

# **Women's Role in Use and Management of Rangeland Resources in Semi-Arid Mountains: a Case Study from Karak District, North Pakistan**

T. Iffat

Department of Geography, University of Peshawar, Pakistan

## **Abstract**

Mountains occupy almost 60% of the area of Pakistan, with over 90% of them lying in arid to semi-arid regions. Agricultural land is limited either because of aridity or relief. Hence rangeland is the most widely-used land type in Pakistan. In spite of its great importance to the economy, rangeland management has largely remained neglected in the region. This is partially due to a lack of coordination and of clearly demarcated areas of responsibility between communities and line agencies. However, an even greater problem is the lack of knowledge, research and technical expertise needed for rational use and management of these resources. Often decisions are made about natural resources without any input from women, who have an intimate knowledge, relationship and vested interest in the land and environment around them. The main objective of this paper was to develop methodology for collecting information about the users of these resources and to provide baseline data for future research. A case study was conducted in mountainous northwest Pakistan to find the key factors responsible for the higher dependency of women on rangeland products and their role in use and management of this resource. Primary data about the users was collected through questionnaires with added interviews. Information collected about the uses, management strategies, present status of resources and changes that have occurred during the recent past was cross-checked by group discussion with the elders of the study area. Results indicate that the low socio-economic status of women is one of the major factors in their high dependency on rangeland resources. Many of these resources have declined in quality and quantity in the study area, though some species have reappeared after a long absence, due to limited use following the availability of alternatives. Women generate considerable cash income from these resources. We can conclude that one of the keys to sustainable development and natural resource management in rangelands is to integrate these marginalised women into the formal economy. This can only be done if they are provided with alternate employment opportunities through skill development programmes and micro-financing. Moreover, their local knowledge can also be integrated as a resource in conservation planning processes.

*Keywords: rangelands, northern Pakistan, women, resource management, arid areas, low mountains, poverty alleviation, village surveys.*

## **1. Introduction**

This paper is based on research carried out in one of the mountainous districts of northern Pakistan. It primarily discusses the degradation of natural resources and the impact on users, who in this case were women from lower socio-economic groups.

## **1.1 Background**

Dry area ecosystems are generally fragile and have a limited capacity to adjust to change. In arid and semi-arid regions where resources are very limited, the over exploitation of already scarce resources can have devastating effects on the habitat and its inhabitants (e.g. von Maydell, 1985). The sparse vegetation native to these regions is easily disturbed as a result of relatively minor changes in climate or over-exploitation caused by socio-economic stress. Rehabilitation of the native vegetation in such an environment is difficult and expensive, and can even be impossible in severe cases of degradation. Removal of vegetation leaves the soil bare, which leads to severe problems such as soil erosion and desertification, which can often have far greater detrimental consequences on the environment than foreseen. Environmental devastation is not simply the wastage of resources; it is a threat to the complex structures that support human development (UNFPA, 2001)

In semi-arid mountainous regions, most agricultural activity occurs in rangelands, which thus have a critical role in agro-pastoral systems and must be recognised as a vital natural resource (Tutwiler et al, 2001). Agriculture and animal husbandry are the main sources of income for most households in these regions (Stöber and Herbers, 2000). As in other arid regions (e.g. Johda, 1986), local communities depend heavily on natural resources for both these activities. In addition, as part of their subsistence strategy, they also collect different rangeland products. These products play a crucial role in supporting community welfare as significant sources of food products, fodder, fuel, fertiliser, fibres, medicines, gums and resins, oils and construction materials. Communities also sell wood, flowers, tamarind, honey and spices to raise important income. Natural resources thus provide opportunities for additional employment and income to the indigenous population (Byers and Sainju, 1994). Activities related to the collection and primary processing of these products can provide opportunities for the equitable participation of women and indigenous people. They are also valued as components of social and cultural identity. However, the uses and values attributed to their activities vary enormously from one area to the next. Women play a central role in gathering, processing, storing, utilising, managing and marketing such products. Women contribute more than 70% of the work, and in some cases carry out all relevant activities (Tutwiler et al, 2001).

## **1.2 The problem**

While the connection between population growth, use of natural resources and the natural environment is obvious, the problems are often aggravated by poverty, mismanagement and recklessly extensive use of resources (Bencherifa and Douglas, 1991). This can have disastrous consequences for both man and the ecosystem in question. Population pressures in the last few decades have increased tremendously, particularly on forests and rangeland resources, which is causing many environmental problems. Because the poor are highly dependent on these natural resources, environmental degradation processes limits their livelihood options. Additionally, non-local interests/extractive industries invest in mountain

resources without always investing some profits locally. This has an overwhelming effect on the environment and those who are most dependent on common property resources.

Mountains occupy almost 60% of area in Pakistan with over 90% of them lying in arid to semi-arid regions, which are often fragile marginal ecosystems. Agricultural land is limited either because of aridity or relief, hence rangeland is the most widely-used land type in Pakistan occupying more than 48% of the land area.

Rural women comprise more than half of the total population of Pakistan and work, on average, 14-16 hours per day. Most women are busy with household work such as cooking, washing, fetching fuel wood and water and some also perform agricultural activities, repair houses and rear livestock etc. Empirical studies showed that between 70-80% of rural women in Pakistan participate in economically recognised activities while the rest work in providing support mechanisms, integral to the rural economy productive system (Shaheed and Mumtaz, 1990). The degree of women's involvement in the family economy varies according to their age and socio-economic status. The geographical location and environmental profile of the region are also important factors. It is a documented fact that the economic participation of women is higher in mountainous and rain-fed areas compared to irrigated land and plains (Shaheed and Mumtaz, 1990). In peripheral and less developed areas, the role of women in the use of natural resources is usually greater than that of men who are generally only directly involved in timber extraction. In many developing countries women are usually responsible for a large part of food production and for fetching water. It is considered the women's job to provide the family with rudimentary and basic initial needs in terms of healthcare and education (Barke, 1993). They also play the key role in the management and day-to-day collection of non-timber forest products (NTFPs) and processing of tree products for self-use as well as income generation to meet household needs.

## **2. Study area**

Karak district is located in the northwestern part of Pakistan (see map 1). The study area stretches between 32°-48° to 33°-23° north latitude and 70°-40° to 71°-30° east longitude, covering a total geographical area of 395,500 ha (3,372 km<sup>2</sup>) in the southern part of the North-West Frontier Province. Overall the area has moderate relief ranging from 300-1,400 m above sea level. Climatically, the district is situated in a semi-arid region of the country where the average annual rainfall is 330 mm and is highly variable in terms of time and amount. Cultivable land is limited and only 18.8% is cultivated, and mostly without irrigation (2% irrigated). The high variability in rainfall in the region often results in crop failure. Only 2.1% of the total area of the district is covered by some kind of forest, which is lowest forest cover rate in the province. Economically, the region is lagging behind other areas in the province. There is no big industry or any other income generating activities. Therefore

most educated and skilled people migrate to other locations within Pakistan or overseas in search of jobs (Shah and Husain, 1998).

Mixed mountain agriculture is practised widely in the district. Arable farming, animal husbandry and rangeland resources are the three major components of this system. Most of the activities are distributed on a gender basis because gender, and labour division based on gender, are decisive elements which give mountain societies stability and cohesiveness (Illich, 1982; Abu-Lughod, 1985). The role of women is more visible in livestock and rangeland related activities than in arable farming. They use the rangeland resources for household use and off-farm income generation. As in many places throughout the world, these domestic economies are systems in which production activities are organised within households, and the business and home are not differentiated. The main aim is to meet the needs of households rather than to maximise profits (Stöber and Herbers, 2000). However, these economies are not necessarily subsistence economies and not all home products are exclusively consumed by the family. Sale of these products on a small scale to meet household needs is common.

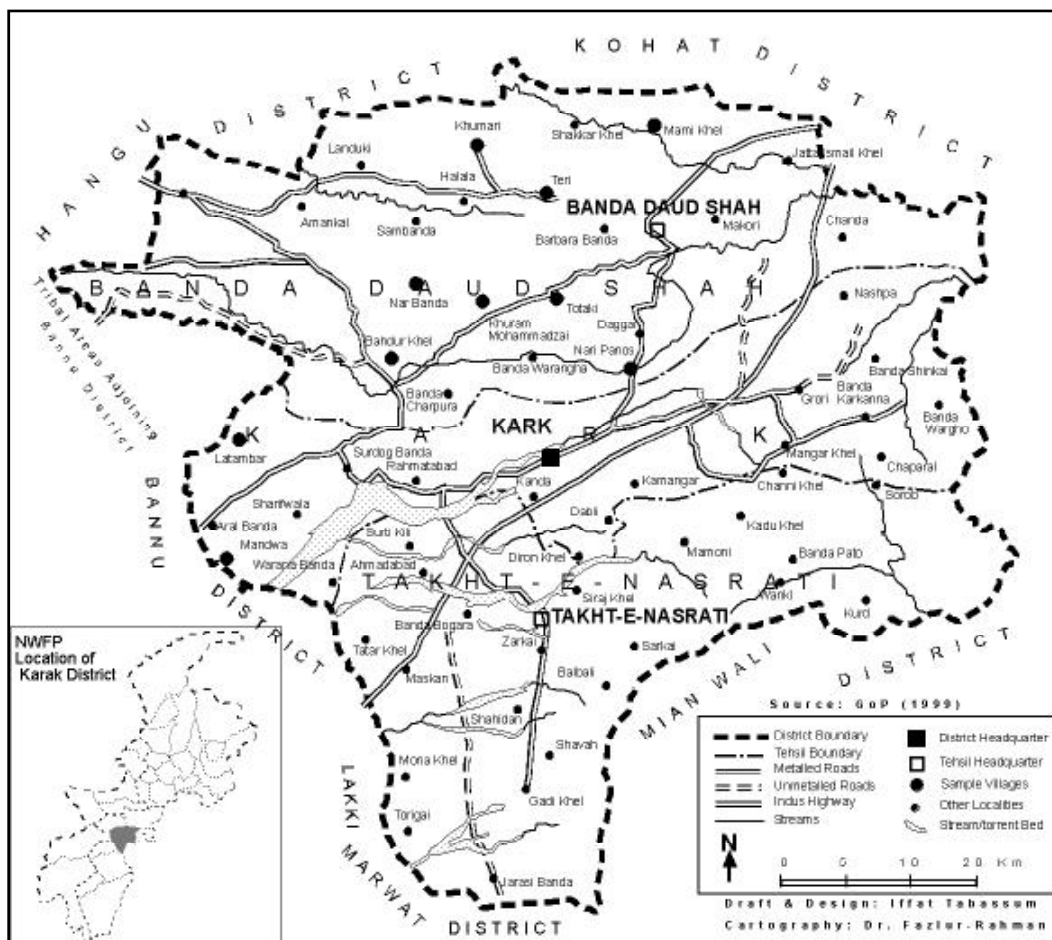


Figure 1: Karak district and location of sampled villages

## **2.1 Rangeland resources in the study area**

Mountain slopes, land with no or little capacity for crop production and the riverbanks serve as rangeland, usually for grazing, and collection of rangeland products. Forests and rangelands provide important economic resources for the inhabitants of mountains and in the surrounding areas. There are a number of groups who are heavily dependent on forest and rangeland products. Marginal groups, including landless, tenant and subsistence farmers, waged workers, nomads, and women are highly dependent on these resources to meet their subsistence needs and to generate additional incomes. Such groups gather a wide variety of products from common land, state forests and private marginal lands for both personal use and for sale. These include food, fuel, fodder, manure, medicinal herbs, oils, materials for house building and handicrafts, resin, gum and honey. Most of the rangeland in the study area is situated within community land, known locally as *shamilat*.

Mountain women have traditionally engaged in small scale entrepreneurial activities based on the use of natural resources (Dagmar, 1990). In the study area, although their role in household economy is highly under-valued in official statistics (Government of Pakistan, 2000; Haq, 2002), case studies showed that women are traditionally engaged in various income generating activities based on the use of natural resources, such as grass and fuel wood cutting. They use the rangeland resources for the generation of household income and their own consumption in many ways (Gul, 2001).

In the past, the people in the semi-arid mountain regions knew how to manage their limited natural resources in an equitable and adaptable way (von Maydell, 1984). The rate of change was slow and allowed time for learning from experience. However, in the recent past, because of rapid population growth, technological development, modern agricultural methods, and better communication and transportation facilities, it has become increasingly difficult for communities to rely entirely on their indigenous knowledge to safeguard the local environment (e.g. Tabassum, 2005). This has had negative effects on both women and the natural environment.

In spite of its great importance in the economy, rangeland management has largely remained neglected in the region (IUCN, 1996). This is partially because of a lack of coordination and clear-cut demarcated areas of responsibilities between communities, line agencies, such as forestry, livestock development and agriculture agencies (Khan, 2001). Nevertheless an even greater problem is the lack of knowledge, research and technical expertise needed for rational use and management of these resources. Furthermore, decisions are often made about natural resources without any input from the women; who are the primary resource managers in many mountain regions and have an intimate knowledge, relationship and vested interest in the land and environment around them. The main

reason for this is the lack of relevant information about both the physical and socio-economic environment of the area. Identification of the existing conditions of the watershed catchments in terms of physical, social and economic consideration with subsequent development of management plans to attain short and long term goals is the prerequisite for maintaining productive watersheds (Tennyson, 1986). The main objective of this research therefore, was to find out the main uses of the rangeland resources, develop a methodology for collection of information about the users of these resources and to provide the baseline data for future research.

### **3. Material and data**

A case study was conducted in Karak district to determine the key factors responsible for women's high dependency on rangeland products, and the role of these in management of rangeland resources. Ten villages out of 105 villages were selected, which were located in the foothills of the mountain range. For the detailed study, the selected villages were visited and surveyed using a self-administered questionnaire interview method. Two different types of questionnaires were used, one for the community and another for individuals. A sample of 10% of individual respondents was studied and group interviews were conducted wherever possible to get information regarding the community as a whole. The collected data was cross-checked by different means such as focus group discussions and ground truthing from official statistics.

### **4. Main findings**

Being the most widespread land-use type (more than 60%) of the region, rangeland is extensively used by local people, particularly women, for household and cash income generation. The traditional role of women in collection, transport and utilisation of fuel wood, fodder and NTFP is crucial (Akhtar, 1992). As in other areas where subsistence agriculture is not possible, the collection and processing of wild vegetables and fruit from rangeland is important to household sustenance. Rangeland is not only the provider of different products but is also a source of additional income. It is also one of the major sources of non-agricultural employment for households with no other alternative income sources (Khan, 1976).

The results of the case study showed that 16% of all women in the sampled area are dependent on the natural resources of the rangeland. The majority of these (90%) were in the 40-50 year-old age group and were married or widowed. It was also found that in all households where women are the head of the family, it is because they were widowed. Almost all (97%) of the users were illiterate and belonged to the lower income group earning less than US\$2 per day. Thus, the majority of the women in the study area belong to the lower socio-economic group and are highly dependent on the utilisation of

the natural resource of rangeland in the study area. This is now becoming a serious issue for sustainability.

Women use these resources in many different ways. They spend, on average, four to eight hours collecting and processing these products. For some products they have to visit the uplands every day, while for others they go on alternate days or once a week. Both men and women use these resources but the involvement of women in these activities is much greater and they play a more dominant role. Details can be seen in tables 1 & 2.

Besides their use for household sustenance, rangeland resources are widely used for income generation. Differences were noticed in the amount of cash generated through these activities in different villages, but on average each household was earning more than 60% of its total income from these resources. In the villages in the foothills or villages on the slopes, the cash value of the products was less, although domestic use of the products was higher.

**Table 1: Participation of women and associated characteristics in rangeland activities by village**

<b>Village</b>	<b>Women aged 15-49</b>	<b>Women engaged in rangeland activities</b>		<b>Average distance covered</b>	<b>Time spent on rangeland activities</b>
<b>Name</b>	<b>No.</b>	<b>No.</b>	<b>%</b>	<b>km</b>	<b>hours per day</b>
Latamber	5,326	650	12	2-3	7-8
Mandawa	874	75	8	2	4-5
Teri	2,448	210	9	2-3	4-5
Khumari	703	200	28	1.5	3-4
Mami khel	620	200	32	1.5	4-5
Totaki	535	105	19	1.5	3-4
Nari panos	1,266	250	26	1.5	5-6
Khuram mohd zai	716	160	22	1.5	5-6
Bahadar khel	1,448	210	15	2-3	6-7
Nar bhandra	327	165	50	1.5	4-5

Source: 2003-2004 field survey, Iffat Tabassum.

The majority of the respondents thought that natural vegetation in the area has deteriorated both in quality and quantity in last fifty ears. Prolonged droughts, as a natural factor, may be one of the principal causes, but the deterioration has been further intensified by increased human interventions. Many species, especially those used for fuel and fodder, have almost disappeared. Firewood has become a serious problem, causing conflicts with the nearby hill tribes, and longer distances must now be covered to bring back fuel to the villages. Apart from these social problems, many environmental problems were noticed by the researcher and reported by local people. Flash floods have occurred in

some areas for the first time, and in other areas flooding has become more frequent. Soil erosion is another serious problem in the area. Both water and wind erosion are common in areas where soil is bare and slopes are steep.

**Table 2: Gender roles and frequency of visits for each activity in the rangelands**

Activity	Carried out by	Frequency of visits
Fruit and vegetable collection	females	occasional
Firewood collection	both	twice a week
Animal dung collection	females	daily
Fodder/grass collection	females	daily
Palm mizzary collection	both	seasonal
Medicinal plant collection	females	occasional
Hunting	males	seasonal
Collection of plants for washing clothes	females	occasional
Construction material collection	males	occasional
Mud and clay collection	both	occasional
Salt collection	males	occasional
Honey collection	males	seasonal
Animal grazing	both	daily
Broom making	females	daily

Source: 2003-2004 field survey, Iffat Tabassum.

#### **4.1 Management of rangeland resources**

For centuries local people have managed to use these resources in a sustainable way, having developed local-level strategies to cope with the main threats of population pressure and climatic variability. These strategies can be classified under the following four sub-headings:

##### **4.1.1 Local norms and rules**

Village-level social institutions are responsible for the implementation of the rules for the use of different resources. Fruits and vegetables are free for everybody all the time but there are restrictions for all other resources in terms of time and user groups. To stop people from cutting down trees and taking away too much grass and firewood, axes and wheels are not allowed in the area.



#### 4.1.2 Religious beliefs

Right from a very early age, mothers and grandmothers train their children that according to their beliefs it is a sin to cut down a green tree. Planting of trees is also associated with “*sadqa-I-jarya*” meaning ‘life long reward’. There is another belief that if you plant a tree in the jungle you be rewarded for it in heaven.

#### 4.1.3 Myths

Many myths about the use and management of rangeland resources are popular in the area. The most important is that no one should cut trees in the mountains in the evening because at that time fairies come to play: if you disturb them they will harm you. Another is that if a mother cuts a green tree she will be punished by having an unhealthy child.

#### 4.1.4 Local knowledge.

Local women know when to harvest vegetation and which parts of plants to harvest in order to continue sustainable use of the rangeland resources. They do not uproot grasses and never graze animal after rains. In fact, the rangeland is completely off-limits to everybody for 15 days after rain to ensure that re-growth can occur.

### **5. Conclusions and recommendations**

In order to assess the impact of population pressure, in any region, considerations cannot be limited to population growth and density, the major concern is the population-resource ratio and population's resource-use system (Din, 2001). Understanding the links between populations and their environment requires a detailed examination of the ways in which different factors interrelate. These include factors such as affluence, consumption, technology and population growth, but also previously ignored and underrated social concerns such as gender roles and relations, political structure, institutions, and governance at all levels.

Social status, low literacy levels, and a lack of awareness of the consequences of environmental degradation, are other important factors that have led to overgrazing and widespread deterioration of rangelands in the study area. It is now commonly recognised, that reforestation and rangeland rehabilitation cannot occur without the cooperation and participation of local users, which enables local communities and groups of users to make rational decisions about the optimal use of land and other natural resources. However, commonly, the rights and subsistence needs of marginalised groups are the least recognised and protected, because they do not hold some form of land tenure or ownership rights.

The key to sustainable development and natural resource management is to integrate marginalised rural people into the formal economy. In the study area, the majority of such people are women from lower socio-economic groups. This can be done only if they are provided with alternate employment opportunities like skill development programs and micro-financing. Moreover, their local knowledge can be integrated as a resource in planning process (Ives et al, 1997). Sustainable watershed and forest policy must therefore consider broader social and gender issues such as poverty alleviation, women's rights and participation, and land ownership and tenure.

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