

Gender Dynamics in Crop Production in the Hills of Nepal
Feminisation of Agriculture?

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Declaration

I, Kiran Kumari Bhattarai, hereby declare to the senate of the Agricultural University of Norway that this is my own original work. It has not previously been submitted to any academic institution for award of any degree.



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This work is

Dedicated to my Parents

Indra Mohan Bhattarai & Sulochana Bhattarai

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Acronyms

DDC	District Development Committee
GDP	Gross Domestic Product
ha	Hectare
HMG	His Majesty's Government
ICIMOD	International Centre for Integrated Mountain Development
IPGRI	International Plant Genetic Resource Institute
LI-BIRD	Local Initiatives for Biodiversity Research Development
MOAC	Ministry of Agriculture and Cooperatives
NARC	Nepal Agricultural Research Council
NORAD	Norwegian Agency for Development Cooperation
Noragric	Centre for International Environment and Development Studies
NPC	National Planning Commission
VDC	Village Development Committee
WID	Women in Development

Abstract

A study was conducted to provide research based information for formulating gender sensitive strategies and approaches to enhance crop production and seed management in the Hills of Nepal. Gender research done so far is mostly concerned with analysis of gender roles. The gender related information on access to and control over resources and benefits, and decision making is still limited. Gender analysis regarding the staple crops rice and maize, and garden crops potato and ginger was done in Indo-Aryan and Tibeto-Burman communities. Task, resource, and benefit analysis were done in focus groups to understand current gender profiles. Elderly key informants were interviewed to understand the change in gender profiles over the past four decades. Household surveys were used to triangulate the information generated from the focus group interviews and to compare gender access to and control over resource and benefits among households with three different wealth status. Qualitative information were analysed and interpreted based on theories while quantitative information were analysed using statistical methods.

Results show that women's involvement in crop production is higher than men's in both the Indo-Aryan and Tibeto-Burman communities. Women equally involve in rice production while they involve more in maize, potato and ginger production than men. Their involvement in crop production and seed management has increased over the past four decades. The change that is mainly caused by men's migration for off farm employment has led to feminisation of the agriculture. Women's access to resources and benefits has increased, but control particularly that involve cash is still with men. Compared to Indo-Aryan women, Tibeto-Burman women have more access to and control over resources and benefits in all the crops. Gender access to and control over resources and benefits associated with crop production are independent of the economic status of households, but women's access to and control over resources and benefits increases with the decrease in wealth status. Although women's involvement in crop production has increased, they still have to seek decision from men. Women ever involved in seed management tasks and their decisions on these tasks have increased. It indicates that women are the main custodians of local seeds and thus have significant contribution in maintaining local crop diversity.

Agriculture research and extension programs should be targeted towards women who are the real actors. Women empowerment should be integrated with crop production and seed management programs. Since most of the benefits from crops are controlled by men, women have limited opportunities for income generation particularly through the sale of the products. Therefore, implementation of women's income generation programs should be supportive to promote women's access to and control over resources and benefits associated with crop production. Further research is needed to understand gender access to and control over all the available resources and distribution of benefits at household level.

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Chapter 1. Introduction

1.1. Background

Nepalese economy is largely based on agriculture on which the livelihoods of eighty one percent of the population depend. Agriculture is the largest sector of the economy and it contributes forty percent to the total GDP (HMG/NPC, 1998). Crop production, which dominates agricultural production, is largely traditional and subsistence oriented. Majority of the people have livestock integrated small farms. Nearly eighty five percent of the people live in rural areas. In such areas, agriculture is the main source of livelihood, and off farm employment opportunities are very limited. Subsistence agriculture places challenges to address the problem of livelihood security for the ever-increasing population of the country. Subsistence production refers to self-sufficient farms where all production is consumed in the household. However, such an ideal subsistence farm is hardly possible in the real world (Rudengren, 1981). In third world subsistence farms, most of the commodities are consumed within farm household and limited produce is sold in the local market.

Farmer's livelihood strategies in rural areas of Nepal, as elsewhere in most of the developing countries, can be categorised into three broad groups (Scoones, 1998). These strategies are subsistence agriculture, livelihood diversification through non-agricultural activities and migration. Rural farmers produce most of the commodities, which are required for their subsistence. In order to meet increasing food demands, there must be either an increase in agricultural production or an increase in non-agricultural income. They are becoming increasingly marginalized in the process and having hardship in securing livelihood from agricultural production alone. In effect, men and women have to search for alternative source of income outside the agricultural sector. Hence, they diversify their livelihood by expanding the share of income from non-agricultural activities such as rural trade and services. Off farm employment outside the rural area works as one of the forces of migration to urban and semi urban areas. One or more of the family members, mostly men, migrate for varying periods of time depending upon their individual livelihood strategy. This migration may be seasonal or even permanent.

In an ideal Nepalese family man generates income and his wife involves in domestic activities. Traditionally, men are responsible to earn either through farming or through off farm employment while women are responsible for child bearing /rearing, household chores

and tending animals. Increased male migration due to rural poverty and better income opportunities in the urban and semi urban areas have resulted in increased work burden for women. In addition to household chores, women have to perform almost all agricultural tasks except ploughing the fields. They contribute sixty percent of the agricultural labour force (HMG/NPC, 1998). In rural areas of Nepal, girls and women work more than boys and men spending about twenty five percent more time on household tasks and agricultural activities (Dhakal and Sheikh, 1997). The increase in female headed households has created greater involvement of women in agricultural tasks and decision making, which ultimately has increased their work burden (Reejal, 1981). When men migrate or involve in off-farm jobs, women become *de facto* household head and have to bear more burdens of the household chores, men's work and farming for subsistence. Hence, local variation in gender roles also results from migration difference by gender (Blumberg, 1990). In addition to the women's position as *de facto* household head, widowed and divorced women are the *de jure* household heads in the absence of their men. There are fewer active members in such households and women have to bear all the responsibility to secure livelihoods. Such households in the Hills of Nepal have much lower income than the male headed households (Sharma, 1996). Moreover, such disadvantaged women have poor access to resources.

The primary objective of all livelihood systems is to secure food and nutrition. Food security exists when all individuals have access to enough food to maintain an active and healthy life. World food summit states, "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 1996:28). Household food security can be maintained either through increasing production or increasing purchasing capacity. In rural areas, particularly in the Hills of Nepal, farmers produce diverse crops to secure food for their household members. Food production depends on availability, access and control of production resources. The major resources are land, labour, irrigation, modern inputs, knowledge and information, market facility, and credit availability. It is obvious that access to and control over livelihood resources (natural capital, human capital, human made capital, and social capital) determine household food security. In Nepal where there is patrilineal society, ownership of land usually goes to men. Moreover, women's relation with her husband determines access to land. As mentioned earlier, women are the attractive labour forces in subsistence agriculture. However, they have limited access to and control over knowledge and information. Men are the ones who have contact with agricultural extension workers. Women

have to depend on men for information and technology. They rarely participate in public discourses and training. Moreover, women have limited access to income and credit. Lack of ownership of land restricts them to acquire institutional credit. Non-institutional credit in rural areas of Nepal is also rarely accessible to women. From the above discussion, it is evident that women have subordinate status in the society despite their key role in household food security.

To understand the gender dynamic in agriculture, we have to recognize that men and women have different roles within the farming system. Gender specific data explain who does what and whether it is men or women who have access to and control over production resources, and subsequent benefits. It also provides the information on gender differentiated decision making. This study focused on past and present gender profiles related to crop production and seed management of staple crops such as rice and maize and garden crops such as potato and ginger. It compares the gender profiles between Indo-Aryan and Tibeto-Burman communities. It also compares the gender access to and control over resources and benefits associated with these crops among three different wealth categories in the Hills of Nepal.

1.2. Objectives

The goal of this study is to enhance livelihoods of rural farmers, particularly women. The purpose is to provide research based information for formulating gender sensitive strategy and approach to enhance crop production and seed management. Specific objectives are:

- i. To analyse the gender roles with regard to crop production;
- ii. To analyse the resources and benefits sharing at household level with regard to crop production;
- iii. To understand household decision-making process in crop production and seed management; and
- iv. To analyse change in gender profile in crop production over past four decades.

1.3. Justification

Gender is an important dimension in the study of society (Eriksen, 1995). Probably all societies hold notions about certain gender differences, but such an idea in itself is a cultural construct and not a part of nature. The study of society is likely to be incomplete unless gender dimension is considered. Geographic and agro-ecological conditions, ethnic communities, education, economic status and migration determine gender roles and access to and control over resources and benefits in the Hill of Nepal (SNV, 1992). However, very few

studies have been carried out in relation to gender profiles in crop production with regard to ethnic communities and wealth status of the households. Hence, this study addresses the gender differences that exist between men and women, between Indo-Aryan and Tibeto-Burman communities, and among different well being categories in the Hills of Nepal.

Gender roles and responsibilities between men and women in a household are affected by cultural, social, economical and agro-ecological conditions as well as government policies (Bajracharya, 1994). It is unrealistic to generalize gender roles in crop production without thorough analysis of local situations. However, the gender studies so far are mostly confined to analysis of gender roles. The other realities of the society including the context and conditions under which individual roles are accomplished are rarely considered. Men and women's access to and control over resources and benefits with regards to crop production, and involvement in decision making processes are rarely addressed.

Men and women have different levels of access to and control over different resources used in crop production. Likewise, they have different access to and control over benefits from crops. Information on access to and control over resources and benefits is limited. Moreover, few studies have been done with regard to decision making role in agricultural sector. In the Hills of Nepal, information on who makes what type of decision in crop production and seed management activities is limited. Due to the biological differences, socialization and ideology, women and men experience the world in different ways (Ortner, 1974). Hence, men and women might make different decision under the same circumstances. One of the key points in gender analysis is to understand the power structure recognizing the arrangements of rights and responsibilities. Often these are complex and they change over time. In many cases, they are partly hidden and may not be obvious without careful investigation. Planning and implementation of agricultural development programs and projects are often done without thorough analysis of gender profiles. Many scholars claim that agricultural development models adopted by the governments are male biased (Gurung and Banskota, 1990). They overlooked women's work, knowledge, and potential capacities. As a consequence, there is poor performance of agriculture in the national economy. With the lack of gender related information about farming communities, it is difficult to plan and implement gender sensitive agricultural programs and policies.

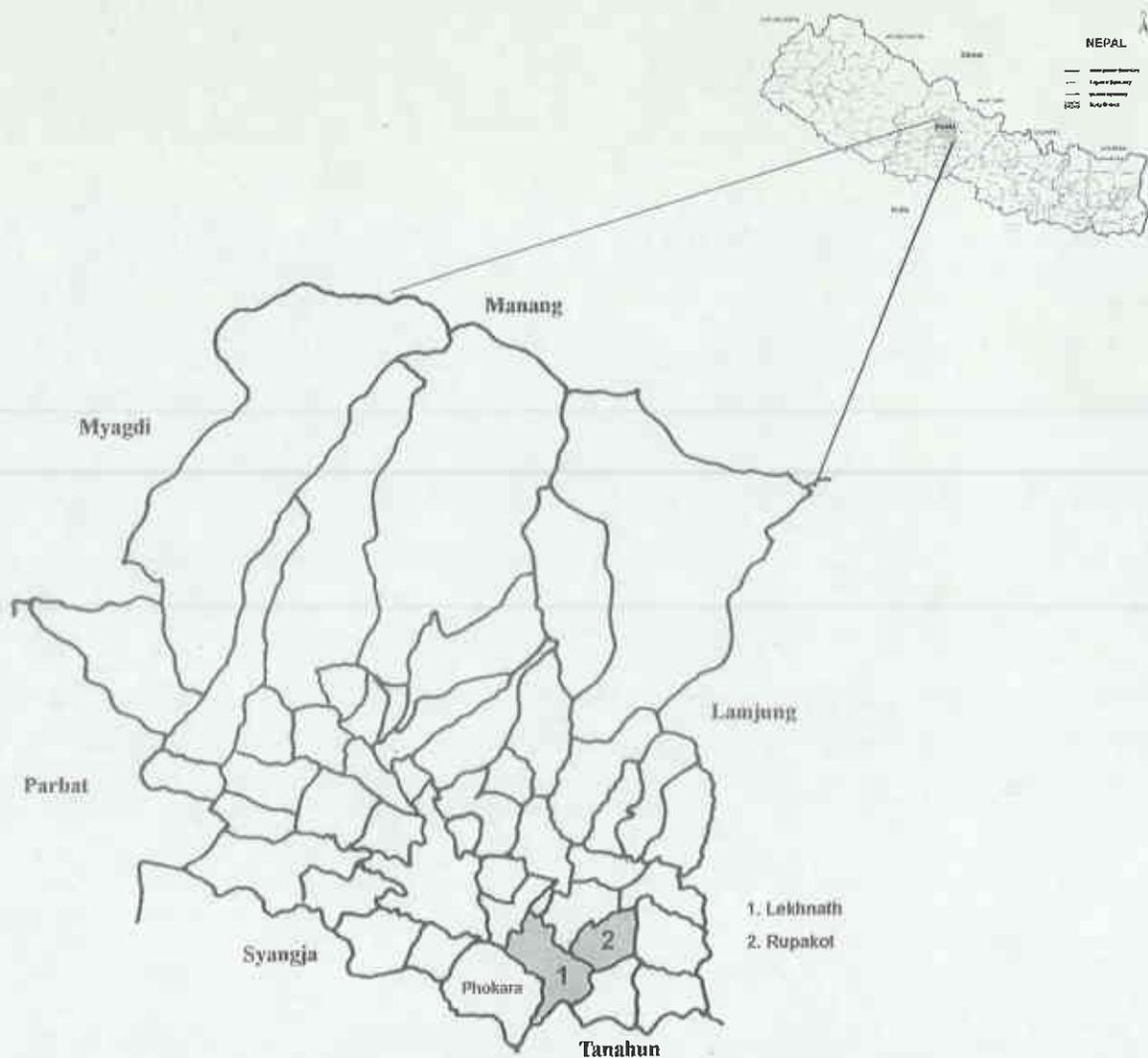


Figure 1.1. Map of Nepal and Kaski district showing study area

1.4. Description of the study area

This section provides the background of the area where this study was carried out. The administrative, climatic and demographic conditions of the country and the Kaski district in particular are briefly covered. The hamlets where this study was conducted are described in terms of the ethnic composition, and cropping pattern.

1.4.1. Background of the country

Nepal is a Mountainous kingdom bordering to India in the East, South and West and China in the North (Figure 1.1.). The country is roughly rectangular in shape having an East-west length of about 880 km and north-south breath varying between 130 to 240 km. It occupies a geographical area of 1 47 181 square kilometer (MOAC, 2000). The total population of the country is about twenty three million with a human population density of about 156 per square kilometer. The population density is the highest in the Terai followed by Hills and

Mountains. The country is divided into three ecological zones from north to south, namely Mountains, Hills and the Terai (low land). However, there is no clearly defined boundary between these eco-regions. Administratively, the country is divided into five development regions from east to west. It has seventy five districts. Nineteen districts are categorized as the Mountains, thirty six districts as Hills and twenty districts as Terai. Nepal is rich in agricultural bio-diversity mainly because of the agro-ecological and human cultural diversity. It has rich diversity of flora and fauna, both wild and cultivated ones. For instance it has enormous diversity of both cultivated and wild relatives of rice (Gupta *et al.*, 1996). The diversity in farming systems has promoted agro-biodiversity through the large numbers of crop and their varieties maintained and utilized at the household level. Most of the planting materials are derived from seeds and vegetative parts that produced, selected and saved by farmers themselves.

Hills of Nepal are inhabited by several human communities. These are people from various ethnic groups such as *Brahmin*, *Chhetri*, *Gurung*, *Mager*, *Newar*, *Kami* (black smith) *Dami* (tailor), *Sarki* (cobbler), *Darai* and *Kumal*. These groups of people are broadly classified into Indo-Aryan and Tibeto-Burman. The Indo-Aryan community includes *Brahimin*, *Chhetri*, *Thakuri*, *Newar*, *Yadav*, *Kami*, *Dami*, and *Sarki* and Tibeto-Burman community includes *Gurung*, *Magar*, *Rai*, *Limbu* and *Tamang*. These two groups differ in terms of division of labour within the household, gender access to and control over household resources and benefits and social mobility (Acharaya and Bennett, 1981). Women in the latter community have relatively better position than women of the former community. Kaski district is one of the places of origin of Gurung people (Bista, 1972) and they have isolated settlements of different size in the area. However, they have also been settled in mixed communities.

1.4.2. Description of the Kaski district

Kaski district lies in the western development region of Nepal with its headquarter in Pokhara. The district covers about two thousand square kilometers. Respectively twenty four, forty five, eleven, and twenty percent of the area are under agriculture, forest, human settlement and other uncultivated inclusions such as snow capped Mountains, Rivers, lakes and rocks. Total population is about 40 thousand with population density of 197 per square kilometre (DDC, 2001). Administratively, this district is divided in two municipalities, forty-three Village Development Committees (VDC) and 1367 hamlets. It has diverse types of landscape and

climates (sub-tropical to temperate). It is endowed with various types of natural heritage of scenic, historical and cultural significance such as lakes, waterfalls, Mountains, caves, wildlife, natural vegetation, temples and monasteries.

River basin is one of the areas of intensive agricultural production in the district. Rice is cultivated in *Khet*, which is irrigated or rain fed flat land. *Bari* is upland where different rain-fed crops including fruits and vegetables are cultivated. Rice, maize, finger millet, potato, buckwheat and barley are the major crops (Poudel *et al.*, 1999). Different species of legumes and oilseeds are also cultivated in association with other species in either sole or mixed cropping. The major cash earning crops are coffee, orange, lime, peach, ginger and potato. Among the major crops, rice is cultivated in about seventeen thousand hectare followed by maize, millet, wheat and barley (MOAC, 2000).

Traditionally, crop production, livestock husbandry and forestry are integrated closely in the Hill farming systems (Carson, 1992; Kiff *et al.*, 1995). The major livestock are cattle, buffalo, sheep, goat, pig, and domestic fowls. The tree fodders and grasses are the main livestock roughages. Livestock dung is used as major source of manure. The use of forest litter for animals bedding provides the opportunity for flow of nutrients from the forest to the cropped areas via livestock production (Turton *et al.*, 1995).

1.4.3. Description of the hamlets

1.4.3.1. Ethnic communities

The Lekhnath municipality and Rupakot VDC, where this study was conducted, are about 16 km Southeast of Pokhara Valley. Eight hamlets were selected for this study (Table 1.1). Three hamlets (Uppalotalbesi, Chaur, and Kholakocheu) lie in Lekhnath municipality and five (Devisthan, Chisapani, Jamunkuna, Talpari and Mohariya) in Rupakot VDC. Pictures of the typical hamlets are presented in Annexure 1.

Table. 1.1. Major ethnic groups and total household of study hamlets

Municipality/ VDC	Name of hamlets	Total household	Major ethnic groups
Lekhnath	Uppalo talbesi	24	<i>Brahman Chhetri</i>
	Chaur	33	<i>Brahman Chhetri</i>
	Kholakocheu	73	<i>Brahman Chhetri</i>
Rupakot	Devisthan	48	<i>Brahman Chhetri, Gurung</i>
	Chisapani	60	<i>Gurung</i>
	Jamunkuna	19	<i>Gurung</i>
	Talpari	46	<i>Brahman Chhetri</i>
	Mohariya	58	<i>Gurung</i>

Original inhabitants of the area are *Brahman, Chhetri, Gurung, and Magar*. The other ethnic groups include *Miya, Kami, Dami, and Jalari*. Out of eight hamlets, four hamlets (Uppalo talbesi, Chaur, Kholakocheu and Talpari) are dominated by Indo-Aryan (*Brahman, and Chhetri*) three hamlets (Chisapani, Jamunkuna, and Mohariya) by Tibeto-Burman (*Gurung*) and one hamlet (Devisthan) by almost equal in number of Indo-Aryan and Tibeto-Burman households.

1.4.3.2. Cropping pattern

Different types of cropping patterns are practiced in the study area. The variation in cropping pattern is mainly influenced by water availability, soil fertility and topography. The main season rice is commonly cultivated in *Khet*(rice field) and maize in the *Bari*(upland terraces). Wheat, oilseed, potato, and several vegetables are cultivated in *Khet* after the main season rice. Likewise, finger millet, potato, oilseeds, peas, or other vegetables are cultivated in *Bari* after the maize crop (Table 1.2.).

Table 1.2. Major cropping pattern in study area

Land use	Cropping patterns
<i>Khet</i>	Rice-fallow-fallow, rice-maize-fallow, rice-wheat-fallow, rice-barley or potato, rice-oilseed-maize, rice-potato-vegetables, rice-fallow-maize, rice-oilseed-maize, rice-potato-fallow, rice-oilseed-early rice
<i>Bari</i>	maize-finger millet-oilseed, maize-finger millet-potato or vegetables, maize-upland rice-millet, maize-millet-vegetables, maize-finger millet-fallow

1.5. Organization of the thesis

This thesis is organized into seven chapters. The introductory chapter presents the background and objectives of the study. It further justifies the study and gives brief description of the study area. Chapter two reviews gender research in agriculture and natural resources management particularly in Nepal. Chapter three provides research methodology, theoretical approach and field procedure. Theoretical approaches include gender task analysis, and resources and benefits analysis. Field procedure includes methods of data collection such as focus group interviews, key informant surveys and household surveys.

Chapter four, five and six presents the finding of this study. Chapter four provides an analysis of the gender involvement in crop production. It also includes access to and control over resources and benefits associated with crop production. These analyses are done for rice, maize, potato and ginger. Comparisons are done between Indo-Aryan and Tibeto-Burman communities, and among various wealth categories. Chapter five presents gender differentiated decision making in crop production and seed management. It compares decision

making process between Indo-Aryan and Tibeto-Burman communities and among various wealth categories. Chapter six is devoted to the analysis of change in gender profile over time. It describes change in agricultural practice, change in gender involvement in crop production, and access to and control over resources and benefits associated with crop production. It also presents change in decision making in crop production and seed management.

Chapter seven ties up all the above chapters, it presents major findings and discusses the significant issues. It further provides implications of the findings for agricultural development and local crop diversity conservation through women's empowerment.

Chapter 2. Gender Research in Agricultural Production in Nepal

2.1. Introduction

This chapter reviews gender research in crop production in Nepal. First it defines gender analysis and gender roles in general followed by a description of the gender approach in development. The involvement of women and men farmers in agricultural production is also reviewed. It is followed by a description of access to and control over resources and benefits. The final section deals with gender differentiated decision making in crop production.

2.2. Gender and gender roles

2.2.1. Gender and gender analysis

The term gender is culturally specific set of characteristics that identifies the social behaviour of women and men and relationship between them. Like the concept of class, race, and ethnicity, gender is an analytical tool for understanding social processes. In other words, the concept of gender refers to the cultural interpretation of biological differences between men and women (Moore, 1988). Gender and gender identity are socially constructed through processes of socialization, whereby human beings become social persons. What men do and women do, how they behave and interact, together with cultural ideas and interpretation of gender differences constitute a gender system.

This system is possible to be analysed through gender analysis. Gender analysis is the systematic examination of the roles, relationships, and processes between women and men in all societies, focusing on imbalances in power, wealth, and workload (EC, 1998). The stereotypes of societies consider men as breadwinner, that is the male as a productive worker. This occurs even in the context where men's unemployment is high and women's productive work actually provides the primary income (Moser, 1993).

2.2.2. Gender roles

Gender roles are due to social factors that influence or allocate activities, responsibilities, and decision-making authority to groups of people. It changes, often spontaneously and sometimes quickly, as the underlying social, economic and technological conditions change. Social factors which underlie and sometimes reinforce gender differences, include religious practices, ethnic or cultural attitudes, class or caste, the formal legal system, and institutional arrangements. Gender roles differ from one culture to another, and one social group to another. As defined by Whitehead (1981) the gender division of labour is even more complex.

Although there are clear gender differentiations of tasks, women generally have triple roles, broadly categorized into productive, reproductive and community roles.

Productive roles are those gender roles that are responsible for the production of goods and services for consumption and as well as sale (William, 1994). It includes market production with exchange value and subsistence production with actual use value. For instance, the agricultural labour, and decision-making are also a part of productive roles.

Reproductive roles refer to those activities, like child bearing and rearing responsibilities, primary domestic tasks (cleaning, washing, food preparation, water and fuel fetching) including the biological reproductive work. It also includes maintenance of work force, which includes taking care of male partners and working children, feeding infant and school going children. These are essential for the survival of the family.

Community roles refer to the work undertaken at the community level. Social relationship includes not only that of household members but also neighbors. It includes collective organization of social events and services by the community members, such as celebrations, community improvement activities, groups and organizations. Moser (1993) found that specially in low income communities throughout the world, there is a consistent trend for political organizations to be run by men, with mainly male members, and for collective consumption groups to be in the hands of women.

2.3. Gender approach to development

Gender is a relatively new approach emerging to complement the Women in Development (WID) approach that was adopted during 1970s. According to the WID approach, women are considered as an untapped resource that can provide an economic contribution to development. Therefore, emphasis was on the improvement of women's life by integrating women in economic activities and in economic institutions. William (1994) mentioned that the WID approach has increased women's workload, reinforced inequalities and widened the gap between men and women. In response to this dilemma, WID efforts in the 1980s developed the gender approach to development. It was intended to address the perceived inequalities between men and women. The ultimate aim is to improve women's quality of life through redistribution of power within society and between societies.

2.4. Gender roles in crop production in Nepal

Ester Boserup was a pioneering researcher in women's role in agriculture development. She was the first to recognize women's role in agriculture development, and strongly encourages further research in this area (Maman and Tate, 1996). Gender issue in agricultural development has since then become an area of concern at global, regional and national levels. The current knowledge based on women's role in development is also one of the main requirements for a sound gender approach to development. Many studies through out the developing world point to the importance of paying attention to the agricultural work of women. Gill (1989) mentioned that conventional farming system research deals with men's farming problems through the eyes of the male household head only.

Several researchers have found that women do more agriculture work than men in the mid Hills of Nepal even though ploughing is men's job. Women do not plough all over South Asia (Agarwal, 1994). In Nepal ninety one percent of the population of active women are engaged in agricultural work and categorized as farm worker (CBS, 1992) whereas only seventy-five percent of the active men are engaged in this sector (Bajracharya, 1994).

Involvement of women in agriculture differs with ecological regions of Nepal. The highest involvement of women is in the Hills, followed by the Mountain, and the Terai. But the difference is not greater than five percent (Bajracharya, *et al.*, 1987). The most time consuming activities which women do are post harvest activities such as drying, cleaning, milling, storage, food processing, cooking, water and fuel collection (Bajracharya and Cecelski, 1990; Dey, 1985). Involvement of women in agricultural production also depends on the wealth status of the households (Shrestha, 1999). She mentions that women from wealthy families do not participate in the actual cultivation tasks, but provide support activities such as preparation of meals to feed the laborer in the fields, arranging exchange labour, supervising the field during plantating, and so on. But among the poor families, the women and female children are involved in the actual performance of the tasks. The reproductive activities that are related to the production, care and maintenance of family members, are generally confined to the households and defined as women's tasks. In fact the activities like fuel and water collection, food preparation, giving birth, childcare, and washing clothes are seen as non-economic activities, and are usually excluded from national income (Shrestha, 1999). All these activities are performed by women and some times assisted by female children. Men are involved in marketing activities and social gatherings. The division

of labour in reproductive activities is related to wealth status. Lower the wealth status higher the involvement of men in reproductive activities (Shrestha, 1999). In poor families men feel no shame in undertaking household tasks. But in rich families, men feel humiliation in helping their wives with household activities. The overall division of labour, access to and control of inputs, resources and benefits from productive and reproductive labour are determined by custom, tradition and religious beliefs. All these place women at a disadvantage, making them submissive or subordinate (Okali, 1995). Subedi *et al.* (2000) also reported that women have lower education levels, lower access to information sources and limited participation in training. However, women farmers are exclusively involved in seed selection, storage, management and processing.

From the above scenario, it is clear that women's involvement in agriculture is higher than that of men's. Several researchers had observed this type of differences. Women's involvement was found seventy three percent in kitchen gardening crop production (Neupane and Dhakal, 1990), fifty nine percent in pea seed production (Munankami and Gautam, 1990) and seventy six percent in ginger production (Basnyat and Shrestha, 1979). Bajracharya (1994) also found higher labour contribution of women in cereal crop production than that of men in Hills and Terai. He found seventy five percent women's contribution in millet, sixty percent in maize, equal contribution in wheat. In contrast some researchers reported that women's labour contribution was found less than men's in some crops in Hills and Terai. Dhungana *et al.* (1989) found forty-five percent women's contribution in potato production and Shrestha (1990) found forty-seven percent in radish production. When women's participation in farming activities increases, time dedicated to food preparation and care taking decreases (Ashby, 1985).

2.5. Gender differentiated access to and control of resource use and benefit sharing

Access to resources and benefits mean conditionality about using it, how it is used, and control over resources and benefits means decision-making about its use (Feldstein, Flora and Poats, 1989). In Nepalese communities, women are the primary agricultural workers in the subsistence sector. But as Sanday (1981) points out, women are virtually indentured through for they have no control over the end products. Watkins (1996) mentioned that women exercise less power, have less authority to make decisions or control resources. Other researchers have noted that women who contribute cash earnings to the households have a greater voice in domestic affairs than women involved solely in subsistence agriculture.

The major resources include land, capital, credit, farm machinery, tools, fertilizer, seeds, extension services, post harvest technologies, mills and pesticides. Most of the women throughout the world do not have the right to property, land or other resources. Land ownership and access to land are crucial factors for both men and women in an agrarian society. In Nepal in rural societies, where land is the most important means of production, women's lack of control over land, unavailability of credit, technical input and training are major reasons for their dependence on men. Gender access and control over resources and benefits is also one of the most important key issues that need to be considered, which contribute to family welfare and agricultural productivity (Tisch, 1992). Subedi (1997) mentioned that in general women have very little opportunity to make financial transaction on their own, as they do not have ownership rights. When it comes to loans, women have limited access to taking loans because they normally do not have collateral to guarantee for the loan. With out land as a collateral, women are refused institutional sources of credit.

Geography, ethnic communities, education, economic status and migration determine access to and control over resources and income (SNV, 1992). Women from Hills have more access to and control over resources and benefits than Terai. In the Hill area sixty percent of the women sell crops, but in Terai only forty percent sell crops. Sanday (1981) point out that in societies where female are co resident or living nearby their close relatives, female solidarity is enhanced. This in turn allows individual woman in their roles as mother and wife to have more social and economic influence in the households and communities. Some researcher have found that female kin clustering has a positive impact on women's control of household economic resources, as well as on their role in decision making. Tibeto-Burman women have more access to and control over resources and income than Indo-Aryan women (SNV, 1992). With regards to income from sale of agricultural products, fifty five percent of Tibeto-Burman women, particularly Magar have control, but in other ethnic communities like the Indo-Aryan, women have relatively less control (SNV, 1992). Educated women have more access to and control over resources and income than illiterate ones. With the decrease in the wealth status of the family, women's access to and control over resources and income increases.

Women with small farm size, have more power to sell household produce. Sharma and Awasthi (1993) found that women of lower socio-economic status participate heavily in local market activities and are also more involved in the market economy as agricultural laborers than women of higher socio-economic status.

There is a connection between male out-migration and women's central roles in the economic and social domains. Male migration and long term absence are quite common in the Hills of Nepal (Watkins, 1996). Mc Dougal (1969) found that in the western region of Nepal, when men migrate for wage labor or trade in community, women control agricultural and domestic matters. Jones and Jones (1976) also studied women's role in the Tibeto-Burman ethnic community of eastern Nepal. They noted that long term male absence led to more independent minded women and a new pattern of female authority that were associated with an increase in female-headed households. They also observed that women's authority and decision-making were not just limited to household affairs but extended outwards into the community.

2.6. Gender differentiated decision making in agricultural production

In the Hills of Nepal, usually men are the household heads as well as decision maker while women contribute valuable inputs. Although the whole process of decision making in the household is complex, men are culturally accepted as being the decision maker in the household. Gender differentiation in decision-making varies with ethnicity, economic status, and farm size (Acharya and Bennett, 1981; Adhikary, 1987 and Bajracharya, 1993). In Tibeto-Burman ethnic groups such as *Mager*, *Gurung*, *Tamang* and *Tharu*, male and female are equally responsible for decision-making (PCRW, 1986). In *Tamang* and *Tharu* ethnic groups, men and women jointly decide what crops to plant. Bajracharya (1994) mentions that, in almost all ethnic groups decision on seed selection is primarily women's responsibility. Caste also plays a main role in decision making in crop production. Singh (1993) described that in so-called lower castes, decision on crop production is made both men and women jointly or women only. Adhikary (1987) found that the role of women in decision-making is inversely related to the farm size in crop production. Bajracharya (1993) observes that poor women have a stronger decision making role as compared to economically better off women.

Some researchers have found that women make more decisions than men with regard to crop production activities. Actually that might be due to consideration of women 's roles but not the gender roles. It has been reported that women make more decisions on crop selection, seed selection, use and amount of manure, time of weeding, time of harvesting, methods of storage, crop yields and grain to be consumed, and crop processing (Bennett, 1981; Dey, 1985 and Sharam and Awasthi, 1993). They also reported that men make more decision than women with regards to type and amount of fertilizer to be used. Subedi *et al.* (2000) reported that

regarding the decision on allocation of a particular variety or landrace for a particular land parcel is made by women in Begnas, Nepal.

2.7. Conclusion

In the Hills of Nepal, women are the main farmers and perform almost all agricultural tasks. Women mostly involve in performing tasks while men are the main decision makers. Moreover, most of the resources are under the control of men. Women have limited access to resources under the consensus of men. Irrespective of ethnicity and caste, most economically active women are concentrated in agriculture (Acharya and Bennett, 1981). Jackson and Pearson (1998), mention that gender inequality is likely to be a barrier to the effective and productive use of human resources to meet human needs. Understanding of gender issues in agriculture particularly in the major activities of crop production and seed management is imperative for agricultural policy formulation for conservation and improvement of crops.

Chapter 3. Methodology and Methods

3.1. Introduction

This chapter deals with research approaches and methods adopted in this study. The main focus is on participatory gender analysis. The site selection processes and criteria are described. It is followed by criteria of crop selection. Secondary data collection process is also described. The field research procedure, and data analysis techniques are described in detail, followed by conclusion. Although it may give some repetition to readers, field research methods are also mentioned in the relevant chapters.

3.2. Research methodology

The term methodology refers to the system of a way of doing something and method is a particular way of doing something. The research methodology covers theory, which is not directly operational in practical field (Mikkelsen, 1995). The research method is defined as a comprehensive set of approaches to gather evidence and analyze specific problems. It covers techniques and tools, which are directly used in field. Literature review, focus group interview, household survey and key informant survey are the techniques for collecting data and information. The research tools are the instruments like diaries, questionnaires, and checklists, pictures, and recorder that are used in field processes. The techniques for analyzing the information are computer based data processing and statistical methods.

3.2.1. *Qualitative and quantitative research methods*

A qualitative research method is iterative and inductive. It is characterized by high flexibility in research design, more holistic views and research content making from respondent's point of interpretation (Mikkelsen, 1995). The qualitative methods, which use natural languages, are best at gaining access to the "life world" of the target group of the study in a short time. The life world of other individuals' includes motives, meaning, emotions, and other subjective aspects of the lives of individuals and groups.

The proponents of qualitative methods believe on constructivism. While, quantitative method is identified with pure positivism. It is characterized by highly structured, standardized, primarily deductive researcher's point of interpretation. The quantitative methods are best for conducting a "positive science" that is, they allow for the clear, rigorous, and reliable collections of data and permit the testing of empirical hypotheses in a logically consistent

manner (Schwartz and Jacob, 1979). Guba and Lincoln (1994) suggest that both qualitative and quantitative methods may be used appropriately with any research paradigm.

3.2.2. Methodological pluralism

A qualitative method encompasses open-ended interview (key informant survey, focus group interview, individual interview), direct observation, and review of the documents (Patton, 1990). Despite continued debate over the practical implications of underlying epistemological differences like induction versus deduction, methodological pluralism generally extends to include quantitative as well as qualitative techniques of enquiry. Underlying such pluralism is a tacit acceptance that knowledge derived from one method of enquiry, or associated with one discipline is always only a partial approximation of the whole truth, a view that is increasingly shared by philosophers of natural science too (Patton, 1987).

3.3.3. Triangulation

Methodological triangulation is an important weapon in exposing bias. Combination of qualitative methods and quantitative enquiry may provide complementary information. For example qualitative enquiry may help with formulation and pre-testing of questionnaires, since good questionnaire requires comprehensive advance knowledge about the system being studied and rigorous preparation. Moreover, qualitative enquiry may also generate hypotheses worthy of further investigation by more detailed surveys (Biggs, 1983). Franzel and Crawford (1987) warn against the assumption that preliminary qualitative enquiry necessarily demands triangulation.

Feldstein and Jiggins(1994) reported that often initial responses during an informal or formal survey reflect cultural stereotypes or norms rather than actual practice. This is frequently true when people describe women's roles. The researcher should be careful to listen and observe whether actual practice matches the answer given to the question. Validation by quantitative surveys includes interaction with individual as well as with groups of people. For example, women, men, various ethnic groups and different professionals can be consulted for triangulation. In such a situation triangulation of such units of observation is essential.

3.4. Research approaches

3.4.1. Farming system research and extension approaches

Farming system research and extension approaches include an explicit focus on resource poor clients, a commitment to farmer's participation in the development of technology designed to

meet their needs (Ewell, 1988). The use of interdisciplinary systems perspective, and integration of on farm and on station experimentation in the design and testing of new or alternate technologies are often used today. The Farming system research and extension approach is currently being applied to technology development in crops, livestock, and agro forestry. In such cases, gender analysis is one of the areas of consideration.

3.4. 2. Participatory gender analysis approaches

Gender analysis is an approach and method, which enables us to analyze the differences that exist, between different gender categories with respect to activities, access and control of resources and benefits, decision-making patterns, knowledge and problems. It has become the commonly accepted term for analyzing gender roles and inter and intra household dynamics with in farming systems. It complements rather than replaces other methods of social analysis. In other words, as an analytical tool that can be integrated into existing research methods or used as the foundation of gender based research approaches, which seeks to explore more fundamental questions about gender, society, and environment.

The participatory gender based analysis in this study involved the analysis of gender roles in decision making pattern in production and seed management systems in selected crops. The main elements of the methodology for this study were physical observation, semi-structured interviews, focus group interviews, key informant surveys, and a household survey. In this study the household is generally taken as the unit of analysis and male and female head of household as the principal decision maker and source of information for household survey. Different types of gender analysis techniques are described in the following sections.

3.4.2.1. Task analysis

Activities analysis indicates who does what, whose labour will be affected by proposed changes, what are the competing demands, and who needs to be taught new methods. Task analysis is used to find out what is the actual involvement of women and men in agricultural production. It finds out who actually are responsible for planning activities and who are the real actors. It identifies who is responsible for what type of activities and who are the knowledge holders for that activity. We need to know which tasks are under taken by men, women and by both. In this study, I used the techniques of task analysis to find out the involvement of women and men in crop production.

3.4.2.2. Resource analysis

This technique is generally used to examine gender access to and control over resources. The access/control analysis explores who has access to (conditionality about using it, how it is used) and control over (decision making about its use) resources used in crop production (Feldstein, Flora and Poats, 1989). In other words, control means the power to decide whether and how resources are used, how it is to be allocated. Access means the freedom or permission to use the resource, perhaps with some decision making once access is obtained. For example, when men have control over oxen, their wives and female relatives may obtain oxen traction service from them. Women have access to traction, but men have control over it. Resources used in crop production include land and the term on which it is available, and capital including cash, tools and livestock for draft power, labour, other inputs, seed, fertilizer, services such as credit facilities and agriculture extension support. If inputs are produced on-farm, such as manure, mulch materials, who controls or has access to them is important. Access to knowledge and information is particularly valuable in crop production as in other production systems.

3.4.2.3. Benefits analysis

As in the case of resource analysis, the gender benefit analysis also provides information about access to and control over benefits perceived from utilization of resources within the household. Benefits are defined as a number of outputs from the use of resources. It is important to understand what motivates people's decision about the allocation of benefits, who benefits from and the intended use of the output of each enterprise. It includes all the end uses of a product. In analyzing benefits, there are important questions to consider like; What are the products? And what are the uses and desirable characteristics of these farm products? Benefits analysis refers specifically to who has access to or control over the outputs of the production. For example, crop yield, income from sale, fodder and compost are benefits.

3.5. Selection of study site

3.5.1. Process of area selection

This study was inbuilt with the project entitled "Strengthening the scientific basis of *in-situ* conservation of agricultural bio-diversity" that has been implemented with the collaboration of Nepal Agriculture Research Council (NARC), and Local Initiatives for Biodiversity Research Development (LI-BIRD), with the support of International Plant Genetic Research Institute (IPGRI) since 1997. This study was inbuilt with the project. The project has been ongoing in Jumla, Kaski and Bara districts of Nepal. This study was carried out in Kaski

district. Kaski lies in the Hills of Western Development Region of Nepal. Since, women's involvement in agriculture is highest in Hills (Bajracharya, *et al.*, 1987), this study was conducted in this region.

During the process of selection of the study area, I visited different villages in Kaski, namely, Begnas, Rupakot and Majhathana. Direct observations as well as participatory rural appraisal were conducted. The major techniques were key informant survey and informal discussion, with rural farmers. The key informant survey was held with village leaders, Village Development Committee (VDC) chairperson, social workers, schoolteachers, and field staff of the above-mentioned project. Having these preliminary field visits, I gained further interest to do my proposed investigations in gender analysis in Begnas and Rupakot.

3.5.2. Criteria used in selection of the study area

During the process of site selection, I reviewed the site selection reports and base line survey reports of the above mentioned project (Rijal *et al.*, 1998; Poudel *et al.*, 1998; Sherchand *et al.*, 1998; Rana *et al.*, 2000a; 2000b; 2000c). The major decisive factors for site selection are mentioned below.

- Site accessibility throughout the year
- Socio cultural and economic diversity
- Previous on farm conservation intervention
- Existence of community based organizations
- Existence of active women's groups
- Appropriate composition of Indo-Aryan and Tibeto-Burman communities

3.5.3. Criteria for crop selection

Rice, maize, potato and ginger were chosen as case crops for this study. Rice and maize are main staple crops in Hills of Nepal. Rijal *et al.* (1998) reported that in Begnas and Rupakot village rice and maize are respectively first and second important crops for household food security. Farmers are growing various types of cereals in this area. Among these, rice and maize are the most important crops in the livelihoods of these village's farmers. Similarly potato and ginger are the important kitchen garden crops. Almost all households grow these crops in small area of the kitchen garden. They mainly use potato as a curry in regular meals.

Ginger is one of the important spices that also has medicinal value. Farmers are growing these crops for their household consumption as well as for sale in local markets for cash income.

3.6. Secondary data collection

Both primary and secondary data were collected for this study. Secondary data was collected from government departments, Non-government Organizations, and Universities. The information on the study area were collected from the district profile obtained from the District Development Committee and District Agricultural Development Office and Lekhnath municipality of the Kaski District.

The main source for secondary data such as books, reports, journals, were also collected from the main and Noragric library at the Agricultural University of Norway and central library of Tribhuvan University in Nepal. Libraries at ICIMOD and LI-BIRD also served as important sources of literature in gender studies in Nepal.

3.7. Field process of primary data collection

3.7.1. Focus group interview

Focus group interviews were conducted with men and women from the Indo-Aryan and Tibeto-Burman communities in the Kholakochheu, Nepal (Annexure 1). *Brahmin*, and *Chhetri* were included from the Indo-Aryan community and Gurungs were included from Tibeto-Burman community. Comparisons of Indo-Aryan and Tibeto-Burman communities were done. After several visits, Kholakochheu was found appropriate for the focus group interview because it has almost equal number of inhabitants of both Indo-Aryan and Tibeto-Burman communities.

To guide the focus group interviews a checklist was developed. The checklist included gender roles, men and women involvement in agricultural production, access to and control over resources, benefits perceived from staple and kitchen garden crops, and decision making of men and women in crop production and seed management activities. Discussions were held with local supervisor, and other LI-BIRD professionals to refine the checklist. The checklist was translated into Nepali, the colloquial language. To validate the uniformity in translation, a third person was requested to retranslate the checklist back into English. Then the checklist was pre-tested with a group of farmers and comments were incorporated and some questions were modified. The final checklist is given in (Annexure 9).

Participants were selected with the help of a community motivator and key informants. The criteria of selecting participants were ethnicity, occupation, gender and knowledge on crop production. Farmers were requested to participate by sending invitation letters. Participants were included in focus groups as suggested by Krueger (1994) including six to ten people in each group. Separate focus groups interviews were conducted for Indo-Aryan and Tibeto-Burman communities. In this study, six-focus group interviews were carried out with groups of men and women separately, and in gender mixed groups (Figure 3.1). Differences in the responses by men's and women's separate focus groups were recorded in each community and discussed again for the final consensus in gender mixed focus groups of each community. Three focus groups interviews were conducted in two weeks duration.

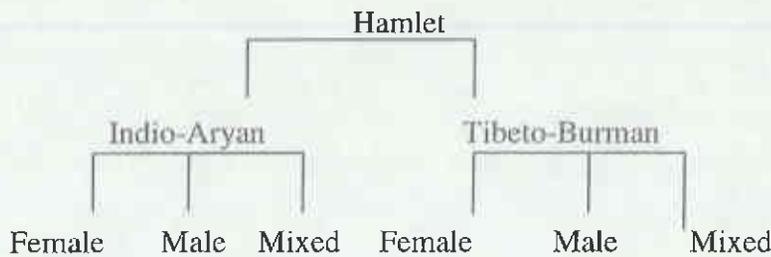


Figure 3.1 Types of focus groups

All focus group interviews were moderated by the researcher herself being accompanied with one male colleague as assistant moderator. One female key informant from the same community having fluency in Gurung language helped during the focus groups interviews with Gurung. The moderator was guiding the interview with the help of checklist and taking few notes. The assistant moderator was handling impulsive interruptions, operating audio recorder, taking photographs, and understanding participants' satirical responses. Immediately after each group interview, the moderator and assistant moderator together listened to the audiocassettes and took additional notes on participant's body language and direct quotations. Audio recording was useful to capture the whole discussion and specific quotation of participants in the interview.

3.7.2. Key informant interview

The key informant survey was conducted in order to analyze the change in gender roles in crop production over time, the reasons for change, and its implications for on-farm conservation and utilization of crop diversity. For key informant interview, three hamlets

namely, Kholakochheu, Rupakot and Chaur were selected. Altogether twelve key informants were interviewed as shown in the table below.

Table 3.1. Number of key informants from different hamlets

Name of hamlets	Indo-Aryan		Tibeto-Burman		Total
	Men	Women	Men	Women	
Kholakochheu	1	1	1	1	3
Chaur	1	1	1	1	3
Rupakot	1	1	1	1	3
Total	3	3	3	3	12

To guide the key informants survey, a checklist was developed as described as in the focus group interview. The checklist includes changes in men and women's involvement, access to and control over resources, benefits perceived; and decision making of men and women in crop production and seed management systems during the last four decades. The final checklist after pretest is given in (Annexure 10.).

For the collection of past information about the change of gender profile in agricultural production, elderly people over the age of sixty years were selected from both Indo-Aryan and Tibeto-Burman communities (Annexure 1.). They are more knowledgeable and experienced in agriculture, and have extensive knowledge about past agricultural practices. They were identified through consultation with local farmers, from focus group interviews, local leaders, social workers, LI-BIRD field staff, and members of women's group. They were informed by sending request letters three days before the proposed day of interview.

I, myself, facilitated all the key informant interviews accompanied by one male colleague as assistant. I posed the questions to the interviewee using the checklist; and my assistant helped to take notes. The information was audio recorded so that it would be convenient to verify the answers. The assistant helped to handle the recorder and to check outsider's interruption. Moris and Copestake (1993) also suggested that conversation should be allowed to flow spontaneously. When the conversation is audio recorded it is easy to capture important questions and prompts, and some forms of simultaneous note taking become essential when names, detailed facts or numerical information are provided. Moris and Copestake (1993) suggested that key informant survey is the single most important diagnostic feature of good

qualitative enquiry. It helps for full exploitation of insights from key informants. The best way to combine methodological discipline with a friendly manner is to conduct interviews in pairs; with one person taking notes checking that nothing is omitted, while the other person is asking questions. Key informants were asked about their past experience with regard to involvement of men and women in crop production, access to and control of resources and perceived benefits from crop production. The principal decision maker in crop production and seed management four decade ago was also consulted. I spent one day for one key informant interview.

3.7.3. Wealth ranking

Wealth ranking solves the problem of identifying truly representative farmers for different wealth categories. Grandin (1994) suggests that wealth ranking is a simple technique that allows the researcher to understand quickly the nature of wealth differences in a community and to determine the approximate wealth status of each community member. Wealth ranking was already done in six hamlets (Rijal, 1999). In two hamlets (Mohariya and Chisapani) wealth ranking was not available from previous studies, and therefore a new wealth ranking exercise was carried out during the initial stage of the study. For the wealth ranking, a list of entire households of Chisapani and Mohariya hamlets were prepared from the Rupakot VDC records. The name of each household was written on separate cards. The key informants like schoolteachers, local leaders, and active farmers were requested to assort the cards into different well being categories. Then I facilitated them to mention the criteria of well being ranking. The major criteria were landholding, livestock holding, food sufficiency, land tenure, credit history, source of off farm income and ownership of a house and land in cities.

3.7.4. Household survey

A household survey was planned based on the qualitative information available from the focus group interviews and key informant surveys. A questionnaire was formulated addressing the research questions and on the basis of the information collected from the qualitative inquiry. The questionnaire was discussed with local supervisor and LI-BIRD professionals. It was translated in to Nepali, the colloquial language. Then it was pretested with one respondent each from the Indo-Aryan and Tibeto-Burman communities. After the pre-test, the questionnaire was modified and finalized (Annexure 11).

A multistage sampling method was applied. At the beginning, the hamlets of mixed communities of Indo-Aryan and Tibeto-Burman communities were purposively selected. Altogether eight hamlets, five hamlets (Devasthan, Mohiriya, Chasipani, Jamaunkuna and Talparisamuha) from Rupakot VDC's and three hamlets (Uppalotalbasi, Chaur and Rupasirjans samuha) from Lekhnath municipality were selected. The strata were based on ethnicity and wealth status (Figure 3.2.).

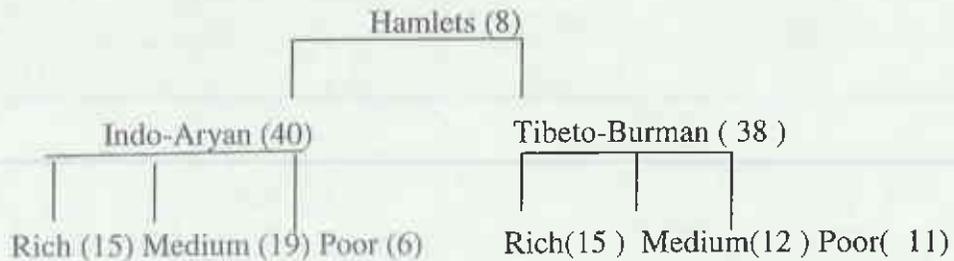


Figure 3.2. Sampling stratification of household survey

In the sampling frame, there were total of 361 households. Out of these households, 167 and 173 households were respectively Indo-Aryan and Tibeto-Burman. Wherein 135,128 and 98 households were respectively rich medium and poor status. Within each stratum random sample of twenty percent households were selected. Thus, a total sample of seventy eight households were interviewed. Among these households forty were Indo-Aryan and thirty eight were Tibeto-Burman. Thirty, thirty-one and seventeen households were respectively from rich medium and poor categories.

For the administration of the survey, three enumerators (one female and two male) were identified. They were hired from the beginning of the fieldwork. All of them had prior experience of interviewing technique. First I administered the questionnaire in their presence to facilitate better collection of information. Then they started to administered questionnaire in my presence. When they developed some confidence, I released them for conducting the survey alone. I usually checked the filled questionnaire every evening and gave feed back to them for further improvements.

3.7.5. Direct observation

In this study, I spent five month in the field for collecting the required data. I grew up in a village close to the study area. However, at the very beginning of this study, I as an observer had a holistic view in the observation of the farming activities. During my stay in the study

area, I kept a diary in which I held a record of my observations, essential issues regarding involvement of men and women in farming and off farm work. Along the process of research, I concentrated on major staples and kitchen garden crops. When I started the fieldwork in August 2001, it was the time for rice plantating and harvesting of maize in this area. It gave me a very good opportunity to observe people at work, who does what, and when? The direct observation was helpful to specify the research questions, which was formulated during the planning of the study. This process cross checked the information collected from focus group interviews and the household survey, the respondents reflected what they really do in practice.

3.7.6. Data analysis

The qualitative data were analyzed and interpreted based on theories. In order to analyze quantitative data statistical package for social sciences (SPSS) and MINITAB were used. I entered the data in Excel spreadsheets and transferred to SPSS and MINITAB for convenience. Descriptive statistics, cross tabulation, Pearsons Chi square test were performed. The outputs from the data were interpreted.

3.8. Conclusion

In this study research problems were handled using multi method approaches. The integration of qualitative and quantitative methods to understand the decision making process in crop production, use of resources and sharing of benefits was found effective. For gender analysis in crop production, it is better to integrate qualitative technique like focus group interviews, and key informant survey with quantitative techniques like household survey. For instance, it is not polite to ask rich or poor people to attend separate focus groups. But it is easier to do gender analysis within different wealth categories by doing a household survey.

Chapter 4. Gender Analysis in Crop Production

4.1. Introduction

A study was carried out to analyze the gender roles, resource use and benefits sharing in crop production. The research questions are: what are the major tasks in rice, maize, potato, and ginger production carried out by men and women. What are the resources used and benefits produced and who has access to and control over such resources and benefits?

In this chapter, the fieldwork procedures are described in brief. Then the gender involvement in rice, maize, potato, and ginger production are described in detail. Gender access to and control over resources and benefits are identified. Analysis of resources and benefits are also done. Finally, the major findings are high lighted.

4.2. Methods

Gender analysis was done for the tasks, resources use, and benefits produced from activities related to crop production. Analysis was done in focus group (men, women and mixed) interview with gender segregated as well as gender mixed groups using the same checklist for all groups. Gender involvement in major activities for rice, maize, potato and ginger production and gender access to and control over resources used and benefits from these production were analyzed for the Indo-Aryan and Tibeto-Burman communities. The gender access to and control over major resources and benefits from crop production at household level were further investigated by household survey, and analysis was also done between the wealth status.

4.3. Gender analysis in rice production

Rice plays an important role in the livelihoods of Nepalese farmers. It is the first crop both in terms of area and production (MOAC, 2000). It covers about forty seven percent of the total cereal area and fifty seven percent of the total yield of the cereals. In the study area, rice is the major crop for food security followed by maize and finger millet (Rijal *et al.*, 1998). A total of sixty nine rice cultivars are found in the area. Gupta *et al.* (1996) have reported more than 2000 rice landraces in Nepal. Farmers choose different landraces by using their indigenous knowledge for adaptability of landraces to the microclimate of the land parcel they have. Therefore rice, maize, potato and ginger were the case crops selected in this study.

In this section, the major activities in rice production, major resources used and benefits from rice production are presented. Variations of gender involvement in these activities between the Indo-Aryan and Tibeto-Burman communities and wealth status are described. Finally, gender access to and control over resources and benefits are analyzed for the same categories.

4.3.1. Gender involvement between the communities

In the Indo-Aryan community, preparing seeds, carrying compost, uprooting, carrying and transplanting seedlings, selection of seeds and second weeding are women's tasks (Table 4.1). Similarly, ploughing, puddling and bunding, irrigation, threshing, winnowing and bullock trampling are men's tasks. Sowing seeds, first weeding, fertilization, harvesting, bundling and carrying the bundles, transportation and storage of grain, and transportation of straw are joint tasks. Although women and men in mixed groups agreed on the above results, there were some disagreements between male and female focus group on some tasks (Annexure 2a).

Table 4.1. Gender variation in involvement in rice production between communities

Involvement	Indo- Aryan	Tibeto-Burman
Women	Preparing seeds, Manure transport, Uprooting of seedling, Carrying seedling, Transplanting, Selection of seeds, Second weeding	Preparing seeds, Manure transport, Sowing seeds , Uprooting of seedling, Carrying seedling, Transplanting, Selection of seeds, First weeding
Men	Ploughing seedbed and field, Puddling and bunding, Irrigation Threshing, Winnowing, Bullock trampling,	Ploughing seedbed and field, Puddling and bunding, Irrigation Threshing, Winnowing, Bullock trampling
Both	Sowing seeds First weeding Fertilization, Harvesting, Bundling and carrying, Transportation of grain, Storing grain, Transportation of straw	Second weeding Fertilization, Harvesting, Bundling and carrying, Transportation of grain, Storing grain, Transportation of straw

Note: The tasks in bold faces are uncommon between communities.

In Tibeto-Burman community, preparing and sowing seed, carrying compost, uprooting and carrying seedlings, transplanting, first weeding and selection of seeds are women's tasks. Ploughing, puddling and bunding, irrigation, threshing, winnowing and bullock trampling are men's tasks. However, second weeding, fertilization, harvesting, bundling and carrying the

bundles, transportation and storage of grain and straw are joint tasks. Although men and women in mixed groups agreed on the above results, there were some disagreements between male and female focus groups on some tasks (Annexure 2b).

Men's and women's involvement in rice production are almost similar in Indo-Aryan and Tibeto-Burman communities. In the Indo-Aryan community, seed sowing and first weeding of rice are joint activities while second weeding is mostly women's task. But in Tibeto-Burman community, second weeding is joint activity while sowing seed and first weeding are women's tasks. One Indo-Aryan woman said, "Men rarely involve in second weeding of rice as they are scared of bruising of their body from the heavily grown rice leaves". They are reluctant to do the activities that need patience. It indicates that women are doing the tasks that need more patience.

4.3.2. Gender access to and control over resources between communities

The major resources used in rice production are land, seed, draft power, manure, fertilizer, labour and acquired knowledge and information. In the Indo-Aryan community, both men and women have access to most of the resources. However, most of the resources are under the control of men. All resources are accessible to both men and women (Table 4.2). However, land, fertilizer, draft power, and acquired knowledge and information are under the control of men. Seed and labour are under the control of both men and women. Although men and women in mixed group agreed on the above results, there were some disagreements between male and female focus groups on access to and control over resources (Annexure 3a, 3b).

Table 4.2. Gender variation in resources use in rice production between communities

Gender	Control over		Access to	
	Indo- Aryan	Tibeto-Burman	Indo- Aryan	Tibeto-Burman
Women		Seed Fertilizer Labour		Seed Labour
Men	Land Fertilizer Draft power Knowledge and information	Land		
Both	Seeds Labour	Draft power Knowledge and information	Draft power Land Seeds Fertilizer Labour Knowledge and information	Land Fertilizer Draft power Acquired knowledge and information

Note: Access is defined as conditionality about using it, how it is used, control is defined as decision-making about its use.

In Tibeto-Burman community, most of the resources such as land, fertilizer, draft power, and acquired knowledge and information are accessible to both men and women. Seeds and labour are accessible to women only. Resources like seed, fertilizer and labour are under the control of women. Land is under the control of men. Draft power, acquired knowledge and information are under control of both men and women. Although men and women in mix group agreed on the above results, there were some disagreements between male and female focus groups on control of some resources (Annexure 3c, 3d).

Gender differentiation in access to and control over resources used in rice production is less in Tibeto-Burman than in Indo-Aryan community. Tibeto-Burman women have access to and control over more resources used in rice production than Indo-Aryan women. For instance, in Tibeto-Burman community, resources like seed, fertilizer and labour are under the control of women. In Indo-Aryan community, seed and labour are under the control of both men and women but fertilizer is under the control of men. It is because purchasing of fertilizer requires cash that is under the control of men. It is because Indo-Aryan women have less control on cash compared to Tibeto-Burman women.

4.3.3. Gender access to and control over resource between wealth status

Since seed is one of the most important resources for rice production, the gender access to and control over it is also assessed between wealth status. Gender access to rice seed is statistically independent of the wealth status ($P=0.106$). In majority of the households, women have access to it. It is because rice seed selection and storage is under women's domain (Figure 4.1. a). Respectively in sixty-three, sixty eight, and ninety four percent of the rich, medium, and poor households women have access to rice seed. As in the case of access, the gender control on rice seed is also statistically independent of wealth status ($P=0.235$). Rice seed is under the control of women in majority of the households (Figure 4.1. b). Respectively in fifty-seven, seventy-seven, and eighty one percent of the rich, medium and poor household, women control the rice seed. It is because storage of rice seed is the responsibility of women. In general, women's access to and control over seed increases with decrease in the wealth status. In other words women in poor households are more concerned with handling of rice seed.

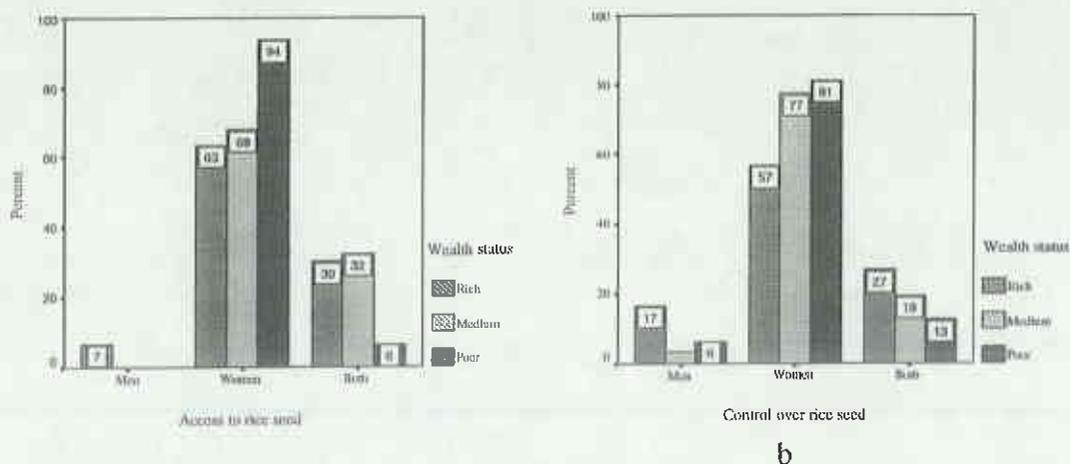


Figure 4.1. Gender access to and control over rice seed among wealth status

4.3.4. Gender access to and control over benefits between communities

Benefits perceived from rice production mentioned by different focus groups are grain for consumption, rice seed, straw, grain for sale, income from sale, rice bran and rice husk. In Indo-Aryan community, both men and women have access to all the benefits except income from sale of rice. Income from sale is inaccessible to women. Both men and women have equal access to grain for consumption and sale, straw, rice-husk, rice bran, and seed (Table 4.3). But most of the benefits from rice are under the control of men. Grain for consumption is under the control of women. Straw and grains for sale are under the control of men. Rice seed, husk and bran are under the control of both men and women. Although men and women in mix group agreed on the above results, there were some disagreements between male and female focus groups on access to and control of some benefits (Annexure 4a, 4b).

Table 4.3. Gender variation in access to and control over benefits from rice between communities

Gender	Control over		Access to	
	Indo- Aryan	Tibeto-Burman	Indo- Aryan	Tibeto-Burman
Women	Grain for consumption	Grain for consumption		
Men	Straw Grain for sale Income from sale		Income from sale	
Both	Husk Rice bran Seed	Straw Grain for sale Income from sale Seed Rice husk Rice bran	Grain for consumption Straw Rice husk Rice bran Grain for sale Seed	Grain for consumption Straw Rice husk Grain for sale Income from sale Seed Rice bran

Note: Access is defined as conditionality about using it, how it is used, control is defined as decision-making about its use.

In Tibeto-Burman community, both men and women have access to and control over all benefits from rice (Table 4.3). Although men and women in mixed group agreed on the above results, there were some disagreements between male and female focus groups on control of some benefits from rice (Annexure 4c).

In Indo-Aryan community, both men and women have access to all benefits except income from sale of rice. However, most of benefits are under the control of men. Men are responsible for all the household expenditure and income. Generally, Indo-Aryan men do not consult with their women for selling or buying by products of crops. In Tibeto-Burman community, both men and women have access to and control of all the benefits. The Tibeto-Burman women have more control on benefits from rice production than Indo-Aryan women. Indo-Aryan men control benefits from crops production when the cash is involved in it.

4.3.5. Gender access to and control over benefits among wealth status

The gender access to and control over major benefits from rice production like grain for consumption, and straw are further investigated between wealth status at household level. Gender access to rice grain for consumption ($P=0.293$) and control ($P=0.381$) are statistically independent of the wealth status. In majority of the rich and medium households, both men and women have access to rice grain for consumption. In majority of poor households women have access to rice grain for consumption (Figure 4.2.a). Comparatively in the majority of the poor households, women have access to grain for consumption but majority of medium and rich household both men and women have access to it.

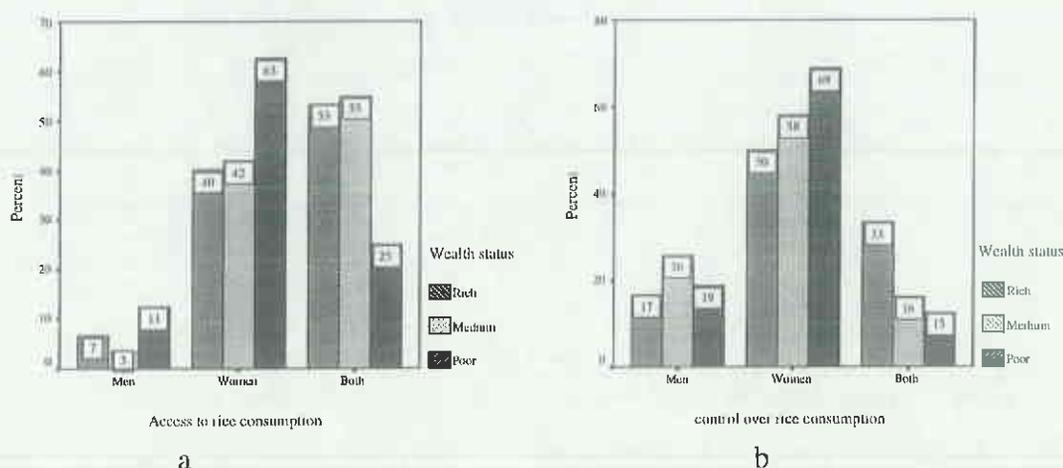


Figure 4. 2. Gender access to and control over rice grain for consumption among wealth status

In majority of the households, rice grain for consumption is under the control of women. Respectively in fifty, fifty-eight and sixty nine percent of the rich, medium and poor household it is under the control of the women (Figure 4.2.b). Since in almost all the households women are responsible for preparation of food for all the family members, they have control on it.

Gender access to ($P=0.750$) and control over ($P=0.981$) the rice straw are statistically independent of the wealth status. In majority of the households, this is accessible to both men and women (Figure 4.3.a). Respectively in seventy-seven, sixty-one and sixty three percent of rich, medium and poor household, both men and women have access to this benefits. But the control over it is different. In the majority of the households, it is under the control of the men. Respectively in forty-seven, forty-five and thirty eight percent of the rich, medium and poor households, rice straw is under the control of men (Figure 4.3.b). Women’s control on rice straw is greater in poor households compared to rich and medium households.

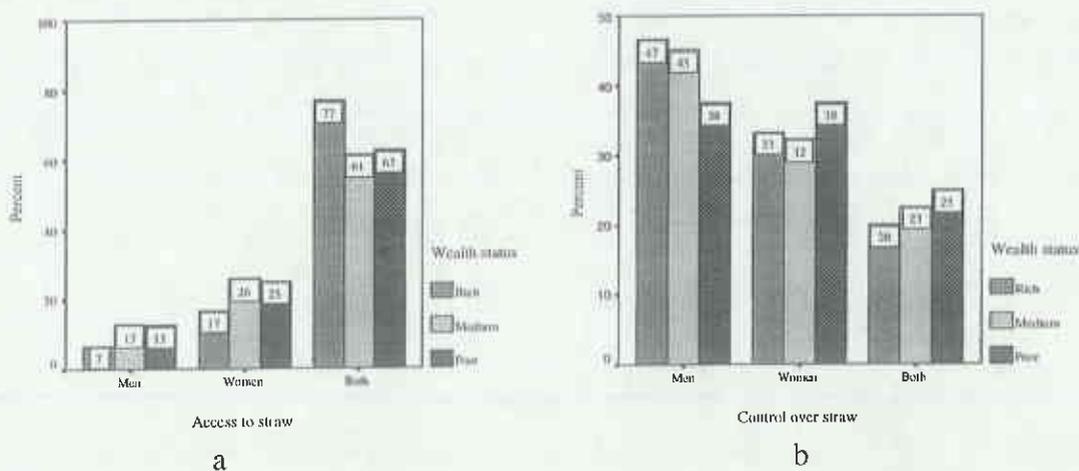


Figure 4.3. Gender access to and control over rice straw among wealth status

The trend shows that gender access to and control over rice grain for consumption and rice straw are independent of wealth status. However, women’s access to and control over those benefits from rice increase with decrease of economic status of the households.

4.4. Gender analysis in maize production

Maize is the second most important crop in Nepal both in terms of area and production (MOAC, 2000). It respectively covers about twenty five and twenty one percentage of the

total cereal area and production in the country. Almost all households in the Hills of Nepal grow this crop. This is used as staple food well as animal feed.

This section describes gender issues in maize production in terms of involvement, resources use and benefits sharing. Comparisons are made between Indo-Aryan and Tibeto-Burman communities.

4.4.1. Gender involvement between communities

Indo-Aryan women carry out more tasks in maize production than men (Table 4.4). Women exclusively involve in transporting manure, planting, first and second weeding, harvesting, cleaning, and selection of seeds. However, ploughing field is men’s task. Planting, stover cutting and storing grain are joint tasks. In the Tibeto-Burman community, women exclusively involve in transporting manure, planting, first and second weeding, harvesting, and selection of seeds. Ploughing field, cleaning cob and storing grain are men’s tasks. However, stover cutting is done jointly. Although men and women in mix group agreed on the above results, there were some disagreements between male and female focus groups on some tasks (Annexure 5a, 5b).

Table 4.4. Gender variation in involvement in maize production between communities

Involvement	Indo- Aryan	Tibeto-Burman
Women	Manure transport First weeding Second weeding, Harvesting Cleaning Selection of seeds	Manure transport Planting First weeding, Second weeding, Harvesting Selection of seeds
Men	Ploughing	Ploughing Cleaning Storing grain
Both	Planting Stover cutting, Storing grain	Stover cutting

Note: The tasks in bold faces are uncommon between communities.

Gender involvement in maize production are almost similar in both Indo-Aryan and Tibeto-Burman communities. Women in both communities carry out most of the tasks in maize production. However, there are differences in some tasks. In the former community, planting and storing grain are joint tasks; while in the latter community these tasks are respectively done by both women and men. Moreover, Indo-Aryan women do cleaning of cobs while Tibeto-Burman men do this task.

4.4.2. Gender access to and control over resources between communities

The major resources used in maize production are land, seed, manure, draft power, and labor. In the Indo-Aryan community, both men and women have access to all the resources (Table 4.5). However, there are differences in control. All resources except land and draft power are under control of both men and women. Land and draft power are controlled exclusively by men.

Table 4.5. Gender variation in resources used in maize production between communities

Gender	Control over		Access to	
	Indo- Aryan	Tibeto-Burman	Indo- Aryan	Tibeto-Burman
Women		Manure Seed Labour		Seed Labour
Men	Land Draft power	Draft power		
Both	Manure Seed Labour	Land	Draft power Land Seed Labour Manure	Draft power Land Manure

Note: Access is defined as conditionality about using it, how it is used, control is defined as decision-making about its use.

In Tibeto-Burman community, both men and women have access to draft power, land and manure. But, seed and labour are only accessible to women. Most of the resources except draft power are under the control of women. It is controlled by men. Land is under the control of both men and women. In this community, women have relatively more power to negotiate for gaining access to resources.

In Tibeto-Burman community, women have more access to and control over resources than Indo-Aryan community. Tibeto-Burman women have their exclusive access to seed and labour but Indo-Aryan women do not have it. Likewise, Tibeto-Burman women controlled manure, seed and labour but Indo-Aryan women do not have independent control on any resources.

4.4.3. Gender access to and control over benefits between communities

The benefits from maize production are grain, seed, stover, cob cover and cob stalk. In Indo-Aryan community, both men and women have access to all the benefits (Table 4.6). Cob cover, cob stalk and stover are under the control of women. It is because women are the caretakers of small ruminants. These are used as feeds. But maize grain is under the control of men. Seed of maize is controlled by both men and women.

Table 4.6. Gender access to and control over benefit from maize between communities

Gender	Control over		Access to	
	Indo- Aryan	Tibeto-Burman	Indo- Aryan	Tibeto-Burman
Women	Cob cover Cob stalk Stover	Cob cover Cob stalk Stover Grain		
Men	Grain			
Both	Seed	Seed	Grain Cob cover Cob stalk Stover Seed	Grain Seed Cob cover Cob stalk Stover

Note: Access is defined as conditionality about using it, how it is used, control is defined as decision-making about its use.

In Tibeto-Burman community, both men and women have access to all the benefits. But most of the benefits except seed are controlled by women. Seed is controlled by both men and women. There are no differences in access to and control of benefits from maize between Indo-Aryan and Tibeto-Burman communities. But control over benefits is different. In the former community, grain is controlled by men while in the latter it is controlled by women.

4.5. Gender analysis in potato production

Potato is the second cash crop after oil seeds in terms of area in Nepal. It respectively covers thirty one and thirty five percent of the area and production of the cash crops in Nepal (MOAC, 2000). In the study area, forty seven percent of the total households grew potato. Ninety one percent of the households grew potato for their home consumption and nine percent of the households sold potato for cash income. Potato is used as a vegetable in the Hills and Terai while it is a staple crop in the Mountains.

In this section, the major activities involved in potato production are presented and gender involvement is compared between the Indo-Aryan and Tibeto-Burman communities. Major resources used and benefits produced are identified. Gender variation in access to and control over resources used and benefits are compared between the communities.

4.5.1. Gender involvement between communities

In the study area, potato is grown as cash crop as well as a kitchen garden crop. Ploughing, transporting manure, preparing seed, planting, weeding, harvesting and selling potato are major activities associated with potato production. In Indo-Aryan community, all tasks except ploughing and harvesting are done by women (Table 4.7). Both men and women do harvesting. As in the Indo-Aryan community, Tibeto-Burman women exclusively carry out all

tasks except ploughing. Harvesting potato is a joint activity. In both communities ploughing field is men's task.

Table 4.7. Gender variation in involvement in potato production between communities

Involvement	Indo- Aryan	Tibeto-Burman
Women	Seed preparation Transport manure Planting Weeding Seed selection and storing Selling	Seed preparation Transport manure Planting Weeding Harvesting Seed selection and storing Selling
Men	Ploughing	Ploughing
Both	Harvesting	

Note: The tasks in bold faces are uncommon between communities.

There are no major differences in gender involvement between two communities except for harvesting potato. In the Indo-Aryan community, it is done by both women and men while in Tibeto-Burman community it is exclusively done by women.

4.5.2. Gender access to and control over resources between communities

Land, seed, fertilizer, manure, income from sale, draft power, labour, and knowledge and information are major resources used in potato production. In Indo-Aryan community, both men and women have access to all the resources (Table 4.8). All the resources except labour and manure are under the control of men. Although men control most of the resources in potato production, these are accessible to both women and men.

In Tibeto-Burman community, all resources except seed and labour are accessible to both men and women. The seed and labour are accessible to women. All the resources except draft power, land, knowledge and information are controlled by women. Draft power is under the control of men. Land, knowledge and information are controlled by both men and women. Although Tibeto-Burman women control most of the resources used in potato production, both women and men have access to these resources.

In both the communities, most of the resources are accessible to both men and women, but there is an interesting difference in control. In Tibeto-Burman community, women control more resources compared to Indo-Aryan community. Thus Tibeto-Burman women have more access to and control over resources used in potato production than Indo-Aryan women.

Table 4.8. Gender variation in resources used in potato production between communities

Gender	Control over		Access to	
	Indo- Aryan	Tibeto-Burman	Indo- Aryan	Tibeto-Burman
Women		Seed Manure Fertilizer Labour Income from sale		Seed Labour
Men	Land Seed Fertilizer Income from sale Draft power Acquired knowledge and information	Draft power		
Both	Labour Manure	Land Acquired knowledge and information	Draft power Land Manure Seed Fertilizer Labour Income from sale Acquired knowledge and information	Draft power Land Manure Fertilizer Income from sale Acquired knowledge and information

Note: Access is defined as conditionality about using it, how it is used, control is defined as decision-making about its use.

4.5.3. Gender access to and control over benefits between communities

Benefits from potato production are tuber for consumption and sale, and income from sale. In Indo-Aryan community, both men and women have access to all the benefits. But most of the benefits except tuber for consumption are under the control of men. Tuber for consumption is under the control of women. Similarly, in Tibeto-Burman community, both men and women have access to all the benefits from potato production. Although tuber for sale and income from sale are under the control of both men and women, tuber for consumption is under the control of women.

There are no differences between Indo-Aryan and Tibeto-Burman communities regarding the gender access to benefits from potato. However, there are differences in control over tuber for sale and income from sale. In the former community, these benefits are controlled by men while in the latter these are controlled by both men and women. Unlike the benefits that involve cash, tubers for consumption are controlled by women in both the communities.

4.6. Gender analysis in ginger production

Ginger is one of the most important spices in Nepal. Most of the farmers grow at least few clumps of ginger, it is grown for spices as well as cash earning. In the study area, seventy six

percent of the total households grew ginger for their household consumption and twenty percent of households sold it for cash income.

In this section the major tasks in ginger production, and variation in gender involvement between the Indo-Aryan and Tibeto-Burman communities are described. Major resources and benefits are identified. Then gender variation in access to and control over resources and benefits between the communities are also described.

4.6.1. Gender involvement between communities

Ploughing fields, transporting manure, selecting seed, planting, mulching, weeding harvesting, selling and seed storing are the major tasks in ginger production. All the tasks except ploughing are done by women in both the Indo-Aryan and Tibeto-Burman communities (Table 4.9.). In other words, there are no gender differences in involvement in ginger production between these two communities.

Table 4.9. Gender involvement in ginger production between communities

Involvement	Indo- Aryan	Tibeto-Burman
Women	Manure transport Planting Mulching Weeding Harvesting Seed selection and storing Selling	Manure transport Planting Mulching Weeding Harvesting Seed selection and storing Selling
Men	Ploughing	Ploughing
Both		

Note: The tasks in bold faces are uncommon between communities.

4.6.2. Gender access to and control over resources between communities

Land, seed, mulch, fertilizer, draft power, labour, manure and acquired knowledge and information are resources used in ginger production. In Indo-Aryan community, both men and women have access to all the resources (Table 4.10). But the major resources such as land, draft power, and acquired knowledge and information used in ginger production are under the control of men. Seed is under women's control. Hence in Indo-Aryan community, men control most of the resources but access is for both women and men.

In Tibeto-Burman community, both men and women have access to all resources except labour. Men do not have access in terms of labour use. However, all the resources except seed rhizome and labour are under the control of both men and women. Women exclusively

control seed rhizome, and labour. In both Indo-Aryan and Tibeto-Burman community, both men and women have access to most of the resources. However, there are differences in control. In the former community, most of the resources are controlled by men but in the latter community, it is controlled by both men and women.

Table 4.10. Gender variation in resources used in ginger production between communities

Gender	Control over		Access to	
	Indo- Aryan	Tibeto-Burman	Indo- Aryan	Tibeto-Burman
Women	Seed	Seed Labour		Labour
Men	Land Draft power Knowledge and information			
Both	Labour Mulch Manure	Land Draft power Knowledge and information Manure Mulch	Draft power Land Seed Mulch Labour Knowledge and information Manure	Land Seed Manure Draft power Knowledge and information Mulch

Note: Access is defined as conditionality about using it, how it is used, control is defined as decision-making about its use.

4.6.3. Gender access to and control over benefits between communities

Benefits from ginger are rhizome for consumption, rhizome for sale, income from sale and rhizome for seed. In Indo-Aryan community, both men and women have access to all benefits except income from sale. Women do not have access to income from sale (Table 4.11). Women have control over the rhizome for consumption and seed while men control the rhizome for sale and income from sale.

Table 4.11. Gender access to and control over benefits from ginger between communities

Gender	Control over		Access to	
	Indo- Aryan	Tibeto-Burman	Indo- Aryan	Tibeto-Burman
Women	Rhizome for consumption Rhizome for seed	Rhizome for consumption Rhizome for seed		
Men	Rhizome for sale Income from sale		Income from sale	
Both		Rhizome for sell Income from sell	Rhizome for consumption Rhizome for sale Rhizome for seed	Income from sale Rhizome for seed Rhizome for consumption Rhizome for sale

Note: Access is defined as conditionality about using it, how it is used, control is defined as decision-making about its use.

In Tibeto-Burman community, both men and women have access to all the benefits from ginger production. Women control rhizome for consumption and seed while rhizome for sale and income from sale are under the control of both men and women.

In Tibeto-Burman community, both men and women have access to all benefits but in Indo-Aryan community, women have no access to rhizome for sale and income from sale. In Indo-Aryan community, men have more control over the benefits from ginger but in Tibeto-Burman community women have more control over it.

4.7. Gender access to and control over major resources among wealth status

Major resources used in crop production are further investigated between the economic status at household level. Gender access to resources used in crop production such as land ($P=0.157$), oxen ($P=0.491$) and fertilizer ($P=0.832$) are independent of the wealth status. Likewise, the gender control of land ($P=0.738$), oxen ($P=0.572$) and fertilizer ($P=0.840$) are also independent of the wealth status of the households. In majority of the households, both men and women have access to land. Respectively in ninety three, eighty one, and seventy seven percentage of the rich medium and poor households, both men and women have access to land (Figure 4.4.a and 4.4.b). Although men have legal ownership of land, respectively in twenty three, thirty five, and thirty five percent of the rich medium and poor households, men and women negotiate on use of land. They jointly decide land transaction. Although women have no alienation right to land, after the death of one's husband she is usually the heir.

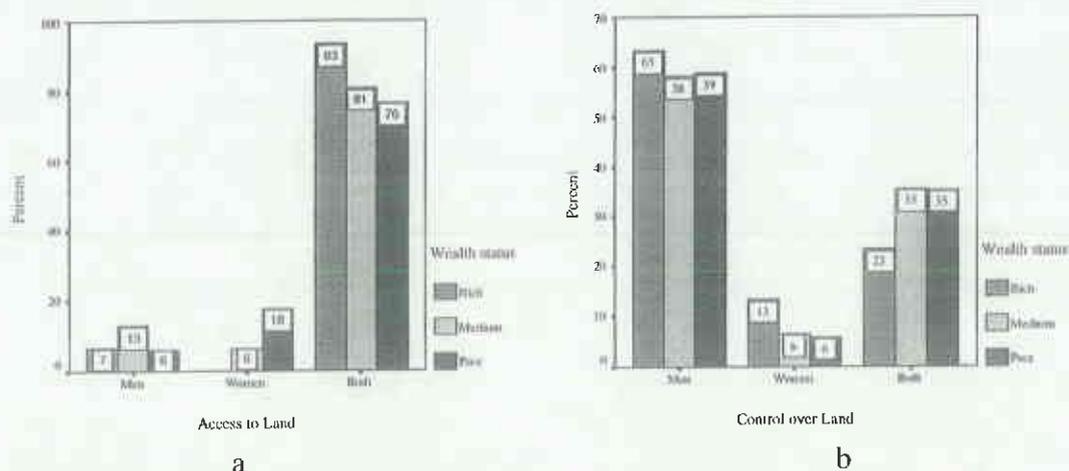


Figure 4.4. Gender access to and control over land among wealth status

In the Hills of Nepal oxen are used as draft power. Majority of the poor households do not have oxen because of landlessness or having limited land. Almost all poor households get oxen by exchanging for human labour. In majority of the rich and poor households, both men

and women have access to oxen. In the majority of households, at all types oxen are under the control of men. However, respectively in sixty four, seventy five, and eighty three percent of the rich, medium and poor households, oxen are under the control of men (Table 4.12). In very few percentages of the households, women have control on oxen. It is because ploughing is the domain of men.

Table 4.12. Gender access to and control over oxen among wealth status in (%)

Gender	Access			Control		
	Rich	Medium	Poor	Rich	Medium	Poor
Men	39.3(11)	50.0(14)	41.7(5)	64.3(18)	75.0(21)	83.3(10)
Women	17.9(5)	10.7(3)	11.8(8)	17.9(5)	10.7(3)	0(0)
Both	42.9(12)	39.3(11)	58.3(7)	17.9(5)	14.3(4)	16.7(2)
Total	100(28)	100(28)	100(12)	100(28)	28(100)	100(12)

Note: Figures in parentheses are number of households.

In the majority of the households, both men and women have access to fertilizer. Respectively in fifty five, fifty eight, and sixty two percent of the rich, medium and poor households, both men and women have access to fertilizer. In majority of the rich households, fertilizer is under the control of both men and women. In medium household, it is under the control of women. Only in twenty three percent of the poor household, women control fertilizer (Table 4.13).

Table 4.13. Gender access to and control over fertilizer among wealth status (%)

Gender	Access			Control		
	Rich	Medium	Poor	Rich	Medium	Poor
Men	15.0(3)	20.8(5)	7.7(1)	25.0(5)	30.4(7)	38.5(5)
Women	30.0(6)	20.8(5)	30.8(4)	35.0(7)	39.1(9)	23.0(3)
Both	55.0(11)	58.3(14)	61.5(8)	40.0(8)	30.4(7)	38.5(5)
Total	100(20)	100(24)	100(13)	100(20)	100(23)	100(13)

Note: Figures in parentheses are number of households.

Gender access to and control over major resources used in crop production are independent of the economic status of the household. Men and women in all categories of households have access to resources but control is different. Land and oxen are controlled by men but fertilizer is controlled by both men and women.

4.8. Conclusion

Men and women farmer's involvement in crop production varies between communities and types of crops. In both the Indo-Aryan and Tibeto-Burman communities, women involve heavily in crop production than men. However, both men and women are almost equally

involved in rice production. In both the communities, activities such as puddling, bunding and threshing are generally carried out by men while activities such as uprooting seedlings, transplanting and weeding are carried out by women. Women's involvement in maize, potato, and ginger production is higher than men. In both the communities, almost all tasks except ploughing are carried out by women. Traditionally, ploughing is carried out by men. In other words, land preparation is men's task and planting and weeding of maize are women's tasks. In both communities, gender involvement in maize production is almost similar, but Tibeto-Burman men participate in more tasks than Indo-Aryan men. It shows that women are the main actors of growing crops in the Hills of Nepal.

Men and women farmers' access to and control over resources used and benefits produced from crop production differ with community, types of crops and economic status of the households. Irrespective of community, both men and women have access to most of the resources and benefits associated with crop production, but control is usually with men. The gender differentiation in terms of access and control is relatively less in Tibeto-Burman community than Indo-Aryan community. In Tibeto-Burman community, seed and labour are usually under the control of women while in Indo-Aryan community these resources are controlled by both men and women. There are exceptions in Indo-Aryan community in terms of potato and ginger. Seed tuber is controlled by men while seed rhizome is controlled by women. Since seed potato is purchased every year owing to the problem of storage, it is controlled by men. On the contrary, seed rhizome is stored locally by women. Since it does not involve cash, the control is with women. Irrespective of crops, Tibeto-Burman women control fertilizer while Indo-Aryan men control it since it obviously involves cash. Regarding knowledge and information, Indo-Aryan women do not have control on it. They cannot participate in extension programs without the permission of male family members, usually husband or father in law.

In Indo-Aryan community both men and women have access to all the benefits from crop production except income from sale of crops. The benefits that generate cash income are controlled by men in Indo-Aryan community, but it is under the control of both men and women in Tibeto-Burman community. This is true with rice, maize, potato and ginger. Irrespective of community, the share of production of these crops for household consumption is controlled by women. It is because women are responsible for food preparation and feeding. Since women are responsible for storage of seeds, the portion of harvest that are set

aside for seed are controlled by women in both the communities. Regarding by products, rice straw is controlled by men in Indo-Aryan community while other minor by products such as husk and bran are controlled by both men and women. However, all the by products of rice are controlled by both men and women in Tibeto-Burman community. Unlike the case of rice, the by products of maize such as cob cover, cob stalk and stover are controlled by both men and women irrespective of community.

Gender access to and control over major resources and benefits associated with crop production are independent of the economic status of the household. Irrespective of the community, women's access to and control over resources and benefits increases with decrease in the wealth status of the households. In other words, in poor households women have relatively more power to negotiate with men as compared to the women's positions in rich households.

Chapter 5. Gender Differentiated Decision Making in Crop Production

5.1. Introduction

This chapter presents the gender differentiated decision-making process in crop production and seed management at a household level. The method used to collect information regarding the decision making process is mentioned in brief. Then I proceed to describe the gender variation on decision-making in crop production between ethnic communities and wealth status of households. It is followed by the description of the gender variation in decision making in seed management between the same categories of households. Finally conclusions are presented.

5.2. Methods

Gender differentiated decision-making in crop production and seed management was investigated through focus group interviews as well as household surveys. Gender differentiated and gender mixed focus group interviews were conducted in the Kholakochheu hamlet, involving participants from both Indo-Aryan and Tibeto-Burman communities. Disagreements between the gender-differentiated focus groups were discussed and concluded upon in gender mixed focus group of each community. Significant issues from the focus group interviews were investigated further in the household survey. The household survey was stratified along ethnicity and wealth status. Focus group interviews and household survey proved to be complementary. For instance, it may be improper to conduct separate focus group interviews for people of different wealth status. Such information could, however, easily be generated from a household survey.

5.3. Gender differentiated decision in crop production between communities

In the Indo-Aryan community, men have more decision making power on crop production activities than women. In the Indo-Aryan community both men and women make decision on selection of varieties, selling of by-products, and time of planting /transplanting (Table 5.1). Men make independent decisions on selection of land and crop, procurement of credit, using chemical fertilizer and manure, time of seedbed preparation and sowing, tillage, and irrigation. However, women make decision independently on hiring of labour, amount of consumption and sale and time of weeding and harvesting. Although women and men in mixed group agreed on the above results, there were some disagreements between male and female focus group (Annexure 14a).

Table 5.1. Gender variation in decision making on crop production between communities

Gender	Indo- Aryan	Tibeto-Burman
Women	Hiring of labour Amount of consumption and sale Time of weeding Time of harvesting	Amount of consumption and sale Hiring of labour Selection of variety Time of harvesting Time of planting/transplanting
Men	Selection of land Selection of crop Procurement of credit Using chemical fertilizer Using manure Seedbed preparation and sowing Time of tillage Time of irrigation	Procurement of credit Time of tillage
Both	Selection of variety Selling of by-products Time of planting/transplanting	Time of weeding Selection of land Selection of crop Using chemical fertilizer Using manure Seedbed preparation and sowing Time of irrigation Selling of by-products

Note: The tasks in bold faces are uncommon between communities.

Unlike in the case of Indo-Aryan community, Tibeto-Burman men and women make most of the decisions jointly regarding crop production (Table 5.1). Women make independent decisions on time of planting/transplanting, selection of varieties, hiring of labour, harvesting and amount of consumption and sale. Likewise, men's independent decisions are on procurement of credit and time of tillage. However, there are some disagreements between male and female focus groups (Annexure 14b).

Household surveys proved to be effective to identify gender differentiated decision making regarding major tasks of the crop production at the household level. Chi-square tests show that gendered decision-making on the time of tillage ($P=0.950$), planting/transplanting ($P=0.675$), and harvesting ($P=0.99$) of crops are independent of communities. Regarding the decision on time of tillage, both Indo-Aryan and Tibeto-Burman men make decisions with regard to this task (Table 5.2). This task is in the domain of men.

Table 5.2. Gender differentiated decision on time of tillage between communities (%)

Decision maker	Communities		Total
	Indo-Aryan	Tibeto-Burman	
Men	45 (18)	47.4 (18)	46.2 (36)
Women	35 (14)	31.6 (12)	33.3 (26)
Both	20 (8)	21.1 (8)	20.5 (16)
Total	100(40)	100 (38)	100 (78)
P Value=0.950			

Note: Figures in parentheses are number of households.

As in the case of tillage, decision on time of planting/transplanting of crops is also independent of communities. In forty and fifty percent of Indo-Aryan and Tibeto-Burman households, women make this decision (Figure 5.1). Likewise gender decision on harvesting of the crop does not depend upon the communities. In the majority of both Indo-Aryan and Tibeto-Burman households, women decide on time of crop harvesting (Figure 5.2.).

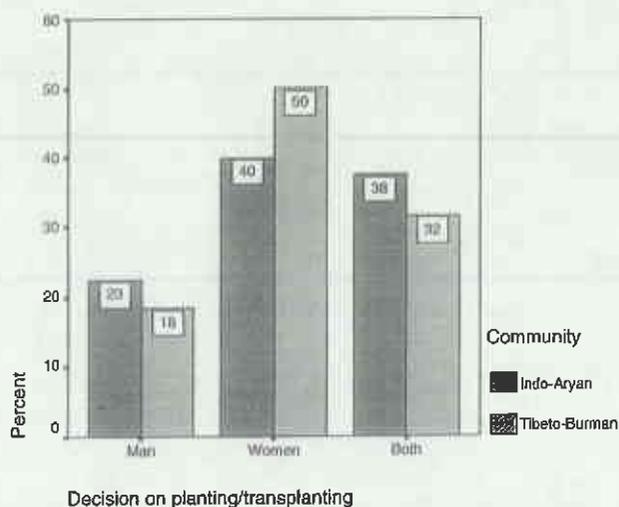


Figure 5.1. Gender decision on time of planting/ transplanting of crop between communities

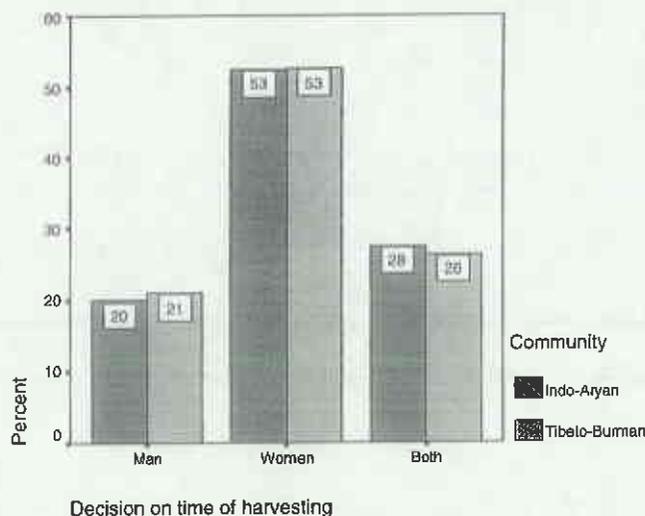


Figure 5.2. Gender decision on crop harvesting between communities

Most of the intercultural operations, such as weeding and manuring are done by women. Chi-square test shows that decision on time of weeding depends on the communities ($P= 0.057$). In respectively seventy three and fifty five percent of the Indo-Aryan and Tibeto-Burman

households, women make this decision. On the contrary, respectively one and eighteen percent of Indo-Aryan and Tibeto-Burman men make this decision (Figure 5. 3). Compared to Tibeto-Burman households, the decision on weeding is more of a women's decision in the Indo-Aryan households.

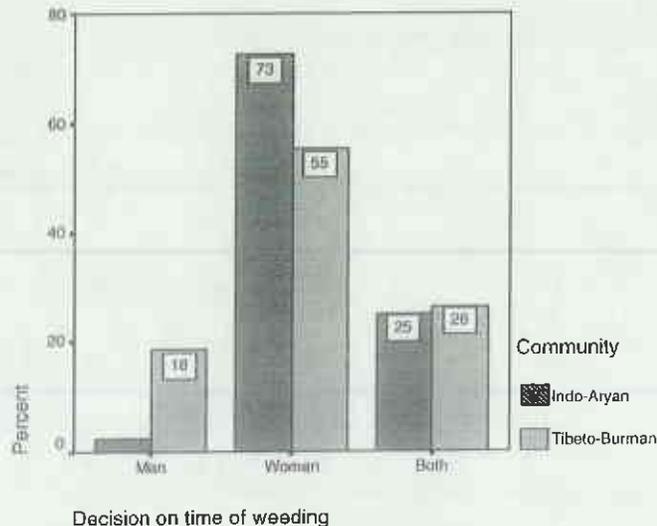


Figure 5.3. Gender decision on time of weeding between communities

The above findings revealed that Tibeto-Burman households practice more joint decision making than Indo-Aryan households. Men make most of the decisions in the Indo-Aryan community without consultation with women. Women in both communities decide hiring of labour, amount of consumption and sale, and time of weeding and harvesting of the crops. These are the women's tasks in both communities. Women decide on amount of consumption and sale because they are responsible to prepare food for all family members in both the communities. Likewise men decide time of tillage and procurement of credit in both communities. It is because tillage is men's job and procurement of credit has been determined by the availability of collateral. Since, women do not have legal ownership to land they are unlikely to get institutional credit. In both communities, men and women jointly decide upon selling of by products. For this decision, they need to consult women because women are responsible to feed animals, and they know the requirement of feed.

5.4. Gender differentiated decision in crop production between wealth status

A household survey was conducted to identify variation in gender differentiated decision making on major tasks of the crop production between wealth status of the households. The Chi square tests show that decision on time of tillage ($P = 0.943$), planting/transplanting ($P=0.425$), weeding ($P=0.766$) and harvesting ($P=0.318$) are independent of the wealth status

of the households. All the P-values are highly insignificant. Regarding the decision on time of tillage, men are the main decision makers in all categories of the households. In respectively fifty, forty two and forty seven percentage of rich, medium and poor households, men make this decision. Irrespective of the wealth status men decided time of tillage. It is because the tillage is in the men's domain.

Women make decision on time of planting /transplanting in all categories of households (Table5.3). Although the decision on time of planting and transplanting is statistically independent of wealth status, women's decision making power increases with decreasing wealth status. Women decide this task respectively in forty, thirty nine and sixty five percent of the rich, medium and poor households. The joint decisions of men and women increases with increasing wealth status.

Table 5.3. Gender decision on time of planting/transplanting of crops between wealth status (%)

Decision makers	Wealth of households			Total
	Rich	Medium	Poor	
Men	20.0(6)	22.0(7)	17.6(3)	20.5(16)
Women	40.0(12)	38.7(12)	64.7(11)	44.9(35)
Both	40.0(12)	38.7(12)	17.6(3)	34.6(27)
Total	100(30)	100(31)	100(17)	100(78)

P Value=0.425

Note: Figures in parentheses are number of households.

In the majority of all categories of households, women decide time of weeding. It is because weeding is considered as a minor job, as well as women's responsibility. Although this decision is statistically independent of the wealth status, women's decision increases with decrease in wealth status (Table 5.4). Respectively in fifty seven, sixty eight and seventy one percent of rich, medium and poor households women make this decision. But the joint decision increases with increasing economic status of the households.

Table 5.4. Gender decision in time of weeding among wealth status (%)

Decision makers	Wealth of households			Total
	Rich	Medium	Poor	
Men	13.3(4)	6.5(2)	11.8(2)	10.3(8)
Women	56.7(17)	67.7(21)	70.6(12)	64.1(50)
Both	30.0(9)	25.8(8)	17.6(3)	25.6(20)
Total	100(30)	100(31)	100(17)	100(78)

P Value=0.766

Note: Figures in parentheses are number of household.

As in the case of planting and weeding, women's decisions are also important for harvesting. Although the decision on harvesting of a crop is independent of wealth status, the decision

made by women increases with decrease in wealth status (Table 5.5). In majority of the poor households men migrate to off farm employment. Generally they do not consider it is important to be present during harvesting the crop. Owing to small farm size, women can decide on their own. However, the joint decisions increase with increase in economic status. It is because the rich households generally have big farm and both men and women are responsible for farming activities. In the Hills farmers have subsistence type of farming so they are unable to afford high labour cost for their crop harvesting. Thus most of the men who are employed in local off farm jobs are also present during the crop harvesting time. Therefore, women's decisions are more crucial in poor households while joint decisions are essential in rich households.

Table 5.5. Gender decision on time of crop harvesting among wealth status (%)

Decision makers	Wealth of households			Total
	Rich	Medium	Poor	
Men	23.3(7)	19.4(6)	17.6(3)	20.5(16)
Women	40(12)	58.4(17)	70.6(12)	52.6(41)
Both	36.7(11)	25.8(8)	11.8(2)	26.9(21)
Total	100(30)	100(31)	100(17)	100(78)
P Value=0.318				

Note: Figures in parentheses are number of household

The above findings show that the lower the economic status of the household the more women decide on major tasks like planting /transplanting, weeding and harvesting of crops. Contrary to this, the higher the economic status of the household, the greater the joint decision. It is because in majority of the poor households men migrate to off farm employment. Owing to their small farm size they do not consider it important to be involved in such decision-making. They rather provide some money and ask their women to decide on their own. But the rich households have relatively large farm size. They consider it important to make decisions under the consensus of both men and women.

5.5. Gender differentiated decision in seed management

In the Indo-Aryan community, seed replacement by improved varieties is both men and women's joint decision. Women make more decisions than men (Table 5.6). Women decide on pre-harvest seed selection, post-harvest processing and selection, storage of seed, selection after storage, and seed selling and distribution of seed as gifts. Likewise, men decide on purchasing improved seeds, selling and redistribution of new seed. Although women and men in mixed group agreed on the above results, there were some disagreements between male and female focus groups (Annexure 15a).

Table 5.6. Gender differentiated decision on seed management between communities

Gender	Indo- Aryan	Tibeto-Burman
Women	Pre-harvest seed selection Post-harvest processing/selection Storage of seed Selection after storage Seed selling and distribution as gift	Pre-harvest seed selection Post-harvest processing/selection Storage of seed Selection after storage Seed selling and distribution as gift Selling and redistribution of new seed
Men	Purchasing improved seeds Selling and redistribution of new seed	Purchasing improved seeds
Both	Seed replacement by improved variety	Seed replacement by improved variety

Note: The tasks in bold faces are uncommon between communities.

As with the Indo-Aryan community, Tibeto-Burman women make more decisions than men concerning seed management. Seed replacement by improved varieties is jointly decided by both men and women (Table 5.6). Women make all the decisions except purchasing improved seeds. Although women and men in mixed group agreed on the above results, there were some disagreements between male and female focus group (Annexure 15b).

As in the case of decisions on crop production, the major decisions on seed management are further verified at household level. Chi-square tests show that decisions on selection of seed ($P=0.992$), amount and type of seed storage ($P=0.299$), and replacement of seed ($P=0.734$) are independent of communities. Regarding the decisions on pre and post harvest seed selection, the majority of both Indo-Aryan and Tibeto-Burman women make decision on this. Respectively in seventy-eight and seventy six percent of Indo-Aryan and Tibeto-Burman communities, women make this decision (Figure 5.4).

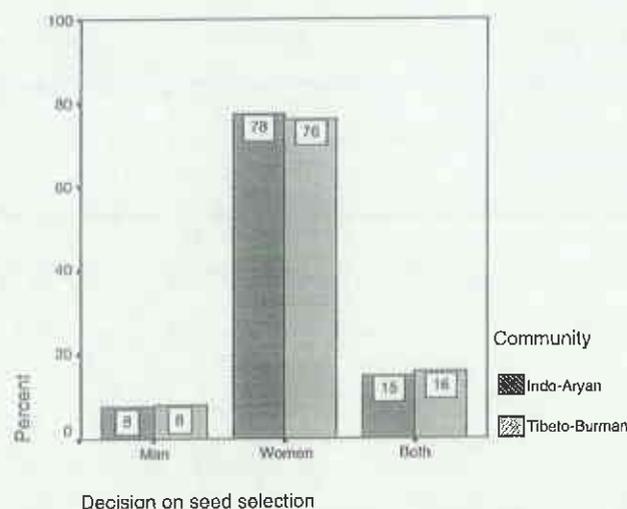


Figure 5.4. Gender decision on pre and post harvest seed selection between communities

As in the case of seed selection, in the majority of the households, women decide on amount and type of seed storage. This decision is statistically independent of the communities. In the

majority of both Indo-Aryan and Tibeto-Burman households women make this decision. Respectively in eighty and ninety two percent of the Indo-Aryan and Tibeto-Burman household women make this decision (Figure 5.5.).

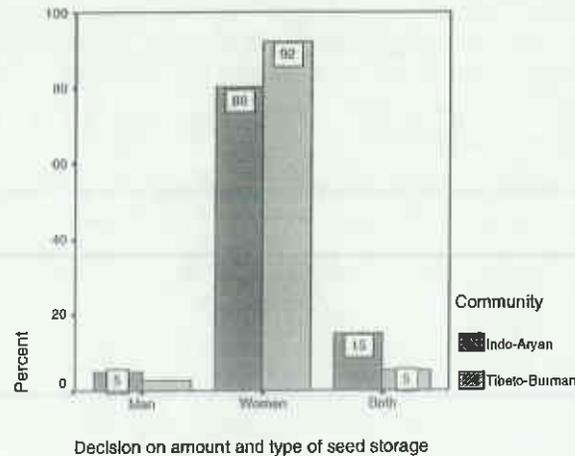


Figure 5.5. Gender decision on seed storage between communities

In the majority of the households of both communities, decision on seed replacement is taken jointly. Respectively in the forty eight and thirty nine percent of Indo-Aryan and Tibeto-Burman households, men and women jointly decide on replacement of the seed (Figure 5.6.). The above results revealed that women make almost all the major decisions on seed management in both Indo-Aryan and Tibeto-Burman communities.

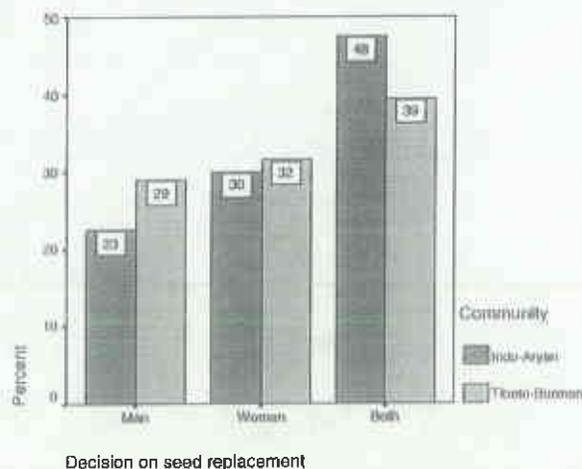


Figure 5.6. Gender decision on seed replacement between communities

5.6. Gender differentiated decision on seed management among wealth status

A household survey was conducted to identify variation in gender differentiated decision making with regard to the major tasks of seed management at the household level between

wealth status. The results show that wealth status of the households plays a greater role in decision on seed selection than in crop production. Chi square tests show that gender decision on seed selection depends on the wealth status of the households ($P=0.08$) (Table 5.7). Lower the wealth status greater the women’s decision on seed selection. Women decide on seed selection respectively in sixty seven, eighty-eight, and eighty-one percent of the rich, medium and poor households. None of the men from medium households make this decision. Likewise in none of the poor households men and women jointly make this decision.

Table 5.7. Decision maker on seed selection among wealth status

Decision makers	Wealth of households			Total
	Rich	Medium	Poor	
Men	13.3(4)	0(0)	11.8(2)	7.7(6)
Women	66.7(20)	80.6(25)	88.2(15)	76.9(60)
Both	20.0(6)	19.4(6)	0(0)	15.4(12)
Total	100 (30)	100(31)	100(17)	100(78)
P Value=0.088				

Note: Figures in parentheses are number of household.

Decisions on amount and type of seed storage ($P=0.32$) and seed replacement ($P=0.50$) are statistically independent of the wealth status of the households. In the majority of all categories of households, women make the decision on amount and type of seed storage. They make decision on amount and type of seed storage respectively in eighty-two, ninety and eighty two percent of rich, medium and poor households (Figure 5.7). In none of the medium households, men decide on amount and type of seed storage. It is because seed storage and maintenance are women’s responsibility (Subedi *et al.*, 2000).

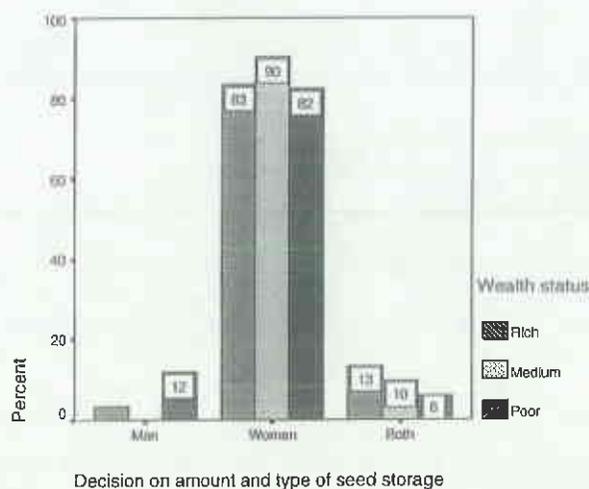


Figure 5.7. Gender differentiated decision on type of seed storage among wealth status

In the majority of the households, the decision on seed replacement is made jointly by men and women.(Figure 5.8.). In respectively forty-three, thirty-nine and fifty-three percent of the

rich, medium and poor households both men and women make decision on seed replacement. Although seed management tasks are mostly decided by women in most of the households, both men and women decide whether the seeds that are being grown should be replaced. However, women in poor households have more decisions for seed management.

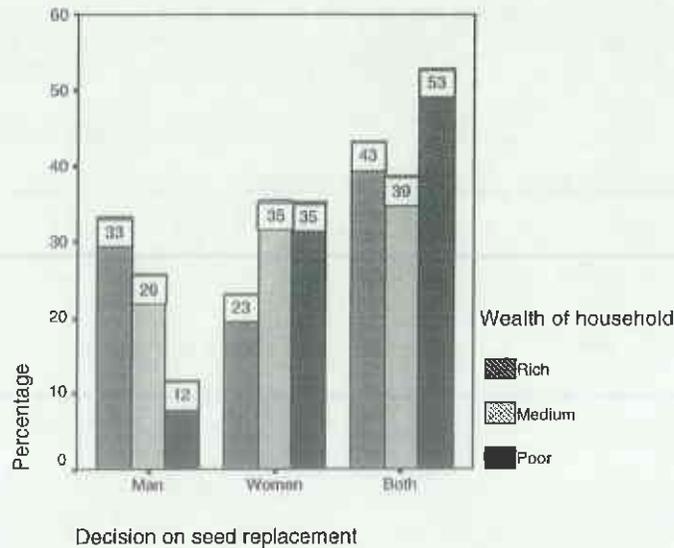


Figure 5.8. Gender differentiated decision on seed replacement among wealth status

5.7. Conclusion

Decision making on crop production and seed management differ between communities and the wealth status of the household. Tibeto-Burman women make more decision than Indo-Aryan women in crop production. Joint decisions are more commonly practiced in the Tibeto-Burman communities compared to the Indo-Aryan. Tibeto-Burman women decide most of the tasks in crop production except tillage and procurement of credit while Indo-Aryan men decide most of the tasks. However, women in both the communities are the principal decision makers in tasks related to seed management. Seed selection, storage and maintenance are women's responsibility. Women's decision making role generally increases with decreasing wealth status. Joint decisions increase with increasing economic status of the household. However, in the majority of the households the decision on seed replacement is made jointly by men and women.

The results show that decision making on crop production and seed management tasks is being feminized in the Hills of Nepal. Women have a crucial role to play in the conservation and utilization of crop diversity and should be considered as an important target group for all interventions with the ultimate aim to increase crop production and maintain on-farm diversity.

Chapter 6. Change in Gender Profile in Agriculture

6.1. Introduction

A study was carried out to analyze change in gender roles in crop production over the past four decades, the reasons for change and its implications. In the beginning of this chapter, the field processes for understanding the changes in gender roles are described in brief. The history of institutional development in the agricultural sector in Nepal is then reviewed. It is followed by a presentation of change in agricultural practices in general. Changes in gender roles in crop production during the 1960s are described specifically taking cases of rice, maize, potato and ginger. This is then followed by a description of changes in access to and control over resources and benefits. The changes in decision making with regard to crop production and seed management are also presented. Finally, the main factors for change in gender roles in crop production are presented and conclusion is drawn.

6.2. Methods

The information presented in this chapter is based on key informant survey with elderly men and women. They were older than 60 years. Altogether twelve key informants were interviewed from Indo-Aryan and Tibeto-Burman communities. They were informed by sending request letters few days ahead of the interview. Interviews were carried out about specific issues concerning the change in gender roles in crop production during the last four decades. To guide the interview, a checklist was used. I myself facilitated all the key informant interviews with the help of a male colleague. I posed the questions presented in the checklist; and my colleague was helping to take notes and handling the audio recorder. I spent about two hours to complete one interview. To have sufficient time to review the information only one key informant was contacted in a day.

6.3. Institutional development in the Nepalese agriculture sector

During 1920s the department of agriculture was created under the Nepal government (Singh *et al.*, 1995). After two decades different research, production and demonstration farms were established in Janakpur, Parwanipur and Pokhara. After significant organization and reorganization of different departments during 1950s to 1970s, two departments namely Department of Agriculture and Department of Livestock and Veterinary Services were created under the Ministry of Agriculture in 1980s. During the year 1990s, the Nepal Agriculture Research Council (NARC) was created as an autonomous research center governed by a high-powered board chaired by the minister of agriculture. The NARC is responsible for research and technology generation, while the Department of agriculture is responsible for

disseminating the technology. With the experience of decades, the department of agriculture now has adopted the group approach in disseminating technology. Under this extension approach farmers are organized in groups of about twenty-five. The executive member of the group is supposed to be the contact person for the extension agents. Such groups are gender segregated as well as gender mixed. This has increased women's involvement in farmers' institutions.

6.4. Overview of changes in agricultural practices

During the 1960s there was sufficient forest and pasture in the study area. Farmers used to cultivate rice once a year in their irrigated lands. Normally most of the crops were harvested by October and November. The rest of the year, the land used to be left fallow until transplanting in June. To utilize the available pasture and crop residues, most of the households used to keep high numbers of livestock for meat, milk, manure and draft power. They used to herd their animals in the pastures. In addition to this, they also grazed their animals in the harvested rice fields. The second category of pasture used to be important for milking animals and their calves. Pastoralists from the high Mountains also used to bring their animals to low land pastures and rice fields. During their stay in the low land pastures, the pastoralists used to barter local herbal medicine they brought from the high Mountain areas and exchanging for food produce.

Development of communication infrastructure in rural areas and increase in population caused change in the farming systems. The population growth was due to immigration from neighbouring villages as well as birth. To meet the increasing demand of the growing population, farmers were forced to intensify crop cultivation. Instead of growing only one rice crop per year, they started to grow three crops a year. The major cropping patterns today are main season rice followed by wheat, mustard or vegetables in winter and maize in summer. Clearance of pastureland for farming coupled with crop intensification has led to scarcity of pasture. Farmers are forced to keep limited number of livestock. With decreasing livestock population they get less amounts of animal manure for their farms. With the decreasing use of farmyard manure, crop productivity has been decreasing over time. Now, they look for chemical fertilizers and high yielding crop varieties to meet their household food requirements.

In addition to the above changes, the key informants gave specific explanations of the changes in the role of male and female farmers in agricultural production during the last four decades. Some of the major explanations are presented here:

1. *Establishment of irrigation systems.* Availability of irrigation made crop intensification possible. This has increased not only men's involvement in crop production but also women's labour burden. Since women are more responsible for most of the field operations crop intensification obviously has increased women's workload.
2. *Establishment of land reform institutions and discontinuation of shifting cultivation.* Land reform policies like provision of land registration to farmers not only provides alienation right, but also provides disincentive to shifting cultivation. The other reason of discontinuation of shifting cultivation in the area is the nationalization of forest in 1952, and provision of community forestry in 1982. The labour force that was involved in shifting cultivation had to seek off farm employment which increased women's role in crop production when their men were absent from home.
3. *Introduction of milling facilities.* Milling was entirely the domain of women. Traditional milling equipments like *dhiki* (pounding machine) and *janto* (grinding machine) were tiresome and time consuming for women. They had to work every day even in late night and early morning. Modern mills have now replaced these traditional mills, and women are released from their tiresome work. Today with the introduction of modern mills men do milling in most of the cases. In other words, men run the mills.
4. *Promotion of women's education.* Women have been empowered with the increasing trend in girls' schooling and women's informal education. They have started to participate in public meetings and income generating activities.

During 1960s in both Indo-Aryan and Tibeto-Burman communities, there was strict division of labour between women and men. Men were perceived as household heads and decision makers. Men had to go far for earning while women were more concerned with productive and reproductive activities in the households and farming. The patrons in the family were usually the husband and father in law. Men used to provide clothes and other essentials to daughter in law, daughter and wife. Women were supposed to be passive recipients of goods that they needed. However, food preparation and feeding was in the domain of women, particularly the housewife. The mother in law is the housewife in most cases. While taking

meals, the first preference went to children and men. Women, particularly daughter in-law, were the last to eat. Now things are changing. Women are not the passive recipients of their essentials. They have gained some access to resources. The trend of women as decision makers is increasing in both the communities.

Earlier, none of the women did hold positions in traditional organizations. Women never represented the decision making body in the society. Traditionally women also rarely participated in public meetings where strangers passed information to the community. So women were disadvantaged in getting first hand information. In an interview, an elderly woman said “When I was a young lady, women could not hold positions in a public decision making body. I never participated in public meetings. Now, I myself represent *aama samuha*(mother’s club) and my daughter in law is a member of a saving and credit group” From this statement it can be inferred that there is a gradual empowerment of women. Women’s role in natural resource management and income generation has increased.

6.5. Change of gender roles in crop production since 1960s

In the Indo-Aryan community, gender roles in **rice** production have not changed much during the last four decades. However, there are a few changes. Traditionally men used to sow rice seed, but today it is done by both sexes. One of the women key informants said that this shift is also due to change in the seedbed preparation methods. “Earlier, we used to raise dry seedbeds. Now most of the rice growers raise wet seedbed. Since sowing seed in wet seedbed is supposed to be easier than in dry seedbed, we have started to sow seed. Earlier, weeding used to be carried out by both sexes. Since there are more off farm opportunities for men, women take more responsibility for crop cultural operations including weeding these days. Moreover, the wage rate for intercultural operations is less for women than men. So those hiring labour prefer to have women as wage labour for such tasks. Men are usually present during the planting and harvesting season. In other words, men usually come back home to plant and harvest major crops like rice. In general women are more involved in crop production than before.

Similarly, Tibeto-Burman communities also show some changes in gender roles in rice production, but reasons are different. As in the case of the Indo-Aryan community, sowing seed used to be men’s task and first weeding of rice was carried out by both sexes. Now, women carry out sowing of seed and weeding of rice in most cases. The change appeared

when male farmers started to migrate to find off farm employment. Likewise, during 1960's, weeding and harvesting of **maize**, and cleaning of cobs were carried out by both sexes in both the communities. However, today it is mostly women's task.

During 1960s in Indo-Aryan community, weeding **potato** was carried out by both sexes and selling potato was men's task. Earlier men did marketing because market access was poor and they have to stay the night outside their homes to sell their products. Women were culturally restricted to stay away from home without pressing needs. Such social restriction was stronger in the Indo-Aryan community than in the Tibeto-Burman community. Now, women carry out weeding as well as selling in most of the cases. The shift has occurred because of the development of infrastructures like markets and transportation facilities. Women are able to sell their products in the local market and return home in the evening. In the Tibeto-Burman community, weeding, harvesting and selling potato were carried out by both sexes. Now, these tasks are carried out by women. The reasons of changes are more or less similar to that of the Indo-Aryan community.

During 1960s, in the Indo-Aryan community, mulching, weeding and harvesting of ginger were carried out by both sexes, and selling of ginger was men's task. Now, these tasks are carried out mainly by women. The reason is that men put emphasis on major crops like rice and maize. They leave the tasks of minor crops to women. As in the Indo-Aryan community, weeding, harvesting and selling ginger were carried out by both sexes in Tibeto-Burman community. Now these are more in the domain of women. It is because almost all males from Tibeto-Burman community have out migrated for off farm job.

From the above results, it is evident that women's role in crop production has increased over the last decades. The major reasons of increase in involvement of women in crop production are mainly related to men's migration. For most of the rural families, the food production is either insufficient or just sufficient for household subsistence. To secure livelihoods, they have to look for some off farm employment. Once they fail to sustain livelihoods from their on-farm sources they have to look for off-farm employment. The better option is migration. There are different levels of migration. These are seasonal and permanent, and domestic and international. Relatively poor households find work with in the country, both seasonal as well as permanent. Better off households find their ways to foreign jobs. In Nepal many manpower companies supply labour to foreign countries like Middle East, Malaysia, Singapore and

Korea. Most of the young men prefer to have foreign employment. There is also a possibility for young men to be recruited in Gorkha regiments to the Indian and British armies. When men migrate to get jobs outside, women have to carry more burdens of the household activities as well as increased farming responsibilities.

6.6. Change in gender access to and control over resources

During the 1960s, in the Indo-Aryan community, seeds, labour and draft power were under the control of men. Access was also mostly limited to men. Men also controlled the labour of women. This means that women could only sell, buy or exchange their labour with the permission of men. Men also controlled the income from women's labour. Now these resources are accessible to both men and women. Both men and women control seeds and labour. However, draft power is still under the control of men. Women can have access with the consent of the elderly man in the family. The immediate reason of this change is that with the increasing off farm employment opportunities, men are largely engaged in cash earning. The agricultural matters are mostly left under the control of women.

Unlike in Indo-Aryan community, there are less changes in access to and control over resources in Tibeto-Burman community. One significant change has, however, been seen in control of land. As in the former community, land was under the control of men. Now, both have more control on land. Although Tibeto-Burman women do not have legal right to own land, they have more control on land these days. It is because Tibeto-Burman men increasingly joined the Gorkha regiment of British and Indian armies during the past four decades. Women have been the de-facto household heads in such situations. They have to take men's role like decision-making on selling and buying land. However, for legal transfer of ownership, men should be present in the land transaction office.

6.7. Change in gender access to and control over benefits

During 1960s, benefits from crop production like grain for consumptions, seed for replanting, grain for sale and income from sale were not accessible to women in both Indo-Aryan and Tibeto-Burman communities. These benefits were under the control of men, and access was also mostly limited to men. Now, these benefits are accessible to both men and women. The shift has occurred by the introduction of education and women's empowerment. Women have started to claim their rights and men have been more cooperative in household tasks. The other reason is related to women's increasing involvement in crop production. Men stay outside their home either the whole year or in particular seasons. When they return home for

short visits or for a season or two, they spend their time with peer groups in public places. The women are responsible to handle all the productive and reproductive tasks and men intentionally handover control on benefits to their women. If men involve equally in daily work as earlier they still hold previous control over benefits.

6.8. Changes in gender differentiated decision making

6.8.1. Change in gender differentiated decision on crop production

During 1960s hiring of labour, amount of consumption and sale, and time of weeding were decided by men. Now, women make these decisions in most of the households. The household survey showed that in fifty percent of the households women are the decision makers in agriculture production activities. The reasons of the changes are related to education, and occupation of the men. In most of the households where women make decisions, the men are mostly educated and involve in off farm employment. In few households women are also the *de-facto* decision makers due to men's permanent absence from the farm. Another reason is that women today are more experienced than men who have not been involved in farming for several years due to their stay away from home. For example, the pension holders of Gorkha regiment of Indian and British Armies are less experienced in farming since they have returned home after more than twenty years employment in foreign countries.

6.8.2. Change in gender differentiated decision on the seed system

During 1960s, decision on procurement of seed, selection of seed, distribution through sale, barter and as gifts were done mainly by men. Today men consider that these tasks are under the domain of women. For example, if some one approaches them to buy seed, their normal reply is that they have to ask their mother or wife. They do not know whether the seed is surplus for them or not. The shift has occurred because of women's increasing involvement in crop production. Men handover their power to women because they remain mostly out of home searching for other income opportunities. Particularly, men are roaming for off farm job because of the subsistence farming nature and responsibility of minimizing economic crisis.

6.9. Conclusion

The study shows that there has been significant increase in women's involvement in crop production the last forty years. These changes have both positive as well as negative influences on the livelihood of women. On one hand, they have to be proud of having more access to and control over resource and benefits related to crop production. Women are increasingly becoming household decision makers, at least in crop production and related

activities, by virtue of engagement of men in off farm employment. On the other hand, they are under the burden of farming activities in addition to the reproductive activities. The development of road facilities, for example, has increased women's involvement in selling of agricultural products. However, creation of infrastructure facilities like milling facilities have substantially reduced women's workload. In households with more educated members, women have a greater role in crop production. Migration of male household members for earning of cash from wage and other employment has forced women to be *de facto* household heads. This has increased women's role in crop production. Such a trend has empowered women both socially and economically. The economic empowerment is more meaningful when they have control over the benefit from crop production

The changes are mainly due to the intervention of new technology, like milling machines development of infrastructure, increase in female education, and migration of male members in search of off farm employment. This is in accordance with Bajracharya (1994) who identified that the major factors contributing to changes in gender roles are education, migration and introduction of new technology.

However, the current Nepalese agricultural policy does not reflect these changes that have taken place in rural areas during the last four decades. Research and extension services do not seem to be aware of women's increasing role as decision makers in agricultural production, "Farmers" are still men. However, this study shows that women are the real farmers in the Hills of Nepal.

Chapter 7. Discussion and Conclusion

7.1. Introduction

This chapter ties up all the previous chapters. The background and objectives presented in the first chapter, and the literature reviewed in the second chapter are discussed in relation to the findings of the fourth fifth and sixth chapter. It discusses the important findings and significant conclusions are drawn.

7.2. Gender roles in crop production

Men and women farmers' roles in rice production vary between communities and crops. Men and women equally involve in rice production in both Indo-Aryan and Tibeto-Burman communities. In both communities, tasks that require more strength are generally carried out by men, while tasks that require more patience and time are carried out by women. Activities such as puddling, bunding and threshing needs more physical strength while task such as uprooting, transplanting, and weeding needs more patience. However, roles in rice production are relatively more gender neutral in Tibeto-Burman than in Indo-Aryan community. Gurung (1995) also reported that gender disparity is less in Tibeto-Burman than in Indo-Aryan community. In contrast to rice, women carry out more activities in maize production than men in both the communities. Indo-Aryan men are less involved in maize production than Tibeto-Burman men. Bajracharya (1994) also reported that women in general contribute more labour in cereal crop production in the Hills of Nepal.

In the case of garden crops, for sale as well as consumption, most of the tasks are carried out independently by women in both Indo-Aryan and Tibeto-Burman communities. Basnyat and Shrestha (1979) also found seventy six percent of women's contribution in terms of the time spent in ginger production. Likewise, Neupane and Dhakal (1990) also found seventy three percent of women's contribution for garden crops in the Hills of Nepal. In the same agro-ecological region several researchers (Neupane and Dhakal, 1990; Munankarmi and Gautam, 1990) found that women do more agricultural work than men. It shows that women are the main actors in growing these crops.

7.3. Gender access to and control over resources and benefits

Gender access to and control over resources in crop production differ with community and wealth status. SNV (1992) also found that ethnicity and economic status of the household determine gender access to and control over resources and income in the Hills of Nepal. Gender differentiation in access to and control over resources is less in Tibeto-Burman than in

Indo-Aryan community. Tibeto-Burman women have access to and control over more resources used in crop production than Indo-Aryan women. Sanday (1981) also found that Tibeto-Burman women have more control on economic resources than Indo-Aryan women in Nepal. For instance, in Tibeto-Burman community, resources like seed, fertilizer and labour are under the control of women. In Indo-Aryan community, seed and labour are under the control of both men and women, but fertilizer is under the control of men. In both communities women's access to and control over rice seed increases with decrease in the wealth status. In the majority of the households rice seed is under the control of women. Gender access to and control on major resources used in crop production are independent of the economic status of the household. Although both men and women have access to land, it is controlled by men in majority of households. Men legally control it. In rural societies, where land is the most important means of production, women's lack of control over land, unavailability of credit, technical input and training are major reasons for their dependence on men (Tisch, 1992).

As in the case of access to and control over resources, control over benefits also vary with community and wealth status. In the Indo-Aryan community, both men and women have access to all benefits except the income from sale of crops. Women do not have access to such income. In the Tibeto-Burman community, both men and women have access to and control over all the benefits from crop production. So the Tibeto-Burman women have more control over benefit from crop production than Indo-Aryan women. In the majority of the Indo-Aryan households, all the benefits are under the control of men. Cultural norms and beliefs also contribute to keeping men in position of power more in the Indo-Aryan community than the Tibeto-Burman community (Thrupp and Green, 1995). Male migration is less in the Indo-Aryan community compared to the Tibeto-Burman community. Because of the male migration, most of the Tibeto-Burman women are *de-facto* heads of households and they have more power to decide the use of benefits from crops. Women's control on benefits decrease with the increase in economic status. Subedi (1997) mentioned that in general women in Nepal have very little opportunity to make financial transactions on their own, as they do not have ownership rights. When it comes to loans, women have limited access to it because they normally do not have collateral to guarantee for the loan. Without land as collateral, women are often refused institutional sources of credit. Women's access to and control over benefits from crop production decrease with increase in wealth status of the households. Women in households with small farm size have more power to sell household products. Sharma and

Awasthi (1993) also found that women of lower economic status participate more in local market activities than women with higher economic status.

Male migration and long term absence are quite common in the Hills of Nepal. There is a connection between male migration and women's major roles in economic and social domains. Generally when men migrate, women become the *de-facto* household head and they control agricultural and domestic matters. Jones and Jones (1976) also found that in the eastern Hills of Nepal, a long-term male absence led to more independent women and an increase in female-headed households. Women's access to and control over resources and benefits from crop production is more obvious in Tibeto-Burman community than the Indo-Aryan community, and more in households of poor economic status as compared to rich households in the Hills of Nepal.

7.4. Gender differentiated decision in crop production and seed management

Decision making on crop production and seed management tasks differ between communities and the wealth status. Tibeto-Burman women make more decisions than Indo-Aryan women in crop production. Negotiations and joint decisions are more commonly practiced in the Tibeto-Burman community compared to the Indo-Aryan. In general, in ethnic groups of the Tibeto-Burman community such as *Mager*, *Gurung* and *Tamang*, men and women are equally responsible for decision making (PCRW, 1986). Tibeto-Burman women decide most of the tasks in crop production except tillage and procurement of credit, while Indo-Aryan men decide most of the tasks. However, women in both the communities are the principal decision makers in tasks related to seed management. It is reported that women in the Hills of Nepal make more decisions on crop production as well as seed management than men (Bennett, 1981; Dey, 1985 and Sharma and Awasthi, 1993). Although these studies do not mention the ethnic communities, the finding supports the gender decision making prevalent in Tibeto-Burman community as evidenced from the present study. Women's decision-making role in crop production generally increases with decreasing economic status. Joint decisions increase with increasing economic status of the household. Since selection, storage and maintenance of seeds are women's responsibility, they make most of the decisions concerning seed management in both the Indo-Aryan and Tibeto-Burman communities. Bajracharya (1994) also found that decisions regarding seed selection are primarily women's responsibility. In the majority of the households the decision on seed replacement is made jointly by men and

women, while purchasing of modern seed is decided by men. It implies that women are the main custodians of local seeds while men are responsible for modern seeds. Hence, decision concerning the tasks of crop production and seed management is being progressively feminized in the Hills of Nepal.

7.5. Change in gender profile in crop production

Agriculture in the Hills of Nepal is progressively dependent on women and they operate most of the farms. The impacts of the changes in gender profile are positive as well as negative. On one hand, women, have more access to and control over resources and benefits related to crop production. They are increasingly becoming household decision makers, at least in crop production and related activities, by virtue of engagement of men in off farm employment. The development of road facilities, for example, has increased women's involvement in selling of agricultural products. Creation of infrastructure facilities like milling facilities have substantially reduced women's workload. Migration of male household members for cash earning from off farm employment has forced women to be *de facto* household heads. On the other hand, they are under the burden of farming activities in addition to the reproductive and community activities. Such a trend has empowered as well as burdened women both socially and economically. The empowerment is more meaningful when they have control over the benefit from crop production. Hence, the major factors contributing to the changes in gender dynamics are education, migration and introduction of new technology.

7.6. Implication for development

The results imply that research and extension programs should be targeted particularly towards those who involve in production activities. Women empowerment program should be integrated with crop production and seed management programs. Although access to and control over resources and benefits from crop production has increased during the past four decades, women rarely control income from sale of agricultural produces. They have very limited opportunities for own income generation. This particularly applies to the Indo-Aryan community. Therefore, women's income generation programs should be lunched. Such programs would be supportive to promote women's access to and control over benefits.

Changes in gender profiles that have taken place in rural areas during the last four decades have been poorly reflected in agricultural policy in Nepal. Research and extension have overlooked women's increasing role as decision makers in agricultural production. They still consider men and farmer are synonymous to each other. However, this study shows that

women are the real farmers in the Hills of Nepal, and should be seriously considered in agricultural strategies and policies in general and in conservation and utilization of local crop genetic resources in particular. In other words, they should be considered as important target group for all interventions with the ultimate goal of increasing crop production and maintaining crop diversity on- farm.

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Annexure 1. Photos from the field



Study hamlets in Begnas



Study hamlets in Rupakot

Annexure 1. continued



Gender mixed focus group interview



Key informant Survey

Annexure 1. continued



Women are busy in rice harvesting



Bullock trampling of rice straw

Annexure 2. Task analysis in rice production from different focus groups

Annexure 2a. Gender involvement in rice production mentioned by focus groups of Indo-Aryan

Involvement	Type of focus groups		
	Male	Female	Mix
Women	Preparing seeds, Manure transport, Uprooting, Carrying, Transplanting seedling. Selection of seeds	Preparing seeds Manure transport, Uprooting, Carrying, transplanting seedling. Second weeding Harvesting, Selection of seeds Storing grain Transportation of straw	Preparing seeds, Manure transport, Uprooting, carrying, transplanting seedling Selection of seeds, Second weeding
Men	Ploughing seedbed and field, Puddling and bounding, Irrigation Threshing, Winnowing, Bullox trampling	Ploughing seedbed and field, Puddling and bounding, Fertilization Irrigation Threshing, Winnowing Bullox trampling	Ploughing seedbed and field, Puddling and bounding, Irrigation Threshing, Winnowing, Bullox trampling,
Both men and women	Sowing seeds First weeding Second weeding Fertilization, Harvesting, Bundling and carrying, Transportation of grain, Storing grain Transportation of straw	Sowing seeds First weeding Bundling and carrying, Transportation of grain,	Sowing seeds First weeding Fertilization, Harvesting, Bundling and carrying, Transportation of grain, Storing grain, Transportation of straw

Annexure 2b. Gender involvement in rice production mentioned by focus groups of Tibeto-Burman

Involvement	Type of focus groups		
	Male	Female	Mix
Women	Preparing seeds, Manure transport, Uprooting, carrying, transplanting seedling. First weeding Second weeding Selection of seeds,	Preparing seeds, Sowing seeds Manure transport, Uprooting, carrying, transplanting First weeding Selection of seeds Irrigation Storing grain	Preparing seeds, Manure transport, Sowing seeds, Uprooting, carrying , transplanting, seedlings Selection of seeds, First weeding
Men	Ploughing seedbed and field, Puddling and bounding, Fertilization, Irrigation Bundling and carrying, Threshing, Winnowing, Transportation of grain, straw Storing grain Bullock trampling	Ploughing seedbed and field, Puddling and bounding, Threshing, Winnowing Bullox trampling	Ploughing seedbed and field, Puddling and bounding, Irrigation Threshing, Winnowing, Bullox trampling
Both	Sowing seeds Harvesting,	First weeding Fertilization, Bundling and carrying, Harvesting, Transportation of grain, and straw	Second weeding Fertilization, Harvesting, Bundling and carrying, Transportation of grain, and straw Storing grain,

Annexure 3. Resource analysis for rice production from different focus groups

Annexure. 3a. Access to resources use in rice production mentioned by focus groups of Indo-Aryan

Access to	Types of focus groups		
	Male	Female	Mix
Women			
Men	Draft power		Draft power
Both	Land Seeds Fertilizer Labour Acquired knowledge and information	Land Seeds Fertilizer Labour Draft power Knowledge and information	Land Seeds Fertilizer Labour Knowledge and information

Annexure 3b. Control over resources use in rice production mentioned by focus group of Indo-Aryan

Control over	Types of focus groups		
	Male	Female	Mix
Women	-	Seeds	-
Men	Land Fertilizer Draft power Acquired knowledge and information	Land Fertilizer Labour Draft power Acquired knowledge and information	Land Fertilizer Draft power Acquired knowledge and information
Both	Seeds Labour	-	Seeds Labour

Annexure 3c. Access to resources use in rice production mentioned by focus groups of Tibeto-Burman

Access to	Types of focus groups		
	Male	Female	Mix
Women	Seed Labour	Seed Labour	Seed Labour
Men	Draft power	-	-
Both	Land Fertilizer Acquired knowledge and information	Land Fertilizer Draft power Acquired knowledge and information	Land Fertilizer Draft power Acquired knowledge and information

Annexure 3d. Control over resources use in rice production mentioned by focus groups of Tibeto-Burman

Control over	Types of focus groups		
	Male	Female	Mix
Women	Seed Labour	Seed Labour	Seed Fertilizer Labour
Men	Land Fertilizer	Draft power	-
Both	Draft power Acquired knowledge and information	Land Fertilizer Acquired knowledge and information	Land Draft power Knowledge and information

Annexure 4. Benefits analysis from rice production from different focus groups

Annexure 4a. Access to benefits from rice mentioned by focus groups of Indo-Aryan

Access to	Types of focus groups		
	Male	Female	Mix
Women		Grain for consumption Rice husk Seed	
Men			Income from sale
Both	Grain for consumption Straw Rice husk Rice bran Grain for sale Income from sale Seed	Straw Rice bran Grain for sale Income from sale	Grain for consumption Straw Rice husk Rice bran Grain for sale Seed

Annexure 4b. Control over benefits from rice mentioned by focus group of Indo-Aryan

Control over	Types of focus groups		
	Male	Female	Mix
Women		Rice husk Seed	
Men	Grain for consumption Straw Grain for sale Income from sale Seed	Grain for consumption Straw Grain for sale Income from sale	Grain for consumption Straw Grain for sale Income from sale
Both	Rice bran Rice husk	Rice bran	Husk Rice bran Seed

Annexure 4.c Control over benefits from rice mentioned by focus group of Tibeto-Burman

Control over	Types of focus groups		
	Male	Female	Mix
Women	Rice bran	Rice husk Rice bran Grain for consumption Grain for sale Income from sale	
Men			
Both	Grain for consumption Straw Rice husk Grain for sale Income from sale Seed	Straw Seed	Grain for consumption Straw Grain for sale Income from sale Seed Rice husk, rice bran

Annexure 5. Task analysis in maize production from different focus groups

Annexure 5a. Gender involvement in maize production mentioned by focus groups of Indo-Aryan

Involvement	Type of focus groups		
	Male	Female	Mix
Women	Manure transport, Selection of seeds,	Manure transport, Planting First weeding Second weeding Harvesting, Cleaning Selection of seeds Storing grain Stover cutting	Manure transport First weeding Second weeding Harvesting Cleaning Selection of seeds,
Men	Ploughing field,	Ploughing field,	Ploughing field
Both	Planting First weeding Second weeding Harvesting, Cleaning Stover cutting Storing grain		Planting Stover cutting Storing grain

Annexure 5b. Gender involvement in maize production mentioned by focus group of Tibeto-Burman

Involvement	Type of focus groups		
	Male	Female	Mix
Women	Manure transport, Planting Harvesting, Cleaning Selection of seeds	Manure transport, Planting First weeding Second weeding Harvesting, Selection of seeds Storing grain	Manure transport Planting First weeding Second weeding Selection of seeds,
Men	Ploughing field Storing grain	Ploughing field,	Ploughing field Storing grain
Both	First weeding Second weeding Stover cutting	Cleaning Stover cutting	Harvesting Cleaning Stover cutting

Annexure 6.Task analysis in potato production from different focus groups

Annexure.6a.Gender involvement in potato production mentioned by focus groups of Indo-Aryan

Involvement	Type of focus groups		
	Male	Female	Mix
Women	Manure transport, Seed preparation,	Manure transport Seed preparation Planting Weeding Harvesting, Selling	Manure transport Seed preparation Planting Weeding Selling
Men	Ploughing field	Ploughing field	Ploughing field
Both	Planting Weeding Harvesting, Selling		Harvesting

Annexure 6b.Gender involvement in potato production mentioned by focus groups of Tibeto-Burman

Involvement	Type of focus groups		
	Male	Female	Mix
Women	Manure transport, Seed preparation Planting Weeding Selling	Manure transport, Seed preparation Planting Weeding Harvesting Selling	Manure transport, Seed preparation Planting Weeding Harvesting, Selling
Men	Ploughing field	Ploughing field,	Ploughing field
Both	Harvesting,		

Annexure 7. Decision making in crop production by gender from different focus groups

Annexure 7a. Gender variation in decision in crop production activities in Indo-Aryan community

Gender	Types of focus groups		
	Male	Female	Mix
Women	Amount of consumption and sale Time of weeding	Selection of land Selection of crop Selection of variety Hiring of labour Seedbed preparation and sowing Time of weeding Time of irrigation	Hiring of labour Amount of consumption and sale Time of weeding
Men	Selection of land Time of tillage Preparation of field Time of irrigation Time of harvesting	Procurement of credit Using chemical fertilizer Using of manure Preparation of field Time of tillage Time of planting /transplanting Time of harvesting	Selection of land Selection of crop Procurement of credit Using chemical fertilizer Using manure Seedbed preparation and sowing Time of tillage Preparation of field Time of planting/transplanting Time of irrigation Time of harvesting
Both	Selection of crop Selection of variety Hiring of labour Procurement of credit Using chemical fertilizer Using manure Time of seed bed preparation and sowing Time of planting/transplanting Selling of byproducts	Amount of consumption and sale Selling of byproducts	Selection of variety Selection of planting material

Annexure 7b. Gender variation of decision in crop production activities in Tibeto-Burman community

Gender	Types of focus groups		
	Male	Female	Mix
Women	Amount of consumption and sale Selection of variety	Hiring of labour Amount of consumption and sale Selection of variety Time of tillage Preparation of field Planting/transplanting Time of harvesting	Hiring of labour Amount of consumption and sale Selection of variety
Men	Procurement of credit Seedbed preparation and sowing Time of tillage Time of planting/transplanting Time of weeding Time of harvesting	-	Procurement of credit Time of planting/transplanting Time of harvesting
Both	Selection of land Selection of crop Hiring of labour Using chemical fertilizer Using manure Preparation of field Time of irrigation Selling of byproducts	Selection of land Selection of crop Procurement of credit Using chemical fertilizer Using manure Seedbed preparation and sowing Time of weeding Time of irrigation Selling of byproducts	Selection of land Selection of crop Using chemical fertilizer Using manure Seedbed preparation and sowing Preparation of field Time of tillage Time of weeding Time of irrigation Selling of byproducts

Annexure. 8. Decision making in seed system by gender from different focus groups

Annexure.8a. Gender variation of decision seed management activities in Indo-Aryan community

Gender	Types of focus groups		
	Male	Female	Mix
Women	Pre-harvest seed selection Post-harvest processing/selection Storage of seed Selection after storage Seed selling and distribution as gift	Pre-harvest seed selection Post-harvest processing/selection Storage of seed Selection after storage Seed selling and distribution as gift Selling and redistribution new seed	Pre-harvest seed selection Post-harvest processing/selection Storage of seed Selection after storage Seed selling and distribution as gift
Men		Seed replacement by improved variety Purchasing improved seeds	Seed replacement by improved variety Purchasing improved seeds Selling and redistribution new seed
Both	Seed replacement by improved variety Purchasing improved seeds Selling and redistribution new seed		

Annexure 8b. Gender Variation of decision seed management activities in Tibeto-Burman community

Gender	Types of focus groups		
	Male	Female	Mix
Women	Pre-harvest seed selection Post harvest Processing/selection Storage of seed Selection after storage Seed replacement by improved variety Seed selling and distribution as gift	Pre-harvest seed selection Post-harvest processing/selection Storage of seed Selection after storage Seed replacement by improved variety Seed selling and distribution as gift Purchasing improved seeds Selling and redistribution new seed	Pre-harvest seed selection Post-harvest processing/selection Storage of seed Selection after storage Seed replacement by improved variety Seed selling and distribution as gift Purchasing improved seeds Selling and redistribution new seed
Men	Purchasing improved seed		
Both	Seed selling and distribution as gift		

Annexure. 9. Checklist for focus group interview

General introduction

1. Prior Information given to participant.
2. Introduction
3. Date of focus group interview
4. Location of focus group interview
5. Focus group type
6. Ethnic category
7. Participant's name

2.2 What are the major crops grown as subsistence and cash crop in this area?

S.N	Crops grown	Grown as		Remarks
		Subsistence	Cash	

2.3 Who has more role and responsibility for these activities listed below for rice production?

2.4 Who has more role and responsibility for these activities listed below for maize production?

2.5 Who has more role and responsibility for these activities listed below for potato production?

2.6 Who has more role and responsibility for these activities listed below for ginger production?

Crops	Activities	Involvement			Remarks
		M	F	B	
Rice	Preparing seeds				
	Preparing seedbed (ploughing seed bed				
	Manuring seed bed				
	Sowing				
	Ploughing field				
	Bounding and puddling				
	Uprooting of seedling				
	Transporting seedlings				
	Transplanting				
	First Weeding				
	Second weeding				
	Fertilization				
	Irrigation				
	Harvesting				
	Bundling				
	First threshing				
	Cleaning				
	Selection of seed				
	Transportation of grain				
	Bullock trampling				
Transportation of straw					
Storing straw and grain					
Maize	Land preparation or ploughing field				

	Manuring field				
	Planting				
	First weeding				
	Second weeding				
	Harvesting				
	Cleaning				
	Selection of seed				
	Stover cutting				
	Storing grain or cobe of maize				
Potato	Land preparation or ploughing				
	Manuring				
	Seed selection				
	Planting				
	Weeding				
	Harvesting				
	Selling				
Ginger	Land preparation				
	Manuring				
	Seed selection				
	Planting				
	Mulching				
	Weeding				
	Harvesting				
	Selection and storing seed				
	Selling				

2.7 What are the socio-cultural constraints and opportunities for increase the production of subsistence and cash crops?

2.8 What are resources used for rice production? And who has access to and control over resources uses in rice production?

2.9 What are resources used for maize production? And who has access to and control over resources uses in maize production?

2.10 What are resources used for potato production? And who has access to and control over resources uses in potato production?

2.11 What are resources used for ginger production? And who has access to and control over resources uses in ginger production?

crops	Used Resources for	Access to resources (conditionality about using it, how it is used)	Control over resources (decision making about its use)
Rice	Land		

	Seeds		
	Fertilizer/ manure		
	Labor /weedier		
	Water		
	Draft power		
	Knowledge and information		
Maize	Land		
	Seeds		
	Fertilizer/ manure		
	Labor /weedier		
	Draft power		
	Knowledge and information		
Potato	Land		
	Seeds		
	Fertilizer/ manure		
	Labor /weedier		
	Water		
	Draft power		
	Knowledge and information		
Ginger	Land		
	Seeds		
	Fertilizer/ manure		
	Mulch		
	Labor /weedier		
	Draft power		
	Knowledge and information		

- 2.12 What are the perceived benefits from rice production? And, who has access to and control over such benefits?
- 2.13 What are the perceived benefits from maize production? And, who has access to and control over such benefits?
- 2.14 What are the perceived benefits from potato production? And, who has access to and control over such benefits?
- 2.15 What are the perceived benefits from ginger production? And, who has access to and control over such benefits?

Crops	Benefits perceived from	Access to benefits	Control over benefits
Rice	Grain for consumption		
	Fodder (straw)		
	Husk		
	Rice bran		
	Grain for sell		
	Income from sell		
	Seed for replant		

Maize	Grain		
	Cob cover		
	Cob stalk		
	Stover		
	Seed		
Potato	Tuber for consumption		
	Tuber for sell		
	Income from sell		
Ginger	Rhizome for consumption		
	Rhizome for seed		
	Rhizome for sell		
	Income from sell		

6. Who decides upon activities involved in subsistence and cash crop production?

Decision variables	Who decide	
	Subsistence	Cash
Pre-production system		
Selection of land		
Selection of crop for production		
Hiring of labor		
Credit/ loan		
How much to consume/sells		
Using pesticides		
Using chemical fertilizer/manure input		
Selling of by products		
Cultivation and harvesting.		
Selection of seed variety		
Time of seed bed preparation and sowing		
Time of preparation of field		
Time of tillage of field		
Time of Plantation/transplantation		
Time of weeding		
Time of irrigation		
Time of harvesting		
Seed system		
Pre harvest selection during cultivation		
Post harvest processing and selection		
Storage of seeds for replanting		
Selection after storage		
Seed replacement by improved varieties		
Seed distribution by selling provided as gift		
Purchasing new improved seeds		
Redistribution of new seeds to relative and selling to neighbors		

Annexure 10. Checklist for key informant survey

General introduction

1. Prior Information given to participant.
2. Introduction
3. Date of survey
4. Location of survey
5. Ethnic category
6. Respondent's name

Age:

- 2.1 What were the major crops grown as subsistence and cash crop in this area, as you remember when you are young?

S.N	Crops grown	Grown as		Remarks
		Subsistence	Cash	

- 2.2 What were the main activities for rice production? And who had more role and responsibilities for rice production before and now? If some change what are the reason for change?
- 2.3 What were the main activities for maize production? And who had more role and responsibilities for maize production before and now? If some change what are the reason for change?
- 2.4 What were the main activities for potato production? And who had more role and responsibilities for potato production before and now? If some change what are the reason for change?
- 2.5 What were the main activities for ginger production? And who had more role and responsibilities for ginger production before and now? If some change what are the reason for change?

Crops	Activities	Involvement		Reason of change
		Before	Now	
Rice	Preparing seeds			
	Preparing seedbed (ploughing seed bed)			
	Manuring seed bed			
	Sowing			
	Ploughing field			
	Bounding and puddling			
	Uprooting of seedling			
	Transporting seedlings			
	Transplanting			
	First Weeding			
	Second weeding			
	Fertilization			
	Irrigation			
	Harvesting			
	Bundling			
	First threshing			
	Cleaning			
	Selection of seed			
	Transportation of grain			
	Bullock trampling			
Transportation of straw				
Storing straw and grain				
Maize	Land preparation or ploughing field			
	Manuring field			
	Planting			
	First weeding			
	Second weeding			
	Harvesting			
	Cleaning			
	Selection of seed			

	Stover cutting			
	Storing grain or cobe of maize			
Potato	Land preparation or ploughing			
	Manuring			
	Seed selection			
	Planting			
	Weeding			
	Harvesting			
	Selling			
Ginger	Land preparation			
	Manuring			
	Seed selection			
	Planting			
	Mulching			
	Weeding			
	Harvesting			
	Selection and storing seed			
	Selling			

- 2.6 What are the implications for the change of gender role in (subsistence and cash) crop production for on-farm management of crop diversity?
- 2.7 What were socio-cultural constraint and opportunity for increase crop production?
- 2.16 What were resources used for rice production? And who had access to and control over resources uses in rice production? If some change before and now on access to and control over what are the reason?
- 2.17 What were resources used for maize production? And who had access to and control over resources uses in rice production? If some change before and now on access to and control over what are the reason?
- 2.18 What were resources used for potato production? And who had access to and control over resources uses in rice production? If some change before and now on access to and control over what are the reason?
- 2.19 What were resources used for rice production? And who had access to and control over resources uses in ginger production? If some change before and now on access to and control over what are the reason?

Crops	Used Resources for	Access to resources (conditionality about using it, how it is used)		Reason for change	Control over resources (decision making about its use)		Reason for change
		Before	Now		Before	Now	
Rice	Land						
	Seeds						
	Fertilizer/ manure						
	Labor /weedier						
	Water						
	Draft power						
	Knowledge and information						
Maize	Land						
	Seeds						
	Fertilizer/ manure						
	Labor /weedier						
	Draft power						
	Knowledge and information						
Potato	Land						
	Seeds						
	Fertilizer/ manure						
	Labor /weedier						
	Water						
	Draft power						
	Knowledge and information						
Ginger	Land						
	Seeds						

	Fertilizer/ manure						
	Mulch						
	Labor /weedier						
	Draft power						
	Knowledge and information						

- 2.20 What were perceived benefits from rice production? And, who had access to and control over such benefits? If some change before and now on access to and control over benefit what are reasons?
- 2.21 What were perceived benefits from maize production? And, who had access to and control over such benefits? If some change before and now on access to and control over what are reasons?
- 2.22 What were perceived benefits from potato production? And, who has access to and control over such benefits? If some change before and now on access to and control over what are reasons?
- 2.23 What were perceived benefits from ginger production? And, who has access to and control over such benefits? If some change before and now on access to and control over what are reasons?

Crops	Benefits perceived from	Access to benefits		Reason for change	Control over benefits		Reasons for change
		Before	Now		Before	Now	
Rice	Grain for consumption						
	Fodder (straw)						
	Husk						
	Rice bran						
	Grain for sell						
	Income from sell						
Maize	Seed for replant						
	Grain						
	Cob cover						
	Cob stalk						
	Stover						
Potato	Seed						
	Tuber for consumption						
	Tuber for sell						
	Income from sell						
Ginger	Rhizome for consumption						
	Rhizome for seed						
	Rhizome for sell						
	Income from sell						

2.16 Who decided activities involved in subsistence and cash crop production before? If some change in before and now, what are reasons?

Decision variables	Who decide					
	Subsistence			Cash		
	Before	Now	Reasons	Before	Now	Reasons
Pre-production system						
Selection of land						
Selection of crop for production						
Hiring of labor						
Credit/ loan						
How much to consume/sells						
Using pesticides						
Using chemical fertilizer/manure input						
Selling of by products						
Cultivation and harvesting.						
Selection of seed variety						
Time of seed bed preparation and sowing						

Time of preparation of field						
Time of tillage of field						
Time of Plantation/transplantation						
Time of weeding						
Time of irrigation						
Time of harvesting						
Seed system						
Pre harvest selection during cultivation						
Post harvest processing and selection						
Storage of seeds for replanting						
Selection after storage						
Seed replacement by improved varieties						
Seed distribution by selling provided as gift						
Purchasing new improved seeds						
Redistribution of new seeds to relative and selling to neighbors						

Annexure. 11. Questionnaire for household survey

Questionnaire code: _____

Wealth status: Code: Rich=1, Medium=2, Poor=3

1. Background information

1.1. Hamlet: _____

1.2. Date of interview: _____

1.3. Name of interviewer: _____

2. Information of respondent

2.1. Ethnicity: Indo-Aryan=0, Tibeto-Burman=1

2.2. Name of the respondent: _____

2.3. Sex of the respondent: Male=0, Female=1

2.4. Respondent's relation to household head: _____

2.5. Respondent's relation to principal decision maker in agriculture (Mention the relation of respondents)

3. Information of family members

Codes:

Occupation: Agriculture=1, Non-agriculture=0;

Education: Illiterate=0, Literate=1, SLC=2, IA equivalent=3, BA equivalent and above=4

S No	Relation to the respondent	Age	Occupation (write in words if other than agriculture)		Education	If some body out of home during past one year(if Yes mention the place)
			Major	Subsidiary		
1	Respondent					
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						

4. Number of household member seasonally work in off-farm: _____

5. Land holding (cultivated only)

Khet			Bari		
Parcel number	Area (Ropeni)	Land (ownership)	Parcel number	Area (Ropeni)	Share in, out or neither

Code: Self cultivated= 1, Share out= 2 share in=3

6. Who has control over land? (Sell, buy etc) women Men Both

Note: Control here refers to managerial decision making.

7. Who has access to land? use to cultivate etc women Men Both

Note: Note: Access here refers to utilization of resources

Annexure 11 continued

8. Did you grow rice this year? Yes=1, No=0

If yes, give the following information.

Name of the varieties	Area (Ropani)	Production	Reason of growing this variety

9. Did you sell rice this year? Yes=1, No=0

If yes, give following information for this year. If no, give the same information for last year.

Variety of rice	Volume of Sell	Value (Rs)

10. Who has control over rice? Women Men Both

11. Who has access to rice? Women Men Both

12. Who has control over seed rice? Women Men Both

13. Who has access to seed rice? Women Men Both

14. Who has control over rice straw? Women Men Both

15. Who has access to rice straw? Women Men Both

16. Did you grow maize this year? Yes=1, No=0

If yes, give the following information.

Name of the varieties	Area (Ropani)	Production	Reason of growing this variety

17. Did you sell maize this year? Yes=1, No=0

If yes, give following information for this year. If no, give the same information for last year.

Variety	Volume of Sell	Value (Rs)

18. Did you grow potato this year? Yes=1, No=0

If yes, give the following information.

Name of the varieties	Area (Ropani)	Production	Reason for growing this varieties

Annexure 11 continued

19. Did you sell potato this year? Yes=1, No=0
 If yes, give following information for this year. If no, give the same information for last year.

Variety	Volume of Sell	Value (Rs)

20. Who has control over potato? Women Men Both

21. Who has access to potato? Women Men Both

22. Who has control over seed tuber? Women Men Both

23. Who has access to seed tuber? Women Men Both

24. Did you grow Ginger this year? Yes=1, No=0

If yes, give the following information.

Name of the varieties	Area (Ropani)	Production	Reason of growing this variety

25. Did you sell Ginger this year? Yes=1, No=0
 26. If yes, give following information for this year. If no, give the same information for last year.

Variety	Volume of Sell	Value (Rs)

27. what are others crops growing this year?

Crops	Yes or no								

28. Do you plant fruits? What are they?

Fruits	Yes/no								

29. what are the crops sold in last year?

S no	Crops	Production	Sell amount	Income from sale

30. where is your near market for sell?

31. Who has control over oxen? Women Men Both

32. Who has access to oxen? Women Men Both

Annexure 11 continued

33. Who has control over labour? Women Men Both

34. Who has access to labour? Women Men Both

35. Who has control over fertilizer? Women Men Both

36. Who has access to fertilizer? Women Men Both

37. Who decide which varieties of crops for plant?

Gender	Rice	Maize	Potato	Ginger
Women				
Men				
Both				

38. Did you take loan for agricultural production so far? Yes/No

If yes =1, No=0

39. Who decides for credit? Women Men Both

40. Who decides time for land preparation?

Women Men Both

41. Who decides on time of plantation and transplantation of crop?

42. Who decides on time of crop weeding?

Women Men Both

43. Who decides on time of crop harvesting?

Women Men Both

44. Who decides for selection of seeds?

Women Men Both

45. Who decides on quantity and type of seed storage?

Women Men Both

46. Who decides purchasing of new or improved seeds?

Women Men Both

47. Type of family

Nuclear (parents and children share same kitchen)=1.

Extended (grand parents also share same kitchen)=2.

Joint (uncle, aunty and cousins share same kitchen)=3

48. Household food grain security: months

Note: If the household is food surplus please ask that how long the food grain they can continue next year assuming there is no sell and no new harvest.

Thank for your kind information.