

## MEDICINAL PLANT RESOURCES FOR ECONOMIC DEVELOPMENT OF RURAL COMMUNITY IN MANKIAL, DISTRICT SWAT

By

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### ABSTRACT

Pakistan forest resource base is mostly found in northern areas like Swat and mountains of KPK. These mountainous areas are characterized by biophysical and socio-cultural diversity and have an important role in the development of nation's economy. However the region suffers from serious environmental problems like deforestation, soil degradation, loss of biodiversity and unsustainable livelihoods. In this context, a study on the ethnobotanical and economic evaluation of coniferous forest of Mankial valley of District Swat was conducted during summer, 2008 with the aim to identify and prepare the inventory of important forest resources particularly medicinal plants for the socio-economic development of study area. The study mainly focused on a series of consultation with local people of different age groups. The study revealed 216 (160 known and 56 unknown to the local) species of 86 families having ethanobotanical importance. They were classified as 145 herbs, 37 trees, 26 shrubs, 4 mushrooms and 4 climbers. However the results showed that gatherers have very little marketing skills and are often unaware of high market value. As a result most of the collected materials are sold to local middleman at very low price. In addition, study also revealed that availability of important medicinal plant SPP is decreasing and the number of rare/ threatened SPP among MAPs is increasing. Further study is, therefore required to quantify the availability of species and to suggest suitable method for their production and conservation.

**Keywords** : SPP stands for species, L / S stands for live stock, NTFPS stands for National Timber Forest Plants, SDC / IC stands for Swiss Development Cooperation / Inter Cooperation

### INTRODUCTION

Forests have high economic and ecological importance. Forests provide fire wood, timber and other products for local communities who are directly dependant on these natural resources for subsistence. The mountainous area of the study is covered by dry temperate coniferous forest, which helps in maintaining a microclimate in the area. This region has been regarded as a natural reservoir for the collection of a variety of wild medicinal and aromatic plants. It is therefore important to create awareness amongst communities, particularly for those spp, which cover area under high bioenvironmental pressure in the area. Mankial valley of District Swat usually comprised of one Union Council and more than 23 villages represent unique and enormous diversity of flora and fauna within a relative small geographical area due to variations in topography, altitude and climate. According to Karkii and Williams, 1999 almost 2000 medicinal and aromatic plant species are estimated to exist in Pakistan, however few of them are harvested and

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90% of them is imported. This is mainly due to the knowledge on medicinal plants being confined to the tribal areas. The medicinal plant species have supported livelihood of many people in the area. The high dependency of rural people on medicinal and aromatic plants for subsistence and unsustainable harvesting practices has resulted in over exploitation of resources in different areas of the country. Similarly, conversion of natural habitats into agricultural land has greatly decreased population size of these plants. Traditional practices of extracting forest resources especially MAPs is mostly unsustainable due to the lack of resource tenure and custodianship, sustainable use and management parameters, proper harvesting, collection procedures and knowledge of marketing. Likewise, quantitative and economic analysis of the effect of extraction on this ecological process is very important to assess the harvesting effect on development of entire forest resources in general and medicinal plants in particular formulate sustainable harvesting regimes. Gathering and processing of MAPs for family use in human and L / S treatment become an old practice (Hassain et al., 2006). In most of the developing countries, the use of traditional medicine for health maintenance has been widely observed as custom. Now, it has been traced to the extraction and development of several drugs and chemo-therapeutics from these plants. Sher et al., 2006 stated that collection and sale of MAPs and other non timber forest resources is an important economic activity in northern parts of Pakistan, and among 5000 families mostly women and children are involved in this process. These collectors receive minimum in the trade chain of medicinal herbs. Therefore, local people are losing the preservation of MAPs. Furthermore, with the increased human population alongwith livestock, has resulted in alarming decrease in the biomass coverage of certain economically and medicinally valuable plant spp. different researchers have worked out on the documentation of medicinal plant uses and ethanobotany of district Swat. But no such reference exists on economic evaluation of coniferous forest of Mankial valley. Therefore, present study was initiated with the aim to prepare an inventory of medicinal plants along with their traditional uses and economic value.

**General objective:**

- To maintain the population cover and density of economically and pharmaceutically important medicinal plants for economic development of rural community.

**Specific Objectives:**

- To document the inventory of medicinal plants for the socio-economic development of the study area.
- To identify the marketable species of medicinal plants.
- To describe the marketing procedures of medicinal plants.
- To suggest measures for development of medicinal plant production.

**MATERIALS AND METHODS**

**General** information regarding medicinal plants and other forest resources of the investigated area were obtained from Forest Department Swat. Area was accordingly divided into different sites and then frequent visits were made first in May, 2nd in June and July and 3rd in August and September.

**3.1 Sampling**

There are approximately 1600 respondents of these villages at Mankial who are involved in the production of NTFPs. A sample of 80 respondents has been drawn through simple random sampling techniques, which are about 50% of the total respondents.

**3.2 Interview Schedule:**

Interview Schedule containing various questions was used as tool for the collection of information. Questions were divided into two parts, first part include personal information such as name, locality, age, education and profession. While, part second was specific containing pattern of forest resource utilization.

**3.3 Pre Test:**

To identify any amendments required in the interview schedule, a pre-test was conducted in the month of May, 2008 in the nearby villages of the valley.

**3.4 Field Survey:**

The traditional uses including medicinal use of plant resources were collected from local people. Mostly elder persons having age groups vary from 40-60 years. Data on marketing of NTFPs in general and medicinal plants in particular were gathered from local experienced persons through interviews and discussions. However information on the market value of the plants were collected from local collectors, hakims and shopkeepers. For every economically and ethnobotanically important plant species the local inhabitants were also asked about its abundance, distribution and population size. This was judged by 20 years old records with the current situation.

**3.5 Research Tools:**

The following research tools were used during research work in the field.

Quadrates, nylon threads, hydrometer, air thermometers, digital camera, interview schedule and questionnaire etc.

**3.6 Data Analysis:**

**Data was analyzed statistically by applying simple percentage formula to draw results and conclusions.**

$$\text{Percentage} = \frac{f}{n} \times 100$$

**f = Total Frequencies**

**n = No. of Observations**

In order to fulfill the main objective that was to assess the effects of medicinal plants resources on the local communities of the study area. Though it is not an easy task to determine the overall effects of medicinal plants, thus “people judgment” method was used to study the effect with the assumption that people have better perceptions than others.

## RESULTS AND DISCUSSION

The main aim of this chapter is to discuss and analyse the results through field investigation. Keeping in view the extent to which the medicinal plants have impact on health, education, rural and cultural events of the community. An interview schedule was developed to analyse the following parameters.

### 4.1 Education

The respondents were classified into four categories on the basis of education. 1st category consist of illiterate, 2nd undermatric, 3rd consist of matric and 4th consist of graduate having higher education. Results found in Table No. 1 showed that out of total 80 respondents 20 were illiterate that becomes 25 % of total respondents 16 (20%) were under matric, 19 (24%) were matriculate and 25 (31%) respondents came under graduate category. Generally it is considered that education affects positively the efficient utilization of resources. The adaptation rates of modern technologies by educated people could be higher than traditional ones. These findings are also confirmed with Marwat (1998) who has reported that awareness as a tool can be used to motivate people to increase their education level as well as to protect their economical medicinal plants from extinction.

**Table # 1**

**Distribution of the Respondents according to their Education Status**

Education level	Frequency / No. of Respondents	Percent (%)
Illiterate	20	25
Under Matric	16	20
Matric	19	24
Graduate	25	31
Total	80	100

### 4.2 Profession

The residents of the study area were in different professions to earn their livelihood. Majority of them were farmers and labourers. Results shown in Table No. 2 showed that farming was the main source of livelihood in this area. Mostly were shopkeeper and 8% were government employees. However, these people also practiced farming as part time profession.

**Table # 2**

**Distribution of the Respondents according to their Professional Status**

Profession	Frequency / No. of Respondents	Percent (%)
Farmers / Agriculture	36	45
Government Servant	08	10
Business Men	10	13

Others	26	32
Total	80	100

### 4.3 Land Holding

In this area land is distributed into small fragments. The areas were mostly occupied by small land holders. Out of 80 respondents, 63% of them had less than 5 acres of total land holding, 25% had between 5 to 20 acres and only 20% were big land holders (Table No. 3). On the other side out of 80 houses which comprised of 653 persons, majority of the respondents had family size between 8-14 members.

**Table # 3**

#### Distribution of the Respondents according to their Land holdings

Land holding	Frequency / No. of Respondents	Percent (%)
< 5 Acres	50	63
5 -20 Acres	20	25
> 20 Acres	10	12
Total	80	100

### 4.4 Earning members of the Households

Prosperity of the society depends upon earning status of its members, but earning hands of this area are very low. The detail of earning members in this area is summarized in Table No. 4 that has showed that 47.50% respondents belong to families in which earning persons were between 1-2 and 30% of them were found between 3-4 and so on. Therefore, results concluded that it is evident that family size in the area is large but earning members within a family are very few, which increases poverty level and hence a pressure on natural resource ecosystem is developed. These findings are correlated with Keerio and Mehboob (1999) who reported that low earning hands cause poverty that can have negative impact on natural resources of that area.

**Table # 4**

#### Earning members of the Households

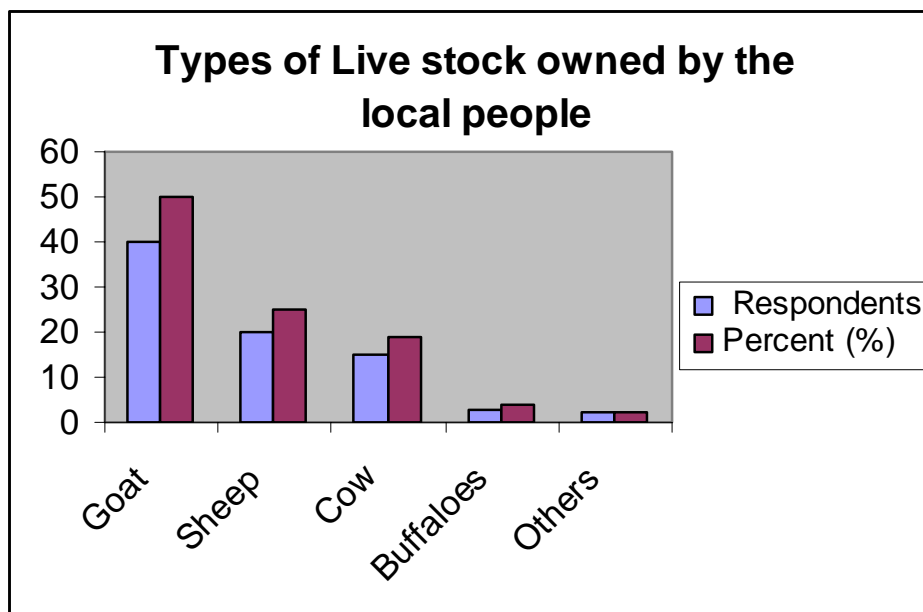
No of Earning members/House hold	Frequency	Percent (%)
1-2	38	47
3-4	24	30
5-6	10	13
7-8	8	10
Total	80	100

### 4.5 Types of livestock owned by local people in study area

Livestock is essential asset of Pakistan. But these assets turn into liability when their number exceeds the natural resources of any area. Hence pressure developed on the resource. Graph # 1 shows that 50% goats, 25% sheep, 19% cows and 4% buffaloes are usually owned by local people. These Livestock owned by native degenerate the ecosystem very fast. Research Findings of Shah (1999) reported that these livestock affects the vegetation in three ways: through trampling that reduces the rate of natural regeneration, browsing of small trees and bushes and soil trampling which results in

compaction, therefore, less growth of new seedling occurs. The target medicinal plants were severely grazed by livestock. It is, therefore important to manage the grazing system to encourage the regeneration of medicinal plants.

**Graph # 1**  
**Types of livestock owned by local people**



#### 4.6 Impact of medicinal plants on socio economic conditions of community

Results found in Table No. 5 described that the impact of medicinal plants cultivation on local community is significant. Majority of the respondents (81%) are believable / confident to have an impact of medicinal plants cultivation in improving their socio-economic conditions, while 19% gave negative response. The same results are also derived by **Qureshi (1999)** that rural people are engaged in the business of natural resource development especially medicinal plant, they meet their house expenses through selling these resources. But present study also noticed that structure of medicinal plant trade is complex involving many players like collector, middleman, wholeseller, retailers. According to SDC / IC (2000) middleman and wholesalers earn a lot of profit from medicinal plants. Therefore, their price becomes double and triple after reaching International markets.

**Table # 5 Impact of medicinal plants on socio economic conditions of community**

Impact on economic condition of community	Frequency	Percent (%)
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Yes	65	81
No	15	19
Total	80	100

Source: field survey

#### 4.7 Collection of medicinal plants

Results found in Table No. 6 showed that among household, majority of men and children were involved in the collection of medicinal plants. However, Rubina (2004) reported that medicinal plants have significant impact on the socio economic condition of the community. Hence, employment and income in this region depends heavily on this resource, therefore its contribution in local community is highly significant.

**Table # 6 Collection of medicinal plants**

Collectors	Frequency	Percent (%)
Children	08	10
Men	24	30
Women	20	25
Children + Men	28	35
Total	80	100

#### 4.8 Problems in collection and marketing

Data presented in Table No. 7 described that 78% of the respondents have no problem in collection and marketing of medicinal plants. While, 22% of them face problems of low prices for medicinal plants and non availability of local purchaser. During the focus group discussion traders dealing medicinal plants identified various problems, including acquiring of transport permit, supply low quality produce, declining margins, non existence of business association and lack of access to market information. These results are also supported by the findings of Qureshi (2000) highlighted similar problems. It was also observed that medicinal plant trade in Pakistan in general and District Swat in particular is largely in the unorganized private sector with very little state control. Often the rare or threatened plant species are collected without check. Sher and Hussain, 2003 stated that trade and collection of plant material is mostly handled by unskilled persons.

**Table # 7 Problems in collection and marketing**

Types of Respondents	Frequency	Percent (%)
No	62	78
Yes	18	22
Total	80	100

#### 4.9 Income of Households from medicinal plants

The average income of the sample population from the medicinal plants per season was estimated about Rs. 13,130. However, results presented in Table No. 8 shown that 55%

respondents have income range from Rs. 0-10,000 per season. While, 45% have income ranging from Rs. 10,001-200,000 per season from the sale of medicinal plants. Sheerin (2002) studied that the commercial importance of medicinal plants of Kalam valley Swat, reported 80 SPP of ethno botanical importance and that of 15 plant SPP collected for sale purposes by the local people. However, commercialization of some medicinal plants like walnut bark and morel mushrooms also function as safety net and livelihood options in this area.

**Table # 8 Income of Households from medicinal plants**

Income in Rs.	Frequency	Percent (%)
0 to 10,000	44	55
10,001 to 200,000	36	45
Total	80	100

#### **4.10 Ethanobotanical uses**

The present study revealed that there were 216 plant species belonging to 86 families. They include 73 dicotyledons, 8 monocots, 4 pteridophytes, 02 gymnosperm families, one from fungi group. Out of 216 plants, 145 herbs, 37 trees, 26 shrubs, 4 mushrooms and 4 climbers were documented in the area Mankial valley district Swat. The study also revealed that investigated area was traditionally rich in traditional usage of plants, forest products. It has been observed that local people have rich indigenous knowledge about distribution, abundance; harvesting and marketing of medicinal and aromatic plants. Most of these plant SPP were used for the treatments of various ailments like for stomach gastro intestinal problems, arthritis, act as anti helmentic, laxative, used for the cure of skin diseases, aching, scabies, eczema even for sore throat and fever. In addition, information regarding the harvesting and use of specific plant parts of medicinal and aromatic plants were also collected. Most of them were used and harvested for roots and rhizomes and various parts having medicinal values such as leaves, fruit and bark.

#### **4.11 Use at local level**

The local medicine uses of few high value medicinal plants species in term of its high traditional medicinal uses are given as follows as local community has strong faith in these few SPP only, while remaining are used in rare cases.

##### **Aconitum or leaves**

The dried powdered rhizomes of Aconitum or leave are mixed with ghee and taken orally for the curing of lumbago problem and for anorexia. In Mankial valley, these are used for the treatment of myalgia.

##### **Bistorta amplexicaule**

The fresh rhizomes of Bistorta amplexicaule is taken orally with glass of water for curing of joint pains.



**Bunium persicum**

These are mainly collected for commercial purposes. It is used as spice and condiment agent at local and national levels.

**Corydalis govaniana**

The rhizomes *Corydalis govaniana* are used to improve eyesight and to treat all kinds of eye diseases.

**Ferula narthex** and **Ephedra geradiana** are used as fuel in Mankial valley.

**Trachyspermum ammi**

The fruits of **Trachyspermum ammi** are used as stimulant, carminative and antispasmodic agent.

**4.12 Availability and distribution**

The study revealed that medicinal plant species and other forest resources like fuel, fodder, timber wood etc are found in almost all habitat of the study area. However, its pattern of distribution of individual species was found to be quite variable due to difference in altitude habitat. Some were found to be quite abundant and some other occurs in restricted habitat of study area. For example among medicinal plants *Bistorta amplexicaule*, *Mentha viridis / longifolia*, *Paeonia emodi*, and *Polygonatum multiflorum / vertillatum* etc still exist in highest number in most of the study area. While, *Morchella esculenta*, *Aconitum* leave, *Valeriana jatamansii*, *Podophyllum hexandrum* and *Berberis vulgaris* were recorded in few site of study area.

**CONCLUSION**

Data was collected through structure and unstructured interviews. Structure interview contain variety of questions. 80 households were selected through simple random sampling from the population. Mostly were illiterate, their main occupation is agriculture and casual labor. An average of four persons per family is earning members. The average income of sample population from medicinal plants per season was estimated about Rs. 13130 per annum. While, Rs. 12777 per annum from agriculture. Survey results revealed that majority of the household had medicinal plant income more than of the labor work income. However, only few species are known, while several species of medicinal and aromatic plants were completely unknown to the community. Most of the respondents have no problem in collection and marketing of medicinal plants while small portion has mentioned that they face problems of low prices MAPs and non availability of local purchaser. In addition, the study recorded valuable information about medicinal plant species.

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