

RAPID APPRAISAL VEGETATION SURVEY OF MIRPUR AND KOTLI DISTRICTS OF AZAD JAMMU & KASHMIR

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ABSTRACT

Rapid appraisal vegetation survey was conducted in the Mirpur and Kotli districts of Azad Jammu & Kashmir with the objectives to explore plant wealth, Identification of floristic composition, current status of indigenes tree species, medicinal, aromatic and economic plants growing in the area and evaluation of future prospects of endemic tree species including medicinal and economic plants that need in-situ conservation of sustainable utilization having market potential and income generation activities for rural communities. The area falls under scrub forests and subtropical Chir pine forests. Inhabitants are holding small land and cultivating maize and millet crops. In Mirpur district visited Jaricus, Subchack, Nagi playan, Khari-sharif and Chachian-Chohan (grave yard) near Khari-sharif. These areas were dominated by *Prosopis juliflora*, and scattered plants of *Zizyphus mauritiana*, *Acacia nilotica*, *Capparis aphylla*, *Saccharum munja*. At Chachian-chohan, a century old graveyard located near Khari-sharif, where *Broussonetia papyrifera* was dominant followed by *Dalbergia sissoo* (pole crop), *Acacia modesta*, *Bombax ceiba* and *Vitex negundo*.

In Kotli district surveyed Charoi, Kohi-ratta, Anderla-kathera, Phalli, Barhai-gala, Makhwai-nala, Mothani-nala, Kerala-gali, Galyali-cross, Nakyal (Fatehpur) and Tatapani localities. The dominant species at upper elevation were *Pinus roxburghii*, *Olea ferruginea*, *Pistacia integerrima*, *Mallotus philippensis*, *Pyrus pashia*, *Ficus auriculata*, *Berberis vulgaris*, *Cannabis sativa*, *Justicia vasica*, *Dodonaea viscosa*. Besides this, at Kerala gali *Robinia pseudoacacia*, *Ulmus wallichiana*, *Rosa moschata*, *Berberis lycium*, *Zizyphus nummularia*, *Zizyphus oxyphylla*, *Dodonaea viscosa* were recorded and going west from Gulpur on Kotli-Rawalpindi road, Sehnsa area was surveyed located adjacent to Holar (the boundary point between Azad Kashmir and Pakistan) at a distance of 35 km from Kotli, Bruhian surrounded by Chir pine forests that give natural beauty and attract to visitors. The present study may provide guideline for planning afforestation activities and conservation of medicinal plants in the study area.

INTRODUCTION

Today when the biodiversity conservation is gaining worldwide recognition and information on large varieties of plant species occurring in the un-explored areas can not be ignored. Considering the multiple uses of trees, it is not only renewable but also makes healthy contributions towards amelioration of environment. Floristic composition is outcome of the environmental condition and biotic influences.

The diverse climatic and topographic conditions are reflected in the form of rich and diverse plant communities represented by 6000 plant species of herbs, shrubs and trees (Stewart, 1958, 1972). Some studies in the Subtropical belt of AJ&K have been carried out (Malik and Hussain 1987, 1988, 1990, Malik and Zandial 1996, Dastagir *et al.*, 1999). The area falls under subtropical Chir pine forest types with an annual rainfall of 1453 mm; maximum during August while minimum occurs in January. The hottest months are May, June, July and September (Champion *et al.*, 1965).

On the directive of Inspector General of Forest, Ministry of Environment

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Islamabad, preliminary rapid appraisal vegetation survey was carried out to explore plant wealth and to determine potential status and suggest strategy for sustainable development as income generation activities of the communities in the area. The objectives of the study were:

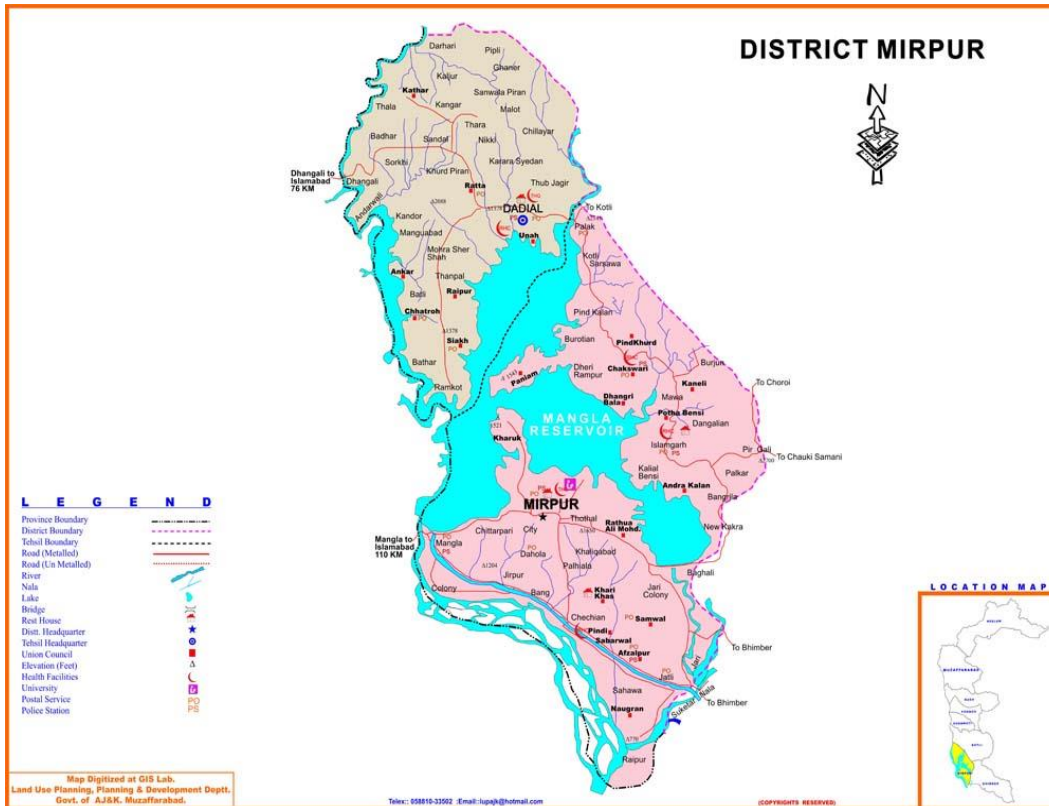
- Identification of floristic composition, current status of indigenous tree species, medicinal, aromatic and economic plants growing in the area.
- Evaluation of future prospects of endemic tree species including medicinal and economic plants that need in-situ conservation of sustainable utilization having market potential and income generation activities for rural communities.

The study area Mirpur and Kotli districts have great diversity of climatic and topographic conditions, which is reflected in the form of diverse flora of the area. The glimpses of original vegetation can be seen in the graveyards which are protected as sacred place. Mirpur is situated on 33° to 33°.34 latitude and 73°.31 to 73°.55 longitudes, 459m above sea level linked with the main Peshawar-Lahore Grand Trunk Road at Dina. Topography of Mirpur district is undulated with hot climate falls under dry subtropical broad leaved thorn forests and the rural inhabitants of the area are mainly farmers. The Kotli is situated at 33°.15 latitude and 73°.33 to 74° longitudes. It is a hilly terrain rising gradually towards the high mountains of Poonch district. Its climate is more moderate than that of Mirpur due to sub-mountainous topography. In Kotli district visited **Tattapani** which lies at a distance of 26km from Kotli via a metalled road. The word Tattapani means hot water. Sulphur spring is perennial one and thousands of people visit each year to find magical cures for illnesses particularly skin diseases. **Sehnsa** is a Thesil headquarters of Kotli district situated at a distance of 35 km from Kotli. In this area Chir pine is the main forest crop of the area.

MATERIAL AND METHODS

On the directives of Inspector General of Forests, meeting and discussions with Project Director/Conservator of Forest and other officers of Forest Departments were undertaken for collection of information about configuration of the study area reputed for rich biodiversity of indigenous vegetation and medicinal plants. After discussion, a rapid appraisal vegetation survey of different localities of the Mirpur and Kotli districts of the Azad Jammu & Kashmir was conducted. Plant samples were collected and identified with the help of Pakistan Forest Institute, Forest Botany Herbarium specimens and nomenclature was followed after Stewart, 1972. Maps of the study area were downloaded from Internet. Beside this, a questionnaire was developed and interviews with community members, user/buyers of medicinal plants were undertaken to know the mode of collection, cultivation and post harvest processing prior to marketing of medicinal herbs and fruits of medicinal value.

RESULT AND DISCUSSION



Floristic composition of different localities of the Mirpur district area:

1. Jaricus (Mirpur- Bhimber road) and Chatter Pari (Mirpur- Mangla road) locality

Mirpur and its suburb area was dominated by *Prosopis glandulosa* and other associated species; *Acacia modesta*, *Dalbergia sissoo*, *Ficus carica*, *Zizyphus mauritiana*, *Z. nummularia*, *Lantana camera* with ground flora like *Cannabis sativa*, *Tribulus terresteris* etc.

2. Subchack locality

It is near by the Mirpur city towards Mangla-Mirpur road. It is undulated area dominated by *Prosopis juliflora* and scattered plants of *Zizyphus mauritiana*, *Z. nummularia*, *Acacia nilotica*, *Capparis aphylla* and *Saccharum munja* etc as depicted in photographs.

3. Nagi playan locality

This area lays 10 km form Mangla colony to Khari-sharif along river. The

vegetation of the marshy area was mainly *Arundo donax*. The other vegetation on river bank was *Ailanthus altissima*, *Dodonaea viscosa*, *Xanthium strumarium*, *Saccharum spontanium* and *Oxalis corniculatus* etc.

4. Khari-sharif locality

Located 8km from Mirpur, known for housing the Shrine of the Sufi Saint known as Baba Pir-e-Shah Ghazi (Damrian Wali Sarkar). The place acts as a great seat of learning for students of Islam. Shrine of the late Mian Mohammed Baksh who wrote the famous story 'Saif-ul-Muluk' is also at Khari-sharif. This is a tale of a prince, who fell in love with a fairy called Badi Jamal, who he saw in dream. The tale chronicles his travels in search of the fairy and the spiritual lessons he learnt on the way. The plants like *Ficus lacor* (پلکان/پلک) and *Ficus religiosa* (پپیل) were plants were showing healthy growth.

5. Chachian-Chohan locality (grave yard vegetation)

Chachian-chohan, a century old graveyard near Khari-sharif where *Broussonetia papyrifera* was dominant followed by *Dalbergia sissoo* (pole crop), *Acacia modesta* and *Bombax ceiba*. Scattered plants of *Vitex negundo* were observed.

The over all floristic composition of different localities of the Mirpur district area is as under:

Trees

SCIENTIFIC NAMES	ENGLISH NAMES	LOCAL NAMES	URDU NAMES
<i>Acacia modesta</i> Wall.	Acacia	Phulai	پھلانی
<i>Acacia nilotica</i> (L.) Willd. ex Delile	Arabic tree	Kikar	کیکر
<i>Acacia nilotica</i> var. <i>cupressiformis</i> L.	Arabic tree	Saro-kikar, Babul	سروکیکر/ببول
<i>Albizzia lebbek</i> Benth.	Black siris	Kala-siris	کالا سرس
<i>Bombax ceiba</i> L.	Silk cotton tree	Simal	سیمل
<i>Broussonetia papyrifera</i> L.	Paper-mulberry	Jangli-toot	جنگلی توت
<i>Dalbergia sissoo</i> Roxb.	Sissoo/Rosewood	Shisham, talhi	شیشم/ٹالھی
<i>Melia azedarach</i> L.	Persian Laic	Bakain	پکانن
<i>Morus alba</i> L.	Mulberry	Shah-Tut	شہتوت
<i>Pongamia pinnata</i> (L.) Pierre.	Indian Beech	Suckchain	سکھ چین
<i>Prosopis glandulosa</i> Torr	Mesquet	Devi	دیوی
<i>Vitex negundo</i> L.	Five-leaved Chaste tree	Marwan	مروان
<i>Zizyphus mauritiana</i> Lam.	Zizyphus	Ber	بیر

Shrubs/ Herbs

SCIENTIFIC NAMES	ENGLISH NAMES	LOCAL NAMES	URDU NAMES
<i>Calotropis procera</i> R. Br.	Swallow-wart, Mudar	Aak	آک
<i>Capparis aphylla</i> Roth.	Leafless caper	Karir	کریر
<i>Gymnosporia royleana</i> Wall.	Gymnosporia	Pataki, Kander	پٹاکی / کندر
<i>Justicia vasica</i> L.	Malabar nut tree	Bhaikar/Barg-e-bansa	بھیکڑ/برگ بانسا
<i>Ipomoea pilosa</i>	Ipomoea	Wilaiti ak	ولایتی آک

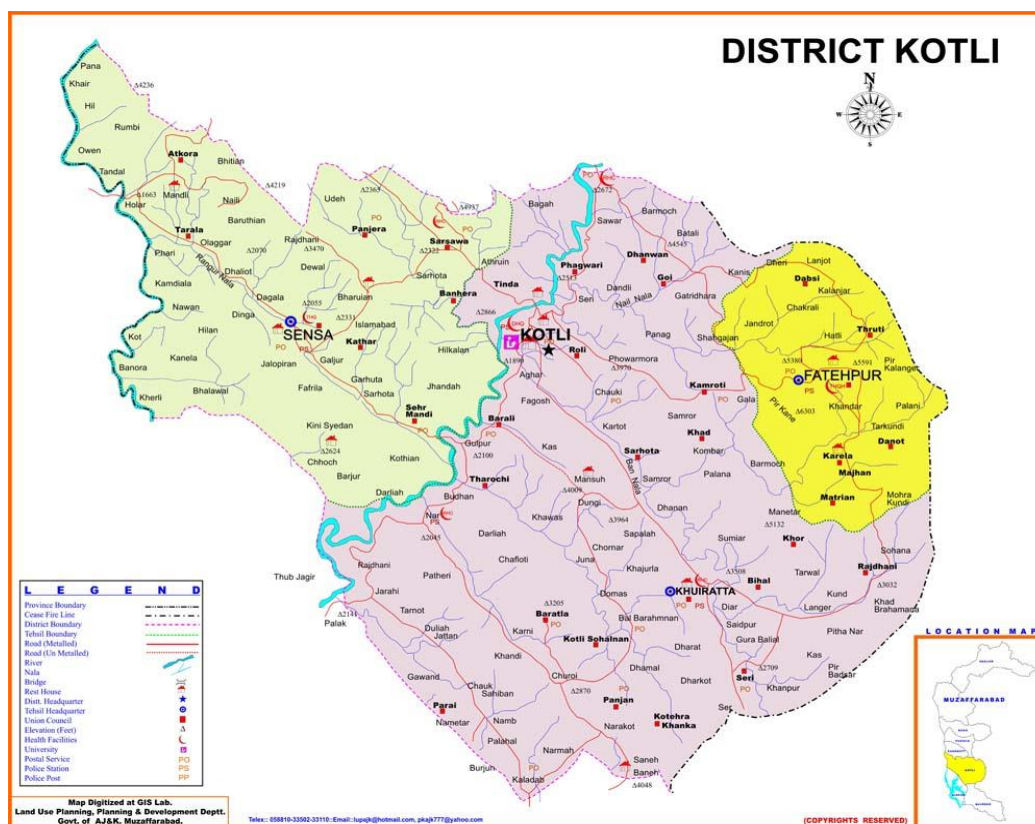
<i>Lantana indica/camera</i> Roxb.	Lantana	Panch-phooli	پانچ پھولی
<i>Zizyphus nummularia</i> Wight.	Zizyphus	Mallah, Ber, Karkana	ملہ/بیر/کرکنا
<i>Achyranthes aspera</i> L.	The prickly chaff	Putkhanda	پٹھکنڈا
<i>Amaranthus viridis</i> L.	Amaranthus	Chaulai	چولائی
<i>Cannabis sativa</i> L.	Hemp	Bhang	بھنگ
<i>Datura alba</i> Nees.	Thorn apple	Dhatura	دھتورا
<i>Lonicera quinquelocularis</i> Hardw.	Honeysuckle	Phut	پھٹ
<i>Solanum xanthocarpum</i> Schrad.	Thorn weed	Kandiali, Mamoli	کنڈیالی/ممولی
<i>Tribulus terrestris</i> L.	Calthrop	Bhakra	بھکڑا

Agricultural practices

Inhabitants cultivated different agricultural crops for domestic use such as:

<i>Sesamum indicum</i>	Gingelly / Sesame Til	Til	تل
<i>Trifolium alexandrinum</i> L.	Berseem /Clover	Barseem/Shaftal	برسیم /شفتل
<i>Triticum vulgare</i> L.	Wheat	Gandam	گندم
<i>Vigna mungo</i> L.	Mung bean/Green gram	Dal-Mash	دال ماش
<i>Vigna radiata</i> L.	Green gram	Dal-Mung	دال مونگ
<i>Vigna trilobata</i> L.	Wild bean	Jangli moth	جنگلی موٹھ

In Kotli district visited Tattapani which lies at a distance of 26km from Kotli via a mettle road. The word Tatapani means hot water. Sulphur spring is perennial one and thousands of people visit each year to find magical cures for illnesses particularly skin diseases. Chir pine is the main forest crop of the area. Sehnsa lies just before Holar (the boundary point between Azad Kashmir and Pakistan). Sehnsa is a sub-divisional (Thesil) headquarters of Kotli district situated at a distance of 35 km from Kotli. The main forest crop was *Pinus roxburghii* (Chir pine), *Dodonaea viscosa* (Sanatha) and other associates. Bruhian surrounded by Chir forests gives natural scenic view.



Medicinal plants and floristic composition of Tattapani and Sehnsa area of Kotli district

Medicinal plants occurring in various ecological zones of southern districts can be broadly classified into two categories along with their distribution, part used, chemical constituents and their application in various system of medicine. Dried mixed ever green, broad leaved deciduous forests which occurred at the lower reaches/ridges of Mirpur and Kotli districts are detailed as under:

Name of plant	Part used	Application	Chemical constituent
Trees			
<i>Acacia modesta</i> (phulai)	Gum	Gum is used as restorative	-
<i>Justicia vasica</i> (bhaikar)	Roots and leaves	Leaves and root efficacious in all sorts of coughs.	Essential oil, non-volatile alkaloids vaccine and adhatodic acid.
<i>Dodonaea viscosa</i> (sanatha)	Leaves	Bruised leaves as poultice, in gout and rheumatism powdered leaves applied to burns and scalds.	Leaves contain tannin, resins, alkaloid and saponin
<i>Olea ferruginea</i> (kao)	Leaves, bark and fruits	Oil obtained from fruits is used as rubefacient. Leaves and bark are bitter and astringent.	Fruit yield oil.
<i>Vitex negundo</i> (marwan)	Leaves and	Leaves and roots are regarded as tonic	Alkaloids and essential oil.

Name of plant	Part used	Application	Chemical constituent
	roots and fruits	and febrifuge. The decoction of leaves is used in headache and catarrh.	
<i>Zizyphus nummularia</i> (jhar-beri)	Fruit	The fruit is considered cooling, astringent and of value in bilious affections.	-
Herbs			
<i>Cannabis sativa</i> (bhang)	Whole plant	The plant is stimulant, anodyne, antispasmodic, narcotic and parturifacient.	Cannabinol, Cannabinin, and Cannin.
<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	Essential oil

Generally the crude herbal drugs are collected by the poor people and grazers and are sold in the markets for earning some income.

Medicinal plants and floristic composition of Dry-sub tropical Chir pine forests

Elevation 770 m to 1692 m Rainfall ranged from 625 mm to 1350 mm. Open inflammable Chir pine forest occurs in the study areas and extends up-to sub-mountainous tract of Poonch. Vegetation is of Chir pine and broad leaved species given as under:

Name of plant	Part used	Application	Chemical constituent
Trees			
<i>Pinus roxburghii</i> (chir)	Wood & oil	Turpentine oil obtained. It has higher medicinal value as stimulant diaphoretic and is used in cough: the tar is employed in chronic bronchitis and phthisis.	Sap wood yield on incision an oleoresin from which turpentine is obtained by steam distillation.
<i>Pistacia integerrima</i> (kakra-shangi)	Gall	The galls are tonic, expectorant and are used in cough, phthisis and asthma.	Galls give essential oil, alpha-penne, romadendrem and acrylic acid.
<i>Mallotus philippensis</i> (kaamila)	Fruits	Glands and hairs; bitter, cathartic, anathematic to tape worm, purgative, parasitic affliction of skin and scabies.	Roterlin
<i>Pyrus pashia</i> (jangli-battang)	Fruit	Fruit is tonic and febrifuge	-
<i>Ficus auriculata</i> (pakur)	Herbaceous branches	Juice is applied to poisoned wounds, indent ulcers.	-
Shrubs			
<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.	The bark is rich in alkaloids berberine.
Herbs			
<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.	Violet flower and root contain and emetic principle violine.
<i>Oxalis corniculata</i> (khataa mitha)	Whole herb	The leaves are considered cooling, refrigerant and stomachic	Oxalic acid

Economic potential for sustainable harvest of medicinal plants

The area of Azad Jammu and Kashmir is rich in indigenous tree species and a variety of medicinal plants, which are of potential importance for their uses in various agro-based and pharmaceutical industries. The vegetative wealth is not homogenous because of different ecological zones, geographical conditions and altitudinal variations. Medicinal plant is a small component of Agriculture sector and contributes its share in economic development. Crude drugs worth approximately Rs.169 million are being used yearly (Wani *et al.*, 2004), which is a good indication of the potential economic value of medicinal plants. There is a need to collect and disseminate data to form a basis for any major cultivation/collection efforts.

CONCLUSION AND RECOMMENDATIONS

- i) Trading and collection sub-centre may be established in the foot-hill towns and Mirpur. Since collecting and trading sub-centers of Madyan and Mingora in Swat have 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.
- ii) The Forest Department of Azad Jammu & Kashmir may regulate the harvest of crude drugs following rotation in working plans and thus sustaining endangered plants for future extraction. Artificial regeneration of medicinal plants may be done in their rare exclusive habitat to conserve species and natural resources.
- iii) Marketing of crude drugs must be streamlined in a manner that the collectors and traders do not suffer losses due to fluctuation in the market prices and monopolistic attitude of big traders.
- iv) The dried seeds of *Punica granatum* is a very common condiment and up to 300 tonnes 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.
- v) Area needs protection from biotic interferences; deforestation, grazing and human influence so that original vegetation can be restored. The Government should take appropriate action against those who are involved in cutting trees and collection of medicinal plants for illegal earning.

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