

## **THE ROLE OF WOMEN IN LAND MANAGEMENT AND CONSERVATION - A CASE FROM THE MIDDLE-HILL REGION OF NEPAL**

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### **Abstract**

In smallholder farming, women play an important role and their contribution to the farm income is often disproportionately high. The study aimed to understand the role and perceptions of women farmers in land management and conservation, and to identify possible pathways for better representation of women's needs in on-farm land management and conservation. The study was conducted in a typical watershed in the Middle-Hill region of Nepal, with a high diversity of age, casts and education amongst the women. All farms in the area are subsistence-oriented. The study is based on semi-quantitative surveys of farming families. There are marked differences in the types of farm work between men and women, but also between different groups of women. Caste was not found to be an important criterion in defining the work of women, but rather education and age. Over the past years, more girls are being sent to schools and this inevitably limits their availability for farm work. This trend has also led to a loss of local knowledge on land management with girls and young women.

Women without school education obtain their knowledge principally from older women and by practical experiences. Women with school education are able to understand extension messages more easily and they usually have a more 'scientific' approach to understanding things. These differences lead to different perceptions of farming and to problem solving. There are also noted differences between more remote villages and the villages closer to the road network and with better access to extension. Women in villages that are more easily accessible have generally a better understanding of modern technologies. These women also have better access to markets for better cash income, which -in turn- gives them more influence on farming decisions.

Additional key words: awareness, caste, indigenous knowledge

### **Introduction**

In the Middle-Hill region of Nepal, rural women contribute significantly to agriculture, especially on farms that depend on subsistence crops (Sontheimer et al., 1997; Bajracharya, 1994). Overall, about 65 percent of the labour force is provided by women (WFDD, 2002). The farmers in this region rely on indigenous land use practices, especially for the management of soil and water, and to control soil erosion (Tamang, 1992). Except for the ploughing, all other farming operations are manual (Ekop, 2001; Pandey, 1992). Agrochemicals are only used on a small scale. Livestock is a very important source of the families' livelihoods, and manure is the main source of plant nutrients and organic matter for soil-fertility maintenance. Women provide the major share of the labour input to livestock rearing, including the transportation of manure and its' spreading onto the fields. Their role is, hence, not only critical for their families' livelihoods but also for the long-term maintenance of soil fertility and land productivity. Men are usually involved in the application of inorganic fertilizers and pesticides. They also do the construction and maintenance of terraces and irrigation canals (Tamang, 1992). Hence, men and women develop different skills and knowledge through the different tasks and roles they fulfill. They therefore have different knowledge about similar things (IFAD, 2004). But the use and development of knowledge varies not only between men and women but also among women. Contrary to the common belief that women are a homogenous group (Ekop, 2001), women's participation in farming and other activities also differs according to the community to which they belong. Caste, age, education, family size and the position within the family are among many socio-cultural factors identified as influencing women's involvement in resource management (Bajracharya, 1994; UNDP, 2001). In Nepal, the management of and control over resources among women often varies between different ethnic groups, and even within the same ethnic group (Bajracharya, 1994). Limited access of women to services, such as education and extension, often leads to marked differences between men and women, e.g., in their perceptions, attitudes, awareness, and constraints (SEAGA, 1997). It is thus important to understand women's roles – and their knowledge – in resource management, their perceptions of land management, and their constraints, because these parameters affect land productivity and the conservation of the resource base.

## **Materials and Methods**

### *Study area*

The study was conducted in the Galaundu Pokhare watershed, located approximately 65 km west of Kathmandu, the capital city of Nepal. The area is typical for the Middle-Hill region of the country. The watershed has a size of about 29 km<sup>2</sup>. Only the northern part of the area has access to a 4 km long stretch of paved road; the other parts of the watershed have only foot paths. It takes about eight hours of walking to reach the southern ridge of the watershed.

There are two distinct agro-climatic zones, i.e., the upper warm temperate zone and the lower sub-tropical zone. The dominant crops in the upper zone are maize and millet, in the lower zone rice and vegetables. On a smaller scale, wheat and potatoes are grown in both zones. The average size of the landholdings is about 0.9 ha, i.e., about 0.14 ha per capita. Most of the arable land –especially in the lower zone– is terraced, but due to lack of reliable water resources in the uplands, dependence on rainfall is high. All farmers in the watershed raise livestock (i.e., cattle, buffalo, goats, and poultry). The forests are a very important source of fodder and bedding material. Other important fodder sources are crop residues.

The area has a population of 5,305 of which 48% are female. There are several castes and ethnic groups. In the study area, *Brahmin* and *Chhetri* represent almost 40 % of the population. The ethnic groups occupy 38 %, the *Newars* (i.e., the traders) 7% and the lower-caste *Shudras* (i.e., the ‘untouchables’) 15%, who are mainly blacksmiths, tailors, and cobblers.

The upper zone is mostly inhabited by the disadvantaged castes and the ethnic groups. The people in the lower zone, due to the better road access, have better education opportunities, extension services and markets.

### *Research approach*

The study followed a semi-quantitative descriptive approach. Data was obtained from a representative household survey (135 households; approximately 20 % of the population), individual interviews and group discussions with women from all castes, ages and educational backgrounds

## **Results and Discussion**

The ways in which the people manage their land have evolved over long periods. The design, construction and maintenance of terraces and on-farm irrigation systems, the maintenance of soil fertility using organic materials, the crop rotations and the intensive livestock keeping are typical examples of indigenous land-management technologies in the area. The contribution of women to farming and technology development and their perceptions of the environmental factors that determine the limits and opportunities of farming are largely dependent on their education –formal and non-formal– and their roles and standing in the society.

### *Education and access to extension*

Generally, men (66 %) have a better literacy level (i.e., in the range from informal to secondary education) than women (44 %). Illiteracy in the upper zone is significantly higher than in the lower zone, both for men and women (men in the upper zone 50 %, in the lower zone 26 %; women in the upper zone 65 %, in the lower zone 46 %). Most of the younger women (65%) have primary education or above. Among the older women (> 45 years), 41 % are illiterate; of the 51 % literate women, most can only identify a few letters. The older women gained their awareness and knowledge through their long working experience while younger women, who attained at least primary level education and who can easily read and write, gain their knowledge at school. They can understand written extension messages easily and quickly and they also learn from family members and the community.

Most upper-caste people live in the lower zone. Because of better road access and the proximity to the administrative center, these people have better access to agricultural extension and training by government and non-government organizations than the majority of the lower-caste people, who live in the upper zone of the watershed.

### *Farm work*

The work of men and women on the farm is largely determined by their social status, the access to resources and the decision-making over the use of the resources. The type of farm work varies not only between men and women, but also between different age groups of men and women (Table 1).

**Table 1. Distribution of farm work according to gender and age**

	Age		
	Below 15 years	15 years – 50 years	Over 50 years
Activities of women	Herding livestock, carrying water, collecting forage, transporting manure, planting maize, feeding livestock, cooking, sowing maize in exchange labour (from the age of 15 years, sometimes 13 years)	Harrowing, weeding, planting, transplanting, threshing, screening seeds, manure transportation and application, leaf litter collection, bedding material collection, harvesting, exchange labour for transplanting, weeding, and manure transportation, forage grass collection, fuel wood collection, transporting produce	Feeding and livestock management, seed selection, corn shelling, cooking, herding livestock, planting maize
Activities of men	Herding livestock, Fodder collection, <i>transporting manure</i> , feeding livestock, sowing maize in exchange labour (from the age of 14 - 15 years)	Ploughing, pesticide and fertilizer application, fuel wood collection, <i>manure transportation and application</i> , transporting produce	Herding of livestock, feeding, <i>fuel wood collection</i> , planting maize

**Note:** *Italicized* activities indicate partial involvement

A marked difference between women of different castes was not found, but was observed for women with different education levels. The rising trend of sending girls to school has reduced their participation in farming. Their involvement in farm work begins after the completion of secondary school and only, if they do not pursue further education away from the community. In villages, where the men seasonally work elsewhere, the women have added responsibilities. In these cases they are also taking over typical men's work.

#### Soil fertility management

The women are well aware of the need for organic materials to maintain soil fertility. They have developed a relative scale of the 'fertility value' for the different types of manure available on the farms (Table 2). The relative preference given to the different types of manure corresponds well with the nutrient levels determined by laboratory analysis. Overwhelmingly, chicken manure is considered to be most effective to stimulate plant growth.

**Table 2. Women's ranking of the perceived 'fertility value' of different types of manure**

Type of manure	Perceived 'Fertility Value' Rank	Average nutrient contents (%) <sup>1)</sup>		
		Nitrogen	Phosphorus	Potassium
Poultry (chicken)	Highest	1.46	0.51	0.51
Sheep	↓	0.60	0.13	0.99
Goat		0.60	0.13	0.99
Pig		0.50	0.18	0.42
Cattle		0.60	0.13	0.66
Buffalo+		Lowest	0.33	0.25

<sup>1)</sup> on dry weight basis; data from FAO, 1997; Tamang, 1992



Whenever possible, crop residues, manure and compost are regularly applied. All organic materials are transported in baskets which are carried by the women on their heads (Plate 1).

In the lower zone, the use of manure is significantly higher than in the upper zone. The main reason for this are the long walking times required to reach the fields in the upper zone.

**Plate 1. Women transporting manure in baskets**

Both men and women give livestock the highest importance for the maintenance of soil fertility (Table 3). They know the beneficial effect of manure on crop yields in this low-external input farming system. The other factors considered important for soil fertility are more indirect, e.g. in the way that they make soil management more labor-demanding (slope, small size of land parcel, distance to the land parcel) or affect the microclimate of the plots (aspect). There is a strong agreement between men and women only on the higher-priority factors.

**Table 3. Perception ranking of factors affecting soil fertility**

Factors perceived as affecting soil fertility	Ranks of importance	
	Men	Women
Number of livestock on the farm (many is good)	1	1
Slope of the land parcel (gentle slope is good)	2	2
Type of land husbandry (rotation and green manure is good)	5	3
Aspect of the land (southern is good)	3	4
Distance to the land parcel (near is good)	5	5
Size of land parcel (larger is good)	4	6
Weather (moist and warmer is good)	3	7

*Perceptions related to land value*

Perceived value of the land is associated with the level of land care people invest in the land. In the area, land value is strongly correlated with soil fertility and other productivity-related attributes. The perceptions of land value vary between men and women, and between the different categories of women (Table 4).

**Table 4. Perception ranking of factors affecting land value**

Factors perceived as affecting land value	Men		Women											
	Overall	Overall	Age Group (years)			Caste Group				Education level				
			13-18	19-45	> 45	Upper caste	Ethnic group	Newar	Lower caste	Illiterate	Literate	Primary	Secondary	Higher
Slope of the land parcel	1	1	1	1	1	2	1	2	1	1	2	2	2	1
Distance to market	2	3	4	3	1	3	2	1	3	2	3	4	4	2
Water availability	3	2	2	2	3	1	2	3	2	5	1	1	1	2
Soil type	4	4	3	5	2	5	3	4	4	4	4	3	3	
Type of management	5	7		8	6	7	7		6	8	7	5		
Soil fertility	6	5	5	4	4	4	5		5	3	5	5	6	3
Trees on the land	7	8		7	6	7	6	5		7				4
Distance to administrative center	8													
Land form	9	6	6	5	6	6	6			6	6	4	5	4
Aspect of the land	10													

Note shaded cells: not perceived as an important influencing factor

It is remarkable that the women do not consider the distance to the administrative center as a factor affecting the value of the land. This may be due to the fact that women do not usually interact with the public administration – including extension. There is therefore no need for them to be close to the administrative center. ‘Distance to market’ is given higher priority by the older women than the younger women; women of the *Newar* – a traditional trader community – give it the first priority. Educated women do not consider ‘soil type’ as an important attribute of land value; they do, however, consider ‘trees on the land’ to be important. But these women are a minority amongst the women in the area.

*Perceptions and awareness related to land management and conservation*

Perceptions of the long-term consequences of different farming practices on soil fertility and conservation vary between women of different age groups, castes and education levels. However, no distinct general pattern was

found. For some of the activities like harrowing, tillage, manure application, irrigation-canal repair and maintenance, impact of grazing on land, etc, there is a difference between the younger (13-45 years) and the older (> 45 years) women. For activities such as weeding, irrigation, making ridges, etc, the perceptions are similar. There are also differences between women of the upper caste and the lower castes. Generally, upper-caste women have a broader perspective of the long-term consequences of land use and farming practices than lower-caste women. No obvious differences exist between women of different education levels

### **Conclusions**

Perceptions and priorities of women do not depend upon age, castes or education alone. They are rather interdependent and also influenced by several other –external– factors, such as the access of women to extension services, exposure to short-term training, individual –or extra– cash-income (e.g., from the sale of vegetables). It is generally assumed that educated women are more aware of land degradation and measures of conservation; but the knowledge of women who actually spend more time working on the land should not be underestimated. Older women –irrespective of caste and most without formal education– usually have excellent practical knowledge and experiences in all aspects of land management.

Although there are no distinct general differences between the different categories of women, some clear differences, however, exist between age groups and women of different education levels. Education and age was strongly correlated because most of the educated women are from the younger age group. Thus, the sharing of knowledge between younger and older women can complement and mutually enhance the individuals' knowledge base. The practical knowledge of older women, complemented by the more science-based knowledge of the younger more formally educated women, can also contribute to better use of the limited available land resources.

Women in villages that are more easily accessible have generally a better understanding of modern technologies. These women also have better access to markets for better cash income, which -in turn- gives them more influence on farming decisions.

The contributions of women to agricultural production in the area are crucial. Therefore, the women's potentials and capabilities need to be strengthened. The local knowledge base of women on land management needs to be further explored. Programs should strengthen and build on the women's knowledge and help create more awareness related to land conservation. In order to be adopted, better land use and conservation practices need to be based on indigenous knowledge and technology that are understood and accepted by the farmers, both men and women.

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