

*Full Length Research Paper*

# **Indigenous knowledge and folk use of medicinal plants by the tribal communities of Hazar Nao Forest, Malakand District, North Pakistan**

**Waheed Murad<sup>1,2\*</sup>, Ashfaq Ahmad<sup>3</sup>, Syed Abdullah Gilani<sup>2</sup> and Mir Ajab Khan<sup>1</sup>**

<sup>1</sup>Department of Plant Sciences, Quaid – I - Azam University, Islamabad, Pakistan.

<sup>2</sup>Department of Botany, Kohat University of Science and Technology, Kohat, Pakistan.

<sup>3</sup>Department of Botany, Islamia College University, Peshawar, Pakistan.

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**Regular field surveys were conducted for two consecutive years in the villages of Brah, Totay, pir khel, Mekhband, Kot and Haryankot of Hazar Nao forest. Hazar Nao is located at about 23 km west of the tribal zone of Dargai, Malakand District, Pakistan. Although, majority of the local inhabitants in the study area depend on plants to treat human ailments, the indigenous knowledge is still not documented. Therefore, the present study is carried out to enlist plant species of this un-explored area and record their medicinal uses before the ethnomedicinal information are lost. Informations about medicinal plants were gathered through formal and informal interviews and questionnaires were filled from local people. The folk medicinal uses of 75 plant species were recorded for various human ailments.**

**Key words:** Hazar Nao, Malakand, human ailments, medicinal plant, Pakistan.

## **INTRODUCTION**

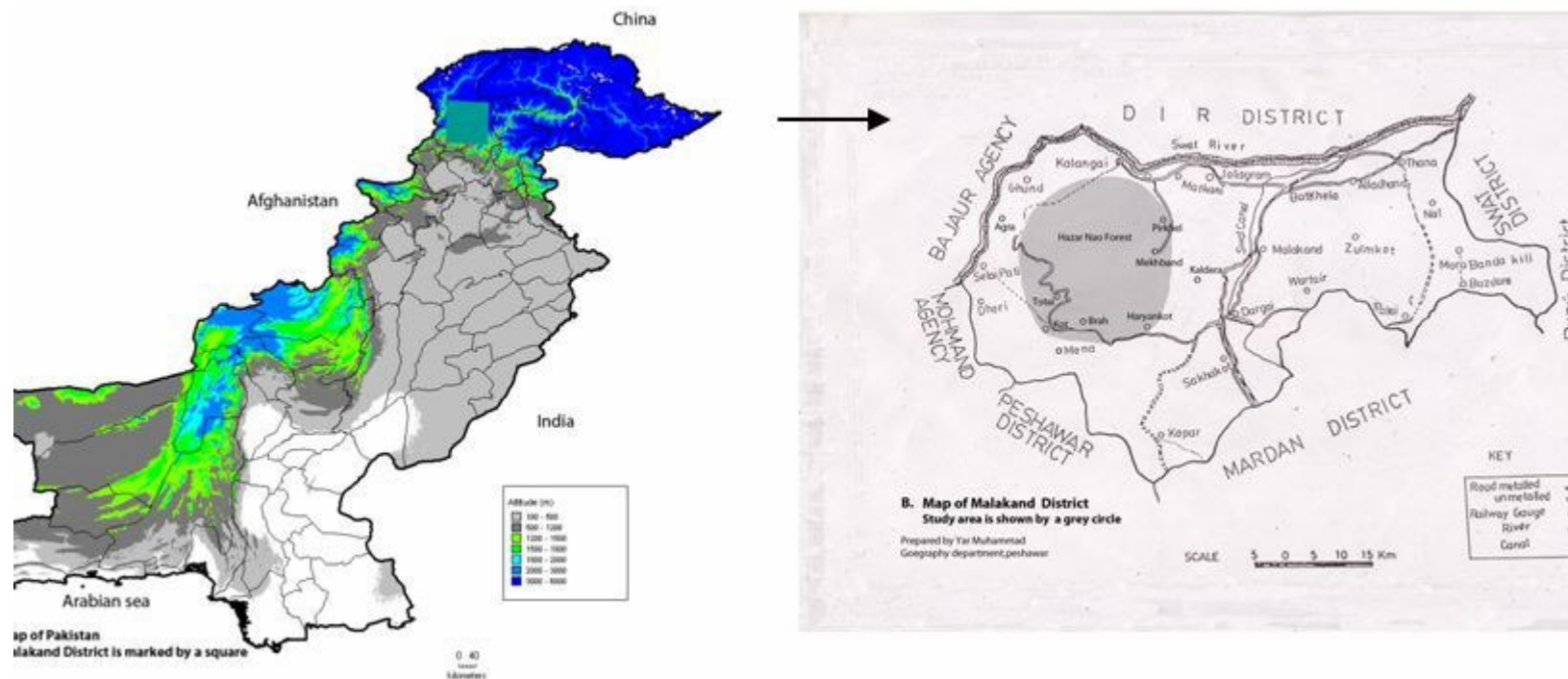
The tribal region of Malakand is the gateway to Dir, Chitral, Swat Districts; Mahmand and Bajaur Agencies - federally administered tribal areas (FATA) which are very famous for tourism. It extends from the rugged and partly glaciated mountain ranges of the Hindukush down to northern edge of the Peshawar basin. It is bounded on the north by Dir, on the north east by Swat, on the east by Buner District, on the south by Mardan and Charsadda Districts and on the west by Mohmand and Bajaur Agencies (Chaghtai and Ghawas, 1976 and Figure 1). The people of the area mostly depend on agricultural products for their subsistence. However, agricultural products are too less to meet the expenditure of the tribal communities. Therefore, the people have to resort to alternative methods for earning their livelihood. A sizeable number of people work in civil armed forces and in other parts of the country while the women perform house hold duties and make handicrafts items like caps, bed sheets, baskets etc. It is a large hilly area and

women support their men by taking care of cattle, cutting fuel wood as well as in the fields.

Traditional health care systems as well as international herbal and pharmaceutical markets are dependent on medicines derived from plants. Nearly 80% of the world populations rely on the use of traditional medicines to meet their primary health care needs (Sandhya et al., 2006) whereas; up to 90% of the developing world relies on the use of medicinal plants (WHO, 2002). Out of the total 4, 22,000 flowering plants reported from the world, more than 50,000 are used for medicinal purposes (Gavaerts, 2001; Schippmann et al., 2002). The multi purpose use and increasing demands for plants have resulted in over-exploitation and over-harvesting of medicinal plants.

Pakistan has a varied climate and is quite rich in medicinal herbs scattered over a large area. A total of 1572 genera and 5521 species are identified (Ali, 2008) but only 600 plant species are documented and used for medicinal uses. Ethnobotany is a virgin field in Pakistan and few papers have been published. The first person who worked in the subject area is, Hocking (1958), and he reported that about 85% of Pakistan's population is

\*Corresponding author. E-mail: [whdicp@yahoo.com](mailto:whdicp@yahoo.com).



**Figure 1.** Please provide figure legend.

dependent on traditional medicines for all or most of their medicinal need. Shinwari (1996) reported the present status of ethnobotany in Pakistan and emphasized on the need of investigation, documentation and application of traditional knowledge in the use of natural resources. Shinwari *et al.* (2002) gave an account of more than 300 medicinal plants to be traded in Pakistani herbal markets. Gilani and Shinwari (2003) compiled the review of ethnobotanical literature of Pakistan. Shinwari *et al.* (2003) reported 275 medicinal plants from the District of Swat, which are locally used. Gilani and Khan (2003) reported 87 threatened plants from Swat,

23 from Buner and 31 species from Chitral. Shinwari and Gilani (2003) reported local uses of medicinal plants from Astore, Pakistan. Ethnomedicinal survey in Kot Manzary Baba valley was conducted by Zabihullah *et al.* (2006) and they reported 82 plant species for different ethnobotanical purposes.

As mentioned above, many workers have documented the ethnobotanical uses of medicinal plants from different parts of Pakistan but the tribal area of Hazar Nao is still unexplored. Therefore, a need was felt to document and conserve the traditional knowledge of the area before the information is lost for ever. The aim of

the present study was to enlist plant species of the area, record and explore their herbal remedies.

## METHODOLOGY

Regular field trips were arranged in different seasons of 2003 to 2004. Information on the traditional uses of plants found in Hazar Nao inhabited villages of Brah, Totay, Pir khel, Mekhband, Kot and Haryankot were gathered through formal and informal interviews and questionnaires from local people. All the people living in Hazar Nao forest are ethnically Pashtoon tribe and speak Pashto language. Communication with the local community through Pashto language led us to mix with the people of the area easily.

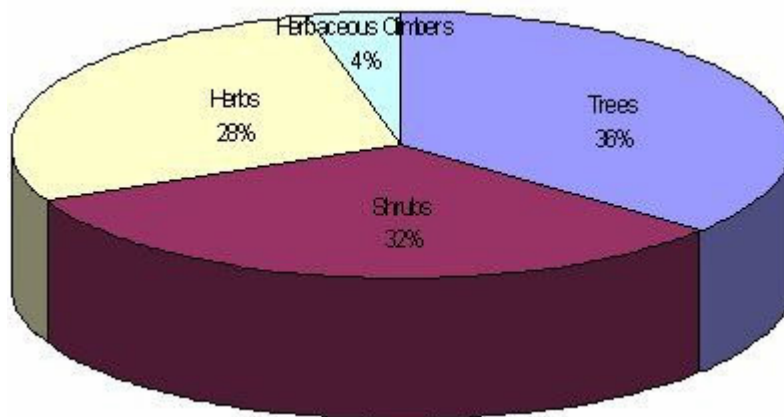


Figure 2. Habitat of medicinal plant species.

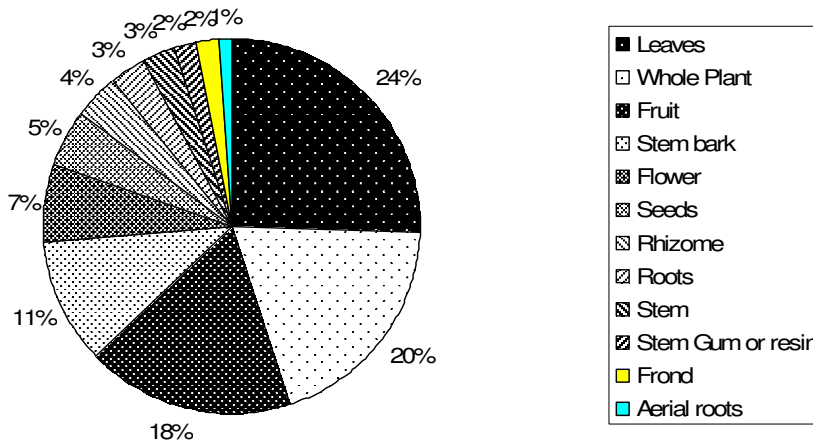


Figure 3. Medicinal plant parts used for different diseases.

Before going through formal and informal interviews for herbal recipes with the local people, we took interest in their daily lives, social and religious activities because first intervention into the community was difficult. The interviews were based on informal small talks with individuals and groups and 300 formal interviews including filling of both closed and open ended questionnaires was conducted. We collected medicinal values of many plants but concentrated on those herbal recipes which were at least repeated by 5 people. For a cross verification, we gave priority to local elder people and two herbal practitioners of the area. Voucher herbarium specimens were collected, dried and identified with help of local available literature, using the herbarium of Biological Sciences, Quaid-e-Azam University, Islamabad.

They were accessioned and submitted in the herbarium, Department of Biological Sciences, Quaid-e-Azam University, Islamabad.

## RESULTS AND DISCUSSION

The results of the field surveys and interviews are

presented below in enumeration. They are arranged alphabetically by family with plant scientific name, local name, habit, part use, flowering season, voucher herbarium number and folk medicinal uses. Medicinal remedies of 75 plant species belonging to 50 families were obtained. Out of 75 plants, majority of the species are trees 27 (36%), followed by shrubs 24 (32%), herbs 21 (28%) and herbaceous climbers 3 (4%) (Figure 2).

Usually, all parts of the plant such as leaves, stem, flower, bark, roots, fruits and seeds are utilized by traditional healers. However, it relies on the need of the user and type of plant. Herbs are used as whole but in case of shrubs and trees a particular part is used. Leaf is the most frequently used part in the preparation of medicinal remedies. The common use of leaf (24%) followed by whole plants (20%) and fruit (18%) reveals that these parts might have strong medicinal properties but it requires chemical screening (Figure 3). The maximum use of leaf in the preparation of remedies is

partly expected due to its relative ease of finding. The leaves are green and available in most part of the year. The common use of leaves in the preparation of remedies is also reported by Muthu et al. (2006) and Kala et al. (2005). A total of 71 (95%) medicinal plants are used for human ailments, 1 (01%) for livestock and 3 (04%) to treat both human and livestock ailments. Data analysis indicates that gastro-intestinal disorders, respiratory diseases, skeleto-muscular problems, dematological complaints and circulatory diseases are very common in the area (Table 1). A total of 39 species are used to treat gastro-intestinal disorders such as diarrhea, dysentery, constipation and stomach-ache. 17 species are used for the treatment of respiratory illness such as asthma and cough. 17 species are used against skeleto-muscular problems like rheumatism, backache and muscular pain. Similarly, 19 species are used to treat dematological diseases, thirteen for cardio vascular complaints and circulatory diseases, 11 to treat fever, headache and sweating of body, 10 for urinary complaints, 7 for dental problems, 6 for ear, nose and throat (ENT) complaints, 5 for nerve disorders, 8 for genital and sexual diseases, 8 species for others (wounds, cuts, narcotic, tonic, anticancer and goiter) and 1 species (*Pinus roxburghii*) is used against snake bite (Table 1).

Different substances like water, juices, sugar, soap, wheat flour, mustard oil, honey, desi ghee (Butter) and milk are added to plant materials during the preparation of medicinal remedies. The remedies are mostly administered through oral (64%), dermal (11%) and both oral and dermal (24%). Only 1% is used through auricular and nasal routes (See enumeration). Remedies of specific doses prescribed by traditional healers lack precision and might be dangerous in cases of over dose. Majority of the plants have multiple uses for curing different diseases (Table 1).

The present study reveals that the inhabitants of the research area are rich in indigenous knowledge of plants and their uses to treat many diseases. During the study period, we found that all informations on the use of medicinal plants were gathered from elder resource persons (above 40 to 90 years of age) who have real knowledge about the utilization of medicinal plants. The younger generation (below 40 years of age) does not rely on traditional treatments due to modern cultural changes. It is, therefore, felt worthwhile to record the traditional knowledge of medicinal plants in the area before the information are depleted.

### ACANTHACEAE

Botanical name: *Justicia adhatoda* Linn.  
Local name: Baiker  
Habit: Shrub  
Part use: Leaves and flowers  
Flowering period: April-May.

Voucher specimen No. 01.

**Folk medicinal uses:** For cough, asthma, bronchitis and tuberculosis, about 1 kg flowers and leaves are mixed in 150 ml water, heated for 1 h and juice is extracted, which is kept in earthen pot. Then, 40 g of "Naushadar" (NH<sub>4</sub>Cl) and 20 ml aqueous extract of *Datura stramonium* is added. The drug is administered to the patient for 1 week, thrice in a day. For rheumatism, about 300 g of leaves are crushed and boiled in 1 l water in an iron vessel, till it is left to half and given to the patient with honey for 2 weeks, 4 times daily.

### ADIANTACEAE

Botanical name: *Adiantum capillus-veneris* Linn  
Local name: Sumbal  
Part use: Fronds  
Voucher specimen No. 02

**Folk medicinal uses:** The juice extracted from frond is used as expectorant, emetic and diuretic.

Botanical name: *Adiantum incisum* Forsk.  
Local name: Sumbal  
Part use: Fronds  
Voucher specimen No. 03

**Folk medicinal uses:** The frond is used for curing skin diseases, fever, cough and diabetes.

### AMARANTHACEAE

Botanical name: *Achyranthes aspera* Linn.  
Local name: Nari Ghishkay  
Habit: Herb  
Part use: Whole plant.  
Flowering period: April to August.  
Voucher specimen No. 04

**Folk medicinal uses:** The paste from fresh leaves is prepared, mixed with gur (Sugarcane product) and soap, applied to blisters twice a day for 5 consecutive days to drain off the pus from the abscess and boils. The plant paste is applied with cotton bandage for fractured bones. Freshly prepared paste of the root is applied externally twice a day for 1 week in case of tonsillitis.

Botanical name: *Amaranthus viridis* Linn.  
Local name: Chalwerae  
Habit: Herb  
Part use: Whole plant  
Flowering period: April to May  
Voucher specimen No. 05

**Folk medicinal uses:** The boiled soft roots are used as

**Table 1.** Medicinal plants and their uses for different diseases.

<b>Disease category name</b>	<b>Plants used</b>
Gastrointestinal disorders	<i>Adiantum capillus-veneris, Ailanthus altissima, Ajuga bracteosa, Amaranthus viridis, Asparagus plumosus, Berberis lycium, Buxus wallichiana, Butea monosperma, Calotropis procera, Celtis australis, Chenopodium ambrosoides, Colebrookia oppositifolia, Echinops echinatus, Ficus carica, Ficus glomerata, Ficus religiosa, Ficus palmata, Ficus benghalensis, Helicteres isora, Lantana camara, Morus alba, Myrsine africana, Myrtis communis, Nannorrhops ritchiana, Oxalis corniculata, Periploca aphylla, Phoenix dactylifera, Pinus roxburghii, Platanus orientalis, Punica granatum, Pyrus pashia, Ricinus communis, Rubus fruticosus, Rumex hastatus, Sarcococca saligna, Solanum nigrum, Solanum surratense, Vitis Jacquemotii, Viola canescens</i>
Dermatological and topical diseases	<i>Achyranthes aspera, Amaranthus viridis, Berberis lycium, Cuscuta reflexa, Debregeasia salicifolia, Dodonaea viscosa, Euphorbia prostrata, Euphorbia helioscopia, Ficus carica, Fumaria indica, Mallotus philippensis, Melia azedarach, Periploca aphylla, Pinus roxburghii, Platanus orientalis, Trichodesma indica, Verbascum thapsus, Woodfordia fruticosa, Ziziphium numularia</i>
Respiratory illness	<i>Ammi visnaga, Bauhinia variegata, Berberis lycium, Calotropis procera, Chenopodium ambrosoides, Echinops echinatus, Ficus carica, Ficus religiosa, Ficus palmata, justacia adhatoda, Punica granatum, Rubus fruticosus, Solanum nigrum, Solanum surratense, Tinospora cordifolia, Verbascum thapsus, Woodfordia fruticosa</i>
Skeletal-muscular problems	<i>Acacia modesta, Achyranthes aspera, Berberis lycium, Buxus wallichiana, Butea monosperma, Cannabis sativa, Chenopodium ambrosoides, Daphne mucronata, Dodonaea viscosa, justacia adhatoda, Lantana camara, Olea ferruginea, Pistacia chinensis, Quercus incana, Rhazya stricta, Sarcococca saligna, Verbascum thapsus</i>
Cardiovascular complaints and circulatory diseases	<i>Adiantum incisum, Asparagus adscendens, Cynodon dactylon, Echinops echinatus, Ficus benghalensis, Fumaria indica, Lantana camara, Oxalis corniculata, Punica granatum, Sageretia thea, Sarcococca saligna, Solanum nigrum, Tinospora cordifolia</i>
Fever, headache and sweating of body (diaphoretic)	<i>Adiantum incisum, Buxus wallichiana, Fumaria indica, Lantana camara, Punica granatum, Pyrus pashia, Rubus fruticosus, Solanum surratense, Tinospora cordifolia, Viola canescens, Xanthium strumarium, Adiantum capillus-veneris, Arundo donax, Asparagus adscendens,</i>
Urinary complaints	<i>Ficus carica, Ficus religiosa, Ficus palmata, Origanum vulgare, Quercus incana, Rumex hastatus, Solanum surratense</i>
Dental problems	<i>Calotropis procera, Ficus glomerata, Nerium oleander, Olea ferruginea, Origanum vulgare, Otostegia limbata, Platanus orientalis,</i>
ENT complaints	<i>Achyranthes aspera, Acacia nilotica, Ajuga bracteosa, Calotropis procera, Origanum vulgare, Woodfordia fruticosa</i>
Nerve disorders (hysteria, epilepsy, sedative)	<i>Colebrookia oppositifolia, Convolvulus arvensis, Echinops echinatus, Pyrus pashia, Solanum nigrum</i>
Genital and sexual diseases	<i>Butea monosperma, Convolvulus arvensis, Cuscuta reflexa, Phoenix dactylifera, Rhazya stricta, Ricinus communis, Solanum surratense, Tinospora cordifolia</i>
Others (wounds, cuts, narcotic, tonic, anticancer and goiter)	<i>Cannabis sativa, Colebrookia oppositifolia, Cynodon dactylon, Mallotus philippensis, Myrtis communis, Otostegia limbata, Rubus fruticosus, Viola canescens</i>
Snake bite	<i>Pinus roxburghii</i>

laxative. The upper surfaces of the leaves are smeared with mustard oil, warmed gently and are applied to the abscesses and boils for ripeness.

### Anacardiaceae

Botanical name: *Pistacia chinensis* Bunge.  
Local name: Ashnay  
Habit: Tree  
Part use: Stem gum  
Flowering period: August to September  
Voucher specimen No. 06

**Folk medicinal uses:** The stem gum is added to the mustard oil, warmed and mixed. The prepared poultice is then applied to the ruptured heels at night.

### Apiaceae

Botanical name: *Ammi visnaga* (L) Lam.  
Local name: Spairkai  
Habit: Herb  
Part use: Dry fruit  
Voucher specimen No. 07

**Folk medicinal uses:** The fruits are used in whooping cough and asthma.

### Apocyanaceae

Botanical name: *Nerium oleander* Linn.  
Local name: Gander  
Habit: Herb  
Part use: Leaves  
Flowering period: April to May  
Voucher specimen No. 08

**Folk medicinal uses:** The fresh leaves are washed, crushed, and then 3 cups of water is added. The filtrate is given to the patients suffering from dental pain or bleeding gums.

Botanical name: *Rhazya stricta* Decene  
Local name: Ghandaray  
Habit: Shrub  
Part use: whole plant  
Flowering period: April to May  
Voucher specimen No. 09

**Folk medicinal uses:** The plant is used for the treatment of syphilis, chronic rheumatism and old joint infections.

### Arecaceae

Botanical name: *Phoenix dactylifera* Linn.

Local name: Khajora  
Habit: Tree  
Part use: fruit.  
Flowering period: March to April  
Voucher specimen No. 11

**Folk medicinal uses:** Fruits are tonic, aphrodisiac, digestive and laxative.

Botanical name: *Nannorrhops ritchiana* Griff  
Local name: Mazari  
Habit: Shrub  
Part use: leaves  
Flowering period: April to May  
Voucher specimen No. 12

**Folk medicinal uses:** The leaves are used for curing dysentery, diarrhea. Young leaves are recommended as purgative in veterinary medicine.

### Asclepiadaceae

Botanical name: *Calotropis procera* (Willd.) R. Br.  
Local name: Spalmae  
Habit: Shrub  
Part use: Whole plant  
Flowering period: August to September  
Voucher specimen No. 13

**Folk medicinal uses:** The plant is used in asthma, cholera, dental cleaning and earache; the latex collected from the leaves and stem is mixed with Bajra (*Pennisetum typhoides*) in the ratio of 1:2. They are then kept in the earthen pot and given in the quantity of 2 g with green tea to asthmatic patient twice a day; about 15 g of roots latex is mixed with *Pennisetum typhoid* (Bajra) in 1:2 ratios. It is kept in earthen pot, heated and tablets of 1 g are prepared. The tablets are given thrice daily to the patient suffering from asthma; the juice extracted from about 15 gram of roots is given to the patient suffering from cholera, thrice daily, for 5 days; mature leaves of the plant are warmed and tied over the temporal bone to alleviate earache; regular use of Maswak (tooth paste) prepared from the stem of the plant is used to cure pyorrhea.

Botanical name: *Periploca aphylla* Linn.  
Local name: Barara  
Habit: Shrub  
Part use: Whole plant  
Flowering period: April to May  
Voucher specimen No. 14

**Folk medicinal uses:** The plant decoction is used as purgative, while the milky juice is applied to tumors and swellings.

**Asteraceae**

Botanical name: *Echinops echinatus* Roxb.  
 Local name: Ount Katara  
 Habit: Shrub  
 Part use: Whole plant  
 Flowering period: March to April  
 Voucher specimen No. 84

**Folk medicinal uses:** The plant is recommended in jaundice, hysteria, dyspepsia, hoarseness of throat and cough. The powdered root is used as antilice and also applied to wounds of cattles for killing maggots.

Botanical name: *Xanthium strumarium* Linn.  
 Local name: Ghut ghiskay  
 Habit: Shrub  
 Part use: Leaves  
 Flowering period: February to April  
 Voucher specimen No. 15

**Folk medicinal uses:** Leaf decoction is used in long-standing malarial fever.

**Berberidaceae**

Botanical name: *Berberis lycium* Royle  
 Local name: Ziar largay  
 Habit: Shrub  
 Part use: Rhizome  
 Flowering period: April to June  
 Voucher specimen No. 16

**Folk medicinal uses:** About 100 g of the powdered rhizome is mixed with the same weight of black pepper (*Piper nigrum*) and 1000 g of desighee, the paste so prepared is applied over the affected parts especially for backache. The root decoction is used as gargle for pharyngitis and intestinal colic wounds.

**Boraginaceae**

Botanical name: *Trichodesma indica* (Linn.) R. Br.  
 Local name: Ghowa-jabbai  
 Habit: Perennial Herb  
 Part use: Roots  
 Flowering period: March to August  
 Voucher specimen No. 20

**Folk medicinal uses:** To relieve swelling of body, roots are finely powdered to make a paste and applied over the affected part of the body twice a day till recovery.

**Buxaceae**

Botanical name: *Buxus wallichiana* Baill

Local name: Shamshad  
 Habit: Shrub or small tree  
 Part use: Whole plant  
 Flowering period: April to June  
 Voucher specimen No. 18

**Folk medicinal uses:** The plant is used as antirheumatic, diaphoretic, purgative and febrifuge.

Botanical name: *Sarcococca saligna*. (D. Don) Muell.  
 Local name: Ladan  
 Habit: Shrub  
 Part use: Leaves and shoots  
 Flowering period: September to May  
 Voucher specimen No. 19

**Folk medicinal uses:** The leaves and shoots are used as laxative, blood purifier and to relieve muscular pains.

**Caesalpinaceae**

Botanical name: *Bauhinia variegata* Linn.  
 Local name: Kuryal or Kachnar  
 Habit: Tree  
 Part use: Bark, Seeds  
 Flowering period: February to April  
 Voucher specimen No. 21

**Folk medicinal uses:** For scrofula, seeds are powdered, little sulphur is added and a poultice is made in the mustard oil. It is applied on the affected part of the body. After 1 or 2 h bath is taken with warm water. About 50 g of the bark is grinded in rice water to make a paste. It is also applied on the affected part twice daily for 1 week.

**Canabaceae**

Botanical name: *Canabis sativa* Linn.  
 Local name: Bhang  
 Habit: Shrub  
 Part use: Leaves and flowers  
 Flowering period: April to August  
 Voucher specimen No. 22

**Folk medicinal uses:** The leaves are antispasmodic, narcotic. They are boiled and the warmed leaves are tied over the affected parts of the body for the treatment of spasm. For narcotic action, the leaves are used in two forms; bhang and charas.

**Bhang**

The larger leaves are crushed, mixed with milk or juice of some other fruits and poppy seeds, and taken as a drink for their narcotic action.

**Charas**

The resinous exudation that collects on the leaves and flowering tops is taken and is smoked.

Habit: Herb  
Part use: Leaves and fruits  
Flowering period: March to April  
Voucher specimen No. 86

**Chenopodiaceae**

Botanical name: *Chenopodium ambrosoides* Linn  
Local name: Chelwai  
Habit: Herb  
Part use: Leaves and stem  
Flowering period: March to April  
Voucher specimen No. 24

**Folk medicinal uses:** The paste of leaves and stem is applied to relieve backache. Dried powdered leaves with chicken soup are used for cough and motions in infants.

**Folk medicinal uses:** The leaves and fruits are used as vermifuge for cattle.

Botanical name: *Euphorbia prostrata* Linn.  
Local name: Warmaga  
Habit: Herb  
Part use: Whole plant  
Flowering period: March/April  
Voucher specimen No. 27

**Folk medicinal uses:** The decoction and its paste are used against ringworms. The paste is applied in skin diseases.

**Convolvulaceae**

Botanical name: *Convolvulus arvensis* Linn.  
Local name: Priwathai  
Habit: Herb  
Part use: Whole plant  
Flowering period: Whole year  
Voucher specimen No. 25

**Folk medicinal uses:** For sexual debility, about 10 g of the plant is finely crushed, boiled in milk, filtered and is given to the patient for about 10 days. For epilepsy, fresh leaves are crushed and the extract is given to the patient till recovery.

Botanical name: *Euphorbia helioscopia* Linn.  
Local name: Mandanro  
Habit: Herb  
Part use: Whole plant  
Flowering period: March to April  
Voucher specimen No. 28

**Folk medicinal uses:** For the treatment of eczema, equal quantity of the plant with *Cuscuta reflexa* is made into paste and applied on the affected parts twice a day.

**Cuscutaceae**

Botanical name: *Cuscuta reflexa* Roxb.  
Local name: Banoshah  
Habit: Herbaceous Climber  
Part use: Whole plant  
Flowering period: August to September  
Voucher specimen No. 26

**Folk medicinal uses:** For the treatment of scabies, the whole plant is crushed and boiled in water. It is strained out and the patient is asked to take bath with the decoction without using soap. The patient must avoid *Capsicum annum* in his food. For inducing sterility, 10 to 15 ml juice of the plant is given to women once only. For eczema, a paste is made from taking equal quantity of *Cuscuta reflexa* and *Euphorbia helioscopia* and applied over the affected part, thrice a day till cure.

Botanical name: *Mallotus philippensis* (Lam) Muell.  
Local name: Kambela  
Habit: Shrub or small tree  
Part use: Bark and leaves  
Flowering period: February to November  
Voucher specimen No. 29

**Folk medicinal uses:** The paste of the bark and juice of fleshy leaves is applied for wounds, cuts and bruises, 3 times a day.

Botanical name: *Ricinus communis* Linn.  
Local name: Arhanda  
Habit: Herb  
Part use: Leaves and seeds  
Flowering period: Throughout the year  
Voucher specimen No. 31

**Folk medicinal uses:** The oil extracted from seeds is used as purgative. A dose of 1 tea spoonfull with milk is given to elders and ½ spoonfull for children. The small quantity of oil is rubbed on the abdomen, which is slowly and gradually absorbed through sweat glands to release constipation. For the treatment of leucorrhoea, fresh leaves are crushed and are boiled in 200 ml of milk. It is filtered and taken for 1 month in divided doses. For the treatment of piles, the castor oil is applied locally for 1 week.

**Euphorbiaceae**

Botanical name: *Andracne cordifolia* (Dane) Muell.  
Local name: Gulpinsa



**Fagaceae**

Botanical name: *Quercus incana* Roxb.  
 Local name: Seray  
 Habit: Tree  
 Part use: Bark and fruits.  
 Flowering period: March to April  
 Voucher specimen No. 32

**Folk medicinal uses:** Bandages of bark are used for cracked bones. The half roasted, powdered fruits are mixed with Desi ghee and used in urinary infections.

**Fumariaceae**

Botanical name: *Fumaria indica* (Hauskn.) H.N.  
 Local name: Papra  
 Habit: Herb  
 Part use: Whole plant  
 Flowering period: March to May  
 Voucher specimen No. 34

**Folk medicinal uses:** The decoction of fresh leaves is taken twice a day for blood purification which results in the treatment of skin diseases. The plant decoction is used for the treatment of goiter and fever.

**Lamiaceae**

Botanical name: *Ajuga bracteosa* Wall. Ex. Benth.  
 Local name: Dagherbooti, Spinabooti  
 Habit: Herb  
 Part use: Whole plant  
 Flowering period: March to December  
 Voucher specimen No. 35

**Folk medicinal uses:** The plant decoction is taken before breakfast for the treatment of dyspepsia and sore throat.

Botanical name: *Colebrookia oppositifolia* Smith  
 Local name: Puddher  
 Habit: Shrub  
 Part use: Leaves and roots  
 Flowering period: January to April  
 Voucher specimen No. 87

**Folk medicinal uses:** Leaves are used as antiseptic for ulcers and applied to wounds. Roots extract is used in epilepsy.

Botanical name: *Origanum vulgare* Linn.  
 Local name: Shamakay  
 Habit: Herb  
 Part use: whole plant

Flowering period: June to September  
 Voucher specimen No. 36

**Folk medicinal uses:** The plant is used for toothache, earache and diuretic.

Botanical name: *Otostegia limbata* (Benth.) Boiss.  
 Local name: Spin azghay  
 Habit: Shrub  
 Part use: Leaves.  
 Flowering period: April-June  
 Voucher specimen No. 37

**Folk medicinal uses:** The leaves are used for gum diseases and curing of wounds.

**Liliaceae**

Botanical name: *Asparagus plumosus* Linn  
 Local name: Tendorai  
 Habit: Herb  
 Part use: root tubers  
 Flowering period: October to November  
 Voucher specimen No. 38

**Folk medicinal uses:** The root tubers are given together with boiled milk and sugar for diarrhea and dysentery.

Botanical name: *Asparagus adscendens* Linn  
 Local name: Shal gwati  
 Habit: Herb  
 Part use: stem and leaf  
 Flowering period: October to November  
 Voucher specimen No. 39

**Folk medicinal uses:** It is diuretic and is also used to cure jaundice and congestive liver.

**Lythraceae**

Botanical name: *Woodfordia fruticosa* (L) S. Kurz.  
 Local name: Zangli Anar  
 Habit: Shrub  
 Part use: Flower and bark  
 Flowering period: April to May  
 Voucher specimen No. 40

**Folk medicinal uses:** The juice of flowers is given twice a day in the dose of 8 to 10 ml for the treatment of sun stroke.

The fresh juice of flowers is also poured in the nostril of the patient, to check bleeding from the nose which is locally called "Naksir or Aspa". For the treatment of cold, the decoction of the bark of the plant is given in the dose of 10 to 12 ml daily for 5 days.

**Meliaceae**

Botanical name: *Melia azedarach* Linn.  
 Local name: Tora bukayanra  
 Habit: Tree  
 Part use: young branches and leaves  
 Flowering period: March to May  
 Voucher specimen No. 41

**Folk medicinal uses:** The extraction of leaves is used by women for the removal of hair lice. The farmers place the leaves in the cereals such as wheat, rice and pulses for the repelling of insects and other pests. The young branches and leaves are used as carminative for cattle. When their abdomen or belly swells up, by gas accumulation due to over eating, the leaves, young branches or fermented, fruits are given.

**Menispermaceae**

Botanical name: *Tinospora cordifolia* Miers  
 Local name: Praiwatay  
 Habit: Herbaceous climber  
 Part use: Leaves and stem  
 Flowering period: March to May  
 Voucher specimen No. 88

**Folk medicinal uses:** The leaves and stem are used for cold, cough, fever, jaundice and as a sexual tonic.

**Mimosaceae**

Botanical name: *Acacia modesta* Wall.  
 Local name: Palusa  
 Habit: Tree  
 Part use: Bark  
 Flowering period: April to May  
 Voucher specimen No. 42

**Folk medicinal uses:** The Gum obtained from the bark is crushed, mixed with wheat flour and is fried in desi ghee. The mixture so obtained is tonic for backache especially for women after delivery. It is given before breakfast with a cup of milk or warm water for a month.

Botanical name: *Acacia nilotica* Linn.  
 Local name: Kikar  
 Habit: Tree  
 Part use: flowers  
 Flowering period: July to August  
 Voucher specimen No. 43

**Folk medicinal uses:** About 30 flowers are burnt in 10 ml mustard oil and filtered. 2 to 4 drops of the oil is poured in the patient's ear for 5 days in cases of earache.

**Moraceae**

Botanical name: *Ficus carica* Linn.  
 Local name: Inzar  
 Habit: Tree  
 Part use: leaves, fruit  
 Flowering period: March to April  
 Voucher specimen No: 44

**Folk medicinal uses:** Fresh leaves are crushed and boiled in milk. It is filtered and given to the patient thrice daily for the treatment of measles, dysentery and bladder problems. Milk juice of the petioles is used to clear warts when applied on them.

The latex is applied to make possible the removal of spines and thorns easily. The fruit is used for the cure of piles.

Botanical name: *Ficus glomerata* Linn.  
 Local name: Oormal  
 Habit: Tree  
 Part use: Bark, leaves and fruits  
 Flowering period: April to May  
 Voucher specimen No. 45

**Folk medicinal uses:** An infusion of the leaves is useful in mouthwash for spongy gums. Stem latex is applied in piles and diarrhea. Fruits are stomachic and carminative.

Botanical name: *Ficus religiosa* Linn.  
 Local name: Peepal  
 Habit: Tree  
 Part use: Bark and fruits.  
 Flowering period: October to November  
 Voucher specimen No. 47

**Folk medicinal uses:** Bark and fruits are used against asthma, weakness of urinary bladder and constipation. Decoction of bark is used for vomiting.

Botanical name: *Ficus benghalensis* Linn  
 Local name: Barh  
 Habit: Tree  
 Part use: Aerial roots  
 Flowering period: April to May  
 Voucher specimen No. 48

**Folk medicinal uses:** Aerial roots are used to treat diarrhea. It is used to control increase in blood sugar of diabetic patient.

Botanical name: *Ficus palmata* Forssk.  
 Local name: Ormal  
 Habit: Tree  
 Part use: fruits  
 Flowering period: May  
 Voucher specimen No. 49

**Folk medicinal uses:** Fruit is laxative and also used in diseases of lungs and urinary bladder.

Botanical name: *Morus alba* Linn.  
Local name: Speen Thooth  
Habit: Tree  
Part use: fruits and leaves  
Flowering period: February to March  
Voucher specimen No. 50

**Folk medicinal uses:** The leaves and fruits are used as purgative.

### Myrsinaceae

Botanical name: *Myrsine africana* Linn  
Local name: Manroo  
Habit: Shrub or small tree  
Part use: Leaves and fruits  
Flowering period: February to April  
Voucher specimen No: 51

**Folk medicinal uses:** The fruits are used as spices, carminative, appetizer and flavoring agent. The leaves are used as tea.

### Myrtaceae

Botanical name: *Myrtis communis* Linn. Myrtle  
Local name: Manroogan  
Habit: Shrub or small tree  
Part use: Leaves and fruits  
Flowering period: May  
Voucher specimen No. 52

**Folk medicinal uses:** The green, dried fruits are used for stomach diseases. Myrtle oil, obtained from the leaves by distillation, is used as tonic.

### Oleaceae

Botanical name: *Olea ferruginea* Royle  
Local name: Khoona  
Habit: Tree  
Part use: Leaves and fruits  
Flowering period: April to May  
Voucher specimen No. 54

**Folk medicinal uses:** The decoction of fresh leaves is kept in the mouth at night till recovery. This strengthens gums and relieves toothache. The oil extracted from the fruits is used as massage in the treatment of rheumatism and dislocation of bones. The patient will avoid bath with cold water during the treatment for 1 week.

### Oxalidaceae

Botanical name: *Oxalis corniculata* Linn.  
Local name: Threwakay  
Habit: Herb  
Part use: Whole plant  
Flowering period: March to April  
Voucher specimen No. 53

**Folk medicinal uses:** The juice extraction from the fresh plant is used for stomach troubles. It is also used for the cleaning of rusted vessels.

### Papilionaceae

Botanical name: *Butea monosperma*. (Lam) P. Kuntra  
Local name: Palay  
Habit: Tree  
Part use: Whole plant  
Flowering period: March to April  
Voucher specimen No. 61

**Folk medicinal uses:** The gum of the plant is (Kamar Kas) fried in desi ghee (butter), mixed with carbohydrate, locally called "Nashasta" (extraction from the grains of wheat) and is given in the dose of 2 to 4 g, twice a day for 20 days, in backache and weakness caused after delivery in women. Equal quantity of pods and root is dried and powdered.

A dose of 20 g of the mixture is given once daily for 1 week to expel worms. In cases of children, the dose should be reduced to half. The flowers, bark and gum of the plant are mixed in equal quantity, powdered and is taken in the dose of 5 g twice a day for the treatment of gonorrhoea;

### Pinaceae

Botanical name: *Pinus roxburghii* Sergeant  
Local name: Nakhtar  
Habit: Tree  
Part use: stem  
Voucher specimen No. 63

**Folk medicinal uses:** The resin (locally called ganda baroja) extracted from the main stem is used against ulcer, snake bites and skin diseases.

### Platanaceae

Botanical name: *Platanus orientalis* Linn.  
Local name: Chinar  
Habit: Tree  
Part use: Bark  
Flowering period: April to May

Voucher specimen No. 64

**Folk medicinal uses:** For blisters, powdered bark is mixed with wheat flour and soap to make a poultice. It is applied with cotton cloth on the affected parts of the body. The bark is given for toothache and diarrhea.

### Polygonaceae

Botanical name: *Rumex hastatus* D. Don  
 Local name: Tarookay  
 Habit: Shrub  
 Part use: Leaves, young shoots.  
 Flowering period: April to August  
 Voucher specimen No. 65

**Folk medicinal uses:** The leaves and young shoots are used as flavoring agents, carminative, purgative, diuretic and for stomach problems.

### Poaceae

Botanical name: *Arundo donax* Linn  
 Local name: Kana Bans  
 Habit: Shrub  
 Part use: rhizome  
 Voucher specimen No. 66

**Folk medicinal uses:** Decoction of rhizome is emollient and diuretic.

Botanical name: *Cynodon dactylon* (Linn) Pers.  
 Local name: Kabal  
 Habit: Herb  
 Part use: Whole plant  
 Flowering period: April to June  
 Voucher specimen No. 67

**Folk medicinal uses:** The plant is used against bleeding. About 10 ml juice of plant is added with crystalline sugar and given 3 times a day for 20 days to check bleeding through nose and urine. The plant is crushed, grinded and applied externally on any body part to stop bleeding. It is also used along with rose flower in jaundice.

### Punicaceae

Botanical name: *Punica granatum* Linn.  
 Local name: Anar, Ananghori  
 Habit: Tree  
 Part use: Leaves, bark, fruits and seeds  
 Flowering period: April to May  
 Voucher specimen No. 71

**Folk medicinal uses:** The peel of the fruit is dried, soaked and grinded. The powder so formed, called "Narsaway", is mixed in small quantity in a cup of curd; which is used twice in a day till recovery for the treatment of external bleeding and dysentery. Fruit (Juicy seeds) is blood purifier and has cooling effects. The bark of stem and root is anthelmintic, antipyretic and expectorant. The dried seeds, locally called anar dana, is used in condiments for its taste.

### Rhamnaceae

Botanical name: *Sageretia thea* Linn  
 Local name: Momanra  
 Habit: Shrub  
 Part use: Root  
 Voucher specimen No. 72

**Folk medicinal uses:** The extraction of roots is used as cooling agent in jaundice.

Botanical name: *Ziziphus numularia* (Burm. f.) Wight and Arn.  
 Local name: Kurkanda  
 Habit: Tree  
 Part use: leaves  
 Voucher specimen No. 73

**Folk medicinal uses:** Leaves are used in scabies and boils.

### Rosaceae

Botanical name: *Rubus fruticosus* Linn  
 Local name: Karwara or Baganra  
 Habit: Shrub  
 Part use: Leaves, fruits  
 Flowering period: June  
 Voucher specimen No. 74

**Folk medicinal uses:** The leaves are useful for diarrhea, coughs and fevers. A glass of sweet extract from the fruits is drunk daily before breakfast for 4 days for asthma and as tonic.

Botanical name: *Pyrus pashia* Ham. Ex. D. Don.  
 Local name: Tanga  
 Habit: Tree  
 Part use: Fruits  
 Flowering period: February to March  
 Voucher specimen No. 76

**Folk medicinal uses:** The fruits are febrifuge, sedative and laxative.

**Sapindaceae**

Botanical name: *Dodonaea viscosa* (L.) Jacq.  
 Local name: Ghwraskay  
 Habit: Shrub  
 Part use: Leaves  
 Flowering period: March  
 Voucher specimen No. 46

**Folk medicinal uses:** The leaves are warmed and kept on joints to relieve pains, swellings and also for softening boils.

**Scrophulariaceae**

Botanical name: *Verbascum thapsus* Linn.  
 Local name: Kharghwug  
 Habit: Herb  
 Part use: leaves, flowers  
 Flowering period: May to August  
 Voucher specimen No. 56

**Folk medicinal uses:** About 40 g of dried leaves and flowers are boiled in 1000 g of Cow's milk for 10 min, strained and the filtered milk is given to the patient thrice daily in cases of asthma. The leaves are warmed, tightly tied on the joints to relieve pain and also used for softening boils.

**Simarubaceae**

Botanical name: *Ailanthus altissima* (Mill) Swingle  
 Local name: Angrizai backyanara  
 Habit: Tree  
 Part use: bark  
 Flowering period: April to May.  
 Voucher specimen No. 77

**Folk medicinal uses:** Bark juice is mixed with milk for curing dysentery and diarrhea.

**Solanaceae**

Botanical name: *Solanum nigrum* Linn  
 Local name: Kachmachu  
 Habit: Herb  
 Part use: Whole plant.  
 Flowering period: April to June  
 Voucher specimen No. 57

**Folk medicinal uses:** It is used in diabetes, diarrhea and also acts as expectorant and sedative.

Botanical name: *Solanum surratense* Burm. f.

Local name: Manraghonay  
 Habit: Herb  
 Part use: Whole plant  
 Flowering period: February to March  
 Voucher specimen No. 58

**Folk medicinal uses:** The plant is expectorant, diuretic and anti-asthmatic. It is also used for stomachache, coughs, fever pains in the chest and gonorrhoea.

**Sterculiaceae**

Botanical name: *Helicteres isora* Linn.  
 Local name: Chamyaray  
 Habit: Shrub or small tree  
 Part use: Flowers and seeds  
 Flowering period: February to March  
 Voucher specimen No. 60

**Folk medicinal uses:** Seeds are used for colic infections and dysentery.

**Thymeleaceae**

Botanical name: *Daphne mucronata* Royle  
 Local name: Laighonai  
 Habit: Shrub  
 Part use: Fruits  
 Flowering period: April to May  
 Voucher specimen No. 78

**Folk medicinal uses:** The fruit poultice is used against rheumatism.

**Ulmaceae**

Botanical name: *Celtis australis* Linn  
 Local name: Tagha  
 Habit: Tree  
 Part use: Fruits  
 Voucher specimen No. 89

**Folk medicinal uses:** The fruits are applied in colic infections and allergy.

**Urticaceae**

Botanical name: *Debregeasia salicifolia* (Forssk).  
 Local name: Ajlai  
 Habit: Shrub  
 Part use: Aerial part  
 Flowering period: April to May  
 Voucher specimen No. 79

**Folk medicinal uses:** The powdered aerial parts are mixed with mustard oil and used as an antifungal for curing skin rashes, dermatitis and eczema.

### Verbenaceae

Botanical name: *Lantana camara* Linn  
 Local name: Amrud gulay  
 Habit: Shrub  
 Part use: Whole plant  
 Flowering period: April to July  
 Voucher specimen No. 80

**Folk medicinal uses:** The plant is diaphoretic, carminative, anti spasmodic and useful for diabetic patients. Decoction is given in tetanus, rheumatism and malaria.

### Violaceae

Botanical name: *Viola canescens* Wall. Ex. Roxb.  
 Local name: Banafsha  
 Habit: Herb  
 Part use: Whole plant  
 Flowering period: March to May  
 Voucher specimen No. 81

**Folk medicinal uses:** It is used as purgative, diaphoretic, febrifuge and an anticancer.

### Vitaceae

Botanical name: *Vitis Jacquemotii* R. Parker  
 Local name: Gedar kwar  
 Habit: Herbaceous climber  
 Part use: Fruits  
 Flowering period: April to May  
 Voucher specimen No. 82

**Folk medicinal uses:** Fruits are laxatives.

### CONCLUSION

The study area is endowed with a wealth of traditional uses of plants. The inhabitants of the area are very poor and have no or insufficient knowledge about proper time of collection, preservation and storage of medicinal plants. The medicinal plants are collected without any scientific approach. They uproot the herbs, cut the shrubs and large trees without any care, making their recovery very hard. Preservation (drying) is done by local inhabitants (traditional healers) by very crude forms. The women spread the plants/ plant part on the floor for 3 to 6 days for drying which are exposed and contaminated

easily. There is no proper place for storage and plants may be infected by fungi and insects. Consequently, the area faces intense deforestation, overgrazing, agricultural expansion, and soil erosion. The local people have to collect the common medicinal plants from remote forests which were once easily available close to their villages. *Acacia modesta*, *Acacia nilotica*, *Asparagus plumosus*, *Bauhinia variegata*, *Berberis lycium*, *Calotropis procera*, *Olea ferruginea*, *Pinus roxburghii*, *Phoenix dactylifera*, *Rhazya stricta*, *Viola canescens* and *Ziziphus numularia* are likely to be wiped out, if no conservation strategy is adapted for the area. Hence, there is a dire need for awareness, to educate and train the local inhabitants regarding the proper use and cultivation of available medicinal resources. In-situ and ex-situ conservation method can be practiced to avoid further depletion of rare plants. Local people can be involved to cultivate sustainable species, control regular grazing and to apply conservation strategies.

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