Kashmir, India, Nepal, Bhutan

Local Distribution:

Baluchistan, Quetta, KP, Swat, Dir, Chitral, Shangla, Hazara, Kohistan, Battagram, Kaghan valley, Kashmir

Altitudinal Elevation:

1500-3000 m

No. of Locations:

Few, fragmented

Decline in Population size:

52%

No. of Mature individuals:

Lack of sufficient information

Local Population:

Reduction in population size & extent of occurrence

Data Quality:

Direct field observation, interview, indirect field information, literature review

Major Threats:

Habitat loss, alteration, fragmentation, over exploitation, overharvesting for fuel wood, human activities

Trade:

No trade information

IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, c, d) as total reduction in population size has been recorded as 52% in last fifty years.
B2, a,b(i,ii,iii,iv,v)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii iii,iv,v) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . Plant species is growing in open areas of temperate forest & found at altitudinal ranges of 1600-2800 m. Plant taxa is collected for medicinal and fuel wood purposes. Decline in population size is due to loss of quality habitat, loss of quality habitat, degradation, human influences, over exploitation overharvesting for fuel wood
CITES Status:	No
IUCN & Endemic Status	Not assessed globally.
Recommendations:	Conservation practices, sustainable utilization, Conservation practices, community awareness & habitat management is highly recommended for livelihood security & safety of the area.

32. *Viola canescens* Wall .ex Roxb.

(CR. Category Criteria, A2(a, b, c, d), B2a,b(i,ii,iii,iii, iv)

Family:	Violaceae
Habit:	Herb
Habitat:	Mostly found in shady & moist places of temperate forest
Local/Eng. Name:	Banafsha/Arrow Violet
Regional Distribution:	Himalayan region of China, Pakistan, Kashmir, India, Nepal, Bhutan
Local Distribution:	Hindu Kush range, KP, Swat, Dir, Shangla, Chitral, Kohistan, Battagram, Hazara, Kaghan,Murre hills, Kashmir

Altitudinal Elevation:	1000-3300 m
No. of Locations:	Few, fragmented
Decline in Population size:	68%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Rapid decline in population & its area of occupancy
Data Quality:	Direct field observation, interview, indirect field information, literature
Major Threats:	Loss of quality habitat due to degradation, habitat alteration, over exploitation, overharvesting for medicine, Human activities & commercial trade
Trade:	Local, National & commercial
IUCN Red List Criteria:	Critically Endangered (CR)
Criteria Based	
A2, a, b, c, d	It is Critically Endangered under IUCN Red List Criteria of Population Reduction A2 Sub Criteria, a, b, c, d as decline in total population size has been observed as 68% in last ten years.
B2, a,b(i,ii,iii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (i,ii,iii, iii, iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² . <i>Viola canescens</i> is growing in restricted parts of the valley & mostly found in shady & moist places between altitudinal ranges 1400-2600 m. Plant is collected for medicinal purposes. Decline in population size is due to loss of quality habitat, habitat destruction, degradation, habitat alteration, over exploitation, human influences, harvest for medicine, & commercial trade
CITES:	No
IUCN Global Status	Not assessed globally
Recommendations:	There is override need of habitat management, sustainable utilization, community awareness, conservation practices &

cultivation program to protect this threatened plant for sustainable livelihood security & safety of the area.

33. *Withania somnifera* (L.) Dunal

Endangered (EN), Criteria: A2(a, b, c, d), B2a,b(ii,iii,iv)

Family:	Solanaceae
Habit:	Shrub
Local/Eng. Name:	Kutilal /Winter cherry, Indian ginseng
Habitat:	Mostly growing in waste places of the valley
Regional Distribution:	Afghanistan, China, Pakistan, Kashmir, India
Local Distribution:	Baluchistan, Punjab, Multan, Faisalabad, KP, Swat, Dir, Shangla, Hazara, Kohistan, Battagram, Peshawar, Kohat, Hangu, Waziristan, Gilgit, Kashmir
Altitudinal Elevation:	Common upto 2300 m
No. of Locations:	Many, fragmented
Decline in Population size:	56%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in population size recorded
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Over exploitation, habitat loss, degradation, overharvesting for medicine, Human activities
Trade:	Local & domestic
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	
A2, (a, b, c, d)	It is Critically Endangered locally under IUCN Red List Criteria of Population reduction, A2, (a, b, c, d) as total population size has been reduced by 56% in last fifty years.
B2, a,b(ii,iii,iv)	Under IUCN Red List Criteria of Geographical range B2 a, b (ii,iii,iv) it is critically endangered locally due to few fragmented locations & area of occupancy less than 500 km ² .

Plant species is growing in waste places & found at altitudinal ranges of 1000-1900 m. It is mostly collected for medicinal purposes. Decline in population size is due to over exploitation, habitat loss, degradation, overharvesting for medicine, human activities.

CITES Status:	No
IUCN & Endemic Status	Not assessed globally
Recommendations:	There is override need of sustainable utilization, conservation practices, community awareness & habitat management for livelihood security & safety of the area.

34. *Ziziphus jujuba* Mill.

Endangered (EN), Criteria: A2(a, b, c, d), C1)

Family:	Rhamnaceae
Habit:	Tree
Local/Eng. Name:	Markhane /Jujube
Habitat:	Mostly growing in sunny dry places, foothills, plains & mountainous area of the valley
Regional Distribution:	Afghanistan, China, Pakistan, Kashmir, India
Local Distribution:	KP, Swat, Dir, Shangla, Hazara, Kohistan, Battagram, Mansehra, Kaghan Valley, Kashmir
Altitudinal Elevation:	900-2000 m
No. of Locations:	Few, fragmented
Decline in Population size:	62%
No. of Mature individuals:	Lack of sufficient information
Local Population:	Reduction in population size & distribution range
Data Quality:	Direct field observation, interview, indirect field information, literature review
Major Threats:	Habitat loss, degradation, over exploitation, harvesting for fuel wood, fences, hedges, fodder & Human activities
Trade:	Local (Fruits)
IUCN Red List Criteria:	Endangered (EN)
Criteria Based:	

A2, (a, b, c, d)

It is Critically Endangered locally under IUCN Red List Criteria of Population reduction A2, (a, b, c, d) as decline in total population size has been recorded by 62% in last fifty years.

C1:

Small population size & decline: Number of population less than 2500 in terms of mature individuals & an estimated decline of atleast 20 percent in next five years or two generations in number of mature individuals. (Upto a maximum of 100 years in future.)

It is Critically Endangered under IUCN Red List category of Small population size & decline as total number of mature individuals is less than 2500 species & an estimated decline in number of mature individuals will be 20% in next 5 years or 2 generations.

Plant species is growing mostly growing in sunny dry places, foothills & mountainous area of the valley & found at altitudinal range of 1000-2000 m. It is mostly collected for fuel wood, fences, hedges, fodder, fruits & medicinal purposes. Decline in population size is due to loss of quality habitat, degradation, over exploitation, overharvesting for fuel wood, fences, hedges, fodder & human activities

CITES Status:

No

IUCN & Endemic Status

Least Concern globally.

Recommendations:

community awareness, sustainable utilization, conservation practices, community awareness & habitat management is highly recommended for livelihood security & safety of the area.

Table-VI. Taxon Data Sheets of Endangered Plant Biodiversity at Malam Jabba Valley, Swat

S.#	Taxon/Family Name	Criteria/Sub Criteria	Threatened due to	Major threats	Trade information
Critically Endangered (CR)					
1.	<i>Aconitum chasmanthum</i> Stapf ex Holmes Ranunculaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Overharvesting for medicine, loss of habitat, fragmentation, alteration, human activities, trampling effects by sheep & goats	Local, national & international market
2.	<i>Aesculus indica</i> (Wall.ex. Camb.) Hook.f. Hippocastinaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, habitat alteration, over exploitation, over harvesting for medicine, timber & furniture wood, Human activities,	Local & domestic trade
3.	<i>Allium humile</i> Kunth. Alliaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Over exploitation, harvesting for medicine, overgrazing, Loss of habitat, sheep trampling by mountain goats/sheep	Local & Domestic
4.	<i>Berberis lycium</i> Royle Berberidaceae	A2(a, b c, d)	Population reduction	Habitat loss & degradation, over exploitation, Overharvesting for medicine, fuel wood, uprooting of plants for medicinal purpose, human influences, domestic & commercial trade of parts (Root & bark)	Local, national & commercial
5.	<i>Buxus wallichiana</i> Baill Buxaceae	A2(a, b c, d)	Population reduction	Loss of quality of habitat due to degradation, fragmentation, overharvesting for medicine, fuel wood, wooden utensils, human influences	Local, domestic market
6.	<i>Caltha alba</i> var. <i>alba</i> Ranunculaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Overharvesting for medicine, food & packing. Loss of quality habitat, trampling by mountain goats & sheep, Human activities,	Local, domestic market
7.	<i>Cedrus deodara</i> (Roxb. ex D.Don) G. Don Pinaceae	A2(a, b c, d)/ B2a,c(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of habitat due to degradation, fragmentation, over logging, Overharvesting for medicine, construction, intensive logging & deforestation for timber & fuel wood, clearing of land for agriculture purpose, human influences, timber mafia	Local
8.	<i>Celtis australis</i> L. Ulmaceae	A2(a, b c, d)	Population reduction	Habitat loss & degradation, over exploitation, overharvesting for timber, fuel wood, agriculture tools, human influences	Local

9.	<i>Colchicum luteum</i> Baker Colchicaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Over exploitation, loss of quality habitat, degradation, overharvesting for medicine,	Local & commercial trade of parts (Corm & seeds)
10.	<i>Crataegus songarica</i> K. Koch. Rosaceae	A2(a, b c, d)/ D1	Population reduction/ Restricted population	Habitat loss, degradation, over exploitation, overharvesting for medicine & fuel wood, human influences	Local
11.	<i>Fritillaria cirrhosa</i> Subsp. <i>Roylei</i> (Hook.) Ali, Syn. <i>Fritillaria roylei</i> Hook. Liliaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Loss of habitat & degradation, over exploitation, Overharvesting for medicine, trampling effect, human activities	Local & Domestic market
12.	<i>Juglans regia</i> L. Juglandaceae	A2(a, b c, d)	Population reduction	Habitat destruction, degradation & fragmentation, human influences, over exploitation, Overharvesting for medicine, furniture & fuel wood, & trade of parts (Fruits & root's bark)	Local, domestic & international market
13.	<i>Olea ferruginea</i> Wall. ex Aitch. Syn. <i>Olea cupidata</i> Wall ex G. Don Oleaceae	A2(a, c, d)	Population reduction	habitat destruction, degradation, Human activities, over exploitation, Overharvesting for medicine, furniture & fuel wood	local market
14.	<i>Paeonia emodi</i> Wall.ex Royle Paeoniaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Habitat loss due to degradation & fragmentation, over exploitation, overharvesting for medicine, Human activities, trampling effects by sheep/goat	Local, national & commercial
15.	<i>Picea smithiana</i> (Wall.) Boiss Pinaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Habitat destruction due to degradation & fragmentation, heavy deforestation, heavy logging, conversion of land for agriculture purpose, overharvesting for medicine, fuel wood, timber wood, human activities	Local, domestic
16.	<i>Pinus gerardiana</i> Wall. Pinaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Habitat destruction due to degradation & fragmentation, overharvesting for fuel wood, timber wood, illegal logging, Human activities, local trade, clearing of pine forests for agriculture purpose, overharvesting for cone & seeds (locally know as chilghoza seeds)	Local, domestic

				also contributes to poor regeneration.	
17.	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f. Anacardiaceae	A2(a, b c, d)/ C1	Population reduction/ small population size & decline	Habitat loss & degradation, overharvesting for medicine, fuel wood, Human activities & trade	Local, national & international market
18.	<i>Podophyllum emodi</i> Wall. ex Royle Podophyllaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Habitat loss due to degradation & fragmentation, overharvesting for medicine, Human activities & commercial trade	Local, national & international market
19.	<i>Polygonatum verticillatum</i> (L.) All. Asparagaceae	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Over exploitation, overharvesting for medicine, loss of habitat due to degradation, habitat alteration, trampling by goats & sheep, Human activities & commercial trade	Local, domestic, commercial trade
20.	<i>Prunus cornuta</i> (Wall. ex Royle) Steud Rosaceae	A2(a, c, d). C1	Population reduction/ small population size & decline	Habitat destruction due to degradation, fragmentation. habitat alteration, over exploitation, overharvesting for fuel & timber wood, & Human activities	Local market
21.	<i>Quercus semecarpifolia</i> Sm. Fagaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Habitat destruction due to degradation, fragmentation. habitat alteration, over exploitation, overharvesting for fuel & timber wood, & Human activities	Local market
22.	<i>Rheum australe</i> D. Don Polygonaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Over exploitation, overharvesting for medicine, loss of habitat, degradation, habitat alteration, trampling effect of goats & sheep, Human activities	Local & national market
23.	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke) Asteraceae	A2(a, b, c, d)	Population reduction	Over exploitation, overharvesting roots of plants for medicine, uprooting of whole plants, loss of habitat due to degradation, habitat alteration, human activities	Local, national & international market
24.	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp. Rutaceae	A2(a ,b, c, d	Population reduction	Overharvesting, habitat loss, degradation, fragmentation, habitat alteration, overharvesting for medicine, human activities	Local /domestic market
25.	<i>Taxus wallichiana</i> Zucc. Taxaceae	A2(a, b, c, d)/ B2a,c(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Indiscriminate deforestation, overharvesting for fuel wood, timber wood, medicine, loss of habitat due to degradation, habitat fragmentation & habitat alteration, conversion of	Local, domestic/ commercial market

				land for agriculture, Human activities	
26.	<i>Valeriana jatamansi</i> Jones Valerianaceae	A2(a, b, c, d)	Population reduction	Over exploitation, loss of habitat due to degradation, habitat alteration, harvesting for medicine, Human activities	Local, national & international market
27.	<i>Viburnum cotinifolium</i> D.Don. Caprifoliaceae	A2(a, c, d)	Population reduction	Loss of quality habitat, degradation, habitat alteration over exploitation, overharvesting for fuel wood, Human activities	Local market
28.	<i>Viola betonicifolia</i> Sm. Violaceae	A2(a, b, c, d)	Population reduction/	Loss of quality habitat, habitat destruction due to degradation & fragmentation, over exploitation, overharvesting for medicine, Human activities	Local, national & commercial market
29.	<i>Viola pilosa</i> Blume Violaceae	A2(a, b, c, d)	Population reduction	Loss of habitat due to degradation, habitat alteration, over exploitation, overharvesting for medicine, Human activities	Local, national & commercial market
30.	<i>Vitis jacquemontii</i> Parker Vitaceae	A2(a, b, c, d), C1	Population reduction/ very small population size & decline	Loss of quality habitat due to degradation, habitat alteration, overharvesting of their host species for fuel & timber wood, fragmentation, Human activities	Local market
Endangered (EN)					
31.	<i>Abies pindrow</i> Royle Pinaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, fragmentation, habitat alteration, over exploitation, over harvesting for timber, fuel wood, indiscriminate deforestation, clearing of forest land for agriculture purpose, Human activities, due to population explosion, developmental programs	Local market
32.	<i>Aconitum heterophyllum</i> Wall. ex Royle Ranunculaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, habitat alteration, over exploitation, over harvesting & uprooting of whole plant for medicinal purpose, trampling by mountain goats & sheep, population explosion, conversion of land for agriculture purpose, Human activities,	Local

					International market
33.	<i>Acorus calamus</i> L. Araceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, over exploitation, Overharvesting for medicine, Human activities,	Local, National & International market
34.	<i>Alnus nitida</i> (Spach) Endl. Betulaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Loss of quality habitat, degradation, over exploitation, over harvesting for timber, fuel wood & furniture, human activities	Local market
35.	<i>Asparagus officinalis</i> L. Asparagaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Habitat loss, fragmentation, human influences, over exploitation, over harvesting for medicinal, vegetable purpose, human activities	Local, National & International market
36.	<i>Bergenia ciliata</i> (Haw.) Sternb. Saxifragaceae	A2(a, c, d)/ B2a,b(i,ii,iv)	Population reduction/ Restricted distribution	Over exploitation, over harvesting for medicinal purpose, human activities	Local, National & International market
37.	<i>Bistorta amplexicaulis</i> (D. Don) Green Polygonaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat, degradation, over exploitation, over harvesting for medicine, Anthropogenic activities	Local, National & International market
38.	<i>Dioscorea deltoidea</i> Wall. ex Kunth Dioscoreaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat, degradation, over exploitation, deforestation, over harvesting for medicinal purpose, human activities	Local, National & International market
39.	<i>Diospyros lotus</i> L. Ebenaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Loss of quality habitat, degradation, over exploitation, harvesting for fuel wood, furniture, human activities & trade	Local, National & International market
40.	<i>Ehretia obtusifolia</i> Hochst. ex DC. Boraginaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat, degradation, over exploitation, harvesting for fuel wood, fodder, furniture, human activities & trade	Local market
41.	<i>Elaeagnus umbellata</i> Thunb. Elaeagnaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, over exploitation, harvesting for fuel wood, human activities	Local market
42.	<i>Ephedra gerardiana</i> Wall.ex Stapf Ephedraceae	A2(a, b,c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, over exploitation, overgrazing, harvesting for medicine, human activities	Domestic & national market
43.	<i>Geranium wallichianum</i>	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/	Loss of quality habitat due to degradation, over exploitation,	Local, National &

	D.Don ex Sweet Geraniaceae		Restricted distribution	overgrazing, harvesting for medicine, human activities	International market
44.	<i>Hyoscyamus niger</i> L. Solanaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Over exploitation, Loss of quality habitat due to degradation, overgrazing, harvesting for medicine, human activities	Local & domestic market
45.	<i>Indigofera heterantha</i> Well. ex Brandis Papilionaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	loss of quality habitat, degradation, habitat alteration, over exploitation, overgrazing, overharvesting for fuel wood, thatching, fencing, booming, human activities	Local market
46.	<i>Iris hookeriana</i> Foster Iridaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Loss of quality habitat, habitat destruction due to degradation & fragmentation, clearance of pastureland for agriculture purpose, trampling effect by sheep/goats & Human activities	Not known /observed
47.	<i>Monothecca buxifolia</i> (Falc.) A. DC Sapotaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	loss of quality habitat, degradation, over exploitation, overharvesting for fuel wood, agriculture tools, human activities & local trade in parts	Local market
48.	<i>Morus alba</i> L. Moraceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	loss of quality habitat, degradation, over exploitation, overharvesting for fuel wood, agriculture tools, house construction, furniture, human activities	Local & domestic market
49.	<i>Myrsine africana</i> L. Myrsinaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Habitat loss, degradation, over exploitation, overharvesting for fuel wood, thatching, overgrazing, human activities	Local & domestic market
50.	<i>Otostegia limbata</i> (Benth.) Boiss. Lamiaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Over exploitation, loss of quality habitat, degradation, overharvesting for medicine, fuel wood, human activities	Local market
51.	<i>Parrotiopsis jacquemontiana</i> (Dcne.) Rehder. Hamamelidaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Over exploitation, loss of quality habitat, degradation, overharvesting for fuel wood, agriculture tools, sheltering in mud made house & walking sticks, overgrazing, human activities	Local market
52.	<i>Pinus roxburghii</i> Sargent Pinaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Over exploitation, deforestation, loss of quality habitat, degradation, fragmentation, overharvesting for fuel wood, timber wood, furniture, extraction of resins, medicine, human influence	Local & domestic market

53.	<i>Pinus wallichiana</i> A.B. Jackson Pinaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, fragmentation, habitat alteration, over exploitation, over harvesting for timber, fuel wood, indiscriminate deforestation, clearing of forest land for agriculture purpose, Human activities, due to population explosion, developmental programs	Local & domestic market
54.	<i>Populus alba</i> L. Salicaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v), C1	Population reduction/ Restricted distribution/ population size & decline	Over exploitation, loss of quality habitat, degradation, fragmentation, overharvesting for fuel wood, human influence	Local market
55.	<i>Primula denticulata</i> Sm. Primulaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Over exploitation, loss of quality habitat, degradation, fragmentation, overharvesting for medicine, trampling by mountain goats & sheep, human influence	Local
56.	<i>Quercus dilatata</i> Royle Fagaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Over exploitation, Habitat loss, degradation, fragmentation, deforestation, illegal logging, overharvesting for fuel wood, charcoal, timber wood & agriculture tools, human influence	Local, domestic market
57.	<i>Quercus incana</i> Roxb. Fagaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Habitat loss, degradation, fragmentation, ruthless deforestation, illegal logging, over exploitation, overharvesting for fuel wood, charcoal, timber wood, building construction, human influence	Local, domestic market
58.	<i>Rosa webbiana</i> Wall. ex Royle Rosaceae	A2(a, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Habitat loss, degradation, fragmentation, over exploitation, overharvesting for fence & medicine, human influence	Local market
59.	<i>Salix babylonica</i> L. Salicaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Habitat loss, degradation, fragmentation, over exploitation, overharvesting for fuel wood, light furniture, cricket bats & fodder purposes, Human activities	Local market
60.	<i>Thymus linearis</i> Benth. Lamiaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted	Over exploitation, Habitat loss, alteration, fragmentation, overharvesting for medicine, Human	Local & National market

			distribution	activities	
61.	<i>Viburnum grandiflorum</i> Wall. ex DC. Caprifoliaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	Population reduction/ Restricted distribution	Habitat loss, alteration, fragmentation, over exploitation, overharvesting for fuel wood, Human activities	Not known/ observed
62.	<i>Viola canescens</i> Wall .ex Roxb. Violaceae	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	Population reduction/ Restricted distribution	Loss of quality habitat due to degradation, habitat alteration, over exploitation, overharvesting for medicine, Human activities	Local, National & commercial market
63.	<i>Withania somnifera</i> (L.) Dunal Solanaceae	A2(a, b, c, d)/ B2a,b(ii,iii,iv)	Population reduction/ Restricted distribution	Over exploitation, Habitat loss, degradation, overharvesting for medicine, Human activities	Local & domestic market
64.	<i>Ziziphus jujuba</i> Mill. Rhamnaceae	A2(a, b, c, d)/ C1	Population reduction/ very small population size & decline	Habitat loss, degradation, over exploitation, harvesting for fuel wood, fences, hedges, fodder & Human activities	Local market
Vulnerable (VU)					
65.	<i>Acacia modesta</i> Wall. Mimosaceae	A2 (a,b,c,d)	Population reduction	Overharvesting for medicine, fuel wood, fences, fodder & honey bee species. overexploitation , loss of quality habitat, degradation	Local market
66.	<i>Andrachne cordifolia</i> (Wall.ex Decne.) Muell. Euphorbiaceae	A2 (a,c,d)	Population reduction	Overharvesting for ethno-veterinary medicine, habitat degradation, Human activities	Not known/ observed
67.	<i>Arisaema utile</i> Hook. f. ex Schott Araceae	A2 (a,b,c,d) /B2, ab(i,ii,iii)	Population reduction/ Restricted distribution	Loss of quality habitat, habitat degradation, Human activities	No Trade
68.	<i>Arisaema flavum</i> (Forsk.) Schott Araceae	A2 (a,b,c,d) B2, ab(i,iii,iv)	Population reduction/ Restricted distribution	Overharvesting for medicine, loss of quality habitat	Local market
69.	<i>Artemisia maritima</i> L. Asteraceae	A2 (a,b,c,d)/ B2, ab(ii,iii)	Population reduction/ Restricted distribution	Habitat degradation, fragmentation, overexploitation , overharvesting for medicine	Local, domestic market
70.	<i>Artemisia scoparia</i> Waldst Kitam. Asteraceae	A2 (a,b,c,d)	Population reduction	Overexploitation for medicine, brooms & also for making of roof edges, loss of quality habitat, human activities	Local market

71.	<i>Asparagus capitatus</i> subsp. <i>gracilis</i> Browicz (Syn. <i>Asparagus gracilis</i> Royle Asparagaceae	A2 (a,b,c,d) /B2, ab(i,iii,iv)	Population reduction/ Restricted distribution	Habitat loss, degradation, human activities	Not known/ observed
72.	<i>Astragalus graveolens</i> Benth. Papilionaceae	A2 (a,c,d)	Population reduction	loss of quality habitat & habitat degradation	No trade
73.	<i>Bunium persicum</i> (Boiss) Fedtsch. Apiaceae	A2 (a,b,c,d /B2, ab(i,ii,iii,iv)	Population reduction/ Restricted distribution	Overharvesting for medicine, aromatic, frequently used as spices, Overharvesting, habitat loss, trade	Local, domestic, international market
74.	<i>Caralluma edulis</i> (Edgew.) Benth. ex Hook.f. Asclepiadaceae	A2 (a,b,c,d)	Population reduction	Overharvesting for Medicine & vegetables, over exploitation, loss of quality habitat, degradation,	Local market
75.	<i>Cotinus coggyria</i> Scop. Anacardiaceae	A2(a,b,c,d)/B2, ab(i,iii,iv)	Population reduction/ Restricted distribution	Habitat destruction, degradation, overharvesting for Medicine & fuel wood, Human activities,	No trade
76.	<i>Clematis connata</i> DC. Ranunculaceae	A2(a,b,c,d)/C1	Population reduction/ restricted population size & decline	Overharvesting for fodder, loss of habitat, habitat degradation, human activities	Not known/ observed
77.	<i>Daphne mucronata</i> Royle Thymelaeaceae	A2(a,b,c,d)/B2ab(i,ii,iii,iv)	Population reduction/ Restricted distribution	Over exploitation, overharvesting for medicine, fuel wood, fences, hedge, habitat degradation , Human activities	Local market
78.	<i>Datura stramonium</i> L. Solanaceae	A2(a,b,c,d)	Population reduction	Loss of quality habitat, habitat, degradation, overharvesting for medicine	Local market
79.	<i>Desmodium elegans</i> DC. Papilionaceae	A2(a,b,c,d)	Population reduction	Habitat loss, overharvesting for medicine, fuel wood	Not known/ observed
80.	<i>Dodonaea viscosa</i> (L.) Jacq. Sapindaceae	A2(a,b,c,d)	Population reduction	Overharvesting for medicine, fuel wood, fencing, thatching, brooming, loss of quality habitat due to degradation, overexploitation	Local market
81.	<i>Dryopteris juxtaoposita</i> Chr. Dryopteridaceae	A2(a,c,d)	Population reduction	Habitat destruction, degradation overharvesting for medicine	Local market
82.	<i>Euphorbia wallichii</i> Hook.f. Euphorbiaceae	A2, a,b,c,d/ B2, ab(ii,iii,iv)	Population reduction/ Restricted	Loss of habitat, fragmentation, overharvesting for medicine but also considered as poisonous plant	Not known/ observed

			distribution		
83.	<i>Ficus carica</i> L. Moraceae	A2, a,b,c,d / C1	Population reduction/ restricted population size & decline	Loss of quality habitat, degradation, Human activities, overharvesting for medicine, fuel wood, fruit, & leaves as fodder.	Local market
84.	<i>Ficus palmata</i> Forsk. Moraceae	A2(a,b,c,d)	Population reduction	Overexploitation for medicine, fuel wood, fruit & leaves as fodder. loss of habitat, degradation , Human activities	Local market
85.	<i>Gentiana kurroo</i> Royle. Syn. <i>Gentianodes Kurroo</i> (Royle) Omer, Ali & Qaiser Gentianaceae	A2, a,b,c,d/ B2, ab(ii,iv)	Population reduction/ Restricted distribution	Overharvesting for medicine, habitat loss, trampling effect by sheep, goats, Human activities	Local market
86.	<i>Gentiana argentea</i> (Royle ex D.Don) Omer Gentianaceae	A2, a,b,c,d/ B2, ab(i,ii,iii,iv)	Population reduction/ Restricted distribution	Habitat destruction, fragmentation, trampling effect by sheep, human activities	Not known/ observed
87.	<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult. Poaceae	A2, a,b,c,d	Population reduction	Overharvesting for floor bedding as a mate specially in old mosque loss of quality habitat, Human activities	No trade
88.	<i>Hypericum perforatum</i> L. Guttiferae	A2(a,b,c,d)	Population reduction	Overharvesting for medicine. habitat destruction, degradation, human activities, trade	Local market
89.	<i>Isodon rugosus</i> (Wall. ex Benth.) Codd Syn. <i>Plectranthus rugosus</i> Wall. ex Benth. Lamiaceae	A2, a,b,c,d/ C1	Population reduction/ restricted population size & decline	Overharvesting for medicine, thatching, sheltering, fodder, fuel wood, habitat loss, degradation, Human activities	Local market
90.	<i>Juniperus communis</i> L. Cupressaceae	Vulnerable A2, a,b,c,d	Population reduction/	Overharvesting for medicine, fuel wood, habitat degradation, human activities	Not known/ observed
91.	<i>Justicia adhatoda</i> L. Acanthaceae	A2(a,b,c,d)/B2, ab(iii,v)	Population reduction/ Restricted distribution	Overharvesting for medicine, habitat loss, degradation , Human activities	Local market

92.	<i>Myrtus communis</i> L. Myrtaceae	A2, a,c,d/ C1	Population reduction/ restricted population size & decline	Loss of quality habitat, degradation overharvesting for medicine. fruits, activities	Local market
93.	<i>Nerium oleander</i> L. Apocynaceae	A2(a,b,c,d)	Population reduction/	Loss of habitat, degradation overharvesting for medicine, human activities	No trade
94.	<i>Notholirion thomsonianum</i> (D.Don) Stapf Liliaceae	A2, a,b,c,d	Population reduction	Not known/observed	Not known/observed
95.	<i>Physalis divaricata</i> D. Don. Solanaceae	A2, a,b,c,d	Population reduction	Loss of quality habitat, degradation , Human activities	No trade
96.	<i>Primula macrophylla</i> D.Don. Primulaceae	A2(a,b,c,d)/ B2, ab(i,ii,iii,v)	Population reduction/ Restricted distribution	Loss of quality habitat, fragmentation, overharvesting for medicine, trampling by mountain goats & sheep, human influence	Local market
97.	<i>Prunus armeniaca</i> L. Rosaceae	A2, a,b,c,d/ B2, ab(i,ii,iii,v,v)	Population reduction/ Restricted distribution	Overharvesting for medicine. fruits, fuel wood, fodder loss of habitat, habitat, degradation , Human activities	Local market
98.	<i>Platanus orientalis</i> L. Plantanaceae	A2,a,b,c,d/ B2,ab(iii,iv,v), C1	Population reduction/ Restricted distribution / restricted population size & decline	Overharvesting for medicine, fuel wood, furniture, loss of habitat, degradation , Human activities	Local market
99.	<i>Prunus persica</i> (L.) Batsch Rosaceae	A2, a,b,c,d.e/ B2, ab(ii,iii,v) C1	Population reduction/ Restricted distribution /restricted population size & decline	Overharvesting for fuel wood, fodder & fruits, loss of habitat, degradation , Human activities	Local market
100	<i>Punica granatum</i> L. Punicaceae	A2, a,b,c,d/ B2, ab(ii,iii,v), C1	Population reduction/ restricted distribution /restricted population size &	Over exploitation, harvest for medicine, fruits, loss of quality habitat, degradation, human activities,	Local, domestic market

			decline		
101	<i>Pyrus pashia</i> Buch.-Ham. ex D.Don Rosaceae	A2, a,b,c,d	Population reduction	Habitat loss, degradation, human activities, overharvesting for medicine, fuel wood, fruits.	Local market
102	<i>Pyrus sinkiagensis</i> T. T. Yu Rosaceae	A2, a,b,c,d/ B2, ab(i,ii,iv), C1	Population reduction/ restricted distribution /restricted population size & decline	Overharvesting for fuel wood, fruits. Habitat degradation, Human activities	Local market
103	<i>Salix tetrasperma</i> Roxb. Salicaceae	A2, a,b,c,d/ B2, ab(i,ii,iv,v), C1	Population reduction/ restricted distribution / restricted population size & decline	Loss of habitat, degradation overharvesting for fuel wood, furniture, cricket bats, Human activities	Local market
104	<i>Salvia lanata</i> Roxb. Lamiaceae	A2, a,c,d	Population reduction	Overharvesting for vegetable, over exploitation, loss of habitat, degradation , Human activities	Local market
105	<i>Sarcococca saligna</i> (Don) Muell. Buxaceae	A2, a,b,c,d/ B2, ab(ii,iii,iv), C1	Population reduction/ restricted distribution /restricted population size & decline	Overharvesting for medicine, fuel wood, roof thatching, loss of habitat, degradation , Human activities	Local market
106	<i>Scilla griffithii</i> Hochr. Hyacinthaceae	A2, a,b,c,d	Population reduction	Loss of habitat, trampling effect by sheep, human activities	Not known/ observed
107	<i>Tussilago farfara</i> L. Asteraceae	A2, a,b,c,d/ B2, abi.(ii,iii)	Population reduction/ Restricted distribution	Habitat loss, degradation, Human activities	Not known/ observed
108	<i>Zanthoxylum armatum</i> DC. Rutaceae	A2, a,b,c,d/ B2, abi.(ii,iii,iv)	Population reduction/ Restricted distribution	Overharvesting for medicine, fence, hedge & spices/ condiments, woody sticks. overharvesting, loss of habitat, degradation, Human activities	Local market
109	<i>Ziziphus nummularia</i> (Burm. f.) Wight	A2, a,c,d/ C1	Population reduction/ /restricted	Loss of habitat, degradation , Human activities, overharvesting for medicine, food, fruit, fence, fuel	Local market

	& Arn. Rhamnaceae		population size & decline	wood & fodder,	
110	<i>Ziziphus oxyphylla</i> Edgew. Rhamnaceae	A2, a,b,c,d/ B2, abi.(i,ii,iv), C1	Population reduction/ restricted distribution /restricted population size & decline	Overharvesting for medicine, fence, fuel wood, honey bee, Overharvesting, loss of quality habitat, degradation, Human activities,	Local market
Near Threatened (NT)					
111	<i>Adiantum pedatum</i> L. Adiantaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvest for medicine, loss of quality habitat	Local & international market
112	<i>Adiantum incisum</i> L. Adiantaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overexploitation for medicine, loss of quality habitat	Not known/ observed
113	<i>Ajuga bracteosa</i> Wall.ex Benth Lamiaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvesting for medicine, habitat loss, habitat degradation, human activities	Local, domestic market
114	<i>Ajuga parviflora</i> Benth. Lamiaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overexploitation for medicine, loss of quality habitat, degradation	Local, domestic market
115	<i>Asphodelus tenuifolius</i> Cavan Asphodelaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvest for medicine, loss of quality habitat, human activities	No trade
116	<i>Asplenium trichomanes</i> (Hud) Hook Aspleniaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvest for medicine, habitat degradation. Human activities	Not known/ observed
117	<i>Cannabis sativa</i> L. Canabinaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Human activities, loss of quality habitat, degradation. overharvest for medicine	Local market
118	<i>Cichorium intybus</i> L. Asteraceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Habitat loss, degradation. overharvesting, human activities	Local market
119	<i>Citrullus colocynthis</i> (L.) Shard.	IUCN Red List Criteria are not applicable	Decline & reduction in local	Loss of quality habitat due to degradation. Harvest for medicine, habitat loss, human activities	No trade

	Cucurbitaceae		population		
120	<i>Cuscuta reflexa</i> Roxb. Cuscutaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvesting for medicine, habitat degradation, human activities	No trade
121	<i>Datura innoxia</i> Mill. Solanaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overexploitation for medicine, loss of quality habitat, degradation, human activities	Local market
122	<i>Echinops griffithianus</i> Boiss. Asteraceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, habitat degradation, human activities	Local market
123	<i>Hedera nepalensis</i> K. Koch. Araliaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvest for medicine, over exploitation, habitat degradation, human activities,	Local, domestic Local market
124	<i>Jasminum humile</i> L. Oleaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, habitat destruction, human activities	Not known/ observed
125	<i>Jasminum officinale</i> L. Oleaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, habitat loss, Human activities	Local market
126	<i>Malus pumila</i> Mill. Rosaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for fruit, fuel wood, agriculture tools. habitat loss, degradation, Human activities	Local market
127	<i>Melia azedarach</i> L. Meliaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, fuel wood, furniture & leaves as fodder. , Overharvesting, habitat loss, degradation, Human activities	Local market
128	<i>Morus nigra</i> L. Moraceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Habitat loss, degradation, over harvesting for medicine, fuel wood, agriculture tools, leaves as fodder for sheep & goats.	Local market
129	<i>Narcissus tazetta</i> L. Amaryllidaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, loss of quality habitat, degradation, overharvesting, human activities	No trade
130	<i>Periploca aphylla</i> Decne. Asclepiadaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Loss of quality habitat, Harvest for medicine, overharvesting, human activities	Local market

131	<i>Prunus domestica</i> L. Rosaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Habitat destruction, degradation, Human activities harvest for medicine, fruit, fuel wood & fresh leaves as fodder	Local market
132	<i>Pteridium aquilinum</i> (L.) Kuhn Dennstaedtiaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine vegetable. Habitat loss, human activities, overharvesting	Local market
133	<i>Rosa moschata</i> Herrm. Rosaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Habitat degradation, harvest for medicine, fencing, hedges human activities	Not known/ observed
134	<i>Rubus ellipticus</i> Smith. Rosaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, fruit, fencing, hedges habitat loss, degradation, human activities	Local market
135	<i>Rubus fruticosus</i> L. Rosaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Loss of quality habitat, degradation, human activities, harvest for medicine, fruit, fencing, hedges	Local market
136	<i>Rubus ulmifolius</i> Schott. Rosaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, fruit, fencing, habitat degradation, Human activities	Not known/ observed
137	<i>Salvia morrcroftiana</i> wall ex Bth. Lamiaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Over exploitation, habitat loss harvest for medicine, Human activities	Local market
138	<i>Solanum nigrum</i> L. Solanaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Habitat loss due to degradation, Human activities, harvest for medicine, overharvesting,	Local market
139	<i>Solanum Surattense</i> Burm.f. Solanaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, Overharvesting, loss of quality habitat, Human activities	Local market
140	<i>Spiraea vaccinifolia</i> D. Don. Rosaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvesting, loss of habitat, human activities harvest for medicine, roof thatching	No trade
141	<i>Teucrium stocksianum</i> Boiss. Lamiaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	habitat degradation, harvest for medicine, Human activities	Local market
142	<i>Urtica dioica</i> L. Urticaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvesting, harvest for medicine, vegetable, loss of habitat due to degradation, human activities	Not known/ observed

143	<i>Verbena officinalis</i> L. Verbenaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Loss of habitat, Harvest for medicine, human activities	Not known/ observed
144	<i>Vitex negundo</i> L. Verbenaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Harvest for medicine, fuel wood. habitat loss, degradation, Human activities	Local market
145	<i>Ziziphus mauritiana</i> var. spontanea (Edgew.) R.R Stewart ex Qaiser & Nazim. Rhamnaceae	IUCN Red List Criteria are not applicable	Decline & reduction in local population	Overharvesting for medicine, fence, fuel wood, loss of quality habitat, degradation , Human activities	Local, domestic Market

Table-VII. List of Endangered Flora in their Historical Range at Malam Jabba Valley, Swat

S.#	Taxon/Family Name	Locality/Occurrence	Population size		Total Population Reduction	Classification Criteria/Sub Criteria
			Present	10 years back		
Critically Endangered Species						
Gymnospermic Flora						
1.	<i>Cedrus deodara</i> (Roxb. ex D.Don) G. Don Pinaceae	Found at altitudinal ranges of about 1800-2900 m. Malam, Spine obo and Malam Jabba	2%	20%	90%	A2(a, b c, d)/ B2a,c(i,ii,iii,iv)
2.	<i>Picea smithiana</i> (Wall.) Boiss Pinaceae	Recorded at higher elevation of about 2300-2900 m. Kuh and Malam Jabba	3%	19%	84%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)
3.	<i>Pinus gerardiana</i> Wall. Pinaceae	Recorded at altitudinal variation of about 1600-1800 m. Malam	1%	19%	95%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)
4.	<i>Taxus wallichiana</i> Zucc. Taxaceae	Recorded in moist and temperate areas with altitude of about 2600 - 2950 m. Malam Jabba	1%	9%	89%	A2(a, b, c, d)/ B2a,c(i,ii,iii,iv,v)
Monocotyledon						
5.	<i>Allium humile</i> Kunth. Alliaceae	Found at higher altitude and subalpine region from 2600-3200 m. Malam Jabba	4%	22%	82%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv)
6.	<i>Colchicum luteum</i> Baker Colchicaceae	Recorded in sunny and exposed area upto an altitude of approximately 1700-2500 m. Malam and Spin Obo	2%	16%	88%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv)
7.	<i>Fritillaria cirrhosa</i> Subsp. <i>Roylei</i> (Hook.) Ali, Syn. <i>Fritillaria roylei</i> Hook. Liliaceae	Recorded above 2800 m on grassy slopes and sub alpine meadows area of Malam Jabba	1%	7%	86%	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)
8.	<i>Polygonatum verticillatum</i> (L.) All.	Recorded above 2600 m in grassy alpine	1%	12%	92%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)

	Asparagaceae	meadows of Malam Jabba.				
Dicotyledon						
9.	<i>Aconitum chasmanthum</i> Stapf ex Holmes Ranunculaceae	Recorded at higher elevation of Malam Jabba with altitude of about 2800-3200 m.	4%	21%	81%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)
10.	<i>Aesculus indica</i> (Wall.ex. Camb.) Hook.f. Hippocastinaceae	Recorded on the hilly slopes with altitudinal ranges of about 1800-2900 m. Malam, Spine Obo and Malam Jabba	3%	20%	85%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)
11.	<i>Berberis lycium</i> Royle Berberidaceae	Recorded at an altitude of about 1000-3000 m. Shinkut, Kashora, Malam, Spin Obo, Kuh and Malam Jabba	2%	14%	86%	A2(a, b c, d)
12.	<i>Buxus wallichiana</i> Baill Buxaceae	Found on the moist hills with altitude of about 1800-2500 m. Malam and Spin Obo	2%	12%	83%	A2(a, b c, d)
13.	<i>Caltha alba</i> var. <i>alba</i> Ranunculaceae	Recorded at higher elevation near alpine meadow with altitude of about 2700-2900. Higher altitude of Malam Jabba	3%	16%	81%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)
14.	<i>Celtis australis</i> L. Ulmaceae	Recorded at altitude of about 1000 -2250 m. Ser, Shinkut, Kashora, Ganajir and Spin Obo	3%	22%	86%	A2(a, b c, d)
15.	<i>Crataegus songarica</i> K. Koch. Rosaceae	Found on rocky hill slopes at altitude of about 1600-2300 m. Malam, Spine Obo and Kuh	3%	19%	84%	A2(a, b c, d)/ D1
16.	<i>Juglans regia</i> L. Juglandaceae	Recorded in temperate forest on hilly slopes upto an altitude of 1100- 2800 m. Shinkut, Kashora, Malam and	2%	15%	87%	A2(a, b c, d)

		Malam Jabba				
17.	<i>Olea ferruginea</i> Wall. ex Aitch. Syn. <i>Olea cupidata</i> Wall ex G. Don Oleaceae	Usually recorded at altitude of about 900- 2100 m. Talegram, Ser, Shinkut, Malam and Spin Obo	2%	11%	82%	A2(a, c, d)
18.	<i>Paeonia emodi</i> Wall.ex Royle Paeoniaceae	Recorded at higher altitude in exposed places upto an altitude of about 2300-2800 m. Kuh and Malam Jabba	1%	10%	90%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)
19.	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f. Anacardiaceae	Found on hilly slopes upto an altitude of about 1100-1800 m. Ser, Shinkut, Ganajir, Kashora and Malam,	3%	21%	86%	A2(a, b c, d)/ C1
20.	<i>Podophyllum emodi</i> Wall. ex Royle Podophyllaceae	Explored at higher elevation of grassy meadows with altitudinal ranges of about 2300-3200 m. Kuh and Malam Jabba	1%	8%	88%	A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)
21.	<i>Prunus cornuta</i> (Wall. ex Royle) Steud Rosaceae	Recorded at an altitude of about 2400-2900 m Kuh and Spine Obo	2%	13%	85%	A2(a, c, d). C1
22.	<i>Quercus</i> <i>semecarpifolia</i> Sm. Fagaceae	Found on upper tree limit from 2750-3100 m. Malam Jabba	4%	25%	84%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
23.	<i>Rheum australe</i> D. Don Polygonaceae	Recorded at higher altitude on grassy slopes with altitude of about 2800-3000 m. Malam Jabba	5%	30%	83%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)
24.	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke) Asteraceae	Found at higher altitude on the moist hill slopes & grassy meadow with altitude of about 2400- 3100 m. Kuh and Malam Jabba	2%	15%	87%	A2(a, b, c, d)

25.	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp. Rutaceae	Found at higher altitude in the mixed forest on the rocky hills with altitude of about 2500- 2850 m. Kuh and Malam Jabba	4%	26%	85%	A2(a ,b, c, d)
26.	<i>Valeriana jatamansi</i> Jones Valerianaceae	Usually grow in early spring in the temperate forest on the grassy slopes from 1650-2750 m. Malam, Kashora, and Malam Jabba	2%	14%	86%	A2(a, b, c, d)
27.	<i>Viburnum cotinifolium</i> D.Don. Caprifoliaceae	Recorded on sunny places from 1500-2500 m. Ganajir, Malam, Spin Obo and Malam Jabba	5%	28%	82%	A2(a, c, d)
28.	<i>Viola betonicifolia</i> Sm. Violaceae	Found at the higher altitude of temperate forest on grassy places and hilly slopes from 1700-2450 m. Malam, Spin Obo and Kuh	1%	7%	86%	A2(a, b, c, d)
29.	<i>Viola pilosa</i> Blume Violaceae	Recorded at the higher altitude of temperate forest on grassy places, hilly slopes from 1600- 2800 m. Shaltalu, Kashora, Malam, Spin Obo and Malam Jabba	1%	8%	88%	A2(a, b, c, d)
30.	<i>Vitis Jacquemontii</i> Parker Vitaceae	Found on hilly slopes with altitudinal ranges of about 1500-2200 m. Shinkut, Ganajir, Kashora and Malam	4%	22%	82%	A2(a, b, c, d), C1
Endangered Species						
Gymnosperm						
31.	<i>Abies pindrow</i> Royle Pinaceae	Found at altitude of about 1900-3100 m. Malam, Spine obo and Malam Jabba	2%	9%	78%	A2(a, b, c, d)/ B2,a,b(i,ii,iii,iv,v)

32.	<i>Ephedra gerardiana</i> Wall.ex Stapf Ephedraceae	Found at an elevation of about 2800-3100 m. Higher altitude of Malam Jabba	10%	25%	60%	A2(a, b,c, d)/ B2a,b(i,ii,iii,iv)
33.	<i>Pinus roxburghii</i> Sargent Pinaceae	Recorded at lower elevations & hilly slopes upto an altitude of about 1800 m. Ser, Malam, Shinkut and Shaltalu	6%	19%	68%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
34.	<i>Pinus wallichiana</i> A.B. Jackson Pinaceae	Found from 1700-2900 m. Kashora, Malam, Spin obo and Malam Jabba	5%	15%	67%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
Monocotyledon						
35.	<i>Acorus calamus</i> L. Araceae	Recorded at altitude of about 1200-1600 m. Ser, Ilane, Shinkat and Ganajir	8%	25%	68%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)
36.	<i>Asparagus officinalis</i> L. Asparagaceae	Recorded at an elevation of about 1900-2300 m. Malam, Spine obo and Kuh	8%	28%	71%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
37.	<i>Iris hookeriana</i> Foster Iridaceae	Found on subalpine meadows and open slopes at altitude of about 2800-3100 m. Malam Jabba	13%	29%	55%	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)
38.	<i>Dioscorea deltoidea</i> Wall. ex Kunth Dioscoreaceae	Found in temperate forest up to an altitude of approximately 2100-2700 m. Spin Obo, Kuh and Malam Jabba	3%	10%	70%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
Dicotyledon						
39.	<i>Aconitum heterophyllum</i> Wall. ex Royle Ranunculaceae	Recorded in grassy meadows with altitudinal ranges of about 2800-3000 m. Malam Jabba	4%	16%	75%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
40.	<i>Alnus nitida</i> (Spach) Endl. Betulaceae	Recorded below 2300 m along stream banks and roadside. Manglaur, Ser, Shinkut and kishora	3%	13%	77%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
41.	<i>Bergenia ciliata</i> (Haw.) Sternb.	Found in temperate forest with altitude of about	9%	25%	64%	A2(a, c, d)/ B2a,b(i,ii,iv)

	Saxifragaceae	2400-2850 m. Kuh and Malam Jabba				
42.	<i>Bistorta amplexicaulis</i> (D. Don) Green Polygonaceae	Recorded at altitude of about 1700-2700 m. Shaltalu, Kashora, Malam, Spine Obo and Malam Jabba	2%	8%	75%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
43.	<i>Diospyros lotus</i> L. Ebenaceae	Recorded upto an altitude of about 2500 m. Talegram, Ser, Shinkut, Malam and Spine Obo	11%	32%	66%	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)
44.	<i>Ehretia obtusifolia</i> Hochst. ex DC. Boraginaceae	Mostly found below 1500 m. Mangalaur, Talegram and Shinkut	8%	18%	56%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)
45.	<i>Elaeagnus umbellata</i> Thunb. Elaeagnaceae	Recorded in dry open places up to an altitude of about 2000 m. Talegram, Ser, Shinkut, Shaltalu and Kashora	9%	21%	57%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)
46.	<i>Geranium wallichianum</i> D.Don ex Sweet Geraniaceae	Found on grassy meadows with altitude of about 1700-3000 m. Malam, Spin Obo, Kuh and Malam Jabba	6%	13%	54%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
47.	<i>Hyoscyamus niger</i> L. Solanaceae	Found at higher elevation up to an altitude of about 2400-2900 m. Kuh, and Malam Jabba	4%	10%	60%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
48.	<i>Indigofera heterantha</i> Well. ex Brandis Papilionaceae	Found on sandy & rocky places along roadside up to altitude of about 2600 m. Shinkut, Shaltalu, Kashora, Malam and Kuh	4%	13%	69%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
49.	<i>Monothea buxifolia</i> (Falc.) A. DC Sapotaceae	Recorded at altitude of about 1500-1900 m on dry rocky hills of the area. Ser, Shinkut and Malam	6%	15%	60%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
50.	<i>Morus alba</i> L. Moraceae	Found upto an altitude of about 3000 m. Talegram, Shinkut, Ser	12%	26%	54%	A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)

		Kashora and Malam Jabba				
51.	<i>Myrsine africana</i> L. Myrsinaceae	Recorded on hilly slopes upto an altitude of about 2100 m. Ser, Shaltalu, Kashora, Malam and Spine Obo	11%	23%	52%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)
52.	<i>Otostegia limbata</i> (Benth.) Boiss. Lamiaceae	Found in the exposed rocky hill slopes with altitudinal ranges of about 900-1600 m. Manglaur, Ser and Shinkut	13%	31%	58%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
53.	<i>Parrotiopsis jacquemontiana</i> (Dcne.) Rehder. Hamamelidaceae	Recorded on hilly area with altitude of about 2100-2800 m. Kuh and Malam Jabba	6%	16%	63%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
54.	<i>Populus alba</i> L. Salicaceae	Recorded in edges of forest with altitude of about 1500-2200 m. Shinkut, Malam, Kishora and Spine Obo	8%	23%	65%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v), C1
55.	<i>Primula denticulata</i> Sm. Primulaceae	Mostly found on the grassy slopes and meadow with altitudinal ranges of about 2600-3050 m. Kuh and Malam Jabba	8%	20%	60%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
56.	<i>Quercus dilatata</i> Royle Fagaceae	Found in temperate forest on hill slopes up to an altitude of about 1700-2900 m. Malam, Spin Obo, Kuh and Malam Jabba	7%	20%	65%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
57.	<i>Quercus incana</i> Roxb. Fagaceae	Recorded in temperate forest on hilly slopes from 1300-2500 m. Shinkut, Ganajir, Kashora, Malam and Kuh	10%	30%	67%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
58.	<i>Rosa webbiana</i> Wall. ex Royle Rosaceae	Found at higher altitude of temperate forest on hilly & grassy places from 1900-2800 m. Spine Obo Kuh and Malam Jabba	5%	12%	58%	A2(a, c, d)/ B2a,b(i,ii,iii,iv)

59.	<i>Salix babylonica</i> L. Salicaceae	Mostly found along water courses below 2500 m. Talegram, Ser, Shinkut, Malam and Kishora	5%	16%	69%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
60.	<i>Thymus linearis</i> Benth. Lamiaceae	Found at an higher elevation of about 2600-3200 m. Malam Jabba	9%	20%	55%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
61.	<i>Viburnum grandiflorum</i> Wall. ex DC. Caprifoliaceae	Recorded at higher elevation in the temperate forest with altitudinal ranges of about 1600-2800 m. Malam, Spin Obo and Malam Jabba	12%	25%	52%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)
62.	<i>Viola canescens</i> Wall. ex Roxb. Violaceae	Found at the higher altitude of temperate forest on grassy places and hill slopes from 1400-2600 m. Shinkut, Kishora, Spine Obo and Kuh	8%	25%	68%	A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)
63.	<i>Withania somnifera</i> (L.) Dunal Solanaceae	Found in the waste places upto an altitude of about 1900 m. Talegram, Shinkut and Ganajir	7%	16%	56%	A2(a, b, c, d)/ B2a,b(ii,iii,iv)
64.	<i>Ziziphus jujuba</i> Mill. Rhamnaceae	Recorded on sunny dry slopes with an altitude of about 1000-2000 m. Manglaur, Talegram, Ser and Shinkut	10%	26%	62%	A2(a, b, c, d)/ C1

Table-VIII. Enumeration of Threatened Flora in Malam Jabba Valley, Swat

		Pteridiphytes	Gymnosperms	Dicots	Monocots	Total
	Critically Endangered (CR)	-	04	22	04	30
1.	Endangered (EN)	-	04	26	04	34
2.	Vulnerable (VU)	01	01	38	06	46
3.	Total	01	09	86	14	110

RESULTS AND DISCUSSION

A detailed investigation was carried out during May 2013-June 2017 in order to determine conservation status of vascular plant biodiversity for sustainable livelihood security of Malam Jabba Valley, Hindu Kush range, District Swat, Pakistan.

The study revealed conservation status of 430 vascular plants distributed within 306 genera and 110 families. Of which 30 species were assessed as Critically Endangered (CR,) 34 species Endangered (EN), 46 species Vulnerable (VU), 78 species Near Threatened (NT), 200 species Least Concern (LC) and 42 species Data Deficient (DD) while 46 species were identified as Cultivated/Exotic. Out of the reported 110 threatened flora, the leading taxonomic groups in term of species percentage were Dicots with a share of (78%) followed by Monocots (13 %), Gymnosperms (08%) and Pteridophytes (01%), (**Table-IX**). Cultivated/Alien species constitutes 46 plant species belonging to 40 genera and 24 families (**Table-V**).

IUCN Red List Criteria was used to establish conservation status of vascular plant biodiversity. IUCN Red List Criteria (2001) version 3.1, Appendix VII, following IUCN Regional guidelines 2003, version, 3.0 & IUCN Categories & Criteria 2010, Version 4.0 were used for detailed investigation of conservation issues. The reduction in population size range was observed by direct field observation. Information on the conservation issues of these plant resources were also collected and documented from local community. The decline in the population size of the plant resources were observed due to its area of occupancy, extent of occurrence, loss of habitat, actual or potential level of exploitation, effect of introduced taxa and attack of pathogens. The results are presented in **Table-VI** regarding plant name, family name, local name, habit, IUCN Category, Criteria, Sub Criteria, reason of reduction & loss.

Various factors/ ecological threats like habitat destruction, alteration, degradation and habitat fragmentation, over exploitation, overgrazing, indiscriminate deforestation, agriculture expansion, land cover change, terraced cultivation, land sliding, unplanned developments, construction works like roads, building, introduced/alien species, attack of pathogens, lack of awareness, non-sustainable utilization of plant resources for fuel and timber wood, population explosion, human interference, excessive tourism, environmental pollution, environmental related disaster and hazards were recorded that responsible for depletion of plant biodiversity in the study area (**Appendix-IX**).

Different habitats were identified regarding their altitudinal range, topography, population size, vegetation cover, richness and severity of different kinds of the study area. Nature of habitat were also determined by considering over grazing impact, soil erosion, deforestation, over exploitation of natural resources, invasion of invasive plants, over population, deforestation, expansion of agriculture land, land sliding, construction/development activities, environmental degradation, habitat loss and some other anthropogenic impacts.

Woody Plant biodiversity was severely disturbed due to habitat loss and habitat alteration, ruthless deforestation, land use change, over exploitation of plant species for fuel and timber wood collection, population explosion and their anthropogenic activities.

Forest plant biodiversity is also decreasing at alarming rate due to ruthless deforestation and some of the highly valuable indigenous trees like *Cedrus deodara*, *Abies pendrow*, *Picea smithiana* & *Taxus wallichiana* are in danger of extinction if proper conservation measurement were not taken in the near future. Conservation measures are needed on urgent basis to protect threatened and critically endangered plant biodiversity of the area from local extinction.

It was recommended that community awareness, conservation practices, sustainable harvesting and habitat management is very crucial for the sustainable livelihood security. It was also recommended to safeguard the plant biodiversity in their native habitats with involvement of local community for the sustainable livelihood security of the research area.

Malam Jabba Valley is one of the most remote valleys in Swat District and there is no even a single authenticated plant specimen available in any of the Herbaria in the country. The Valley is virgin and unexplored, hence a detail investigation of the vascular plant biodiversity is planned to document the plant natural resources, their conservation status and traditional knowledge of local community about medicinal plants.

RECOMMENDATIONS AND SUGGESTIONS

Based on the finding of this study, the following recommendations and suggestions were developed and offered for further research.

1. Unsustainable harvesting of plant resources had threaten a significant portion of wild flora in the area which resulted a major decline in plant biodiversity and associated indigenous knowledge/local practices that support sustainable livelihoods, nutrition, local food security, medicine and health care.
2. There is override need of environmental education, public awareness and community mobilization regarding importance of wild flora, conservation practices, sustainable harvesting and natural resource management for long term livelihood security of the area.
3. Public awareness, community mobilization and environmental education should be enhanced with involvement of government institutions and environment related organization at grass root level in order to prevent loss of plant biodiversity and environmental degradation which threaten ecosystem services and livelihood security of the area.
4. Ecosystem management, sustainable utilization , in situ and exsitu conservation practices are very crucial steps for threatened and rare flora as these species more vulnerable to extinction due to narrow and limit distribution
5. Wild flora needs proper assessment, therefore basic education regarding collection, post collection, sustainable harvesting, drying, storage & processing techniques may be extended to the local inhabitants for sustainable livelihood security
6. Rangeland management practices should be enhanced to reduce pressure on the wild plants and pastures due to trampling effect of livestock and grazing.
7. To identify major factors /threats responsible for depletion of plant biodiversity and indigenous knowledge of the area.
8. Deforestation is one of the most significant drivers of ecosystem degradation in the area. Majority of local community depend upon forest and forest products for their livelihoods therefore necessary steps should be taken to control ruthless deforestation and maintain healthy ecosystem for the betterment of the area.
9. Forest play a key role in socio-economic and sustainable development of any area therefore proper management practices should be encouraged to increase job opportunities and sustainable livelihood security of the area.

10. Afforestation, reforestation, forest management practices and plantation campaign of native flora should be enhanced in the area to initiate restoration, rehabilitation of degraded habitats and ecosystems services. It will also mitigate environmental degradation and climate change.
11. There is huge biotic pressure on the woody plant resources used for fuel purposes. Biotic pressure on these plants should be reduced by providing alternate source of energy like gas, electricity and fast growing in the area.
12. Collaboration with local community to participate in plantation campaign & conserve natural forest can play a key role in restoration and rehabilitation process of degraded ecosystem which will reduce pressure on the woody plant biodiversity.
13. Honey bee industry should be developed to improve the local economy & livelihood security of the area.
14. Horticulture practices are rare in the valley as compared to other part of the district so it should be encouraged to eradicate the poverty in the area.
15. Skill development of indigenous community for good agriculture practices should be encouraged in order to improve the socio economic condition of the area.
16. A natural balance between natural forest ecosystem and agro ecosystems needs to be maintained for sustainable livelihood security of the area.
17. Ecotourism is well developed industry in the valley and thousands of tourists across the globe visits the area to enjoy its natural beauty/majesty. However, due to heavy influx of tourism, they are adding a lot of in garbage/waste materials to the area. Proper waste management system and community awareness about environment should be enhanced for healthy ecosystem services. It will also mitigate environmental degradation.
18. Plant biodiversity of the area should be preserved to safeguard the biodiversity of area for sustainable livelihood security of the area.
19. Botanical gardens and other environmental related organizations should encourage sharing skills through plant conservation training courses in order to boost capacity for conservation, cultivation, restoration and rehabilitation of threatened plant species.
20. Botanical garden should be established at school and college level to develop capacity building for promotion of environmental education and conservation practices about indigenous flora which lead to restoration, rehabilitation of degraded habitats and ecosystems in the area.

21. Removing of invasive species is key management activity for effective conservation practices as it is considered one of the most significant drivers of environmental and ecosystem degradation which has serious impacts on the indigenous plant biodiversity, economy and human health therefore proper measures should be taken to control or minimize its presence in the area.
22. Convention on biological diversity stressed on the equitable sharing arising from natural resources. Non equitable sharing often lead to unsustainable practices therefore equitable sharing arising from plant resources should be practiced for sustainable practices.

Chart-I. Shows Number of species, genera and families in Vascular Plants

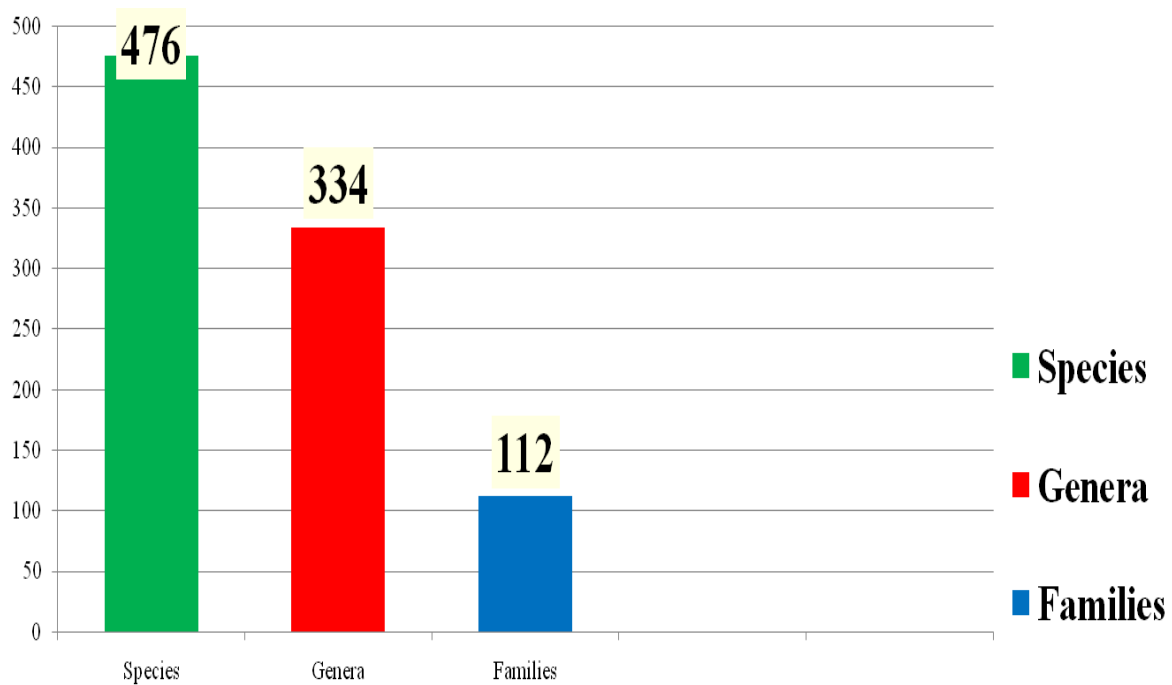


Chart-II. Shows Percentage of species in different Taxonomic Groups of Vascular Plants

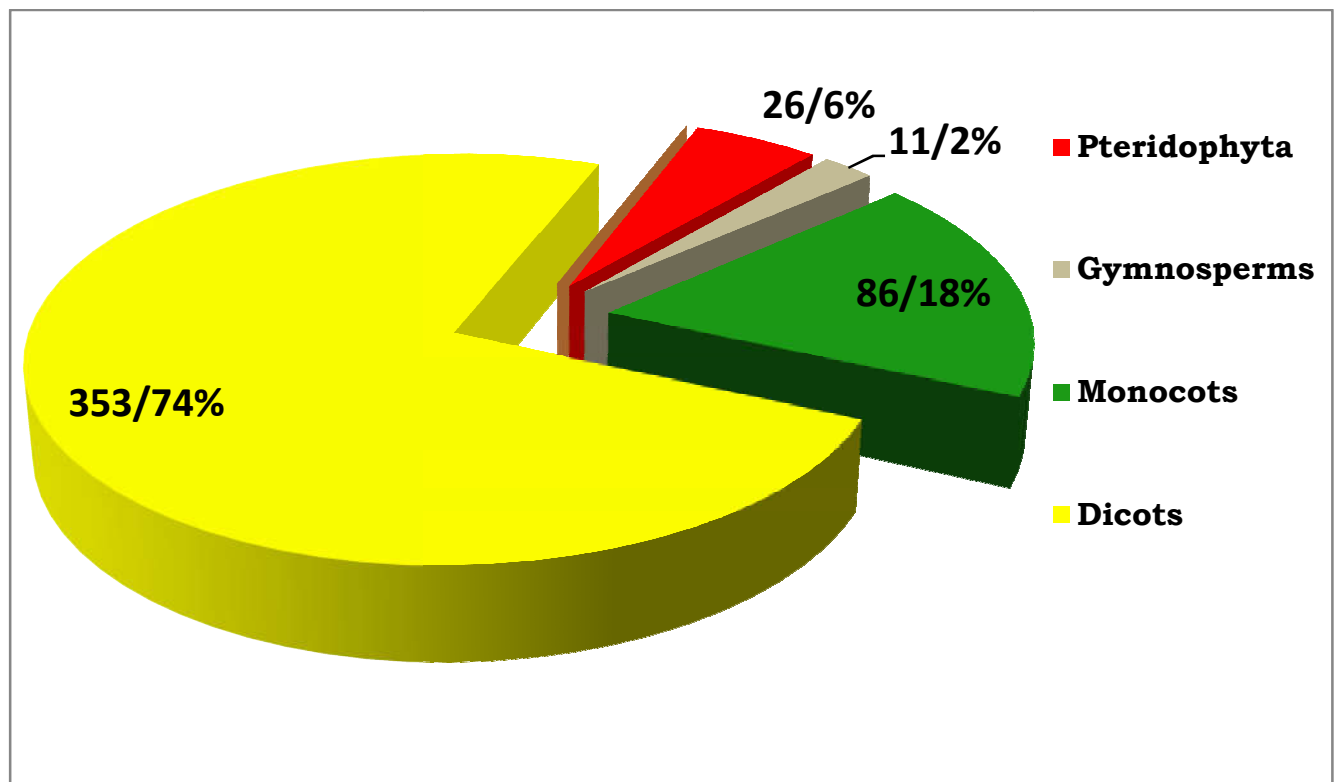


Chart-III. Shows Number of genera in different Taxonomic Groups of Vascular Plants

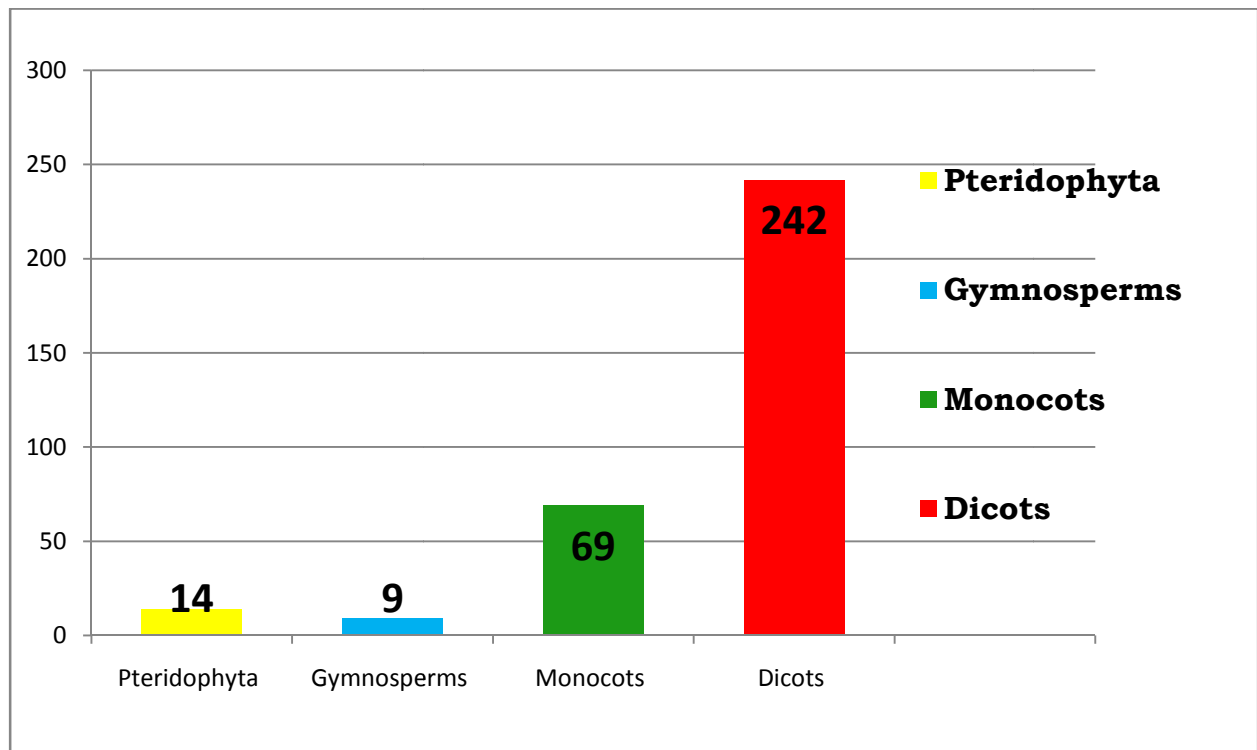


Chart-IV. Shows Percentage of Families in different Taxonomic Groups of Vascular Plants

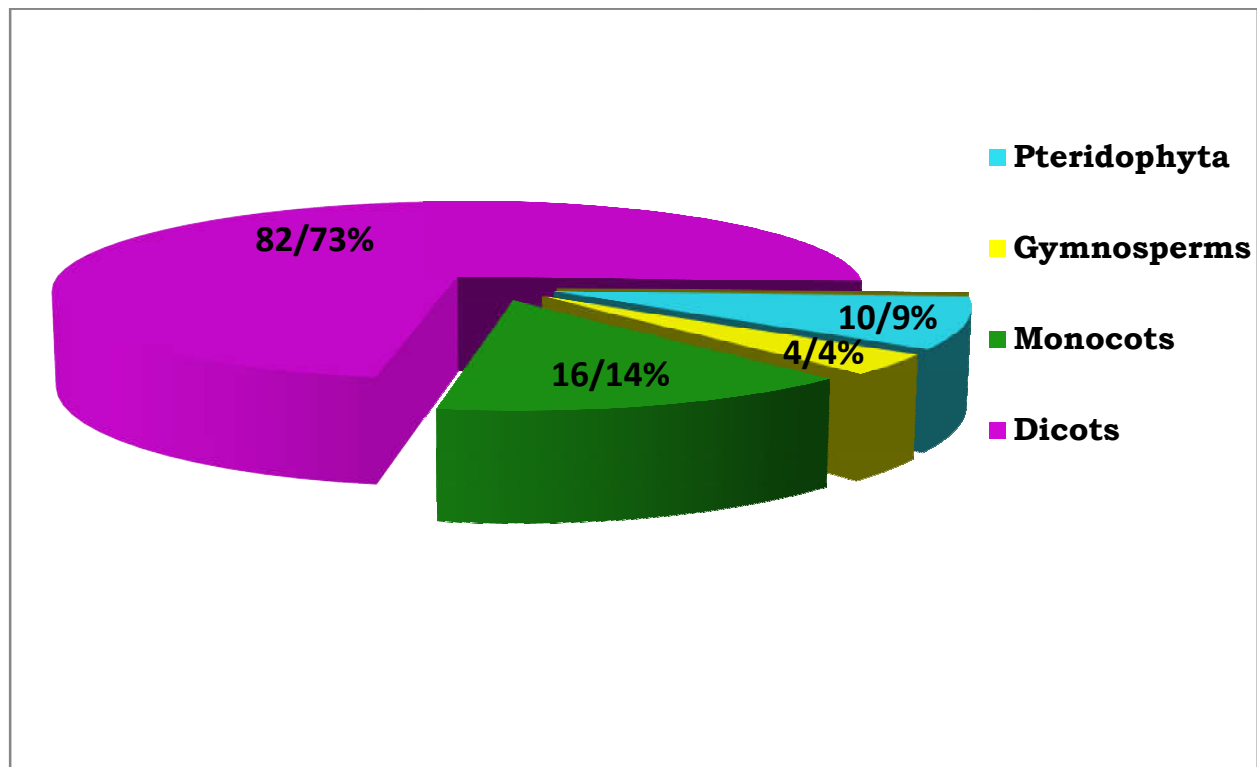


Chart-V. Shows Number and Percentage of some leading Families on the basis of species

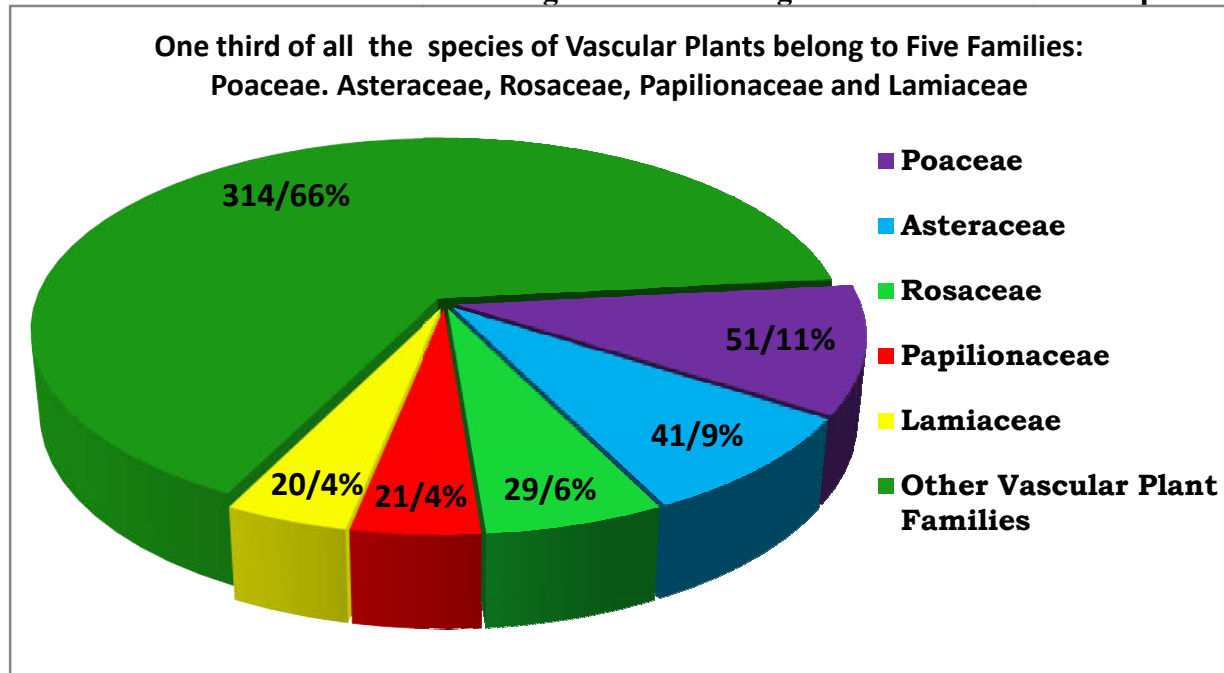


Chart-VI. Shows largest Families on the basis of genera in Vascular Plant biodiversity

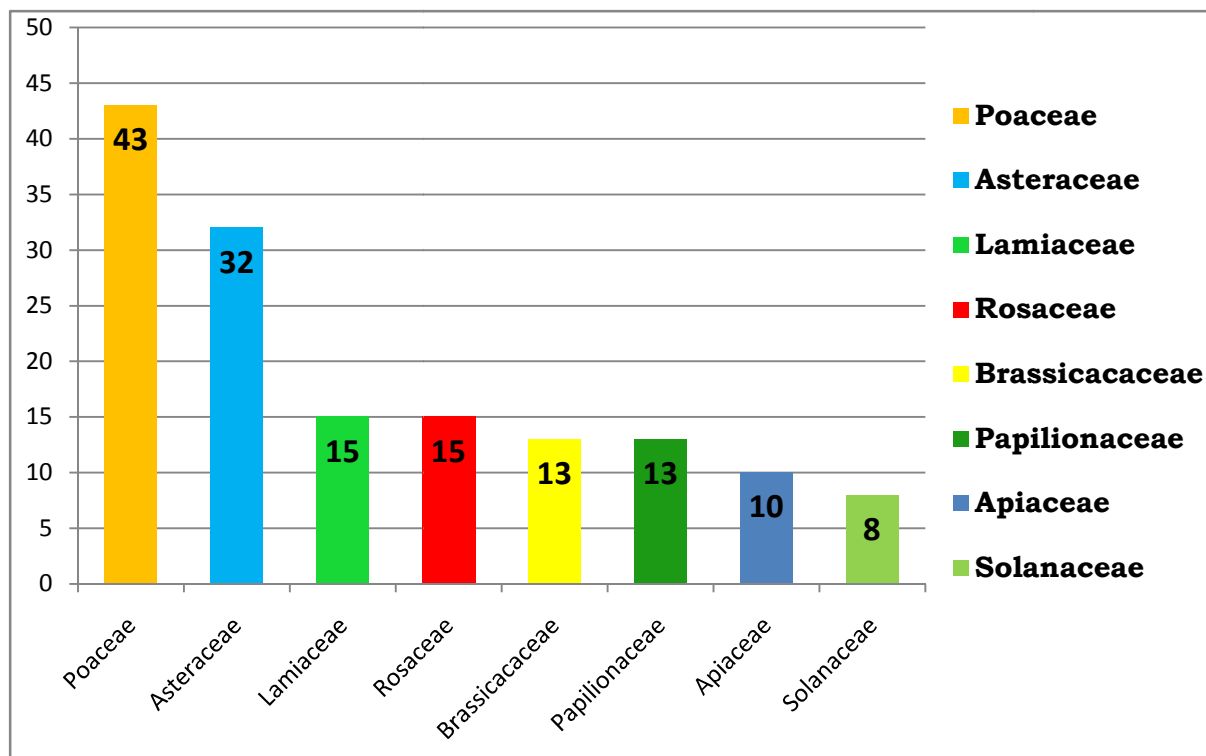


Chart-VII. Shows Number and Percentage of Herbs, Shrubs, Trees, Climbers and Parasitic Herb in Vascular Plant Biodiversity

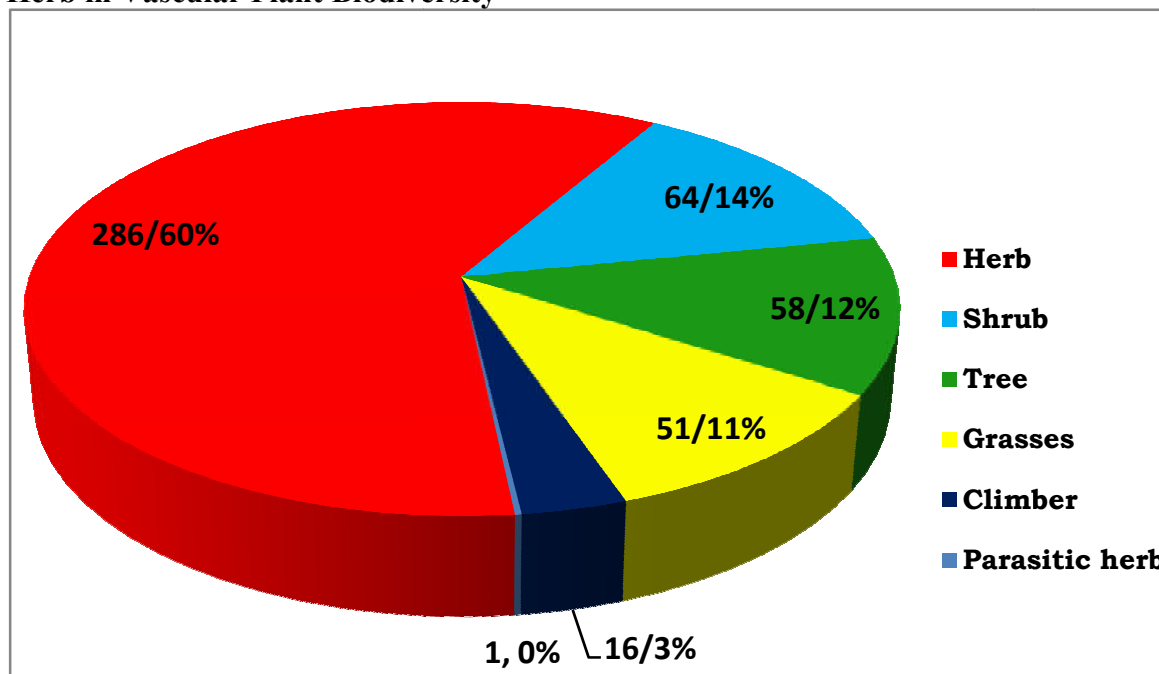


Chart-VIII. Shows Number and Percentage of Native and Non-Native Vascular Flora

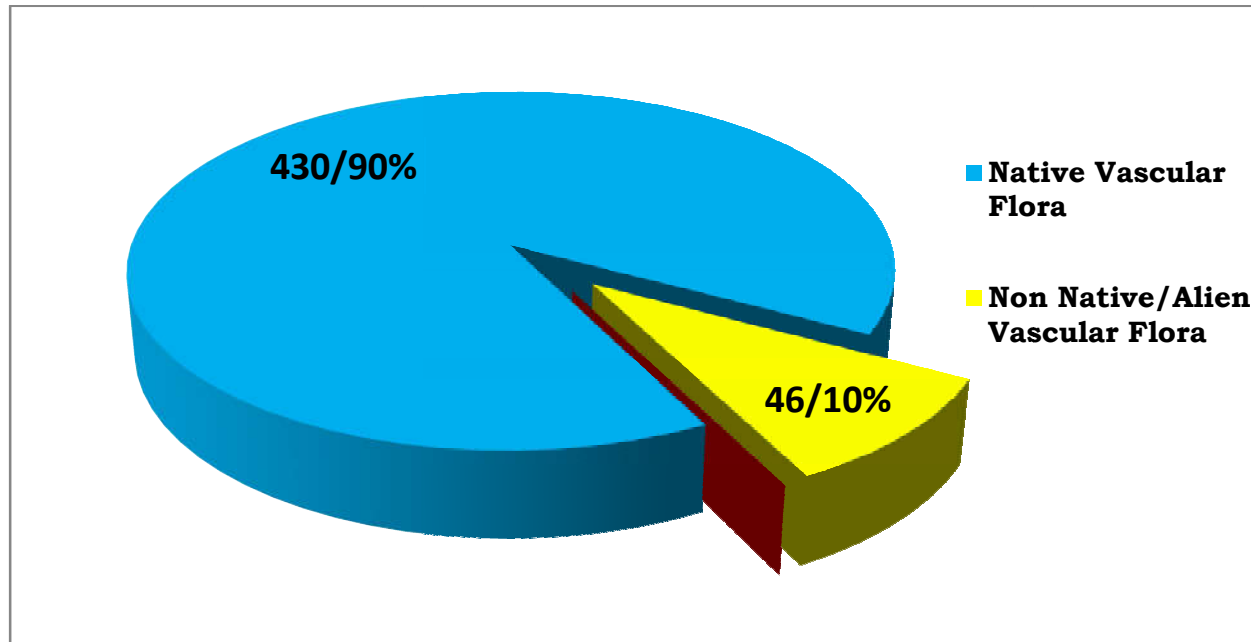


Chart-IX. Shows Number and Percentage of species in each IUCN Red List Category

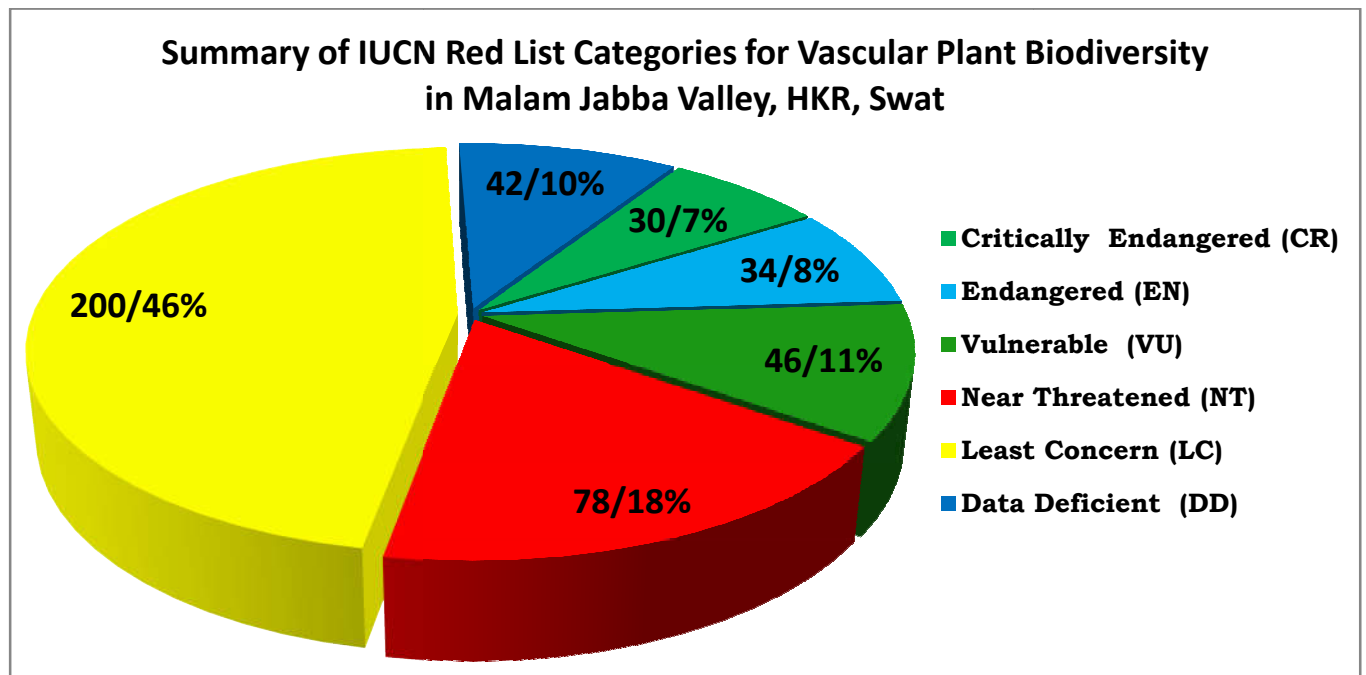


Chart-X. Shows Number and Percentage of Threatened and Non-Threatened Vascular Plants

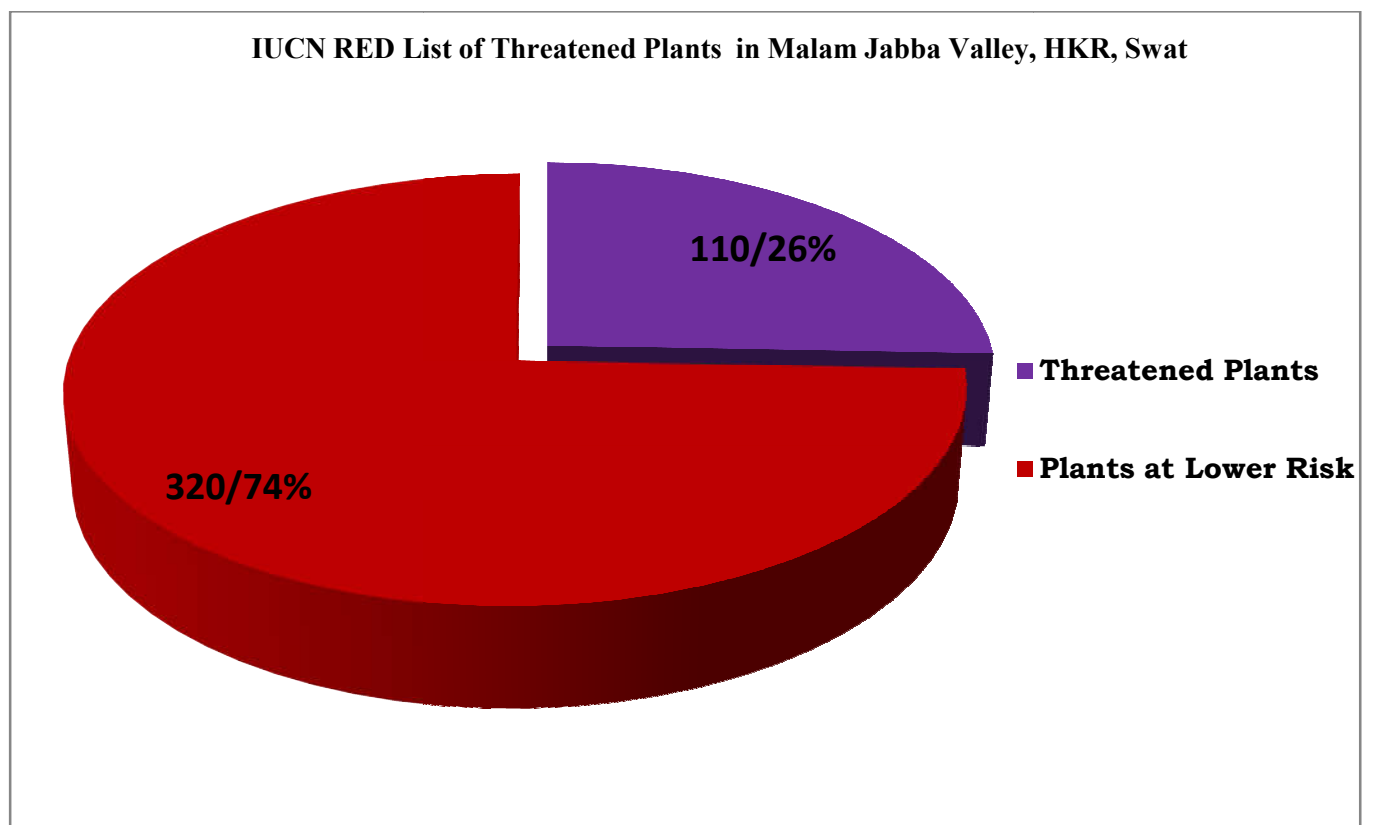
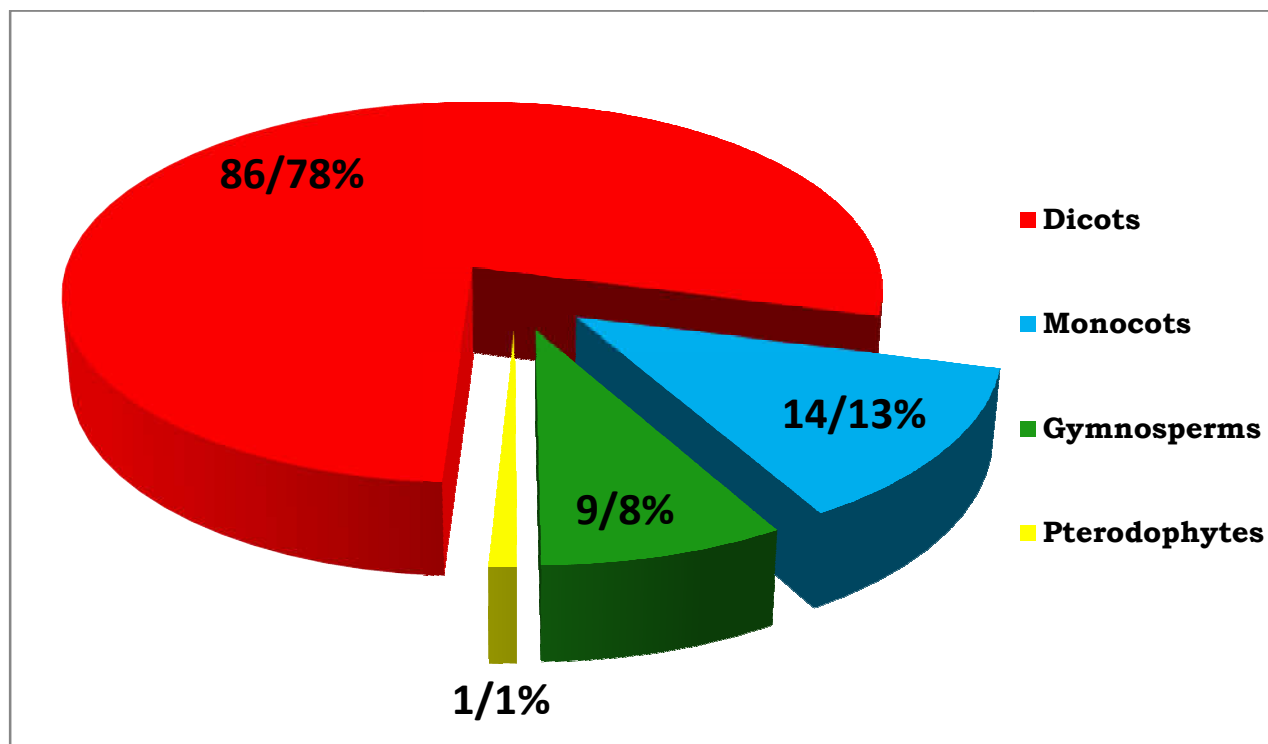


Chart-XI. Number and Percentage of Threatened Species in Major Taxonomic Groups of Vascular Flora of Malam Jabba Valley



Chapter –III

ETHNOMEDICINAL STUDIES

The term ethno botany was first used by an American Scientist/Botanist Johan W. Harshberger in 1896 with reference to the botanical culture of an ancient North American people as revealed through archaeological research.

Traditional medicines have been developed over long periods of time through a close relationship between local people and the natural world, which, resulting in thousands of plants used in medicine all over the world both in pharmaceutical industries and for primary health care. The use of plants in traditional medicine will undoubtedly continue to rise, as populations increase day by day. Modern western medicine is much expensive for poor community in developing countries while indigenous medicine is much cheaper and more trusted, at least for certain medical conditions. (Walters and Hamilton, 1993).

The branch of Science, which deals with the drugs, is known as Pharmacognosy. This Science concerned with history, selection, collection, identification and preservation of crude drugs & raw materials.

The terms Pharmacognosy was first of all used by Sydelar in his dissertation in titled “Analectica” Pharmacognostic, which is appeared in 1815.

The world Pharmacognosy is derived from Greek word, Pharmacon means drugs or medicine and Gnosis means Knowledge of drugs. The study of the action of drugs is known as Pharmacology. There are more than two lakes fifty thousand flowering plants all over the world. Most of them are known by ehnobotanist and also utilized by Herb doctors and Ayurvedic viads. The use of plants forms the basis of traditional medicines all over the world. The evidence reveals that plant based medicines goes back at least 100,000 years, and probably even longer. The development of Systematic Pharmacopeias date back as far as 3000 BC, when chinees were already using 350 herbal remedies. In India out of about 16000 species of flowering plants, 500 are used in some way by people.

Animals also use medicinal plants, Chimpanzees use plants medicinally, sometimes identical species used by local villagers. Holly Dublin of WWF recounts an example of a pregnant elephant which apparently deliberately trekked many kilometers to eat the leaves of a certain plant, and then gave birth: local Maasai women also use the same plant to induce birth. Traditional pastoralists are well aware of plants, which cattle seek out when ill. Studies of the use

of plants by animals may aid medical research. A powerful antibiotic from the African genus *Aspilia* was discovered through field observations of the use of this plant by chimpanzees. The long history of medicinal plants resulted in the development of formal systems of medicine, particularly in China and India, and also in Arabia, Egypt and Europe. Ayurveda, a system of herbal medicine in India. Sarilanka and South East Asia, has more than 8000 plant remedies and is still the main kind of medicine used in these areas. In Pakistan, the Unani system is also largely plant based. About 5000 out of China's total flora of 30,000 species are used in traditional Chinese medicine. (Walters and Hamilton, 1993).

Around 35,000 to 70,000 of the 250,000 taxa of higher plant biodiversity has been utilized for medicinal purposes. In developing countries, eighty percent of local inhabitants continue to rely mainly on traditional, predominantly herbal medicine for their primary health diseases. (Sarangzai et al 2013).

Many countries are trying to develop traditional medicine system while countries where traditional medicine forms the largest sector, modern western medicine is the sole beneficiary of government support. Apart from financial considerations, promoting traditional medicine play a key role to stabilizes the value of local cultures.

Few drugs are cultivated while most of the supplied by wild plants growing in all parts of the worlds. The drugs derived from plant natural resources are known as "Jari booti". The Medicinal value of plants is due to the presence of some Chemical substances in the plant tissues, which produce a definite physiological action on human body. Important chemical substances are alkaloids, carbon compound, nitrogen glycosides, essential oils, resins etc while valuable drugs like Taxol (anticancer), Aspirin, digoxin,(Heart disorders), Opium, Cichona, Diosgenin, Hyoscimine, Atripine, etc. are derived from these chemical.

Ethnobotany is applied to the direct relation of people with plant at any stage i. e. ranging from indigenous and traditional societies to the most modern and sophisticated cultures. Ethnobotany is a multi-disciplinary science encompassing botany, anthropology, economics, and linguistics, which study the ways in which a study relates to its environment. These relations can be social, religious, economics, commercial, artistic and symbolic. Ethnobotany was originally based on quantitative methods such as chicklist of plants and their utilarian study, with special reference to the economic importance of plants. This approach is largely associated with colonial periods in western countries when explorers and scientists had a major interest in finding new plants (Thomas and Shenji, 2003). Broadly it means all aspects of direct relation of plants with

man.

Ethnobotany is the study of People's interaction with plants at species, genetic, and ecosystem level. Ehtnobotany is the discipline concerned with the relationships between people and plants. It is the science in which human interact with plants and its ecosystem. (Shenji, 2001).

Ethnobotany is the direct relationship of people with the plants at any stage i.e ranging from indigenous and traditional societies to the modern and sophisticated cultures (Stijfhoon, 1997).

Ethnobotany is the study of plant, s classification, management and use of plant species.(Martin, 1995). Jones (1941) defined Ethnobotany as “of direct relation/interaction between human and plant population through its culture”

Ehtnobotany is the discipline concerned with the relationships between people and plants. Wild and cultivated plants apart from the major food crops, are crucial to the lives of large proportion of the world, s population providing, Medicines food supplements, low-cost building materials, fuel, tools, and source of income (Connngham, 2001).

The importance of ethnobotany however is not limited to hard science but has an important role in conservation of nature and culture and in particular, the biological diversity and the diversity of traditional human cultures in the world. Use of edible plant species differs from one area to another and one ethnic group/community to another. Traditional knowledge is hundred or even thousands of years old and involves strategies of protection of sustainable harvesting and use of plant resources. In these respects ethnobotany has played important role and will play in the future to document and describe traditional knowledge on medicine and edible plants in different ecological zones and human societies in the world. Ethno botany has been recognized as a research tool. It is also considered as viable approach for studying sustainable utilization of natural resources. Ethnobotany and sustainable use of plant resources, was started in July 1992 (Martin, 1995).

From the beginning of life, plants have been used for healing purpose. The relation of people and plants is very old. Little attention has been given to the development of this resources in past. Considerable descriptive work on ethnomedicinal studies in Pakistan has been carried out by different workers but the works seems to be fragmentary and negligible due to extremely varied and diverse flora of Pakistan. Despite the fact, that a large proportion of country's population is dependent upon curative properties of the plants.

TRADITIONAL SYSTEM OF MEDICINES IN PAKISTAN

In Indo Pak Sub Continent, traditional and indigenous system of health care has always remained as most popular system of health care practice. With the passage of time, the Greeco-Arabic system of medicine made its headway in the India during Mughal period. It was compiled in the form of Rig Veda from 4500-1600 B.C and Ayurveda from 2500- 600 B.C (Zaman and Khan, 1972). The latter is still practiced under name of Verdic medicine. Greeks modified Verdic,s into Unani system which was modified into Hikmat or Tibb by Muslim scholars(Khan, 1951). The term Unani System is derived from the Arabic word “Tibb-e-Yunani” means “Greek medicines” the origin of Unani traditional is deeply rooted in Greek and Arab medical History.

The ancient system of Herbal medicine practiced in Pak while traditional Doctors use plant species for various diseases (to treat illness). Pakistan is bestowed with rich natural resources and medicinal plants, which is spread over wide range of Ecological zones of Pakistan. It has rich flora of over 6000 species of flowering plants, which occur in different province of Pakistan including Kashmir. Majority of plant species is found in North and North Western Part of Himalayan regions. The people know about 2000 medicinal plants species including higher and lower plants. The number of plants with active constituents is about 500 species while 300 of medicinal plants enter the Herbal market of Pakistan. Furthermore about 50000-60000 Tabibs and huge number of unregistered practitioners are found in scattered in rural and remote hilly areas using more than two hundreds plants as household remedies for several ailments in primary health care. ((Zaidi 2003).

IMPORTANCE AND PHARMACEUTICAL USES OF MEDICINAL PLANTS

Many plants based drugs are now used to treat illnesses that were once thought incurable. Unlike traditional medicine, the pharmaceutical industry mainly uses plants as sources, directly or indirectly, of single active chemicals. To give an idea of the scale of the trade, the turnover of the pharmaceutical trade in Western Europe in 1989 was US \$65 billion (compared to US \$2.2 billion for plant medicines). Global market for herbal medicines was estimated 12.4 billion US Dollar in 1994, increasing to 19.6 billion US Dollar in 1996. About 25% of prescriptions for pharmaceutical drugs (in the USA) contain one or more substances of plant origin (Adhikari B. 2001).

There is considerable interest in exploring the plant world for new chemical leads, and some promising discoveries have been made. Plants have contributed to the development of pharmaceutical medicine in different ways. Some plants yield drugs directly. In other cases, chemicals are extracted and used in an altered form. Once discovered, many drugs have been later synthesized from inorganic chemicals, especially if this is more cost effective. An example of a plant still grown or harvested wild for a pharmaceutical drug is a relative of the foxglove, *Digitalis Lanata*. This is a source of digoxin, used to treat disorders of the heart.

The chemical taxol is extracted from bark of *Taxus wallichiana*, which is the best source of for this chemical. Taxol has been found to be effective against the growth of various types of cancerous cells, and scientists are now testing it more fully and working at methods of harvesting or synthesizing it. Recently, there has been some success in synthesizing taxol, thereby diminishing the threat to trees in the wild. Chemical extracted from *Rauvolfia*, key role in controlling of blood pressure and have a tranquilizing effect. One of the most widely used drugs, aspirin, is now synthesized, but forms of the drug were originally extracted from willow bark and from meadowsweet. For centuries, the pain-killing effects of willow bark have been known and herbalists used extracts to treat fever, rheumatism and other aches and pains. In the nineteenth century, the active ingredient, salicin, was isolated from willow, and the similar salicylic acid from meadowsweet. Further research discovered that the related compound acetylsalicylic acid, acid, called aspirin, and was more effective still. Vinblastin and vincristine isolated from the *Catharanthus roseus* is used for treatment of Hodgkins, choriocarcinoma, , small cell lung and breast cancer (Farnsworth and Blowster, 1967).

Many poisonous plants have been identified over the centuries to yield healing medicines. Prime examples are certain members of the potato family, for example deadly *Atropa belladonna*

(nightshade), *Hyoscyamus*, (henbane), and *Datura stramonium*. All three contain alkaloids with important medical applications. Chemicals derived from these plants are atropine, tropine and hyoscyamine alkaloids respectively now routinely used in medicine to treat heart disorders, asthma, whooping cough, gastric and intestinal cramps, relax smooth muscles. And atropine is also used to dilate the pupil of the eye during ophthalmic examinations. (Hamilton 2006).

The purple flowered opium poppy, *Papaver somniferum* is another example. It yields opium, from which codeine and the painkiller morphine is manufactured. Codeine is used in the treatment of colds, coughs and diarrhea. Quinine, Cinchona, one of the world's most precious medicines comes from the bark of cinchona tree. South American and Indian first used this bark to treat fevers. Tree grows naturally in South America, particularly in Peru and Bolivia. Traditionally, extracts of the bark were used by the local people as a painkiller and stimulant. The bark of certain species yields quinine, used to prevent and treat malaria, and quinidine, used for treating abnormal heart rhythms. Spanish missionaries originally introduced this traditional medicine to Europe from Peru. Cinchona is one of the few medicinal plants to have been developed as a major crop, with plantations in India and Indonesia, as well as in its native Andean region. Today more than 100 million people suffer from the disease malaria and many of them are treated with quinine. An example of a plant containing chemicals, which have been the inspiration for synthetic pharmaceutical drugs, is khella, *Ammi visnaga*. Khella was traditionally used in Egypt for skin, lung and kidney complaints. Drugs Amiodarone, Nifedipine, Sodium cromoglycate extracted from the plant is utilized for abnormal heart rhythms, for angina hypertension, and asthma. *Dioscorea deltoidea*, contain the steroid diosgenin. Isolation of this chemical led to the production of progesterone, the basis of the oral contraceptive pill, 80 million of which are taken every day. The derived compounds cortisone and hydrocortisone are used to treat skin diseases, allergies, rheumatism and arthritis. Cotton, *Gossypium barbadense*, is being investigated as a possible source for a male contraceptive pill (Waters and Hamilton 1993).

REVIEW OF LITERATURE

Much work has been carried out on the ethnobotany, ethnomedicine and ethno veterinary plants of the Himalays and Hindu Kush Range but many workers have been contributed to the medicinal flora of the Pakistan. Prominent workers among them are as follo

Jones, (1941) defined Ethno botany as the direct relation/interaction between plant and human population through its culture.

Hocking (1958) estimated that in early 1950 up to eighty four percent of the Pakistani peoples were rely on tradition/indigenous medicine for or most of their medicinal needs.

Hussain (1987) reported that in Pakistan nearly fifty percent of the drug currently used in modern system of medicine is made synthetically from petrochemical based raw material.

Pei and Manandhar (1987) found that in Himalayan region at least seventy percent of the animals and plants are wild species. 70 to 80 % of the population in these mountainous areas depends upon indigenous/traditional medicines for their primary health care diseases.

Jain (1988) defined ethnobotany is the overall relationship between plants and human popolatos of past and present.

Joesph and Kharkongor, (1990) described over one hundred plants of ethnobotanical importance, used by the tribal community of khasi and Jaintia hills for various purposes like medicines, food and shelters.

Shingji, (1994) suggested that Ethnobotany is a science of determining traditional knowledge on the utilization of plants by indigenous people and for further assessing human interactions with natural environment, it has great potential for contributing to biodiversity conservation in the Himalayan region.

Khaliq and Hussain (1995) collected information and explored 140 species under 53 families from Dabargai hill District Swat. Study revealed that 125 species have been used for enthobotanical purposes. Of which 69 species are ethnomedicinal and used in traditional system of medicine in local community.

Rafiq (1995) documented information on 96 plant species of ethnobotanical importance with special reference to their conservation value. He used major categories of endangered, Vulnerable, rare, frequent and common.

Shinwari *et al.*, (1995) explored ethnobotanical profile of Kaghan with special reference to their medicinal and fodder species. A total of 48 species have been recorded. Out of which 26 species are used as medicine and 21 fodder species.

Ahmad & Sirajuddin (1996) carried out a survey to document ethnonotanical data on Swat valley. They reported a total of 1541 taxa belonging to 135 families. Of which 48 medicinal plants were also recorded.

Shinwari and Shah (1996) enlisted 171 species of angiosperms Kharan Distt., Baluchistan. These species were used by the local community for medicine and some other ethnobotanical purposes.

Qureshi and Ahmad (1996) documented information on medicine plants and reported that herbal medicine (Tebb-e-Yunani) is one of the key methods of treatment various ailments in our country.

Aumeeruddy (1997) defined that ethno botany is the branch of science, which deals the relation/inter relationship between society, environment and plant biodiversity.

Rashid *et al.*, (1997) reported habitats of some medicinal plants from Margalla hills. They also mentioned and screen out potential threat the medicinal plant resources.

Iqbal (2000) explored 187 ethno botanical plants species used from Malam Jabba, valley, Swat. He differentiated plant utilities into medicinal, ornamentals, vegetables plants, agro forestry plants, pot herbs, honey bee species, agricultural tool making plants, thatching, sheltering hedge plants, timer, poisonous plants etc.

Martin (2001) using the term ethnobotany to local peoples, perception and management of the complex and coevolved relationships between plants and culture, ecological and economic components of anthropogenic and natural ecosystem.

Zabiullah (2002), collected and explored 30plants with medicinal importance from Manzarae Baba, Malakand Agency.

Ali *et al.*, (2003) carried out a market survey and reported a total 99 medicinal plants from Swat valley. Out of these, 40 medicinal plants dealers are associated with the business. Among them six dealers are exporters and 28 are retailers. It was also found that annual extraction of the plant species from Swat gave rise to the circulation of Rs.182 million to the market during 2003.

Ahmad *et al.* (2003) undertaken a study of agrological and biodiversity of the catchments area of Swat river and concluded the most of plant and animal diversity are under sever biotic

stress of overuse, ecological amplitude, habitat losses, palatability and limits of tolerance of the species concerne.. Some of medicinal plants like *Aconitum chasmanthum*, *Aconitum heterophyllum*, *Aconitum violaceum*, *Caralluma tuberculata*, *Colchicum luteum*, *Litsea monopetala*, *Podophyllum emodi*, *Quercus dilatata*, *Rheum emodi* are threatened due to overharvesting for medicinal purposes.

Rehman *et al.* (2003) carried out a study and found that 55 plant taxa are locally used as healing agents. Shinwari (2003a) explored ethno botanical profile from Bar Ghabair and Shuki Sair and reported a total of 150 plant taxa.

Shinwari (2003b) collected data on non-timber forest products in Palas, Kohistan. He find the enhancement of earning of non timber forest products in the area.

Sirajuddin *et al.*, (2003) recorded 33 ethno medicinal taxa with special reference to the various gastrointestinal ailments from Midan valley, district Dir, Pakistan. These medicinal plants are supplied and sold in national and international markets.

Ahmad *et al.*, (2004) find out 85 plant taxa belonging to 37 genera under therapeutic uses among local inhabitants from Thar Desert. It was concluded that more than ninety percent of the rural people depend on the folk medicine for their primary health care ailments.

Hussain *et al.*, (2004) undertaken ethnobotanical surve on timber wood from South Waziristan.

Hussain *et al.* (2006) recorded 121 plants species from shawar valley, Matta Tehsil, Swat which are used for various purposes. Of these 65 (53.7 %) are medicinal, 52 (43%) fodder, 31 (25.6 %) fire wood, 30 (24.9%) honey bee 16 (13 %) timber wood 11 (9%) vegetable 19 (15 %) fruits and 9 (7%) furniture wood species.

Hussain *et al.* 2006 conducted a survey on ethnobotanical informations of gymnosperms from Kaghan Valley and reported a total of 12 species.

Hamayun *et al.*, (2006) conducted a study on the District Swat, HKR Pakistan with special emphasis on ethnomedicinal studies. They recoded 49 medicinal plant classified among 32 families which were traded to the local herbal markets of Swat. Most of these plants were utilized by local community for treatment different diseases, while some are also exported to various cities of Pakistan.

Islam, M., *et al* 2006 enlisted 30 plans from Shawar valley, of these, 8 plant species were pure weeds and 22 plants as weed with medicinal

Ullah et al., (2006) conducted a study on the Ex-situ conservation of trees in University of Peshawar Campus. They collected a total of 117 species of trees, belonging to 45 families. Of these, Gymnosperms contributed 08 species followed by Angiosperms with 109 species.

Rehmatullah Shah *et al.*, (2006) identified 19 weed species belonging to different families, found in Maize and Wheat crops. Most of the weed was found highly effective against many ailments.

Hussain et al., (2007) collected information on traditional resource evaluation of some plants from Mastuj valley, Mastuj, Chitral, Pakistan. A total of 111 species belonging to 46 families were recorded. Of which 39 families of dicots (98 spp.), 5 families of monocots (11 spp.) and 2 of gymnosperms (2 spp.) were also identified. Leading families were Asteraceae with 11 species followed by Papilionaceae 10 species, Rosaceae 9 species which were being used for various purposes.

Asad Ullah and Rashid (2007) documented 23 species among weeds of different crops in Mankyal Valley i.e. Maize, potato, turnip, cabbage and tomatoes. These weeds were used as a remedy for various diseases.

Shah and Hussain (2008) collected information on the medicinal plant biodiversity of Mount Elum, District Bunir. A total of 76 plant species were collected which include 47% medicinal, 21% fuel wood, 9% fruit, 19% honeybee, 20% timber yielding and 4% poisonous plant species.

Ali *et al.*, 2009 screened out & analyzed medicinal plant biodiversity in Chitral Valley, Pakistan. A total of 83 plant species are enlisted, used locally in various primary health care diseases. Most of the herbal recipes are prepared in the form of decoction. Root is the major part of medicinal plant used in most of the folk recipes.

Hassan *et al.* (2010) reported 28 plant taxa belonging to 23 families for the treatment of livestock in the Malakand area. Majority of the plant species were reported from the wild (68 %) where as few were found to be cultivated.

Marwat *et al.*, (2009) collected detailed information on 10 fruit plant species belonging to 10 genera and 9 families. 9 Holy Quran and Ahadith Books.

Razzaq *et al.*, (2010) carried out a comprehensive field survey and documented a total 50 plant taxa belonging to 32 families from Changa valley, District Shangla, HKR Pakistan.

Khan *et al.*, (2011) explored a total of 31 medicinal plants belonging to 21 from Chitral Gol National Park Pakistan.

Daud *et al.*, (2013) carried out an ethnotaxonomical study on Gymnosperms and collected a total of 11 plant species belong to 4 families from Razmak North (NWA).

Hadi *et al.*, (2013) explored 29 ethnobotanical woody plants belonging to 21 genera and 16 families from Rech Valley, Torkhow, District Chitral which were utilized for different human ailments and other purposes.

Luseba and Tshisikhawe, (2013) explored medicinal plants used in the treatment of livestock diseases in Vhembe region, Limpopo province. It was found that Cattle, followed by sheep and goats were dominant owned by old men who cure by themselves their livestock for worm and tick infestations. A total of 47 indications prepared from leaves, followed by bark of 34 plant species of 22 families.

Razzaq *et al.*, (2013) explored ethno botanical profile and conservation status of Plant Biodiversity in Alexander the Great Valley, Shangla, Pakistan. A total of 32 plant species were collected from the Valley. These plants include herbs, shrubs and trees

Hadi *et al.*, (2014) explored and documented Ethno botanical Profile of Gymnospermic Flora of Kalash Valley, District Chitral. 9 gymnosperms were collected distributed in seven genera and three families growing at Bumburet, Birir and Rumbor areas of famous and historical Kalashvalley, district Chitral, Pakistan.

Sher *et al.*, (2014) 2014 explored 24 high value MAPs sold in largest quantities in Swat District, Pakistan.

Midrarullah *et al.*, (2014) compiled 16 ethno veterinary plants belonging to 14 families for curing of different disorders of animals in Udigram Swat, KP, Pakistan.

Tariq. *et al.*, (2014) conducted a study on the ethno veterinary plants of in tribal society of Suleiman Range A total 41 plant taxa belonging to 30 families were used to treat animal diseases in the study area.. It was reported that leaves were dominant used in recipes formulation mostly in the form of decoction.

Sher *et al.*, (2014) carried out ethnobotanical study and recorded a total of 163 plant species belonging to 73 families from Ashezai and Salarzai Valleys, District Buner, Pakistan. Among these 110 were medicinal, 51 were fodder, 37 were fuel wood, 33 were vegetable, 22 were fruit yielding, 20 were thatching, 13 were timber, 18 were ornamental, 8 were poisonous, 10 were fencing, 4 were agricultural tools making and 5 were honeybee plants species.

Ahmad *et al.*, (2015) documented information on the status of natural resources in the uplands of the Swat Valley, HKR, Pakistan. It was found from demographic data that unplanned

population growth in district Swat is leading to the deterioration of social as well as natural environment.

Razzaq *et al.*, (2015) explored 25 medicinal plant taxa belonging to 21 families at higher altitude of District Shangla. of these 19 species were herbaceous, 3 shrubs, 2 climbers and 1 was tree.

Teklay (2015) documented information on veterinary medicine in Kilte Awulaelo District, Northern Ethiopia. A total of 50 species belonging to 44 genera and 27 were determined.

A survey was undertaken to document wild edible vegetables & their ethnomedicinal utility by the local community of Harnai District, Baluchistan, Pakistan. A total of 59 wild vegetables species belonging to 41 genera and 20 families are explored used in vegetables, salads as well as for treatment of various ailments. The greatest number of species was used to as remedy for gastrointestinal disease. The most prominent parts of the plant taxa used as vegetable and medicine are their leaves followed by whole plant. (Tareen *et al.*, 2016).

Ali and Begum *et al.*, (2017) An ethno medicinal exploration was undertaken to record 65 wild plant taxa belonging to 35 families used indigenous system of medicine in Tirat Valley, District, Swat, Pakistan.

Afsa, *et al* (2017) documented information on traditional knowledge and medicinal plant of native plants from local communities of Lakki Marwat, Darra Tang, Kundal & Mianwali. A total of 94 medicinal plants belonging to 40 families were recorded, used in indigenous system of medicine for treatment of various ailments. The greatest amount of species was used to treat renal, gastrointestinal, inflammation, urinary and dermatological disorders.

Shinwari *et al.*, (2017) explored & documented information on traditional use of herbal medicines for treatment of different human diseases in selected areas of Northern Pakistan. A semi structured questionnaire was used to document data on 61 medicinal plants of 49 genera and 34 families. Lamiaceae was the dominant used family consisting 7 species & 6 genera.

Aziz and Adnan *et al.*, (2018) identified a total of 64 medicinal plant taxa classified among 60 genera and 41 families from Mohmand Agency, Fata, Pakistan. Dominant families were Lamiaceae with 8 species followed by Asteraceae 7 species, Apocynaceae and Brassicaceae 4 species each.

MATERIALS AND METHODS

A. Field Explorations & Observations

Botanical field explorations were carried out from 2013 to 2017 in order to explore the vascular plant biodiversity & their conservation for sustainable livelihood security of Malam Jabba Valley, Hindu Kush range, District Swat, Pakistan

Study tours were made to the different areas of Malam Jabba Valley during the flowering season to collect the field data about various plants. The main exploration collection spots in the study area were Manglaur, Talegram, Ser, Shinkat, Ganajir, Shaltalu, Kashora, Malam, Spin obo, Kuh, Malam Jabba having an altitude of about 950, 1050, 1100, 1270 m, 1500 m, 1660 m, 1700, 1600 m, 1800 m, 1900 m, 2300 m and 2800 respectively.

The field explorations include surveys, guided field walks and field observations. Interview, group discussions & direct field observations were frequently used while visiting different spots of the research area. Research area was divided into twelve sites and each site was visited thrice for collection, documentation and exploration of ethno-medicinal and ethno-veterinary plants with special reference to their conservation value.

B. Plant Preservation and Identification

Preserved plant specimen provides significant information about plant diversity & distribution of any range and serves as evidence of plant's existence in any time and space. So the plants were carefully preserved with all aspects.

Medicinal Plant species were collected, pressed, dried, mounted on standard herbarium sheets size (41.25 cm x 28.75 cm), labeled, sorted and identified with the help of flora of Pakistan & other available literature, Quraishi and Khan, 1965-69, 1971; Nasir and Rafiq, 1995; Stewart; 1967, 1972; Nasir and Ali, 1970-89; Beg and Khan, 1977; Kitamura, 1977; Ali and Nasir, 1989-1991; Ali and Qaiser, 1993-2017. The identified voucher specimens were deposited at Herbarium of Centre of Plant Biodiversity (HCPB), University of Peshawar and Herbarium, UC Davis Center for Plant Diversity, USA.

C. Data Collections & Documentation

Frequent field trips were undertaken in 2013-2017 in order to explore ethno medicinal profile and conservation issues of plant biodiversity for the sustainable livelihood security of the the Malam Jabba Valley, Hindu Kush Range Swat, Pakistan. Surveys & collections of vascular plants were made in entire valley in different seasons of the years depend upon the availability of

the plant in the seasons. The study area was divided into twelve sites and each site was visited thrice for collection, documentation and exploration of ethnomedicinal plants and their conservation value. The geographical co ordinates of the different sites were recorded using global position system (GPS).

The field work includes Eco-geographic field surveys, interviews, group discussion, guided field walk and direct field observations.

An enclosed questionnaire (**Appendix I-IX**) was designed in order to collect information regarding medicinal values & conservation status of vascular plant biodiversity. A total of 120 key respondents were selected to record data on vascular plant biodiversity for the treatment of human & animal diseases. Out of 120, 85 were old age (40 to 80 plus) whereas 35 were middle age (30-40). Majority of the local informants were illiterate while few were educated. Due to cultural limitation of local community, female inhabitants were not allowed to participate in interview. Information regarding folk uses and recipes of medicinal plants was mostly obtained from local elders, herbalists/traditional practitioners, farmers, plant collectors, shop keepers (engaged in medicinal plants business), Pansaries, Ajars, Gujars belonging to different localities through interview, group discussion and informal conversation. Priority was given to elderly persons, traditional healers and other local community members having sound knowledge of ethnomedicinal plants.

Personal observations & different queries were recorded on various aspects of medicinal plants such as vernacular name, habitat, part used, availability time, abundance, distribution range, flowering time, harvesting time, traditional collection methods, drying, storage, processing, folk recipes/medicinal utilization of various plants, quantity of plant used, rate of consumption, market value and conservation issues. Data was mostly collected from local elders, herbalists/traditional practitioners, Shop keepers (engaged in medicinal plants business), Pansaries, Ajars, Gujars belonging to different habitat and sub localities through interview, group discussion and informal conversation. Priority was given to local elderly persons, Hakims and other local community members having sound knowledge of ethnomedicinal plants.

Boulos (1938) were followed for terminologies of various medicinal plants. Voucher specimens and seeds of important medicinal plant species were deposited at Herbarium of Center of Plant Biodiversity (HCPB), University of Peshawar.

The following approach was adopted for collection of plant specimens according to their uses, local names and identification.

Selecting the informants

The selection of individual as informants is a delicate social and political process. I will keep myself aware of the social and political map of the community to avoid biased information. The informants were selected from a broad range of people belonging to different and diverse groups of local community.

1. Sampling techniques

Stijfhoorn (1996-1997) and martin 2004, procedure were followed for the documentation of various data regarding specimen and questions as per following schedule.

a. Ex Situ sampling (artifact method)

Highly rich Ethanbotanical specimens were screen out with help of local people along with indigenous knowledge and local name about plant biodiversity.

b. In Situ sampling (inventory)

This step was followed by artifact method in which a written list of all objects were made in the research area for further verification.

D. Seed Collection and Preservation

Seeds of highly rich targeted medicinal, endangered, and globally important plant species were collected from research area as well as from local market to ensure their maximum availability. These seeds were dried, thrashed, graded, packed and stored.

ETHNOMEDICINAL DESCRIPTION

A. Pteridophytes

Botanical Name:	<i>Adiantum capillus-veneris</i> L. (Plate No: 1)
Family Name:	Adiantaceae
Vern. Names:	Sumbal
Habit:	Herb
Locality:	Mostly prefer rocky & shady places, commonly growing near water bodies & wet places.
Conservation status:	Least Concerned
Part used:	Fronds
Collection method:	Cutting
Local Distribution:	Hindu Kush Range, KP, Dir Swat, Chitral, Hazara, Kohistan, Battagram, Mansehra, usually found Throughout Pakistan from plains to 2000 m.
Sp. period:	May-August
Medicinal Use:	The plant is diuretic, expectorant, coolant, emetic, hair tonic, demulcent, & also used for diabetes, hypertension and wounds healing. It is also for the treatment of cough, cold, fever & toothaches.
Folk Recipes:	A Paste is prepared from the whole plant & applied externally to treat cuts and wounds. A fresh frond is crushed to make a paste & applied on the snake & scorpion bite twice a day. Decoction of the frond is used as refrigerant & hair tonic. Juice & decoction of the plant is used as expectorant, diuretic & emetic. Decoction is also used as hair tonic in the form of hair wash.
Botanical Name:	<i>Adiantum incisum</i> Forssk. (Plate No: 1)
Family Name:	Adiantaceae
Vern. Names:	Sumbal
Habit:	Herb
Locality:	Mostly growing in the damp & wet places and prefer waterfalls and bank of stream.

Conservation status:	Near Threatened
Part used:	Fronds & rhizome
Collection method:	Cutting
Local Distribution:	Sindh, Balochistan, KP, Hazara, Kohistan, Battagram & Kashmir. Mostly found between altitudinal ranges of about 900-2000 m.
Sp. period:	Summer-fall
Medicinal Use:	Fronds are used to cure asthma, skin problems, fever, cough & scorpion bites. The fronds are externally used in skin ailments.
Folk Recipes:	Juice of plant is used for diabetes, jaundice and hepatic disorders. A Paste prepared from the rhizome of plant is applied externally for healing of cuts and wounds.
Botanical Name:	<i>Adiantum pedatum</i> L. (Plate No: 2)
Family Name:	Adiantaceae
Vern. Names:	Sumbal
Habit:	Herb
Locality:	Mostly growing in the damp & moist places along water courses
Conservation status:	Near Threatened
Part used:	Fronds
Collection method:	Cutting
Regional Distribution:	China, India, Kashmir, Nepal, Bhutan. Altitudinal variation from 300-3500 m. First report from the area.
Sp. period:	Summer-fall
Medicinal Use:	Plant is mostly used in similar way as like <i>Adiantum capillus veneris</i> . It is cooling agent and used as good remedy for cough & asthma
Botanical Name:	<i>Adiantum venustum</i> D. Don. (Plate No: 2)
Family Name:	Adiantaceae
Vern. Names:	Sumbal
Habit:	Herb
Locality:	Mostly growing in the damp, moist places & rock crevices
Conservation status:	Least Concerned
Part used:	Fronds

Collection method:	Cutting
Local Distribution:	Kurram, Dir, Chitral. Shangla, Hazara, Kohistan, Battagram, Swat, Hazara. Found between altitudinal ranges of about 1500-2900 m.
Sp. period:	May -September
Medicinal Use:	Fronds of the plant are diuretic, ophthalmic, expectorant, tonic, blood purifier, refrigerant and also used for fever, cough & backache. Frond is also used as remedy for headache, jaundice, hepatic disorders, chest infection & scorpion bites. Plant is also taken for cleaning of teethes and toothache.
Folk Recipes:	The fronds are boiled in water, cooled, and the filtered water is used for eye trouble. A Paste prepared from the rhizome of plant is applied externally for healing of cuts and wounds. A fresh frond is crushed to make a paste & applied on the snake & scorpion bite twice a day. Decoction of frond is used as coolant, diuretic, emetic & expectorant. The decoction is also mixed with oil to prevent hair loss.
Botanical Name:	Asplenium dalhousiae Hook. <i>Syn. Ceterach dalhousiae</i> (Hook.) C. Chr (Plate No: 4)
Family Name:	Aspleniaceae
Vern. Names:	Booghma Botayl
Habit:	Herb
Locality:	Mostly growing in the damp places & along watercourses
Conservation status:	Data Deficient
Part used:	Fronds
Collection method:	Cutting
Local Distribution:	Hindu Kush, KP, Hazara, Kohistan, Battagram. Found between altitudinal ranges of about 900-3000 m.
Sp. period:	Summer-fall
Medicinal Use:	Plant is used for curing of cough & cold. Plant is expectorant & laxative.
Folk Recipes:	The frond is crushed into powdered and then mixed with honey and used for treatment of cough and cold.

Animal Use:	Locally the fronds are crushed and then mixed with corn flour and used for treatment of diarrhea in livestock and animals.
Botanical Name:	Asplenium trichmanes L. (Plate No: 4)
Family Name:	Aspleniaceae
Vern./Eng. Names:	Dalhousie spleenwort
Habit:	Herb
Locality:	Mostly growing in the lower & upper part of the valley
Conservation status:	Near Threatened
Part used:	Fronds
Collection method:	Cutting
Local Distribution:	Hazara, Kohistan, Battagram, Swat, Chitral, Shangl, Dir, Muree, Kashmir, 1200-2500 m.
Sp. period:	Spring
Medicinal Use:	The frond is considered as diuretic, expectorant, laxative & also used in hepatic disorders. Plant is also smoked for head and chest infection.
Botanical Name:	Cystopteris fragilis (L.) Bernh.
Family Name:	Athyriaceae
Vern. Names:	Brittle bladder-Fern
Habit:	Herb
Locality:	Mostly growing in the upper part of the valley
Conservation status:	Least Concerned
Part used:	Fronds & rhizome
Collection method:	Cutting
Local Distribution:	Hindu Kush, KP, Hazara, Swat, Kashmir, Usually growing between altitudinal ranges of about of 1800-3800 m.
Sp. period:	June –September
Medicinal Use:	Plant is expectorant & coolant. Juice of the rhizome is used as anthelmintic agent.
Botanical Name:	Dryopteris juxtaposita Chr.
Family Name:	Dryopteridaceae
Vern. Names:	Kwanjae

Habit:	Herb
Locality:	Mostly growing both in upper & lower part of the valley
Conservation status:	Vulnerable
Collection Part used:	Fronds & rhizome
Collection method:	Cutting, digging
Local Distribution:	Hindu Kush, KP, Swat, Dir, Shangla, Hazara, Kaghan, growing between altitudinal ranges of about 1700-3200 m.
Sp. period:	July –September
Medicinal Use:	The frond is tonic, used to improve digestive system & enhance digestion. It is also used in constipation. The rhizome is used for treatment of menstrual disorders in women. It is also used for stomachaches.
Botanical Name:	<i>Equisetum arvense</i> L.
Family Name:	Equisetaceae
Vern. Names:	Bandakae
Habit:	Herb
Locality:	Mostly growing both in upper & lower part of the valley
Conservation status:	Least Concerned
Part used:	Whole plant
Collection method:	Cutting, digging
Local Distribution:	Hindu Kush, KP, Hazara, Swat, Shangla, Dir, Chitral. Usually found between 160-2600 m.
Sp. period:	May –September
Medicinal Use:	The frond is diuretic, antipyretic, antiseptic, hair tonic & also used for healing of wounds. It is also used for inflammation of urinary bladder and other urine disorders.
Folk Recipes:	Fresh shoots are crushed & mixed with flour to make a poultice. It is used to treat wounds. A paste of plant is applied in fracture and dislocation of bones. The extract of frond with mustard oil is used as hair tonic & anti lice agent.

Botanical Name:	Onychium Japonicum (Thunb.) Kunze Syn. Onychium cryptogrammoides Christ (Plate No: 7)
Family Name:	Pteridaceae
Vern. Names:	Atir
Habit:	Herb
Locality:	Mostly growing in the upper part of the valley & prefer damp shady places
Conservation status:	Least Concerned
Part used:	Fronds
Collection method:	Cutting
Local Distribution:	Hazara, Swat, Shangla, Muree, found between altitudinal ranges of about 2000-3000 m.
Sp. period:	July-September
Medicinal Use:	The extract of frond is considered as hair tonic.
Folk Recipes:	Fronds of plant is grinded into powdered form & its juice is extracted & used as hair tonic.
Botanical Name:	Pteridium aquilinum (L.) Kuhn.
Family Name:	Dennstaedtiaceae
Vern. Names:	Ladora
Habit:	Herb
Locality:	Mostly growing both in upper & lower part of the valley
Conservation status:	Near Threatened
Part used:	Young fronds & rhizome
Collection method:	Cutting & digging
Local Distribution:	Hindu Kush, Hazara, Kohistan, Battagram, Swat, Dir, Shangla, Chitral, Kurram Agency, Usually growing between altitudinal ranges of about 1600-3150 m.
Sp. period:	July –September
Medicinal Use:	The young fronds are considered as diuretic, vermicide & refrigerant. Rhizome of the Plant is used as anthelmintic and astringent.

Botanical Name:	<i>Pteris cretica</i> L. (Plate No: 7)
Family Name:	Pteridaceae
Vern. Names:	Atir
Habit:	Herb
Locality:	Mostly growing in the upper entire valley of the Malam Jabba
Conservation status:	Least Concerned
Part used:	Fronds
Collection method:	Cutting
Animal Use:	The frond is fed to the cattle during cough.
Local Distribution:	Hazara, Battagram, Malakand, Dir, Swat, Shangla, Kurram Agency, Kashmir.
Sp. period:	July –September
Medicinal Use:	Plant is antiseptic & used to treats cuts & wounds.
Folk Recipes:	A paste prepared from the frond is applied as a poultice for treatment of cuts and wounds.
Botanical Name:	<i>Pteris vittata</i> L. (Plate No: 8)
Family Name:	Pteridaceae
Vern. Names:	Atir
Habit:	Herb
Locality:	Mostly growing in the lower part of the research area
Conservation status:	Least Concerned
Part used:	Whole plant
Collection method:	Cutting
Local Distribution:	Hazara, Khyber Agency, Kurram Agency, Swat, Shangla, Dir, Chitral. Usually found below 1700 m.
Sp. period:	June –September
Medicinal Use:	Plant is antipyretic, antiseptic, antibacterial & also used in cough, cold, high blood pressure & wounds.
Folk Recipes:	A paste is prepared by grinding frond of the <i>Pteris vittata</i> & applied as a poultice on the affected areas for wound healing. A paste of the frond can be also prepared with pepper & taken orally to relieve cold, cough & fever.

B. Gymnosperms

Botanical Name:	<i>Abies pindrow</i> Royle (Plate No: 10)
Family:	Pinaceae
Vernacular Name:	Achar
Habit:	Tree
Locality:	Mostly found at higher altitude & north side of temperate forest
Conservation Status:	Endangered (EN)
Part Used:	leaves
Collection method:	Plucking/Cutting
Local Distribution:	KP, Swat, Chitral, Kohistan, Battagram, Dir, Shangla, Rawalpindi Distt. District, Hazara, Muree hills, Khyber Agency, Kashmir. Found between altitudinal ranges of about 1800-3100 m.
Flowering period:	March-April
Medicinal Use:	Leaves of plant are used for treatment of cough and cold.
Folk Recipes:	The leaves are powdered and mixed with honey and used for treatment of cough, cold and chest infection. The nomads used the leaves as substitute of tea.
Botanical Name:	<i>Cedrus deodara</i> (Roxb. ex D.Don) G. Don (Plate No: 10)
Family:	Pinaceae
Vernacular Name:	Dyar, Deodar
Habit:	Tree
Locality:	Mostly found at higher altitude & prefer dry steep slopes
Conservation Status:	Critically Endangered (CR)
Part Used:	Wood oil (Resins)
Collection method:	Picking
Local Distribution:	Mostly found in West Himalayas, Swat, Dir Kohistan, Khyber Agency, Hazara, Kohistan, Shangla, Dir, Chitral, Murree hills between altitudinal ranges 1700-3000 m.
Flowering period:	October

Medicinal Use:	Locally resin or oil extract of wood is diuretic, carminative, antipyretic, and also used in piles, rheumatic problems, ulcers and various skin diseases.
Folk Recipes:	Locally 2 -3 drops of resin extract is taken with a glass of milk early in the morning before breakfast for curing skin rashes & other skin ailments. 2-3 drops of wood extract or resin extract (Ranzra) is taken with a glass of water for blood purification and lowering body temperature.
Animal Use:	The extract or resin of wood (Ranzra) is also used as anthelmintic for livestock.
Botanical Name:	Cupressus sempervirens L. (Plate No: 9)
Family Name:	Cupressaceae
Vern. Names:	Serva
Habit:	Tree
Locality:	Usually cultivated in lower plains & foot hills
Conservation status:	Cultivated/Alien (IUCN Red List Criteria is not applicable)
Part used:	Fruit
Collection method:	Picking
Local Distribution:	KP, Gilgit Islamabad, Dir, Swat, Shangla, Chitral, Hazara, widely cultivated in the lower plain and foot hills upto 1100 m.
Flowering period:	Feb-March
Medicinal Use:	The fruit is used as anthelmintic and astringent.
Botanical Name:	Ephedra gerardiana Wall.ex Stapf
Family Name:	Ephedraceae
Vern. Names:	Asmani bootai,
Habit:	Shrub
Locality:	Usually growing in dry rocky slopes of higher altitude
Conservation status:	Endangered (EN)
Part used:	Shoot, root and fruit
Collection method:	Digging, Cutting & Picking
Constituents:	Ephedrine

Local Distribution:	Baluchistan Ziarat, Himalayan areas of KP, Swat, Dir, Chitral, Kohistan, Hazara, Kaghan, Baltistan, Kashmir. Usually growing in inner drier valleys of Himalayas between 2200-3500 m.
Flowering period:	May to July
Medicinal Use:	Plant is cardiac stimulant, blood purifier, febrifuge & expectorant. The young shoots are used in asthma, cold & hay fever. Fruit and extract of shoots is used for cleaning of teeth & blood purification
Folk Recipes:	The young shoots and branches are crushed into powdered and boiled in water to get extract which is used twice times a day in morning and evening time after meal for treatment of asthma, hay fever and cold. The decoction of young shoots is used as expectorant & febrifuge. Ash obtained from root of <i>Ephedra</i> is used to treat cuts and wounds.
Botanical Name:	Juniperus communis L.
Family Name:	Cupressaceae
Vern. Names:	Gugar/Shahroos
Habit:	Medium sized tree
Locality:	Usually growing in alpine region of the area
Conservation status:	Vulnerable (VU)
Part used:	Leaves, fruits, roots
Collection method:	Digging, Plucking & Picking
Local Distribution:	KP, Swat, Chitral, Hazara, Kohistan, Battagram, Shangla, Dir, Chitral, Kaghan, Gilgit, Baltistan, Baluchistan & Kashmir. Usually growing in alpine region of Himalayas from 2700-4000 m.
Flowering period:	April-May
Medicinal Use:	Root of plant is used for wound healing. The oil obtained from berries is used as antiseptic, stomachic, carminative, diuretic, antirheumatic & blood tonic. Medicinally the plant is also used against tension and depression. It is also used for blood purification and mental refreshment.
Folk Recipes:	An infusion of berries is used as diuretic. The powdered berry is used as remedy for treatment of swelling, and other skin problems.

Dried leaves of *Juniperus* and *Skimmia* are mixed and burned in combination. The smoke is used to cure the effect of bad and evil eyes.

Botanical Name:	<i>Picea smithiana</i> (Wall.) Boiss (Plate No: 11)
Family Name:	Pinaceae
Vern. Names:	Mangazay, Himalayan spruce
Habit:	Tree
Locality:	Commonly found mixed with blue pine & fir forest
Conservation Status:	Critically Endangered (CR)
Part used	Leaves & Resins
Collection method:	Plucking & Picking
Local Distribution:	Mostly in Himalayas, Swat, Chitral, Dir, Shangla, Hazara, Kohistan, Battagram, Kurram, Kashmir, growing between altitudinal ranges of about 2300-3600 m.
Flowering period:	April-May
Medicinal Use:	Locally leaves of plant are used as remedy for kidney stone and rheumatism. Resin is collected locally & used as remedy for cracks of heels and wounds.
Folk Recipes:	A tea prepared from fresh leaves of <i>Picea smithiana</i> is used once in a day for one week to remove stone from kidney.
Botanical Name:	<i>Pinus gerardiana</i> Wall.
Family Name:	Pinaceae
Vern. Names:	Chilghoza Pine
Habit:	Tree
Locality:	Inner dry areas & rocky slopes of the valley
Conservation Status:	Critically Endangered (CR)
Part used	Seeds, barks, leaves, resins.
Collection method:	Picking, Cutting & Plucking
Local Distribution:	Baluchistan, KP, Swat, Chitral, Dir, Buner, Shangla, Hazara, Gilgit, Astor, Kashmir. Mostly found in inner dry valleys of the Himalaya and Baluchistan between altitudinal ranges 1600-2700 m
Flowering period:	June July

Medicinal Use:	Seeds are tonic and stimulant. Resin or oil obtained from the bark of wood is used for skin disorders and healing of wounds.
Folk Recipes:	The seeds are edible commonly called “Chilghoza nut” used as dry fruit, tonic and stimulant. Juice is obtained from the fresh leaves and added with water and taken twice a day before meal for curing of lung infections and sore throat. Dried leaves and bark is grinded into powdered & taken with glass of water for diarrhea. A decoction of the leaves is used for curing of scabies.
Botanical Name:	<i>Pinus roxburghii</i> Sargent (Plate No: 11)
Family Name:	Pinaceae
Vern. Names:	Nakhtar, Chir pine
Habit:	Tree
Locality:	Mostly growing in rocky hills but at higher altitude form association with <i>Pinus wallichiana</i> tree
Conservation Status:	Endangered
Part used	Resins (Jaula), bark
Collection method:	Picking & Cutting
Local Distribution:	Hindu Kush range, KP, Swat, Lower Dir, Chitral, Hazara, Buner, Shangla, Battagram, Natia gali, Murree hills, Kashmir, commonly growing in lower elevations & hill slopes from 600-1800 m.
Flowering period:	March-April
Medicinal use:	Medicinally resin of bark is used for skin diseases, external wounds, blood purification, ulcer, constipation, snake & scorpion bites.
Folk Recipes:	Resin or oil obtained from the wood is externally applied as a plaster for healing of wounds and also to treat cracked heel. Resin of bark locally known as "Jaula", is stimulant used in ulcer, constipation, snake and scorpion stings. It is also used as blood purifier. The resin is boiled with milk & used to treat acne.

Botanical Name:	<i>Pinus wallichiana</i> L. (Plate No: 12)
Family Name:	Pinaceae
Vern. Names:	Peouch, Blue Pine
Habit:	Tree
Locality:	Mostly growing at higher altitude, often mixed with <i>Abies</i> , <i>Picea</i> & <i>Quercus</i> in temperate forest
Conservation Status:	Endangered
Part used	Resins/leaves
Collection method:	Picking & Plucking
Local Distribution:	KP, Swat, Chitral, Kohistan, Battagram, Dir, Buner, Hazara, Bara Gali, Muree hills, Islamabad & Kashmir. Mostly found from 1600-3300 m.
Flowering period:	April-May
Medicinal/Folk use:	Locally plant is used for the treatment of external wounds, asthma, bronchitis & cough.
Folk Recipes:	A tea prepared from the leaves has traditionally been used for the treatment of bronchitis, cough & asthma. 3-4 drops of resins are added with mustard oil & is applied on the ruptured skin for healing of wounds.
Botanical Name:	<i>Taxus wallichiana</i> Zucc (Plate No: 12)
Family Name:	Taxaceae
Vern. Names:	Banya
Habit:	Tree
Locality:	Found at higher altitude /open slope of temperate forest
Conservation status:	Critically endangered
Part used:	Bark, leaves, shoot, fruit, root,
Collection method:	Cutting, Plucking & Picking
Constituents:	Taxol
Local Distribution:	Hindu Kush Range, Kp, Swat, Dir, Chitral, Hazara, Battagram, Kohistan, Kaghan, Khyber Agency, Murree, Kashmir Commonly found in moist and temperate valleys of Himalayas from 1800 -3000 m.

Flowering period:

Feb-March

Medicinal Use:

Leaves of plant are used in asthma, cough, bronchitis, epilepsy, stomach disorders, & indigestion. Bark is a source taxol, used in cancer & considered as antitumorous agent. Powdered bark is used as antispasmodic. Fruits are used as sedative and antiseptic.

Folk Recipes:

Bark of *Taxus wallichiana* is crushed into powdered which is then mixed with cup of milk & used as antispasmodic & emmenagogue. Decoction of root is used in hepatic problems & jaundice. Decoction of bark is used in muscular pain and also as tea substitute

C. Monocots

Botanical Name:	Acorus calamus L. (Plate No: 15)
Family Name:	Araceae
Vern. Names:	Skhawaja
Habit:	Herb
Conservation status:	Endangered (EN)
Part used:	Bulbs, leaves
Collection method:	Digging, Plucking
Local Distribution:	Afghanistan, China, Pakistan, Bangladesh, Kashmir, India, Bhutan, Sri Lanka & Nepal, KP, Swat, Chitral, Dera Ismail Khan, Battagram, Dir, Shangla, Hazara, Peshawar District & Kashmir, Poonch. Mostly found in, standing water, marshy places & along water courses with altitudinal variation of about 1000-2000 m.
Flowering period:	June to July
Medicinal Use:	The plant is used in dysentery, Diarrhea, rheumatism, intestinal colic, flatulence and also used as diuretic. Chewing of root is thought to be alleviating toothache.
Folk Recipes:	The dried rhizome is crushed into powder and mixed with mustard oil and used externally for treatment of rheumatism. Extraction of fresh plant is also used to treat abdominal pain. The dried rhizome is also crushed into powder for treatment of dysentery and diarrhea.
Animal Use:	Rhizome is used to increase body temperature of livestock and also used for treatment of local disease called charmaikh.
Folk Recipes:	A paste is prepared by grinding rhizome & mixed with flours to bring cow in heat and become pregnant.

Botanical Name:	Allium cepa L
Family Name:	Alliaceae
Vern. Names:	Pyaz/Onion
Habit:	Herb
Conservation status:	Cultivated
Part used:	Bulbs, leaves
Collection method:	Digging, Cutting
Local Distribution:	Mostly cultivated everywhere & grow at varying altitude. China, India, Kashmir, Nepal, Pakistan, KP, Swat, Dir, Chitral, Shangla, Hazara, Mansehra, Battagram, Kohistan. Onion is widely cultivated species in most part of the the valley.
Flowering period:	May-August (summer)
Medicinal Use:	The bulbs are aphrodisiac, stimulant, antiseptic and very useful in jaundice. The leaves are diuretic and expectorant.
Folk Recipes:	The juice of plant is mixed with honey and is used for curing flue and diabetes. Juice of the plant is also used to treat irritation caused by scorpion sting.
Animal Use:	Bulb is used to alleviate abdominal pain in cattle.
Botanical Name:	Allium humile L.
Family Name:	Alliaceae
Vern. Names:	Ghra Pyaz/Small Alpine Onion
Habit:	Herb
Conservation status:	Critically Endangered (CR)
Part used:	Bulbs, leaves
Collection method:	Digging, Cutting
Local Distribution:	Mostly alpine & Himalayan areas of Pakistan & India. From Himalayas to Swat, Chitral lowari Pass, Kohistan, Hazara, Dir, Naran, Saiful Malook Lake, Kashmir. Mostly grow at higher altitude on the hill slopes near subalpine region 2900-4500 m.
Flowering period:	June to July

Medicinal Use:	Leaves and bulbs are stimulant, diuretic, anti-hypertensive, expectorant and carminative.
Folk Recipes:	Chewing of leaves and bulb is used to treat headache and vomiting
Animal Use:	Bulb is used in tick infection & intestinal parasitic worms.
Botanical Name:	Allium Sativum L.
Family Name:	Alliaceae
Vern. Names:	Ooga/Garlic
Habit:	Herb
Conservation status:	Cultivated
Part used:	Bulbs, leaves
Collection method:	Digging, Cutting
Local Distribution:	China, India, Kashmir, Nepal, Pakistan, KP, Swat, Dir, Chitral, Buner, Shangla, Kohistan, Battagram, Hazara. Kurrum, Garlic is extensively cultivated species in most part of the country, highly valuable medicinal plant, frequently used as in vegetables especially in the valley.
Flowering period:	June to July
Medicinal Use:	The bulb are carminative, aromatic, diaphoretic, diuretic, expectorant and is also used as good remedy for high blood pressure, (hypertension), flue, cold and cough and heart ailments. Decoction is effective in hysteria, flatulence, asthma and whooping cough. It is also used in epilepsy.
Folk Recipes:	The decoction of the plant is used twice a day for High blood pressure. The Young leaves and bulb are grinded into powdered and mixed with soup and used is used for treatment of cough & flue. Chewing of bulb alleviates toothache.
Animal Use:	Bulbs are mixed with wheat flour and fed to the cattle for improved digestion.

Botanical Name:	<i>Arisaema flavum</i> (Forssk.) Schoot. (Plate No: 15)
Family Name:	Araceae
Vern. Names:	Marjarai
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Rhizome
Collection method:	Digging
Local Distribution:	Himalaya, Tibet, China, Afghanistan, Nepal, Baluchistan, Punjab, KP, Swat, Dir, Shangla, Hazara, Battagram, Kaghan, Shogran, Kashmir, mostly found in open & sunny places between altitude ranges of about 1700-3000 m.
Flowering period:	June to July
Medicinal Use:	The fruit and rhizome is poisonous, Rhizome is anthelmintic & stomachic but small amount of rhizome is used for treatment of stomach disorder and also to kill worm.
Animal Use:	The rhizome is grinded into powdered form and small amount is given orally in bolus form to livestock especially cows and buffaloes for curing respiratory infection and cough.
Botanical Name:	<i>Asparagus officinalis</i> L.
Family Name:	Asparagaceae
Vern. Names:	Tindorai
Habit:	Herb
Conservation status:	Endangered
Part used:	Rhizome & young shoots
Collection method:	Digging & Cutting
Local Distribution:	Russia, Mongolia, Kazakstan, China, Taiwan, Baluchistan KP, Swat, Chitral Drosh, Battagram, Dir, Shangla, Hazara, Parachinar & Kashmir, commonly found on mountain slopes upto an altitude of approximately 2500 m.
Flowering period:	May to June

Medicinal Use:	Rhizome is tonic and demulcent and also used in dysentery and diarrhea. Asparagus is also known for his diuretic & laxative properties.
Folk Recipes:	Rhizome is taken with boiled milk and sugar for dysentery and diarrhea.
Animal Use:	Young shoots are given to cattle for increase milk production.
Botanical Name:	Asphodelus tenuifolius Cav.
Family Name:	Asphodelaceae
Vern. Names:	Piazakay
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Fresh leaves and seeds
Collection method:	Plucking & Picking
Local Distribution:	Afghanistan, India, Pakistan, Baluchistan, Punjab, KP, Swat, Shangla, Rawalpindi Distt., Kashmir. It is found commonly grown to an altitude of 2200 m as a weed species.
Flowering period:	Nov. to April
Medicinal Use:	Fresh leaves are used in Jaundice where as seeds are used in piles.
Folk Recipes:	The juice obtained from the plant is coolant & used in Jaundice
Botanical Name:	Colchicum luteum Baker (Plate No: 36)
Family Name:	Colchicaceae
Vern. Names:	Piazakay
Habit:	Herb
Conservation status:	Critically Endangered (CR)
Part used:	Corm
Collection method:	Digging
Local Distribution:	Afghanistan, Himalayan region of Pakistan & India KP, Hindu Kush range, Dir, Swat Hazara, Kohistan, Abbotabad, Murre hills, Kashmir. Mostly found in sunny, exposed area upto an altitude of approximately 1500- 2500 m.
Flowering period:	Feb. to May but depend upon the altitude of the area

Medicinal Use:	Corm of <i>Colchicum luteum</i> is used as laxative, blood purifier & aphrodisiac.
Folk Recipes:	The Locally fresh corm of plant is dried, grinded into powdered form, mixed with egg & fried with cow's ghee. Mixture is then given to the elderly peoples for treatment of rheumatism & joints pain.
Botanical Name:	Cynodon dactylon L.
Family Name:	Poaceae
Vern. Names:	Drab
Habit:	Herb
Conservation status:	Least Concerned
Part used:	Whole plant
Collection method:	Cutting & digging
Local Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Sind, Baluchistan, Punjab, KP, Peshawar, Dir, Swat Hazara, Kohistan, Abbotabad, Murre hills, Kashmir. Commonly grown in waste areas, field margins, along roadsides & also cultivated as lawn grass upto an altitude of about 2500 m.
Flowering period:	All year round
Medicinal Use:	The plant is diuretic, refrigerant and also used in Diarrhea, Jaundice and blood purification.
Folk Recipes:	Decoction of plant is used in blood purification. Plant is antiseptic and fresh leaves are applied on cuts and wounds to stop bleeding. Fresh leaves are applied on cuts and bleeding wounds.
Animal Use:	A paste is prepared from plant & fed to the cattle for improved quality & quantity of milk.
Botanical Name:	Dioscorea deltoidea Wall. ex Kunth
Family Name:	Dioscoreaceae
Vern. Names:	Qanees
Habit:	Climber
Conservation status:	Endangered (EN)
Part used:	Tubers/rhizome

Collection method:	Digging
Local Distribution:	From Himalaya to Afghanistan, China, Pakistan, Nepal, Bhutan, Myanmar & Kashmir Himalayas, Dir, Swat, Hazara, Kohistan, Battagram, Kaghan, Shangla, Chitral, Murree hills & Kashmir. It is a perennial climber, twinning clockwise & commonly found in temperate forest upto an altitude of approximately 1500-2700 m.
Flowering period:	May-August
Medicinal Use:	Roots and tuber is diuretic and expectorant. The root of plant is used as vermifuge and especially in case of children.
Folk Recipes:	The dried rhizome of the plant is fried in cow, s ghee and taken early in the morning before breakfast for the treatment of urinary infections. Rhizome of plant is grinded into powdered and mixed with powdered of <i>Berberis lyceum</i> and used for treatment of Jaundice and ulcer.
Botanical Name:	Fritillaria cirrhosa Subsp. Roylei (Hook.) Ali, Syn. Fritillaria roylei Hook.
Family Name:	Liliaceae
Vern. Names:	Chor
Habit:	Herb
Conservation status:	Critically Endangered (CR)
Part used:	Rhizome, bulb
Collection method:	Digging
Local Distribution:	Afghanistan, India, Paksitan, Kashmir, Hindu Kush Range, KP. Swat, Chitral, Kurram Agency, Parachinar, Hazara, Kaghan, Naran, Gilgit and Kashmir. Mostly grow at sub Alpine meadows & grassy slopes between altitudinal ranges of about 3000-3500 m.
Flowering period:	April-July
Medicinal Use:	Rhizome is used as general body tonic where as bulb is used in the treatment of rheumatism
Folk Recipes:	Ethnomedically the rhizome of plant is boiled in milk and taken early in the morning before breakfast for the general body tonic.

Botanical Name:	<i>Polygonatum verticillatum</i> (L.) All.
Family Name:	Asparagaceae
Vern. Names:	Nore Alam
Habit:	Herb
Conservation status:	Critically Endangered (CR)
Part used:	Rhizome, bulb
Collection method:	Digging
Local Distribution:	Afghanistan, China, India, Pakistan, Nepal & Bhutan, KP, Swat, Dir, Shangla, Kaghan, Kohistan, Murree, Kashmir Mostly growing in alpine meadows & grassy hill tops between altitudinal ranges of about 2600-40000 m.
Flowering period:	May-June
Medicinal Use:	Rhizome is used as general body tonic where as bulb is used in the treatment of rheumatism.
Folk Recipes:	The decoction of rhizome is mixed with sugar and used for treatment of rheumatism.
Animal Use:	The decoction of rhizome is administrated to cattle for removal of placenta.

D. DICOTS

Botanical Name:	<i>Acacia modesta</i> Wall.
Family Name:	Mimosaceae
Vern. Names:	Palusa
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Leaves, flowers, gums
Collection method:	Cutting, picking, digging
Local Distribution:	Afghanistan, India, Pakistan, Baluchistan, Punjab, KP, Swat, Dir, Shangla, Hazara, Haripur, Kohistan, Battagram, Peshawar, Rawalpindi Distt., Lower Murree hills, commonly grow at lower elevations & foothills upto an altitude of about 1200 m.
Flowering period:	March-May
Medicinal Use:	Gums are also used for treatment of dysentery, backaches & weakness.
Folk Recipes:	A dried gum is grinded, mixed with flour, almonds, poppy seeds, dates & sugars & then fried in ghee. This is locally called “Halva” & given to the women after delivery for weakness & as tonic.
Botanical Name:	<i>Achyranthes aspera</i> L.
Family Name:	Amaranthaceae
Vern. Names:	Gishkay
Habit:	Herb
Conservation status:	Least Concerned
Part used:	Root, seeds & whole plant
Collection method:	Cutting, picking, digging
Local Distribution:	China, Taiwan, India, Sri Lanka, Nepal, Thailand, Baluchistan, Sind, KP, Swat, Dir, Shangla, Hazara, Waziristan, Rawalpindi Distt., Kashmir, mostly found on the roadside, waste places & hill slopes upto an altitude of about 800-2300 m.
Flowering period:	April-September

Medicinal Use:	Seeds are grinded into powdered & used for sparkling and strengthening of teeth. Decoction of the plant is stomachic, diuretic & laxative.
Folk Recipes:	The smoke of root & seed are used to relieve cough, asthma .An infusion prepared from root of plant is used as remedy to remove small stones from kidney.
Botanical Name:	<i>Aconitum chasmanthum</i> Stapf ex Holmes
Family Name:	Ranunculaceae
Vern. Names:	Zaharmora/Ghra Zahar
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Rhizome
Collection method:	Digging
Local Distribution:	Pakistan, Kashmir, Nepal and India, Himalayas to Swat, Chitral, Lowari Pass, Hazara, Kohistan, Dir, Baltistan, Kashmir, commonly grow at higher altitude of alpine meadows from 2300-4300 m.
Flowering period:	August-September
Medicinal Use:	Rhizome is used as remedy in rheumatism, arthritis, fever & general body tonic.
Folk Recipes:	The rhizome of <i>Aconitum chasmanthum</i> is tied or wrapped in sheep or goat intestine & thoroughly boiled in milk. The Milk is then discarded & rhizome is dried, powdered & used against rheumatism & arthritis. The rhizome is also crushed into powdered & mixed with cow's ghee & used as general body tonic. Rhizome is also toxic & may cause death if overdosed.
Botanical Name:	<i>Aconitum heterophyllum</i> Wall ex Royle
Family Name:	Ranunculaceae
Vern. Names:	Serba zela
Habit:	Herb
Conservation status:	Endangered
Part used:	Rhizome
Collection method:	Digging

Local Distribution:	Pakistan, N. W Himalaya, Kashmir, India, Nepal KP, Swat, Shangla, Dir, Chitral, Kohistan, Hazara, Kaghan, Gilgit, Baltistan, Kashmir, Mostly found at alpine meadows with altitudinal ranges of about 2400-4500 m.
Flowering period:	July-August
Medicinal Use:	Medicinally plant is used as aphrodisiac, anthelmintic, tonic, stomachic & expectorant. Rhizome & roots is also used in sexual weakness, diarrhea, dysentery, fever, and rheumatism & vomiting.
Folk Recipes:	The rhizome is also crushed into powdered, mixed with cow's ghee & used as remedy for sexual weakness & general body tonic.
Botanical Name:	Aesculus indica (Wall.ex. Cambl.) Hook.f.
Family Name:	Hippocastinaceae
Vern. Names:	Jawaz
Habit:	Tree
Conservation status:	Critically Endangered
Part used:	Fruits, seeds
Collection method:	Picking
Local Distribution:	Afghanistan, Pakistan, India West Himalaya to Kashmir, Nepal, India, KP, Baluchistan, KP, Loralai, Swat, Chitral, Kohistan, Dir, Shangla, Hazara, Battagram, Muree hills & Kashmir, mostly grow from foothills to higher elevation on the hill slopes along roadside with elevation ranges of about 1200-3300 m.
Flowering period:	April-May
Medicinal Use:	Nuts & seeds are anthelmintic, intestinal colic, tonic, purgative & astringent.
Folk Recipes:	Seeds are grinded into powdered & used for abdominal pain & intestinal colic. Oil taken from the plant is externally used for rheumatism.
Animal Use/Recipes:	Nuts & seeds are anthelmintic, colic and also given to horses & donkeys for curing of chest diseases. Nuts & seeds are anthelmintic, colic and also given to horses & donkeys for curing of chest

diseases. Seeds & nuts are grinded, given to the horses & other animals in colic, cough, fever & chest infections.

Botanical Name:	<i>Ailanthus altissima</i> (Mill) Swingle
Family Name:	Simaroubaceae
Vern. Names:	Bekyana
Habit:	Tree
Conservation status:	Alien / Exotic
Part used:	Bark
Collection method:	Cutting
Local Distribution:	China, Taiwan, India, Kashmir, KP, Swat, Chitral, Kohistan, Dir, Shangla, Hazara, Abbotabad, Battagram, & Kashmir, usually grow from plains to mountainous areas as roadside tree with altitude range of about 2500 m.
Flowering period:	May-June
Medicinal Use:	Bark of plant is used as anthelmintic & also for skin problems.
Folk Recipes:	Seeds are grinded into powdered & used for abdominal pain & locally bark of plant is mixed with milk for treatment of diarrhea & dysentery.

Botanical Name:	<i>Ajuga bracteosa</i> Wall.ex Benth. (Plate No: 47)
Family Name:	Lamiaceae
Vern. Names:	Khwaga Booti
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Whole plant
Collection method:	Cutting, plucking, digging
Local Distribution:	Afghanistan, China, India, Kashmir, Burma, Pakistan, KP, Swat, Chitral, Malakand: Chakdara, Kohistan, Dir, Shangla, Hazara, Balakot, Waziristan, Parachina, Kohat Pass & Kashmir, mostly grow from plains to grassy hilly slopes upto an altitude of about 2500 m.
Flowering period:	March-December

Medicinal Use:	Plant is used as refrigerant, antidiabetic, astringent, stimulant, cardiac tonic. Leaves is used as remedy for treatment of jaundice, hypertension, blood purification & sore throat
Folk Recipes:	Decoction of plant is used for jaundice, Hepatitis c, blood purification & hypertension. Powdered plant is cooked with Desi ghee of cow & taken early in the morning before breakfast for curing of fever & vomiting.
Botanical Name:	<i>Ajuga parviflora</i> Benth. (Plate No: 48)
Family Name:	Lamiaceae
Vern. Names:	Tarkha Booti
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Whole plant
Collection method:	Cutting, plucking, digging
Local Distribution:	Afghanistan, China, India, Kashmir, Burma, Pakistan, KP, Swat, Chitral, Kohistan, Dir, Shangla, Hazara, Abbotabad, Mansehra, Kurram: Parachianr, Rawalpindi Distt., Muree hills & Kashmir, upto an altitude of about 600-2050 m.
Flowering period:	March-June
Medicinal Use:	Plant is tonic & used in hepatitis, rheumatism, fever, anti tonsilits & throat sore.
Folk Recipes:	Dried leaves in grinded into powder & is mixed with sugar & taken with glass of water for curing of hepatitis disorders & rheumatism.
Botanical Name:	<i>Amaranthus viridis</i> L.
Family Name:	Amaranthaceae
Vern. Names:	Chalwai
Habit:	Herb
Conservation status:	Least Concerned
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, Pakistan, KP, Swat, Dir, Shangla, Hazara, Peshawar, Dera Ismail Khan, Nowshehra, Waziristan, Rawalpindi Distt., Jehlum,

	Sargodha, Karachi, Hyderabad, Quetta, Kashmir, mostly found in the fields & waste places upto an altitude of about 1250 m.
Flowering period:	June-August
Medicinal Use:	Plant is emollient and vermicide but traditionally it is used as vegetable. Paste of leaves is also used for scorpion sting.
Animal Use:	The plant is given to cattle for abdomen swelling.
Botanical Name:	<i>Andrachne cordifolia</i> (Wall.ex Dec) Muell.
Family Name:	Euphorbiaceae
Vern. Names:	Krachay
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Fruits, leaves
Collection method:	Picking, plucking
Local Distribution:	China, India, Kashmir, Nepal, Pakistan, Punjab, KP, Swat, Shangla, Chitral, Dir, Shangla, Hazara, Kaghan, Khyber Agency, Muree hills & Kashmir, mostly growing in stony soil & exposed rocky hill slopes along water courses from 700-2300 m.
Flowering period:	June-October
Animal Use/Recipes:	Fruit & leaves are used as vermicide & purgative for livestock. Decoction of leaves is used to expel intestinal worms.
Botanical Name:	<i>Artemisia maritima</i> L. (Plate No: 17)
Family Name:	Asteraceae
Vern. Names:	Loam
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Whole plant
Collection method:	Cutting, plucking, digging
Local Distribution:	Tibet, India, Pakistan, Nepal, KP, Hindu Kush Range, KP, Swat, Chitral, Shangla, Baltistan, Hunza, Kashmir. Usually grow at higher altitude on open dry rocky hills from 2000-3300 m
Flowering period:	July-September
Medicinal Use:	Plant is anthelmintic & stomachic.

Folk Recipes:	Plant is dried, boiled in water and the extract is cooled and used as anthelmintic.
Botanical Name:	<i>Artemisia scoparia</i> Waldst Kitam. (Plate No: 18)
Family Name:	Asteraceae
Vern. Names:	Jaukey
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Leaves, shoots & seeds
Collection method:	Cutting, picking
Local Distribution:	Afghanistan, China, India, Pakistan, Baluchistan: Quetta, Punjab, KP, Hindu Kush Range, Gilgit, Baltistan, Astor, Swat, Malakand, Chitral, Hazara, Kaghan, Kurram: Parachinar, Peshawar Distt., Kashmir. Mostly growing in sandy clay soil & dry rocky hill slopes upto an altitude of about 3500 m.
Flowering period:	July-November
Medicinal Use:	Plant is purgative, antispasmodic, stomachic, respiratory stimulant & anthelmintic. Plant is also used as good remedy for ear infection/earaches.
Folk Recipes:	Plant is used for wound healing in livestock.
Botanical Name:	<i>Berberis lycium</i> Royle. (Plate No: 27)
Family Name:	Berberidaceae
Vern. Names:	Kware
Habit:	Shrub
Conservation status:	Critically Endangered
Part used:	Leaves, Stems, Roots, Fruit & bark
Collection method:	Cutting, picking, digging
Local Distribution:	North West Himalayas, Kashmir, Pakistan, India, Nepal, KP, Swat, Dir, Buner, Shangla, Chitral, Hazara, Battagram, Murree, Gilgit, Baluchistan, Kashmir, Jehlum valley, Poonch. Mostly found in exposed sunny places & along road side with altitudinal ranges of about 850-3500.
Flowering period:	April-June

Medicinal Use:	Root & stem of plants is general body tonic, febrifuge, stomachic, expectorant & diuretic. Bark of root is used for treatment of liver disorders, stomach problems, ulcers, internal & wound healing & intestinal colic. Plant is also used in diarrhea, piles, blood purification & Hepatitis. The decoction of root is used as aphrodisiac. Fruits are edible & used in jaundice & diarrhea. Root of plant is antiseptic, antibiotic & recommended in throat infection. Plant is also in women delivery cases.
Folk Recipes:	Root is antiseptic, tied upon the fracture bones and utilized for healing of fractured bones, external wounds and arthritis. Root of plant is grinded into powdered & mixed with egg & fried in cow, s ghee for the treatment of fractured bones & wound healing.
Animal Use/Recipes:	The bark of rhizome is very useful for internal and external wounds and body pain in livestock. Dried rhizome is boiled in water and filtered through fine cloths and the extract is used for internal wound and body warmth in livestock.
Botanical Name:	<i>Bergenia ciliata</i> Sternb.
Family Name:	Saxifragaceae
Vern. Names:	Makanpath./Ghat panra/Kmar panra
Habit:	Herb
Conservation status:	Endangered
Part used:	Rhizome
Collection method:	Digging
Local Distribution:	East Afghanistan, Bhutan, India, Pakistan, Nepal, Kashmir, Kp, Swat, Chitral, Hazara, Kaghan, Battagram, Kohistan, Dir, Shangla, Hazara, Muree, Kurram & Kashmir, mostly growing in the temperate forest on crevices of rocks with altitude of about 2000-3500.
Flowering period:	April-July
Medicinal Use:	Plant is tonic, antidiabetic, expectorant, stomachic & blood purifier. Rhizome is used in muscular pain, general body tonic, wound healing, running eye & sunburn.

Folk Recipes:	Rhizome is powdered & eaten with glass of water for treatment of diabetes & also as astringent. The powdered form of rhizome is also useful in urinary disorders, stomach ulcer, diarrhea, backache & muscular diseases. Locally the powdered rhizome is boiled with water for an hour. The remaining gum like extract of rhizome is then applied on the cut wound for healing.
Animal Use/Recipes:	Rhizome is used for discharge of pus in case of animals.
Botanical Name:	<i>Bistorta amplexicaulis</i> (D. Don) Green. (Plate No: 68)
Family Name:	Polygonaceae
Vern. Names:	Tarvapana/Anjabar
Habit:	Herb
Conservation status:	Endangered
Part used:	Rhizome, Shoots & leaves
Collection method:	Digging, cutting, plucking
Local Distribution:	Afghanistan, Bhutan, India, Pakistan, Nepal, Kashmir, Ziarat, KP, Swat, Chitral, Dir, Battagram, Kohistan, Dir, Shangla, Hazara, Mansehra, Abbotabad, Kaghan Valley, Muree hills, Changla Gali, Kurram & Azad Kashmir, Leepa Valley, from 1200-4000 m.
Flowering period:	June-September
Medicinal Use:	Plant is used for inflammation of mouth, sore throats, rheumatism, fever, flu, general body tonic & gout. The young shoots & leaves are used for curing cancer.
Folk Recipes:	A local tea is prepared from the rhizome which is used as remedy for fever and flue. The rhizome is also effective to cure ulcers. The rhizome is powdered and is taken with water for curing of rheumatism & gout. Rhizome is also mixed with egg & fried in cow, s ghee & considered effective for general body tonic.
Animal Use/Recipes:	Rhizome is crushed & mixed with milk for softening of mammary gland in cattle
Botanical Name:	<i>Brassica rapa</i> subsp. <i>campestris</i> (Linn.) Clapham
Family Name:	Brassicaceae
Vern. Names:	Sharsham

Habit:	Herb
Conservation status:	Least Concerned
Part used:	Seeds
Collection method:	Picking
Local Distribution:	India, Pakistan, Sind: Khairpur, Baluchistan: Sibi, Punjab, KP, Swat, Chitral, Dir, Battagram, Dir, Shangla, Hazara, Galyat, Kurram, Kashmir, Lahore, Karachi, frequently cultivated and also found as weed in the wild.
Fl & Fr. period:	Jan-March
Medicinal Use:	Oil obtained from seeds is used as ointments for body massage & hair tonic.
Animal Use/Recipes:	In livestock it is considered as tonic and also used for tick infection. Seed cakes locally known as “Khal” is prepared from trash of seeds after extracting oil & fed to cattle as tonic agent & also for promotion lactation in livestock.
Botanical Name:	Brassica rapa subsp. rapa
Family Name:	Brassicaceae
Vern. Names:	Tapar
Habit:	Herb
Conservation status:	Cultivated
Part used:	Leaves & fruits
Collection method:	Plucking & Picking
Local Distribution:	India, Pakistan, Sind, Baluchistan, Punjab, KP, Swat, Chitral, Dir, Battagram, Dir, Chitral, Buner, Shangla, Hazara, Kurram, Khyber Agency, Kashmir, Multan, Khairpur. It is extensively cultivated throughout the world & especially in northern areas of Pakistan upto an altitude of about 2700 m.
Flowering period:	March-April
Medicinal Use:	Leaves & roots are good remedy for treatment of ulcer & stomach disorders.

Botanical Name:	Bunium persicum (Boiss) Fedtsch.
Family Name:	Apiaceae
Vern. Names:	Tora zeera
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Fruits
Collection method:	Picking
Local Distribution:	Iran, Afghanistan, , India, Pakistan, Baluchistan, Ziarat, Quetta, Loralai, KP, Swat, Chitral, Dir, Kohistan, Hazara, Kohat, Kaghan, pass, Cherat hills, Peshawar Distt., Gilgit, Baltistan, Astor, Kashmir, mostly found in dry exposed mountain slopes & scrubby slopes in the Himalayas with altitude of about 1000-2000 m.
Flowering period:	July -August
Medicinal Use:	Fruit of plant is carminative, stomachic, antiseptic, lactagogue & vermicide.
Animal Use/Recipes:	Seeds are antipyretic & used as remedy in fever.
Botanical Name:	Buxus wallichiana Baill (Plate No: 32)
Family Name:	Buxaceae
Vern. Names:	Shamshad
Habit:	Shrub
Conservation status:	Critically Endangered
Part used:	Leaves, fruits
Collection method:	Plucking, picking
Local Distribution:	Afghanistan, India, Pakistan, Nepal, Bhutan, North Himalayas to Hindu Kush range, KP, Swat, Buner, Shangla, Hazara, Kaghan valley, Kashmir, Poonch District, usually grow from foothills to higher elevations on the moist hills with altitude of about from 1000-3000 m.
Flowering period:	March -May
Medicinal Use:	Medicinally plant is used for treatment of rheumatism problem. Plants are used as febrifuge, diaphoretic & purgative. Stem is also used as tooth brush which considered as remedy for toothaches.

Animal Use/Recipes:	Seeds are antipyretic & used as remedy in fever.
Botanical Name:	<i>Calendula arvensis</i> L.
Family Name:	Asteraceae
Vern. Names:	Ziar gule
Habit:	Herb
Conservation status:	Least Concerned
Part used:	Leaves & flowers
Collection method:	Plucking
Local Distribution:	Iran, Afghanistan, India, Pakistan, Kashmir, KP, Swat, Buner, Shangla, Hazara, Mansehra, Peshawar, Murree hills, usually annual spring weed, usually grow in roadside, waste places & field margins with altitude of about 1300 m.
Flowering period:	April –May
Medicinal Use:	The leaves are anthelmintic, tonic & diaphoretic. The leaves and flowers are also given to children for scrofula.
Folk Recipes:	The leaves are grinded into powdered which is used as snuff for mucous discharge.
Botanical Name:	<i>Calendula officinale</i> L.
Family Name:	Asteraceae
Vern. Names:	Ziar gule
Habit:	Herb
Conservation status:	Cultivated
Part used:	Leaves & flowers
Collection method:	Plucking & picking
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Taiwan, KP. Swat, Dir, Buner, Shangla, Malakand, Chakdara, Hazara, Mansehra, Abbotabad, Peshawar, Rawalpindi Distt., widely cultivated & grow in sunny places upto an altitude of about 2600 m.
Flowering period:	April-September
Medicinal Use:	Flowers & shoots are used for treatment of wounds & skin problems. Flowers are used with honey as stimulant, astringent, antispasmodic & stomachic

Botanical Name:	<i>Calotropis procera</i> (Willd) R. Br.
Family Name:	Asclepiadaceae
Vern. Names:	Spalmay
Habit:	Shrub
Conservation status:	Least Concern
Part used:	Leaves, bark, latex
Collection method:	Plucking, picking
Local Distribution:	Iran, Afghanistan, India, Pakistan, Kashmir, Baluchistan: Bolan Pass, Quetta, Himalayas to Swat, Dir, Shangla, Hazara, Peshawar, Kohat, Rawalpindi Distt., Bannu, Kohat Sialkot, Hyderabad, usually grow from plains to foothills on dry sandy places upto an altitude of about 1800 m.
Flowering period:	All year round
Medicinal Use:	Plant is used for treatment of diabetes, skin diseases, diarrhea, dog bites, ulcer, cough & asthma
Folk Recipes:	Leaves are smoked to cure cough & asthma. Leaves are crushed with gur (sugar raw) to make a paste which is applied as poultice on dog bitten wounds. Latex of plant is also used in skin diseases & diarrhea.
Animal Use:	Bark of plant is used to promote lactation in cattle
Botanical Name:	<i>Caltha alba</i> Camb.
Family Name:	Ranunculaceae
Vern. Names:	Makan Path/Maspal
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Flowers, leaves
Collection method:	Picking, cutting
Local Distribution:	China, Pakistan, India, Kashnir, West Himalayas, Nepal, Chitral, Dir, Swat, Hazara, Kaghan, Changla Gali, Kohistan, Kashmir, Gilgit, Baltistan, Kashmir, Usually grow at higher altitude near alpine meadow, grassy slopes near water courses with altitude of about 2700-4300 m

Flowering period:	June-July
Medicinal Use:	Locally plant is used in jaundice, hepatic disorders, skin problems & also enhance digestion. Flowering shoots are laxative & diuretic.
Folk Recipes:	Traditionally local community used leaves of plant for wound healing, skin lesions & sores. Juice of flowers is applied to forehead & used as remedy for headache.
Botanical Name:	<i>Cannabis sativa</i> L. (Plate No: 33)
Family Name:	Canabinaceae
Vern. Names:	Bhang
Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Leaves & flowering tops
Collection method:	Plucking, picking
Local Distribution:	China, Iran, India, Bhutan, Pakistan, Kashmir, Sind, Punjab, KP, Himalayas to Swat, Chitral, Buner, Dir, Shangla, Malakand, Hazara, Abbotabad, Battagram, Peshawar, Rawalpindi & Islamabad Distt., Lahore, Sarghoda, Gilgit, Karachi University from plains to higher elevation upto an altitude of about 3050 m.
Flowering period:	April-September
Medicinal Use:	Locally Dried & fresh leaves are used as narcotic. Powdered leaves and flowering tops are as used as stimulant, tonic, sedative & anodyne. Plant is also used as cooling agent.
Folk Recipes:	Traditionally milk & nut is mixed with juices of plant to make a cold drink "Tandai" which is considered as stimulant & produce a pleasant excitement.
Animal Use:	Leaves are grinded & mixed with salt and used twice a week for uterine prolapsed after giving birth.
Botanical Name:	<i>Capsella bursa pastoris</i> (L.) Medik. (Plate No: 29)
Family Name:	Brassicaceae
Vern. Names:	Bambesa
Habit:	Herb
Conservation status:	Least Concern

Part used:	Seeds & leaves
Collection method:	Picking, plucking,
Local Distribution:	China, India, Pakistan, Kashmir, Baluchistan, Quetta, Ziarat, Punjab, KP, Himalayas to Swat, Dir, Chitral, Shangla, Hazara Haripur, Kurram, Muree hills, Peshawar, Baltistan, Gilgit, Rawalpindi Distt., commonly found from plains to higher elevations on the waste places, edge of the field, hill slopes upto an altitude of about 3500 m.
Flowering period:	March-June
Medicinal Use:	Seeds of plant are astringent, diuretic & stimulant. It is also used in dropsy.
Folk Recipes:	Pastes of fresh leaves are taken with milk for diarrhea.
Botanical Name:	Capsicum annuum L.
Family Name:	Solanaceae
Vern. Names:	Marchakay
Habit:	Herb
Conservation status:	Cultivated
Part used:	Fruit
Collection method:	Picking
Local Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Swat, Dir, Shangla, Hazara, Peshawar, Rawalpindi Distt., Lahore, Kashmir, Poonch, Baltistan, widely cultivated throughout the country for their key utilization as vegetable & spices
Flowering period:	May-August
Medicinal Use:	Fruit is stimulant, carminative, digestive, appetizer & also used in common cold, whooping cough, dyspepsia.
Botanical Name:	Caralluma tuberculata N.E. Brown
Family Name:	Asclepiadaceae
Vern. Names:	Pamankay
Habit:	Succulent Herb
Conservation status:	Cultivated
Part used:	Succulent & juicy stem

Collection method:	Cutting
Local Distribution:	India, Pakistan, Baluchistan, Punjab, KP, Swat, Dir, Malakand Agency, Waziristan, Kurram Agency, Attock, Rawalpindi Distt., Gilgit, commonly found in cleft of rocks & stony rocky slopes upto an altitude of approximately 750-2300 m.
Flowering period:	Jan-June
Medicinal Use:	Juicy stem of plant is bitter tonic but it is commonly used as vegetable. Plant is carminative, febrifuge, stomachic & anti-diabetic. Plant is also used in rheumatism & high blood pressure.
Botanical Name:	<i>Celtis australis</i> L.
Family Name:	Ulmaceae
Vern. Names:	Tagha
Habit:	Tree
Conservation status:	Critically Endangered
Part used:	Fruit, leaves
Collection method:	Picking, plucking
Local Distribution:	Iran, India, Pakistan, Kashmir, Nepal, Himalayas Baluchistan, KP, Swat, Hazara, Abbotabad, Kohistan, Battagram, Shangla, Dir, Chitral, Murree, Gilgit, Kashmir. A deciduous shade tree commonly grow from plains to mountainous areas, prefer sandy soils with altitude of about 900 -2250 m
Flowering period:	March-May
Medicinal Use:	Plant is stomachic, colic, anthelmatic, & cooling agent. The fruit is edible & used for treatment of colic, amenorrhea, menstrual bleeding, allergy & skin problems.
Folk Recipes:	Decoction of fruit is used as remedy for amenorrhea, menstrual bleeding. & diarrhea
Botanical Name:	<i>Chenopodium album</i> L.
Family Name:	Chenopodiaceae
Vern. Names:	Sarmay
Habit:	Herb
Conservation status:	Least Concern

Part used:	Leaves & roots
Collection method:	Picking, digging
Local Distribution:	Pakistan, Kashmir, Baluchistan, Himalayas to Swat, Dir, Shangla, Chitral, Kafiristan, Hazara, Kohistan, Peshawar, Kohat, Parachinar, Rawalpindi Distt., Gilgit, Hunza, Astore, Karachi, commonly cultivated in the waste fields, roadside & on the hill slopes with altitude ranges of about 360-4330 m.
Flowering period:	Jan-September
Medicinal Use:	Plant is laxative, diuretic & anthelmintic. Roots are used for treatment of urinary & hepatic disorders.
Animal Use:	Plant is antispasmodic in case of livestock.
Botanical Name:	Cichorium intybus L. (Plate No: 19)
Family Name:	Asteraceae
Vern. Names:	Han
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Leaves & flowers
Collection method:	Plucking, picking
Local Distribution:	China, India, Pakistan, Kashmir, Taiwan, KP. Hindu Kush range, Swat, Dir, Shangla, Hazara, Battagram, Peshawar, Rawalpindi Distt., commonly found in the waste places & foothills upto altitude of approximately 1500 m.
Flowering period:	May-September
Medicinal Use:	Plant is used for treatment of Jaundice, hepatic disorders, fever & headache.
Folk Recipes:	Decoction of root is taken orally for curing of fever, jaundice & hepatic disorders. Leaves of plant is mixed with the juice of <i>Adiantum venustum</i> & mixture is then used as remedy for treatment of headache, jaundice, hepatic & sexual disorders.
Botanical Name:	Citrullus colocynthis (L.) Shard.
Family Name:	Cucurbitaceae
Vern. Names:	Kalkanday

Habit:	Herb
Conservation status:	Near Threatened
Part used:	Fruits
Collection method:	Picking
Local Distribution:	China, India, Pakistan, Nepal, Kashmir, Baluchistan, Sind, KP, Swat, Dir, Kohat, Bannu, D.G Khan, Quetta, Tharparkar Distt., Dadu, Karachi, mostly grow in sandy soil upto an altitude of about 1500 m.
Flowering period:	Jan-April
Medicinal Use:	Juice of fruit is purgative & also given in dropsy. Seeds are boiled & extract is used for Hematuria (bleeding in urine).
Folk Recipes:	Seeds of the plant are boiled & extract is used for Hematuria (bleeding in urine).
Animal Use:	Fruit of plant is administrated to livestock for treatment of intestinal disorders.
Botanical Name:	<i>Convolvulus arvensis</i> L. (Plate No: 37)
Family Name:	Convolvulaceae
Vern. Names:	Prewatai
Habit:	Climber
Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Digging, plucking, picking
Local Distribution:	China, Pakistan, India, Kashmir, Nepal, Sind, Baluchistan, Punjab, KP, Swat, Dir, Chitral, Shangla, Hazara, Peshawar University, , Dara Adam Khel, Kurram, Rawalpindi Distt., Gilgit, commonly found as a weed in the fields, along roadsides, from 600-2500 m.
Flowering period:	All year round
Medicinal Use:	Plant is laxative & purgative. Plant is applied in skin disorders & also used as antidandruff.
Folk Recipes:	The decoction of fresh leaves is used in hepatic disorders.
Animal Use:	In livestock it is used in urethral problems & helminthiasis.

Botanical Name:	Erigeron canadensis L. (Syn. Conyza canadensis (L.) Cronquist.)
Family Name:	Asteraceae
Vern. Names:	Mallooch
Habit:	Herb
Conservation status:	Least Concern
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, India, Pakistan, Kashmir, Taiwan, Swat, Dir, Buner, Shangla, Hazara, Kohistan, Battagram, Peshawar, commonly found in the waste, open places & roadside upto an altitude of about 2500 m.
Flowering period:	May-Nov.
Medicinal Use:	Leaves of plant are stimulant, astringent diuretic. Plant is also used in Diarrhea.
Botanical Name:	Coriandrum sativum L.
Family Name:	Apiaceae
Vern. Names:	Dhanya
Habit:	Herb
Conservation status:	Cultivated
Part used:	Leaves & Seeds
Collection method:	Plucking, picking
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Baluchistan, Quetta, Swat, Dir, Shangla, Hazara, Abbotabad, Khyber Agency, Rawalpindi Distt., Gilgit, commonly cultivated from plains to hilly areas upto an altitude of approximately 2700 m.
Flowering period:	March-June
Medicinal Use:	Mostly plant is used as condiment but it is aromatic, stimulant, carminative, digestive & flavoring agent. It is also useful remedy against piles & hypertension. Seeds are used as appetizer.

Folk Recipes: *Stellaria media* is fried in ghee and garlic with coriander to treat piles. Decoction of plant is useful remedy for colic, dyspepsia & bleeding piles.

Botanical Name: ***Cotinus coggyria* Scop. (Plate No: 14)**

Family Name: Anacardiaceae

Vern. Names: Chamyarae

Habit: Shrub

Conservation status: Vulnerable

Part used: Wood & leaves

Collection method: Cutting, picking

Local Distribution: Turkey, Afghanistan, China, India, Pakistan, Kashmir, Nepal, Baluchistan, KP, Hindu Kush Rang, Kurram Agency, Swat, Dir, Shangla, Hazara, Battagram, Muree, commonly found from plains to foothills upto an altitude of about 750-1600 m.

Flowering period: April-May

Medicinal Use: Wood of plant is antipyretic & ophthalmic.

Animal Use/Recipes: Leaves are given to cattle against liver fluke.

Botanical Name: ***Crataegus songarica* K. Koch. (Plate No: 77)**

Family Name: Rosaceae

Vern. Names: Changa/Tampasa

Habit: Tree

Conservation status: Critically Endangered

Part used: Fruits

Collection method: Picking

Local Distribution: Afghanistan, Kazakhstan, Iran, China, Pakistan, Kashmir, Baluchistan, KP, Hindu Kush Range, Swat, Dir, Shangla, Chitral, Kurram, Hazara, Battagram, Kohistan, Muree, Gilgit, commonly found on rocky hilly slopes along roadside upto an altitude of about 1300- 2700 m.

Flowering period: May

Medicinal Use: Berries are edible & considered as cardio tonic and used as remedy for hypertension, high blood pressure & blood circulation.

Botanical Name:	<i>Cucumis sativus</i> L.
Family Name:	Cucurbitaceae
Vern. Names:	Badrang
Habit:	Climber
Conservation status:	Cultivated
Part used:	Fruits
Collection method:	Picking
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Myanmar, Hindu Kush Range, KP, Swat, Dir, Shangla, Buner, Hazara, Chitral, Kurram Agency, Bannu District, commonly cultivated in mountain slopes & maize fields upto an altitude of about 700-2000 m.
Flowering period:	All year round
Medicinal Use:	Fruit of plant is cooling agent & used in jaundice & hepatic disorder. It is commonly used as salad.
Botanical Name:	<i>Cucurbita maxima</i> Duch. ex Lam.
Family Name:	Cucurbitaceae
Vern. Names:	Khog Kadoo
Habit:	Climber
Conservation status:	Cultivated
Part used:	Young shoots, leaves, fruits & seeds.
Collection method:	Plucking, Picking
Local Distribution:	China, India, Pakistan, Kashmir, Baluchistan, KP, Swat, Dir, Shangla, Buner, Kohistan, Bannu, Khyber Agency, Hazara, Abbotabad, Nathiagali, Peshawar, Rawalpindi Distt., commonly cultivated worldwide especially in India, Pakistan.
Fl. & Fr. period:	April-November
Medicinal Use:	Young shoots, leaves & fruit are frequently used as vegetable but are considered as good remedy for treatment of ulcer, Jaundice & digestive disorders. Seeds are used as anthelmintic.
Botanical Name:	<i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poir.
Family Name:	Cucurbitaceae
Vern. Names:	Gharangay Kadoo

Habit:	Climber
Conservation status:	Cultivated
Part used:	Young leaves, fruits & seeds.
Collection method:	Plucking, Picking
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Taiwan, Baluchistan, KP, Swat, Dir, Shangla, Buner, Hazara, Kohistan, Mansehra, Peshawar, Kohat, Karak, Khyber Agency, Rawalpindi Distt., frequently cultivated in Pakistan especially in rural areas & used as vegetables.
Fl. & Fr. period:	April-November
Medicinal Use:	Young leaves & fruit are used as vegetable but it is considered as excellent diet for patient suffering from Jaundice & hepatic disorders. Fruit is also used in heat & stomach problems.
Botanical Name:	Cuscuta reflexa Roxb.
Family Name:	Cuscutaceae
Vern. Names:	Zelai
Habit:	Parasitic Herb
Conservation status:	Near Threatened
Part used:	Whole plant
Collection method:	Plucking, cutting
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Myanmar, Sri Lanka, Baluchistan, Quetta, KP, Swat, Dir, Shangla, Hazara, Peshawar, Muree hills, Karachi, Bahawalpur, Gilgit, commonly found as parasitic herb on the <i>Duranta</i> , <i>Artemisia</i> , <i>Ziziphus</i> , <i>Spiraea</i> , <i>Salix</i> , <i>Viburnum</i> , upto an altitude of about 900-3300 m.
Flowering period:	Almost throughout the year
Medicinal Use:	Young Plant is antidiabetic, purgative, diuretic & anthelmintic.
Folk Recipes:	The plant is boiled in water and the juice extracted from the plant is then used as a remedy for blood purification, jaundice & diabetes.

Botanical Name:	<i>Daphne mucronata</i> Royle (Plate No: 89)
Family Name:	Thymelaeaceae
Vern. Names:	Liaghonai
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Leaves, fruit
Collection method:	Plucking, Picking
Local Distribution:	Iran, Afghanistan, Pakistan, Kashmir, Baluchistan, Ziarat hills, Quetta, KP Swat, Dir, Shangla, Chitral, , Hazara, Kohistan, Battagram, Kaghan, Hazara, Kaghan, Abbotabad, Kurram, Khyber Agency, Kohat, Poonch. A saprophytic shrub commonly found from plains to mountains upto an altitude of about 800-3000 m.
Flowering period:	April-September
Medicinal Use:	Plant is anthelmintic, antirheumatic & also used in gonorrhea.
Folk Recipes:	Leaves & fruit poultice is applied for curing of joint pain & rheumatism.
Botanical Name:	<i>Datura innoxia</i> Mill.
Family Name:	Solanaceae
Vern. Names:	Batora/Dhatora
Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Leaves, seeds
Collection method:	Plucking, Picking
Local Distribution:	Afghanistan, India, Pakistan, Kashmir, Baluchistan, Quetta, KP, Swat, Dir, Shangla, Hazara, Malakand Agency, Waziristan, Peshawar, Kohat, Rawalpindi Distt., Islamabad, Sialkot, commonly found in the waste & weedy places along roadside upto altitude of about 1600 m.
Flowering period:	May-Oct.
Medicinal Use:	Plant is used as narcotic, antiseptic, antipyretic & sedative. Seeds are narcotic & antipyretic. Dried seeds & leaves are used for

curing asthma. Whole plant is toxic & cause coma & even death if overdosed by human or livestock

Folk Recipes:	Extract of leaves is used in headache, toothache & epilepsy.
Botanical Name:	<i>Datura stramonium</i> L. (Plate No: 88)
Family Name:	Solanaceae
Vern. Names:	Harhanda/Datora
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Leaves, seeds
Collection method:	Plucking, Picking
Local Distribution:	Afghanistan, India, Pakistan, Kashmir, Nepal, Taiwan, Baluchistan, Qila Abdullah, Swat, Chitral, Dir, Shangla, Hazara, Battagram, Abbotabad, Khyber Agency, Khyber Agency, Islamabad, commonly found in the waste places, weedy places between altitudinal ranges of about 900-2300 m.
Flowering period:	June-July
Medicinal Use:	Leaves & seeds of plants are antipyretic, narcotic, sedative, also used in earaches & skin problems.
Folk Recipes:	Juice of the flower is used as eardrops to alleviate earaches. Poultice of flowers is applied on skin to relieve the pain. Seeds are used for cough & cold.
Animal Use:	Plant is traditionally used for heating of animal.
Botanical Name:	<i>Diospyros kaki</i> L. (Plate No: 41)
Family Name:	Ebenaceae
Vern. Names:	Ziar Amlook
Habit:	Tree
Conservation status:	Cultivated
Part used:	Fruits
Collection method:	Picking
Local Distribution:	Originating from Japan but cultivated throughout Eastern Asia, Japan, China, Nepal, Taiwan, KP, Swat, Dir, Shangla, Hazara,

Battagram, Peshawar, widely cultivated species used as commercial crop upto an altitude of about 2000 m.

Flowering period:	May
Medicinal Use:	It is one of the key commercial crop of the area & used as laxative.
Botanical Name:	Diospyros lotus L. (Plate No: 41)
Family Name:	Ebenaceae
Vern. Names:	Tor Amlook
Habit:	Tree
Conservation status:	Endangered
Part used:	Fruits
Collection method:	Picking
Local Distribution:	Afghanistan, China, Japan, Pakistan, India, Kashmir, throughout Himalayas, Swat, Shangla, Chitral, Dir, Buner, Hazara, Kohistan, Kurram Parachinar, Murree, & Kashmir. Mostly grow upto an altitude of about 1000 to 2500 m
Flowering period:	May-June
Medicinal Use:	Fruit is purgative, carminative & cause flatulence.
Folk Recipes:	The decoction of ripened fruit is boiled in milk and taken as remedy for curing of dysentery & constipation.
Botanical Name:	Dodonaea viscosa (L.) Jacq.
Family Name:	Sapindaceae
Vern. Names:	Ghwaraskay
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, India, West Pakistan, Kashmir, Taiwan, Baluchistan, Sind, Quetta, KP, Swat, Dir, Shangla, Hazara, Battagram, Abbotabad, Peshawar, Rawalpindi Distt., commonly found in the lower elevations on the low hilly areas, forest margins upto altitude of about 2000 m.
Flowering period:	Jan-March

Medicinal Use:	Leaves of plant are antirheumatic, antispasmodic, & astringent. It is also used for treatment of skin problems, wounds, swellings & burns.
Animal Use/Recipes:	Plant is used to as anthelmintic in livestock.
Botanical Name:	Echinops griffithianus Boiss.
Family Name:	Asteraceae
Vern. Names:	Ghwand Saray
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Stem & Leaves
Collection method:	Cutting, Plucking
Local Distribution:	Afghanistan, Pakistan, Kashmir, Baluchistan, Quetta, KP, Swat, Shangla, Waziristan, common weed of waste places & cultivated fields upto 1600 m.
Flowering period:	March-August
Medicinal Use:	Stem & leaves of plant are aphrodisiac & diuretic.
Botanical Name:	Elaeagnus umbellata Thunb. (Plate No: 42)
Family Name:	Elaeagnaceae
Vern. Names:	Ghanam Ranga
Habit:	Shrub
Conservation status:	Endangered
Part used:	Flowers, Fruits, Seeds
Collection method:	Plucking, Picking
Local Distribution:	China, Assam, from Himalaya to Afghanistan, Pakistan, Kashmir India, Bhutan, KP, Swat, Dir, Chitral, Shangla, Buner, Kurram, Hazara, Kaghan, Muree, Gilgit, Battagram, Kashmir, usually grow in dry sunny places upto an altitude of about 1000-3300 m
Flowering period:	May-June
Medicinal Use:	Plant is heart tonic, stimulant & used in cough & chest problems.
Folk Recipes:	Decoction of flowers is used twice a day to cure heart diseases. Decoction of leaves is effective against cough.

Botanical Name:	Eucalyptus globules Labill.
Family Name:	Myrtaceae
Vern. Names:	Lachi
Habit:	Tree
Conservation status:	Cultivated
Part used:	Fruit, leaves
Collection method:	Picking, Plucking
Local Distribution:	Originating from Japan but cultivated throughout Eastern Asia, China, India, Pakistan, Kashmir, Taiwan, Punjab, KP, Swat, Dir, Shangla, Hazara, Peshawar, Rawalpindi Distt., Islamabad, commonly cultivated along roadside & waste places upto 2000 m.
Flowering period:	December-May
Medicinal Use:	Plant is antiseptic. Leaves are locally used for flu, asthma & chest infection.
Botanical Name:	Euphorbia helioscopia L. (Plate No: 42)
Family Name:	Euphorbiaceae
Vern. Names:	Mandanrhro/Prewatka
Habit:	Herb
Conservation status:	Least Concern
Part used:	Shoots & roots
Collection method:	Plucking, digging
Local Distribution:	China, India, Pakistan, Kashmir, Punjab, KP, Swat, Chitral, Dir, Shangla, Hazara, Kohistan, Battagram Peshawar, Khyber Agency, Rawalpindi Distt., Murree, Quetta, Turbat, Lahore, commonly found in the sandy soils, along roadsides & waste places upto an altitude of about 200-2000 m.
Fl. & Fr. period:	Jan-July
Medicinal Use:	Locally it is considered as poisonous plant but local traditional herbalists used it as laxative, cathartic, anthelmintic, and also for constipation. Latex is toxic, irritant & cause swelling on the skin. Juice is applied over skin eruption
Animal Use/Recipes:	In cattle it s used for constipation.

Botanical Name:	<i>Euphorbia indica</i> Lam.
Family Name:	Euphorbiaceae
Vern. Names:	Jangali Spalmai
Habit:	Herb
Conservation status:	Least Concern
Part used:	Milky latex
Collection method:	Picking
Local Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Mansehra, Nathiagali, Waziristan, Tirah, Hazara, Peshawar, Islamabad, Lahore, Hyderabad, Makran, Turbat, commonly grow in the waste places, cultivated fields, along roadside upto an altitude of about 1500 m.
Fl. & Fr. period:	June-Jan.
Medicinal Use:	The milky juice is used for treating ringworm disease.
Botanical Name:	<i>Euphorbia prostrata</i> Ait.
Family Name:	Euphorbiaceae
Vern. Names:	Vermaga
Habit:	Herb
Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Picking, Plucking
Local Distribution:	Afghanistan, China, Pakistan, Kashmir, Assam, Swat, Chitral, Dir, Shangla, Battagram, Abbotabad, Mohamand Agency, Khyber Agency, Hazara, Hangu, Peshawar, Rawalpindi Distt., Lahore, Karachi, Thar Parker, Bagh, commonly found in the fields, along roadside from 520-1800 m.
Fl. & Fr. period:	April-Oct.
Medicinal Use:	The plants are used as remedy for skin ailments.
Folk Recipes:	The paste of plant is applied for skin problems. The decoction of plant is also used for skin diseases & especially treating ring worms.

Botanical Name:	<i>Euphorbia wallichii</i> Hook.f. (Plate No: 43)
Family Name:	Euphorbiaceae
Vern. Names:	Shangla
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Latex, shoots
Collection method:	Picking, Plucking
Local Distribution:	Afghanistan, China, Pakistan, Nepal. Kashmir, Swat, Chitral, Dir, Shangla, Kohistan, Hazara, Battagram Peshawar, Waziristan, Parachinar, Rawalpindi Distt., Jehlum Valley, Kashmir, mostly growing at higher altitude, on the open meadows & grassy hill slopes from 2440-3600 m.
Flowering period:	May-August
Medicinal Use:	Plant is poisonous but local Hakeems used it as anthelmintic & laxative agents who also cause acute diarrhea & dysentery. Dried leaves & seeds are used for treating bowel problems in children.
Animal Use/Recipes:	The decoction of plant is considered as strong cathartic agent in livestock.
Botanical Name:	<i>Ficus carica</i> L. (Plate No: 54)
Family Name:	Moraceae
Vern. Names:	Inzar
Habit:	Tree
Conservation status:	Vulnerable
Part used:	Fruit & leaves
Collection method:	Picking, Plucking
Local Distribution:	Afghanistan, Iran, China, India, Pakistan, Kashmir, KP, Swat, Dir, Shangla, Buner, Malakand Agency, Kurram, Kohistan, Battagram, Hazara, Peshawar, , commonly found in the waste places, margins of cultivated fields, along roadside upto 1500 m.
Fl. & Fr. period:	April-December
Medicinal Use:	Fruit is considered as purgative, laxative, stomachic, demulcent, aphrodisiac & antipyretic. It is also used in urinary disorders, piles

and constipation. Leaves are used in treatment of jaundice. Latex is applied on the skin to take out spines lodged deeply in the flesh of skin.

Animal Use/Recipes: The paste of plant is applied for skin problems. The decoction of plant is also used for skin diseases & especially treating ring worms.

Botanical Name: **Ficus palmata** Forsk.

Family Name: Moraceae

Vern. Names: Inzar

Habit: Tree

Conservation status: Vulnerable

Part used: Fruit

Collection method: Picking

Local Distribution: Afghanistan, Iran, China, India, Pakistan, Kashmir, Baluchistan, Punjab, KP, Swat, Chitral, Dir, Shangla, Kohistan, Battagram, Abbotabad, Hazara, Mardan, Peshawar, Rawalpindi Distt., Zhob, Distt., Gilgit, commonly found in the on dry hill slopes, along roadside upto an altitude of about 2500 m.

Fl. & Fr. period: May-November

Medicinal Use: Fruit is laxative, demulcent, carminative & emollient. Fruit is also used for constipation, piles & dysentery. Milky latex is used for removal of spine from skin.

Folk Recipes: Latex of plant is applied on the skin to take out spines lodged deeply in the flesh of skin.

Botanical Name: **Fumaria indica** (Haukskn.) Pugsley

Family Name: Fumariaceae

Vern. Names: Papra

Habit: Herb

Conservation status: Least Concern

Part used: Whole plant

Collection method: Picking, Plucking

Local Distribution:	Afghanistan, India, Pakistan, Kashmir, Nepal, Baluchestan, Quetta, Ziarat, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Abbotabad, Peshawar, Rawalpindi Distt., Hyderabad, Karachi, Bagh, Kashmir, commonly found as weed in the waste places, near cultivated fields, along roadside upto 2400 m.
Flowering period:	March-June
Medicinal Use:	Plant is anthelmintic, diuretic, stomachic, antipyretic & also used as remedy for Jaundice, blood purification, constipation & dyspepsia.
Folk Recipes:	Decoction of plant is used in blood purification & constipation. The fresh plant is crushed, soaked in water, filtered & the extract is then used for jaundice. Juice of plant is used in stomach problems & fever.
Animal Use/Recipes:	Plant is antipyretic & coolant. Decoction of plant is used to treat fever in cattle.
Botanical Name:	Gentiana kurroo Royle. Syn. Gentianodes Kurroo (Royle) Omer, Ali & Qaiser
Family Name:	Gentianaceae
Vern. Names:	Sitara Bootey
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Root
Collection method:	Digging
Local Distribution:	Indian Himalaya, Pakistan, Kashmir Hinukush Range, , Swat, Dir, Shangla, Hazara, Kahgan, Balakot, Peshawar, Kurram, Waziristan, Sulaiman mountains, Rawalpindi Distt., Murree hills, Kashmir, Kotli, commonly grow at higher altitude near sub alpine area on hill slopes & pasture grassland upto an altitude of about 2700 m.
Flowering period:	Sept-Nov.
Medicinal Use:	Root is stomachic, astringent, antispasmodic, tonic & febrifuge.
Folk Recipes:	Dried root are powdered and used with Desi ghee as stomachic.

Animal Use/Recipes:	Plant is used as tonic in horses.
Botanical Name:	<i>Geranium collinum</i> Steph .ex Willd.
Family Name:	Geraniaceae
Vern. Names:	Sra Zela
Habit:	Herb
Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Digging, plucking
Local Distribution:	Turkey, Iran, Russia, India, Pakistan, Kashmir, Nepal, North West Himalaya, Hindu Kush Range, Swat, Chitral, Tirich Mir, Dir, Shangla, Battagram, Hazara, Gilgit, Baltistan, Kashmir, Quetta, usually growing at higher altitude near alpine & subalpine meadows, prefer damp places from 2200-4800 m.
Flowering period:	July-August
Medicinal Use:	Plant is antipyretic & tonic.
Folk Recipes:	Decoction of plant is used for curing fever, cough & cold.
Botanical Name:	<i>Geranium wallichianum</i> D.Don ex Sweet (Plate No: 46)
Family Name:	Geraniaceae
Vern. Names:	Sra Zela
Habit:	Herb
Conservation status:	Endangered
Part used:	Root
Collection method:	Digging
Local Distribution:	Afghanistan, India, Pakistan, Kashmir, Nepal, Swat, Dir, Chitral, Shangla, Kohistan, Battagram, Hazara, Dunga Gali, Shogran, Khyber Agency, Parachinar, Rawalpindi Distt. Distt., Kala Bagh, Kashmir, commonly found from foothills to subalpine meadows upto altitude of about 1600-3400 m.
Flowering period:	July-September
Medicinal Use:	Plant is antipyretic & astringent. Roots are used in cough, cold & kidney disorders.

Folk Recipes:	Dried roots are mixed with egg, fried in cow, s ghee and used as useful remedy for rheumatism & backache.
Botanical Name:	Hedera nepalensis K. Koch. (Plate No: 16)
Family Name:	Araliaceae
Vern. Names:	Palool/Zelai
Habit:	Herb
Conservation status:	Least Concern
Part used:	Leaves & fruites
Collection method:	Plucking & picking
Local Distribution:	Himalaya, Afghanistan, India, Pakistan, Kashmir, Nepal, Swat, Dir, Chitral, Shangla, Kohistan, Hazara, Abbotabad, Kaghan, Rawalpindi Distt., Murree, Kurram, Muzaffarabad, Kashmir, commonly grow in the temperate forest, climbs on the <i>Cedrus</i> , <i>Abies</i> , <i>Pinus</i> trunks by its aerial roots from 1000- 3000 m.
Flowering period:	October-April
Medicinal Use:	The leaves are stimulant & used in Diabetes & blood pressure. Decoction of the leaves is used for abdominal pain & urinary troubles. Leaves extract is used for curing diabetes. Fruits are purgative
Folk Recipes:	The plant is crushed into powdered form & boiled with milk & used early in the morning for treatment of diabetes.
Animal Use:	Extract of the leaves is used to remove leeches from the nose of cattle.
Botanical Name:	Helianthus annuus L.
Family Name:	Asteraceae
Vern. Names:	Nwarparast
Habit:	Herb
Conservation status:	Least Concern
Part used:	Seeds
Collection method:	Picking
Local Distribution:	China, India, Pakistan, Kashmir, Taiwan, Hindu Kush Range, Swat, Dir, Chitral, Shangla, Hazara, Mansehra, Kurram Agency,

Khyber Agency, Kashmir, commonly found in exposed places along roadsides & also widely cultivated upto an altitude of about 3000 m.

Flowering period: July-September
Medicinal Use: Seeds of plant are used as laxative & diuretic.
Botanical Name: **Hyoscyamus niger** L.
Family Name: Solanaceae
Vern. Names: Shamala/ Dewana bhang
Habit: Herb
Conservation status: Endangered
Part used: Leaves & Seeds
Collection method: Plucking & picking
Local Distribution: Iraq, Iran, Afghanistan, India, Pakistan, Kashmir, Nepal,

Himalayas, Swat, Chitral, Dir, Shangla, Hazara, Naran, Balakot, Baltistan, Gilgit, Astore, Muzaffarabad, Kashmir, commonly found at higher altitude along roadside upto an altitude of about 1900-3800 m.

Flowering period: June-July
Medicinal Use: Seeds of plant are narcotic, sedative & tonic. It is also use for respiratory problems & toothaches.
Folk Recipes: The seeds of plant are applied to the teeth to alleviate toothache
Botanical Name: **Hypericum perforatum** L.
Family Name: Guttiferae
Vern. Names: Ghra Shin Chay
Habit: Herb
Conservation status: Vulnerable
Part used: Stems & Leaves
Collection method: Cutting, Plucking
Local Distribution: Afghanistan, India, Pakistan, Kashmir, Nepal, Swat, Dir, Chitral, Shangla, Kohistan, Battagram, Hazara, Abbotabad, Kurram Valley, Parachinar, Murree hills, Gilgit, Astore Valley, Kashmir,

commonly grow in shady & open grassy places from altitudinal ranges of about 1200-3000 m.

Flowering period:	June-September
Medicinal Use:	Plant is analgesic, diuretic, anthelmintic, astringent & anti hypertensive.
Folk Recipes:	Locally green tea is prepared from the leaves which is considered as stimulant, analgesic, carminative & also used in cold.
Botanical Name:	Indigofera heterantha Well.ex Brandis (Plate No: 58)
Family Name:	Papilionaceae
Vern. Names:	Ghwareja
Habit:	Shrub
Conservation status:	Endangered
Part used:	Leaves & roots
Collection method:	Cutting, Digging
Local Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Nepal, Bhutan, Punjab, KP, Swat, Dir, Chitral, Drosh, Shangla, Kohistan, Battagram, commonly found from foothills to higher altitude on sandy & rocky places along roadside upto altitude of about 600-3300 m.
Flowering period:	May-July
Medicinal Use:	Leaves are used as remedy for abdominal pain & stomach disorders.
Folk Recipes:	Traditionally the powdered roots are taken with water twice a day for treatment of chest pain, headache & scabies.
Botanical Name:	Isodon rugosus (Wall. ex Benth.) Codd Syn. Plectranthus rugosus Wall. ex Benth. (Plate No: 48)
Family Name:	Lamiaceae
Vern. Names:	Sperkay
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Leaves
Collection method:	Picking

Local Distribution: SW China, Afghanistan, Bangladesh, Bhutan, India, Pakistan, Nepal, KP, Swat, Dir, Chitral, Shangla, Kohistan, Battagram, Hazara, Shogran Waziristan: Razmak, Kurram: Parachinar, Kohat, Kaghan, Gilgit, Kashmir, Usually growing from plains to higher altitude on the dry rocky slopes with altitudinal ranges of about 900-3000 m.

Flowering period: March-Oct.

Medicinal Use: Plant is aromatic & used as antiseptic & astringent.

Folk Recipes: Dried leaves are placed on the mouth to relieve toothaches & gum diseases. Decoction of leaves is antiseptic. A paste of leaves is used as poultice for healing of wounds on the skin.

Botanical Name: *Jasminum humile* L.

Family Name: Oleaceae

Vern. Names: Ziar Chambele

Habit: Shrub

Conservation status: Near Threatened

Part used: Leaves & roots

Collection method: Cutting, Digging

Local Distribution: Himalaya, Hindu Kush, Afghanistan, West China, India, Pakistan, Kashmir, Nepal, Taiwan, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Kaghan, Kurram, Waziristan, Peshawar, Rawalpindi Distt., Murree, commonly found in temperate forest along roadside from 1000- 3000 m.

Flowering period: April-June

Medicinal Use: Root is anthelmintic, diuretic & also used for treatment of ringworm.

Folk Recipes: Flowers are dried, powdered, boiled in water & used as remedy for jaundice & blood purification. Root decoction is used for curing ringworms.

Botanical Name: *Jasminum officinale* L.

Family Name: Oleaceae

Vern. Names: Spin Chambele

Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Leaves, flowers, & roots
Collection method:	Cutting, Picking, Digging
Local Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Nepal, Taiwan, Baluchistan, Quetta, Hindu Kush, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Nathia Gali, Kurram, Kaghan, Rawalpindi Distt., Murree hills, commonly found in temperate forest along roadside upto altitude of about 1100- 2800 m.
Flowering period:	May-July
Medicinal Use:	Root is diuretic & also used for used against ringworm. The leaves are analgesic, blood purifier & antipyretic. The flowers are diuretic, aphrodisiac, antispasmodic, antiseptic, also used in skin ailments, headache & mouth rashes.
Folk Recipes:	Juice extracted from flowers is used in skin ailments, headache & mouth rashes.
Animal Use:	Traditionally decoction of plant is administrated to livestock during cough & fever and also for increase milk production.
Botanical Name:	<i>Juglans regia</i> L. (Plate No: 47)
Family Name:	Juglandaceae
Vern. Names:	Ghuz
Habit:	Tree
Conservation status:	Critically Endangered
Part used:	Root bark, leaves & fruit
Collection method:	Cutting, Picking, Digging
Local Distribution:	Iran, Afghanistan, China, India, West Pakistan, Tibet, Kashmir, Nepal, Taiwan, Baluchistan, Quetta, KP, Swat, Chitral, Dir, Shangla, Kohistan, Battagram, Hazara, Changla Gali, Kurram: Parachinar, Kashmir, commonly grow in temperate forest on hilly slopes & roadside upto an altitude of 1000- 3300 m.
Flowering period:	Feb-April

Medicinal Use: Root bark (Locally called as Dandasa) is used for cleaning and sparkling teeth. The fruit are edible and used for increasing mental & sexual capacity. The unripe fruit is given to the children as vermifuge.

Folk Recipes: The decoction of internal membrane of fruit is used in treatment of urinary disorders. Decoction of leaves is used as vermicide & also taken as remedy for eczema. The ripened fruit is used as brain & sexual tonic.

Botanical Name: ***Justicia adhatoda* L.**

Family Name: Acanthaceae

Vern. Names: Baiker

Habit: Shrub

Conservation status: Vulnerable

Part used: Leaves

Collection method: Plucking

Local Distribution: China, India, Sri Lanka, Pakistan, Kashmir, Nepal, KP, Swat, Dir, Shangla, Battagram, Chakdara, Hazara, Peshawar, Kohat, University, Rawalpindi Distt., Mirpur, Jhelum, commonly found in lower foothills along roadsides upto 1500 m.

Flowering period: July-Oct.

Medicinal Use: Leaves are used in rheumatism, bronchitis, cough, swelling, snakebite, expectorant, ophthalmic and eye diseases.

Folk Recipes: The leaves are grinded into powdered form and are used in cough, bronchitis, rheumatism and expectorant. Locally the leaves are used for treatment of swelling. The leaves are heated and paste on the swelling & acne to release pus.

Animal Use: Leaves of plant is anthelmintic agent & also used for treatment of dysentery in livestock.

Botanical Name: ***Lathyrus aphaca* L. (Plate No: 58)**

Family Name: Papilionaceae

Vern. Names: Kurkamanay

Habit: Herb

Conservation status:	Near Threatened
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Swat, Chitral: Drosh, Dir, Shangla, Battagram, Hazara, Peshawar, Rawalpindi Distt., Lahore, Karachi, commonly found at lower altitude in shady places & cultivated fields upto 1600 m.
Flowering period:	Feb-Aug.
Medicinal Use:	Traditionally decoction of seeds is used for healing of wounds.
Folk Recipes:	The leaves are grinded into powdered form and are used in cough, bronchitis, rheumatism and expectorant. Locally the leaves are used for treatment of swelling. The leaves are heated and paste on the swelling & acne to release pus.
Animal Use/Recipes:	Dried roots are mixed wheat flour & given to the livestock in bolus form for curing various body infections.
Botanical Name:	Luffa cylindrica (L.) Roem.
Family Name:	Cucurbitaceae
Vern. Names:	Kurkamanay
Habit:	Herb
Conservation status:	Cultivated
Part used:	Fruit
Collection method:	Picking
Local Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Nepal, Taiwan, Sind, Baluchistan, Loralai, KP. Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Peshawar, Kashmir, Jehlum, Karachi. Widely cultivated for its fruit which is used as vegetables, upto altitude of about 1700 m.
Flowering period:	April-Oct.
Medicinal Use:	Fruits are used as vegetable but considered as good remedy for ulcer & stomach problems.
Botanical Name:	Malus pumila Mill.
Family Name:	Rosaceae

Vern. Names:	Zangali Manra
Habit:	Tree
Conservation status:	Near Threatened
Part used:	Fruit
Collection method:	Picking
Local Distribution:	Afghanistan, S.W China, Bhutan, India, Pakistan, Kashmir, Nepal, Swat, Chitral, Dir, Shangla, Buner, Kohistan, Battagram, Hazara, Kurram, Khyber Agency, Peshawar, Kohat, Bannu, frequently cultivated for its delicious fruits upto an altitude of about 2500 m.
Flowering period:	May
Medicinal Use:	Fruit is expectorant, purgative, antispasmodic & also considered as heart tonic. Fruit is also used to control cholesterol level.
Botanical Name:	Melia azedarach L.
Family Name:	Meliaceae
Vern. Names:	Tora Bekyana/Shandai
Habit:	Tree
Conservation status:	Near Threatened
Part used:	Whole Plant
Collection method:	Plucking, picking, digging
Local Distribution:	Iran, China, India, Burma, Pakistan, Kashmir, Bhutan, Nepal, West Himalays, Baluchistan, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Peshawar, Rawalpindi Distt., Karachi, commonly found from plain areas to foothills along roadside upto 1700 m.
Flowering period:	March-May
Medicinal Use:	Plant is anthelmintic & traditionally used as remedy for allergy, rheumatism, diabetes, hypertension & jaundice. Seeds are used in joints pain & high blood pressure. Seeds are used in rheumatism & high blood pressure. Bark is cathartic & emetic.
Folk Recipes:	Decoction of leaves is used in hysteria & Jaundice. Decoction of bark is used as remedy for allergy. Flowers applied as poultice.

	Ripened fruits are used as anti-diabetic. Dried fruits are crushed and used as carminative & antipyretic.
Animal Use:	Plant is anthelmintic. Leaves & young branches are also given to livestock in gas trouble. Leaves with wheat flour are traditionally administered to livestock as anthelmintic.
Botanical Name:	Momordica charantia L.
Family Name:	Cucurbitaceae
Vern. Names:	Karela
Habit:	Climber
Conservation status:	Cultivated
Part used:	Fruit
Collection method:	Picking
Local Distribution:	Afghanistan, China, India, Pakistan, Taiwan,, Nepal, Punjab: Sarghoda, Khoshab, Swat, Dir, Shangla, Battagram, Hazara, Peshawar, Rawalpindi Distt., widely cultivated for its fruit during summer season which is used as vegetable upto an altitude of about 2100 m.
Flowering period:	April-July
Medicinal Use:	Fruit of plant is commonly used as vegetable but it is tonic, antidiabetic, antipyretic, carminative & expectorant.
Folk Recipes:	Juice of fruit is used as remedy for treatment of diabetes & jaundice.
Animal Use:	Fruits are boiled and taken as remedy for swelling in teat & udders.
Botanical Name:	Mentha longifolia (L.) Huds.
Family Name:	Lamiaceae
Vern. Names:	Vallenay
Habit:	Herb
Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Picking, Cutting, Digging
Local Distribution:	Hindu Kush, Afghanistan, China, India, Pakistan, Kashmir, Nepal, Baluchistan: Quetta, Kalat, Ziarat, KP, Chitral, Kurram,

	Parachinar, Swat, Dir, Shangla, Battagram, Hazara, Kagahn, Naran, commonly found from foothills to higher altitude on the sandy soil along watercourses with altitude of about 1200-3300 m.
Flowering period:	May-Nov.
Medicinal Use:	Plant is stomachic, carminative, stimulant & anti-rheumatic. Dried leaves are used in diarrhea, dysentery, abdominal pain, Tonsilites & gastric problems.
Folk Recipes:	Decoction of leaves is used in cough, vomiting & diarrhea. Powdered leaves are also taken with boiled egg for Tonsilites. Rice is cooked with leaves of <i>Mentha longifolia</i> for diarrhea.
Animal Use:	Plant is used for gastro intestinal disorders in livestock.
Botanical Name:	<i>Mentha spicata</i> L. (Plate No: 49)
Family Name:	Lamiaceae
Vern. Names:	Podina
Habit:	Herb
Conservation status:	Data Deficient
Part used:	Leaves & Stems
Collection method:	Plucking, Cutting
Local Distribution:	Russia, Afghanistan, China, India, Pakistan, Kashmir, Nepal, KP, Swat, Dir, Chakdara, Shangla, Kohistan, Battagram, Kurram Agency, Parachinar, Hazara, Peshawar, Kashmir, frequently cultivated species from plains to higher altitude throughout Pakistan especially KP upto an altitude of about 2700 m.
Flowering period:	July-Sept.
Medicinal Use:	Plant is carminative, stimulant, refrigerant and used in dyspepsia, vomiting, dysentery, stomachache and other digestive problems.
Folk Recipes:	The powdered of plant is mixed with sugar & taken with water early in the morning before breakfast to control vomiting. Decoction of leaves is used as mouth wash.
Botanical Name:	<i>Micromeria biflora</i> Buch.
Family Name:	Lamiaceae
Vern. Names:	Naray Shamakay

Habit:	Herb
Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Plucking, Cutting
Local Distribution:	East Afghanistan, Bhutan, China, North West India, Pakistan, Kashmir, Nepal, KP, Chitral, Swat, Dir, Shangla, Malakand, Hazara, Mansehra, Kurram, Parachinar, Peshawar, Kohat, Rawalpindi Distt., Murree hills, Kashmir, mostly growing in a wide variety of habitats ranging from plains to 2400 m.
Flowering period:	Year round
Medicinal Use:	Plant is antiseptic & used in cold flu & fever. Plant is also used in toothache, mouth wash & gum disease.
Folk Recipes:	A paste of plant is used as poultice for external wounds.
Botanical Name:	Mirabilis jalapa L. (Plate No: 55)
Family Name:	Nyctaginaceae
Vern. Names:	Gule bada
Habit:	Herb
Conservation status:	Least Concern
Part used:	Leaves
Collection method:	Plucking, Cutting
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Baluchistan, Quetta, Swat, Dir, Shangla, Battagram, Hazara, Abbotabad, Haripur, Peshawar, Kohat, Rawalpindi Distt., widely cultivated as ornamental & also used in medicine, recorded in waste places upto 1800 m.
Flowering period:	Sep-Oct
Medicinal Use:	Plant is wound healer. Extract of Leaf is used for cleaning & healing of wound.
Animal Use/Recipes:	A hot paste of leaves is used to mature & resolve boils.
Botanical Name:	Morus alba L.
Family Name:	Moraceae
Vern. Names:	Spin toot
Habit:	Tree

Conservation status:	Endangered
Part used:	Leaves, fruits, wood
Collection method:	Plucking, Picking, Cutting
Local Distribution:	Hindu Kush, Afghanistan, China, India, Pakistan, Kashmir, Nepal, Taiwan, Baluchistan, Quetta, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Lahore, Hyderabad, Karachi, commonly found & cultivated from plains to mountains along roadside upto an altitude of about 3500 m.
Flowering period:	April-September
Medicinal Use:	Leaves are emollient, anthelmintic, refrigerant & astringent. Leaves are also used for sore throat infection. Fruit is laxative & purgative. Bark is used in cough & fever.
Botanical Name:	Morus nigra L.
Family Name:	Moraceae
Vern. Names:	Tor toot
Habit:	Tree
Conservation status:	Near Threatened
Part used:	Leaves, fruits, wood
Collection method:	Plucking, Picking, Cutting
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Myanmar, Hindu Kush, KP, Swat, Chitral, Dir, Buner, Shangla, Kohistan, Battagram, Hazara, Mansehra, Peshawar, Sawabi, Gilgit, commonly found from plains to hill slopes upto an altitude of about 2200 m.
Flowering period:	March-July
Medicinal Use:	Leaves are emollient, refrigerant, vermicide, astringent. Fruit is laxative & purgative. Bark is used in cough & fever.
Folk Recipes:	Decoction of leaves is used in throat infection.
Animal Use/Recipes:	Fruit is used for treatment of constipation & cough.
Botanical Name:	Myrsine africana L.
Family Name:	Myrsinaceae
Vern. Names:	Marurang
Habit:	Shrub

Conservation status:	Endangered
Part used:	Fruit, leaves
Collection method:	Picking, Plucking,
Local Distribution:	Hindu Kush, China, India, Pakistan, Kashmir, Nepal, Myanmar, KP, Swat, Dir, Shangla, Buner, Kohistan, Battagram, Hazara, Abbotabad, Rawalpindi Distt., Murree, Changla Gali, Kashmir, commonly found on open sunny places & hilly slopes along roadsides upto an altitude of about 900-3600 m.
Flowering period:	March-May
Medicinal Use:	Leaves are used in blood purification. Fruit is anthelmintic & also used for treatment of toothache & colic pain.
Folk Recipes:	A decoction of leaves is used in blood purification.
Animal Use/Recipes:	Fresh leaves are given to the cattle for indigestion.
Botanical Name:	Myrtus communis L.
Family Name:	Myrtaceae
Vern. Names:	Manro
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Fruit, leaves
Collection method:	Picking, Plucking
Local Distribution:	Afghanistan, China, India, Pakistan, Kashmir, Nepal, Baluchistan, KP, Swat, Dir, Shangla, Battagram, Hazara, Kurram Agency, Malakand Agency, Peshawar University, commonly grow in lower foot hillsides at altitude ranges of about 900-1700 m.
Flowering period:	July-August
Medicinal Use:	Plant is carminative, expectorant, appetizer, antiseptic & stomachic.
Folk Recipes:	Leaves are boiled in water with sugar and its tea used as remedy for cough, bronchial disorders, abdominal pain & diarrhea.
Animal Use/Recipes:	A decoction of leaves is given to the cattle for treatment of diarrhea.

Botanical Name:	<i>Narcissus tazetta</i> L. (Plate No: 13)
Family Name:	Amaryllidaceae
Vern. Names:	Gwale Nargis
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Roots & whole plant
Collection method:	Plucking, Digging
Local Distribution:	It is a widespread species & now become naturalized in Afghanistan, China, India, Pakistan, Kashmir, Nepal, Himalayas, Baluchistan, KP, Swat, Buner, Dir, Shangla,, Battagram, Hazara, Malakand, commonly from plains to lower foot hills on sandy places, waste places with altitude of about 1200 m.
Flowering period:	March-April
Medicinal Use:	Juice of the plant is purgative & emetic and also used for blood purification & wound healing.
Folk Recipes:	The root is used as poultice for treatment of boils and other skin problems.
Botanical Name:	<i>Nerium oleander</i> L.
Family Name:	Apocynaceae
Vern. Names:	Ganderay
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Leaves, roots
Collection method:	Plucking, Digging
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Baluchistan, Quetta, Khuzdarr, KP, Swat, Dir, Shangla, Malakand, Battagram, Hazara, Peshawar, Kohat, Waziristan, Rawalpindi Distt., Karachi, commonly cultivated & now become naturalized at lower foothills in most parts of the Pakistan upto altitude of about 1700 m.
Flowering period:	April-Oct.

Medicinal Use:	Plant is poisonous so great care should be taken while using the plant materials. Leaves of plant are used in skin eruptions & other skin diseases. Leaves and roots are used in snake bites and also as insecticide.
Folk Recipes:	Decoction of leaves in paste form is applied externally on the skin eruptions & other skin diseases.
Botanical Name:	<i>Nicotiana tabacum</i> L.
Family Name:	Solanaceae
Vern. Names:	Tamako
Habit:	Herb
Conservation status:	Cultivated
Part used:	Leaves
Collection method:	Picking
Local Distribution:	China, India, Pakistan, Kashmir, Taiwan, KP, Swat, Hazara, Mansehra, Mardan, Sawabi, Charsada, Rawalpindi Distt., Attock, Mirpur, Kashmir, Gilgit. Frequently cultivated on commercial scale in most parts of the Pakistan, especially KP upto an altitude of about 2600 m.
Flowering period:	April-May
Medicinal Use:	Plant is nerves stimulant, antiseptic, narcotic, used in snuff & applied on the wound for its healing & also to stop bleeding.
Botanical Name:	<i>Ocimum basilicum</i> L. (Plate No: 50)
Family Name:	Lamiaceae
Vern. Names:	Kashmalay
Habit:	Herb
Conservation status:	Cultivated
Part used:	Leaves & seeds
Collection method:	Cutting, Picking
Local Distribution:	China, India, Pakistan, Kashmir, Taiwan, Baluchistan, Quetta, KP, Swat, Dir, Shangla, Hazara, Peshawar, Rawalpindi Distt., Las Bela, Karachi, widely cultivated as ornamental plant upto an altitude of about 1500 m.

Flowering period:	April-May
Medicinal Use:	Leaves are expectorant & also used in cold, flu & mouth sore infection.
Folk Recipes:	Leaves are chewed as remedy for cold, flu, mouth & tongue sore.
Botanical Name:	Olea ferruginea Wall. ex Aitch. Syn. Olea cupidata Wall ex G. Don
Family Name:	Oleaceae
Vern. Names:	Khona
Habit:	Tree
Conservation status:	Critically Endangered
Part used:	Leaves & seeds
Collection method:	Cutting, Picking
Local Distribution:	Afghanistan, India, Pakistan, Kashmir, Nepal, Baluchistan: Loralai, KP, Swat, Chitral, Dir, Shangla, Malakand, Tirah, Hazara, Peshawar University, Rawalpindi Distt., Usually growing at lower elevations from plains to foot hills, graveyards & considered as sacred tree from 500-2000 m.
Flowering period:	April-May
Medicinal Use:	Leaves are anthelmintic, antiseptic, antipyretic, astringent & diuretic. Leaves are used as painkiller to soothe toothaches & also as remedy for gum diseases. Fruit is used for treatment of diabetes.
Folk Recipes:	Decoction of leaves is used for treatment of toothaches, gum diseases & sore throat. Oil obtained from the seeds is used as rubefacient & used for treatment of rheumatism & joints pain.
Botanical Name:	Origanum vulgare L.
Family Name:	Lamiaceae
Vern. Names:	Shamakay
Habit:	Herb
Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Cutting, Picking

Local Distribution:	China, Pakistan, Kashmir, Nepal, Taiwan, KP, Swat, Chitral, Dir, Shangla, Malakand, Kohistan, Battagram, Hazara, Mansehra, Balakot, Rawalpindi Distt., Murree hills, Kashmir, growing from plains to higher altitude on grassland & hillsides with altitudinal ranges of about 600-4000 m.
Flowering period:	June-October
Medicinal Use:	Plant is diuretic, stomachic, carminative, antispasmodic & stimulant. Leaves & shoots are used as remedy for curing earache & toothache.
Folk Recipes:	Shoot is chewed for toothache.
Botanical Name:	Otostegia limbata (Benth.) Boiss. (Plate No: 51)
Family Name:	Lamiaceae
Vern. Names:	Spin Azghay
Habit:	Shrub
Conservation status:	Endangered
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, India, Pakistan, Kashmir, Taiwan, KP, Swat, Dir, Shangla, Hazara, Mansehra, Abbotabad, Peshawar, Bannu, Kohat, Kurram: Parachnar, , Rawalpindi Distt., Attock, Mianwali, Usually growing in the waste places & exposed rocky hill slopes with altitudinal ranges of about from 650-1900 m.
Flowering period:	April-May
Medicinal Use:	Plant is used in treatment of jaundice, hypertension, gum diseases & wounds.
Folk Recipes:	Recipes: Juice of leaves is used in gum diseases while dried leaves are used in Jaundice.
Botanical Name:	Oxalis corniculata L. (Plate No: 56)
Family Name:	Oxalidaceae
Vern. Names:	Zmake Tarukay
Habit:	Herb
Conservation status:	Least Concern

Part used:	Leaves, fruits, seeds
Collection method:	Plucking, Picking
Local Distribution:	Japan. China, India, Pakistan, Myanmar, Nepal, Taiwan, Baluchistan, Sind: Khairpur, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Sulaiman Ranges, Peshawar, Rawalpindi Distt., Jehlum Distt. A cosmopolitan species, growing in the waste places, fields, hilly slopes along roadsides up to an altitude of about 2700 m.
Flowering period:	March-Dec.
Medicinal Use:	Plant is vermifuge, coolant, antipyretic & used in stomach disorders. Leaves are also used as remedy for treatment of sensitive teeth.
Folk Recipes:	Decoction of plant is used in digestion, fever & dysentery. Fresh leaves are crushed, mixed with water & sugar for treatment of hepatic disorders & jaundice.
Animal Use/Recipes:	The plant is mixed with maize & fed to the cattle for treatment of diarrhea.
Botanical Name:	<i>Paeonia emodi</i> Wall.ex Royle (Plate No: 56)
Family Name:	Paeoniaceae
Vern. Names:	Mamekh
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Rhizome & seeds
Collection method:	Digging, Picking
Local Distribution:	East Afghanistan, North & North West Himalaya in India, Pakistan, Kashmir, KP, Swat, Chitral, Dir, Shangla, Buner, Kohistan, Battagram, Hazara, Kaghan, Shogran, Kashmir, Usually growing at higher altitude in exposed places upto an altitude of about 2200-3000 m.
Flowering period:	May-June

Medicinal Use:	Rhizome of plant is tonic, cathartic, antirheumatic, blood purifier & used in treatment of backbone aches, general body weakness, colic, dropsy & epilepsy. Seeds are purgative.
Folk Recipes:	Rhizome is boiled in milk and the extract is used in backbone aches & considered as powerful aphrodisiac & tonic. The powdered rhizome is mixed with Desi ghee & used twice a day after meal for general body weakness.
Animal Use/Recipes:	Rhizome is administrated to the livestock to increase milk production.
Botanical Name:	<i>Papaver somniferum</i> L. (Plate No: 57)
Family Name:	Papaveraceae
Vern. Names:	Qashqash/Apium
Habit:	Herb
Conservation status:	Cultivated
Part used:	Latex & seeds
Collection method:	Picking
Local Distribution:	Afghanistan, China, India, Pakistan, Myanmar, Kashmir, Thailand, KP, Swat, Dir, Shangla, Hazara, Haripur, Mardan, Rawalpindi Distt., Murree, Karachi University, widely cultivated species as source of morphine, heroine, papaverine & other alkaloids used in the medicine. Usually grow & cultivated from plains to foothills upto an altitude of about 1800 m.
Flowering period:	April-June
Medicinal Use:	Latex is used as anodyne, narcotics, sedative, expectorant & pain killer. Capsule & seeds is narcotic, tonic, used in cough & fever.
Folk Recipes:	A tea made from the seeds has traditionally used for treatment of cough, cold & fever.
Animal Use/Recipes:	Rhizome is administrated to the livestock to increase milk production.
Botanical Name:	<i>Periploca aphylla</i> Decne.
Family Name:	Asclepiadaceae
Vern. Names:	Barrha

Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Leaves, Milky latex
Collection method:	Plucking, Picking
Local Distribution:	Iraq, Iran, India, Pakistan, Kashmir, A shrub of the arid. Dry zones of west Punjab, Sind, Baluchistan, KP, Swat, Dir, Chitral, Shangla, Hazara, Peshawar, Waziristan: Miran Shah, Kurram Agency, Margala Rawalpindi, Loralai, Quetta, Dadu to Karachi Distt. Usually grow on the dry rocky hills & lopes upto an altitude of about 1800 m.
Flowering period:	March-May
Medicinal Use:	Milky juice of plant is laxative, antipyretic & antitumorous.
Folk Recipes:	Recipes: Milky juice of plant is used in curing fever. Milky Juicy extract of stem & fruit is applied on the skin as antitumor & also for curing swelling.
Animal Use/Recipes:	Stem latex of plant is used for treatment of dermatitis & skin infections against fungal diseases in livestock.
Botanical Name:	Persicaria barbata (L.) Hara
Family Name:	Polygonaceae
Vern. Names:	Pulpulak
Habit:	Herb
Conservation status:	Least Concern
Part used:	Seeds & Roots
Collection method:	Plucking, Picking
Local Distribution:	China, India, Pakistan, Kashmir, Taiwan, KP, Swat, Dir, Shangla, Hazara, Peshawar, Rawalpindi Distt., Usually found in the lower hills, graveyards & considered as sacred tree from 500-2000 m.
Flowering period:	April-May
Medicinal Use:	Seeds are used in colic. Root is refrigerant & astringent.
Botanical Name:	Pistacia chinensis subsp. integerrima (J. L. Stewart ex Brandis) Rech. f. (Plate No: 14)
Family Name:	Anacardiaceae

Vern. Names:	Shnae
Habit:	Tree
Conservation status:	Critically Endangered
Part used:	Whole plant
Collection method:	Cutting, Plucking, Picking
Local Distribution:	Afghanistan, Pakistan, Kashmir, North West Himalaya, KP, Swat, Dir, Chitral, Shangla, Kohistan, Battagram, Hazara, Peshawar, Kurram Agency, Gilgit. Usually grow on exposed hilly slopes & also cultivated in plain areas upto an altitude of about 500-2000 m.
Flowering period:	March-May
Medicinal Use:	The plant is antiseptic, refrigerant and used for Jaundice and Hepatitis. The plant is also good remedy for treatment of cough & asthma. Fruit of plant is tonic. Decoction of plant is used for jaundice & liver ailments.
Folk Recipes:	Leaves bark & fruit are crushed together and some water is added then filter extract is considered as useful remedy for Jaundice & Hepatitis.
Animal Use/Recipes:	Leaves are boiled in water, cooled & mixed with gur, used for treatment of dysentery.
Botanical Name:	<i>Plantago lanceolata</i> L. (Plate No: 62)
Family Name:	Plantaginaceae
Vern. Names:	Jabai
Habit:	Herb
Conservation status:	Least Concern
Part used:	Leaves. Seeds
Collection method:	Plucking, Picking
Local Distribution:	Japan, China, India, Pakistan, Kashmir, Nepal, Taiwan, KP, Swat, Dir, Chitral, Shangla, Hazara, Shogran, Abbotabad, Changla Gali, Peshawar, Rawalpindi Distt., Kashmir, Kurram Agency: Parachinar, Sarghoda. Usually grow on the mountain slopes along roadside, sandy & waste places upto an altitude of about 3000 m.
Flowering period:	June-July

Medicinal Use:	Leaves of plant are refrigerant, astringent, antiseptic.
Folk Recipes:	Leaves, s extract is used for wound healing, sores, inflammation & burn on the skin. Decoction of seeds & leaves are used for mouth bleeding, diarrhea, dysentery & stomach problems. Leaves are boiled in water, cooled & mixed with gur, used for treatment of dysentery.
Botanical Name:	Plantago major L. (Plate No: 63)
Family Name:	Plantaginaceae
Vern. Names:	Ghata Jabai
Habit:	Herb
Conservation status:	Least Concern
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, India, Pakistan, Nepal, Taiwan, KP, Swat, Chitral, Dir, Shangla, Hazara, Abbotabad, Nathia Gali, Parachinar, Murree, Gilgit, Kashmir, Hyderabad, Makran, Ziarat, usually grow in waste damp places & meadows upto an altitude of about 3000 m.
Flowering period:	Aug-Sep
Medicinal Use:	Leaves are used as antiseptic, astringent, refrigerant. Seeds are tonic & cooling agent. Plant is also used in stomach disorders.
Folk Recipes:	Leaves are warmed and mixed with flour of maize and applied externally on ruptured skin for wound healing. The seeds are mixed with honey and used in constipation. A decoction of root is used in treatment of diarrhea, dysentery, asthma & cold.
Animal Use/Recipes:	Leaves are boiled in water, cooled & mixed with gur, used for treatment of dysentery.
Botanical Name:	Platanus orientalis L.
Family Name:	Plantanaceae
Vern. Names:	Chinar
Habit:	Tree
Conservation status:	Vulnerable
Part used:	Bark

Collection method:	Cutting
Local Distribution:	Turkey, Iran, China, Afghanistan, , India, Pakistan, Nepal, Taiwan, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Hazara, Peshawar, Rawalpindi Distt., commonly grown & also cultivated for its shade & coolness along roadsides, sandy ground, sunny & moist places upto an elevation of about 1500 m.
Flowering period:	April-May
Medicinal Use:	Bark is used to relieve toothaches & also for curing of diarrhea.
Botanical Name:	Podophyllum emodi Wall. ex Royle.
Family Name:	Podophyllaceae
Vern. Names:	Kakora
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Rhizome & Seeds
Collection method:	Digging, Picking
Local Distribution:	W China, Tibet, Afghanistan, India, Pakistan, Nepal, Himalayas, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Shogran, Gilgit, Kashmir, Murree hills. Usually grow at higher altitude in grassy meadows with altitudinal ranges of about 2300-45000 m.
Flowering period:	April-May
Medicinal Use:	Rhizome is purgative, emetic, hepatic stimulant & used in hepatic disorders.
Folk Recipes:	The powdered rhizome is mixed with Desi ghee & used for backache & cancer. Powdered rhizome is hepatic stimulant & used to treat other liver diseases. Seeds are crushed into powdered & taken with glass of water as general body tonic.
Animal Use:	Rhizome is given to livestock for increase milk production
Botanical Name:	Polygonum aviculare L. (Plate No: 69)
Family Name:	Polygonaceae
Vern. Names:	Masloom/Knotweed
Habit:	Herb
Conservation status:	Least Concern

Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, India, Pakistan, Kashmir, Nepal, Taiwan, KP, Swat, Chitral, Dir, Shangla, Hazara, Mansehra, Peshawar, Charsadda, Kurram, Khyber Agency, Rawalpindi Distt. Sarghoda, Quetta, Kalat, Gilgit. A cosmopolitan weed, usually grow from plains to higher altitude in damp, moist ground & waste places upto an altitude of about 4200 m.
Flowering period:	April-May
Medicinal Use:	Leaves of plant are astringent, anthelmintic, diuretic & also used for curing diarrhea, dysentery & ulcers.
Folk Recipes:	Decoction of leaves is used orally for treatment of diarrhea, dysentery.
Botanical Name:	Portulaca oleracea L.
Family Name:	Aizoaceae
Vern. Names:	Warkharay
Habit:	Herb
Conservation status:	Data Deficient
Part used:	Whole plant
Collection method:	Picking, Plucking
Local Distribution:	China, India, Pakistan, Nepal, Taiwan, KP, Swat, Chitral, Dir, Shangla, Kohistan, Battagram, Hazara, Balakot, Kashmir, Jehlum valley, Sialkot Distt., Lahore, Quetta, Turbat, Karachi. Usually grow in moist waste places & cultivated fields as pot herbs upto 1500 m.
Flowering period:	Usually open in morning throughout the year.
Medicinal Use:	It is locally used as pot herb. Plant is considered as cooling agent and used as remedy for inflammation of the urinary system. It is also used as useful remedy for liver and kidney problems.
Botanical Name:	Primula denticulata Smith.
Family Name:	Primulaceae
Vern. Names:	Asli Mamera

Habit:	Herb
Conservation status:	Endangered
Part used:	Rhizome, Flowers
Collection method:	Digging, Picking
Local Distribution:	China, Afghanistan, Bhutan, India, Pakistan, Nepal, Myanmar, Kashmir, KP, Chitral, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Shogran, Thandiani, Changla, Kashmir, Muzaffarabad, Gilgit, Baltistan. Usually grow at higher altitude on the grassy slopes, moist meadows & open places with altitudinal ranges of about 1500-4100 m.
Flowering period:	May-July
Medicinal Use:	Rhizome is expectorant and considered as effective agent to clear phlegm. Flowers are used in ophthalmic diseases.
Folk Recipes:	Dried flowers are powdered & applied to the eye with small stick for curing eye ailments & to improve eye sight.
Botanical Name:	<i>Primula macrophylla</i> D.Don.
Family Name:	Primulaceae
Vern. Names:	Mamera
Habit:	Herb
Conservation status:	Vulnerable
Part used:	Rhizome, Flowers
Collection method:	Picking
Local Distribution:	China, Afghanistan, Bhutan, Sikkim, India, Pakistan, Nepal, Hindu Kush, Karakoram, KP, Swat, Chitral, Dir, Shangla, Kohistan, Battagram, Hazara, Kaghan, Astore, Baltistan, Gilgit. Usually growing at higher altitude of alpine zone on the grassy hill slopes, moist meadows, rock crevices with altitudinal ranges of 3200-4500 m.
Flowering period:	April-July
Medicinal Use:	Flowers are used as remedy in ophthalmic diseases.

Folk Recipes:	Flowers of plant is grinded into fine powdered and applied to the eyes with small stick for curing eye ailments & to improve eye sight.
Botanical Name:	<i>Prunus armeniaca</i> L.
Family Name:	Rosaceae
Vern. Names:	Khobanai
Habit:	Tree
Conservation status:	Vulnerable
Part used:	Fruits, Seeds
Collection method:	Picking
Local Distribution:	Afghanistan, India, Pakistan, Nepal, Baluchistan: Quetta, KP, Swat, Chitral, Buner, Dir, Shangla, Kohistan, Battagram, Hazara, Mansehra, Kaghan, Gilgit, Baltistan, Kashmir. A widely cultivated species; usually grow on mountain slopes, margins of cultivated fields & along roadsides upto 3500 m.
Fl. & Fr. period:	April-Aug.
Medicinal Use:	Fruit of plant is laxative, purgative, antipyretic & also as used refrigerant. Fruit is considered as tonic & also good remedy for constipation. Seeds are tonic, also used in piles & hepatic disorders. Gum obtained from stem of <i>Prunus armeniaca</i> is considered as anticancerous agent.
Botanical Name:	<i>Prunus domestica</i> L. (Plate No: 78)
Family Name:	Rosaceae
Vern. Names:	Alucha
Habit:	Tree
Conservation status:	Near threatened
Part used:	Fruits, Seeds
Collection method:	Picking
Local Distribution:	China, India, Pakistan, Baluchistan: Ziarat, Quetta, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Peshawar, Rawalpindi Distt.. A widely cultivated species, usually grow on mountainous areas along roadsides, margins of cultivated fields' upto 2000 m.

Fl. & Fr. period:	April-Sep.
Medicinal Use:	Fruit of <i>Prunus domestica</i> is laxative, refrigerant & also in constipation & stomach problems.
Botanical Name:	<i>Punica granatum</i> L.
Family Name:	Punicaceae
Vern. Names:	Anangoray
Habit:	Tree
Conservation status:	Vulnerable
Part used:	Fruits, seeds, leaves, stem, bark
Collection method:	Picking, Plucking, Cutting
Local Distribution:	China, India, Pakistan, Nepal, Taiwan, Baluchistan, KP, Swat, Chitral, Kurram Agency, Dir, Shangla, Kohistan, Battagram, Waziristan, Hazara, Abbotabad, Peshawar Forest Institute, Rawalpindi Distt., usually grow from plains to mountainous areas on dry exposed slopes with altitude of about 1000-2500 m.
Flowering period:	April-July
Medicinal Use:	Fresh juice of the fruit is coolant, blood purifier, used in jaundice, diarrhea & urinary disorders. The pulp of fruit & seed is cardiac stimulant & stomachic. Leaves are used in skin ailments & dysentery. Bark of stem & root is anthelmintic, antipyretic, expectorant & also used as mouthwash
Folk Recipes:	Epicarp of the fruit is locally known as “Nersawey” which is used for treatment of gonorrhea, urinary diseases, bronchial asthma & whooping cough.
Botanical Name:	<i>Pyrus pashia</i> L. (Plate No: 80)
Family Name:	Rosaceae
Vern. Names:	Tangai
Habit:	Tree
Conservation status:	Vulnerable
Part used:	Fruits
Collection method:	Picking

Local Distribution:	China, Bhutan, India, West Pakistan, Kashmir, Myanmar, Thailand, Nepal, KP, Swat, Dir, Malakand, Chitral, Buner, Shangla, Kohistan, Battagram, Hazara, Kaghan, Abbotabad, usually growing on mountainous areas along roadsides & margins of cultivated fields from 600-3000 m.
Fl. & Fr. period:	March-Sep.
Medicinal Use:	Fruit of plant is astringent, febrifuge & laxative.
Folk Recipes:	Juice of fruit is used as remedy for diarrhea.
Botanical Name:	<i>Quercus dilatata</i> Royle (Plate No: 44)
Family Name:	Fagaceae
Vern. Names:	Tor banj
Habit:	Tree
Conservation status:	Endangered
Part used:	Seeds & Nuts
Collection method:	Picking
Local Distribution:	Afghanistan, India, Pakistan, Temperate Himalayas from Kashmir to Nepal, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Kaghan, Nathia Gali, Khyber Agency: Sher Dara, Rawalpindi Distt., Kashmir, usually growing in temperate forest on hill slopes upto altitude of about 1600-2900 m.
Flowering period:	April-July
Medicinal Use:	Roasted seeds are diuretic, astringent & used for treating indigestion, diarrhea & asthma.
Folk Recipe:	The dried roasted fruit & seeds are used as anti-inflammatory in diarrhea and in urinary diseases.
Botanical Name:	<i>Quercus incana</i> Roxb. (Plate No: 44)
Family Name:	Fagaceae
Vern. Names:	Spin banj
Habit:	Tree
Conservation status:	Endangered
Part used:	Seeds & Nuts
Collection method:	Picking

Local Distribution:	India, Pakistan, Nepal, Burma, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Abbotabad, Rawalpindi Distt., Murree hills, Kashmir: Pooncch, commonly growing in temperate forest on hill slopes from 1000-2700 m.
Flowering period:	April-May
Medicinal Use:	Fruits are diuretic & astringent & used for curing dysuria, diarrhea & asthma.
Folk Recipes:	The wheat flour is mixed with powdered of the ripped fruit & fried with desi ghee of cow. It is locally called 'halva' considered as a remedy for weakness and general body tonic.
Botanical Name:	Quercus semecarpifolia Smith.
Family Name:	Fagaceae
Vern. Names:	Mer (Tarra)
Habit:	Tree
Conservation status:	Critically Endangered
Part used:	Nuts
Collection method:	Picking
Local Distribution:	Afghanistan, Himalayas, Tibet, China, India, Pakistan, Nepal, Bhutan, KP, Swat, Dir, Shangla, Chitral, Kohistan, Battagram, Hazara, Khyber Agency: Darpir, Kurram Agency: Parachinar, Kashmir, Changla Choti, usually growing at higher altitude on upper tree limit from 2600-4000 m.
Flowering period:	May-June
Medicinal Use:	The fruit of plant is used as diuretic & general body tonic.
Folk Recipes:	The powdered of the ripped fruit mixed with wheat flour & fried with cow, s ghee. Mixture is locally called Halva & used for general body tonic.
Botanical Name:	Ranunculus aquatilis L.
	Syn. Batrachium trichophyllum (Chaix) Van der Bosch.
Family Name:	Ranunculaceae
Vern. Names:	Gaghagha
Habit:	Herb

Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Picking
Local Distribution:	Russia, Kazakhstan, China, India, Pakistan, Nepal, KP, Swat, Dir, Shangla, Kohistan, Battagram, Hazara, Attock, usually growing in lakes, ponds & streams upto an altitude of about 3600 m.
Flowering period:	March-May
Medicinal Use:	Decoction of plant is used in fever & asthma.
Animal Use/Recipes:	Plant is used as purgative for cattle especially goats.
Botanical Name:	Raphanus sativus var. sativus
Family Name:	Brassicaceae
Vern. Names:	Moolay
Habit:	Herb
Conservation status:	Cultivated
Part used:	Young leaves, shoots, roots
Collection method:	Cutting, Digging
Local Distribution:	China, India, Pakistan, Nepal, Baluchistan: Quetta, SindL Khairpur, Karachi, KP, Swat, Dir, Shangla, Buner, Chitral, Kohistan, Battagram, Hazara, Kurram Agency, Khyber Agency, usually cultivated worldwide from plains to mountainous areas upto an altitude of about 2500 m.
Flowering period:	Jan-April
Medicinal Use:	Young leaves & roots are used as Salad which is carminative, digestive & diuretic. Leaves & roots are also used as remedy for urinary disorders, jaundice & piles.
Botanical Name:	Rheum australe D. Don
Family Name:	Polygonaceae
Vern. Names:	Chotial
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Roots
Collection method:	Digging

Local Distribution:	China, India, Pakistan, Nepal, KP, Swat, Dir, Shangla, Chitral, Kohistan, Battagram, Hazara, Gilgit, Astor, Kashmir: Muzaffarabad, usually found at higher altitude on grassy slopes with altitude of about 3200-4300 m.
Flowering period:	June-Sep
Medicinal Use:	Root is blood purifier, laxative & tonic, Root of plant is used in intestinal pain & skin problems.
Folk Recipes:	Traditionally root are powdered & taken with a glass of water twice a day for removal of kidney stone & other kidney infections. Dried powdered root is used in wound healing.
Botanical Name:	Ricinus communis L.
Family Name:	Euphorbiaceae
Vern. Names:	Harhanda
Habit:	Shrub
Conservation status:	Alien / Exotic
Part used:	Seeds, leaves
Collection method:	Picking, Plucking
Local Distribution:	China, India, Pakistan, Nepal, KP, Swat, Dir, Shangla, Battagram, Hazara, Kohat, Kurram, Waziristan, Kashmir: Jehlum, Rawalpindi, Quetta, Makran, Karachi. Usually cultivated from plains to sub himalayan tracts & occasionally naturalized in some places upto altitude of about 2400 m.
Flowering period:	April-Jan. (mosly in all season)
Medicinal Use:	Seed is sedative & antipyretic whereas seed oil is purgative & used in constipation. Leaves are purgative, narcotic & emetic.
Folk Recipes:	Traditionally a paste of leaves is applied as poultice for swelling.
Botanical Name:	Rosa moschata Herrm. (Syn. Rosa brunonii Lindl.) (Plate No: 80)
Family Name:	Rosaceae
Vern. Names:	Qurach/Zangali Gulab
Habit:	Shrub
Conservation status:	Near Threatened

Part used:	Flowers & leaves
Collection method:	Picking, Plucking
Local Distribution:	Afghanistan, China, India, Northern Pakistan, Kashmir, Bhutan, Nepal, KP, Chitral, Kurram, Swat, Dir, Chitral, Buner, Shangla, Kohistan, Battagram, Hazara, Abbotabad, Kaghan, Kurram Agency, Rawalpindi Distt. Murree hills, Kashmir, usually grow in the margins of forest & hilly slopes with altitude of about from 900-2600 m.
Flowering period:	June-July
Medicinal Use:	Flowers & leaves are used in stomach disorders, skin burning & eye diseases.
Folk Recipes:	Decoction of leaves is used early in the morning before breakfast for curing of stomach disorders.
Botanical Name:	<i>Rosa webbiana</i> Wall. ex Royle (Plate No: 81)
Family Name:	Rosaceae
Vern. Names:	Zangali gulab
Habit:	Shrub
Conservation status:	Endangered
Part used:	Fruits & leaves
Collection method:	Picking, Plucking
Local Distribution:	Afghanistan, China, Tajikistan, Kyrghystan, India, Pakistan, Nepal, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara, Kaghan valley, Gilgit, Hunza, Baltistan, Skardu, Kashmir, commonly grow in temperate forest at higher altitude on hilly slopes & grassy places from 1800-4500 m.
Flowering period:	June-Aug
Medicinal Use:	Leaves are stimulant. Flowers are astringent & antispasmodic.
Folk Recipes:	A fresh ripened fruit of <i>Rosa webbiana</i> is used as antispasmodic agent. Extract of flower is ophthalmic & used for treatment of eye diseases.

Botanical Name:	Rubus ellipticus Smith. (Plate No: 81)
Family Name:	Rosaceae
Vern. Names:	Goraj/Ziara karwara
Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Fruits, roots
Collection method:	Picking, Digging
Local Distribution:	China, India, Pakistan, Bhutan, Myanmar, Sri Lanka, Nepal, Thailand, Philippines, KP, Swat, Chitral, Kurram, Dir, Shangla, Buner, Kohistan, Battagram, Hazara, Abbotabad, Kaghan valley, Murree hills, Kashmir, mostly grow from plains to higher elevations on waste places & hill slopes along roadsides with altitude of about 900-2600 m.
Flowering period:	March-May
Medicinal Use:	Fruit is edible, tonic carminative, antipyretic & used as remedy for sore throat, cough, cold & kidney stone.
Folk Recipes:	Juice of fruit is used as remedy for treatment of cough, cold, colic & sore throat. Decoction of root is carminative & also used in diarrhea & dysentery.
Botanical Name:	Rubus fruticosus Hook.f. (Plate No: 82)
Family Name:	Rosaceae
Vern. Names:	Baganra/ karwara
Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Fruits
Collection method:	Picking, Digging
Local Distribution:	Afghanistan, India, Assam, Pakistan, Kashmir, KP, Swat, Buner, Chitral, Kurram, Dir, Shangla, Battagram, Hazara, Siran valley, Abbotabad, Malakand Agency, Kurram Agency, Parachinar, Rawalpindi Distt., Kashmir, usually on waste places, roadsides, hillsides & margins of forest with altitude of about 900-2000 m
Flowering period:	May-July

Medicinal Use:	Fruit are edible, used as carminative & stomachic. Leaves of plant are diuretic, antipyretic & also used in treatment of cough & diarrhea.
Folk Recipes:	Ripened fruit of <i>Rubus fruticosus</i> is eaten to control stomach problems & enhance digestion. A decoction of root is used for removal of kidney stone.
Botanical Name:	Rubus ulmifolius Schott. (Plate No: 82)
Family Name:	Rosaceae
Vern. Names:	Karwara
Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Fruits
Collection method:	Picking
Local Distribution:	Afghanistan, India, Kashmir, Pakistan, Himalayas, KP, Swat, Chitral, Kurram, Dir, Shangla, Buner, Kohistan, Battagram, Malakand: Batkhela, Hazara, Kaghan valley, Kashmir, commonly grow on waste places, hillsides & prefer sunny places from 900-2100 m.
Flowering period:	May-July
Medicinal Use:	Fruit is edible & considers as aphrodisiac, tonic, carminative & antipyretic.
Folk Recipes:	Fruit Juice is used as tonic, carminative & aphrodisiac.
Botanical Name:	Rumex dentatus L. (Plate No: 70)
Family Name:	Polygonaceae
Vern. Names:	Shalkhey
Habit:	Herb
Conservation status:	Least Concern
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	Russia, Afghanistan, India, Pakistan, Nepal, Taiwan, Kashmir: Sarinagar, Sind: Hyderabad, Baluchistan: Turbat, Quetta, Hindu Kush Range, Swat, Chitral, Kurram, Dir, Shangla, Kohistan,

Battagram, Hazara, Malakand Agency, Peshawar, Rawalpindi Distt.. Attock, Gilgit, Lahore, Usually found from plains to mountains on hilly slopes, prefer moist places upto an altitude of about 3000 m.

Flowering period: May-July

Medicinal Use: Leaves are used as astringent, diuretic & demulcent. It is also used to soothe effect of irritation caused by the *Urtica dioica*.

Folk Recipes: Leaves are used as poultice for wound healing.

Animal Use/Recipes: Leaves of *Rumex dentatus* are crushed into powdered & mixed with wheat for treatment of constipation in livestock.

Botanical Name: ***Rumex hastatus* D. Don. (Plate No: 70)**

Family Name: Polygonaceae

Vern. Names: Tarokey

Habit: Herb

Conservation status: Least Concern

Part used: Leaves & roots

Collection method: Plucking, Digging

Local Distribution: North East Afghanistan, SW China, India, Pakistan, Nepal, Kashmir: Sarinagar, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara, Abbotabad, Mansehra, Mardan Distt., Kohat, Rawalpindi Distt., Gilgit, commonly grown from plains to higher elevations on the dry rocky slopes with altitude of about 900-2700 m.

Flowering period: June-Oct.

Medicinal Use: Leaves are used as astringent, stomachic, carminative, refrigerant & diuretic. It is also used for wound healing & abdominal pain.

Folk Recipes: Traditionally warmed leaf used as poultice over the wound for their healing. Roots are boiled in water & gur, the mixture is then filtered after cooling & used in case of abdominal pain.

Animal Use/Recipes: Root of plant is used in colic & abdominal pain. Leaves of plant are considered as appetizer for livestock. Roots are boiled in water

along with gur, mixture is then filtered & given to the livestock in case of colic.

Botanical Name: *Salvia mocroftiana* wall ex Bth. (Plate No: 52)
Family Name: Lamiaceae
Vern. Names: Khardag
Habit: Herb
Conservation status: Near Threatened
Part used: Leaves & stems
Collection method: Plucking, Cutting
Local Distribution: East Afghanistan, India, Pakistan, Nepal, Kashmir, KP, Swat, Chitral, Kurram Agenc, Dir, Buner, Shangla, Hazara, Abbotabad, Mansehra, Kaghan valley, Muree hills, Kashmir, commonly grown in the temperate forest on the open hill slopes with altitude of about 1500-2700 m.

Flowering period: April-June

Medicinal Use: Plant is traditionally used as aphrodisiac & also to treat skin diseases.

Folk Recipes: leaves of plant is mixed & warmed with the mustard oil & applied on the skin for healing of wounds, cleaning of lesions/sores to release puss where as inner part of the stem is chewed & considered as aphrodisiac agent.

Animal Use/Recipes: Fresh leaves are fed to the cattle for removal of placenta after birth.

Botanical Name: *Sarcococca saligna* (Don) Muell. (Plate No: 32)
Family Name: Buxaceae
Vern. Names: Laden
Habit: Shrub
Conservation status: Vulnerable
Part used: Leaves & stems
Collection method: Plucking, Cutting
Local Distribution: Afghanistan, China, India, Pakistan, Taiwan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Battagram, Hazara, Balakot, Kaghan valley, Nathia Gali, Murree hills, Kashmir: Muzaffarabad,

	Bagh, commonly grown in the temperate forest on moist & shady places from 1200-3000 m.
Flowering period:	Sep-April
Medicinal Use:	Leaves of plant is used as for rheumatism & muscular plain.
Folk Recipes:	Infusion of leaves is used is for rheumatism whereas as leaves is heated in mustard oil for muscular pain.
Botanical Name:	Saussurea costus (Falc.) Lipsch. (Syn.Saussurea lappa Clarke)
Family Name:	Asteraceae
Vern. Names:	Kuth
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Root
Collection method:	Digging
Local Distribution:	East Afghanistan, India, Pakistan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Hazara, usually grown at higher altitude on the moist hill slopes & grassy meadow from altitude of about 3200-3800 m.
Flowering period:	June-July
Medicinal Use:	Root is tonic, carminative, stomachic & antispasmodic. Root is also used in asthma, cough & cholera.
Folk Recipes:	Root of plant is grinded into powdered and mixed with cow, s ghee & used twice a day for treatment of antispasmodic & stomachic problem.
Botanical Name:	Silene vulgaris (Moench) Garcke.
Family Name:	Caryophyllaceae
Vern. Names:	Manghotay
Habit:	Herb
Conservation status:	Least Concern
Part used:	Young shoots & leaves
Collection method:	Cutting, Plucking
Local Distribution:	China, Magnolia, India, Pakistan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara,

Abbotabad, Kaghan, Naran, Gilgit, Kashmir, commonly grown in the temperate forest on the open hill slopes from 1500-3100 m.

Flowering period:	June-July
Medicinal Use:	Young shoots of plant are stomachic & emollient.
Folk Recipes:	Paste of leaves is used as cosmetic for whitening of skin.
Botanical Name:	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp.
Family Name:	Rutaceae
Vern. Names:	Manghotay
Habit:	Shrub
Conservation status:	Critically Endangered
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	Afghanistan, North East India, India, Pakistan, Bhutan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Battagram, Hazara, Murree hills, Kashmir, commonly grown at higher altitude in the mixed forest on the rocky hills from 2400-2800 m.

Flowering period:	April-June
Medicinal Use:	Leaves of plant are antiseptic, used in dyspepsia, cold & cough.
Folk Recipes:	Smoke of dried leaves is considered as antiseptic. Dried leaves are also smoked to expel evils & bad eyes. It is also considered as remedy in cough & cold.

Botanical Name:	<i>Solanum nigrum</i> L. (Plate No: 88)
Family Name:	Solanaceae
Vern. Names:	Manghotay
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Leaves, fruit
Collection method:	Plucking, Picking
Local Distribution:	China, India, Pakistan, Nepal, Taiwan, Kashmir, Hindu Kush Range, Baluchistan: Quetta, KP, Swat, Chitral, Kurram, Dir, Shangla, Battagram, Hazara, Haripur, Abbotabad, Peshawar,

	Margalla hills, Sialkot, Lahore. A cosmopolitan species grown from plains to higher altitude with altitude ranges 900-3000 m.
Flowering period:	May-Oct.
Medicinal Use:	Plant is diuretic, carminative, tonic, antipyretic & expectorant. Fruit & leaves are used in hepatic disorders, abdominal inflammation, skin diseases, & washing of wounds. Leaves are also used in kidney stone.
Folk Recipes:	A paste made from leaves is applied on the skin to treat inflammation & itching.
Botanical Name:	<i>Solanum surattense</i> Burm.f. (Plate No: 89)
Family Name:	Solanaceae
Vern. Names:	Maraghonay
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Whole plant
Collection method:	Plucking, Digging
Local Distribution:	East Afghanistan, India, Pakistan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Battagram, Hazara, Peshawar, Khyber Agency, Waziristan, Attock, Islamabad, Distt., Karachi, Hyderabad, Kashmir, a widely distributed species found in most part of the country on the open & waste places upto an altitude of about 1500 m.
Flowering period:	Almost year round
Medicinal Use:	Plant is stomachic, diuretic, expectorant & also used as remedy for cough, fever, asthma & gonorrhea. Fruit is used for abdominal pain & jaundice.
Folk Recipes:	Dried plant is powdered, mixed with sugar & taken with glass of water for treatment of stomach disorders & asthma.
Animal Use/Recipes:	The fresh leaves are fed to the livestock for the treatment of digestive problems

Botanical Name:	<i>Sorbaria tomentosa</i> (Lindl.) Rehder
Family Name:	Rosaceae
Vern. Names:	Sra bakayana
Habit:	Shrub
Conservation status:	Least Concern
Part used:	Flowers
Collection method:	Picking
Local Distribution:	Afghanistan, India, Pakistan, Nepal, Kashmir, Himalyas, Hindu Kush Range, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara, Peshawar, Rawalpindi Distt., commonly grown in the temperate forest at altitude of about 1200-3200 m.
Flowering period:	June-September
Medicinal Use:	Flowers of plant are antiseptic & used for skin problems.
Folk Recipes:	Flowers of plant are mixed with mustard oil & then applied on the new born babies for treatment of skin rashes.
Botanical Name:	<i>Spiraea nervosa</i> Franch & Sav.
Family Name:	Rosaceae
Vern. Names:	Sra bakayana
Habit:	Shrub
Conservation status:	Near Threatened
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	China, Pakistan, Hindu Kush Range, KP, Swat, Chitral, Kurram, Dir, Shangla, Battagram, Hazara, commonly grow in open places & hilltops along roadsides upto an altitude of about 2000 m.
Flowering period:	April-July
Medicinal Use:	Leaves of plant are used in women delivery.
Folk Recipes:	Tea prepared from the leaves is given to the women to ease child birth.
Botanical Name:	<i>Stellaria media</i> (L.) Cyr. (Plate No: 35)
Family Name:	Caryophyllaceae
Vern. Names:	Olalai

Habit:	Herb
Conservation status:	Least Concern
Part used:	Whole plant
Collection method:	Plucking, Digging
Local Distribution:	Afghanistan, China, Japan, Korea, Pakistan, Nepal, Taiwan, Kashmir, Himalayas, Baluchistam, Ziarat, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan Battagram, Hazara, Peshawar, Muree hills, Kashmir, Gilgit, Lahore, A cosmopolitan species & usually grow in waste places, fields, roadsides, open places upto an altitude of about 2600 m.
Flowering period:	April-August
Medicinal Use:	Plant is astringent purgative & antidiabetic. Plant is used to treat piles, rheumatism & constipation.
Folk Recipes:	Plant is cooked with garlic & coriander for treatment of piles. Decoction of plant is used as purgative.
Botanical Name:	<i>Taraxacum officinale</i> F. H. Wigg. (Plate No: 24)
Family Name:	Asteraceae
Vern. Names:	Ziar Gule
Habit:	Herb
Conservation status:	Least Concern
Part used:	Flowers, root & leaves
Collection method:	Picking, Plucking, Digging
Local Distribution:	Pakistan, Nepal, Taiwan, Kashmir, Himalayas, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan Battagram, Hazara, Peshawar, Rawalpindi Distt.. Kashmir, Gilgit, Baltistan, A cosmopolitan & commonly grow in grassland, pastures, waste ground, roadsides, damp places upto an altitude of about 3300 m.
Flowering period:	Almost throughout the year
Medicinal Use:	Plant is tonic, purgative & diuretic. The root is used in jaundice, diabetics & diuretic. It is also used against tumors. Leaves are used for used for jaundice, kidney & liver disorders.

Folk Recipes:	Decoction of leaves is used for blood purification, jaundice, kidney & liver disorders.
Animal Use/Recipes:	Plant is mixed with leaves of <i>Acacia modesta</i> & given to the livestock for promoting lactation.
Botanical Name:	Teucrium stocksianum Boiss.
Family Name:	Lamiaceae
Vern. Names:	Kwandi bootay
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	Iran, Oman, Afghanistan, Pakistan, Baluchistan, Quetta, Loralai, KP, Swat, Dir, Chitral, Kurram Agency, Khyber Agency, Waziristan, Landi Kotal, Kohat, Hangu, commonly grown in the open & exposed places upto an altitude of about 900-1550 m.
Flowering period:	May-Sept.
Medicinal Use:	Leaves of plant are used as expectorant & refrigerant.
Folk Recipes:	A decoction of leaves is used as remedy to treat sore throat.
Botanical Name:	Thalictrum foliolosum DC.
Family Name:	Ranunculaceae
Vern. Names:	Mamera
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Rhizome
Collection method:	Digging
Local Distribution:	China, Tibet, India, Pakistan, Myanmar, Thailand, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Gilgit, Hazara, Changla Gali, Rawalpindi Distt., Margalla hills, commonly grown in the temperate forest on the hill slopes from 1000-2500 m.
Flowering period:	July-August
Medicinal Use:	Medicinally rhizome of <i>Thalictrum foliosum</i> is ophthalmic & used in various eye diseases.

Botanical Name:	<i>Thymus linearis</i> Benth.
Family Name:	Lamiaceae
Vern. Names:	Ghra Chai, Zangali Sperkay
Habit:	Herb
Conservation status:	Endangered
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	North East Afghanistan, India, Pakistan, West Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara, Kaghan valley, Gilgit, Baltistan, Kashmir: Muzaffarabad, commonly grown at higher elevation with altitude of about 1800-4200 m.
Flowering period:	April-August
Medicinal Use:	Leaves of plant are antispasmodic, carminative, digestive & antipyretic.
Folk Recipes:	A Green tea prepared from the leaves has been used as remedy for cough, cold & d fever. Juice of plant is used to relieve toothache.
Botanical Name:	<i>Urtica dioica</i> L. (Plate No: 90)
Family Name:	Urticaceae
Vern. Names:	Sezonke/Jalbang
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Leaves
Collection method:	Plucking
Local Distribution:	Afghanistan, Himalayas, West China, Tibet, India, Pakistan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Buner, Shangla, Kohistan, Battagram, Hazara, Siran valley, Changla Gali, Rawalpindi Distt., Murree, Gilgit, Skardu, commonly grown from foothills to higher altitude on the moist & grassy places with 1100-4500 m.
Flowering period:	May-Sept.

Medicinal Use:	The smoke of plant is used for treatment of bronchial & asthmatic problem. Locally it is also used as vegetable for curing constipation & lung diseases.
Folk Recipes:	The dried leaves are powdered & used as cigarette for asthma.
Animal Use/Recipes:	Leaves of plant are fed to the cattle for increase milk production.
Botanical Name:	Valeriana jatamansi Jones (Plate No: 91)
Family Name:	Valerianaceae
Vern. Names:	Mushke Bala
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Rhizome
Collection method:	Digging
Local Distribution:	East Afghanistan, India, Pakistan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara, Dunga Gali, Abbotabad, Kurram Agency, Peshawar, Rawalpindi Distt: Murree hills, Gilgit, Kashmir, commonly grow in early spring in the temperate forest on the grassy slopes from 1300-3200 m.
Flowering period:	March-May
Medicinal Use:	Rhizome of plant is antispasmodic, carminative, hair tonic, aromatic & also used in hysteria & epilepsy.
Folk Recipes:	Decoction of rhizome is used in treatment of dysentery & cholera. Locally the dried rhizome is powdered, mixed with Desi ghee and used for treatment of epilepsy. Dried rhizome is also taken with milk for intestinal pain & constipation.
Animal Use/Recipes:	Leaves of plant are fed to the cattle for increase milk production.
Botanical Name:	Verbascum thapsus L.
Family Name:	Scrophulariaceae
Vern. Names:	Khrdhag
Habit:	Herb
Conservation status:	Least Concern
Part used:	Leaves, flowers

Collection method:	Plucking, Picking
Local Distribution:	China, Tibet, India, Pakistan, Kashmir, Bhutan, Nepal, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara, Kaghan Valley, Bara Gali, Rawalpindi Distt., Kashmir, commonly grown in the temperate forest on the hill slopes & along roadsides with 900-4000 m.
Flowering period:	June-August
Medicinal Use:	Plant is antiseptic, analgesic, narcotic & also used in cough, lung diseases, wound healing & other skin problems.
Folk Recipes:	Fresh leaves are considered as antiseptic, analgesic & applied on the skin as poultice for treatment of swelling & pus discharge. It is also used in joint pains. The decoction of leaves & flowers are used as remedy for curing of cough, lung diseases wounds
Animal Use/Recipes:	Fresh Leaves of plant are fed to the livestock for curing of diarrhea & dysentery.
Botanical Name:	<i>Verbena officinalis</i> L.
Family Name:	Verbenaceae
Vern. Names:	Shamakay
Habit:	Herb
Conservation status:	Near Threatened
Part used:	Whole plant
Collection method:	Plucking, Picking
Local Distribution:	China, Pakistan, Nepal, Taiwan, KP, Swat, Chitral, Kurram, Dir, Shangla, Chitral, Kohistan, Battagram, Hazara, Abbotabad, Chakdara, Mardan, Peshawar University, Kohat Distt., Rawalpindi Distt., Sarghoda, Chakwal, Quetta, commonly grown from plains to mountain on sandy clay ground, waste places upto an altitude of about 500-2000 m.
Flowering period:	June-Dec.
Medicinal Use:	Plant is refrigerant, antimalarial & febrifuge.
Folk Recipes:	Decoction of the fresh plant is used twice a day for curing of malaria fever.

Botanical Name:	<i>Viburnum cotinifolium</i> D.Don. (Plate No: 34)
Family Name:	Caprifoliaceae
Vern. Names:	Zangali Chamyarai
Habit:	Shrub
Conservation status:	Critically Endangered
Part used:	Fruit
Collection method:	Picking
Local Distribution:	Afghanistan, North India, Pakistan, East Bhtan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Chitral, Shangla, Kohistan, Battagram, Hazara, Abbotabad, Kurram Agency, Muree hills, Kashmir, commonly grown in the foothills & higher altitude on exposed sunny places from 900-3500 m.
Flowering period:	March-May
Medicinal Use:	Fruit of plant is edible & considered as general body tonic.
Animal Use/Recipes:	Plant is administrated to livestock for expulsion of placenta after delivery.
Botanical Name:	<i>Viburnum grandiflorum</i> Wall. ex DC. (Plate No: 34)
Family Name:	Caprifoliaceae
Vern. Names:	Ghaz meva
Habit:	Shrub
Conservation status:	Endangered
Part used:	Fruit
Collection method:	Picking
Local Distribution:	China, Sari Lanka, Burma, Bhutan India, Pakistan, Nepal, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Battagram, Hazara, Kaghan valley, Changla Gali, Murree hills,, Kashmir, commonly grown at higher altitude in the temperate forest with altitudinal ranges of about 1500-3000 m.
Flowering period:	Nov.-June
Medicinal Use:	Fresh of plant is used for gastro intestinal problems especially stomachache.

Botanical Name:	<i>Viola betonicifolia</i> Sm. (Plate No: 91)
Family Name:	Violaceae
Vern. Names:	Banafsha
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Whole plant
Collection method:	Plucking.Digging
Local Distribution:	China, India, Pakistan, Nepal, Burma, Sri Lanka, Kashmir, KP, Swat, Chitral, Kurram, Buner, Dir, Shangla, Kohistan, Hazara, Peshawar Distt., commonly grown in the temperate forest on the hill slopes, grassy places, margins of forest with altitude of about 1000-2200 m.
Flowering period:	May-Aug.
Medicinal Use:	Plant is antipyretic, demulcent, diaphoretic, diuretic, anticancer astringent, purgative, febrifuge & antipyretic. Flowers are collected. Leaves & flowers are used in cold, cough, epilepsy, jaundice and nervous diseases.
Folk Recipes:	Locally decoctions of flowers are used in flu, cough & cold.
Botanical Name:	<i>Viola canescens</i> Wall .ex Roxb. (Plate No: 92)
Family Name:	Violaceae
Vern. Names:	Banafsha
Habit:	Herb
Conservation status:	Endangered
Part used:	Whole plant
Collection method:	Plucking.Digging
Local Distribution:	China, India, Pakistan, Nepal, Burma, Sri Lanka, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Hazara, Abbotabad, Balakot, Gari Habib Ullah, Battagram, Murree hills, Kashmir: Poonch, commonly grown at the higher altitude of temperate forest on grassy places, hill slopes from 1500-3300 m.
Flowering period:	March-June.

Medicinal Use:	Plant is demulcent, diaphoretic, diuretic, astringent, purgative, febrifuge & antipyretic. Flowers are collected at commercial scale & used as diaphoretic, antiseptic & febrifuge. Leaves & flowers are used in cold, cough & fever. Plant is cooling agent & used in jaundice.
Folk Recipes:	Flowers are mixed with leaves & boiled in water; the mixture is then used in flu, cough, cold & liver congestion. Decoction of flowers is considered as blood purifier and cooling agent.
Botanical Name:	<i>Viola pilosa</i> Blume (Plate No: 92)
Family Name:	Violaceae
Vern. Names:	Banafsha
Habit:	Herb
Conservation status:	Critically Endangered
Part used:	Whole plant
Collection method:	Plucking.Digging
Local Distribution:	China, India, Pakistan, Nepal, Burma, Sri Lanka, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Hazara, Abbotabad, Chagla Gali, Kaghan, Murree hills, Kashmir, commonly grown in the temperate forest on grassy places, hill slopes with altitudinal ranges of about 1500-3000 m.
Flowering period:	April-Aug.
Medicinal Use:	Flowers are collected at commercial scale & used as diaphoretic, antiseptic & febrifuge. Leaves & flowers are used in cold, cough & fever. Plant is cooling agent & used in jaundice.
Folk Recipes:	Flowers are mixed with leaves & boiled in water; the mixture is considered useful agent against cough, cold & liver congestion. Decoction of flowers is considered as blood purifier and refrigerant.
Botanical Name:	<i>Vitex negundo</i> L.
Family Name:	Verbenaceae
Vern. Names:	Marvanday
Habit:	Shrub

Conservation status:	Near Threatened
Part used:	Leaves, roots, flower
Collection method:	Plucking, Picking, Digging
Local Distribution:	China, India, Pakistan, Nepal, Taiwan, Baluchistan: Turbat, Khuzdar, KP, Swat, Chitral, Kurram, Dir, Shangla, Battagram, Hazara, Nathia Gali, Peshawar, Kurram Agency, Nowshera, Nawab Shah Distt., Karachi Distt., commonly grown at the lower altitude on the foothills along roadsides upto altitude of about 2300 m.
Flowering period:	June-July (Full blooming)
Medicinal Use:	Leaves of plant is used as diuretic, anthelmintic, febrifuge, and antipyretic & also used as pain killer. Flower is used as astringent & tonic.
Folk Recipes:	Fresh root is used as bandage to alleviate pain in chest & back. Branches are used as Miswak (Tooth brush) for cleaning & sparkling of teeth. Leaves are smoked to alleviate headache. Decoction of plant is used for weight loss.
Botanical Name:	<i>Vitis Jacquemontii</i> Parker
Family Name:	Vitaceae
Vern. Names:	Gidar kwar
Habit:	Woody climber
Conservation status:	Critically Endangered
Part used:	Fruit
Collection method:	Picking
Local Distribution:	India, Pakistan, Nepal, Sub Himalayan tract, Hindu Kush, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Hazara, Battagram, Kotli, Poonch District, Kashmir, commonly grown from plains to hilly slopes with altitudinal ranges of about 900-2400 m.
Fl. & Fr. period:	May-Aug.
Medicinal Use:	Fruit of plant is tonic, coolant, laxative & purgative.
Folk Recipes:	Juice prepared from fresh fruit which is then used as tonic, refrigerant, laxative & also for hepatic disorders.

Botanical Name:	<i>Vitis vinifera</i> L.
Family Name:	Vitaceae
Vern. Names:	kwar
Habit:	Woody climber
Conservation status:	Cultivated
Part used:	Fruit & leaves
Collection method:	Picking & Plucking
Local Distribution:	Iran, China Japan, India, Pakistan, Nepal, Hindu Kush, Baluchistan, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Hazara, Battagram, Baltistan, Gilgit, Quetta, Karachi Distt., Kashmir, commonly grown from plains to mountains with altitudinal ranges of about 2500 m.
Fl. & Fr. period:	May-Aug.
Medicinal Use:	Fruit of plant is refrigerant, laxative, stomachic, blood purifier & hepatic stimulant. Leaves are astringent & used for external wounds
Botanical Name:	<i>Withania somnifera</i> (L.) Dunal
Family Name:	Solanaceae
Vern. Names:	Kotilal
Habit:	Shrub
Conservation status:	Endangered
Part used:	Whole plant
Collection method:	Picking, Plucking, Digging
Local Distribution:	Iran, Syria, Turkey, China, India, Pakistan, Nepal, Burma, Sri Lanka, Kashmir, KP, Swat, Chitral, Kurram, Dir, Shangla, Kohistan, Hazara, Khyber Agency, Attock, Multan & Faisalabad Distt., Karachi, Peshawar University, Gilgit, Astor, commonly grown in the waste places upto an altitude of about 2300 m.
Flowering period:	Almost year round
Medicinal Use:	Locally plant is used as aphrodisiac, tonic & antiemetic. It is also used in diarrhea & dysentery.

Folk Recipes:	Powdered of plant is mixed with water & honey. The mixture is then taken for diarrhea & dysentery. Paste of root is used as poultice to relieve swelling.
Animal Use/Recipes:	It is given to cattle during fever & also to increase milk production.
Botanical Name:	Xanthium strumarium L. (Plate No: 25)
Family Name:	Asteraceae
Vern. Names:	Gishkay
Habit:	Shrub
Conservation status:	Data Deficient
Part used:	Leaves, fruit
Collection method:	Plucking, Picking
Local Distribution:	China, India, Pakistan, Nepal, Burma, Bhutan, Taiwan, KP, Swat, Chitral, Kurram, Dir, Buner, Shangla, Battagram, Hazara, Abbotabad, Mansehra, Kurram Agency: Parachinar, commonly grown in waste places, margins of field along roadside & damp places upto an altitude of about 2500 m.
Flowering period:	July-Aug.
Medicinal Use:	Plant is tonic, diuretic & antipyretic Fruit is demulcent & cooling agent.
Folk Recipes:	Decoction of leaves is used in malarial fever.
Botanical Name:	Zanthoxylum armatum D. C. (Plate No: 84)
Family Name:	Rutaceae
Vern. Names:	Dambara
Habit:	Shrub
Conservation status:	Vulnerable
Part used:	Fruit, seed, bark, young stem
Collection method:	Plucking, Picking
Local Distribution:	China, India, Pakistan, Nepal, Taiwan, Bhutan, Vietnam, Thailand, Kashmir, KP, Swat, Chitral, Kurram, Dir, Buner, Shangla, Battagram, Hazara, Abbotabad, Kahgan valley, Shogran, Kurram Agency, Parachinar, commonly grown from foot hills to mountain top upto an altitude of about 1100- 2500 m.

Flowering period:	March-April.
Medicinal Use:	Fruit is carminative, stomachic & also used as remedy for toothache. Seeds are tonic, aromatic and antipyretic. Bark is tonic & stimulant.
Folk Recipes:	The young shoots are used as toothbrush & useful in treatment of gum diseases. Infusion of leaves is used for curing gonorrhea. Fruits are powdered and eaten with boiled egg for chest infection.
Botanical Name:	<i>Ziziphus jujuba</i> Mill.
Family Name:	Rhamnaceae
Vern. Names:	Markhanay
Habit:	Tree
Conservation status:	Endangered
Part used:	Fruits & leaves
Collection method:	Picking, Plucking
Local Distribution:	Afghanistan, China, Japan, Mangolia, Tibet, India, Pakistan, Nepal, KP, Swat, Chitral, Kurram, Dir, Shangla, Battagram, Kohistan, Hazara, Mansehra, Abbotabad, Kashmir: Muzaffarabad, Mirpur, commonly grown from plains to sunny dry slopes on the mountain with an altitude of about 900-2200 m.
Flowering period:	June-July
Medicinal Use:	Fruit are edible & used in whooping cough & cold. It is also astringent, coolant & used in curing of jaundice.
Folk Recipes:	Leaves are anti diabetic and chewed as remedy for treatment of diabetic patients.
Botanical Name:	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.
Family Name:	Rhamnaceae
Vern. Names:	Karkanra
Habit:	Tree
Conservation status:	Vulnerable
Part used:	Fruits & leaves
Collection method:	Picking, Plucking

Local Distribution:	Iraq, Iran, Afghanistan, India, Pakistan, Nepal, KP, Swat, Chitral, Kurram, Dir, Shangla, Buner, Malakand, Hazara, Havrlan, Attock, Dera Ghazi Khan, Peshawar, Rawalpindi Distt: Jamrud, Karachi & Hyderabad Distt., commonly grow from plains to rocky hill slopes upto an altitude of about 1700 m.
Flowering period:	March-June
Medicinal Use:	Fruit of plant is laxative, astringent. Leaves are used in scabies & other skin problems.
Folk Recipes:	Decoction of leaves in used to treat scabies.
Botanical Name:	<i>Ziziphus oxyphylla</i> Edgew.
Family Name:	Rhamnaceae
Vern. Names:	Elanae
Habit:	Tree
Conservation status:	Vulnerable
Part used:	Fruits & leaves, root
Collection method:	Picking, Plucking, Digging
Local Distribution:	China, Afghanistan, India, Pakistan KP, Swat, Murre hills, Margala hills, Rawalpindi Distt., Jehlum, Dir, Shangla, Buner, Hazara, Mansehra, Abbotabad, Kashmir: Muzaffarabad, Jehlum valley, Rawalpindi Distt., commonly found from plains to mountain on hill slopes along roadsides between an altitude of about 1000-2200 m.
Flowering period:	June-Sept.
Medicinal Use:	Fruit is tonic, laxative. anti diabetic & used in jaundice. Root is used in jaundice & hepatic problems. Leaves are used in fever.
Folk Recipes:	Leaves extract are used in fever. Root is dried, boiled & filtrated with a cloth & stored in a glass. Root extract is then given to the patients suffered in Jaundice & hepatic problems.

Botanical Name:	<i>Ziziphus mauritiana</i> var. <i>spontanea</i> (Edgew.) R.R Stewart ex ` Qaiser & Nazim.
Family Name:	Rhamnaceae
Vern. Names:	Bera
Habit:	Tree
Conservation status:	Near Threatened
Part used:	Fruits & leaves
Collection method:	Picking, Plucking
Local Distribution:	Himalayas, India, Pakistan, Kashmir, Punjab: Khushab, KP, Dir, Shangla, Buner, Hazara, Peshawar University, Khushab, Rawalpindi District, Kashmir: Rawalpindi, commonly grow from plains to hilly slopes along roadsides upto an altitude of about 1800 m.
Flowering period:	July-Sept.
Medicinal Use:	Fruit are coolant, expectorant, anti diabetic & tonic. Leaves of plant are used in Jaundice.
Folk Recipes:	Juice of fresh leaves is used in hepatic problems.

Table-IX. Medicinal Plant Biodiversity and their Medicinal Values in Malam Jabba Valley, Swat

S.#	Bot. Name	Family Name	Local Name	Part used	Ethnomedicinal Use/Folk Recipes
Pteridophyta					
1.	<i>Adiantum capillus-veneris</i> L.	Adiantaceae	Sumbal	Whole plant	The plant is diuretic, expectorant, coolant, emetic, hair tonic, demulcent & also used for diabetes, hypertension and wounds healing. It is also for the treatment of cough, cold, fever & toothaches. Recipes: A Paste is prepared from the whole plant & applied externally to treat cuts and wounds. A fresh frond is crushed to make a paste & applied on the snake & scorpion bite twice a day. Decoction of the frond is used as refrigerant & hair tonic. Juice & decoction of the plant is used as expectorant, diuretic & emetic. Decoction is also used as hair tonic in the form of hair wash.
2.	<i>Adiantum incisum</i> L.	Adiantaceae	Sumbal	Fronds & rhizomes	Fronds are used to cure asthma, skin problems, fever, cough & scorpion bites. The fronds are externally used in skin ailments. Juice of plant is used for diabetes, jaundice and hepatic disorders. Recipes: A Paste prepared from the rhizome of plant is applied externally for healing of cuts and

					wounds.
3.	<i>Adiantum pedatum</i> L.	Adiantaceae	Sumbal	Fronds	Plant is mostly used in similar way as like <i>Adiantum capillus veneris</i> . It is cooling agent and used as good remedy for cough & asthma.
4.	<i>Adiantum venustum</i> D. Don.	Adiantaceae	Sumbal	Fronds & Rhizome	Fronds of the plant are diuretic, ophthalmic, expectorant, tonic, blood purifier, refrigerant and also used for fever, cough & backache. Frond is also used as remedy for headache, jaundice, hepatic disorders, chest infection & scorpion bites. Plant is also taken for cleaning of teethes and toothache Recipes: The fronds are boiled in water, cooled, and the filtered water is used for eye trouble. A Paste prepared from the rhizome of plant is applied externally for healing of cuts and wounds. A fresh frond is crushed to make a paste & applied on the snake & scorpion bite twice a day. Decoction of frond is used as coolant, diuretic, emetic & expectorant. The decoction is also mixed with oil to prevent hair loss.
5.	<i>Asplenium dalhousiae</i> Hook. <i>Syn. Ceterach</i>	Aspleniaceae	Booghma Botay	Fronds	Plant is used for curing of cough & cold. Plant is expectorant & laxative.

	<i>dalhousiae</i> (Hook.) C. Chr				Recipes: The fronds are crushed into powdered and then mixed with honey and used for treatment of cough and cold.
6.	<i>Asplenium trichmanes</i> L.	Aspleniaceae		Fronds	The frond is considered as diuretic, expectorant, laxative, & also used in hepatic disorders. Recipes: Plant is smoked for head and chest infection.
7.	<i>Cystopteris fragilis</i> (L.) Bernh.	Athyriaceae		Fronds & rhizome	Plant is expectorant & coolant. Juice of the rhizome is used as anthelmintic agent
8.	<i>Dryopteris juxtaposita</i> Chr.	Dryopteridaceae	Kwanjae	Young Fronds and Rhizome	The frond is tonic, used to improve digestive system & enhance digestion. It is also used in constipation. The rhizome is used for treatment of menstrual disorders in women. It is also used for stomach aches.
9.	<i>Equisetum arvense</i> L.	Equisetaceae	Bandakey	Whole Plant	The frond is diuretic, antipyretic, antiseptic, hair tonic & also used for healing of wounds. It is also used for inflammation of urinary bladder and other urine disorders. Folk Recipes: Fresh shoots are crushed & mixed with flour to make a poultice. It is used to treat wounds. A paste of plant is applied in fracture and dislocation of bones. The extract of frond with mustard oil is used as hair tonic & anti lice agent.

10.	<i>Onychium Japonicum</i> (Thunb.) Kunze Syn. <i>Onychium cryptogrammoides</i> Christ	Pteridaceae	Atir	Fronds	The extract of frond is considered as hair tonic. Recipes: Fronds of plant is grinded into powdered form & its juice is extracted & used as hair tonic.
11.	<i>Pteridium aquilinum</i> (L.) Kuhn ex Deken.	Dennstaedtiaceae	Ladora	Young fronds	The young fronds are considered as diuretic, vermicide & refrigerant. Rhizome of the Plant is used as anthelmintic and astringent.
12.	<i>Pteris cretica</i> L.	Pteridaceae	Atir	Fronds	Plant is antiseptic & used to treats cuts & wounds. Recipes: A paste prepared from the frond is applied as a poultice for treatment of cuts and wounds.
13.	<i>Pteris vittata</i> L.	Pteridaceae	Atir	Whole Plant	Plant is antipyretic, antiseptic, antibacterial & also used in cough, cold, high blood pressure & wounds. Recipes: A paste is prepared by grinding frond of the <i>Pteris vittata</i> & applied as a poultice on the affected areas for wound healing. A paste of the frond can be also prepared with pepper & taken orally to relieve cold, cough & fever.

Gymnosperms					
14.	<i>Abies pindrow</i> Royle	Pinaceae	Achar	Leaves	Leaves of plant are used for treatment of cough and cold. Recipes: The leaves are powdered and mixed with honey and used for treatment of cough, cold and chest infection. The nomads used the leaves as substitute of tea.
15.	<i>Cedrus deodara</i> (Roxb. ex D.Don) G. Don	Pinaceae	Diyar, Ranzra	Resins leaves & barks	Locally resin or oil extract of wood is diuretic, carminative, antipyretic, and also used in piles, rheumatic problems, ulcers and various skin diseases. Recipes: Locally 2 -3 drops of resin extract is taken with a glass of milk early in the morning before breakfast for curing skin rashes & other skin ailments. 2-3 drops of wood extract or resin extract (Ranzra) is taken with a glass of water for blood purification and lowering body temperature.
16.	<i>Cupressus sempervirens</i> L.	Cupressaceae	Serva	Fruits	The fruit is used as anthelmintic and astringent.
17.	<i>Ephedra gerardiana</i> Wall ex Stapf	Ephedraceae	Asmani booti	Shoots, roots & fruits	Plant is cardiac stimulant, blood purifier, febrifuge & expectorant. The young shoots are used in asthma, cold & hay fever. Fruit and extract of shoots is used for cleaning of teeth & blood purification. Recipes: The young shoots and

					branches are crushed into powdered and boiled in water to get extract which is used twice times a day in morning and evening time after meal for treatment of asthma, hay fever and cold. The decoction of young shoots is used as expectorant & febrifuge. Ash obtained from root of <i>Ephedra</i> is used to treat cuts and wounds.
18.	<i>Juniperus communis</i> L.	Cupressaceae	Gugar/ Awbeer	Root, leaves, fruits	Root of plant is used for wound healing. The oil obtained from berries is used as antiseptic, stomachic, carminative, diuretic, antirheumatic & blood tonic. Medicinally the plant is also used against tension and depression. It is also used for blood purification and mental refreshment. Recipes: An infusion of berries is used as diuretic. The powdered berry is used as remedy for treatment of swelling, and other skin problems. Dried leaves of <i>Juniperus</i> and <i>Skimmia</i> are mixed and burned in combination. The smoke is used to cures the effect of bad and evil eyes.
19.	<i>Picea smithiana</i> (Wall.) Boiss	Pinaceae	Mangazay	Leaves & Resins	Locally leaves of plant are used as remedy for kidney stone and rheumatism. Resin is collected locally & used as remedy for cracks of heels and wounds.

					Recipes: A tea prepared from fresh leaves of <i>Picea smithiana</i> is used once in a day for one week to remove stone from kidney.
20.	<i>Pinus gerardiana</i> A.B. Jackson	Pinaceae	Chilghoza Pine	Seeds, leaves, bark and resins	Seeds are tonic and stimulant. Resin or oil obtained from the bark of wood is used for skin disorders and healing of wounds. Recipes: The seeds are edible commonly called “Chilghoza nut” used as dry fruit, tonic and stimulant. Juice is obtained from the fresh leaves and added with water and taken twice a day before meal for curing of lung infections and sore throat. Dried leaves and bark is grinded into powdered & taken with glass of water for diarrhea. A decoction of the leaves is used for curing of scabies
21.	<i>Pinus roxburghii</i> Sargent	Pinaceae	Nakhtar, Chir pine	Resins	Medicinally resin of bark is used for skin diseases, external wounds, blood purification, ulcer, constipation, snake & scorpion bites. Recipes: Resin or oil obtained from the wood is externally applied as a plaster for healing of wounds and also to treat cracked heel. Resin of bark locally known as "Jaula", is stimulant used in ulcer, constipation, snake and scorpion stings. It is also used as blood purifier. The resin is

					boiled with milk & used to treat acne.
22.	<i>Pinus wallichiana</i> A.B Jackson	Pinaceae	Peuch	Leaves	Locally plant is used for the treatment of external wounds, asthma, bronchitis & cough. A tea prepared from the leaves has traditionally been used for the treatment of bronchitis, cough & asthma. 3-4 drops of resins are added with mustard oil & is applied on the ruptured skin for healing of wounds.
23.	<i>Taxus wallichiana</i> Zucc.	Taxaceae	Banyra	Leaves, roots barks & fruits	Leaves of plant are used in asthma, cough, bronchitis, epilepsy, stomach disorders, & indigestion. Bark is a source taxol, used in cancer & considered as antitumorous agent. Powdered bark is used as antispasmodic. Fruits are used as sedative and antiseptic. Recipes: Bark of <i>Taxus wallichiana</i> is crushed into powdered which is then mixed with cup of milk & used as antispasmodic & emmenagogue. Decoction of root is used in hepatic problems & jaundice. Decoction of bark is used in muscular pain and also as tea substitute.

Monocots					
24.	<i>Acorus calamus</i> L.	Araceae	Skhawaja	Rhizome	The plant is used in dysentery, Diarrhea, rheumatism, intestinal colic, flatulence and also used as diuretic. Chewing of root is thought to be alleviating toothache. Recipes: The dried rhizome is crushed into powdered and mixed with mustard oil and used externally for treatment of rheumatism. Extraction of fresh plant is also used to treat abdominal. The dried rhizome is also crushed into powdered for treatment of dysentery and diarrhea.
25.	<i>Allium cepa</i> L.	Alliaceae	Pyaz	Bulbs, leaves	The bulbs are aphrodisiac, stimulant, antiseptic and very useful in jaundice. The leaves are diuretic and expectorant. Recipes: The juice of plant is mixed with honey and is used for curing flue and diabetes. Juice of the plant is also used to treat irritation caused by scorpion sting.
26.	<i>Allium humile</i> Kunth.	Alliaceae	Ghra Piaz	Leaves & bulbs	Leaves and bulbs are stimulant, diuretic, anti-hypertensive, expectorant and carminative. Recipes: Chewing of leaves and bulb is used to treat headache and vomiting

27.	<i>Allium Sativum</i> L.	Alliaceae	Ooga	Bulbs/ Fruits	The bulb are carminative, aromatic, diaphoretic, diuretic, expectorant and is also used as good remedy for high blood pressure, (hypertension), flue, cold and cough and heart ailments. Decoction is effective in hysteria, flatulence, asthma and whooping cough. It is also used in epilepsy. Recipes: The decoction of the plant is used twice a day for High blood pressure. The Young leaves and bulb are grinded into powdered and mixed with soup and used is used for treatment of cough & flue. Chewing of bulb alleviates toothache.
28.	<i>Arisaema flavum</i> (Forssk.) Schoot.	Araceae	Marjarai	Rhizome	The fruit and rhizome is poisonous, Rhizome is anthelmintic & stomachic but small amount of rhizome is used for treatment of stomach disorder and also to kill worm.
29.	<i>Asparagus officinalis</i> L.	Asparagaceae	Tindorai	Rhizome & Young shoots	Rhizome is tonic and demulcent and also used in dysentery and diarrhea. <i>Asparagus</i> is also known for his diuretic & laxative properties. Recipes: Rhizome is taken with boiled milk and sugar for dysentery and diarrhea.

30.	<i>Asphodelus tenuifolius</i> Cavan	Asphodelaceae	Piazakay	Fresh leaves and seeds	Fresh leaves are used in Jaundice where as seeds are used in piles. Recipes: The juice obtained from the plant is coolant & used in Jaundice.
31.	<i>Colchicum luteum</i> Baker	Colchicaceae	Suranjan-e-Talkh / Chunar phund	Corm	Corm of <i>Colchicum luteum</i> is used as laxative, blood purifier & aphrodisiac. Recipes: Locally fresh corm of plant is dried, grinded into powdered form, mixed with egg & fried with cow's ghee. Mixture is then given to the elderly peoples for treatment of rheumatism & joints pain.
32.	<i>Cynodon dactylon</i> L.	Poaceae	Kabal	Whole Plant	The plant is diuretic, refrigerant and also used in Diarrhea, Jaundice and blood purification. Recipes: Decoction of plant is used in blood purification. Plant is antiseptic and fresh leaves are applied on cuts and wounds to stop bleeding. Fresh leaves are applied on cuts and bleeding wounds.
33.	<i>Dioscorea deltoidea</i> Wall. ex Kunth	Dioscoreaceae	Kanis	Tuber/ rhizome, root	Roots and tuber is diuretic and expectorant. The rhizome of plant is used as vermifuge and especially in case of children. Recipes: The dried rhizome of the plant is fried in cow, s ghee and taken early in the morning before breakfast for the treatment of

					urinary infections. Rhizome of plant is grinded into powdered and mixed with powdered of <i>Berberis lyceum</i> and used for treatment of Jaundice and ulcer.
34.	<i>Fritillaria cirrhosa</i> Subsp. <i>Roylei</i> (Hook.) Ali, Syn. <i>Fritillaria roylei</i> Hook.	Liliaceae	Chor	Rhizome and bulb	Rhizome is used as general body tonic where as bulb is used in the treatment of rheumatism. Recipes: Ethnomedically the rhizome of plant is boiled in milk an and taken early in the morning before breakfast for the general body tonic
35.	<i>Polygonatum verticillatum</i> (L.) All.	Asparagaceae	Nore Alam	Rhizome/ bulb	Rhizome is used as aphrodisiac and general body. Rhizome Is also used for treatment of rheumatism Recipes: The decoction of rhizome is mixed with sugar and used for treatment of rheumatism.
Dicots					
36.	<i>Acacia modesta</i> Wall.	Mimosaceae	Palusa	Leaves, flowers, Gums	Used as pain killer, specially backache, tonic. The powdered gum Gums of plant are sexual tonic, stimulant & demulcent. Gums are also used for treatment of dysentery, backaches & weakness. Recipes: A dried gum is grinded, mixed with flour, almonds, poppy seeds, dates & sugars & then fried in ghee. This is locally called

					“Halva” & given to the women after delivery for weakness & as tonic.
37.	<i>Achyranthes aspera</i> L.	Amaranthaceae	Gishkay	Root, seeds & whole plant	Seeds are grinded into powdered & used for sparkling and strengthening of teeth. Decoction of the plant is stomachic, diuretic & laxative. Recipes: The smoke of root & seed are used to relieve cough, asthma. An infusion prepared from root of plant is used as remedy to remove small stones from kidney
38.	<i>Aconitum chasmanthum</i> Stapf ex Holmes	Ranunculaceae	Zaharmora/ Ghra Zahar	Rhizome	Rhizome is used as remedy in rheumatism, arthritis, fever & general body tonic. Recipes: The rhizome of <i>Aconitum chasmanthum</i> is tied or wrapped in sheep or goat intestine & thoroughly boiled in milk. The Milk is then discarded & rhizome is dried, powdered & used against rheumatism & arthritis. The rhizome is also crushed into powdered & mixed with cow's ghee & used as general body tonic. Rhizome is also toxic & may cause death if overdosed.
39.	<i>Aconitum heterophyllum</i> Wall ex Royle	Ranunculaceae	Serba zeal	Rhizome	Medicinally plant is used as aphrodisiac, anthelmintic, tonic, stomachic & expectorant. Rhizome & roots is also used in sexual

					weakness, diarrhea, dysentery, fever, and rheumatism & vomiting. Recipes: The rhizome is also crushed into powdered, mixed with cow's ghee & used as remedy for sexual weakness & general body tonic
40.	<i>Aesculus indica</i> (Wall.ex. Cambl.) Hook.f.	Hippocastinaceae	Jawaz	Fruits	Nuts & seeds are anthelmintic, intestinal colic, tonic, purgative & astringent. It is also used for skin ailments. Recipe: Seeds are grinded into powdered & used for abdominal pain & intestinal colic. Oil taken from the plant is externally used for rheumatism.
41.	<i>Ailanthus altissima</i> (Mill) Swingle	Simaroubaceae	Bekyana	Bark	Bark of plant is used as anthelmintic & also for skin problems. Recipes: Locally bark of plant is mixed with milk for treatment of diarrhea & dysentery.
42.	<i>Ajuga bracteosa</i> Wall.ex Benth.	Lamiaceae	Khwaga Booti	Whole plant	Plant is used as refrigerant, antidiabetic, astringent, stimulant, cardiac tonic. Leaves is used as remedy for treatment of jaundice, hypertension, blood purification & sore throat Recipe: Decoction of plant is used for jaundice, Hepatitis c, blood purification & hypertension. Powdered plant is cooked with Desi

					ghee of cow & taken early in the morning before breakfast for curing of fever & vomiting.
43.	<i>Ajuga parviflora</i> Benth.	Lamiaceae	Tarkha Booti	Whole plant	Plant is tonic & used in hepatitis, rheumatism, fever, anti tonsillitis & throat sore. Recipes: Dried leaves are grinded into powder & is mixed with sugar & taken with glass of water for curing of hepatitis disorders & rheumatism
44.	<i>Amaranthus viridis</i> L.	Amaranthaceae	Chalwai	Leaves	Plant is emollient and vermicide but traditionally it is used as vegetable. Paste of leaves is also used for scorpion sting.
45.	<i>Andrachne cordifolia</i> (Wall.ex Dec) Muell.	Euphorbiaceae	Krachay	Fruit & leaves	
46.	<i>Artemisia maritima</i> L.	Asteraceae	Loam	Whole Plant	Plant is anthelmintic & stomachic. Recipes: Plant is dried and boiled in water and the extract is cooled and used as anthelmintic.
47.	<i>Artemisia scoparia</i> Waldst Kitam .	Asteraceae	Jaukay	Leaves, shoots & seeds	Plant is purgative, antispasmodic, stomachic, respiratory stimulant & anthelmintic. Plant is also used as good remedy for ear infection/earache
48.	<i>Berberis lycium</i> Royle	Berberidaceae	Kware	Leaves, Stems, roots, fruit & bark	Root & stem of plants is general body tonic, febrifuge, stomachic, expectorant & diuretic. Bark of root is used for treatment of liver disorders, stomach problems,

					ulcers, internal & wound healing & intestinal colic. Plant is also used in diarrhea, piles, blood purification & Hepatitis. The decoction of root is used as aphrodisiac Fruits are edible & used in jaundice & diarrhea. Root of plant is antiseptic, antibiotic & recommended in throat infection. Plant is also in women delivery cases. Recipe: Root is antiseptic, tied upon the fracture bones and utilized for healing of fractured bones, external wounds and arthritis. Root of plant is grinded into powdered & mixed with egg & fried in cow, s ghee for the treatment of fractured bones & wound healing.
49.	<i>Bergenia ciliata</i> Sternb.	Saxifragaceae	Makanpat, Ghat Panra/ Kmar Panra	Rhizome	Plant is tonic, antidiabetic, expectorant, stomachic & blood purifier. Rhizome is used in muscular pain, general body tonic, wound healing, running eye, & sunburn. Recipes: Rhizome is powdered & eaten with glass of water for treatment of diabetes & also as astringent. The powdered form of rhizome is also useful in urinary disorders, stomach ulcer, diarrhea, backache & muscular diseases. Locally the powdered rhizome is

					boiled with water for an hour. The remaining gum like extract of rhizome is then applied on the cut wound for healing.
50.	<i>Bistorta amplexicaulis</i> (D. Don) Green.	Polygonaceae	Tarvapanā/ Anjabar	Rhizome Shoots & Leaves	Plant is used for inflammation of mouth, sore throats, rheumatism, fever, flu, general body tonic & gout. The young shoots & leaves are used for curing cancer. Recipes: A local tea is prepared from the rhizome which is used as remedy for fever and flu. The rhizome is also effective to cure ulcers. The rhizome is powdered and is taken with water for curing of rheumatism & gout. Rhizome is also mixed with egg & fried in cow's ghee & considered effective for general body tonic.
51.	<i>Brassica rapa</i> subsp. <i>campestris</i> (L.) Clapham	Brassicaceae	Sharsham	Seeds	Oil obtained from seeds is used as ointments for body massage & hair tonic.
52.	<i>Brassica rapa</i> subsp. <i>Rapa</i>	Brassicaceae	Tapar	Leaves & roots	Leaves & roots are good remedy for treatment of ulcer & stomach disorders.
53.	<i>Bunium persicum</i> (Boiss) Fedtsch.	Apiaceae	Tora zeera	Fruit	Fruit of plant is carminative, stomachic, antiseptic, lactagogue & vermicide
54.	<i>Buxus wallichiana</i> Baill	Buxaceae	Shamshad	Leaves & stems	Medicinally plant is used for treatment of rheumatism problem Plants is used as febrifuge, diaphoretic & purgative. Stem is

					also used as tooth brush which considered as remedy for toothaches.
55.	<i>Calendula arvensis</i> L.	Asteraceae	Ziar gule	Leaves & flowers	The leaves are anthelmintic, tonic & diaphoretic. The leaves and flowers are also given to children for scrofula. Recipes: The leaves are grinded into powdered which is used as snuff for mucous discharge.
56.	<i>Calendula officinale</i> L.	Asteraceae	Ziar gule	Leaves, shoots & flowers	Flowers & shoots are used for treatment of wounds & skin problems. Flowers are used with honey as stimulant, astringent, antispasmodic & stomachic.
57.	<i>Calotropis procera</i> (Willd) R. Br.	Asclepiadaceae	Spalmay	Whole Plant	Plant is used for treatment of diabetes, skin diseases, diarrhea, dog bites, ulcer, cough & asthma. Recipes: Leaves are smoked to cure cough & asthma. Leaves are crushed with gur (sugar raw) to make a paste which is applied as poultice on dog bitten wounds. Latex of plant is also used in skin diseases & diarrhea.
58.	<i>Caltha alba</i> Camb.	Ranunculaceae	Makan path	Flowers, leaves	Locally plant is used in jaundice, hepatic disorders, skin problems & also enhance digestion. Flowering shoots are laxative & diuretic. Recipes: Traditionally local community used leaves of plant for wound healing, skin lesions &

					sores. Juice of flowers is applied to fore head & used as remedy for headache.
59.	<i>Cannabis sativa</i> L.	Canabinaceae	Bhang	Leaves & flowers	Dried & fresh leaves are used as narcotic. Powdered leaves and flowering tops are as used as stimulant, tonic, sedative & anodyne. Plant is also used as cooling agent. Locally milk & nut is mixed with juices of plant to make a cold drink ” Tandai” which is considered as stimulant & produce a pleasant excitement.
60.	<i>Capsella bursa pastoris</i> (L.) Medik.	Brassicaceae	Bambesa	Seeds & leaves	Seeds of plant are astringent, diuretic & stimulant. It is also used in dropsy. Recipes: Pastes of fresh leaves are taken with milk for diarrhea.
61.	<i>Capsicum annum</i> L.	Solanaceae	Marchakay	Fruit	Fruit is stimulant, carminative, digestive, appetizer & also used in common cold, whooping cough, dyspepsia.
62.	<i>Caralluma edulis</i> (Edgew.) Bth ex HK.f.	Asclepiadaceae	Pamankay	Juicy stem	Juicy stem of plant is bitter tonic but it is commonly used as vegetable. Plant is carminative, febrifuge, stomachic & anti-diabetic. Plant is also used in rheumatism & high blood pressure.
63.	<i>Celtis australis</i> L.	Ulmaceae	Tagha	Fruit, leaves	Plant is stomachic, colic, anthelmatic & cooling agent. The fruit is edible & used for treatment of colic, amenorrhea. menstrual

					bleeding, allergy & skin problems Recipes: Decoction of fruit is used as remedy for amenorrhea, menstrual bleeding. & diarrhea.
64.	<i>Chenopodium album</i> L.	Chenopodiaceae	Sarmay	Leaves & roots	Plant is laxative, diuretic & anthelmintic. Roots are used for treatment of urinary & hepatic disorders.
65.	<i>Cichorium intybus</i> L.	Asteraceae	Han	Root, leaves	Plant is used for treatment of Jaundice, hepatic disorders, fever & headache. Recipes: Decoction of root is taken orally for curing of fever, jaundice & hepatic disorders. Leaves of plant is mixed with the juice of <i>Adiantum venustum</i> & mixture is then used as remedy for treatment of headache, jaundice, hepatic & sexual problems.
66.	<i>Citrullus colocynthis</i> (L.) Shard.	Cucurbitaceae	Kalkanday	Fruits	Juice of fruit is purgative & also given in dropsy. Seeds are boiled & extract is used for Hematuria (bleeding in urine)
67.	<i>Convolvulus arvensis</i> L.	Convolvulaceae	Prewatai	Whole plant	Plant is laxative & purgative. Plant is applied in skin disorders & also used as antidandruff Recipes: The decoction of fresh leaves is used in hepatic disorders.
68.	<i>Erigeron canadensis</i> L. (Syn. <i>Conyza canadensis</i>)	Asteraceae	Mallooch	Leaves	Leaves of plant are stimulant, astringent diuretic. Plant is also used in Diarrhea.

	(L.) Cronquist.)				
69.	<i>Coriandrum sativum</i> L.	Apiaceae	Dhanya	Leaves & Seeds	Mostly it is used as condiment but it is aromatic, stimulant, carminative, digestive & flavoring agent. It is also useful remedy against piles Seeds are appetizer where as decoction of plant is useful remedy for colic. Recipes: <i>Stellaria media</i> is cooked in ghee, and garlic with coriander to treat piles
70.	<i>Cotinus coggyria</i> Scop.	Anacardiaceae	Chamyarae	Wood & leaves	Wood of plant is antipyretic & ophthalmic.
71.	<i>Crataegus songarica</i> K. Koch.	Rosaceae	Changa/ Tampasa	Fruits	Berries are edible & considered as cardio tonic and used to relieve hypertension, high blood pressure & blood circulation.
72.	<i>Cucumis sativus</i> L.	Cucurbitaceae	Badrang	Fruit	It is cooling agent & used in jaundice & hepatic disorder. It is commonly used as salad.
73.	<i>Cucurbita maxima</i> Duch. ex Lam.,	Cucurbitaceae	Khog Kadoo	Young shoots, leaves, fruits & seeds.	Young shoots, leaves & fruit are frequently used as vegetable but are considered as good remedy for treatment of ulcer, Jaundice & digestive disorders. Seeds are used as anthelmintic.
74.	<i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poir.	Cucurbitaceae	Gharangay Kadoo	Leaves & fruits	Young leaves & fruit are used as vegetable but it is considered as excellent diet for patient suffering from Jaundice & hepatic disorders. Fruit is also used in heat & stomach

					problems.
75.	<i>Cuscuta reflexa</i> Roxb.	Cuscutaceae	Zelai	Whole plant	Plant is antidiabetic, purgative, diuretic & anthelmintic. Recipes: The plant is boiled in water and the juice extracted from the plant is used as a remedy for blood purification, jaundice & diabetes.
76.	<i>Daphne mucronata</i> Royle	Thymelaeaceae	Liaghonai	Leaves, fruit	Plant is anthelmintic, antirheumatic & also used in gonorrhea. Recipes: Leaves & fruit poultice is applied for curing of joint pain & rheumatism.
77.	<i>Datura innoxia</i> Mill.	Solanaceae	Batora/ Dhatora	Leaves, seeds	Plant is used as narcotic, antiseptic, antipyretic & sedative. Extract of leaves is used in headache, toothache & epilepsy. Seeds are narcotic & antipyretic. Dried seeds & leaves are used for curing asthma. Whole plant is toxic & cause coma & even death if overdosed by human or livestock.
78.	<i>Datura stramonium</i> L.	Solanaceae	Harhanda/ Datora	Leaves, seeds	Leaves & seeds of plants are antipyretic, narcotic, sedative, also used in earaches & skin problems. Recipes: Juice of the flower is used as eardrops to alleviate earaches. Poultice of flowers is applied on skin to relieve the pain. Seeds are used for cough & cold.
79.	<i>Diospyros kaki</i> L.	Ebenaceae	Ziar	Fruit	It is one of the key commercial crop

			Amlook		of the area & used as laxative
80.	<i>Diospyros lotus</i> L.	Ebenaceae	Tor Amlook	Fruit	Fruit is purgative, carminative & cause flatulence. Recipes: The decoction of ripened fruit is boiled in milk and taken as remedy for curing of dysentery & constipation.
81.	<i>Dodonaea viscosa</i> (L.) Jacq.	Sapindaceae	Ghwarasky	Leaves	Leaves of plant are antirheumatic, antispasmodic, & astringent. It is also used for treatment of skin problems, wounds, swellings & burns.
82.	<i>Echinops griffithianus</i> Boiss	Asteraceae	Ghwand Saray	Stem & Leaves	Stem & leaves of plant are aphrodisiac & diuretic.
83.	<i>Elaeagnus umbellata</i> Thunb.	Elaeagnaceae	Ghanam Ranga	Flowers, fruit & seeds	Plant is heart tonic, stimulant & used in cough & chest problems. Recipes: Decoction of flowers is used twice a day for heart problems. Decoction of flowers used twice a day to cure heart diseases; decoction of leaves against cough.
84.	<i>Eucalyptus globulus</i> Labill.	Myrtaceae	Lachi	Fruit, leaves	Plant is antiseptic. Leaves are locally used for flu, asthma & chest infection.
85.	<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	Mandanhro /Prewatka	Shoots & roots	Locally it is considered as poisonous plant but local traditional herbalists used it as laxative, cathartic, anthelmintic, and also for constipation. Latex is toxic, irritant & cause swelling on the skin. Juice is applied over skin eruption

86.	<i>Euphorbia indica</i> Lam.	Euphorbiaceae	Jangali Spalmai	Milky latex	The milky juice is used for treating ringworm disease.
87.	<i>Euphorbia prostrata</i> Ait.	Euphorbiaceae	Vermaga	Whole Plant	The paste of plant is applied for skin problems. The decoction of plant is also used for skin diseases & especially treating ring worms
88.	<i>Euphorbia wallichii</i> Hook.f.	Euphorbiaceae	Shangla	Latex, shoots	Plant is poisonous but local Hakeems used it as anthelmintic & laxative which cause acute diarrhea & dysentery. Dried leaves & seeds are used for treating bowel problems in children.
89.	<i>Ficus carica</i> L.	Moraceae	Inzar	Fruit & leaves	Fruit is considered as purgative, laxative, stomachic, demulcent, aphrodisiac & antipyretic. It is also used in urinary disorders, piles & constipation. Leaves are used in treatment of jaundice. Latex is applied on the skin to take out spines lodged deeply in the flesh of skin.
90.	<i>Ficus palmata</i> Forsk.	Moraceae	Inzar	Fruits	Fruit is laxative, demulcent, carminative & emollient. Fruit is also used for constipation, piles & dysentery. Milky latex is used for removal of spine from skin.
91.	<i>Fumaria indica</i> (Hausskn.) Pugsley	Fumariaceae	Papra	Whole Plant	Plant is anthelmintic, diuretic, stomachic, antipyretic & also used as remedy for Jaundice, blood purification, constipation & dyspepsia. Recipes: Decoction of plant is used

					in blood purification & constipation. The fresh plant is crushed, soaked in water, filtered & the extract is then used for jaundice. Juice of plant is used in stomach problem & fever.
92.	<i>Gentiana kurroo</i> Royle. Syn. <i>Gentianodes</i> <i>Kurroo</i> (Royle) Omer, Ali & Qaiser	Gentianaceae	Sitara Bootey	Root	Root is stomachic, astringent, antispasmodic, tonic & febrifuge. Recipes: Dried root are powdered and used with Desi ghee as stomachic.
93.	<i>Geranium collinum</i> Steph .ex Willd.	Geraniaceae	Sra Zela	Whole plant	Plant is antipyretic & tonic. Recipes: Decoction of plant is used for curing fever, cough & cold.
94.	<i>Geranium wallichianum</i> D.Don ex Sweet	Geraniaceae	Sra Zela	Roots	Plant is antipyretic & astringent. Roots are used in cough, cold & kidney disorders. Recipes: Dried roots are mixed with egg, fried in cow, s ghee and used as useful remedy for rheumatism & backache.
95.	<i>Hdera nepalensis</i> K. Koch.	Araliaceae	Zelai	Leaves & fruits	The leaves are stimulant & used in Diabetes & blood pressure. Decoction of the leaves is used for abdominal pain & urinary troubles. Leaves extract is used for curing diabetes. Fruits are purgative. Recipes: The plant is crushed into powdered form & boiled with milk & used early in the morning for treatment of diabetes.

96.	<i>Helianthus annuus</i> L.	Asteraceae	Nwarparast	Seeds	Seeds of plant are used as laxative & diuretic.
97.	<i>Hyoscyamus niger</i> L.	Solanaceae	Shamala/ Dewana bhang	Leaves, seeds	Seeds of plant are narcotic, sedative & tonic. It is also use for respiratory problems & toothaches. The seeds of plant are applied to the teeth to alleviate toothache.
98.	<i>Hypericum perforatum</i> L.	Guttiferae	Ghra Shin Chay	Stems & leaves	Plant is analgesic, diuretic, anthelmintic, astringent & anti hypertensive. Recipes: Locally green tea is prepared from the leaves which is considered as stimulant, analgesic, carminative & also used in cold.
99.	<i>Indigofera heterantha</i> Well.ex Brandis	Papilionaceae	Ghwareja	Leaves & roots	Leaves are used as remedy for abdominal pain & stomach disorders. Recipes: Traditionally the powdered roots are taken with water twice a day for treatment of chest pain, headache & scabies.
100.	<i>Jasminum humile</i> L.	Oleaceae	Ziar Chambele	Root, leaves	Root is anthelmintic, diuretic & also used for treatment of ringworm. Recipes: Flowers are dried, powdered, boiled in water & used as remedy for jaundice & blood purification. Root decoction is used for curing ringworms.
101.	<i>Jasminum officinale</i> L.	Oleaceae	Spin Chambele	Leaves, flowers, roots	The root is used against ringworm. The leaves are analgesic, blood purifier & antipyretic. The flowers

					are diuretic, aphrodisiac, antispasmodic, antiseptic, also used in skin ailments, headache & mouth rashes. Recipes: Juice extracted from flowers is used in skin ailments, headache & mouth rashes.
102.	<i>Juglans regia</i> L.	Juglandaceae	Ghuz	Root bark, leaves & fruit	Root bark (Locally called as Dandasa) is used for cleaning and sparkling teeth. The fruit are edible and used for increasing mental & sexual capacity. The unripe fruit is given to the children as vermifuge. Recipes: The decoction of internal membrane of fruit is used in treatment of urinary disorders. Decoction of leaves is used as vermicide & also taken as remedy for eczema. The ripened fruit is used as brain & sexual tonic.
103.	<i>Justicia adhatoda</i> L.	Acanthaceae	Baiker	Leaves	Leaves are used in rheumatism, bronchitis, cough, swelling, snakebite, expectorant, ophthalmic and eye diseases. Recipes: The leaves are grinded into powdered form and are used in cough, bronchitis, rheumatism and expectorant. Locally the leaves are used for treatment of swelling. The leaves are heated and paste on the swelling & acne to release pus.

104.	<i>Lathyrus aphaca</i> L.	Papilionaceae	Kurkamany	Leaves	Traditionally decoction of seeds are used for healing of wounds
105.	<i>Luffa cylindrica</i> (L.) Roem.	Cucurbitaceae	Torai	Fruit	Fruits are used as vegetable but considered as good remedy for ulcer & stomach problems.
106.	<i>Malus pumila</i> Mill.	Rosaceae	Manra	Fruits	Fruit is expectorant, purgative, antispasmodic & also considered as heart tonic. Fruit is also used to control cholesterol level.
107.	<i>Melia azedarach</i> L.	Meliaceae	Tora Bekyana/ Shandai	Whole plant	Plant is anthelmintic & traditionally used as remedy for allergy, rheumatism, diabetes, hypertension & jaundice. Seeds are used in joints pain & high blood pressure. Seeds are used in rheumatism & high blood pressure. Bark is cathartic & emetic. Recipes: Decoction of leaves is used in hysteria & Jaundice. Decoction of bark is used as remedy for allergy. Flowers applied as poultice. Ripened fruits are used as anti-diabetic. Dried fruits are crushed and used as carminative & antipyretic.
108.	<i>Momordica charantia</i> L.	Cucurbitaceae	Karela	Fruit	Fruit of plant is commonly used as vegetable but it is ant diabetic, antipyretic & expectorant. Recipes: Juice of fruit is used as remedy for treatment of diabetes & jaundice

109.	<i>Mentha longifolia</i> (L.) Huds.	Lamiaceae	Vallenay	Whole plant	Plant is stomachic, carminative, stimulant & anti-rheumatic. Dried leaves are used in diarrhea, dysentery, abdominal pain, Tonsilites & gastric problems. Recipes: Decoction of leaves are used in cough, vomiting & diarrhea. Powdered leaves are also taken with boiled egg for tonsilites. Rice is cooked with leaves of <i>Mentha longifolia</i> for diarrhea.
110.	<i>Mentha spicata</i> L.	Lamiaceae	Podina	Leaves & Stems	Plant is carminative, stimulant, refrigerant and used in dyspepsia, vomiting, dysentery, stomachache and other digestive problems. Recipes: The powdered of plant is mixed with sugar & taken with water early in the morning before breakfast to control vomiting. Decoction of leaves is used as mouth wash.
111.	<i>Micromeria biflora</i> Buch.	Lamiaceae	Naray Shamakay	Whole plant	Plant is antiseptic & used in cold flu & fever. Plant is also used in toothache, mouth wash & gum disease. Recipes: A paste of plant is used as poultice for external wounds
112.	<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Gule bada	Leaves	Plant is wound healer. Extract of Leaf is used for cleaning & healing of wound. A hot paste of leaves is used to mature & resolve boils.

113.	<i>Morus alba</i> L.	Moraceae	Spin toot	Leaves, fruits, wood	Leaves are emollient, anthelmintic, refrigerant & astringent. Leaves are also used for sore throat infection. Fruit is laxative & purgative. Bark is used in cough & fever.
114.	<i>Morus nigra</i> L.	Moraceae	Spin toot	Leaves, fruits, wood	Leaves are emollient, refrigerant, vermicide, astringent. Fruit is laxative & purgative. Bark is used in cough & fever. Recipes: Decoction of leaves is used in throat infection
115.	<i>Myrsine africana</i> L.	Myrsinaceae	Marurang	Fruit, leaves	Leaves are used in blood purification. Fruit is anthelmintic & also used for treatment of toothache & colic pain. Recipes: A decoction of leaves is used in blood purification
116.	<i>Myrtus communis</i> L.	Myrtaceae	Manro	Leaves & fruit	Plant is carminative, expectorant, appetizer, antiseptic & stomachic. Recipe: Leaves are boiled in water with sugar and its tea used as remedy for cough, bronchial disorders, abdominal pain & diarrhea.
117.	<i>Narcissus tazetta</i> L.	Amaryllidaceae	Gwale Nargis	Roots & whole plant	Juice of the plant is purgative & emetic and also used for blood purification & wound healing. Recipes: The root is used as poultice for treatment of boils and other skin problems.
118.	<i>Nerium oleander</i> L.	Apocynaceae	Ganderay	Leaves, roots	Plant is poisonous so great care should be taken while using the

					plant materials. Decoction of leaves in paste form is applied externally on the skin eruptions & other skin diseases. Leaves and roots are used in snake bites and also as insecticide.
119.	<i>Nicotiana tabacum</i> L.	Solanaceae	Tamako	Leaves	Plant is nerves stimulant, antiseptic, narcotic, used in snuff & applied on the wound for healing & to stop bleeding.
120.	<i>Ocimum basilicum</i> L.	Lamiaceae	Kashmalay	Leaves & seeds	Leaves are expectorant & also used in cold, flu & mouth sore infection. Recipes: Leaves are chewed as remedy for cold, flu, mouth & tongue sore.
121.	<i>Olea ferruginea</i> Wall. ex Aitch. Syn. <i>Olea cupidata</i> Wall ex G. Don	Oleaceae	Khona	Leaves, fruits, seeds	Leaves are anthelmintic, antiseptic, antipyretic, astringent & diuretic. Leaves are used as painkiller to soothe toothaches & also as remedy for gum diseases. Fruit is used for treatment of diabetes. Recipes: Decoction of leaves is used for treatment of toothaches, gum diseases & sore throat. Oil obtained from the seeds is used as rubefacient & used for treatment of rheumatism & joints pain.
122.	<i>Origanum vulgare</i> L.	Lamiaceae	Shamakay	Whole Plant	Plant is diuretic, stomachic, carminative, antispasmodic & stimulant. Leaves & shoots are used as remedy for curing earache & toothache.

					Recipes: Shoot is chewed for toothache.
123.	<i>Otostegia limbata</i> (Benth.) Boiss.	Lamiaceae	Spin Azghay	Leaves.	Plant is used in treatment of jaundice, hypertension, gum diseases & wounds. Recipes: Juice of leaves is used in gum diseases while dried leaves are used in Jaundice.
124.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Zmake Tarokay	Leaves, fruits, seeds	Plant is vermifuge, coolant, antipyretic & used in stomach disorders. Leaves are also used as remedy for treatment of sensitive teeth. Recipes: Decoction of plant is used in digestion, fever & dysentery. Fresh leaves are crushed, mixed with water & sugar for treatment of hepatic disorders & jaundice.
125.	<i>Paeonia emodi</i> Wall.ex Royle	Paeoniaceae	Mamekh	Rhizome & seeds	Rhizome of plant is tonic, cathartic, antirheumatic, blood purifier & used in treatment of backbone aches, general body weakness, colic, dropsy & epilepsy. Seeds are purgative Recipes: Rhizome is boiled in milk and the extract is used in backbone aches & considered as powerful aphrodisiac & tonic. The powdered rhizome is mixed with Desi ghee & used twice a day after meal for general body weakness.

126.	<i>Papaver somniferum</i> L.	Papaveraceae	Qashqash/ Apium	Latex & seeds	Latex is used as anodyne, narcotics, sedative, expectorant & pain killer. Capsule & seeds is narcotic, tonic, used in cough & fever. Recipes: A tea made from the seeds has traditionally used for treatment of cough, cold & fever.
127.	<i>Periploca aphylla</i> Decne.	Asclepiadaceae	Barrha	Leaves, Milky latex	Milky juice of plant is laxative, antipyretic & antitumorous. Recipes: Milky juice of plant is used in curing fever. Milky Juicy extract of stem & fruit is applied on the skin as antitumor & also for curing swelling
128.	<i>Polygonum aviculare</i> L.	Polygonaceae	Masloom/ Knotweed	Leaves	Leaves of plant are astringent, anthelmintic, diuretic & also used for curing diarrhea, dysentery & ulcers. Recipes: Decoction of leaves is used orally for treatment of diarrhea, dysentery.
129.	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f.	Anacardiaceae	Shnae	Whole plant	The plant is antiseptic, refrigerant and used for Jaundice and Hepatitis. The plant is also good remedy for treatment of cough & asthma. Fruit of plant is tonic. Decoction of plant is used for jaundice & liver ailments. Recipes: Leaves bark & fruit are crushed together and some water is added then filter extract is considered as useful remedy for

					Jaundice & Hepatitis.
130.	<i>Plantago lanceolata</i> L.	Plantaginaceae	Jabai	Leaves & seeds	Leaves of plant are refrigerant, astringent, antiseptic. Recipes: Leaves, s extract is used for wound healing, sores, inflammation & burn on the skin. Decoction of seeds & leaves are used for mouth bleeding, diarrhea, dysentery & stomach problems. Leaves are boiled in water, cooled & mixed with gur, used for treatment of dysentery.
131.	<i>Plantago major</i> L.	Plantaginaceae	Ghata Jabai	Leaves	Leaves are used as antiseptic, astringent, refrigerant. Seeds are tonic & cooling agent. Plant is also used in stomach disorders. Recipes: Leaves are warmed and mixed with flour of maize and applied externally on ruptured skin for wound healing. The seeds are mixed with honey and used in constipation. A decoction of root is used in treatment of diarrhea, dysentery, asthma & cold.
132.	<i>Isodon rugosus</i> (Wall. ex Benth.) Codd Syn. <i>Plectranthus rugosus</i> Wall. ex Benth.	Lamiaceae	Sperkay	Leaves	Plant is aromatic & used as antiseptic & astringent. Recipes: Dried leaves are placed on the mouth to relieve toothaches & gum diseases. Decoction of leaves is antiseptic. A paste of leaves is used as poultice for

					healing of wounds on the skin.
133.	<i>Podophyllum emodi</i> Wall. ex Royle	Podophyllaceae	Kakora	Rhizome & seeds	Rhizome is purgative, emetic, hepatic stimulant & used in hepatic disorders. Recipes: The powdered rhizome is mixed with Desi ghee & used for backache & cancer. Powdered rhizome is hepatic stimulant & used to treat other liver diseases. Seeds are crushed into powdered & taken with glass of water as general body Tonic.
134.	<i>Portulaca oleracea</i> L.	Aizoaceae	Warkharay	Whole plant	It is locally used as pot herb. Plant is considered as cooling agent and used as remedy for inflammation of the urinary system. It is also used as useful remedy for liver and kidney problems.
135.	<i>Primula denticulata</i> Smith.	Primulaceae	Asli Mamera	Flowers & rhizome	Rhizome is expectorant and considered as effective agent to clear phlegm. Flowers are used in ophthalmic diseases.. Recipes: Dried flowers are powdered & applied to the eye with small stick for curing eye ailments & to improve eye sight
136.	<i>Primula macrophylla</i> D.Don.	Primulaceae	Mamera	Flowers	Flowers are used as remedy in ophthalmic diseases. Recipes: .Flowers of plant is grinded into fine powdered and applied to the eyes with small stick

					for curing eye ailments & to improve eye sight.
137.	<i>Prunus armeniaca</i> L.	Rosaceae	Khobanai	Fruits, seeds	Fruit of plant is laxative, purgative, antipyretic & also used refrigerant. Fruit is considered as tonic & also good remedy for constipation. Seeds are tonic, also used in piles & hepatic disorders. Gum obtained from stem of <i>Prunus armeniaca</i> is considered as anticancerous agent
138.	<i>Prunus domestica</i> L.	Rosaceae	Alocha	Fruits, gums	Fruit of <i>Prunus domestica</i> is laxative, refrigerant. It is also used in constipation & stomach problems.
139.	<i>Punica granatum</i> L.	Punicaceae	Anangoray	Fruits, seeds, leaves, Stem, bark	Fresh juice of the fruit is coolant, blood purifier, used in jaundice, diarrhea & urinary disorders. The pulp of fruit & seed is cardiac stimulant & stomachic. Leaves are used in skin ailments & dysentery. Bark of stem & root is anthelmintic, antipyretic, expectorant & also used as mouthwash, Recipes: Epicarp of the fruit is locally known as “Nersawey” which is used for treatment of gonorrhea, urinary diseases, bronchial asthma & whooping cough.
140.	<i>Pyrus pashia</i> L.	Rosaceae	Tangai	Fruits	Fruit of plant is astringent febrifuge & laxative. Recipes: Juice of fruit is used as

					remedy for diarrhea.
141.	<i>Quercus dilatata</i> Royle	Fagaceae	Tor banj	Seeds & Nuts	Roasted seeds are diuretic, astringent & used for treating indigestion, diarrhea & asthma. Recipe: The dried roasted fruit & seeds are used as anti-inflammatory in diarrhea and in urinary diseases.
142.	<i>Quercus incana</i> Roxb.	Fagaceae	Spin banj	Seeds & Nuts	Fruits are diuretic & astringent & used for curing dysuria, diarrhea & asthma. . Recipes: The powdered of the ripped fruit mixed with wheat flour & fried with cow's ghee. Mixture is locally called Halva used for general body tonic.
143.	<i>Quercus semecarpifolia</i> Smith.	Fagaceae	Mer (Tarra)	Nuts	Recipes: The powdered of the ripped fruit mixed with wheat flour & fried with cow's ghee. Mixture is locally called Halva used for general body tonic
144.	<i>Ranunculus aquatilis</i> L.	Ranunculaceae	Gaghagha	Whole Plant	Decoction of plant is used in fever & asthma.
145.	<i>Raphanus sativus</i> var. sativus	Brassicaceae	Moolay	Young leaves, shoots, roots	Young leaves & roots are used as Salad which is carminative, digestive & diuretic. Leaves & roots are also used as remedy for urinary disorders, jaundice & piles.
146.	<i>Rheum australe</i> D. Don	Polygonaceae	Chotial	Roots	Root is blood purifier, laxative & tonic, Root of plant is used in intestinal pain & skin problems. Recipes: Traditionally root are

					powdered & taken with a glass of water twice a day for removal of kidney stone & other kidney infections. Dried powdered root is used in wound healing
147.	<i>Ricinus communis</i> L.	Euphorbiaceae	Harhanda	Seeds, leaves	Seed is sedative & antipyretic whereas seed oil is purgative & used in constipation. Leaves are purgative, narcotic & emetic. Leaves poultice is applied for swelling.
148.	<i>Rosa moschata</i> Herrm. (Syn. <i>Rosa brunonii</i> Lindl.)	Rosaceae	Qurach/ Zangali Gulab	Flowers & leaves	Flowers & leaves are used in stomach disorders, skin burning & eye diseases. Recipes: Decoction of leaves is used before breakfast for curing of stomach disorders.
149.	<i>Rosa webbiana</i> Wall. ex Royle	Rosaceae	Zangali Gulab	Fruits & leaves	Leaves are stimulant. Flowers are astringent & antispasmodic. Recipes: A fresh ripened fruit of <i>Rosa webbiana</i> is used as antispasmodic agent. Extract of flower is ophthalmic & used for treatment of eye diseases.
150.	<i>Rubus ellipticus</i> Smith.	Rosaceae	Goraj/Ziara karwara	Fruits	Fruit is edible, tonic carminative, antipyretic & used as remedy for sore throat, cough, cold & kidney stone Recipes: Juice of fruit is used as remedy for treatment of cough, cold, colic & sore throat. Decoction of root is carminative & also used

					in diarrhea & dysentery.
151.	<i>Rubus fruticosus</i> Hook.f.	Rosaceae	Baganra/ karwara	Leaves, fruits, root	Fruit are edible, used as carminative & stomachic. Leaves of plant are diuretic, antipyretic & also used in treatment of cough & diarrhea. Recipes: Ripened fruit of <i>Rubus fruticosus</i> is eaten to control stomach disorders & enhance digestion. A decoction of root is used for removal of kidney stone.
152.	<i>Rubus ulmifolius</i> Schott.	Rosaceae	Karwara	Fruits	Fruit is edible & considers as aphrodisiac, tonic, carminative & antipyretic. Recipes: Fruit Juice is used as tonic, carminative & aphrodisiac.
153.	<i>Rumex dentatus</i> L.	Polygonaceae	Shalkhay	Leaves	Leaves are used as astringent, diuretic & demulcent. It is also used to soothe effect of irritation caused by the <i>Urtica dioica</i>. Recipes: Leaves are used as poultice for wound healing
154.	<i>Rumex hastatus</i> D. Don.	Polygonaceae	Tarukay	Leaves & roots	Leaves are used as astringent, stomachic, carminative, refrigerant & diuretic. It is also used for wound healing & abdominal pain. Recipes: Traditionally warmed leaf used as poultice over the wound for their healing are boiled in water & gur, the mixture is then filtered after cooling & used in case of

					abdominal pain.
155.	<i>Salvia mocroftiana</i> wall ex Bth.	Lamiaceae	Khardag	Leaves & stems	Plant is traditionally used as aphrodisiac & also to treat skin diseases. Recipes: Fresh leaves of plant is mixed & warmed with the mustard oil & applied on the skin for healing of wounds, cleaning of lesions/sores to release puss where as inner part of the stem is chewed & considered as aphrodisiac agent.
156.	<i>Sarcococca saligna</i> (Don) Muell.	Buxaceae	Laden	Leaves	Infusion of leaves is used is for rheumatism where as leaves is heated in mustard oil for muscular pain.
157.	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke)	Asteraceae	Kuth	Root	Root is tonic, carminative, stomachic & antispasmodic. Root is also used in asthma, cough & cholera. Recipes: Root of plant is grinded into powdered, mixed with cow, s ghee & used twice a day for treatment of antispasmodic & stomachic problem.
158.	<i>Silene vulgaris</i> (Moench) Garcke.	Caryophyllaceae	Manghotay	Young shoots & leaves	Young shoots of plant are stomachic & emollient. Recipes: Paste of leaves is used as cosmetic for whitening of skin.
159.	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp.	Rutaceae	Nazar panra	Leaves	Leaves of plant are antiseptic, used in dyspepsia, cold & cough. Recipes: Smoke of dried leaves is

					considered as antiseptic. Dried leaves are also burnt to expel evils & bad eyes. It is also considered as remedy in cough & cold. Tea prepared from the leaves is taken after meal for treatment of dyspepsia.
160.	<i>Solanum nigrum</i> L.	Solanaceae	Kacamacho	Leaves, fruit	Plant is diuretic, carminative, tonic, antipyretic & expectorant. Fruit & leaves are used in hepatic disorders, abdominal inflammation, skin diseases, & washing of wounds. Leaves are also used in kidney stone. Recipes: A paste made from leaves is applied on the skin to treat inflammation & itching.
161.	<i>Solanum surrattense</i> Burm.f.	Solanaceae	Maraghony	Whole Plant	Plant is stomachic, diuretic, expectorant & also used as remedy for cough, fever, asthma & gonorrhea. Fruit is used for abdominal pain & jaundice. Recipes: Dried plant is powdered, mixed with sugar & taken with glass of water for treatment of stomach problems & asthma.
162.	<i>Sorbaria tomentosa</i> (Lindl.) Rehder	Rosaceae	Sra bakayana	Flowers	Flowers of plant are antiseptic & mixed with mustard oil & then applied on the new born babies for treatment of skin rashes.

163.	<i>Spiraea nervosa</i> Franch & Sav.	Rosaceae	Krachay	Leaves	Leaves of plant are used in women delivery. Recipes: Tea prepared from the leaves is given to the women to ease child birth.
164.	<i>Stellaria media</i> (L.) Cyr.	Caryophyllaceae	Olalai	Whole Plant	Plant is astringent purgative & antidiabetic. Plant is used to treat piles, rheumatism & constipation. Recipes: Plant is cooked with garlic & coriander for treatment of piles. Decoction of plant is used as purgative
165.	<i>Taraxacum officinale</i> F. H. Wigg.	Asteraceae	Ziar Gule	Flowers, root & leaves	Plant is tonic, purgative & diuretic. The root is used in jaundice, diabetics & diuretic. It is also used against tumors. Decoction of leaves is used for blood purification, jaundice, kidney & liver disorders.
166.	<i>Teucrium stocksianum</i> Boiss.	Lamiaceae	Kwandi bootay	Leaves	Leaves are expectorant & refrigerant. Recipes: Leaf decoctions are used to treat sore throat.
167.	<i>Thalictrum foliolosum</i> DC.	Ranunculaceae	Mamera	Rhizome	Medicinally rhizome of <i>Thalictrum foliosum</i> is ophthalmatic & used in eye diseases.
168.	<i>Thymus linearis</i> Benth.	Lamiaceae	Ghra Chai, Zangali Sperkay	Leaves	Leaves of plant are antispasmodic, carminative, digestive & antipyretic. Recipes: A Green tea prepared from the leaves has been used as remedy for cough, cold & d fever.

					Juice of plant is used to relieve toothache.
169.	<i>Urtica dioica</i> L.	Urticaceae	Sezonke/ Jalbang	Leaves	The smoke of plant is used for treatment of bronchial & asthmatic problem. Locally it is also used as vegetable for curing constipation & lung diseases. Recipes: The dried leaves are powdered & used as cigarette for asthma.
170.	<i>Valeriana jatamansi</i> Jones.	Valerianaceae	Mushke Bala	Rhizome	Rhizome of plant is antispasmodic, carminative, hair tonic, aromatic & also used in hysteria & epilepsy. Recipes: Decoction of rhizome is used in treatment of dysentery & cholera. Locally the dried rhizome is powdered, mixed with Desi ghee and used for treatment of epilepsy. Dried rhizome is also taken with milk for intestinal pain & constipation.
171.	<i>Verbascum thapsus</i> L.	Scrophulariaceae	Khrdhag	Leaves, flowers	Plant is antiseptic, analgesic, narcotic & also used in cough, lung diseases, wound healing & other skin problems. Recipes: Fresh leaves are considered as antiseptic, analgesic & applied on the skin as poultice for treatment of swelling & pus discharge. It is also used in joint pains. The decoction of leaves &

					flowers are used as remedy for curing of cough, lung diseases wounds.
172.	<i>Verbena officinalis</i> L.	Verbenaceae	Shamakay	Whole plant	Plant is refrigerant, antimalarial & febrifuge Recipes: Decoction of the fresh plant is used twice a day for curing of malaria
173.	<i>Viburnum cotinifolium</i> D.Don.	Caprifoliaceae	Zangali Chamyarai	Fruit	Fruit of plant is used as general body tonic.
174.	<i>Viburnum grandiflorum</i> Wall. ex DC.	Caprifoliaceae	Ghaz meva	Fruit	Fresh fruit of plant is eaten as remedy for stomach disorders.
175.	<i>Viola betonicifolia</i> Sm.	Violaceae	Banafsha	Whole plant	Plant is antipyretic, demulcent, diaphoretic, diuretic, anticancer astringent, purgative, febrifuge & antipyretic. Flowers are collected at commercial scale. Leaves & flowers are used in cold, cough, epilepsy, jaundice and nervous diseases. Recipes: Locally decoctions of flowers are used in flu, cough, cold
176.	<i>Viola canescens</i> Wall. ex Roxb.	Violaceae	Banafsha	Whole plant	Plant is demulcent, diaphoretic, diuretic, astringent, purgative, febrifuge & antipyretic. Flowers are collected at commercial scale & used as diaphoretic, antiseptic & febrifuge. Leaves & flowers are used in cold, cough & fever. Plant is cooling agent & used in jaundice. Recipes: Flowers are mixed with

					leaves & boiled in water; the mixture is then used in flu, cough, cold & liver congestion. Decoction of flowers is considered as blood purifier and cooling agent.
177.	<i>Viola pilsa</i> Blume	Violaceae	Banafsha	Whole plant	Flowers are collected at commercial scale & used as diaphoretic, antiseptic & febrifuge. Leaves & flowers are used in cold, cough & fever. Plant is cooling agent & used in jaundice. Recipes: Flowers are mixed with leaves & boiled in water; the mixture is considered useful agent against cough, cold & liver congestion. Decoction of flowers is considered as blood purifier and refrigerant.
178.	<i>Vitex negundo</i> L.	Verbenaceae	Marvanday	Leaves, roots, flower	Leaves of plant is used as diuretic, anthelmintic, febrifuge, and antipyretic & also used as pain killer. Flower is used as astringent & tonic. Recipes: Fresh root is used as bandage to alleviate pain in chest & back. Branches are used as Miswak (Tooth brush) for cleaning & sparkling of teeth. Leaves are smoked to alleviate headache. Decoction of plant is used for weight loss.

179.	<i>Vitis Jacquemontii</i> Parker	Vitaceae	Gidar kwar	Fruit	Fruit of plant is tonic, coolant, laxative & purgative.
180.	<i>Vitis vinifera</i> L.	Vitaceae	Kwar	Fruit, leaves	Fruit of plant is refrigerant, laxative, stomachic, blood purifier & hepatic stimulant. Leaves are astringent & used for external wounds.
181.	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Kotilal	Whole Plant	Locally plant is used as aphrodisiac, tonic & antiemetic. It is also used in diarrhea & dysentery. Recipes: Powdered of plant is added with water & honey. The mixture is then taken for diarrhea & dysentery. Paste of root is used as poultice to relieve swelling.
182.	<i>Xanthium strumarium</i> L.	Asteraceae	Gishkay	Leaves, fruit	Plant is tonic, diuretic & antipyretic. Decoction of leaves is used in malarial fever. Fruit is demulcent & cooling agent.
183.	<i>Zanthoxylum armatum</i> D. C.	Rutaceae	Dambara	Fruit, seed, bark, young stem	Fruit is carminative, stomachic & also used as remedy for toothache. Seeds are tonic, aromatic and antipyretic. Bark is tonic & stimulant. Recipes: The young shoots are used as toothbrush & useful in treatment of gum diseases. Infusion of leaves is used for curing gonorrhea. Fruits are powdered and eaten with boiled egg for chest infection.
184.	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Markhanay	Fruits & leaves	Fruit are edible & used in whooping cough & cold. It is also astringent,

					coolant & used in curing of jaundice. Leaves are antidiabetic and chewed as remedy for treatment of diabetic patients. Recipes: Dried leaves are crushed into powder & taken with glass of before breakfast early in the morning for treatment of diabetic patients.
185.	<i>Platanus orientalis</i> L.	Plantanaceae	Chinar	Bark	Bark is used to relieve toothaches & also for curing of diarrhea.
186.	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Rhamnaceae	Karkanra	Fruit, Leave	Fruit of plant is laxative, astringent. Leaves are used in scabies & other skin problems. Decoction of leaves is used to treat scabies.
187.	<i>Ziziphus oxyphylla</i> Edgew.	Rhamnaceae	Elanae	Fruits & leaves, root	Fruit is tonic, laxative. anti diabetic & used in jaundice. Root is used in jaundice & hepatic problems. Leaves are used in fever. Recipes: Leaves extract are used in fever. Root is dried, boiled & filtrated with a cloth & stored in a glass. Root extract is then given to the patients suffered in Jaundice.
188.	<i>Ziziphus mauritiana</i> var. spontanea (Edgew.) R.R Stewart ex Qaiser & Nazim.	Rhamnaceae	Bera	Fruits & leaves,	Fruit are coolant, expectorant, ant diabetic & tonic. Leaves of plant are used in Jaundice. Recipes: Juice of fresh leaves is used in hepatic problems.

**Table-X. Inventory and Medicinal uses of Ethno Veterinary Plants in Malam Jabba Valley,
Swat, Hindu Kush Range, Pakistan**

S.#	Bot. Name	Family Name	Local Name	Part used	Ethno veterinary Plants/Animal Use
Pteridophytes					
1.	<i>Asplenium dalhousiae</i> Hook. <i>Syn. Ceterach dalhousiae</i> (Hook.) C. Chr	Aspleniaceae	Booghma Botay	Fronds	Locally the fronds are crushed and then mixed with corn flour and used for treatment of diarrhea in livestock and animals
2.	<i>Pteris cretica</i> L.	Pteridaceae	Atir	Fronds	The frond is fed to the cattle during cough
Gymnosperms					
3.	<i>Cedrus deodara</i> (Roxb. ex D.Don) G. Don	Pinaceae	Diyar, Ranzra	Resins	The extract or resin of wood (Ranzra) is also used as anthelmintic for livestock.
Monocotyledons					
4.	<i>Acorus calamus</i> L.	Araceae	Skhawaja	Rhizome	Rhizome is used to increase body temperature of livestock and also used for treatment of local disease called charmaikh. Recipes: The crushed rhizome is mixed with flours to bring cow in heat and become pregnant.
5.	<i>Allium cepa</i> L.	Alliaceae	Pyaz	Bulbs	Bulb is used to alleviate abdominal pain in cattle.
6.	<i>Allium humile</i> Kunth.	Alliaceae	Ghra Piaz	Leaves & bulbs	Bulb is used in tick infection & intestinal parasitic worms.
7.	<i>Allium Sativum</i> L.	Alliaceae	Ooga	Bulbs/ Fruits	Bulbs are mixed with wheat flour and fed to the cattle for improved

					digestion.
8.	<i>Arisaema flavum</i> (Forssk.) Schoot.	Araceae	Marjarai	Rhizome	Rhizome is used in respiratory disorders. Recipes: The rhizome is grinded into powdered form and small amount is given orally in bolus form to livestock especially cows and buffaloes for curing respiratory infection and cough.
9.	<i>Asparagus officinalis</i> L.	Asparagaceae	Tindorai	Rhizome & shoots	Young shoots are given to cattle for promotion lactation.
10.	<i>Cynodon dactylon</i> L.	Poaceae	Kabal	Whole plant	A paste is prepared from plant & fed to the cattle for improved quality & quantity of milk. Recipes: Plant is crushed & paste is prepared it and is fed to the cattle for increases lactation in the livestock
11.	<i>Polygonatum verticillatum</i> (L.) All.	Asparagaceae	Norealam	Rhizome/ Bulb	The decoction of rhizome is administrated to cattle for removal of placenta.
Dicotyledons					
12.	<i>Aesculus indica</i> (Wall.ex. Cambl.) Hook.f.	Hippocastinaceae	Jawaz	Nuts & seeds	Nuts & seeds are anthemintic, colic and also given to horses & donkeys for curing of chest diseases. Recipes: Seeds & nuts are grinded, given to the horses & other animals in colic, cough, fever & chest infections.
13.	<i>Amaranthus viridis</i> L.	Amaranthaceae	Chalwai	Leaves	The plant is given to cattle for abdomen swelling.

14.	<i>Andrachne cordifolia</i> (Wall.ex Dec) Muell.	Euphorbiaceae	Krachay	Fruit & leaves	Fruit & leaves are used as vermicide & purgative for livestock. Decoction of leaves is used to expel intestinal worms.
15.	<i>Artemisia scoparia</i> Waldst Kitam .	Asteraceae	Jaukay	Leaves & seeds	Plant is used for wound healing in livestock.
16.	<i>Berberis lycium</i> Royle	Berberidaceae	Kware	Bark & root	Bark of root and stem is very useful for internal and external wounds and body pain in livestock Recipes: Dried bark is boiled in water and filtered through fine cloths and the extract is used for internal wound and body warmth in livestock.
17.	<i>Bergenia ciliata</i> Sternb.	Saxifragaceae	Ghat panra /Kmar Panra	Rhizome	Rhizome is used for discharge of pus in case of animals
18.	<i>Bistorta amplexicaulis</i> (D. Don) Green.	Polygonaceae	Tarvapana /Anjabar	Rhizome	Rhizome is crushed & mixed with milk for softening of mammary gland in cattle
19.	<i>Brassica rapa</i> subsp. <i>campestris</i> (L.) Clapham	Brassicaceae	Sharsham	Seeds	In livestock it is considered as tonic and used for intestinal helmenthisis & tick infection
20.	<i>Bunium persicum</i> (Boiss) Fedtsch.	Apiaceae	Tora zeera	Fruit & seeds	Seeds are antipyretic & used as remedy in fever.
21.	<i>Calotropis procera</i> (Willd) R. Br.	Asclepiadaceae	Spalmay	Bark	Bark of plant is used to promote lactation in cattle.
22.	<i>Cannabis sativa</i> L.	Canabinaceae	Bhang	Leaves	Leaves are grinded & mixed with salt and used twice a week for uterine prolapsed after giving birth
23.	<i>Chenopodium album</i> L.	Chenopodiaceae	Sarmay	Leaves	In livestock plant is considered as antispasmodic.

24.	<i>Citrullus colocynthis</i> (L.) Shard.	Cucurbitaceae	Kalkanday	Fruit	Fruit of plant is administrated to livestock for treatment of intestinal problems..
25.	<i>Convolvulus arvensis</i> L.	Convolvulaceae	Prewatai	Whole plant	In livestock it is used in urethral problems & helminthiasis.
26.	<i>Cotinus coggyria</i> Scop.	Anacardiaceae	Chamyarae	Leaves	Leaves are given to cattle against liver fluke
27.	<i>Datura stramonium</i> L.	Solanaceae	Harhanda /Dathora	Leaves, seeds	Plant is traditionally used for heating of animals.
28.	<i>Dodonaea viscosa</i> (L.) Jacq.	Sapindaceae	Ghwarasky	Leaves	Plant is used to as anthelmintic in livestock.
29.	<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	Mandanrhro /Prewatka	Shoots & roots	In cattle it s used for constipation.
30.	<i>Euphorbia wallichii</i> Hook.f.	Euphorbiaceae	Shangla	Latex & shoots	The decoction is considered as strong cathartic agent for livestock.
31.	<i>Ficus carica</i> L.	Moraceae	Inzar	Fruit & leaves	The plant is administered to livestock for removal of placenta & urinary disorders.
32.	<i>Fumaria indica</i> (Hauskn.) Pugsley	Fumariaceae	Papra	Whole plant	Plant is antipyretic & coolant Recipes: Decoction of plant is used to treat fever in cattle.
33.	<i>Gentiana Kurroo</i> (Royle) Omer, Ali & Qaiser	Gentianaceae	Sitara Bootey	Root	Plant is used as tonic for horses.
34.	<i>Hdera nepalensis</i> K. Koch.	Araliaceae	Zelai	Leaves	Extract of the leaves are used to remove leeches from the nose of cattle
35.	<i>Jasminum officinale</i> L.	Oleaceae	Spin Chambele	Leaves	Traditionally decoction of plant is administrated to livestock during cough & fever. It is also used for increase milk production.

36.	<i>Justicia adhatoda</i> L.	Acanthaceae	Baiker	Leaves	Leaves are used for treatment of dysentery and also for elimination of intestinal worms, as antehelminthic agent.
37.	<i>Lathyrus aphaca</i> L.	Papilionaceae	Kurkamanay	Leaves	Dried roots are mixed wheat flour & given to the livestock in bolus form for curing various body infections.
38.	<i>Melia azedarach</i> L.	Meliaceae	Tora Bekyana/ Shandai	Leaves	Plant is anthelmintic. Leaves & young branches are also given to livestock in gas trouble. Recipes: Leaves with wheat flour are traditionally administered to livestock as anthelmintic.
39.	<i>Momordica charantia</i> L.	Cucurbitaceae	Karela	Fruit	Fruits are boiled and taken as remedy for swelling in teat & udders.
40.	<i>Mentha longifolia</i> (L.) Huds.	Lamiaceae	Vallenay	Whole plant	Plant is used for gastro intestinal disorders in livestock.
41.	<i>Morus nigra</i> L.	Moraceae	Spin toot	Fruits	Fruit is used for treatment of constipation & cough.
42.	<i>Myrsine africana</i> L.	Myrsinaceae	Marurang	Fresh leaves	Fresh leaves are given to the cattle for indigestion.
43.	<i>Myrtus communis</i> L.	Myrtaceae	Manro	Leaves	A decoction of leaves is given to the cattle for treatment of diarrhea.
44.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Zmake Tarukay	Leaves, fruits	The plant is mixed with maize & fed to the cattle for treatment of diarrhea.
45.	<i>Paeonia emodi</i> Wall.ex Royle	Paeoniaceae	Mamekh	Rhizome	Rhizome is administrated to the livestock to increase milk production.

46.	<i>Periploca aphylla</i> Decne.	Asclepiadaceae	Barrha	Milky latex	Stem latex of plant is used for treatment of dermatitis & skin infections against fungal diseases in livestock
47.	<i>Podophyllum emodi</i> Wall. ex Royle	Podophyllaceae	Kakora	Rhizome	Rhizome is given to livestock for increase milk production.
48.	<i>Pyrus pashia</i> L.	Rosaceae	Tangai	Fruits	Fruit juice is ophthalmic agent & used for eye infections in cattle
49.	<i>Ranunculus aquatilis</i> L. Syn. <i>Batrachium trichophyllum</i> (Chaix) Van der Bosch	Ranunculaceae	Gaghagha	Whole plant	Plant is used as purgative for cattle like goats & sheep.
50.	<i>Ricinus communis</i> L.	Euphorbiaceae	Harhanda	Seeds	Traditionally powdered seed is administered to livestock for curing constipation & gastrointestinal disorders.
51.	<i>Rumex dentatus</i> L.	Polygonaceae	Shalkhay	Leaves	Leaves of <i>Rumex dentatus</i> are crushed into powdered & mixed with wheat for treatment of constipation in livestock.
52.	<i>Rumex hastatus</i> D. Don.	Polygonaceae	Tarukay	Roots & leaves	Root of plant is used in colic & abdominal pain. Leaves of plant are considered as appetizer for livestock. Recipes: Roots are boiled in water along with gur, mixture is then filtered & given to the livestock in case of colic.
53.	<i>Salvia mocroftiana</i> wall ex Bth.	Lamiaceae	Khardag	Fresh Leaves	Fresh leaves are fed to the cattle for removal of placenta after birth

54.	<i>Solanum surrattense</i> Burm.f.	Solanaceae	Maraghonay	Fresh Leaves	The fresh leaves are fed to the livestock for the treatment of digestive problems
55.	<i>Taraxacum officinale</i> F. H. Wigg.	Asteraceae	Ziar Gule	Root, leaves	Plant is mixed with leaves of <i>Acacia modesta</i> & given to the livestock for promoting lactation.
56.	<i>Urtica dioica</i> L.	Urticaceae	Sezonke/ Jal Bang	Leaves	Leaves of plant are fed to the cattle for increase milk production
57.	<i>Valeriana jatamansi</i> Jones.	Valerianaceae	Mushke Bala	Rhizome	Vegetative plant is fed to the cattle for increased milk production.
58.	<i>Verbascum thapsus</i> L.	Scrophulariaceae	Khrdhag	Leaves	Fresh Leaves of plant are fed to the livestock for curing of diarrhea & dysentery
59.	<i>Viburnum cotinifolium</i> D.Don.	Caprifoliaceae	Zangali Chamyarai	Fruit	Plant is administrated to cattle for removal of placenta after delivery.
60.	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Kotilal	Whole plant	It is given to cattle during fever & also to increase milk production.
61.	<i>Zanthoxylum armatum</i> D. C.	Rutaceae	Dambara	Fruit, seed,	Plant is used to increase milk production in livestock.

Table-XI. List of key Marketable Medicinal Plants traded to National & International Market from Malam Jabba Valley, Hindu Kush Range. Swat

S.#	Taxon	Family	Local Name	Part used	IUCN Category/ Criteria	Local market	National market	International Market
1.	<i>Aconitum heterophyllum</i> Wall. ex Royle	Ranunculaceae	Serba botay/ Serba waley	Rhizome	Endangered A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
2.	<i>Aconitum chasmanthum</i> Stapf ex Holmes	Ranunculaceae	Zahra mora /Ghra zahar	Rhizome	Critically Endangered A2(a, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
3.	<i>Acorus calamus</i> L.	Araceae	Skhawaja	Rhizome	Endangered A2(a, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
4.	<i>Adiantum capillus-veneris</i> L.	Adiantaceae	Sumbal	Fronds	Least Concerned	+	+	+
5.	<i>Asparagus officinalis</i> L.	Asparagaceae	Tindorai/ Muslisufaid	Rhizome & Young shoots	Endangered A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
6.	<i>Berberis lycium</i> Royle	Berberidaceae	Kware/Ziarlarge	Leaves, Stems, roots, fruit & bark	Critically Endangered A2(a, b c, d)	+	+	+
7.	<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Makanpath, ghat panra/Kmar panra	Rhizome	Endangered A2(a, c, d)/ B2a,b(i,ii,iv)	+	+	+

8.	<i>Bistorta amplexicaulis</i> (D. Don) Green.	Polygonaceae	Tarvapana/Anjabar	Rhizome, Shoots & leaves	Endangered A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
9.	<i>Bunium persicum</i> (Boiss) Fedtsch.	Apiaceae	Tora zeera	Fruit	Vulnerable A2(a,b,c,d)/ B2,ab(i,ii,iii,iv)	+	+	+
10.	<i>Colchicum luteum</i> Baker	Colchicaceae	Suranjan-e-Talk	Corm	Critically Endangered A2(a, b c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
11.	<i>Dioscorea deltoidea</i> Wall. ex Kunth	Dioscoreaceae	Kanis	Tubers/ rhizome, roots	Endangered A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
12.	<i>Diospyros lotus</i> L.	Ebenaceae	Tor Amlook	Fruit	Endangered A2(a, c, d)/ B2a,b(i,ii,iii,iv,v)	+	+	+
13.	<i>Ephedra gerardiana</i> Wall.ex Stapf	Ephedraceae	Asmani Booti	Shoots, roots & fruits	Endangered A2(a, b,c, d)/ B2a,b(i,ii,iii,iv)	+	+	-----
14.	<i>Geranium collinum</i> Steph .ex Willd.	Geraniaceae	Sra Zela	Roots	Endangered A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
15.	<i>Hedera nepalensis</i> K. Koch.	Araliaceae	Zelai	Leaves & fruits	Least Concerned	+	+	-----

16.	<i>Hyoscyamus niger</i> L.	Solanaceae	Shamala/ Dewana bhang	Leaves, seeds	Endangered A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	+	+	-----
17.	<i>Hypericum perforatum</i> L.	Guttiferae	Ghra Shin Chay	Stems & leaves	Vulnerable A2(a,b,c,d)	+	+	-----
18.	<i>Paeonia emodi</i> Wall ex Royle	Paeoniaceae	Mamekh	Rhizome & seeds	Critically Endangered A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	+	+	+
19.	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f.	Anacardiaceae	Shnae	Whole plant	Critically Endangered A2(a, b c, d)/ C1	+	+	+
20.	<i>Podophyllum emodi</i> Wall. ex Royle	Podophyllaceae	Kakora	Rhizome & seeds	Critically Endangered A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	+	+	+
21.	<i>Polygonatum verticillatum</i> (L.) All.	Asparagaceae	Nory alam	Rhizome/bulb	Critically Endangered A2(a, b c, d)/ B2a,b(i,ii,iii,iv,v)	+	+	+
22.	<i>Rheum australe</i> D. Don	Polygonaceae	Chotial	Roots	Critically Endangered A2(a, c, d)/	+	+	-----

					B2a,b(i,ii,iii,iv)			
23.	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke)	Asteraceae	Kuth	Roots	Critically Endangered A2(a, b, c, d)	+	+	+
24.	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp.	Rutaceae	Nazar panra	Leaves	Critically Endangered A2(a, b, c, d)	+	+	-----
25.	<i>Thymus linearis</i> Benth.	Lamiaceae	Ghra Chai, Zangali Sperkay	Leaves	Endangered (A2(a, b, c, d)/ B2a,b(i,ii,iii,iv,v)	+	+	-----
26.	<i>Valeriana jatamansi</i> Jones	Valerianaceae	Mushke Bala	Rhizome	Critically Endangered A2(a, b, c, d)	+	+	+
27.	<i>Viola betonicifolia</i> Sm.	Violaceae	Banafsha	Whole plant	Critically Endangered A2(a, b, c, d)	+	+	+
28.	<i>Viola canescens</i> Wall .ex Roxb.	Violaceae	Banafsha	Whole plant	Endangered A2(a, b, c, d)/ B2a,b(i,ii,iii,iv)	+	+	+
29.	<i>Viola piolsa</i> Blume	Violaceae	Banafsha	Whole plant	Critically Endangered A2(a, b, c, d)	+	+	+

Table-X11. Biodiversity & Conservation Values of Medicinal Plant Malam at Jabba Valley
Hindu Kush Range Swat

S.#	Family	Botanical name	Habit	Conservation status
Critically Endangered (CR) 30				
1.	Ranunculaceae	<i>Aconitum chasmanthum</i> Stapf ex Holmes	Herb	Critically Endangered
2.	Hippocastinaceae	<i>Aesculus indica</i> (Wall.ex. Camb.) Hook. f.	Tree	Critically Endangered
3.	Alliaceae	<i>Allium humile</i> Kunth.	Herb	Critically Endangered
4.	Berberidaceae	<i>Berberis lycium</i> Royle	Shrub	Critically Endangered
5.	Buxaceae	<i>Buxus wallichiana</i> Baill	Shrub	Critically Endangered
6.	Ranunculaceae	<i>Caltha alba</i> Camb.	Herb	Critically Endangered
7.	Pinaceae	<i>Cedrus deodara</i> (Roxb. ex D. Don) G. Don	Tree	Critically Endangered
8.	Ulmaceae	<i>Celtis australis</i> L.	Tree	Critically Endangered
9.	Colchicaceae	<i>Colchicum luteum</i> Baker	Herb	Critically Endangered
10.	Rosaceae	<i>Crataegus songarica</i> K. Koch.	Tree	Critically Endangered
11.	Liliaceae	<i>Fritillaria cirrhosa</i> Subsp. <i>Roylei</i> (Hook.) Ali, Syn. <i>Fritillaria roylei</i> Hook.	Herb	Critically Endangered
12.	Juglandaceae	<i>Juglans regia</i> L.	Tree	Critically Endangered
13.	Oleaceae	<i>Olea ferruginea</i> Wall. ex Aitch. Syn. <i>Olea cupidata</i> Wall ex G. Don	Tree	Critically Endangered
14.	Paeoniaceae	<i>Paeonia emodi</i> Wall ex Royle	Herb	Critically Endangered
15.	Pinaceae	<i>Picea smithiana</i> (Wall.) Boiss	Tree	Critically Endangered
16.	Pinaceae	<i>Pinus gerardiana</i> Wall.	Tree	Critically Endangered
17.	Anacardiaceae	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f.	Tree	Critically Endangered
18.	Podophyllaceae	<i>Podophyllum emodi</i> Wall. ex Royle	Shrub	Critically Endangered
19.	Asparagaceae	<i>Polygonatum verticillatum</i> (L.) All.	Herb	Critically Endangered
20.	Rosaceae	<i>Pyrus pashia</i> Buch.-Ham. ex D.Don	Tree	Critically Endangered
21.	Fagaceae	<i>Quercus semecarpifolia</i> Sm.	Tree	Critically Endangered
22.	Polygonaceae	<i>Rheum australe</i> D. Don	Herb	Critically Endangered
23.	Asteraceae	<i>Saussurea costus</i> (Falc.) Lipsch. (Syn. <i>Saussurea lappa</i> Clarke)	Herb	Critically Endangered

24.	Rutaceae	<i>Skimmia laureola</i> (D.C.) Sieb. & Zucc. ex Walp.	Shrub	Critically Endangered
25.	Taxaceae	<i>Taxus wallichiana</i> Zucc.	Tree	Critically Endangered
26.	Valerianaceae	<i>Valeriana jatamansi</i> Jones	Herb	Critically Endangered
27.	Caprifoliaceae	<i>Viburnum cotinifolium</i> D.Don.	Shrub	Critically Endangered
28.	Violaceae	<i>Viola betonicifolia</i> Sm.	Herb	Critically Endangered
29.	Violaceae	<i>Viola pilosa</i> Blume	Herb	Critically Endangered
30.	Vitaceae	<i>Vitis Jacquemontii</i> Parker	Climber	Critically Endangered
Endangered (EN) 30				
31.	Pinaceae	<i>Abies pindrow</i> Royle	Tree	Endangered
32.	Ranunculaceae	<i>Aconitum heterophyllum</i> Wall ex Royle	Herb	Endangered
33.	Araceae	<i>Acorus calamus</i> L.	Herb	Endangered
34.	Asparagaceae	<i>Asparagus officinalis</i> L.	Shrub	Endangered
35.	Saxifragaceae	<i>Bergenia ciliata</i> (Haw.) Sternb.	Herb	Endangered
36.	Polygonaceae	<i>Bistorta amplexicaulis</i> (D. Don) Green.	Herb	Endangered
37.	Dioscoreaceae	<i>Dioscorea deltoidea</i> Wall. ex Kunth	Climber	Endangered
38.	Ebenaceae	<i>Diospyros lotus</i> L.	Tree	Endangered
39.	Ephedraceae	<i>Ephedra gerardiana</i> Wall ex Stapf	Shrub	Endangered
40.	Geraniaceae	<i>Geranium wallichianum</i> D.Don ex Sweet	Herb	Endangered
41.	Solanaceae	<i>Hyoscyamus niger</i> L.	Herb	Endangered
42.	Papilionaceae	<i>Indigofera heterantha</i> Well.ex Brandis	Shrub	Endangered
43.	Moraceae	<i>Morus alba</i> L.	Tree	Endangered
44.	Myrsinaceae	<i>Myrsine africana</i> L.	Shrub	Endangered
45.	Lamiaceae	<i>Otostegia limbata</i> (Benth.) Boiss.	Shrub	Endangered
46.	Pinaceae	<i>Pinus roxburghii</i> Sargent	Tree	Endangered
47.	Pinaceae	<i>Pinus wallichiana</i> A.B Jackson	Tree	Endangered
48.	Primulaceae	<i>Primula denticulata</i> Smith.	Herb	Endangered
49.	Primulaceae	<i>Primula macrophylla</i> D.Don.	Herb	Endangered
50.	Rosaceae	<i>Prunus armeniaca</i> L.	Tree	Endangered

51.	Fagaceae	<i>Quercus dilatata</i> Royle	Tree	Endangered
52.	Fagaceae	<i>Quercus incana</i> Roxb.	Tree	Endangered
53.	Rosaceae	<i>Rosa webbiana</i> Wall	Shrub	Endangered
54.	Buxaceae	<i>Sarcococca saligna</i> (Don) Muell.	Shrub	Endangered
55.	Lamiaceae	<i>Thymus linearis</i> Benth.	Herb	Endangered
56.	Caprifoliaceae	<i>Viburnum grandiflorum</i> Wall.ex DC.	Tree	Endangered
57.	Violaceae	<i>Viola canescens</i> Wall .ex Roxb.	Herb	Endangered
58.	Elaeagnaceae	<i>Elaeagnus umbellata</i> Thunb	Shrub	Endangered
59.	Solanaceae	<i>Withania somnifera</i> (L.) Dunal	Shrub	Endangered
60.	Rhamnaceae	<i>Ziziphus jujuba</i> Mill.	Tree	Endangered
Vulnerable (VU) 27				
61.	Mimosaceae	<i>Acacia modesta</i> Wall.	Tree	Vulnerable
62.	Euphorbiaceae	<i>Andrachne cordifolia</i> (Wall.ex Dec) Muell.	Shrub	Vulnerable
63.	Araceae	<i>Arisaema flavum</i> (Forssk.) Schott.	Herb	Vulnerable
64.	Asteraceae	<i>Artemisia scoparia</i> Waldst Kitam .	Shrub	Vulnerable
65.	Asteraceae	<i>Artemisia maritima</i> L.	Shrub	Vulnerable
66.	Apiaceae	<i>Bunium persicum</i> (Boiss) Fedtsch.	Herb	Vulnerable
67.	Asclepiadaceae	<i>Caralluma edulis</i> (Edgew.) Benth. ex Hook.f.	Herb	Vulnerable
68.	Anacardiaceae	<i>Cotinus coggyria</i> Scop.	Shrub	Vulnerable
69.	Thymelaeaceae	<i>Daphne mucronata</i> Royle	Shrub	Vulnerable
70.	Solanaceae	<i>Datura stramonium</i> L.	Herb	Vulnerable
71.	Sapindaceae	<i>Dodonaea viscosa</i> (L.) Jacq.	Shrub	Vulnerable
72.	Dryopteridaceae	<i>Dryopteris juxtaoposita</i> Chr.	Herb	Vulnerable
73.	Euphorbiaceae	<i>Euphorbia wallichii</i> Hook.f.	Herb	Vulnerable
74.	Moraceae	<i>Ficus carica</i> L.	Tree	Vulnerable
75.	Moraceae	<i>Ficus palmata</i> Forsk.	Tree	Vulnerable
76.	Gentianaceae	<i>Gentiana kurroo</i> Royle.	Herb	Vulnerable
77.	Guttiferae	<i>Hypericum perforatum</i> L.	Herb	Vulnerable
78.	Lamiaceae	<i>Isodon rugosus</i> (Wall. ex Bth.) Codd	Shrub	Vulnerable

79.	Cupressaceae	<i>Juniperus communis</i> L.	Shrub	Vulnerable
80.	Acanthaceae	<i>Justicia adhatoda</i> L.	Shrub	Vulnerable
81.	Myrtaceae	<i>Myrtus communis</i> L.	Shrub	Vulnerable
82.	Apocynaceae	<i>Nerium oleander</i> Mill.	Shrub	Vulnerable
83.	Plantanaceae	<i>Platanus orientalis</i> L.	Tree	Vulnerable
84.	Punicaceae	<i>Punica granatum</i> L.	Tree	Vulnerable
85.	Rutaceae	<i>Zanthoxylum armatum</i> DC.	Shrub	Vulnerable
86.	Rhamnaceae	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Shrub	Vulnerable
87.	Rhamnaceae	<i>Ziziphus oxyphylla</i> Edgew.	Shrub	Vulnerable
Near Threatened (NT) 35				
88.	Adiantaceae	<i>Adiantum pedatum</i> L.	Herb	Near Threatened
89.	Adiantaceae	<i>Adiantum incisum</i> L.	Herb	Near Threatened
90.	Lamiaceae	<i>Ajuga bracteosa</i> Wall.ex Benth	Herb	Near Threatened
91.	Lamiaceae	<i>Ajuga parviflora</i> Benth.	Herb	Near Threatened
92.	Asphodelaceae	<i>Asphodelus tenuifolius</i> Cavan	Herb	Near Threatened
93.	Aspleniaceae	<i>Asplenium trichmanes</i> (Hud) Hook	Herb	Near Threatened
94.	Canabinaceae	<i>Cannabis sativa</i> L.	Shrub	Near threatened
95.	Asteraceae	<i>Cichorium intybus</i> L.	Herb	Near Threatened
96.	Cucurbitaceae	<i>Citrullus colocynthis</i> (L.) Shard.	Herb	Near Threatened
97.	Cuscutaceae	<i>Cuscuta reflexa</i> Roxb.	Parasitic Herb	Near Threatened
98.	Solanaceae	<i>Datura innoxia</i> Mill.	Herb	Near Threatened
99.	Asteraceae	<i>Echinops griffithianus</i> Boiss.	Herb	Near Threatened
100.	Araliaceae	<i>Hedera nepalensis</i> K. Koch.	Climber	Near Threatened
101.	Oleaceae	<i>Jasminum humile</i> L.	Shrub	Near Threatened
102.	Oleaceae	<i>Jasminum officinale</i> L.	Shrub	Near Threatened
103.	Rosaceae	<i>Malus pumila</i> Mill.	Tree	Near Threatened
104.	Meliaceae	<i>Melia azedarach</i> L.	Tree	Near Threatened
105.	Moraceae	<i>Morus nigra</i> L.	Tree	Near Threatened
106.	Amaryllidaceae	<i>Narcissus tazetta</i> L.	Herb	Near Threatened

107.	Asclepiadaceae	<i>Periploca aphylla</i> Decne.	Shrub	Near Threatened
108.	Rosaceae	<i>Prunus domestica</i> L.	Tree	Near threatened
109.	Dennstaedtiaceae	<i>Pteridium aquilinum</i> (L.) Kuhn	Herb	Near Threatened
110.	Rosaceae	<i>Rosa moschata</i> Herrm.	Shrub	Near Threatened
111.	Rosaceae	<i>Rubus ellipticus</i> Smith.	Shrub	Near Threatened
112.	Rosaceae	<i>Rubus fruticosus</i> L.	Shrub	Near Threatened
113.	Rosaceae	<i>Rubus ulmifolius</i> Schott.	Shrub	Near Threatened
114.	Lamiaceae	<i>Salvia morcroftiana</i> wall ex Bth.	Herb	Near Threatened
115.	Solanaceae	<i>Solanum nigrum</i> L.	Herb	Near Threatened
116.	Solanaceae	<i>Solanum Surattense</i> Burm.f.	Herb	Near Threatened
117.	Rosaceae	<i>Spiraea vacciniifolia</i> D. Don.	Shrub	Near Threatened
118.	Lamiaceae	<i>Teucrium stocksianum</i> Boiss.	Herb	Near Threatened
119.	Urticaceae	<i>Urtica dioica</i> L.	Herb	Near Threatened
120.	Verbenaceae	<i>Verbena officinalis</i> L.	Herb	Near Threatened
121.	Verbenaceae	<i>Vitex negundo</i> L.	Shrub	Near Threatened
122.	Rhamnaceae	<i>Ziziphus mauritiana</i> var. spontanea (Edgew.) R.R Stewart ex Qaiser & Nazim.	Tree	Near Threatened
Least Concerned (LC) 41				
123.	Amaranthaceae	<i>Achyranthes aspera</i> L.	Herb	Least Concerned
124.	Adiantaceae	<i>Adiantum capillus-veneris</i> L.	Herb	Least Concerned
125.	Adiantaceae	<i>Adiantum venustum</i> D. Don.	Herb	Least Concerned
126.	Amaranthaceae	<i>Amaranthus viridis</i> L.	Herb	Least Concerned
127.	Brassicaceae	<i>Brassica rapa</i> subsp. <i>campestris</i> (Linn.) Clapham	Herb	Least Concerned
128.	Asteraceae	<i>Calendula arvensis</i> L.	Herb	Least Concerned
129.	Asclepiadaceae	<i>Calotropis procera</i> (Ait.) Ait. f.	Shrub	Least Concerned
130.	Brassicaceae	<i>Capsella bursa-pastoris</i> (L.) Medik.	Herb	Least Concerned
131.	Chenopodiaceae	<i>Chenopodium album</i> L.	Herb	Least Concerned
132.	Convolvulaceae	<i>Convolvulus arvensis</i> L.	Climber	Least Concerned
133.	Asteraceae	<i>Cynodon dactylon</i> (L.) Pers.	Herb	Least Concerned
134.	Athyriaceae	<i>Cystopteris fragilis</i> (L.) Bernh.	Herb	Least Concerned

135.	Poaceae	<i>Equisetum arvense</i> L.	Herb	Least Concerned
136.	Equisetaceae	<i>Erigeron bonariensis</i> L. (Syn. <i>Conyza bonariensis</i> (L.) Cronquist.	Herb	Least Concerned
137.	Euphorbiaceae	<i>Euphorbia helioscopia</i> L.	Herb	Least Concerned
138.	Euphorbiaceae	<i>Euphorbia indica</i> Lam.	Herb	Least Concerned
139.	Euphorbiaceae	<i>Euphorbia prostrata</i> Ait.	Herb	Least Concerned
140.	Fumariaceae	<i>Fumaria indica</i> (Hausskn.) Pugsley	Herb	Least Concerned
141.	Geraniaceae	<i>Geranium collinum</i> Steph .ex Willd.	Herb	Least Concerned
142.	Asteraceae	<i>Helianthus annuus</i> L.	Herb	Least Concerned
143.	Papilionaceae	<i>Lathyrus aphaca</i> L.	Herb	Least Concerned
144.	Lamiaceae	<i>Mentha longifolia</i> (L.) Huds.	Herb	Least Concerned
145.	Lamiaceae	<i>Micromeria biflora</i> Buch.	Herb	Least Concerned
146.	Nyctaginaceae	<i>Mirabilis jalapa</i> L.	Herb	Least Concerned
147.	Pteridaceae	<i>Onychium Japonicum</i> (Thunb.) Kunze Syn. <i>Onychium cryptogrammoides</i> Christ	Herb	Least Concerned
148.	Lamiaceae	<i>Origanum vulgare</i> L.	Herb	Least Concerned
149.	Oxalidaceae	<i>Oxalis corniculata</i> L.	Herb	Least Concerned
150.	Plantaginaceae	<i>Plantago lanceolata</i> L.	Herb	Least Concerned
151.	Plantaginaceae	<i>Plantago major</i> L.	Herb	Least Concerned
152.	Polygonaceae	<i>Polygonum aviculare</i> L.	Herb	Least Concerned
153.	Pteridaceae	<i>Pteris cretica</i> L.	Herb	Least Concerned
154.	Pteridaceae	<i>Pteris vittata</i> L.	Herb	Least Concerned
155.	Polygonaceae	<i>Rumex dentatus</i> L.	Herb	Least Concerned
156.	Polygonaceae	<i>Rumex hastatus</i> D. Don.	Herb	Least Concerned
157.	Caryophyllaceae	<i>Silene vulgaris</i> (Moench) Garcke.	Herb	Least Concerned
158.	Rosaceae	<i>Sorbaria tomentosa</i> (Lindl.) Rehder	Shrub	Least Concerned
159.	Caryophyllaceae	<i>Stellaria media</i> (L.) Cyr.	Herb	Least Concerned
160.	Asteraceae	<i>Taraxacum officinale</i> F. H. Wigg.	Herb	Least Concerned
161.	Ranunculaceae	<i>Thalictrum foliolosum</i> D.C	Herb	Least Concerned
162.	Scrophulariaceae	<i>Verbascum thapsus</i> L.	Herb	Least Concerned
163.	Asteraceae	<i>Xanthium strumarium</i> L.	Shrub	Least Concerned

Data Deficient (DD) 4				
164.	Aspleniaceae	<i>Asplenium dalhousiae</i> Hook. Syn. <i>Ceterach dalhousiae</i> (Hook.) C. Chr	Herb	Data Deficient
165.	Lamiaceae	<i>Mentha spicata</i> L.	Herb	Data Deficient
166.	Aizoaceae	<i>Portulaca oleracea</i> L.	Herb	Data Deficient
167.	Ranunculaceae	<i>Ranunculus aquatilis</i> L.	Herb	Data Decient
Alien/ Exotic(AS) 03				
168.	Simaroubaceae	<i>Ailanthus altissima</i> (Mill) Swingle	Tree	Alien / Exotic
169.	Myrtaceae	<i>Eucalyptus globulus</i> Labill.	Tree	Alien / Exotic
170.	Euphorbiaceae	<i>Ricinus communis</i> L	Shrub	Alien / Exotic
Cultivated /Non Native (NN) 18				
171.	Alliaceae	<i>Allium cepa</i> L.	Herb	Cultivated
172.	Alliaceae	<i>Allium Sativum</i> L.	Herb	Cultivated
173.	Brassicaceae	<i>Brassica rapa</i> subsp. <i>Rapa</i>	Herb	Cultivated
174.	Asteraceae	<i>Calendula officinale</i> L.	Herb	Cultivated
175.	Solanaceae	<i>Capsicum annum</i> L.	Herb	Cultivated
176.	Apiaceae	<i>Coriandrum sativum</i> L.	Herb	Cultivated
177.	Cucurbitaceae	<i>Cucumis sativus</i> L.	Climber	Cultivated
178.	Cucurbitaceae	<i>Cucurbita maxima</i> Duch. ex Lam.,	Herbaceous Climber	Cultivated
179.	Cucurbitaceae	<i>Cucurbita moschata</i> (Duch. ex Lam.) Duch. ex Poir.	Herbaceous Climber	Cultivated
180.	Cupressaceae	<i>Cupressus sempervirens</i> L.	Tree	Cultivated
181.	Ebenaceae	<i>Diospyros kaki</i> L.	Tree	Cultivated
182.	Cucurbitaceae	<i>Luffa cylindrica</i> (L.) Roem.	Annual climber	Cultivated
183.	Cucurbitaceae	<i>Momordica charantia</i> L.	Climber	Cultivated
184.	Solanaceae	<i>Nicotiana tabacum</i> L.	Herb	Cultivated
185.	Lamiaceae	<i>Ocimum basilicum</i> L.	Herb	Cultivated
186.	Papaveraceae	<i>Papaver somniferum</i> L.	Herb	Cultivated
187.	Brassicaceae	<i>Raphanus sativus</i> L.	Herb	Cultivated
188.	Vitaceae	<i>Vitis vinifera</i> L.	Climber	Cultivated

RESULTS AND DISCUSSION

Malam Jabba is a lush green valley strewn with an amazing variety of plants which supports spectacular medicinal plant biodiversity of promising economic values. A detailed study was carried out from June 2013 to September 2017 in order to elucidate ethno medicinal profile and establish conservation values of medicinal plant biodiversity for the sustainable livelihood security of the Malam Jabba Valley, Hindu Kush Range, Swat, Pakistan.

A total of 476 plant taxa belonging have been explored from thMalam Jabba Valley. Of these, 188 species belonging to 146 genera and 83 families were used under ethnomedicinal & ethnoveterinary utility by the local inhabitants for treatment of both human and livestock health care. (Table-VIII-IX).

Adiantaceae with 4 species was identified as the largest family of Pteridophyta, followed by Pteridaceae with three species, Aspleniaceae with two species. Athyriaceae Dennstaedtiaceae, Dryopteridaceae and Equisetaceae are monogeneric & monospecific that contribute 1 genus & species each.

Pinaceae with 6 species was recorded as the predominant family in Gymnosperms followed by Cupressaceae with 2 genera and 2 species each while Ephedraceae and Taxaceae are monophyletic families that contribute one genus and species each.

In Angiosperms, families with greatest number of species are Lamiaceae and Rosaceae with twelve species each under 10 and 8 genera followed by Asteraceae with eleven species distributed within 9 genera; Solanaceae 8 species of 6 genera; Cucurbitaceae and Euphorbiaceae six species each classified among 5 and 3 genera; Polygonaceae and Ranunculaceae five species and 4 genera each; Brassicaceae, Moraceae and Rhamnaceae with 4 species each under 3, 2 and 1 genera respectively. Five families are represented by Alliaceae, Asclepiadaceae, Fagaceae, Oleaceae and Violaceae that contributed three species each. Seventeen families are represented by Araceae, Asparagaceae, Amaranthaceae, Anacardiaceae, Apiaceae, Buxaceae, Caprifoliaceae, Caryophyllaceae, Ebenaceae, Geraniaceae, Myrtaceae, Papilionaceae, Plantaginaceae, Primulaceae, Rutaceae, Verbenaceae and Vitaceae which contribute two species each: Thirty nine families viz., Acanthaceae, Aizoaceae, Amaryllidaceae, Apocynaceae, Araliaceae, Asphodelaceae, Berberidaceae, Canabinaceae, Chenopodiaceae, Colchicaceae, Convolvulaceae, Cuscutaceae, Dioscoreaceae, Elaeagnaceae, Fumariaceae, Gentianaceae, Guttiferae, Hippocastinaceae, Juglandaceae, Liliaceae, Meliaceae, Mimosaceae, Myrsinaceae, Nyctaginaceae, Oxalidaceae,

Paeoniaceae, Papaveraceae, Plantanaceae, Poaceae, Podophyllaceae, Punicaceae, Sapindaceae, Saxifragaceae, Scrophulariaceae, Simaroubaceae, Thymelaeaceae, Ulmaceae and Urticaceae, Valerianaceae are identified as monogeneric & monophytic that contribute one species each.

Herbaceous layer (99 species) were found to be most used life forms followed by shrubs (42), trees (36 species, climbers (10 species) & parasitic plant (01 species) in descending order.

Present study documented and explored a total of 61 ethno-veterinary important plants for sustainable livelihood security of the area. Leaves (31%) were the most frequently used plant parts in the preparation of ethno medicinal folk recipes for the health care diseases followed by fruit (19%), whole plant (10%), roots (09%), seeds (09%), flower (05%), fronds (04%), shoots (04%), Bark (03%), rhizome (02%), bulbs (02%), latex and resins (01% each).

Local community used crude drug and folk recipes in the form of decoctions, infusion, paste and powder form. In majority cases, roots stem and leaves are used in the form of decoction for the preparation of various recipes. Usually recipes are taken two time and some cases three times a day for 7-30 days depends on the nature of disease and recipes. Mostly a single medicinal plant species were used and mainly taken orally. Local inhabitants used medicinal plant biodiversity for different ailments. Fifty five diseases/health groups of human and twenty four of livestock were recorded during the course of study being cured with ethno-medicinal and ethno-veterinary plants. The most common disease of human recorded in the study area were hepatic disorders, Jaundice, digestive/stomach problems, gastrointestinal disorders, rheumatism/Joints pain, colic/abdominal pain, expectorant, laxative, carminative, asthma, cough/cold, tonic, stimulant, snakebites, constipation, skin problems, diarrhea/dysentery, diuretic. wound healing, anthelminthic, dental/gums disease, upper respiratory infections, urinary disorders, nervous disorders, antiemetic, hypertension, sexual problems, antidiabetic, piles, ulcers, anticancer, diaphoretic, epilepsy, cardiovascular disorders, gonorrhea, gynecological disorders and menstrual disorders. Study also revealed that some plants have multiple medicinal values where as some were found to treat only one disease.

Highest numbers of plants were used for Cold/cough (63 species) followed by as tonic (56 species) Antipyretic/febrifuge (54 species), digestive/ Stomach disorders (52 species), hepatic disorders/Jaundice and Skin Problems (51 species each), Diarrhea/dysentery (45 species), Diuretic (42 species), Cuts/wound Healers (36 species), Anthelminthic/vermifuge (34 species), Astringent (31 species), Dental/gums disease (30 species), refrigerant (27 species), Carminative and Stimulant (26 species each), Laxative, Antiseptic/antibiotic and Expectorant (25 species each), Upper

Respiratory infections and Blood purifier (23 species each), Purgative and Urinary disorders (22 species each), Asthma and Rheumatism/Joints Pain (19 species each), Constipation (16 species), Nervous /Antispasmodic (14 species), Antiemetic, and blood pressure/Hypertension (13 species each), Aphrodisiac/sexual problems (12 species). Analgesic/pain killer and Antidiabetic (11 species each), Demulcent, Ulcers, Headache and piles (9 species each), Colic and Ophthalmic/eye Care (8 species each), Sedative and Anticancer (7species each), Diaphoretic, Epilepsy, Cardiovascular/heart tonic, Gastrointestinal disorders and Dyspepsia (06 species each), Hair tonic/wash (05 species each), Gonorrhea and Gynecological/delivery disorders (4 species each), Cathartic, Dropsy, Earache, Amenorrhea/ Menstrual disorders (3 species each), Anodyne (2 species) while Dysuria, Eczema and Neurosis (single species each).

Medicinal plant biodiversity are important of source of drugs in traditional system of medicine. Human and especially mountainous community used these medicinal plant resources as remedy for the treatment of animal and human health care since time immemorial. Plants are important source of indigenous/traditional medicine that is used for treatment of different diseases. About 422000 flowering plants are reported from our planet with more than fifty thousands have been utilized for ethnomedicinal purposes & traditional medicine across the globe. In developed countries people especially rural communities still depend on traditional and indigenous system of health care due to its low price and least side effects, as compared to the modern allopathic medicine. It is one of the main reasons that are why people used extensively throughout the world especially in the third world countries (Walter & Hamilton,1993).

South Asia and especially Pakistan harbor a huge diversity of valuable medicinal plants naturally found in fragile ecosystems that are predominantly inhabited by indigenous and rural communities. The careful and sustainable management of these medicinal plants resources have enormous potential for the sustainable livelihood security and also help to protect and conserve biodiversity of nationally and globally importance. The medicinal plant resource is an integral part of natural resource management contributing to economic development, environmental protection and trade. Hindu Kush range is the significant and diverse range of plant biodiversity that have enormous potential for the medicinal value whose indigenous knowledge and healing properties are known to the local healers and traditional doctors locally known as Hakeem's for centuries but unfortunately these medicinal plant resources are currently threatened due to over exploitation and unsustainable use (Rynjah, 1995; Bordekar, 2000).

Medicinal flora of these Mountainous regions plays a significant role in the livelihood security of poor communities of the area. Medicinal plant Collection, simple processing and trading of medicinal plants contribute significantly to the progress and poverty eradication in these regions. Unsustainable collection and extensive harvesting of the natural habitats without providing equitable benefit to the local people is of great concern and causing environmental degradation and enhanced negative impacts on poverty eradication (Karki, 2002).

In Indo –Pak Rig Veda between 4500- 1600 BC and Ayurveda between 2500-600 BC are considered among the first compiled data/records of medicinal plant biodiversity where as prevalent of indigenous system of medicine traces its origin to Greek medicine system, which was adopted by the Arabs and spread to the whole subcontinent and Europe. Indo-Pak sub-continent where this system is known by Unani or Ayurvedic (Haq, 1993).

Pakistan has a diverse flora containing about 6000 species of flowering plants with a unique biodiversity that is distributed within 9 major ecological zones. A large number of medicinal plants are being utilized by local inhabitants of various geographical regions of the country, having old indigenous knowledge on such plants. It has been estimated that 700 plant species are used for medicinal and aromatic purposes (Pie, 1992). Malam Jabba is a beautiful valley in Swat District and one of the most famous tourist place in Pakistan. The Valley runs with District Shangla on the North Eastern side whereas river Swat on its western side. The environmentalist, conversationalist, taxonomist and ethnobotanist have identified it as hot centre of plant Biodiversity. The unique Mountains environment foster a rich diversity of some rare species of plants in the area. Most part of the valley is Cultivated and have much fertile soil and agriculture production is good. More than 40,000 People are living in the Valley and local people utilized these plant resources of valley for their daily livelihood.

In the Swat and especially of rural communities using medicines plants for primary health care from centuries, based on previous experience as most villages are located in remote areas and distantly located from cities and hence lack most of modern health facilities. Prices of synthetic drugs are increasing day by day. Local inhabitants are mostly poor or middle class and they cannot effort the sharply rising prices of synthetic drugs, so as a consequence, non-availability of expensive synthetic drugs (Shinwari and Khan, 1998).

Despite the fact that ethno medicinal and veterinary plant species is very crucial in indigenous system of medicine for the human and animal health care of most region of our country, it has not yet been well explored, analyzed, documented and also their documentation is

very much neglected in remote areas of our country. Much effort and works is needed for research and integration activities in the field of medicinal plant biodiversity to enhance the sustainable livelihood security and safety of the area.

Local habitants of the area are very poor and primarily dependent upon plant resources, agriculture, agro forestry, forest products, horticulture, livestock rearing and ecotourism as a major source of income for their livelihood security. Overharvesting of medicinal plants, over population, habitat loss and degradation, overgrazing, introduction of exotic/invasive species, forest fire, deforestation, influx of increased tourism and pathogenic diseases exerts huge pressure on these plant resources. Shinwari and Khan 1998 also reported same situation of environmental degradation due to huge pressure on plant biodiversity of the area.

The local community of the Malam Jabba valley has been using plant biodiversity for treatment of human and animal health care. The local people know traditional knowledge of medicinal plants and preparation of folk recipes through ancestral prescription, personal experience and dependent on plant resources for a very long time. In the upper part of the valley the medical facilities like government hospital, private clinics, and pharmacies are not easily accessible so the use of plants resources for medicinal purposes is very common and frequent. But the people living in the lower part of the valley like Manglaur, Telegram and Ser villages where hospitals and other health facilities are easily accessible therefore utility of medicinal plants resources is infrequent as compared to the upper part of research area.

Local people especially women & children's collect a huge quantity of medicinal plants & supply them to different medicinal plant trading centers located in domestic and national markets of Pakistan including whole sale dealers in Mingora city, Islamabad, Peshawar, Lahore & Karachi. National trading centers supply it to the international markets. Out of 188 medicinal plant taxa, 29 plants species have high market values, collected in large quantities & supplied to the international & commercial markets. Highest price paid for some medicinal plants like *Valeriana jatamansi*, *Viola betonicifolia*, *Viola canescens*, *Viola piolsa* etc. The price of each medicinal plant species vary from season to seasons and year to year. The price also depends upon the demand & availability (Table-11).

Some highly valuable & important medicinal plant taxa like *Aconitum chasmanthum*, *Aconitum heterophyllum*, *Acorus calamus*, *Aesculus indica*, *Artemisia maritima*, *Asparagus officinalis*, *Berberis lycium*, *Bergenia ciliata*, *Bistorta amplexicaulis*, *Buxus wallichiana*, *Caralluma edulis*, *Colchicum luteum*, *Cotinum*, *Crataegus songarica*, *Dioscorea deltoidea*,

Elaeagnus umbellata, *Ephedra gerardiana*, *Frittellaria roylei*, *Geranium wallichianum*, *Hyoscyamus niger*, *Juglans regia*, *Olea ferruginea*, *Paeonia emodi*, *Pistacia chinensis subsp. integerrima*, *Podophyllum hexandrum*, *Polygonatum verticillatum*, *Primula denticulata*, *Primula macrophylla*, *Saussurea lappa*, *Skimmia laureola*, *Thymus linearis*, *Valeriana jatamansi*, *Viburnum cotonifolium*, *Vitis jacquemonti*, *Viola canescens*, *Viola betonicifolia*, *Viola pilosa* were severely threatened due to over exploitation by the local people for ethno medical and ethno veterinary purposes

Local community is unaware and ignorant about the importance of these rare, endemic, highly valuable and globally important medicinal plants. Some time medicinal plants are collected in huge quantity where as in most cases the whole plant is uprooted. Local people are mostly illiterate and unaware about the pre and post harvest method, proper time of plant collection, drying, storing and preservation techniques, which ultimately lead to wastage of plant resource. Therefore it is dire need that they should be trained regarding pre and post harvest method of medicinal plants. It will play a key role for sustainable livelihood security and create extra sources of income and will also reduce pressure on the extraction of these rare, endemic, highly rich and globally important medicinal plants.

Furthermore ruthless and indiscriminate deforestation severely affect the whole ecosystem and natural beauty of the area which are the dominant source of income in the form of ecotourism for sustainable livelihood security of the area. Forest of valley is not only regional but also global ecological importance. Local people, landlords and timber mafia should be properly monitored and discouraged to preserve natural forest in its pristine form with the involvement of the local community.

Livestock rearing is a significant part of most livelihoods in the area and the traditional valley lifestyle involves keeping & rearing cattle like buffalos, cows, goats and sheep for milk and other dairy products. These are the source of food and income for the livelihood security in most part of the valley.

Horticulture is commonly practiced in lower part of valley. *Diospyrus kaki* is commonly practiced in the area but sometime *Diospyros lotus* is used for grafting purposes. Some important wild fruit plants of the area are *Diospyros Kaki*, *Diospyros lotus*, *Prunus domestica*, *Prunus armeniaca*, *Prunus persica*, *Pyrus communis*, *Pyrus pashia*, *Vitis jacquemontii*, *Vitis vinefera*, *Eriobotrya japonica*, *Juglans regia*, *Elaeagnus umbellata*, *Ziziphus jujuba*, *Ziziphus nummularia*, *Ziziphus mauritiana var. spontanea* which plays a tremendous role for the

livelihood security of the area. Some fast growing tree species like *Alianthus altissima*, *Eucalyptus camadulensis* and *populus nigra* are planted in the valley for fuel purposes but it gradually replacing the natural flora and has adverse affect on native vegetation of ecosystem.

Honey bee keeping is an old tradition in Swat but In Malam Jabba Valley only a few families keep bees. Honey bee industry should be encouraged for the improved livelihood security. The important plants which are used in the honey bees in Malam Jabba Valley are *Acacia modesta*, *Canabis sativa*, *Cucurbita maxima*, *Jasminium humile*, *Indegoefera heterantha*, *Plectrannthus rugosus* and *Prunus armeniaca*.

Majority of the local inhabitants also depend upon agriculture. Wheat and maize is commonly cultivated but rice cultivation is not common in the area. Maize is the major kharif while wheat is the major rabbi crop of the area. Important crops of the area are cabbage potato, onion, beans, cucumber and turnip,

It was concluded that most of medicinal plant biodiversity are severely threatened in the research area due to habitat destruction, degradation, habitat fragmentation, unscientific and overexploitation of natural resources for medicine, fuel wood, timber wood, overgrazing, ruthless deforestation, forest fire, introduction of invasive species, pathogenic diseases, human population and anthropogenic activities. Poverty, ignorance and lack of scientific knowledge also create pressure on the medicinal plant resources and result is degradation of environment. There is also override need to safeguard the plant biodiversity for the better and long-term livelihood security of the area.

CONSERVATION ISSUES OF MEDICINAL PLANTS

Plant biodiversity of the Malam Jabba Valley is slumping at an alarming rate that adversely damages the health of our ecosystem and its services. Exhaustive surveys were conducted from 2013-2017 to record the threatened and endangered flora of Malam Jabba Valley, Hindu Kush Range Swat. A total of 167 wild medicinal plant species were assessed/evaluated according IUCN Red List Criteria at Malam Jabba Valley, Hindu Kush Range, Swat, Pakistan. Thirty species (18%) were recorded critically Endangered, 30 taxa (18%) Endangered, 27 taxa (16%) Vulnerable, 35 taxa (21%) Near Threatened, 41 taxa (25%) Least Concern, 04 taxa (2%) Data deficient while 21 taxa were identified as Cultivated/Alien. Of the 188 medicinal plant species more than two quarter (52 %) are being threatened i.e. Critically Endangered, Endangered or Vulnerable

IUCN Red List Criteria was used to establish conservation status of vascular plant biodiversity. IUCN Red List Criteria (2001) version 3.1, Appendix VII, following IUCN Regional guidelines 2003, version, 3.0 & IUCN Categories & Criteria 2010, Version 4.0 were used for detailed investigation of conservation issues. The reduction in population size was observed by direct field observation. Information on the conservation issues of these plant resources were also collected and documented from local community. The results are presented in Table V and VI regarding plant name, family name, habit, IUCN Criteria, Sub Criteria, major threats and reason of reduction & loss.

Dominant factors which are used for the evaluation of conservation status are a. Population reduction, b. Restricted distribution, c. Population size, d. No. of Mature individuals in the wild. e. Probability of extinction. The taxa depend on each or any of these five criteria determine conservation values of plant biodiversity. A large number of plants are threatened due to population reduction or highly restricted distribution in the wild while few taxa are threatened due to presence of limited numbers of mature individuals or very small number of species in the wild and population size.

Majority of medicinal plants are also threatened due to population reduction in their native habitats or restricted distribution because of multiple factors including over exploitation, overgrazing, human interference, population explosion, introduction of invasive species, clearing of land for agriculture purpose and indiscriminate deforestation, forest fire, trade and growing demand of selected medicinal plants for pharmaceutical industry.

It was recorded during the field studies that some species confined to narrow geographical range/single locality. Some species were found in small population size with only one or few populations. Many species were reported from different locality while many other species were distributed in whole tract. Some species are cosmopolitan in nature and found in the whole valley.

Growing demand of medicinal plants for pharmaceutical industry, their domestic, national and commercial trade has resulted in large scale extraction of medicinal plants from the wild for medicine preparations. The study find out that more than 85 % taxa of medicinal plants are under threat due to over exploitation, overharvesting, land cover change, overgrazing, habitat loss, degradation and trade. Ignorance, poor socio economic condition, lack of scientific knowledge is also some factors that further threaten and create biotic pressure on medicinal plant biodiversity. Of the 188 plant species more than 52% are being threatened i.e. Critically Endangered, Endangered or Vulnerable.

Some key medicinal plants are decreasing at alarming rate due to overharvesting for medicine and are in danger of local extinction if proper conservation measurement were not taken in the near future

Some of the highly rich medicinal plants are intensively harvested for medicinal purposes and as a result most of them become critically endangered. Some highly rich Medicinal plants are on the verge of extinction in near future due to excessive utilization and overexploitation by the local community. Some targeted and highly rich medicinal plant taxa lik *Colchicum luteum*, *Bistorta amplexicaulis*, *Geranium wallichianum*, *Viola pilsa*, *Viola canescen* etc were collected from research area along with their roots and associated soils as a part of ex situ conservation. These species were then planted and grown in Botanical Garden as a part of ex situ conservation. Some of these species shown successful results and acclimatized in the Garden in the initial stages but in later stages their growth was failed due to anthropogenic activities.

Some commercially and globally important threatened medicinal plants of the area are *berberis lycium*, *Colchicum luteum*, *Viola pilosa*, *Viola canescens*, *Skimmia laureola*, *Bistorta amplexicaulis*, *Primula denticulate*, *Valeriana jatamansi*, *Podopyllum emodi*, *Paeonia emodi*, *Polygonatum verticillatum*, *Geranium wallichianum*, *Ajuga brateasa*, *Saussurea lappa*, *Valeriana jatamansi*, *Juglans regia*, *Rheum emodi* etc. Non-sustainable and over harvesting of these medicinal plants faces a great threat to the flora of the Malam Jabba Valley. It may face a local extinction in near future if constantly being exploited at such rates commercial rates.

Conservation measures are needed on urgent basis to protect these threatened and critically endangered medicinal plant biodiversity from local extinction in near future. There is override need to identify globally important, critically endangered, endemic, rare plants of the country. Sustainable utilization and management is very crucial steps for threatened and rare flora as these species more vulnerable to extinction due to narrow and limit distribution. Sustainable utilization & cultivation of selected and highly rich medicinal plants are very crucial for sustainable livelihood security of the area.

Plant biodiversity play an important role in the livelihoods of indigenous and local communities of the research area. It was concluded that about 52% of medicinal plant biodiversity are in daner of extinction due to different ecological factors/threats like habitat loss, habitat degradation, habitat fragmentation, environmental pollution, land cover change for agriculture proposes, excessive use of agriculture, indiscriminate deforestation, invasion of plant species, over grazing, over exploitation, terraced cultivation, influx of excessive tourism, population explosion, environmental related disaster and hazards. There is override for conservation practices, sustainable utilization, community awareness, habitat management, cultivation of highly rich & threatened medicinal plants for sustainable livelihood security and safety of the area.

MAJOR THREATS/FACTORS

Following are some major threats/factors that severely disturbed plant biodiversity of the area.

1. Habitat loss/ habitat destruction
2. Habitat alteration/degradation
3. Habitat fragmentation
4. Population explosion/anthropogenic activities
5. Deforestation
6. Illegal logging
7. Lack of proper range management practices/overgrazing
8. Clearing of land for agriculture purpose/ Agriculture expansion
9. Land cover change/ Land use change
10. Unplanned construction and development
11. Influx of excessive ecotourism
12. Over harvesting/ over exfoliation of plant resources
13. Lack of scientific research and unscientific extraction of plant resources
14. Smuggling or Illegal trade in some threatened medicinal plant taxa
15. Introduction of non palatable species/ alien invasive species
16. Environmental related disaster and hazards
17. Land sliding/flash flood
18. Pathogenic disease
19. Lack of conservation practices in the form of Insitu and exsitu conservation
20. Degradation of environment and ecosystem services
21. Lack of community awareness regarding importance of wild flora
22. Lack of community based management approaches.
23. Lack of environmental education
24. Lack of linkages between research institutes like Botanical garden and Local community
25. Lack of managing production
26. Lack of Capacity building for plant conservation

RECOMMENDATIONS AND SUGGESTIONS

1. Medicinal plant biodiversity play a significant role in supporting local economy besides contributing in food security, nutrition and medicine. It generate additional income and job opportunity therefore basic education regarding proper collection, sustainable harvesting at proper time, drying, preservation, storage, processing techniques and packing about medicinal flora should be extended to the local community for for sustainable livelihood security.
2. Proper scientific methods should be carried out to streamline the regeneration, conservation and proper extraction of medicinal plant resources in the area.
3. Natural rangeland practices, such as cattle grazing are one of dominant source of income for the local community. This have resulted a decline in plant resources therefore, rangeland management practices/ rotational grazing of plant resources should be encouraged in order to reduce pressure on the medicinal plant biodiversity and pastures due to trampling effect of grazing and animals.
4. Community participation & mobilization should be strongly desirable for conservation and sustainable utilization of rare, endemic, threatened & globally important medicinal plants to protect them from further genetic erosion & extinction in near future.
5. Environmental education, public awareness and community mobilization regarding importance of wild flora, conservation and sustainable harvesting are needed on urgent basis to protect endangered medicinal flora for the sustainable livelihood security of the area.
6. Proper training should be arranged for the local community about conservation, sustainable use and management of rare, endemic, endangered and globally important medicinal plants.
7. A long term ethno medicinal program will be strongly desirable that address issues of conservation, sustainable utilization and sustainable management of plant resources for betterment livelihood security.
8. There is no policy and effective legislation to protect natural resources therefore proper measurements should be taken to protect medicinal plant biodiversity of the area.
9. There is dire need of proper documentation and conservation of indigenous knowledge about medicinal flora.

10. Enough regeneration time should be given to medicinal plants to keep their optimum time of growth in view.
11. It is also recommended that due to growing demand in medicinal plants of our country it is necessary to develop a long term strategy to conserve these plant products for sustainable livelihood security of local communities in rural areas.
12. Conservation priority areas of medicinal plants in the natural habitat of the valley should be developed with the involvement of local communities.
13. Highly rich, commercially & globally important plant taxa like *Berberis lycium*, *Bistorta amplexicaulis*, *Colchicum luteum*, *Geranium wallichianum*, *Paeonia emodi*, *Podophyllum hexandrum*, *Polygonatum verticilatum*, *Valeriana jatamansi*, *Viola canscens*, *Viola pilosa* can be introduced as minor crops on marginal fields which will reduce pressure on these important plants and improved the livelihood security.
14. Nurseries of highly rich & globally important medicinal plants should be established in the research area in order to reduce pressure on the wild medicinal flora for improved livelihood security.
15. Herbal Industries and local communities should be brought together for the better socio-economic returns and livelihood security of the area.
16. Herbal industries should be developed in the area in order to improve socio economic condition and livelihoods of the area.
17. There is override need to streamline access of the local community towards national and commercial markets which will play a vital role for socio-economic conditions of the backward area.
18. There is urgent need to address issue of ownership and sustainable utilization of medicinal plants in order to get full benefits from the utilization of medicinal plant resources and their conservation.

Chart-XII. Shows Number of species, genera and families in Medicinal Plant Biodiversity

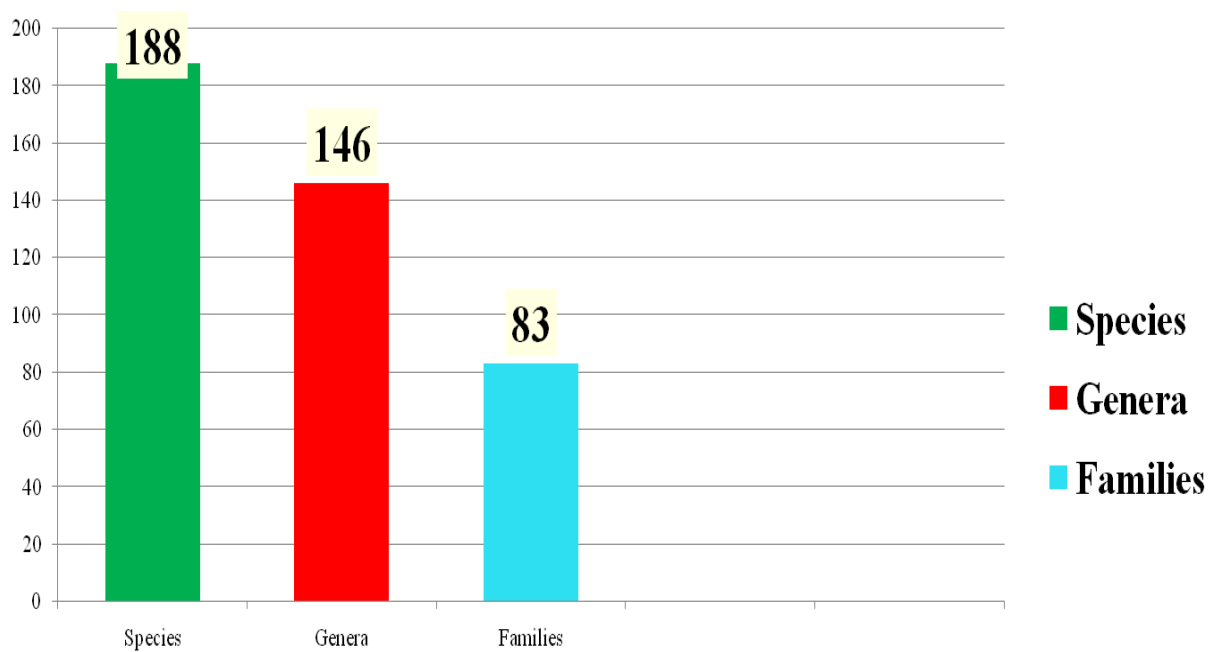


Chart-XIII. Shows Number of species in Different Taxonomic Groups of Medicinal Plant

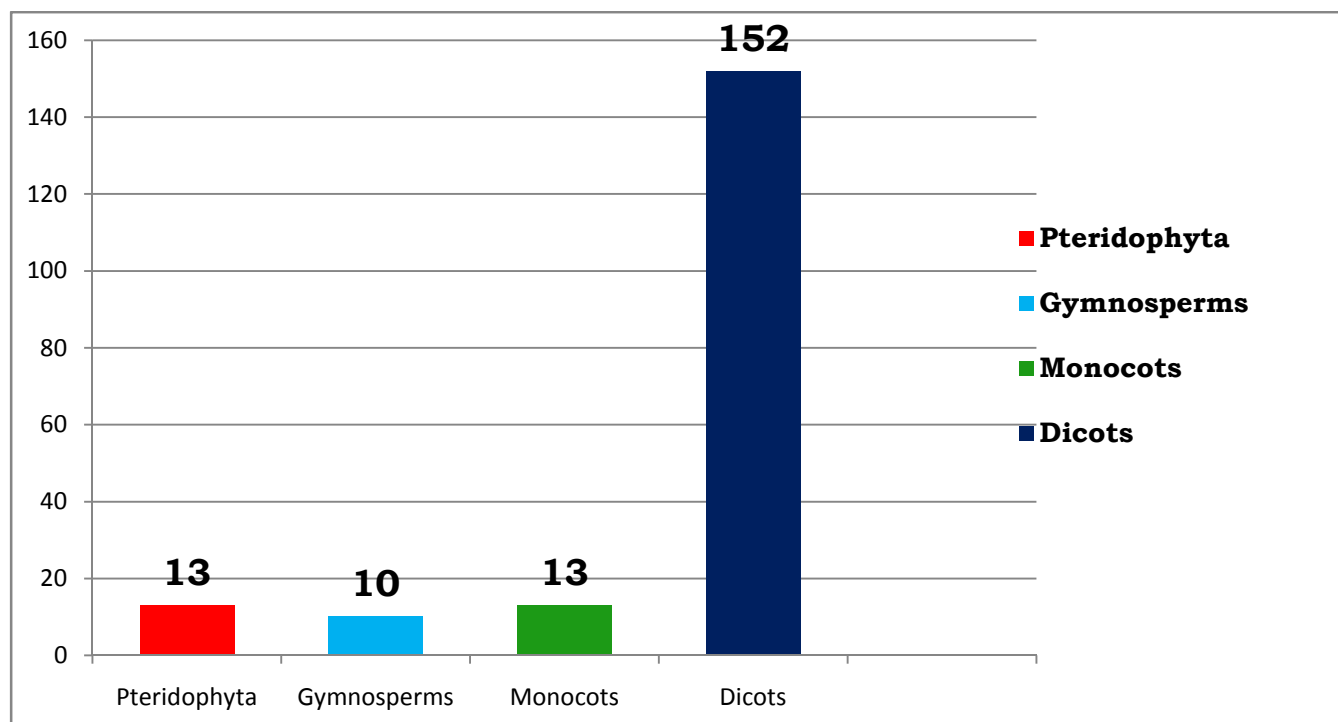


Chart-XIV. Shows Percentage of genera in different Taxonomic Groups of Medicinal Plants

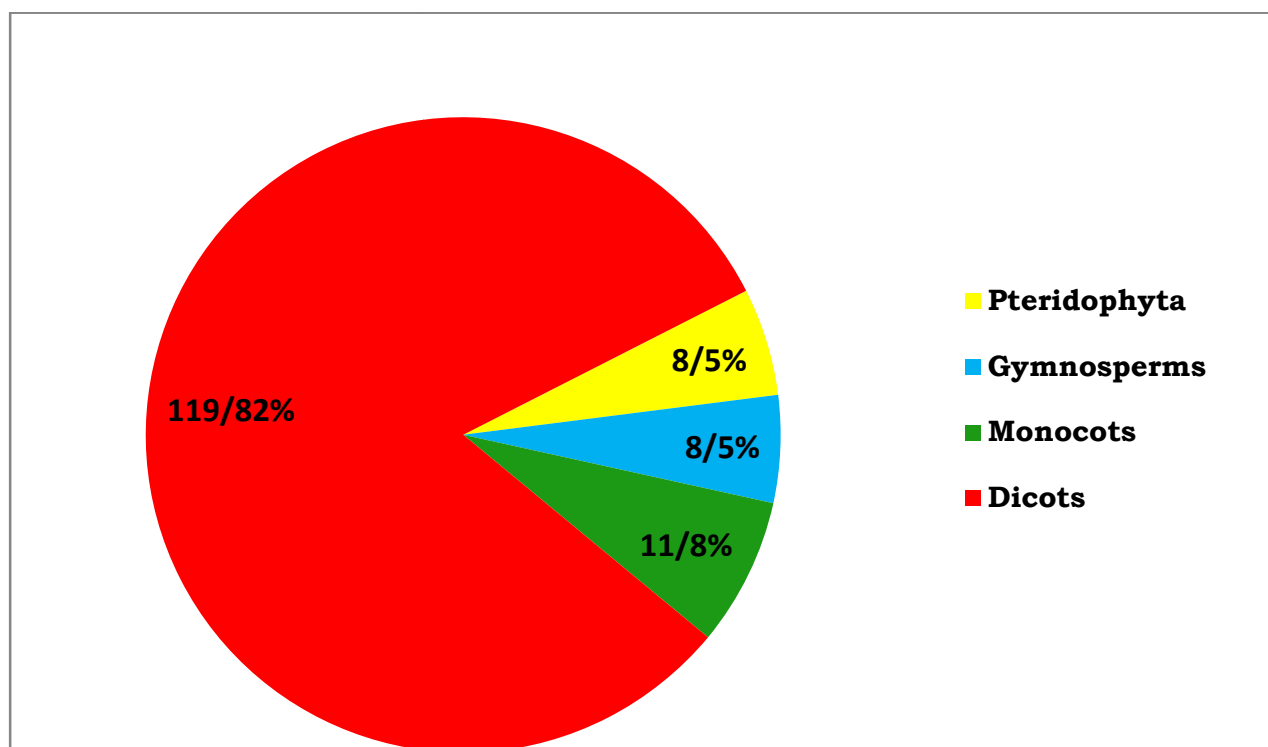


Chart-XV. Shows Number and Percentage of some leading Families on the basis of species

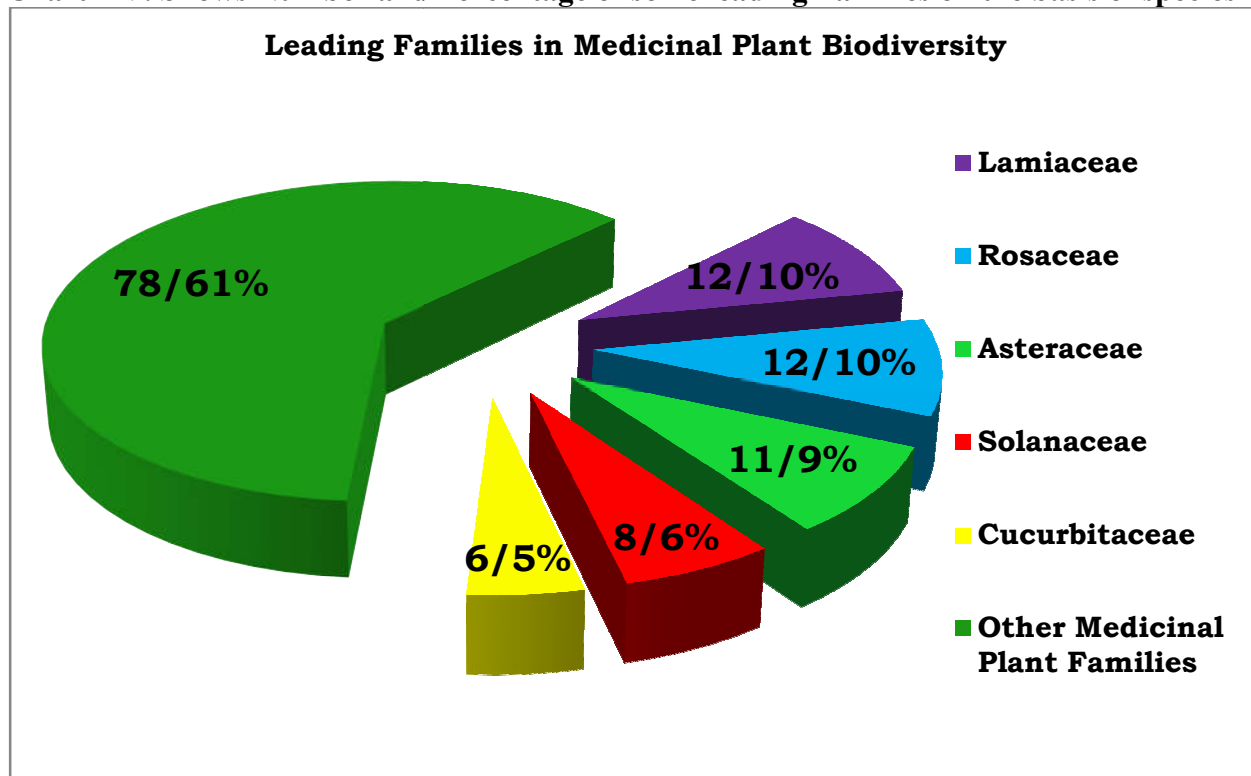


Chart-XVI. Shows Number of genera in leading Families of Medicinal Plants

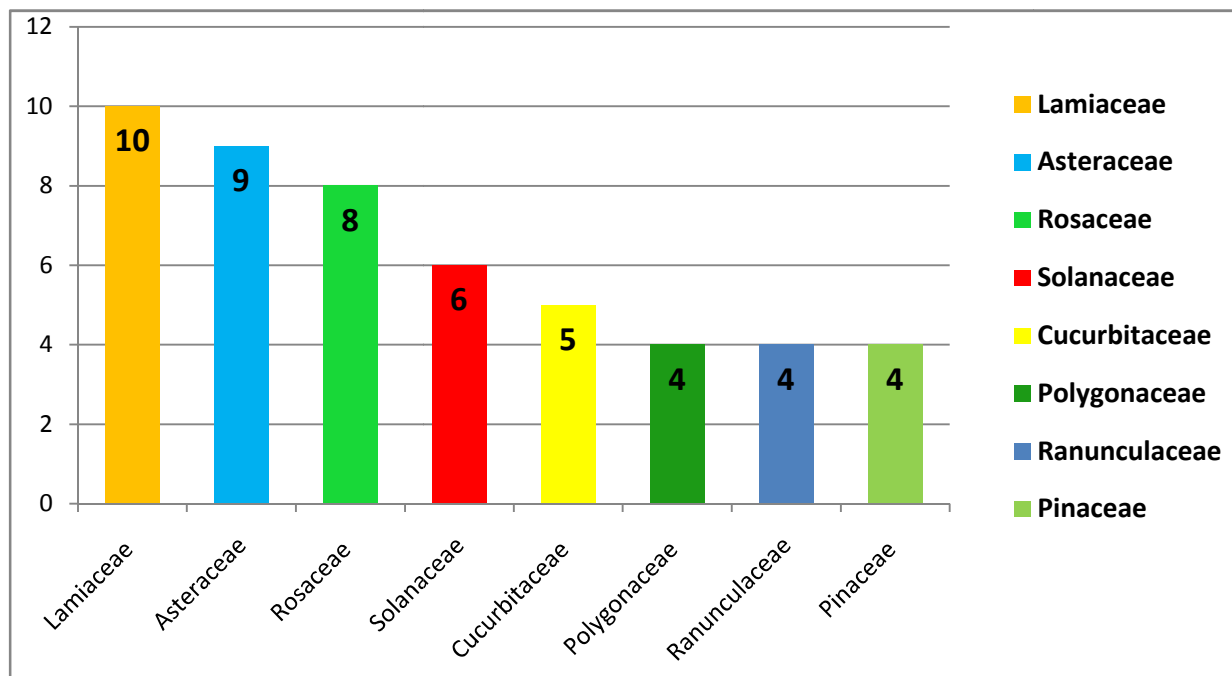


Chart-XVII. Shows Number and Percentage of Herbs, Shrubs, Trees, Climbers and Parasitic Herb on the Basis of Habit in Medicinal Plants

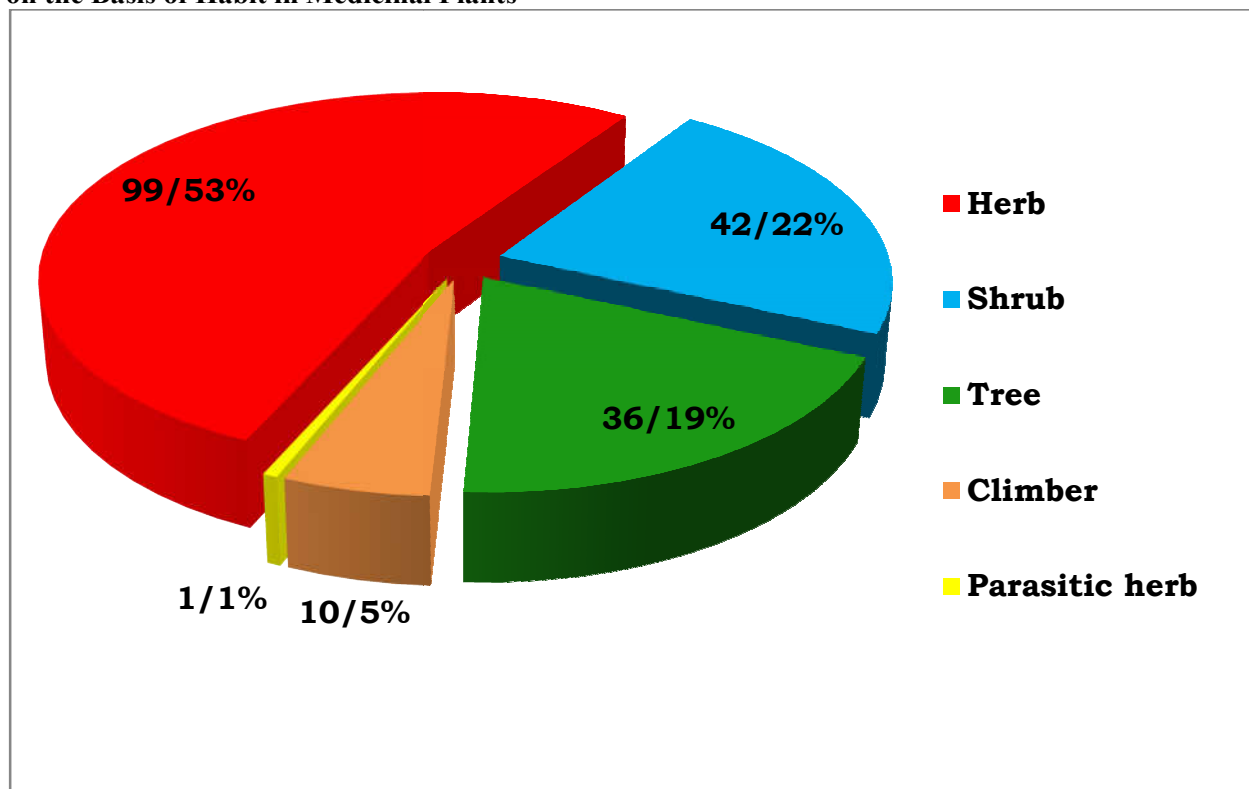


Chart-XVIII. Shows Percentage of Native and Non-Native Medicinal Plant Biodiversity

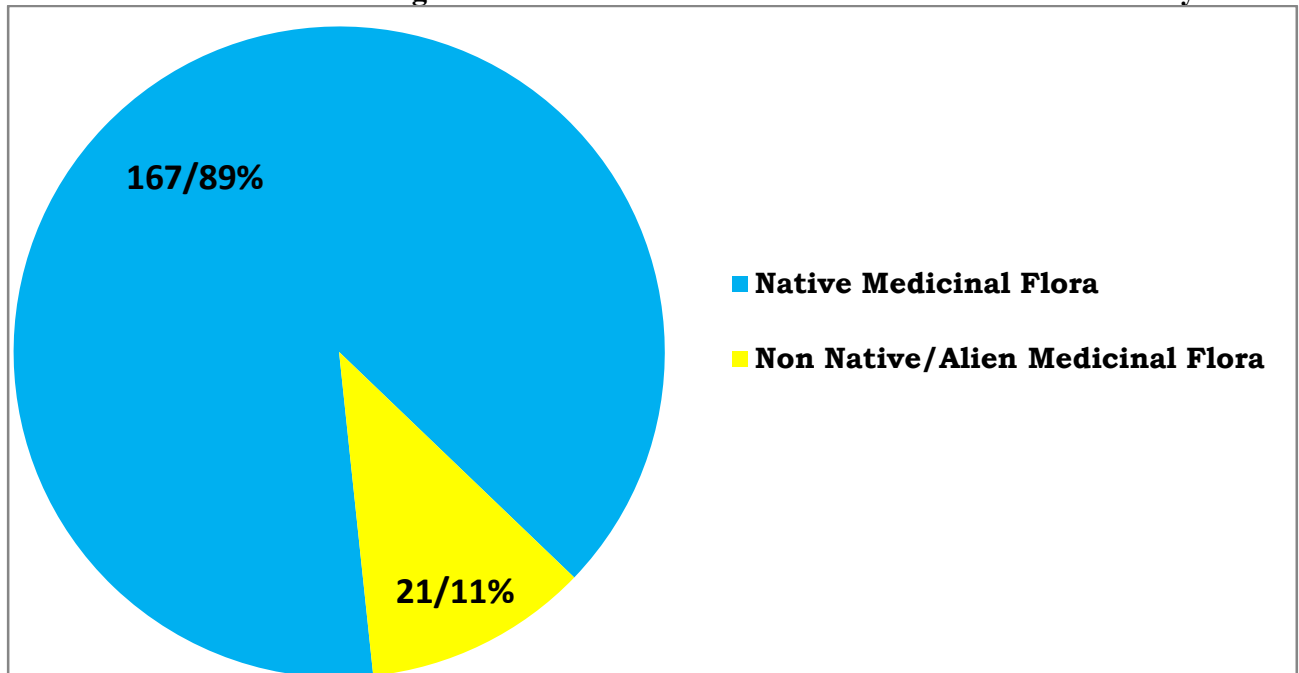


Chart-XIX. Shows Number and Percentage of Medicinal and Non- Medicinal Flora

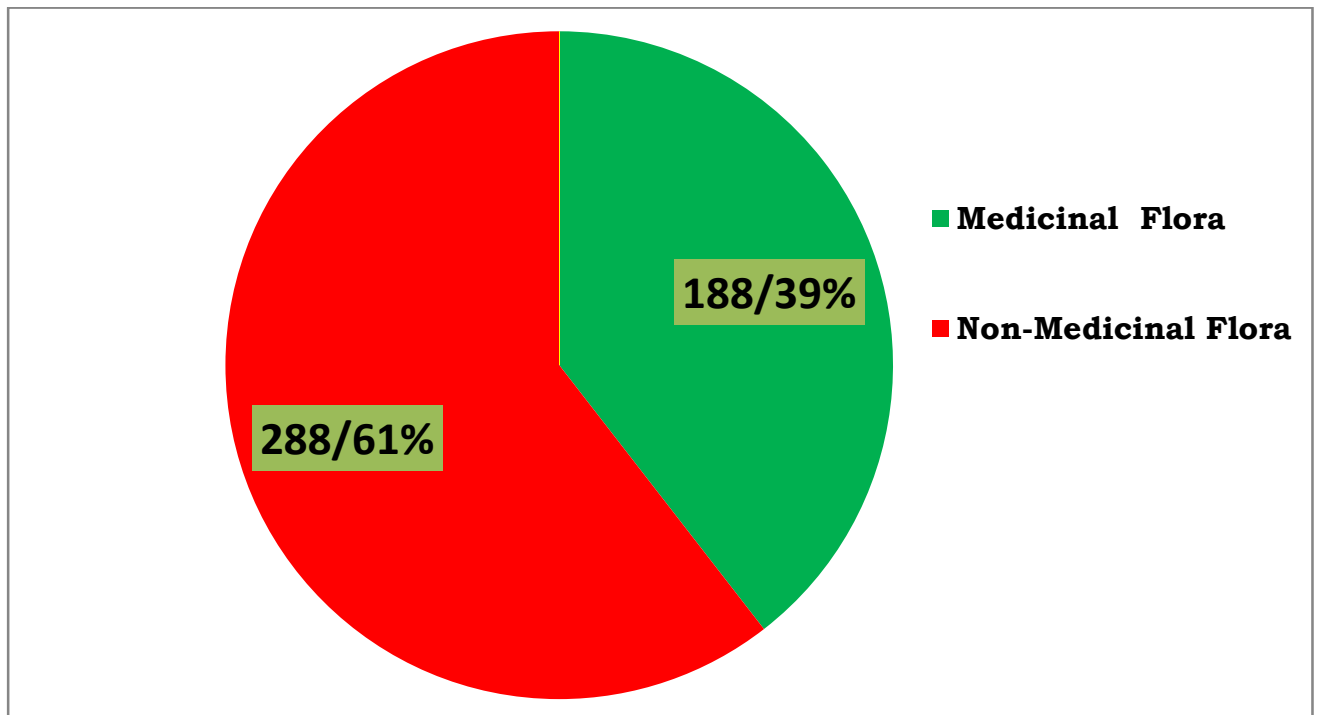


Chart-XX. Shows Ethnomedicinal Plant Parts in the Preparation of Human Folk Recipes

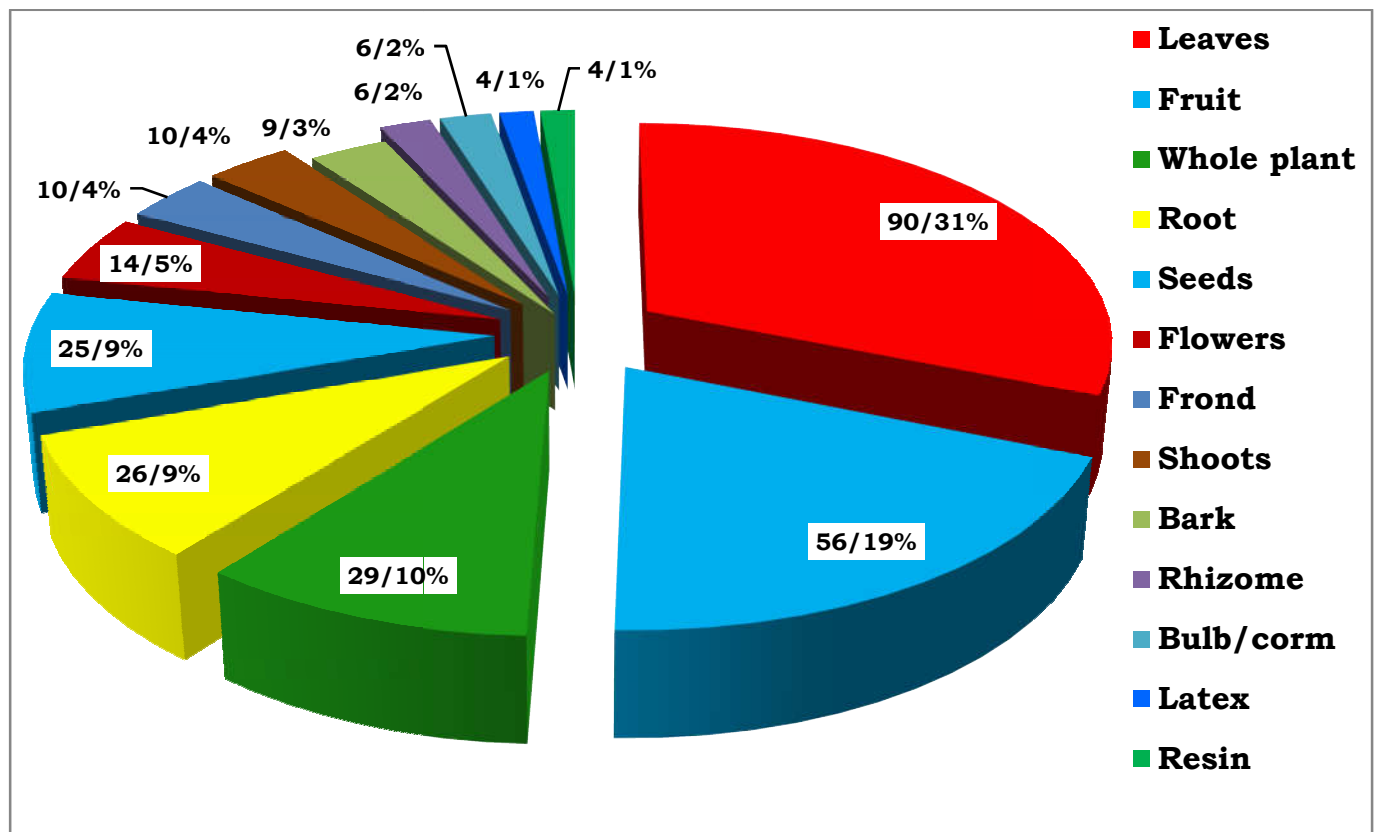


Chart-XXI. Shows Ethnoveterinary Plant Parts in the Preparation of Animal Folk Recipes

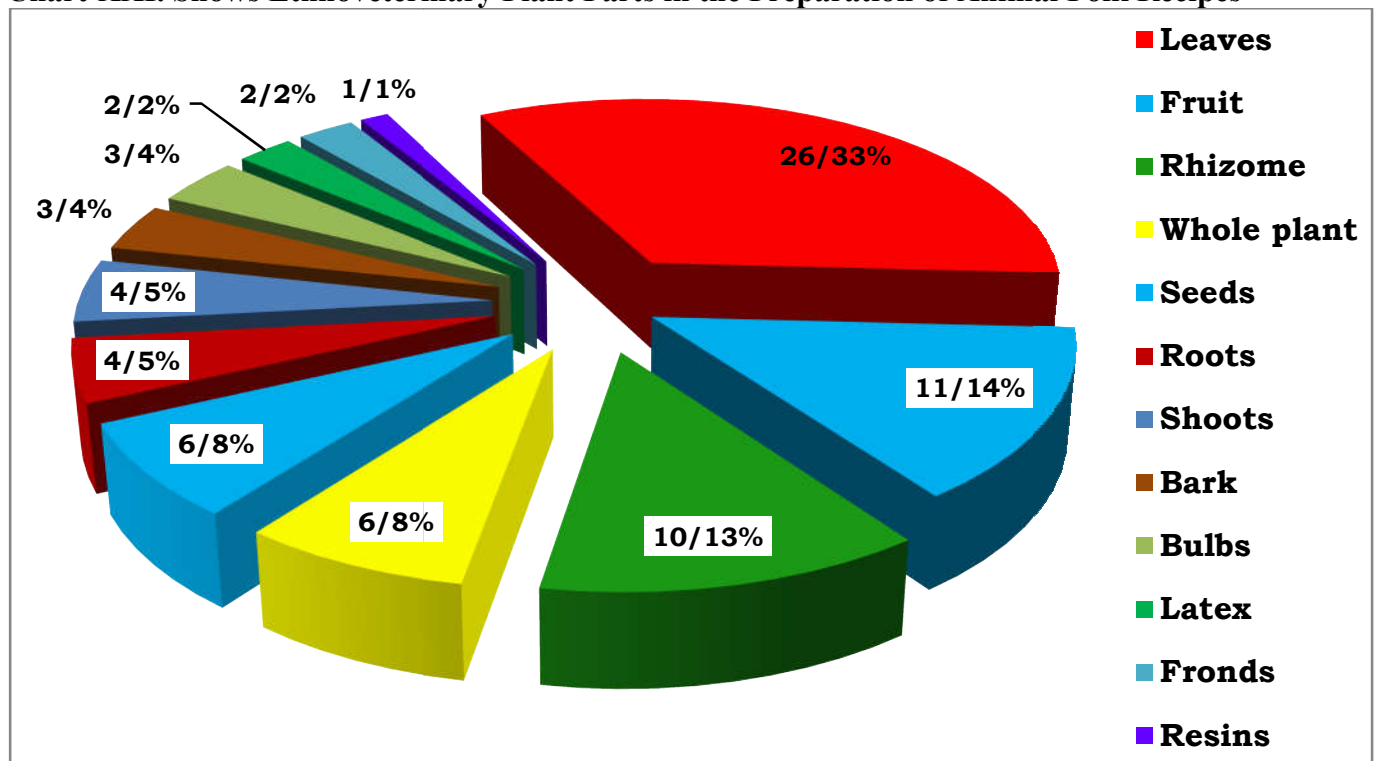
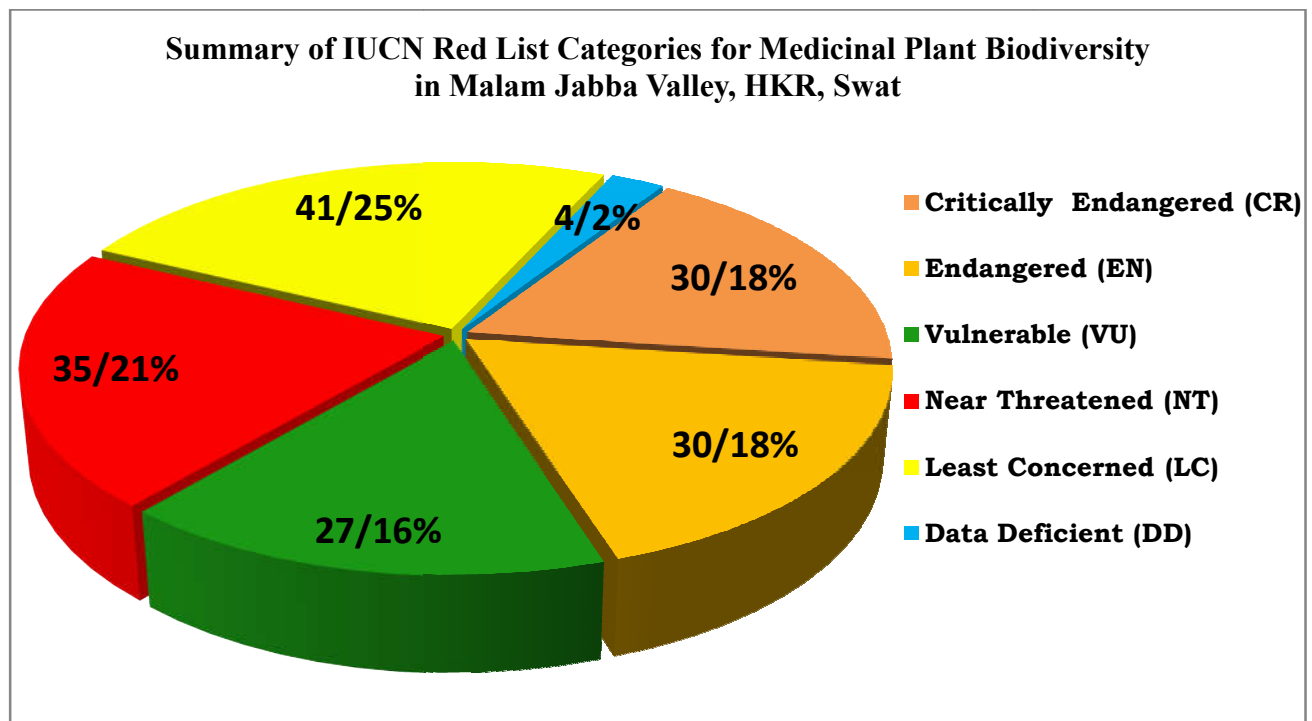
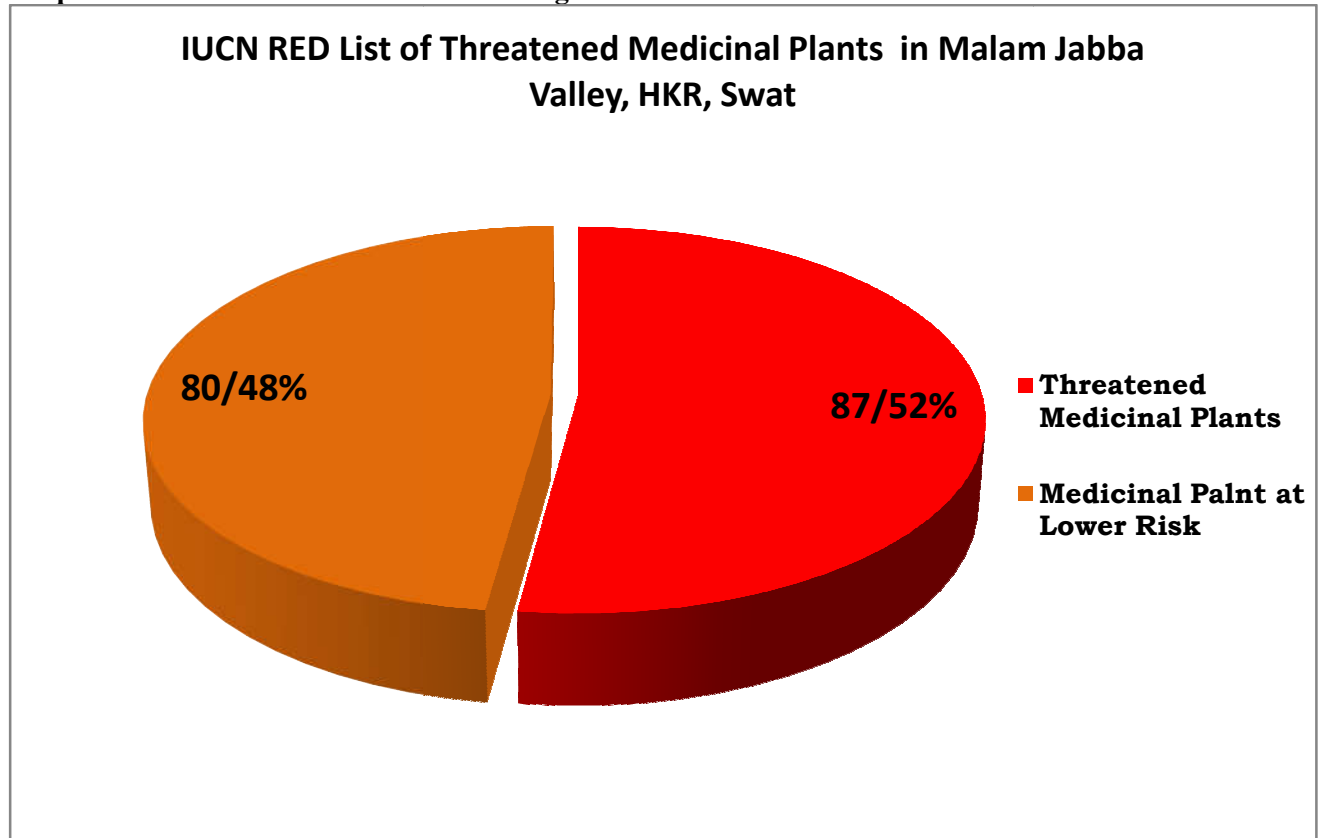


Chart-XXII. Shows Number and Percentage of species in each IUCN Red List Category of MP



Graph-XXIII. Shows Number and Percentage of Threatened and Non Threatened Medicinal flora

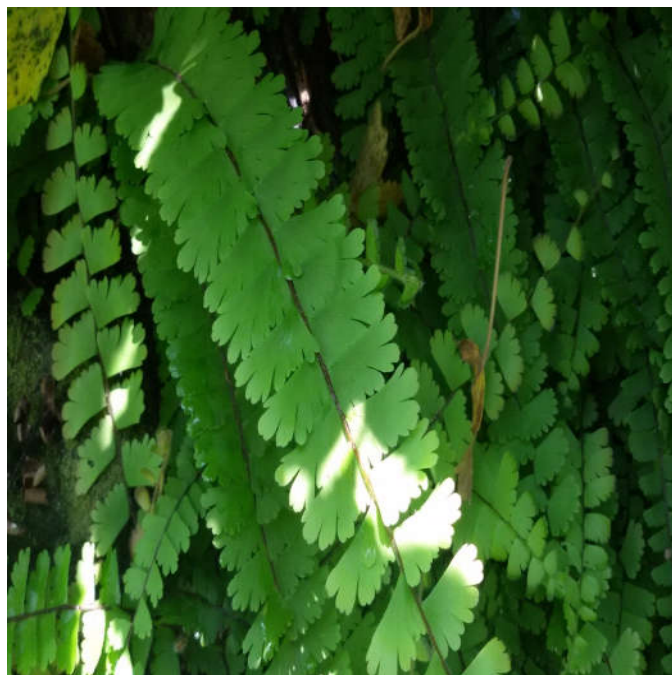


PTERIDOPHYTES

Family Name : **Adiantaceae**



Plate No: 1
Botanical Name: **Adiantum capillus-veneris L.**



Adiantum incisum L.



Plate No: 2
Botanical Name: **Adiantum pedatum L.**



Adiantum venustum D. Don.

Family Name: Aspleniaceae



Plate No: 3
Botanical Name: *Asplenium adiantum-nigrum* L.



Asplenium ceterach L.



Plate No: 4
Botanical Name: *Asplenium dalhousiae* Hook.



Asplenium trichomanes L.

Family Name: **Dennstaedtiaceae**



Plate No: 5

Botanical Name: ***Pteridium aquilinum* (L.) Kuhn ex Deken**

Family Name: **Marsileaceae**

Pteridaceae



Plate No: 6

Botanical Name: ***Marsilea minuta* L.**

***Cheilanthes farinose* L.**

Family Name: Pteridaceae



Plate No: 7

Botanical Name: *Onychium Japonicum* (Thunb.) Kunze

Pteris cretica L.

Family Name: Pteridaceae

Thelypteridaceae



Plate No: 8

Botanical Name: *Pteris vittata* L.

Cyclosorus dentatus (Forssk.) Ching.

GYMNOSPERMS

Family: Cupressaceae



Plate No: 9

Botanical Name: *Cupressus sempervirens* L.

Family: Pinaceae



Plate No: 10

Botanical Name: *Abies pendula* Royle



Botanical Name: *Cedrus deodara* (Roxb. ex. D.Don) G. Don

Family: Pinaceae



Plate No: 11
Botanical Name: *Picea smithiana* (Wall.) Boiss



Pinus roxburghii Sargent

Family: Pinaceae

Taxaceae



Plate No: 12
Botanical Name: *Pinus wallichiana* L.



Taxus wallichiana Zucc

ANGIOSPERMS

Family: Acanthaceae

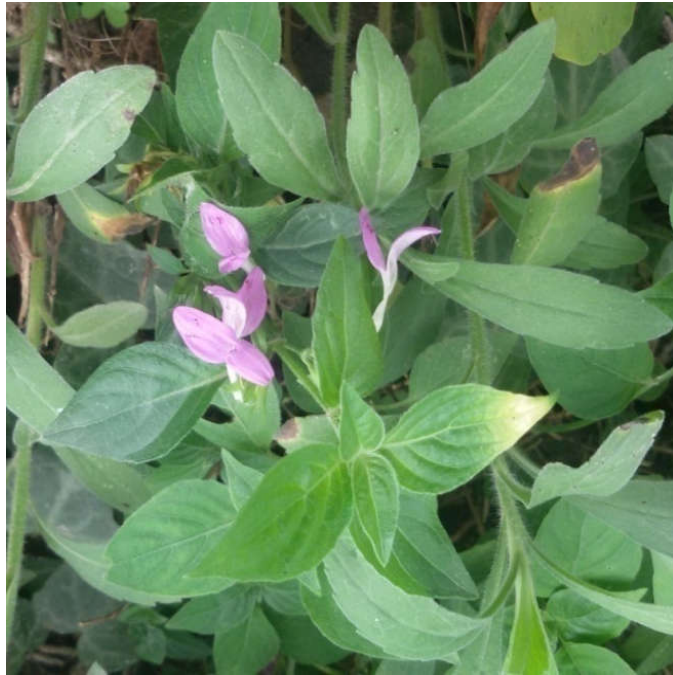


Plate No: 13
Botanical Name: *Dicliptra bupleorides* Nees.

Family: Amaryllidaceae

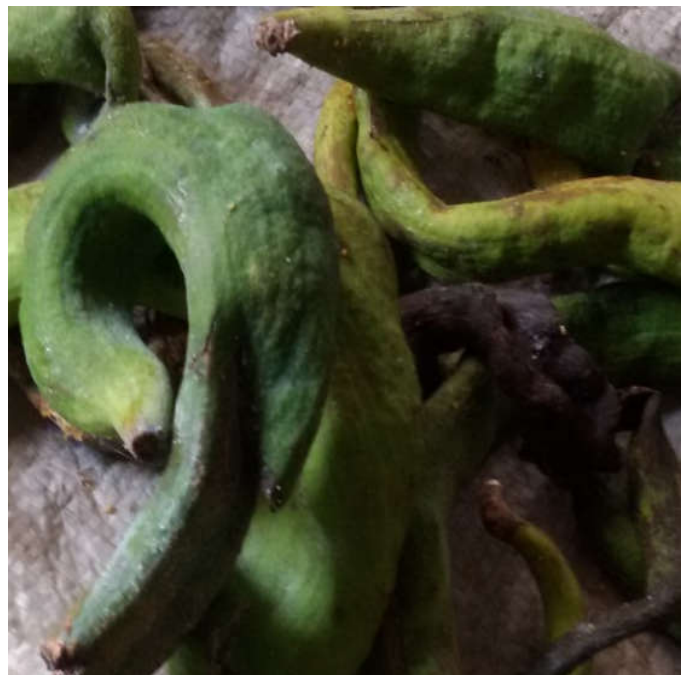


Narcissus tazetta L

Family: Anacardiaceae



Plate No: 14
Botanical Name: *Cotinus coggyria* Scop.



Fruit of *Pistacia chinensis* subsp. *Integerrima*

Family: Araceae



Plate No: 15

Botanical Name: *Acorus calamus* L.



Arisaema flavum (Forsk.) Schott

Family: Araliaceae



Plate No: 16

Botanical Name: *Hedera nepalensis* K. Koch.

Family: Asteraceae



Plate No: 17
Botanical Name: *Artemisia dubia* Wall.



Artemisia maritima L.



Plate No: 18
Botanical Name: *Artemisia santolinifolia* Turcz. ex Krasch *Artemisia scoparia* Waldst Kitam.



Family: **Asteraceae**



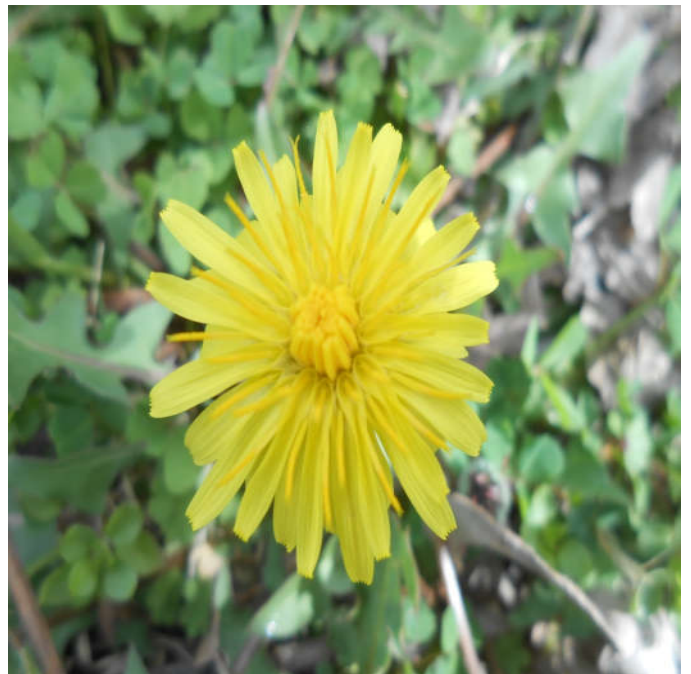
Plate No: 19
Botanical Name: **Cichorium intybus L.**



Cirsium arvense (L.) Scop.



Plate No: 20
Botanical Name: **Cirsium falconeri (Hook. f.) Petrak.**



Crepis multicaulis Leded.

Family: Asteraceae



Plate No: 21

Botanical Name: *Conyza bonariensis* (L.) Cronquist.



Galinsoga parviflora Cav.



Plate No: 22

Botanical Name: *Leontopodium himalayanum* DC.

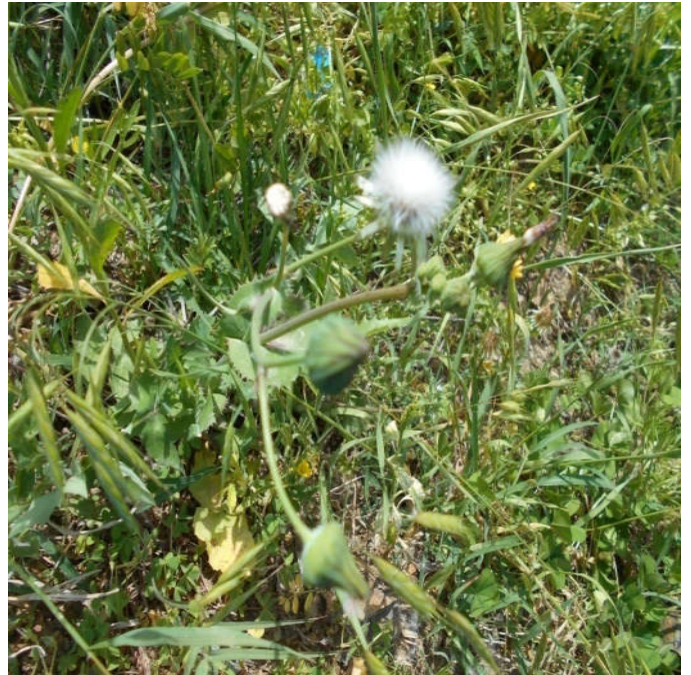


Onopordum acanthium L.

Family: Asteraceae



Plate No: 23
Botanical Name: *Phagnalon niveum* Edgew.



Sonchus oleraceus L.



Plate No: 24
Botanical Name: *Taraxacum officinale* F. H. Wigg.



Tussilago farfara L.

Family: Asteraceae



Plate No: 25

Botanical Name: *Xanthium strumarium* L.

Balsaminaceae



Impatiens bicolor Royle.

Family: Balsaminaceae



Plate No: 26

Botanical Name: *Impatiens brachycentra* Kar. & Kir.



Impatiens glandulifera Royle

Family: Berberidaceae

Boraginaceae



Plate No: 27

Botanical Name: Berberis lycium Royle



Buglossoides arvensis (L.) Johnston.

Family: Boraginaceae

Brassicaceae



Plate No: 28

Botanical Name: Ehretia obtusifolia Hochst. ex DC.



Alliaria petiolata (M. Bieb) Cavara

Family: **Brassicaceae**



Plate No: 29

Botanical Name: **Capsella bursa pastoris (L.) Medik.**

Cardamine flexuosa With.



Plate No: 30

Botanical Name: **Coronopus didymus (L.) Smith**

Nasturtium officinale R. Br.

Family: **Brassicaceae**



Plate No: 31
Botanical Name: **Thlaspi arvense L.**

Buddlejaceae



Buddleja crispa Benth.

Family: **Buxaceae**



Plate No: 32
Botanical Name: **Buxus wallichiana Baill**



Sarcococca saligna (Don) Muell.

Family: **Campanulaceae**

Canabinaceae



Plate No: 33

Botanical Name: **Campanula tenuisssima** Dunn

Cannabis sativa L.

Family: **Caprifoliaceae**



Plate No: 34

Botanical Name: **Viburnum cotonifolium** D. Don.

Viburnum grandiflorum Wall. ex DC.

Family: Caryophyllaceae



Plate No: 35

Botanical Name: *Silene conoidea* L.



Stellaria media (L.) Cyr.

Family: Celastraceae

Colchicaceae



Plate No: 36

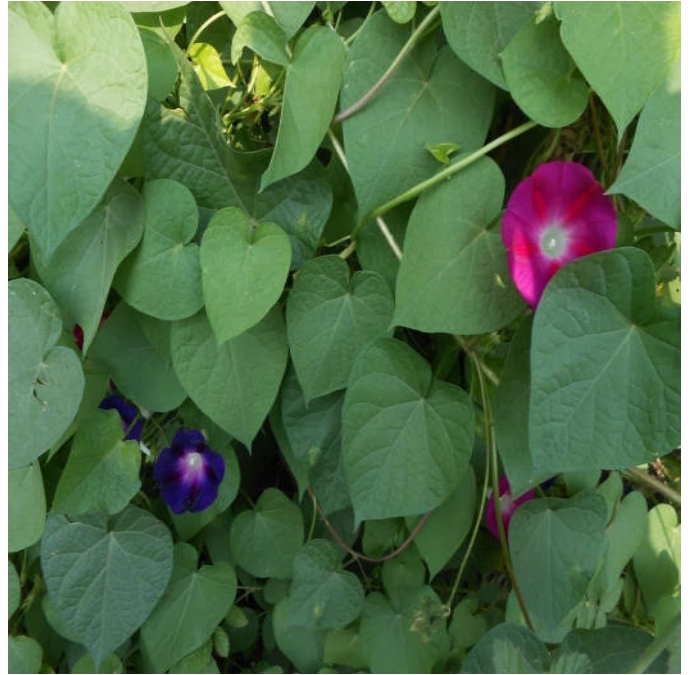
Botanical Name: *Maytenus royleanus* (Wall. ex Lawson) Cufodontis *Colchicum luteum* Baker



Family: **Convolvulaceae**



Plate No: 37
Botanical Name: **Convolvulus arvensis L.**



Ipomoea purpurea (L) Roth.

Family: **Crassulaceae**



Plate No: 38
Botanical Name: **Rosularia adenotricha (Wall. ex Edgew.) Jansson & Rech** **Sedum hispanicum L.**



Family: **Cyperaceae**



Plate No: 39

Botanical Name: **Cyperus rotundus L.**

Eleocharis palustris (L.) Roem. & Schult.

Family: **Cyperaceae**



Plate No: 40

Botanical Name: **Erioscirpus comosus (Wall.) Palla**

Family: Ebenaceae

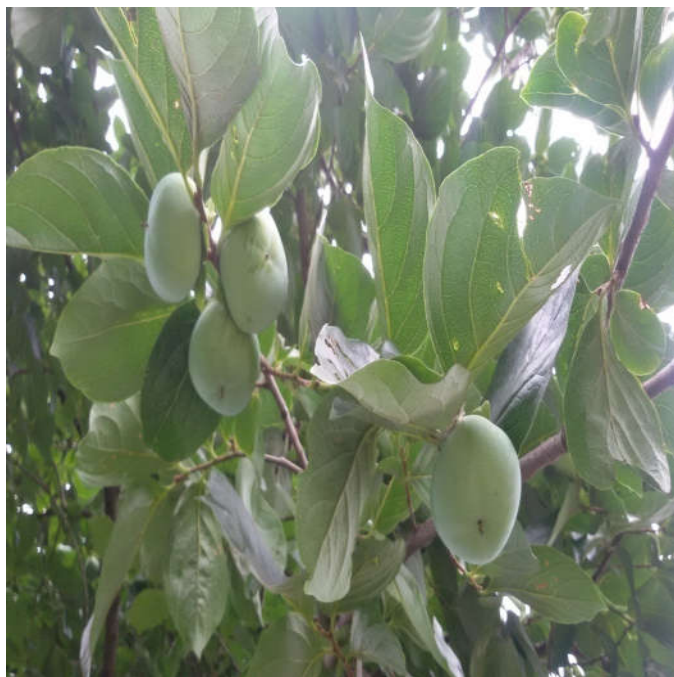


Plate No: 41
Botanical Name: *Diospyros kaki* L.



Diospyros lotus L.

Family: Elaeagnaceae



Plate No: 42
Botanical Name: *Elaeagnus umbellata* Thunb.



Euphorbia helioscopia L.

Family: **Euphorbiaceae**



Plate No: 43
Botanical Name: *Euphorbia hirta* L.



Euphorbia wallichii Hook.f.

Family: **Fagaceae**



Plate No: 44
Botanical Name: *Quercus dilatata* Royle.



Quercus incana Roxb.

Family: **Gentianaceae**



Plate No: 45

Botanical Name: **Gentianodes argentea** (Royle ex D.Don) Omer

Geraniaceae



Geranium nepalense Sweet, Geran.

Family: **Geraniaceae**



Plate No: 46

Botanical Name: **Geranium ocellatum** Camb.



Geranium wallichianum D.Don ex Sweet

Family: **Juglandaceae**

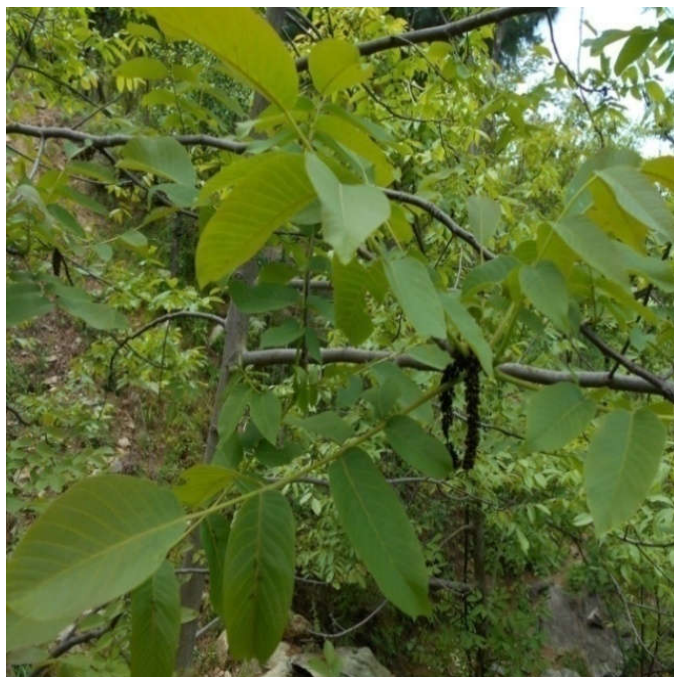


Plate No: 47

Botanical Name: **Juglans regia L.**

Lamiaceae



Ajuga bracteosa Wall.ex Benth.

Family: **Lamiaceae**



Plate No: 48

Botanical Name: **Ajuga parviflora Benth.**



Isodon rugosus (Wall. Ex Bth.) Codd

Family: **Lamiaceae**



Plate No: 49
Botanical Name: **Lamium amplexicaule L.**



Mentha spicata L.



Plate No: 50
Botanical Name: **Nepeta laevigata (D. Don) Hand.**



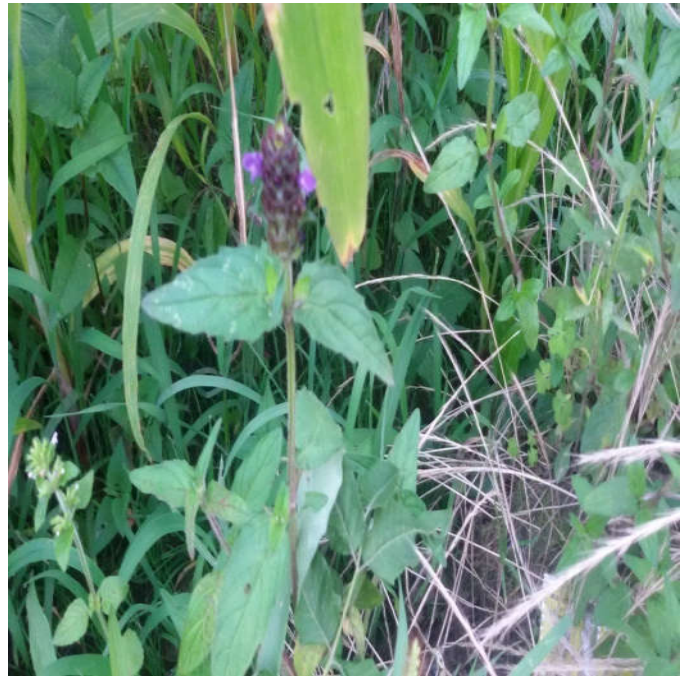
Ocimum basilicum L.

Family: **Lamiaceae**



Plate No: **51**

Botanical Name: **Otostegia limbata (Benth.) Boiss.**



Prunella vulgaris L.



Plate No: **52**

Botanical Name: **Salvia lanata Roxb.**



Salvia mocroftiana wall ex Bth.

Family: Liliaceae

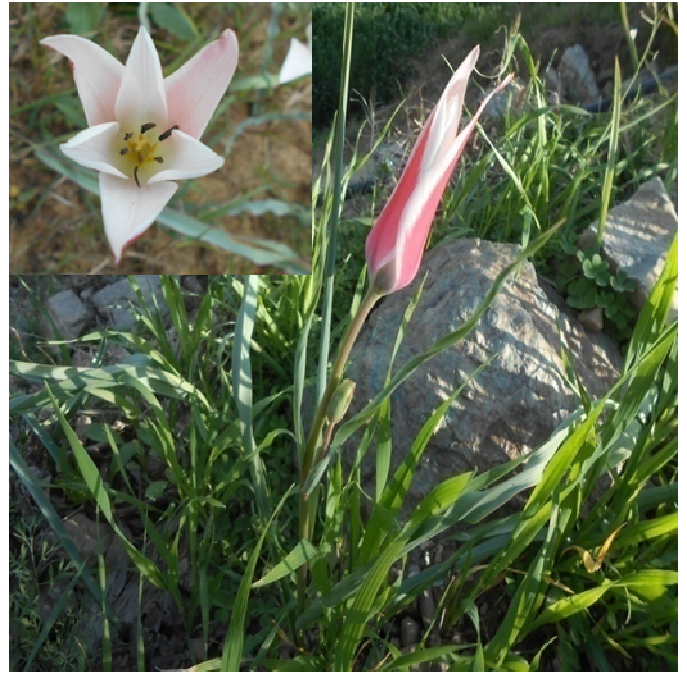
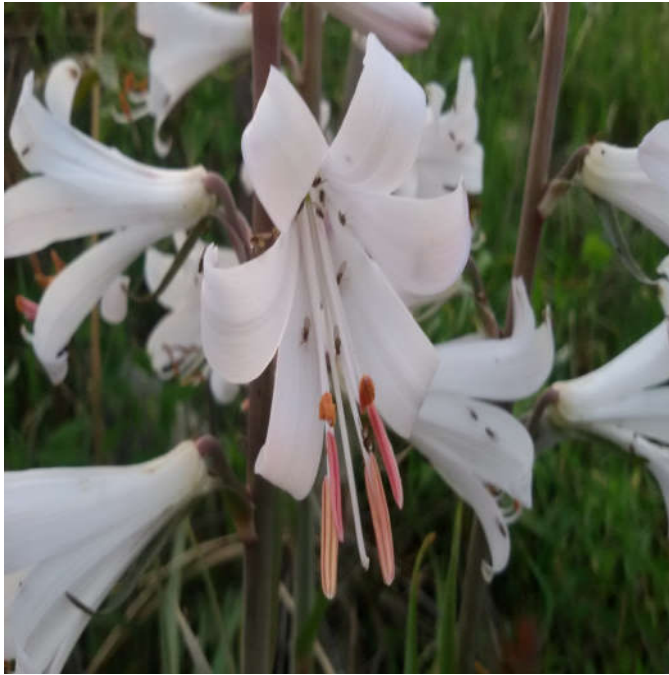


Plate No: 53

Botanical Name: *Notholirion thomsonianum* (D. Don) Stapf *Tulipa clusiana* DC.

Family: Moraceae

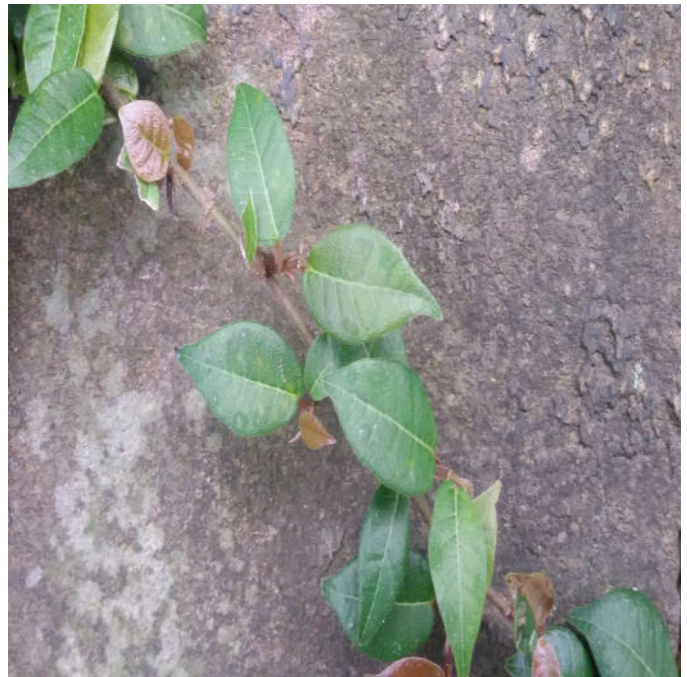


Plate No: 54

Botanical Name: *Ficus carica* L.

Ficus pumila L.

Family: **Nyctaginaceae**

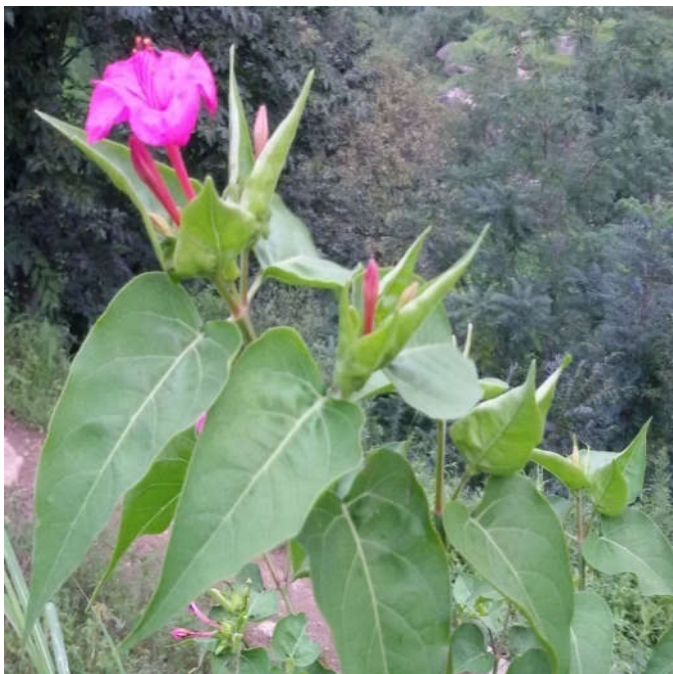


Plate No: 55
Botanical Name: **Mirabilis jalapa L.**

Onagraceae



Oenothera rosea L.

Family: **Oxalidaceae**



Plate No: 56
Botanical Name: **Oxalis corniculata L.**

Paeoniaceae



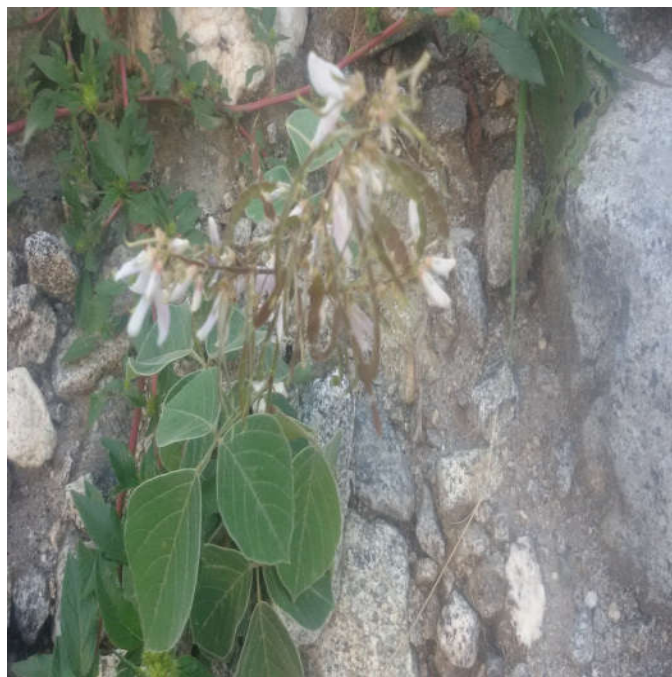
Paeonia emodi Wall.ex Royle

Family: **Papaveraceae**



Plate No: 57
Botanical Name: **Papaver somniferum L**

Papilionaceae



Desmodium elegans DC.

Family: **Papilionaceae**

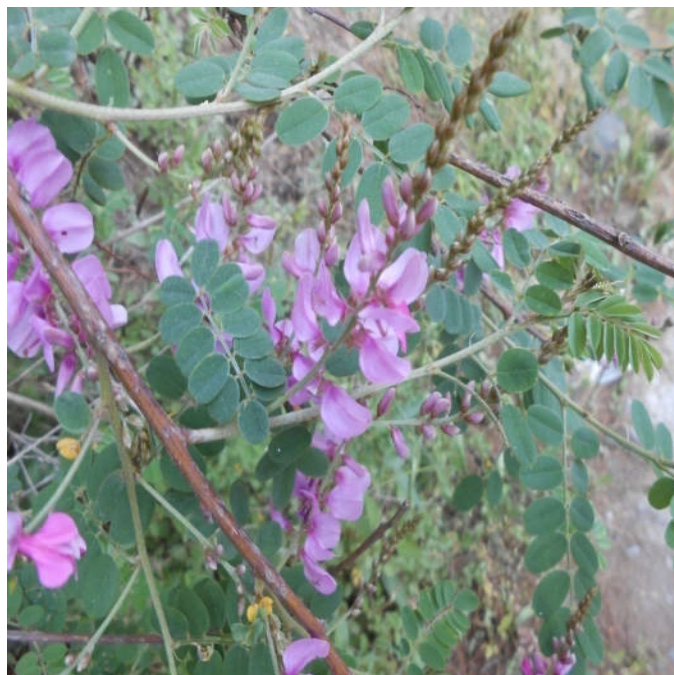
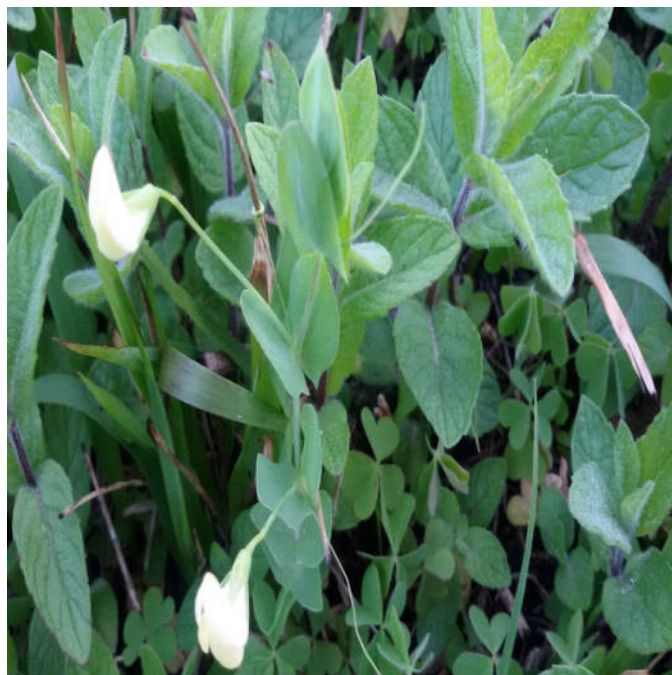


Plate No: 58
Botanical Name: **Indigofera heterantha Well. ex Brandis.**



Lathyrus aphaca L.

Family: **Papilionaceae**



Plate No: **59**

Botanical Name: **Lespedeza juncea (Linn.f.)Pers.**

Lotus corniculatus L.



Plate No: **60**

Botanical Name: **Medicago minima (L.) Grufb**

Oxytropis chiliophylla Royle ex Benth.

Family: **Papilionaceae**



Plate No: 61
Botanical Name: *Vicia hirsuta* (L.) S. F. Gray



Trifolium repens L

Family: **Papilionaceae**

Plantaginaceae



Plate No: 62
Botanical Name: *Vicia sativa* L.



Plantago lanceolata L.

Family: Plantaginaceae

Poaceae



Plate No: 63

Botanical Name: *Plantago major* L.



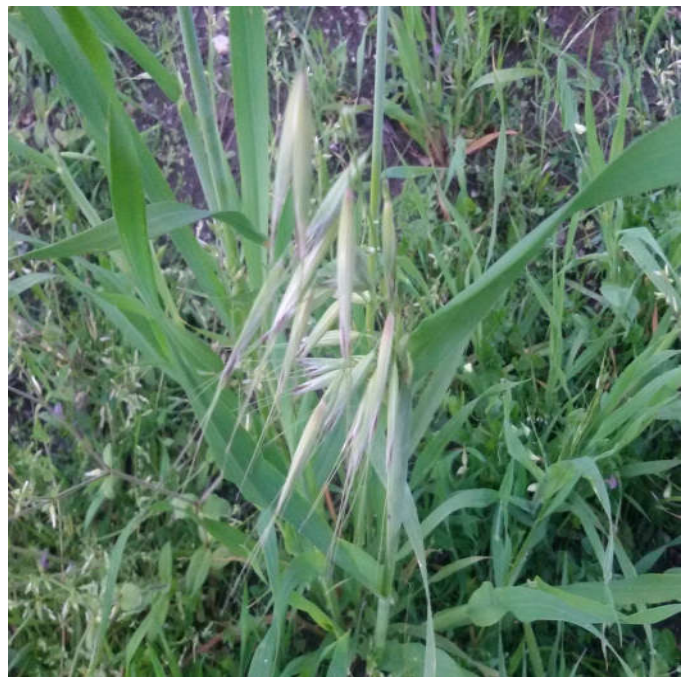
Agrostis stolonifera L.

Family: Poaceae



Plate No: 64

Botanical Name: *Arthraxon prionodes* (Steud.) Dandy.



Avena fatua L.

Family: Poaceae



Plate No: 65

Botanical Name: *Brachiaria ramosa* (L.) Stapf



Cenchrus ciliaris L.



Plate No: 66

Botanical Name: *Imperata cylindrica* (L.) Raeusch.



Pennisetum orientale Rich.

Family: Poaceae



Plate No: 67
Botanical Name: *Phalaris minor* Retz



Polypogon monspeliensis (L.) Desf.

Family: Polygonaceae



Plate No: 68
Botanical Name: *Bistorta amplexicaulis* (D. Don) Green



Family: Polygonaceae



Plate No: 69
Botanical Name: Polygonum aviculare L.



Botanical Name: Polygonum plebejum R. Br.



Plate No: 70
Botanical Name: Rumex dentatus L.

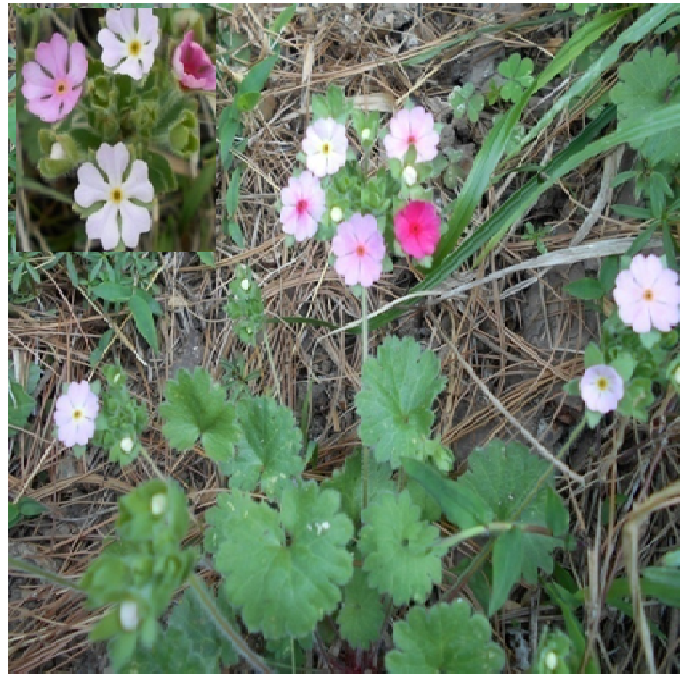


Botanical Name: Rumex hastatus D. Don.

Family: **Primulaceae**



Plate No: 71
Botanical Name: *Anagalis arvensis* Linn.



Androsace rotundifolia Hardw.

Family: **Ranunculaceae**



Plate No: 72
Botanical Name: *Adonis aestivalis* L.

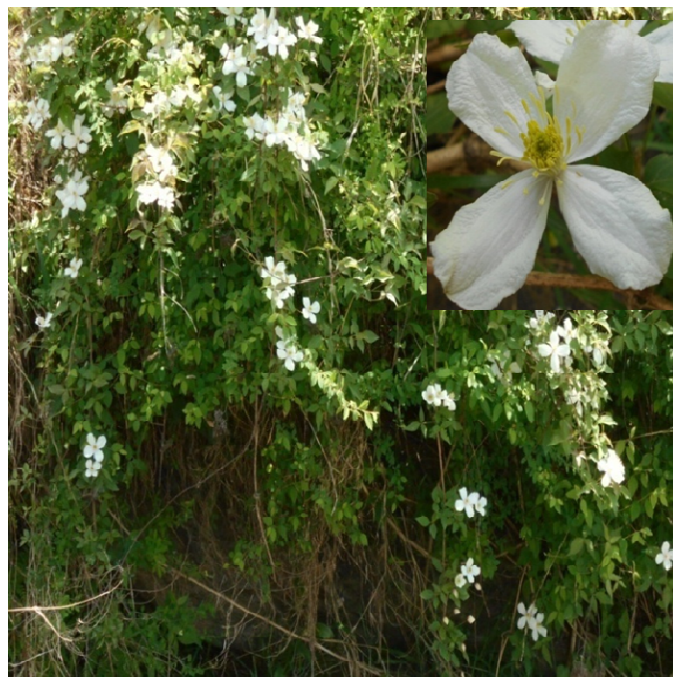


Aquilegia pubiflora Wall.ex Royle

Family: **Ranunculaceae**



Plate No: 73
Botanical Name: **Clematis connata DC.**



Clematis grata Wall.



Plate No: 74
Botanical Name: **Delphinium denudatum Wall. ex Hook. f. & Thoms. Ranunculus arvensis L.**



Family: **Ranunculaceae**



Plate No: 75

Botanical Name: *Ranunculus laetus* Wall .ex Hook .f. & J.W. Thomson *Ranunculus muricatus* L

Family: **Ranunculaceae**

Rosaceae



Plate No: 76

Botanical Name: *Thalictrum pedunculatum* Edgew. *Cotoneaster microphyllus* Wall. ex Lindl.

Family: Rosaceae



Plate No: 77

Botanical Name: *Crataegus songarica* K. Koch.

Duchesnea indica (Andrews) Focke



Plate No: 78

Botanical Name: *Fragaria nubicola* (Lindl. ex Hook.f.) Lacaita

Prunus domestica L

Family: **Rosaceae**



Plate No: 79
Botanical Name: **Prunus persica (L.) Batsch**



Pyrus communis L.

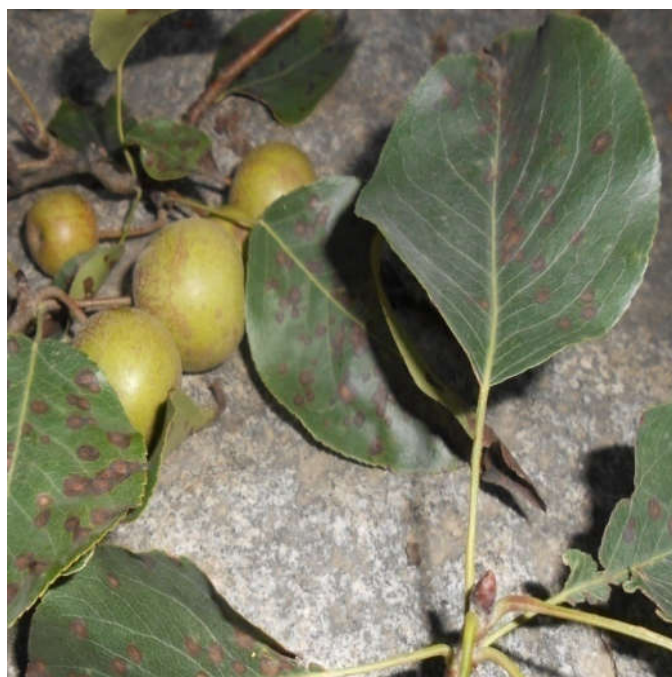


Plate No: 80
Botanical Name: **Pyrus pashia Buch.-Ham. ex D.Don**



Rosa moschata Herrm.



Plate No: 81

Botanical Name: *Rosa webbiana* Wall. ex Royle

Rubus ellipticus Smith.

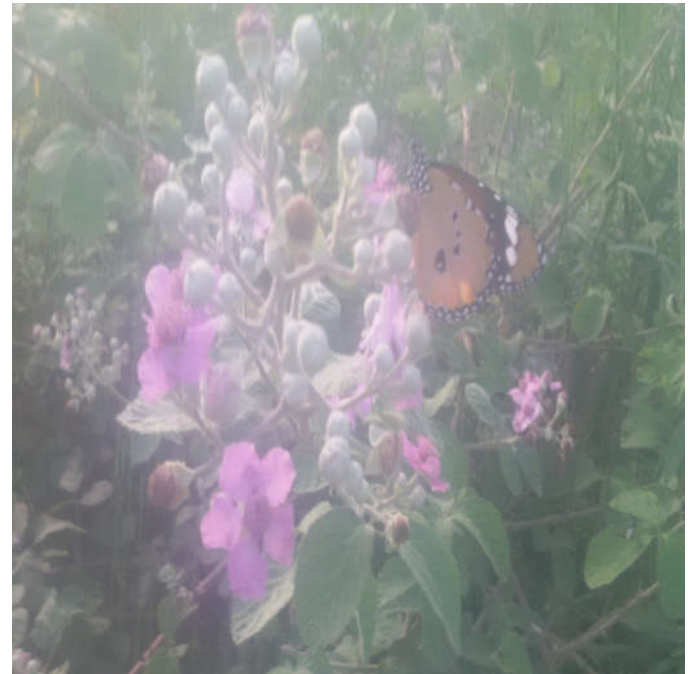
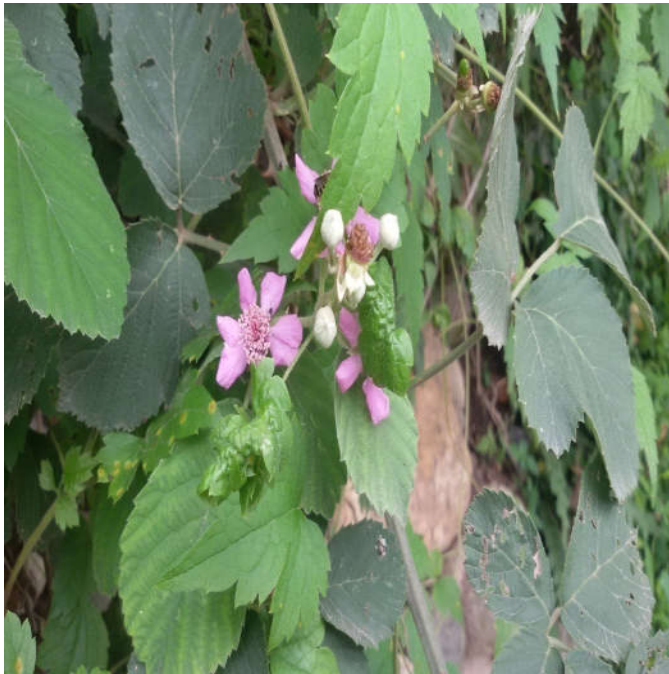


Plate No: 82

Botanical Name: *Rubus fruticosus* L.

Rubus ulmifolius Schott.

Family: Rosaceae



Rubiaceae



Plate No: 83

Botanical Name: Sorbaria tomentosa (Lindl.) Rehder

Galium aparine L.

Family: Rubiaceae



Rutaceae



Plate No: 84

Botanical Name: Himalrandia tetrasperma (Roxb.) Yamazaki **Zanthoxylum armatum DC.**

Family: Salicaceae



Plate No: 85
Botanical Name: *Populus alba* L.



Populus nigra L.

Family: Salicaceae



Plate No: 86
Botanical Name: *Salix tetrasperma* Roxb.



Sambucus wightiana Wall ex Wight. & Arn

Family: **Scrophulariaceae**



Plate No: 87

Botanical Name: **Veronica anagallis-aquatica L.**



Veronica polita Fr.

Family: **Solanaceae**



Plate No: 88

Botanical Name: **Datura stramonium L.**



Solanum nigrum L.

Family: Solanaceae

Thymelaeaceae



Plate No: 89

Botanical Name: Solanum Surattense Burm.f.



Daphne mucronata Royle

Family: Thymelaeaceae

Urticaceae



Plate No: 90

Botanical Name: Wikstroemia canescens Wall. ex Meisn.



Urtica dioica L.

Family: Valerianaceae



Plate No: 91
Botanical Name: *Valeriana jatamansi* Jones

Violaceae



Viola betonicifolia Sm.

Family: Violaceae



Plate No: 92
Botanical Name: *Viola canescens* Wall .ex Roxb.



Viola pilosa Blume

Conservation & Seed Preservation of Critically Endangered Medicinal Plants

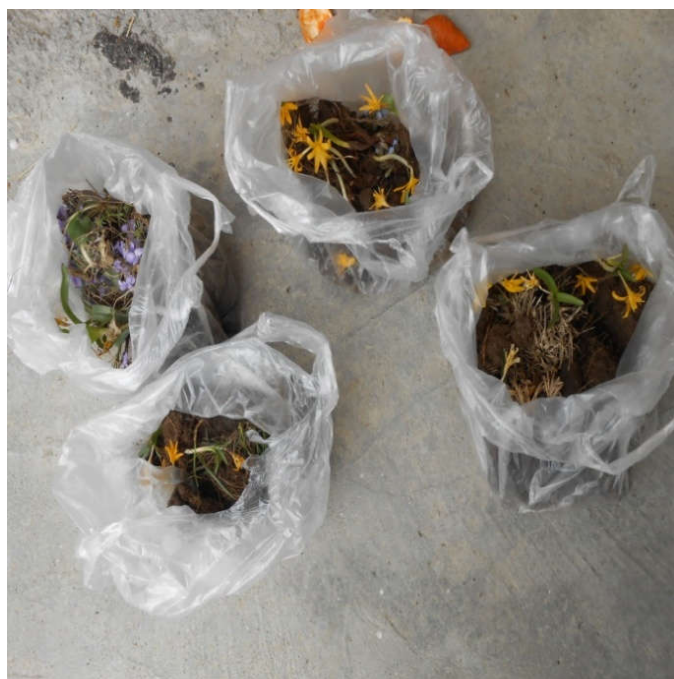


Plate No: 93

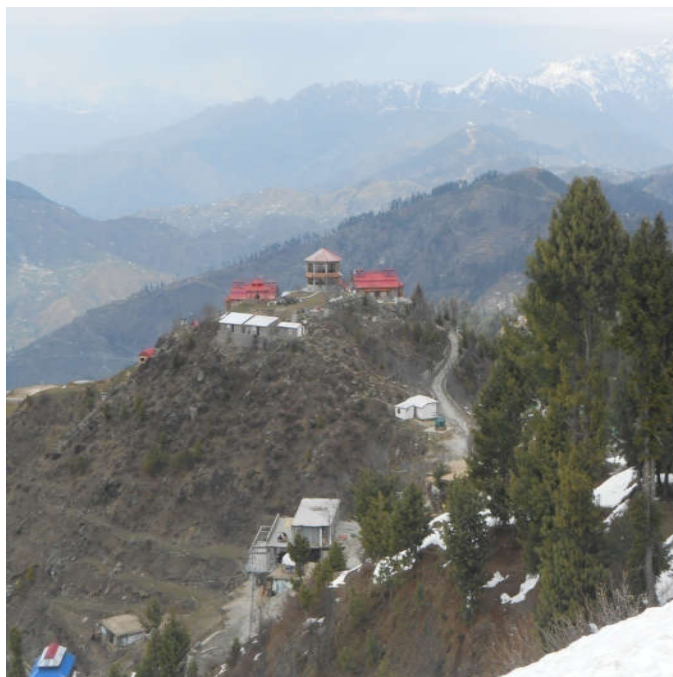
Ex Situ Conservation of Critically Endangered & globally important Medicinal Plants



Plate No: 94

Seeds Drying and packing are in progress

A Beautiful View of the Malam Jabba Valley



A S.E view of Malam Jabba Valley



A snowy view of thick Pine forest at the Valley



A view of cultivated fields at the top of Malam Jabba



North Eastern view of dense Pine Forest

Collection & Documentation of Vascular Plant Biodiversity in the Malam Jabba Valley



Collection of highly rich & endangered plant (*Paeonia emodi*) at the higher altitude of MJV



Author collecting vascular plants at the foothill of the valley



Data collection & field observation during harsh winter season

A View of Deforestation & Enviromentatal Degradation



Severely fragmented population of Cedrus deodara



Forest land is cleared for agriculture purpose at the top of valley



Deforestation & degradation due to forest fire



Plant trunk is used for Charcoal production, locally known as Skara



Environmental degradation due to heavy influx of tourism



Overgrazing at higher altitude of the Valley

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Glossary Terms for Ethnomedicinal Plants

S. No	Glossary/Terms	Definition
1.	Analgesic	Any agent used to relieve severe pain or is drugs that alleviate pain without causing anesthesia.
2.	Anodyne	An anodyne is any substances used to lessen pain through reducing the sensitivity of the brain or nervous system
3.	Anthelminthic	Anthelmintics are substances used to killed or eradicate parasitic worms (helminthes) from the human body.
4.	Antidiabetic	The ability to control high blood sugar level.
5.	Antiemetic	Any agent that have the ability to control vomiting.
6.	Antispasmodic	Agents that suppresses or relieve muscle spasms.
7.	Aphrodisiac	The agent which stimulate sexual desire.
8.	Asthma	Infection of air passages in lungs cause breathing difficulties by narrowing of the bronchi.
9.	Astringent	An agent that causes the contraction or shrinkage of body tissues, typically used to protect & improve the skin and to reduce bleeding from minor abrasions.
10.	Carminative	A medicine that prevents formation of gas in the gastrointestinal tract or facilitates the expulsion of gas or a drug that causing expulsion of gas from the stomach and relive colic and abdominal pain.
11.	Cathartics	Any substances which causes the evacuation of bowel.
12.	Colic	Pain due to intermittent contraction of the abdomen.
13.	Constipation	Failure of bowels to excrete residue at proper intervals.
14.	Demulcent	A substance that relieves irritation of the mucous membranes in the mouth by forming a protective film.
15.	Diaphoretic.	An agent that promotes sweating, inducing perspiration.
16.	Diarrhea	It is Increase frequency and looseness of bowel movement or frequent passage of loose, watery, soft stools with or without abdominal bloating, pressure and cramps.
17.	Digestive	Any substances that helps in digestion.

18.	Diuretic	A diuretic is medicine or drug that promotes and increased production of urine.
19.	Dropsy	A swelling of soft tissues due to the accumulation of excess water or swelling of any body parts due to the accumulation of excessive fluid in the tissues.
20.	Dysentery	It is an infection of the intestines that causes severe diarrhea containing blood or mucus. Marked by inflammation and ulceration of the lower part of the bowels, with diarrhea & sometime abdominal pain
21.	Dysuria	Dysuria is the feeling of pain, burning, or discomfort upon urination especially women suffering from disease of urinary organs.
22.	Eczema	A dermatitis disease that describes inflammation of the skin where patches of skin become inflamed, itchy, red, cracked, and rough.
23.	Emmenagogue	A substance that stimulates or increase menstrual flow
24.	Epilepsy	A disorder in which nerve cell activity in the brain is disturbed, causing convulsions, associated with abnormal electrical activity in the brain
25.	Febrifuge	A medicine used to reduce fever/Antipyretic
26.	Galactagogue	A drug that promotes or increases the flow of a mother's milk.
27.	Gonorrhea	Venereal disease that affects sex organs
28.	Jaundice	It is a disorder in which unusual presence of bile pigment in blood due to obstruction of bile ducts.
29.	Laxative	Laxative are drugs that loosen stools promotes evacuation of bowels. They are used to treat and prevent constipation..
30.	Neurosis	Also called psychoneurosis, a functional disorder in which a person experiences strong feelings anxiety, fear or worry.
31.	Purgative	A purgative is a medicine that is strongly laxative in effect & promotes evacuation of bowels which get rid unwanted waste from the body.
32.	Rheumatism	A disease characterized by inflammation and pain in the joints, muscles, or fibrous tissue, especially rheumatoid arthritis.
33.	Stomachic	A medicine that helps in digestion & promote appetizer and improve function of digestion.
34.	Tonic	Substances used to give strength and vigor to the body.

Questionnaire-1

Section-A

Questionnaire No: _____ Date: _____

Personal information about the informant (person interviewed) and environment

1. Name _____
2. Age _____
3. Educational level _____
4. Family or Tribe _____
5. Male/Female _____
6. Locality _____
7. Sub locality _____
8. Address & contacts: _____
9. Respondent's status:
 - a. Farmer: _____
 - b. Other: _____
10. Land holding:
 - a. Agricultural land _____
 - b. Forest owned _____
11. Soil and Climatic Condition _____
12. Altitude/Height _____
13. Data of GPS _____

Section-B

General information about the plant biodiversity used for different purposes in study area.

1. Major crops:

a) Rabbi Crops: 1 _____ 2 _____ 3. _____

b) Rabbi Crops: 1 _____ 2 _____ 3. _____

2. Can you specify and tell name of few plant which are frequently used in your daily life?

If yes then name of few plant specimens 1. _____ 2. _____ 3. _____

4 _____ 5 _____ 6 _____

16. Keep livestock & if keep then utility of Medicinal Plants for: Yes/No If Yes then specify name of plants which are used for animal care 1 _____ 2 _____ 3 _____

3. Name of few Invasive Plants, which extensively used in research area

1 _____ 2 _____ 3. _____ 4 _____ 5 _____ 6 _____

4. Can you specify some exotic/alien plant species which have negative impacts on local or native plant biodiversity Yes/ No If yes then how much?

a. Suppressed the native plants

b. Strongly affected the native plants

c. Have no effect on local plants

5. Major problem related to plant

biodiversity. _____

Section-C

Information about Ethno Medicinal and Ethno Veterinary plants

1. Can you differentiate and specify name of ethno medicinal and ethno veterinary plants which are frequently used in your daily life? If yes then name of few plant specimens 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____

2. Name of few major ethno medicinal and ethno veterinary plants, which extensively used in research area.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 8. _____

Bot. Name, Family, Vernacular Name, Habit, Part used, preparation of folk recipes, name of ailment treated, mode of administration and recovery of diseases were recorded in the following table.

S #	Bot. Name	Family	Local Name	Habit	Part Used	Preparation of Folk recipes		Name of Disease Treated		Mode of Administration		Recovery Period		Name of animal treated
						Livestock	Human	Animal	Human	Animal	Human	Animal	Human	
1.														
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														

Section-D

1. Is the medicinal plant stored? Yes _____ No _____
If yes when and how _____
2. Do you or member of your family utilize or collect medicinal plants if yes
then age of your family member ? _____
3. Which member of the of village community collects medicinal
plants _____
4. How many member of your family regularly involved
in collecting medicinal plants _____
5. Do you utilize this Ethno-medicinal or Ethno-veterinary plant species in combination or
alone? Yes/No
if Yes then specify plants and parts used _____
6. Do you sell/collect medicinal for sale Yes/No
if Yes then specify plants name and number _____
7. Do you consider a medicinal plant is effective if yes then specify percentage how
much _____
8. Do you sell medicinal to?
 - a. Hakims b. Local Pansari c. Whole seller
 - d. Local Seller e. Shop keeper f. Other

S. No.	Botanical Name	Local Name	Ailment Treated	Part used (Sale)	Quantity

Section E**1. Access of People to treatment with traditional ethno medicines/ Ethno veterinary:**

- a) Are hakims/ practitioners using traditional medicines available:
- b) How hakims/ practitioners are paid for the services?
- c) Approximate population using such treatment for ailments in human being/livestock

2. Why people use traditional ethno medicines/ Ethno veterinary:

- a) Have access to modern veterinary hospitals/doctors but still use traditional veterinary medicines as alternative treatment:
- b) Have access to modern veterinary hospitals/doctors but unable to afford modern allopathic treatment:
- c) Do not have access to modern veterinary hospitals/doctors therefore use traditional veterinary medicines:

3. Challenges facing the profession of ethno veterinary and ethno medicines :

4. What should be done to improve traditional Ethno medicinal and veterinary services

5 General Comments and suggestions of respondents.

The following IUCN Categories, Conservation Strategies, Rules, Guidelines and Criteria were adopted for conservation assessment of plant taxa. (IUCN Red List Criteria (2001) version 3.1, Appendix VII, following IUCN Regional guidelines 2003, version, 3.0)

1. Extinct (EX)

A taxon is known to be Extinct when there is no reasonable doubt that the last individual has finished. A taxon is supposed Extinct when extensive surveys in known/or expected habitat at appropriate time(diurnal, annual, diurnal , seasonal)(diurnal, seasonal, annual), throughout its historic range have failed to document an individual. Surveys should be over a time frame suitable to the taxon, s life cycle and life form.

2. Extinct the the Wild (EW)

A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. . A taxon is assumed Extinct in the wild when extensive surveys in known/or expected habitat at appropriate time (diurnal, annual, diurnal, seasonal)(diurnal, seasonal, annual), throughout its historic range have failed to document an individual. Surveys should be over a time frame suitable to the taxon, s life cycle and life form.

3. Critically Endangered (CR)

A Taxon is Critically Endangered when it is considered to be facing an extremely high risk of extinction in the wild immediate future as defined by any of the criteria A –E for Critically Endangered.

4. Endangered (EN)

A Taxon is Endangered when it is considered to be facing vey high risk of extinction in the wild in near future and the best available evidence indicates that it meets any of the Criteria defined A –E for Endangered.

5. Vulnerable (VU)

A Taxon is Vulnerable, when not Critically Endangered or Endangered but facing high risk of extinction in the wild in near future and the best available evidence indicates that it meets any of the Criteria defined A –E for Vulnerable

6. Near Threatened (NT)

A taxon is at lower risk of extinction /or Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable but it is close to qualifying for or likely to qualify for threatened category in near future.

7. Least Concern (LC)

A taxon is Least Concern when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Abundant and widespread taxa are covered under this category.

8. Data Deficient (DD)

A taxon is Data Deficient when there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

9. Not Evaluated (NE)

A taxon is not evaluated when it has not yet been assessed against the criteria.

IUCN has established five basic criteria from A-E for assessing the taxon at regional/national level. To enlist a particular taxon in any of the categories of threats, only one of the criteria, A, B, C, D OR E need to met. However a taxon should be assessed against as many criteria as available data permit and the listing should be annotated by as many criteria as are applicable for a specific category of threat (IUCN, 2003).

These five criteria are:

- A. Declining population (past, present and/or projected)
- B. Geographic range size, and fragmentation, decline or fluctuations
- C. Small population size & fragmentation, decline or fluctuations
- D. Very small population or very restricted distribution
- E. Quantitative analysis of extinction risk (e.g. Population Viability Analysis)

Summary of the five criteria (A-E) used to assess if a taxon belongs in a threatened category (Critically Endangered, Endangered or Vulnerable). Use any of the criteria A-E for Critically Endangered, Endangered and Vulnerable.

A. Population reduction: Decline measures over the longer of 10 years or 3 generations

A1 > 90% > 70% > 50%

A2, A3 & A4 > 80% > 50% > 30%

A1. Population reduction observed, estimated, inferred, or suspected in the past where the cause of reduction are clearly reversible and understood and ceased based on specifying any of the following: (a) (a) direct observation

(b) An index of abundance appropriate to the taxon

(d) A decline in AOO, EOO and/or habitat quality

(a) Actual or potential levels of exploitation

(e) Effect of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased or may not be understood or may not be reversible, based on any of (a) to (e) under A1

A3. Population reduction projected or suspected to be met in future (upto a maximum of 100 years) based on any of (b) to (e) under A1.

A4. An observed, estimated, inferred, or suspected population reduction (up to a maximum of 100 years) where the time period must include both the past and the future, and where the cause of reduction may not have ceased or may not be understood or may not be reversible based on any of (a)(e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy)

B1. Either extent of occurrence $< 100 \text{ km}^2 < 5,000 \text{ km}^2 < 20,000 \text{ km}^2$

B2. Or area of occupancy $< 10 \text{ km}^2 < 500 \text{ km}^2 < 2,000 \text{ km}^2$ and 2 of the following 3:

(a) Severely fragmented or # locations = 1 = 2-5 = 6-10

(b) Continuing decline in (i) extent of occurrence (ii) area of occupancy, (iii) area, extent and/or quality of habitat, (iv) number of locations or subpopulations and (v) number of mature individuals.

(c) Extreme fluctuations in any of (i) extent of occurrence, (ii) area of occupancy, (iii) number of locations or subpopulations and (iv) number of mature individuals.

C. Small population size and decline

Number of mature individuals $< 250 < 2,500 < 10,000$ and either **C1** or **C2**:

C1. An estimated continuing decline of at least 25% in 3 years 20% in 5 years 10% in 10 years up to a maximum of 100 years or 1 generation or 2 generations or 3 generations

C2. A continuing decline and (a) and/or (b)

(a i) No. of mature individuals in largest subpopulation $< 50 < 250 < 1,000$

(a ii) or % individuals in one subpopulation = 90-100% 95-100% 100%

(b) Extreme fluctuations in the number of mature individuals

D. Very small or restricted population

Either (1) number of mature individuals $< 50 < 250 < 1,000$ or

(2) restricted area of occupancy typically:

AOO $< 20 \text{ km}^2$ or # locations ≤ 5

E. Quantitative Analysis

Indicating the probability of extinction 50% in 10 years, 20% in 20 years, 10% in 100 years in the wild to be observed at least in 3 generations or 5 generations

Questionnaire-II

Name of Respondent: _____ Date: _____

Questioner No: _____

Documentation of Vascular Plant Species according to IUCN red list Category/Criteria

S. No.	Bot. Name	Family	Vern. Name	Habit	Locality	IUCN Category	IUCN Criteria
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

Appendix-IX

Questionnaire-III

Name of Respondent: _____ Date: _____

Questioner No: _____

Documentation of Major Threats and Trade Information of Medicinal Plant Biodiversity

S. No.	Bot. Name	Family Name	Vern. Name	Threatened due to	Trading level
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					