

Involution or Evolution? Conceptualizing the Changes in Farming System of Eastern Nepal

Prem Sagar Chapagain
ps.chapagain@gmail.com

Abstract

The traditional farming system of growing cereal crops and livestock for the purpose of subsistence has gradually been replaced by the cash crops. Farmers, particularly after 1980, have started cultivating cash crops such as cardamom, ginger, broom-grass, orange and dairy cow for commercial purposes. Consequently, previously unused and marginal lands are now covered by these high value cash crops. These changes in farming system are neither just an intensification nor they can be understood as agricultural involution. These changes in crops and cropping pattern have changed the agricultural landscape and environment resulting to agricultural evolution.

Key words: Farming system, intensification, subsistence, stagnation, involution, cash crops, transformation, evolution.

Introduction

Farming is an integrated land based activity. It is the complex arrangement of several components such as land, labour, livestock, market, and other resources that household mobilize for production in accordance with households's preference, capabilities and available technologies in the existing environmental (bio-physical and socio-cultural) setting (Shaner et al., 1981; Turner & Brush, 1987). While talking about the agricultural system of Nepal, instead of different trajectories of agricultural development such as agricultural stagnation, agricultural involution and agricultural evolution in the different parts of the country, Blaikie et al. (1981) presented pessimistic views on agricultural transformation in 'Nepal in Crisis'. They concluded that there has not been any radical transformation in traditional farming system even after the development of the road particularly in Central Western part of Nepal. The revised and enlarged version of the book came in 2005 in which they have also presented the same scenarios of lack of positive changes in the economy and environment.

Contrary to the overall picture of stagnant development as presented in 'Nepal in Crisis' (Blaikie, et al., 2005), there are several studies from the different parts of the country that have demonstrated several changes in agricultural system and even radical transformation in various parts of the country. A few to mention of such studies are Adhikari (1996), Poudel (2002) from Central West Nepal who have claimed about adoption of market oriented production such as vegetables and

dairy cow; Sharma (1997) has reported radical agricultural transformation in Ilam; Ministry of Agriculture (MoA, 1971) has reported changes in the traditional farming system after 1950 and clearly mentioned about the possibilities of developing new crops, livestock enterprises, fisheries, horticulture crops and other types of production in different parts of Nepal; Shrestha and Katuwal's (1992) studies in four locations including both accessible and inaccessible areas in the central Hill of Nepal reported positive transformation; Bishop (1990) has presented several activities and coexisting livelihood strategies that are varied in single village, villages and from valley to valley in the north western part (Karnali zone) of Nepal. In this context, this paper has tried to present the changes in farming system that has taken place during the last two decades, roughly the same period as presented in 'Nepal in Crisis' in the three villages in Ilam and further tried to interpret those changes based on the different theoretical grounds.

Concept, Methods and Materials

Population resource relationships particularly in the case of agricultural development can be viewed from different theoretical point of views. Among those, Malthus (1798) considered population growth as a negative factor for agricultural development. Contrary to Malthus, Boserup (1965) argues that population growth is actually the stimulus to expansion of food production. She has demonstrated population induced agricultural change and argued that increasing demand of food forces human to change farming system. She claims that this condition led progressive transformation in the farming through the phases of forest-fallow, bush-fallow, grass-fallow, and finally, annual cropping to the multi-cropping system. Besides Malthus and Boserup, Geertz (1963) introduced the concept of 'involution' as the ability of absorbing additional labour in agriculture without changing the agricultural system. Under the intensive farming system, the additional labour involve in better treatment of soils, irrigation management, weeding, etc., so that productivity is maintained.

Pingali, Bigot and Binswanger (1987) have presented a hypothesis of accessibility and market driven agricultural change in which agricultural intensification can take place in response to improved access to markets even where the density of population is low. Thus, population growth and density are not only the variables for agricultural intensification but accessibility, market and good price are also the important factors for agricultural changes. In addition to the Boserupian process of agricultural change, the hypothesis of market and accessibility induced agricultural change give a new integrated theoretical perspective. This framework presents population growth as a valid but not a sufficient factor for agricultural change.

Based on the farming system approach, both qualitative and quantitative methods are used for data collection and analysis. The data of this paper were collected using participatory observation and open interview methods from the randomly selected

84 households (32 from Mixed Village, 25 from Yakha village and 27 from Yolmu village) of the study area. I worked as ‘participant-as-observer’ during field survey and observed, asked and tried to get information about the land types, uses and its perception, before and after 1980 in the study villages. I also used unstructured interview method. The unstructured interview did not follow the predetermined and standardized list of questions. Being native of the study village (Mixed Village), I had noticed different types of land and their utilization pattern. Based on this background knowledge, I did open unstructured interview with many farmers of these villages and asked in detail about the major changes in land use, crops and cropping pattern and the reasons behind those changes. I basically focused on the cash crops cultivation and the date they started those crops. It was difficult to get the data from the time before 1980¹. I reconstructed the past by linking the particular events such birth of a particular child, or some major events either in the family or in the village and asked about their farming practices and other activities concurring at that time. For income related information, I asked the market price of different crops and derived the income from cash crops. I collected information about the number of people involved in off-farm activities. Besides income, other information was also cross-checked in order to enhance the reliability of the data. In addition to simple quantitative tools and techniques, an interpretative approach is adopted for the analysis.

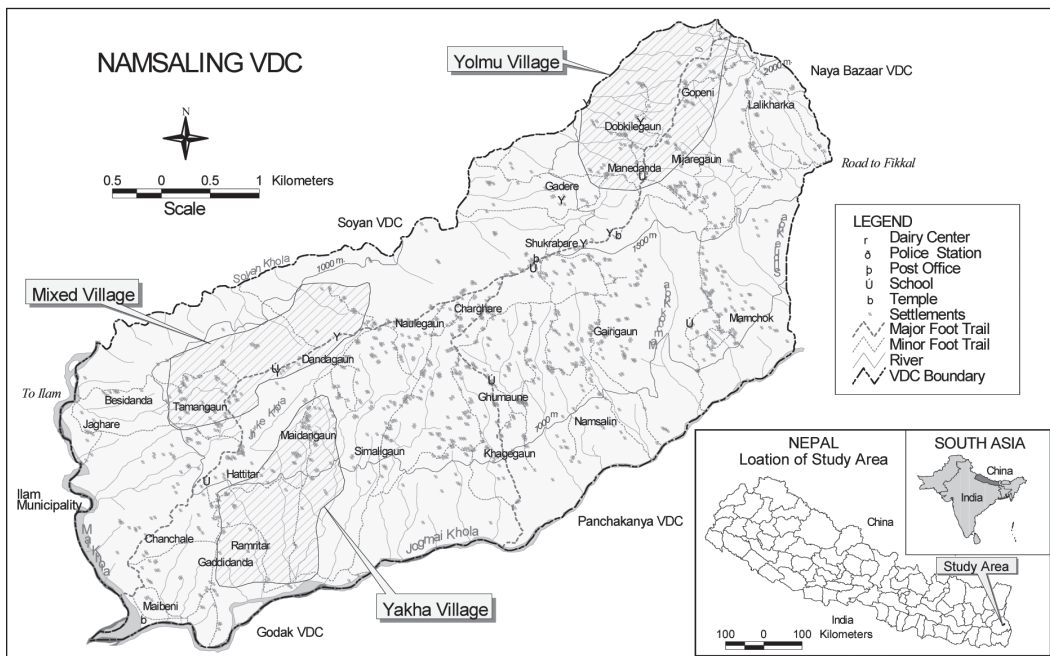
The Study Area

The Namsaling VDC lies in the Ilam District in eastern Nepal. With total area of 22 sqkm, the VDC ranges from 500masl to 2000masl altitudes. For the purpose of this study, three settlements (small villages); Mixed Village, Yakha Village and Yolmu Village were selected.

Out of the three villages, Yolmu village lies at an altitude of above 1500masl at the northern part of the VDC. Yakha Village lies in the southern part below 1000m asl elevations. The Mixed Village lies in-between these two villages ranging from 1000masl to 1500masl elevation (Figure1). These villages are ecologically representative of the river valley, mid belt and high land what is locally known as *Besi*, *Kachhad* and *Lek*. This ecological setting of the villages is also representative to the different crop-livestock combination and the production system.

¹ The year ‘1980’ does not refer to the exact date. It is used as a working tool to refer to ‘the practices and reality’ for about two decades ago

Figure 1. Location of the Study Area



The total population of the VDC has been increasing over the time from 4464 in 1981, 4978 in 1991 and 6443 in 2001 (CBS, 2001). People of different caste and ethnic groups live in the villages. Originally the Lepcha people settled the village, followed by Kiranti and caste groups later (Subedi, 2000:8). The Yolmu people who claim themselves belonging to the people of Helambu live in the Yolmu village believe to have been immigrated even after caste groups and settled in the highland. Yakha, belongs to the Kiranti group supposed to have been originated in Chainpur of Sankhuwasabha district and migrated to Yakha village six generations ago (ibid:25), live in the Yakha village whereas different caste, ethnic and dalit people live in the other villages what is referred as Mixed village in this study.

Changing Farming System of the Village

Nepalese agricultural system is basically subsistence in its characteristics. Although, elevation is one of the major factors of determining crops and livestock combination, culture cannot be negated as it determines the type of technology used for production. The interface of bio-physical and cultural pattern also reflect in production system due to which cereal crops and livestock are mainly reared in the mid hill regions. The changes in the technology and gradual adoption of market oriented production along with external linkage show progressive change in production system over the traditional one (Gurung, 2003).

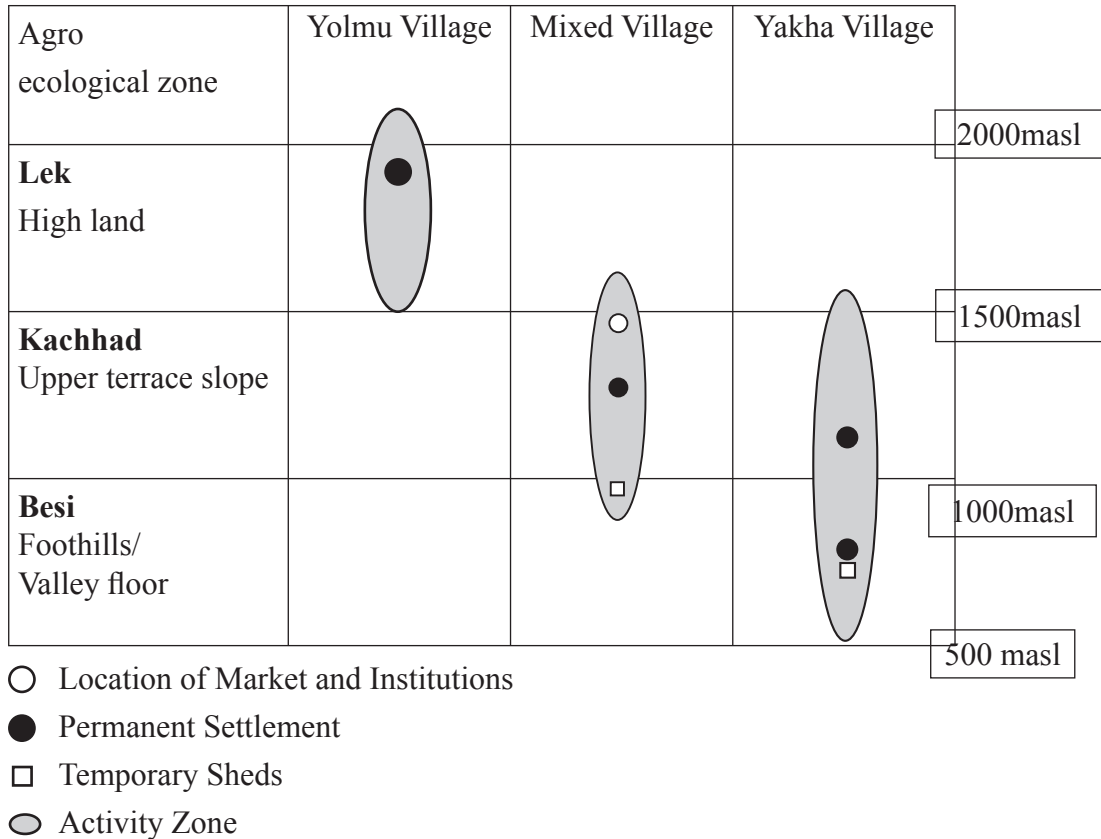
Ecological variation was reflected in the production system thus people of the three different ecological belts have different adaptation strategy. During 1980s, it was emphasized to cereal crops production. The combination of crops and livestock was the common strategy that was varied by villages mainly due to the ecological limits and cultural pattern of adaptation. The Yolmu who lived above 1500 meter elevation emphasized to maize and potato cultivation. The farmers of the Mixed village grew several crops, fruits and vegetables as they had different types of land resources between the two ecological belts. But they mainly emphasized to grow maize, millet and rice. Similarly, Yakha farmers mainly grew paddy, maize and millet. Apart from cereals, livestock was an integrated part of the traditional farming. Differentiations in animal rearing practices were commonly noticed among the villages. Livestock such as cow, ox, buffalo and goat were commonly reared in Yakha and Mixed village but Yolmu had emphasized on cow and sheep. Livestock were the source of milk, meat, manure, draught power, and cash income too.

Under the traditional farming system, only one crop could grow in *lek*, two crops in *kachhad* and three crops in *besi*. As the number of crops grown were varied throughout the villages, the different types of farming practice were obviously resulted that can be termed as *lek* type (highland type) for Yolmu village, *kachhad* type (upland/ midbelt type) for Mixed Village and *besi* type (low land type) for the Yakha Village (Chapagain, 2003).

Farmers were mainly involved in subsistence production for maintaining both biological and social demand. Limited food grains and livestock were sold for cash income. Off-farm income opportunities were limited. Therefore, all household members were involved in farming activities. Besides cereals production, root crops were produced to meet the increasing food demand. It is clearly observed that the ecology had its dominance (Figure 2) on the possibilities of growing crops and livestock.

The farmers of different castes and ethnic groups required different crops and livestock for various socio-cultural activities such as white-rice for Brahmin and Chhetries, millet, chickens, pig, etc. for Limbu and Yakha. The cultural factors were associated with hospitality, feasts and festivals and religious rituals in these villages. Among the different types of arable land such as khet (irrigated terrace), bari (rainfed terrace), pakho (slope); khet land had special meaning and importance as paddy grown on it. During 1980s, white rice could be produced in limited irrigated land and there were no enough food supply from the outside market. Thus, it was considered as a prestigious diet that could only manage by rich people or the big man for the year round. Maize was the second and the millet in the third position in the diet hierarchy. The diet hierarchy was also reflected in the land category and the hierarchy of people who were normally supposed to eat particular diet. In this

Figure 2. Location of Settlement and the Pattern of Vertical Access of Resources



way, agricultural production was considered both an idea and expression of social circumstance (Annis, 1987) by which farmers of different castes and ethnic groups justified their rationality of farming activities. It was further the bases of reflecting uneven economic and social development in the villages.

Changes in the farming system, especially the adoption of cash crops, in Ilam district reflected in land use pattern and in the increasing household income (Sharma, 1997). Major changes in the agricultural system in the study area have been noticed after 1980 with the adoption of five cash crops namely large cardamom, ginger, broom-grass, potato and dairy cow within last five to ten years (NCDC, 1996). These changes in farming system, particularly adoptions of non-cereal crops were positive and innovative interventions in the mountain farming system in eastern Nepal (FAO, 2001).

These five cash crops were initially grown on marginal lands. Large cardamom was planted on banks of streams and river, wetland and steep slope where there could have irrigation facility. Broom-grass was also plated on marginal and dry land and at the edge of higher rain-fed terraces. These crops were gradually introduced on *bari*

and *khet* land at the cost of cereal production. Not all cash crops were introduced simultaneously in all three villages. In the case of Mixed village, cardamom was introduced before 1980 and orange, ginger, broom-grass, dairy cows were gradually adopted resulting dramatic changes in the land cover types (Table 1).

Table 1. Cardamom Growing Area by Village

Time period	Cardamom area by village (in ropani)		
	Mixed Village	Yakha Village	Yolmu Village
Before 1980	17	-	92
1980 to 2002	86	16	325
Total Area	103	16	417

Source: Field Survey, 2003., 1 ropani = 19.64 ha.

The conversion of land use into cardamom, orange and broom-grass cultivation was noticed the highest during 1990-95. After this period, farmers moved towards the least suitable area for cardamom cultivation. However, broom-grass cultivation advanced from marginal land to *bari* and even to *khet* land. Ginger was continually adopted since 1985. In addition, off-seasonal green vegetables and orange trees were also planted in the *bari* land close to the house in Mixed and Yakha village, so that it could appropriately care. Yakha village lies on the southern slope so that very limited lands were suitable for cardamom where they planted cardamom during 1985. Broom grass was also adopted after few years of cardamom and ginger in 1990. Yakha farmers adopted these cash crops by 5 to 10 years later than Mixed villagers. Among the three villages, the Yolmu farmers had land best suitable for cardamom cultivation and highly benefited from it.

Subedi's (1982) study is the benchmark in explaining the land use conservation of the study area. Out of the total cardamom cultivated land, 40 percent area was previously wasteland, 38 percent forest and bushes, 15 percent pasture land and remaining 7 percent was the cultivated land during early 1980s. Among the study villages in Ilam, the northern area of Namsaling VDC, the Yolmu village, has more wasteland (Subedi, 1982). Therefore, farmers planted cardamom in the moist and wet land along the banks of streams and river at first. In the second phase, they replaced cereals of least fertile *bari* land close to the previously cardamom planted area. Finally, they planted cardamom in the best *bari* land where there were irrigation potentialities. Later, they completely replaced the cereals particularly maize cultivation. Further they replaced the broom-grass plantation area by cardamom especially in Yolmu village. The rapid increase in plantation area of cardamom in

Yolmu village was most significant after 1995. The adaptation of those cash crops has significantly changed the agricultural landscape of the villages (Table 2).

Table 2. Land Under Different Use categories by Village

Land use category	Area by villages (in <i>ropani</i>)		
	Mixed	Yakha	Yolmu
Khet	300	334	102+
Bari (mainly cereal crops cultivated)	388	500	497
Cardamom bari	103	-	417
Orange bari	46	-	-
Broom grass	56	73	57
Mixed use*	168	48	-
Total land	1061	955	1073
No of household	32	25	27
Ropani/HH	33.15	38.2	39.74

*Used for cardamom, broom grass, forest, orange, thatching grass, fodder trees & grass etc.

+ Land they bought in besi.

Source: Field Survey, 2003.

Cardamom is bush plant that needs sheds to maintain soil moisture and protect from direct sunlight. Thus, farmers planted trees, mainly *uttis* (*Alnus nepalensis*), *siris* (*Albizia lebbek*) and fodder trees. The fallen tree leaves maintained soil fertility and the trees become the source of timber, firewood and fodder too. This has greatly support the livestock component and household requirement of firewood, timber and litter. The broom-grass also supported in many ways. The broom was sold in good price. The (broom) grass used for animal fodder that encouraged dairy cow rearing. The remaining stick of the broom-grass was used for firewood. With increasing adaption of cash crops, many farmers have grown cereals only to the limited land closer to the settlement. The farmers who had plots at distance from the settlement gave off cereal growing and planted different types of fodder and timber trees. Consequently, forest area has largely increased and farmers also benefited from private forest. With these new crops, the women who are mainly responsible for firewood, fodder, and litter collection have been greatly benefited due to availability of those resources closer to the settlement.

The major incentive after those changes in farming system was the construction of Mechi-Highway during 1980 and the link road to the study villages were completed

by 1995. During the time many market places have emerged along the road. The study area is then directly linked to the market centers of different levels. The easy access to the widespread marketing network has favorably affected the increase in prices of different cash crops over the time. An unthinkable increment has taken place in cardamom price that was 2 NRs per kilogram in 1963/64 reached to 20 in 1970, 70 in 1985 and 300 per kilogram in 2000. The price of broom-grass and ginger has also significantly increased (Table 3).

Table 3. Market Price of Different Cash Crops

Cash crops	Per unit price (NRs/kg)							
	1963/64 *	1967/68*	1970/71*	1979/80*	1985	1990	1995	2000
Cardamom	2	5	20	32	70	105	150	300
Broom-grass					7	12	30	35
Ginger					17	10	20	13

Source: * Subedi, 1982; Field Survey, 2003.

The changes in farming system have resulted drastic increase in household income that was unthinkable before 1980. Out of the major sources of income, cardamom noticed the most important in Yolmu village, ginger in Mixed village and broom-grass in the Yakha village (Table 4).

Table 4. Average Annual Household Income² by Village

Villages	Household Income (in NRs)						
	Cardamom	Ginger	Broom (flower)	Livestock	Potato	Others	Total
Yolmu Village	92700	-	4700	4700	3100	13000	118200
Mixed Village	8500	8600	4000	2500	-	19900	43500
Yakha Villige	3200	3220	3600	3700	-	1600	15320

Source: Field Survey, 2003.

In this way, a dramatic transformation has taken place in farming system, household income and overall agricultural landscape of the villages. With this brief description, I further discuss the changes in farming system from different theoretical perspective particularly from population-resource relationships below.

² The average income is calculated based on the market price of June 2002. The average per unit (kilogram) price of cardamom was 250, ginger 12.50; broom grass 35, potato 12.50. Other refers to the cash income from orange, vegetables, remittances and job/services.

Perspectives in Understanding Changes in Farming System

Population Induced Perspectives

The process of agricultural changes in the study area cannot be fully conceptualized on the basis of Boserupian process of intensification alone. The agricultural land was already intensively used under the traditional farming system. Farmers of all three villages practiced multi-cropping system as far as possible. The change that took place in the farming system in these villages was from subsistence to the commercial cash crops cultivation. For instance, from being restricted only to food production and labour-intensive subsistence production it moved away to the labour extensive commercial production. Moreover, after the adoption of the commercial cash crops, some of the farmers left multi-cropping system, particularly in the land lying far away from settlement areas. In these plots, they turned back to the annual cropping system from the multi-cropping system. Only maize is cultivated in the case of *bari* land and paddy in the case of *khet* land. Moreover, some farmers have planted fodder trees and private forest instead of cereal cultivation. These changes in the farming system, especially the pattern of land use intensification, are in-fact contrary to the Boserupian concept of progressive shortening of fallow periods.

The consumption demand theme of Boserup assumes that the increasing demand for food is met by additional input of labour and technology. However, in the study area, with the changing farming system, labour input has decreased and technology has not significantly changed. The application of chemical fertilizers is significantly increased under the modern farming system. This change is mainly due to the increasing household income from different cash crops rather than due to population growth. Unlike to the argument of Boserup, with the changing farming system from traditional to modern, per unit labour input has decreased, while both land and labour productivity have significantly increased. Farmers have become more oriented towards the market and always tried to adopt crops that are most profitable in terms of exchange value.

According to Boserup (1965), farmers intend to meet their goal of biological demand of production by least effort or cost. She takes food production only for subsistence. But farmers need additional production for various purposes that may lead to agricultural intensification. Such a production may be for social obligation such as for ceremony and rituals (Dattoo, 1978). In the study villages, the production of additional food and rearing of livestock for social obligations such as feasts, festivals and for rituals are found very significant. For instance, Limbu, Yakha, Tamang and Yolmu farmers essentially need their own production of millet for beer production and paddy for rituals purposes. Besides biological limits to subsistence requirement, farmers need additional production for guests and such ceremonial purposes so that they maintain the *izzat* (prestige) and *samman* (honour) in the society. In other

words, the social reproduction of the family claims a broader range of agricultural items than the mere biological reproduction.

Boserup's system of agricultural change follows a "simple action" where action proceeds in one direction and no feedback effects are detected. Boserup has considered human population growth as an independent variable that determines the level of agricultural change. Moreover, her hypothesis or process of intensification takes place when high population density coincides with poor infrastructures and relative remoteness from the market centers (Goldman, 1993). In the study villages, however, the new agricultural infrastructures such as market, road, and extension services have developed. The construction of Mechi Highway accelerated the growth of new market centers. On the whole, her theory seems inadequate to explain the agricultural changes that have taken place in the study villages.

Accessibility and Market Induced Perspectives

The allocation of land and labour is to a large degree determined by the local demographic condition in subsistence agriculture. In market agriculture, on the other hand, the local demographic condition does not directly affect the production goals (Turner et. al., 1977; Turner & Brush, 1987). Irrespective of population density, agricultural innovation occurs based both on land use intensification and the expansion of economic opportunities in the areas where there is good access to markets. It is argued that important changes also occur with low population density if there is good market access and a cash crop infrastructure. Under such circumstances, a series of positively reinforcing changes can take place (Goldman, 1993). Pingali, Bigot and Binswanger (1987) have also pointed out the possibility that both population growth and improved market access can lead to intensification and innovation in agricultural system.

During the early 1980s, transportation cost was the determining factor for the cardamom market. Therefore, farmers used to sell cardamom to the nearest market or to the middlemen who had a monopoly in the market price. The increasing price was the incentive to expand the area of cardamom cultivation (Subedi, 1982). However, the situation has changed after the construction of the Mechi Highway, which has accelerated the growth of market centers and towns of various sizes and functions along the Highway. Later, the study area was also directly linked to the market centers of different levels. This has stimulated the market-oriented agricultural products in the rural areas (Chapagain, 2002). The easy access to the widespread marketing network has favorably affected the increase in prices of different cash crops over time. Only a few farmers cultivated cardamom and orange in Yolmu and Mixed Villages before 1980. But after 1980, many farmers started cultivating different cash crops such as cardamom, broom grass, ginger, orange, and vegetables in these three villages. The cash crops, especially cardamom and the broom grass, are expanded

from the marginal and unproductive land areas to the cereal growing *khet* and *bari* land. The local market centers are connected to the market centers of different levels, which bring dynamics in the regional development process.

After the adoption of these cash crops, significant changes are observed both in land use and other income generating activities in all the three villages resulting significant increases in per unit output of land. Moreover, labour productivity also increases due to the cultivation of labour extensive cash crops. The youth and children have started moving to the cities for education and employment due to the significant increase in the household income. The agricultural innovation is also related to the information flow through different sources. The increased household income from farming has further accelerated a series of changes in other fields as well. For example, farmers have recently started spending on education for their children, housing, and purchasing of land. In addition, they have started using more money on food and industrial products as well.

Such a positive impact of road and market centers in agricultural development have been noticed in the different parts of Nepal. Katuwal and Shah (1992), Baskota (1989) and Paudyal (1998) have also claimed that easy access to markets as one of the major factors of agricultural transformation. The effective extension services and quality inputs also accelerate agricultural changes. Boserup (1981) has also realized the importance of accessibility to technological change. Wilbanks (1972) has also found the positive role of transportation facilities to bring about changes in agriculture. In the case of this study, farmers of Yolmu and Mixed villages started planting cardamom before 1980 although there was no transportation facility. The production of cardamom was in small scale. Cardamom is a high value, low weight and non-perishable crop that could be transported by porters even under the condition of inaccessibility. The role of extensive service and other inputs are, all three villages, found less significant for agricultural change compared to market. However, due to the income from different cash crops, farmers have been able to buy more chemical fertilizers and agricultural tools so that production of cereals has also significantly increased. This can perhaps be interpreted as the spreading of innovation of cash crops and its broadening effect (Goldman, 1993).

It may now safely be said that the easy access and a widespread pattern of marketing facilities have positively and significantly contributed to the agricultural change in the study area. The changes in agricultural system in all three villages have been both causes and consequences of changes in other several aspects of socio-economic life of the villagers.

Agricultural Involution or Evolution

Geertz (1963) has presented the idea of involution as an outcome of changes in the relation between population and agricultural intensification. He defines involution as 'extraordinary ability to maintain levels of marginal labour productivity by always managing to work one more man in without a serious fall in per capita income.' The additional labour is supplied for better treatment of soil, weeding, use of special tools and techniques and cultivation of marginal land so that labour productivity is maintained. More specifically, the concept of involution helps to understand the agricultural system that supports large and dense population such as intensive subsistence farming of humid tropics of Asia (Turner & Brush, 1987).

Under the traditional farming system in the study villages, land was intensively used. The increasing population supplied the additional labour. However, the land was limited and there was no possibility for expanding the land. The off-farm employment and income opportunities were very limited. Thus, the increasing labours were involved in the farming activities such as in better treatment of soils, land management, weeding, etc. In addition to cereals production, most of the farmers cultivated root crops such as sweet potato, alocasia, yam, etc. These root crops were important diet in winter season. Thus, the concept of 'agricultural involution' is useful to describe this kind of farming system.

The changes in agricultural system in the study villages are caused by other factors than just the population increments. Moreover, the changes in the farming system are the outcomes of the local farmers' active utilization of the available marketing opportunities. These changes cannot be said to have occurred because of the government policies. The steep slope, gullies, wetland and other marginal and environmentally susceptible land are brought under cash crop cultivation. Thus, instead of environmental degradation, cultivation of these cash crops has significantly improved the environmental conditions. These empirical changes in the farming system in the study villages are associated with accessibility and the marketing opportunities.

The opening of markets and other employment opportunities in the villages and in different cities and towns, and opening of labour migration have resulted agricultural labour shortage. This situation of labour shortage has motivated farmers to adopt labour extensive cash crops. Moreover, different government and non-government organizations have provided incentives such as loan, extension services, training, etc which have motivated farmers to adopt cash crops. The historical socio-economic linkages of the study area to Indian cities such as Darjeeling and Sikkim, from where farmers learned, and got inspiration and encouragement to adopt those crops and a

modern life style, have also played a significant role to bring changes in the farming system. In this way, the farming system has changed from the subsistence to market oriented production. Irrespective of the population growth, market and accessibility, availability of various types of land and information have played a major role in bringing this sort of agricultural intensification. The observed changes in the study area are real and substantial that should be labeled as agriculture evolution rather than agriculture involution.

Conclusion

On the whole within the two decades of time, from 1980 to 2002, the farmers have significantly changed their farming practices from the subsistence production to the commercial production. Due to the adoption of high value cash crops the output intensity of the land has significantly increased. These crops require less labour, thus, the labour productivity has also increased. Accordingly, the Boserupian hypothesis of agricultural intensification is found inadequate and less significant in explaining the changes in the agricultural system. These changes seem to support Goldman (1993) and Pingali, Bigot and Binswanger's (1987) hypothesis.

However, under the same condition of accessibility and market opportunities, people of these three villages seem to have been affected differently in terms of changing farming system. The farmers of Yolmu and Mixed Village adopted the cash crops farming immediately after the construction of the road and getting easy access to the marketing opportunities. However, the Yakha farmers started adopting the cash crops farming almost a decade later. Why did not the change in the farming system or cash crops farming take place among the Yakha farmers, while the villagers of the other two villages were immediately motivated to go over most of the new cash crops farming?

Farmers of different villages have different ways of grasping the economic opportunities. Economic incentives are very significant but such incentives may not always affect the change in farming system at all. The Yolmu farmer posses land along the banks of streams and rivers and they had only the *bari* land where they could only grow maize and potato. They faced severe food shortage. Socially and economically they were considered as falling in the lowest stratum among the three villagers. On the other hand, the Yakha farmers possessed better *khet* and *bari* land on the southern slope and along the river valley where they grew paddy, wheat, maize, lentils, mustard seeds etc. Such land types were considered 'prestigious' and with a higher social value. Thus, the way people perceive land, its produces and other resources also play significant role in agricultural transformation. It is due to this prestige associated to land, the Yakha farmers could not adopt cash crops in the

better land, i.e. khet and bari, because of which they economically least benefited in the changing situation.

Although Pingali et al.'s (1987) hypothesis may seem quite instrumental in showing the relationship between the change in farming system in relation to development of marketing and road transportation facilities. The case of Yakha village compared to the other two villages show that this hypothesis needs to be critically look upon. The analysis above showed that it is not only 'the accessibility and marketing opportunities', but how people utilize these opportunities and the ways they utilize this opportunity depends upon, in the case of this study, susceptibility to change conditioned by their economic, social and cultural conditions of living.

Acknowledgement

I am thankful to Prof. Tor H. Aase, University of Bergen for his kind cooperation, comments and suggestions.

References

- Adhikari, J., 1996. *The Beginnings of Agrarian Change: A Case Study in Central Nepal*. Kathmandu: T. M. Publication.
- Annis, S., 1987. *God and Production in Guatemalan Town*. Austin: University of Texas Press.
- Baskota, M., 1989. *Hill Agriculture and Wider Market Economy: Transformation Processes and Experience of the Bagmati Zone in Nepal*. Kathmandu: ICIMOD.
- Bishop, B. C., 1990. *Karnali Under Stress: Livelihood Strategies and Seasonal Rhythms in a Changing Nepal Himalaya*. Chicago: University of Chicago.
- Blaikie, P. M., Cameron, J., & Seddon, D., 1981. *Nepal in Crisis: Growth and Stagnation at the Periphery*. New Delhi: Adroit Publishers.
- Blaikie, P. M., Cameron, J., & Seddon, J. D., 2005. *Nepal in Crisis. Growth and Stagnation at the Periphery* (Revised and Enlarged ed.). New Delhi: Adroit Publishers.
- Boserup, E., 1965. *The Condition of Agricultural Growth: The Economics of Agrarian Change Under Population Pressure*. London: Allen and Unwin.
- Boserup, E., 1981. *Population and Technological Change: A Study of Long-term Trends*. Chicago: University of Chicago Press.
- Chapagain, P. S., 2002. Emergence of market centers and nature and trend of commodity flow in the Mechi Highway: A case study of Panchami market center. *Humanities and Social Sciences Journal*. 1 (1): 63-76. Kathmandu: Tribhuvan University, R. R. Campus.
- Chapagain, P. S., 2003. *Involution or Evolution? Recent Changes in Farming System in Ilam, Eastern Nepal*. Unpublished M. Phil. Thesis, Submitted to Department of Geography, University of Bergen.

- Dattoo, B., 1978. Toward a reformulation of Boserup's theory of agricultural change. *Economic Geography*. 54 (2): 135-144.
- Dunn, K., 2000. Interviewing. In I. Hay (Ed.), *Qualitative Research Methods in Human Geography*. Oxford: Oxford University Press.
- FAO., 2001. *Farming System and Poverty: Improving Farmers' Livelihoods in a Changing World*. Rome: Food and Agricultural Organization of United Nations.
- Geertz, C., 1963. *Agricultural Involution: The Processes of Ecological Change in Indonesia*. Berkeley: University of California Press.
- Goldman, A., 1993. Agricultural innovation in three areas of Kenya: New Boserupian theories and regional characterization. *Economic Geography*. 69 (1): 44-71.
- Gurung, H., 2003. Highland agriculture as peasant perseverance. In T. Ya, & P. Tulachan (Eds.), *Mountain Agriculture in the Hindu Kush-Himalaya: Proceedings of an International Symposium*. Kathmandu, ICIMOD: 17-22.
- Katuwal, B. and Shah, I., 1992. *Transformation of Mountain Agriculture: A Case Study*. MFS Discussion Paper no 26, Kathmandu: ICIMOD.
- Malthus, T. R., 1798. An essay on the principles of population. In A. Flew (Ed.), *An Essay on the Principles of Population and a Summary View of the Principle of Population* (1970 edition). England: Penguin Books Ltd.
- MoA., 1971. *Farm Management Study in Selected Regions of Nepal 1968-69*. Kathmandu: Ministry of Agriculture (MoA), HMG.
- NCDC., 1996. *A Case Study of Village Level Environmental Program: Namsaling VDC* (in Nepali). Namsaling/ Ilam: Namsaling Community Development Center (NCDC).
- Paudyal, D., 1998. *Access Improvement and Sustainable Development: Rural Road Development in Nepal*. Kathmandu: ICIMOD.
- Pingali, P., Bigot, Y., & Binswanger, H., 1987. *Agricultural Mechanization and the Evolution of Farming System in Sub-Saharan Africa*. Baltimore: Johns Hopkins University Press.
- Poudel, G. S. 2002. Coping with Land Scarcity: Farmers' Changing Landuse and Management Practice in Two Mountain Watersheds of Nepal. *Norwegian Journal of Geography*. Vol.56: 21-31.
- Shaner, W. W., Philipp, P. F., & Schmell, W. R., 1981. *Farming System Research and Development: Guideline for Developing Countries*. Colorado, Boulder: West View Press.
- Sharma, S., 1997. *Agricultural Transformation Processes in the Mountains of Nepal: Empirical Evidence from Ilam District*. Kathmandu: ICIMOD.
- Shrestha, H., & Katuwal, B., 1992. Farmers strategies in the Middle Hills of Nepal. In N. S. Jodha, & T. Partap (Eds.), *Sustainable Mountain Agriculture: Perspectives and Issues*. Vol. II: 447-476, New Delhi: Oxford and IBH Publishing.
- Subedi, B. P., 1982. Large Cardamom Farming in Some Villages of Ilam District. *The Himalayan Review*. Vol. 14: 25-37.

- Subedi, B. P., 2000. Conceptualizing territorial mobility through language of those who move and the dimension of caste and ethnicity: From inside a rural Nepali community. *The Himalayan Review*. Vol. 31: 1-36.
- Turner, B. L., & Brush, S. B., 1987. *Comparative Farming System*. New York: The Gulford Press.
- Turner, B. L., Hanham, R., & Portararo, A., 1977. Population pressure and agricultural intensity. *Annals of the Association of American Geographers*. 67 (3): 384-396.
- Wilbanks, T., 1972. Accessibility and technological change in Northern India. *Annals of the Association of American Geographers*. 62 (3): 384-396.