

## RAPID APPRAISAL VEGETATION SURVEY OF BHIMBER DISTRICT OF AZAD JAMMU & KASHMIR

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### ABSTRACT

Rapid appraisal vegetation survey was conducted in Bhimber district of Azad Jammu & Kashmir with the objectives to explore plant wealth and examine the status of biodiversity. The plain area falls under dry subtropical broad leaved thorn forests and hilly area under dry subtropical Chir pine forests. Bhimber district is very rich in biodiversity, enchanting valley present panoramic views to the visitors and is important from Archaeological point of view. During survey visited many places, notable among these were Surela plantation on Mirpur-Bhimber road, Bhimber headquarter, Kadala nurseries, Barnala at Brulian-wala, Thub, Kajloor, Patni, Rakh-Watala and Singri areas. Among these, Rakh Watala was spread more than 2000 acres and its vegetation was unique consists of mixed crops of *Mangifera indica*, *Butea monosperma*, *Zizyphus mauritiana*, *Dalbergia sissoo*, *Adhatoda vasica*, *Cedrula toona*, *Melia azedarach* and rarely *Tamarindus indica* and *Azadirachta indica*. Singri is another large tract, where settlers cultivated agricultural crops like wheat, rice, maize, sugar-cane etc. This area had footprints of Hindu civilization near Singri Police Chouki, Seth Powaridas dug well on 9<sup>th</sup> January, 1860 for drinking water, currently the same well is being used for irrigation to forest nursery spread over an area of 5 acres. Singri area is fertile and suitable for planting trees having commercial and medicinal value like *Emblica officinalis* (Amla), *Moringa oleifera* (Sohanjna), *Acacia catechu* (Katha, Khair) *Terminalia belerica* (Bhera) and *Sapandis mukrossii* (Retha) etc to augment income of inhabitants as well as conservation of genetic diversity for future prosperity. Jandi-Chontra to Baghsar locality of Tehsil Samani rich in herbal drugs and the main forest crop of this area was Chir (*Pinus roxburghii*) with other associated species. The information gathered will provide guideline in preparing future forest management plan.

### INTRODUCTION

Bhimber city is situated 32°.48 to 33°.34 latitude and 73°.55 to 74°.45 longitudes at a distance of 50 km from Mirpur and 166 kilometers from Rawalpindi connected both Mirpur & Gujrat through metttled roads along with basic facilities provided by the government. Bhimber was declared as an independent district in 1996. This district is very rich in biodiversity from Archaeological point of view. Its enchanting valleys present panoramic views to the visitors. The district headquarter is Bhimber, an old historic town as discussed by Mughal Emperor, "Jahangeer" in his book "Tuzh-e-Jahangiri". It falls on the route that was followed by the Mughal Emperors for their frequent visits to the Kashmir valley. Bhimber district comprised of plain and hilly areas with hot and cool climate. From forestry point of view, the area falls under dry subtropical broad leaved thorn forests and dry subtropical Chir pine forests. The inhabitants of the area are mainly agriculturist.

The diversity of climatic and topographic conditions reflected in the form of diversity of herbs, shrubs and trees (Stewart, 58, 1972). It is rich in a variety of medicinal and economic plants, some of which are of pharmacopoeial importance while many others are used in primary health care against several diseases. Although, some of the areas possessed great potential of natural vegetation along with a variety of medicinal

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and aromatic plants, which never explored and their richness still is unknown. This natural resource at present is not utilized according to resource availability, as a result a number of pharmacopoeial plant species became scarce due to detrimental extraction by inhabitants. There are many other plants, such as *Sapindus mukrosi* (Soap nut), *Mangifera indica* (Aam) *Terminalia bebrica* (Bahira) *T. cheleula* (Harir), *Emblica officinalis* (Amla), which are of great economic importance, and needs sustainable development for utilization as one of the income generating activities of these areas. Some studies in the Subtropical belt of AJ&K have been carried out (Malik and Hussain 1987, 88, 90, Dastagir *et al.* 1999, Shehzad *et al.* 1999) on the subject are of similar thoughts/findings.



## MATERIAL AND METHODS

In order to evaluate the status of bio-diversity, on site inspection of vegetation growing in the study area, a rapid appraisal survey of plants growing naturally or cultivated was carried out. Survey included different aspects of bio-diversity indicators like floristic composition, current level of indigenous species, medicinal, aromatic and economic importance. Future potential of cultivation of medicinal was determined by the existing marketing of these commodities in the area. Short interviews of community members, user/buyers of medicinal plants were undertaken to investigate the mode of collection, cultivation including post harvesting processing prior to marketing of herbs and fruits of medicinal value.

## RESULT AND DISCUSSION

Floristic composition of different localities of the Bhimber district:

### Jetlan to Bhimber

Jetlan is a district boundary line in between Mirpur and Bhimber. On the way from Mirpur to Bhimber visited different locations and studied/recorded and taken photographs of the vegetation. The vegetation is of the similar type as reported Shehzad *et al.*, 1999.

### Panjari Grave yard (floristic composition) Trees/Shrubs

Scientific Names	English Names	Local Names	Urdu Name
<i>Acacia modesta</i> Wall	Acacia	Phulai	پھولانی
<i>Albizia lebbek</i> Benth.	Black siris	Kala-siris	کالا سرس
<i>Butea monosperma</i> Lam.	Flame of forest	Dhak	ڈھاک
<i>Carissa carandas</i> L.	Karaunda	Karanda	کرندا
<i>Cordia oblique</i> Wild	Sepistan	Bara Lasurra	بڑا لسوڑا
<i>Ficus infectoria/lacour</i> Auct.	Fig	Palakan/Plak	پلکان/پلک
<i>Ficus palmata</i> Forssk.	Indian Rubber	Phagwara	پھگوڑا
<i>Ficus religiosa</i> L.	The Peepal	Peepal	پیپل
<i>Grewia oppositifolia/optiva</i> Roxb.	Grewia	Dhaman, Bhimal	دھمن
<i>Gymnosporia royleana</i> Wall.	Gymnosporia	Pataki, Kander	پٹاکی / کندر
<i>Mallotus phillippinensis</i> Lam.	Rottlera/Monkey face	Kamila	کمیلا
<i>Melia azedarach</i> L.	Persian Laic	Bakain	بکائن
<i>Salvadora oleoides</i> Decne.	Salvadora	Jal,Wan,Peelu	جال/وان/پیلو
<i>Zizyphus mauritiana</i> Lam.	Zizyphus	Ber	بیر
Herbs			
<i>Achyranthes aspera</i> L.	The prickly chaff	Putkhanda	پٹھکندا
<i>Artemisia vulgaris</i> L.	Santonica	Jhau	جھو
<i>Justicia vasica</i> L.	Malabar nut tree	Bhaikar/Barg-e-bansa	بھیکڑ/برگ بانسا
Climber			
<i>Cotoneaster bacillaris</i> Wall. ex. Lindl.	Cotoneaster	Luni	لونی
<i>Cucumis prophetarum</i> L.	Wild cucumber	Chihbar	چھبڑ
<i>Tinospora cordifolia</i> Willd.	Heart-leaved	Gloe/Gulancha	گلو/گلنچا

### Surela plantation

This area was newly developed by the land owner comprised of 110 acres, lies under rain-fed conditions. The plantation established in August 2004 and the species raised in this plantation were *Acacia nilotica*, *Dalbergia sissoo*, *Eucalyptus camaldulensis*, and *Parkinsonia aculeata*. The plant growth was excellent and attained 12-15ft height about in 2 year's growth. Natural vegetations recorded were:

**Shrubs/Herbs**

Scientific names	English names	Local names	Urdu names
<i>Aerva tomentosa</i> Forssk.	Woody amaranths	Boh	بوه
<i>Artemisia vulgaris</i> L.	Santonica	Jhau	جھو
<i>Capparis aphylla</i> Roth.	Leafless caper	Karir	کریر
<i>Citrullus colocynthis</i> L.	Bitter apple	Tumba, hantal	تمبا/ہنٹل
<i>Fagonia critica</i> Deepa.	Prickly clover	Damma	دما
<i>Vetiveria zizanioides</i> L.	Khus-khus grass	Khas-khas	خس خس

**Bhimber headquarter and Kadala nurseries**

At Bhimber headquarter, a tube and bedded nursery was established one year back under Watershed Rehabilitation Development Project (WRDP) in collaboration with Ministry of Environment with the objectives to conserve indigenous endangered species along with other native species viz. *Acacia catechu*, *Moringa oliefera*, *Acacia nilotica*, *Acacia modesta*, *Melia azedarach*, *Albizia lebbek*, *Dalbergia sissoo*, *Alistonia scholaris*, *Bauhinia variegata*, *Heterophragma adenophyllum*, *Populus sp.*, *Robinia pseudoacacia* for planting on denuded areas of both public and private land. This nursery was well maintained. In the barren land naturally occurring *Artemisia scoparia* L. (Jhau, جھو) was recorded near Kadala nursery.

**Barnala at Brulian-wala**

On Barnala-Chamb road at Brulian-wala, an area of about 50 acres was planted in current monsoon season 2006 in seasonal nalah. The species planted *Acacia nilotica*, *Acacia modesta*, *Butea monosperma*, *Leucaena leucocephala* and *Zizyphus mauritiana*. Nature favoured and the seedlings growing very well with almost 100% success. The plants occurring naturally in the area were *Butea monosperma*, *Mangifera indica*, *Vitex negundo*, *Arundo donax* and *Sesamum indicum*. On agricultural land cultivation of maize, millet and kala-til (کالا تیل) crop is common practice for domestic use.

**Thub –Kajloor to Patni (Sub tropical pine forests zone)**

The area is hilly and rugged tract covered mainly with *Pinus roxburghii* and other associated species found at foothills were *Mallotus philippinensis*, *Dodonaea viscosa*, *Adhatoda vasica*, *Cedra toona*, *Ailantus altissima*, *Butea monosperma*, *Ficus carica*, *Dalbergia sissoo*, *Morus alba*, *Cotoneaster sp.* etc. Dense growth was observed in ravine as compared to thin/scattered on slopes *Monotheca buxifolia* was found rarely. It is near by line of control area (border area) and local community mainly engaged in agriculture for their subsistence.

**Rakh Watala**

This is a vast and barren area spread more than 2000 acres. The detail of floristic composition of the area is given in the table below. Huge *Tamarindus indica* tree was noted and according to locals that it was planted by Maharaja Hari-Sing and he used to sit under this tree for worship. It was a unique diversity which ever seen in the forests.

Therefore, it is suggested that this area may be declared as “Rakh Watala National Park”. Presently it is in the control of Pak. Army and the sale proceeds of Mango fruit and Dhak flowers (*Butea monosperma*) are supervised by the Pak. Army.

### Floristic composition of Rakh-Watala

Scientific names	English names	Local names	Urdu names
<i>Acacia modesta</i> Wall	Acacia	Phulai	پھولانی
<i>Acacia nilotica</i> (L.) Willd. ex Delile	Arabic tree	Kikar	کیکر
<i>Albizia lebbek</i> Benth.	Black siris	Kala-siris	کالا سرس
<i>Azadirachta indica</i> A. Juss.	Margosa tree, lilac	Nim	نیم
<i>Butea monosperma</i> Lam.	Flame of forest	Dhak	ڈھاک
<i>Cedrela toona</i> Roxb.	The Toon	Tun	تن
<i>Cordia obliqua</i> Wild	Sepistan	Bara Lasurra	بڑا لسوڑا
<i>Emblica officinalis</i> L.	Emblic Myrobalan	Amla	آملا
<i>Terminalia belerica</i> Roxb.	Beleric Myrobalan	Bahera	بھیڑا
<i>Terminalia chebula</i> Retz.	Myrobalan	Harrar	ہرڑ
<i>Ficus carica</i> L.	Fig	Injeer	انجیر
<i>Ficus infectoria/lacor</i> Auct.	Fig	Palakan/Plak	پلکان/پلک
<i>Ficus palmata</i> Forssk.	Indian Rubber	Phagwara	پھگواڑا
<i>Ficus religiosa</i> L.	The Peepal	Peepal	پپیال
<i>Gymnosporia royleana</i> Wall.	Gymnosporia	Pataki, Kander	پٹاکی / کنڈر
<i>Mallotus philippinensis</i> Lam.	Rottlera/Monkey face	Kamila	کمیلا
<i>Mangifera indica</i> L.	Mango	Aam	آم
<i>Melia azedarach</i> L.	Persian Laic	Bakain	بکائن
<i>Melia azedarach</i> L.	Persian Laic	Bakain	بکائن
<i>Morus alba</i> L.	Mulberry	Shah-Tut	شہتوت
<i>Tamarindus indica</i> L.	Tamarind	Imlee	املی
<i>Zanthoxylum alatum</i>	Timar	Prickly ash	تمر
<i>Zizyphus mauritiana</i> Lam.	Zizyphus	Ber	بیر
<i>Sapindus mukrossi</i> Garten.	Soap nut	Ritha	ریتھا
Shrubs			
<i>Justicia vasica</i> L.	Malabar nut tree	Bhaikar/Barg-e-bansa	بھیگڑ/برگ بانسا
<i>Tribulus terrestris</i> L.	Calthrop	Bhakra	بھکڑا
<i>Dodonaea viscosa</i> L.	Hopseed bush	Sanatha	سنٹھا
<i>Lantana indica/camera</i> Roxb.	Lantana	Panch-phooli	پانچ پھولی
<i>Ricinus communis</i> L.	Castor Oil	Arind	ارنڈ
<i>Ipomoea crassicaulis</i> Benth.	Ipomoea	Wilaiti ak	ولانیتی اک
Herbs			
<i>Medicago sativa</i> L.	Lucerne/Alfalfa	Lusan	لوسن/ارشکا
<i>Amaranthus viridis</i> L.	Amaranthus	Chaulai	چولانی
<i>Achyranthes aspera</i> L.	The prickly chaff	Putkhanda	پٹھکنڈا
Climber			
<i>Clitoria ternata</i> L.	Butterfly pea	Nili bel/ Gokran	نیلی بیل/گوکران
<i>Cotoneaster bacillaris</i> Wall. ex. Lindl.	Cotoneaster	Luni	لونی

### Singri Area

This area was included in Azad Jammu & Kashmir during 1971 war since then the settlers cultivating the agriculture crops like wheats, rice, maize, sugar-cane etc. This area had footprints of Hindu civilization near Singri Police Chouki, Seth Powanidas, dug well on Jeth 9, 1860 for drinking water. Currently the same well is being used for irrigation to Forest nursery established at Singri on 5 acres. The soil was sandy loam, rich, fertile and very suitable for planting trees having commercial and medicinal value like *Emblica officinalis* (Amla), *Moringa oleifera* (Sohanjna), *Acacia catechu* (Katha, Khair) *Terminalia belerica* (Bhera) and *Sapandis mukrossii* (Retha). The inhabitants may be motivated through extension services in raising said plants for supplying free seedlings by Forest Department in order to conserve and enhance genetic diversity for prosperity.

### Jandi chontra

Jandi chontra is located 17km from north of Bhimber and 67km from Mirpur. It is hilly, undulated tract and connected with metalled road to Bhimber and Mirpur. The area is known for its panoramic views and furthermore the Shrine of the Sufi Saint Baba Shadi Shaheed located in this area.

### Jandi chontra to Baghsar

From Jandi Chontra to Baghsar via Sudhari are half way metalled and the rest earthen road. Along the ravine/nallahs, vegetation was thick whereas on the steep slopes scattered and thin. Jandi chontra Forest Rest House located at 2500 ft elevation that gives picturesque view. This area is rugged with steep to moderate slopes and water streams. The Chir pine was the main crop and other associated species were *Dodonaea viscosa*, *Melia azedarach*, *Siyigium cuminii*, *Mallotus philippenensis*, *Ficus carica*, *Ficus palmata*, *Gymnospora royleana*, *Carissa spinosa*, *Cedrella toona*, *Ailanthus altissima*, and *Acacia catechu* and *Indigofera* sp. were found rarely. Under watershed rehabilitation program, a number of indigenous tree species have been planted to coupe the barren land area. Chir pine pole crop was growing well but according to Mr. Azam and Farooq Mirza RFO Samhani Teretorial and Watershed informed that frequent forest fire is big problem in this area.

### Baghsar

It is 975 meters high above sea level and is an ideal tourist resort in Samahni valley and act as an observatory point. The Sar is local name for a lake is nearly half-kilometer long and crystal-clear water sheet that soothes the senses of a visitor. The lake is full of lotus and inhabitants used the lotus root as vegetable. Near lake a number of fruit trees like *Psidium guajava*, *Emblica officinalis*, *Mangifera indica*, *Punica granatum*, *Citrus medica* and other trees like *Eucalyptus camaldulensis*, *Grewia optiva*, *Salix*, *Ficus infectoria*, were planted, the naturally occurring plant like *Cedrela toona*, *Sapindus mukorosi*, *Broussonetia papyrifera*, *Rubus fruticosus*, *Zanthoxylum armatum* etc were also protected and act as camouflage. The local community cultivates the maize and millet crops on agriculture land. On the top of hill a famous Mughal fort looking the lake that adds grandeur to the area. This four-storied massive structure of granite shows the

glory of Mughal engineering art. It played an important role in the history during the times of Ahmad Shah Abdali, Ranjeet Sing and Gulab Sing regimes. It is said that Emperor Jahangir on his way back from Kashmir fell ill and ultimately expired in this fort. It is situated on north-west of Sumahani on Line of control.

### Charoi to Kohi Ratta

On the way near Charoi, a number of trees and shrubs such as *Olea ferruginea*, *Acacia modesta*, *Sapindus mukorossii*, *Broussonetia papyrifera*, *Bombax ceiba*, *Melia azedarich*, *Morus alba*, *Adhatoda vasica* etc were growing naturally in small/scattered patches while on degraded land *Zanthium armatum* was seen. At upper elevation Chir pine forest observed both dense and thin.

At Thamal nala, Dhamas, Maida town, Munshi-Mor, Muhajar Camp, Juna Bazar, Bangali, Mansooh, Dungi etc. came across along the road side where on private land *Albizia lebbek*, *Dalbergia sissoo*, *Ailanthus* were planted as boarder plant. The nearby Banah is a beautiful area full of natural springs and waterfalls.

At Bahees Naraha several springs emerged from the mountains. This was an important Hindu place of worship in ancient times. Close to Khoi-Ratta are the Bagh Fatehpur and Bagh Sain Hazuri which are known for their natural beauty. Thousands of people visit to Mai-ka-Makam Shrine, a distance of 4km from Khoi Ratta, to pay homage to Mai Toti Sahiba. Khoi Ratta. At Anderla -kathera visited old graveyard near Army Camp. The vegetation of the whole tract is almost the same with minor differences such as *Pyrus pasia*, *P. communus*, *P. persica*, *Juglans regia* due to aspect or water table frequency. Near Barhi gala, well growing dense pole crop of chir pine was observed.

### Medicinal plants of the study area

Medicinal plants occurring in various ecological zones of Bhimber district are broadly classified into two categories along with their distribution, part used and their application in various system of medicine. The detailed as under:

Name of plant	Part used	Application
<b>Trees</b>		
<i>Acacia catechu</i> (khair)	Bark	Paste on swelling
<i>Acacia modesta</i> (phulai)	Gum	Gum is used as restorative
<i>Adhatoda vasica</i> (bhaikar)	Roots and leaves	Leaves and root efficacious in all sorts of coughs.
<i>Butea monosperma</i> (dhak)	Seeds	Paste and powder used as an anthelmintic
<i>Calotropis procera</i> (ak)	Leaves and bark	Leaves are used for poulticing sores, powdered bark in dysentery.
<i>Capparis aphylla</i> (kerir)	Root, bark and berries	The tender shoots are made into a powder and used as a blister and root for infection of liver and spleen.
<i>Dodonaea viscosa</i> (sanatha)	Leaves	Bruised leaves as poultice, in gout and rheumatism powdered leaves applied to burns and scalds.
<i>Emblica officinalis</i> (amla)	Fruit	Acrid, cooling, refrigerant, diuretic and laxative. Dried fruit used as anti-hemorrhage, diarrhea, dysentery in

Name of plant	Part used	Application
		combination with iron in jaundice, in dyspepsia; with lemon juice, acute bacillary dysentery.
<i>Nerium odorum</i> (kanair)	Roots	An oil extracted from root-bark is used in leprosy
<i>Punica granatum</i> (anar, durana)	Root, bark and fruit	The roots bark is astringent, anthelmintic to tape worm
<i>Ricinus communis</i> (arind)	Young leaf	Warmed, applied to reduce muscular swelling, head ache and as poultice against boils
<i>Terminalia chebula</i> (harir)	Fruit Bark	Astringent, laxative, as an external application in ulcers and wounds; Powder: in dentifrice useful in carious tooth bleeding, bleeding and ulceration of gums
		Diuretic and carduitibuc.
<i>Terminalia bellirica</i> (bhera)	Fruit	Half ripe: purgative, ripe fruit: astringent, laxative, antipyretic used in piles, dropsy, diarrhea, biliousness, dyspepsia and headache.
<i>Zizyphus nummularia</i> (jhar-beri)	Fruit	The fruit is considered cooling, astringent and of value in bilious affections.
<u>Herbs</u>		
<i>Achyranthes aspera</i>	Plant (decoction)	Purgative, diuretic, piles, boils, Skin eruption and dropsy.
<i>Artemisia scoparia</i> (harmal)	Whole plant	The seeds are employed for the treatment of "Parkinsonism". The seeds are narcotic, hypnotic, anodyne, emetic and emmenagogue.
<i>Cannabis sativa</i> (bhang)	Whole plant	The plant is stimulant, anodyne, antispasmodic, narcotic and parturifacient.
<i>Cymbopogon jwarancusa</i> (lamjak)	The fibrous root and flower	It is used as a stimulant, diaphoretic in gout and also used to purify the blood
<i>Datura stramonium</i> (datura)	Leaf	Smoke for Asthma; Paste: Anodyne and in scabies
<i>Fumaria indica</i> (shatra)	Whole plant	Used as laxative, diuretic, alterative, tonic and febrifuge.
<i>Mentha sylvestris</i> (spear mint)	Leaves	Stimulant, carminative, useful in bilious vomiting.
<i>Solanum. Xanthocarpum</i> (kandiari)	Root	Epectorant, Cough, Cold and asthma
	Leaves	With black pepper in rheumatism: Decoction in gonorrhoea
<i>Tribulus terrestris</i> (ghokru)	Fruit	Cooling, diuretic, aphrodisiac, calculus infections, painful micturition, urinary discharges and impotence; in the form of infusion useful as diuretic, in gout and kidney diseases and gravel
<i>Withania coagulens</i> (panir dodi)	Fruits	Fruits are emetic, anodyne and carminative. The fruits have the property for coagulating milk.
<i>Withania somnifera</i> (asghand nagori)	Whole plant	The root is used as tonic and diuretic. The juice of whole plant is useful in rheumatism.



**Medicinal plants of Dry-sub tropical Chir pine forests**

Name of plant	Part used	Application
<b>Trees</b>		
<i>Pinus roxburghii</i> (chir)	Wood & oil	Turpentine oil obtained from it is much valued medicinally.
<i>Pistacia integerrima</i> (kakra-shangi)	Gall	The galls are tonic, expectorant and are used in cough, phthisis and asthma.
<i>Mallotus philippensis</i> (kaamila)	Fruits	Glands and hairs; bitter, cathartic, anthelmintic to tape worm, purgative, parasitic affliction of skin and scabies.
<i>Pyrus pashia</i> (jangli-batang)	Fruit	Fruit is tonic and febrifuge
<i>Berberis vulgaris</i> (kashmal)	Root, bark and wood	The water extract from the roots and stem is called "rasut" which is useful in ophthalmic. Fruit is cooling and laxative.
<i>Rosa moschata</i> (jangli-ulab)	Root and flower	The flower buds are astringent, cardiac tonic. The flowers are used for the production of attar which is aphrodisiac
<i>Rubus wallichii</i>	Fruit and leaves	Infusion of leaves is a remedy for severe laxity of bowels, dysentery, cholera and passive haemorrhage from stomach etc.
<i>Zizyphus vulgaris</i> (unab)	Fruit and bark	The dried fruit is purgative, expectorant and purifier of blood. The bark is used to clean wounds and sores.
<b>Herbs</b>		
<i>Viola serpens</i> (banafsha)	Whole plant	Flower and leaves are used as a diaphoretic and diuretic. An infusion of the flowers is used as a mild purgative.
<i>Oxalis corniculata</i> (khataa mitha)	Whole herb	The leaves are considered cooling, refrigerant and stomachic
<i>Thymus serpyllum</i> (ban-ajwain)	Whole plant	The bruised root is used as an application to cutaneous eruptions. Flowers are cordial and stimulant in rheumatism
<i>Zenthoxylum armatum</i> (timar)	Fruit and seeds fruit	Carminative, Stomachic given in indigestion, toothache. Dyspepsia and in Cholera. Paste applied on forehead to cure headache and nasal congestion.

The plants occurring in this zone have low significance as limited quantities ranging from 5-20 tonnes of each species are consumed in the country by the manufactures of Greeco-Arab medicines. Generally the crude drugs are collected by the poor people and grazers and are sold in the markets for earning some income.

**CONCLUSION**

The dry-sub-tropical zone of Bhimber district is suitable for the cultivation of medicinal plants i.e. *Psoralea corylifolia*, (babchi) *Mentha arvensis*, (mint) *Catharanthus roseus*, (sada bahar) *Nigella sativa* (kalonji), *Foeniculum vulgare* (fennel), *Pimpinella anisum* (aniseed), *Cymbopogon citratus* (lemon grass) and other species of medicinal plants under irrigated condition.

The dried seeds of *Punica granatum* is a very common condiment and up to 300 tones of seeds are consumed in the market. Similarly dried fruits of *Zizyphus vulgaris* (unab) have good potential of exploitation. Dried petals of *Rosa moschata*, *Viola serpens* (*banafsha*) are also in good demand and have potential for exploitation.

Medicinal plant species like *Punica granatum* (anar), *Emblica officinalis* (amla), *Sapindus mukorossi* (soap-nut), *Terminalia belerica* (hirhir), *T. chebula* (behra), *Citrullus colocynthis* (tumba) etc packed in gunny bags and forwarded to Mirpur Market; the main trading centre from where these commodities accumulate and ultimately find their way to Akbari mandi Lahore for consumption and export. These medicinal herbs have great demand and can fetch handsome price in the market of Pakistan.

## RECOMMENDATIONS

- The Forest Department may regulate the harvest of crude drugs following rotation in working plans and thus sustaining endangered plants for future extraction. Artificial regeneration of scarce medicinal plants may be done in their exclusive habitat to conserve species and natural resources.
- Trading and collection sub-centre may be established in the foot-hill towns and Mirpur to some what flourished owing to liberal policy through charging nominal royalty on the out going produce, trading centers should first be established to stabilize the market.
- Rakh Watala may be declared as National park due to unique plant diversity and emphasis should be given for the conservation of indigenous plant species including medicinal plants for prosperity.
- Since medicinal plants are used both in indigenous system of medicine as well by the pharmaceutical industries, thus there is a need to create awareness among local people about the importance of these plants and provide them guidance, training in collection, cultivations and post harvest processing prior to marketing to enhance their income.

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