

CHAPTER I

INTRODUCTION

1.1 Background

Nepal is a small landlocked country wedged between China and India. It lies between 27° and 30° N latitude and 83° and 88° E longitude. Its rectangular shape covers a length of roughly 800 km and a width of 130-140 km. Nepal has been ranked as one of the least developed countries in the world, inhabited by large masses of people living under abject poverty. The population of the country is more than 21 million with largely rural based economy where almost 95% of the total poor population are getting their sustenance from the agriculture (Dahal and Guru-Gharana, 1993). Therefore, poverty in the country can be considered as a rural phenomenon. The rural poor lack the most important asset in agricultural setting, the land. They have small unproductive plots or no land at all and the estimated per capita annual income of the rural poor is less than 45 percent of that of the rural non-poor (Guru-Gharana, 1993)

Low level of production, low income, unemployment, illiteracy, food insecurity and malnutrition are the major attributing factors of poverty in the country. Although, agriculture remains as the basis of livelihood and backbone of national economy, it is still traditional and subsistence in nature. Agriculture as the major source of income and employment, which contributes about 61 % in the real GDP, has now, however, stagnated for the last 15 years (Chaudhury and Garcia, 1993). Because of the dismal performance of agricultural sector in the past two decades, Nepal once a net grain exporter country has now shifted to partially grain importer in the recent years [Agricultural Project Service Center and John Mellor Associates (APROSC and JMA), 1995]

The diverse geographic condition consisting of plain alluvial low land (*terai*) to the gigantic rocky Himalayan zone and many small valleys in the country magnify the multiform of agricultural systems. The physiographic domain of the country are readily defined by the five parallel ranges that transverse the country from east to west in the ascending order of elevation. The *terai* land (southern plain averaging 30 km in width with altitude range from 60 to 300m), which is considered as the 'grain bowl' of the, comprises 17 percent of the total country land, and constitutes the most productive area relatively with better infrastructure (Baskota, 1992). Adjacent to *terai* in the north a small strip of *siwalik* foothills extends from east to the west with the elevation range of 120 to 200 masl, comprising dry, friable and immature soils with a very few dispersed settlement. After *siwalik* a gigantic middle mountain extends from the altitude range of 200 to 3500 masl, consisting of about 65 per cent of the total land where more than 45 percent of the total country population reside (Thapa, 1996). High mountains with the elevation of about 1000 masl in the river valley to 4000 masl in the upper ridge further to the high Himalayas extending beyond the altitude of 4000 masl (Sill and Kirkby, 1990).

About half of the total population in the country are below the poverty line and the daily supply of calorie per capita was estimated 2,126 Kilocalorie per day in 1992-94 (FAO, 1995) which is slightly less than minimum calorie requirement of 2,250 on an average (Gautam, 1990). So far as food production and consumption is concerned, for the last two decades food production has not been able to keep pace with population growth, and the agricultural productivity has declined by virtue of degrading environments (Islam, 1984 and Pudasaini, 1993).

Out of roughly three million hectare of cultivated land in the country, the *terai*, hills and mountains account for 41.6, 49.9 and 8.5 per cent respectively. Although the population density in the hills and mountain seems comparatively less in terms of per unit area of land, it comes to be perhaps very high in terms of unit area of cultivated land (Thapa and Rosegrant, 1995). Declining productivity and growing population are the

major challenge of agricultural development and poverty alleviation issues in the country. The increasing demand of food for the ever growing population has, therefore, accelerated the encroachment on natural resources which further exacerbate the environment degradation in the hills resulting rapid depletion of non-renewable natural resources like forest to meet the growing demand of food and fuel (Bajracharya, 1983 a)

Despite the array of changes in agricultural development approaches during the past two decades in the country, no remarkable change has been achieved towards meeting the needs of farmers. This could be in one way, due to poor impact of agricultural extension which in turn is due to lack of clear set of priorities geared to achieving national objective through agricultural growth (APROSC and JMA, 1995). The poor agricultural performance has further been reflected by the low level of research expenditure, which is in fact significantly lower (i.e. 0.69 per cent of agricultural GDP) than that of other developing countries (ibid.). Data records for the past two decades showed declining productivity of major cereals crops (rice, maize, millet, wheat and barley) and natural resources (forest and pasture). This situation has further aggravated the quality of life in the hills and mountain reducing the per capita availability of food grain and animal products (Shrestha and Yadav, 1992).

1.2 Statement of problem

Nepal, where more than 80 per cent of the economically active population are engaged in agricultural, imports a significant quantity of food grain. Small cultivable land holding against increasing population pressure has been threatening the food security situation of the country (UNICEF, 1992). Slow agriculture growth coupled with high population growth and unmanageable urbanization converting agricultural land into human settlement has resulted in higher demand for food with decreasing food production (Koirala *et al*, 1995). Analysis of population growth and per capita calorie availability for the last 25 year shows that food availability has lagged behind the

population growth (Table 1.1). Taking 1975 as the base year, population growth has far exceeded the growth in per capita calorie availability during the past 25 years (1961-94). If the trend continues in the same way, there seems a serious threat on the national food security in the next millennium.

Table 1.1. Index of population and per capita calorie availability in Nepal during 1961-1994 (three years average)
(1975=100)

	Year										% increased 1961-94
	1961	1964	1969	1974	1979	1982	1984	1987	1989	1992	
	-63	-66	-71	-76	-81	-84	-85	-89	-91	-94	
Population	78	83	91	103	118	129	135	145	153	165	111.5
Calorie /capita	91	90	91	90	89	93	95	105	109	101	10.9

(Source: Calculation based on FAO food balance sheets (Nepal), 1980 and 1995)

By the same token, analysis of the past two decades data on expansion of cultivated area and production revealed that the increased supply of food grain was just by way of expansion of agricultural land rather than technological improvement. The data pertaining to growth rate of major cereal production and area of production during 1967-1989 indicate the growth rate of cereal production lagged behind the growth in the area of cereal cultivation (Thapa and Rosegrant, 1995). When compared the growth in food grain production between the regions, the growth rate of cereal production during the same period (1967-1989) was negative in the hills and mountain (Table 1.2). This scenario indicates a poor performance of agriculture production both in *terai* and hills aggravating the food deficit in the hills and reducing the exportable surplus in the *terai* (Khadka and Gautam, 1981). Furthermore, Khadka and Gautam (1981) have projected

balance between supply and demand of food in the country using linear trend for 1980-2000, which indicates a big gap between production and demand of food in the hills.

Table 1.2 Growth rate (percentage) of area, production and yield of major food crops by ecological zones (1967/68-1989/90)

Crop	Ecological Zone			
		Mountain	Hills	Terai
Paddy	Area	3.86	3.45	0.35
	Production	2.35	2.28	1.17
	Yield	-1.51	-1.17	0.82
Maize	Area	1.41	3.50	0.27
	Production	-0.24	1.32	0.38
	Yield	-1.65	-2.18	0.11
Wheat	Area	1.17	5.87	5.60
	Production	0.39	5.93	8.43
	Yield	-0.78	0.06	2.83
Millet	Area	2.36	2.56	-2.29
	Production	1.26	1.40	1.81
	Yield	-1.30	-1.16	0.48
Barley	Area	0.79	2.16	-4.28
	Production	-0.30	1.37	-2.92
	Yield	-1.09	-0.79	1.36
Potato	Area	2.80	2.41	2.49
	Production	4.25	1.80	3.33
	Yield	1.45	-0.61	0.84

(Source: Thapa and Rosegrant, 1995)

Because of high altitude and rugged mountain, Nepal has small percentage (16%) cultivating land thereby creating extremely unfavorable land-man ratio, particularly in the hills and mountain, where nearly 60 per cent of the total country's population reside. The cultivated area on an average per rural household in the hills is only 0.125 hectare (Islam, 1984). Therefore, with the overwhelming proportion of the population depending on

agriculture, a hectare of land has to sustain over six people. Because of high rate of population growth (2.1% annual), availability of land steadily decreased from 0.6 hectare per person in 1954 to 0.24 in 1990 (UNICEF, 1992). In addition, due to high degree of inequality in land distribution, a large section of rural population in the hills has to eke out their living from the very tiny land holding. Therefore, the hills and mountain of Nepal as a whole have been facing intricate problem of rapid population growth, dwindling natural resource base and the consequent problem of food insecurity in the recent decade (Banskota, 1992).

There are wide range of microclimatic variations within the same village in the hills arising from the interaction of elevation and aspect. Generally there is monsoon climate and more than 80 percent rainfall occurs between June to September with a great spatial variation (Sill and Kirkby, 1991). The diverse topography, erratic rainfall, draught, multi-ethnicity, less access to road and market has made the rural hills more disadvantaged. Therefore, it has now been developed a general understanding that the agricultural systems in the hills of Nepal are complex, diverse, risk prone in nature.

Agriculture in the hills is largely undertaken in valleys and slopes carved into innumerable terraces with intensive land use systems. The limited infrastructure and high variation in the micro-climatic condition accompanied by the large family size with less than one hectare of arable land per farm household has led the hills farmers to adopt a complex set of mixed farming for their subsistence living. The hill farming systems, therefore, are characterized as low productive, substantially diverse and a high degree of self-reliance (Yadav, 1990).

Agriculture in the hills heavily depends on monsoon, and productivity is low because of inadequate supply of agricultural inputs, technologies and finance. Those may be the factors partly responsible for rural poverty and wide spread food insecurity in the hills. Uneven access to food is another detrimental factor intensifying the rural poverty.

It has been estimated that about 36 per cent of the total population in Nepal consume less than minimum calorie requirement. The percentage of households consuming less than the required calorie is 47 in rural hills, 40 in urban areas, and 31 in the mountain. When compared with hills the calorific intake in *terai* region is higher, as only 23 per cent people living in the rural *terai* consume less than calorie requirement (UNICEF, 1992).

The mid hills of the country suffer from the extreme population pressures in-terms of availability of cultivating land and economic resources (Sill and Kirky, 1991). It is estimated that in the eastern hill districts, the amount of cultivable land has remained static for over the past 50 years. With continued population pressure, the land is unable to support people at the existing level of technology and the farming systems as increasing population pressure on cultivated land places greater demand on the physical environment. The expansion of cultivation on the marginal land has, therefore, virtually reduced the average agricultural yield and pronounced the soil degradation due to increasing erosion and reducing soil fertility. As a result of worsening population pressure and food deficit in the eastern hills during the eighties, permanent migration from the hills to the *terai* was rapidly enhanced.

The eastern hills of Nepal have an amazing diversity of climatic zones on its wide range of elevation. Majority of inhabitant of the eastern hills can be characterized as having low income, small land holding (<0.5 ha) and food deficit (Gautam, 1994). Since food insecurity is the major problem among the rural poor, poverty alleviation and food security can thus be interpreted almost synonymously in the context of eastern hills.

The above mentioned scenario of deteriorating environment and worsening economy worsening of the hills further exacerbate the increasing problem of food insecurity and miserable livelihood of the hill people. As a result, about 70 per cent of the hill districts confront with food deficit. (APROSC and JMA, 1995). Therefore, the

present situation of the hills demands an urgent strategic program in order to combat with the worsening situation of poverty and food insecurity.

1.3 Rationale of the study

It is obvious that food security at higher level does not necessarily translate as the security at the lower level of aggregation. Therefore, a country which is food secure at the national level will almost certainly contains groups of people which are severely food insecure and vice versa. Since the attainment of national food sufficiency comprises aggregate supply and demand of food in the country level, which some times do not reflect the food security of all regions within the country. Staatz *et al* (1990) have therefore warned the consequences of national food sufficiency policies, which some times create regional disparity where there is poor market integration. Therefore, despite the attainment of national food sufficiency, in some case it does not translate into the household food security if the households are not able to afford for the available foods. The concern on household food security has, therefore, been shifted from macroeconomic production oriented to microeconomic consumption oriented concept at the household-level analysis (Maxwell and Frangerburger, 1992, Von Braun, 1988).

Nepal development efforts in the past were not based on the empirical analysis of the situation. Thus many policy instruments in the past particularly related to food grain and fertilizers distribution has not been able to reach to the targeted poor people; instead, the actual beneficiaries of those policies were politically important groups, urban residents and the government officials (Thapa and Rosegrant, 1995). The food policy of the government in past was to grow more food to meet the basic calorie requirement of the population. But the increased production has not been able to improve the food situation, of the poor. This milieu occurred due to lack of integrated approach in food production (.Ustribution as well as income and employment generation (UNICEF, 1992). To improve the effectiveness of poverty alleviation and food security program, it

is, however, essential to understand underlying factors of poverty and food insecurity in order to address the real problem of the target sector of the society. The Agricultural Perspective Plan (APP) of Nepal has now, therefore, been taken up as main foundation of a long-term strategy to increase food production, food security, employment and income generation thereby ameliorating poverty situation in the country. In order to bring about desirable changes in the food security and peoples' prosperity it is important to target the development activities to the needy. It is perceived that there are gradations in poverty and food security level in the societies, and understanding of the dimensions of the problem is essential to analyze the situation in order to make any research and development interventions effective. Therefore, the present study on factors determining the household food security will provide a basis for setting priorities of research and development activities. Moreover, this study will fill the household level information gap on of the rural hills, which will provide basis for further research.

Small fragmented pieces of landholding, high population density per unit area of cultivating land, lack of off-farm employment opportunities, lack of transport and marketing networks, and the vagaries of unreliable monsoon add to the problem of the hill inhabitants. Because of tiny farm size, it can be assumed that no marketable surplus can be produced and the subsistence living from the present level of resource base is barely possible in the hills. On the other hand, skewed distribution of cultivating land further aggravates the problem of subsistence living to the poor peasant in the hills. From the small parcel of land, the poor hill farmers can not support even the minimum subsistence living of their family, therefore, they have to either supplement by agricultural laboring or non-farm laboring. Which may be the reasons partially responsible to declining productivity due to seasonal migration of agricultural labor to seek non-farm works out side (Waldie, 1993). Therefore, the problem of household food security revolves around a complex set of agriculture production, distribution, and its interrelationship within and between the systems components. The problem of household food security is not simply a problem of agricultural outputs, but encompasses all factors

affecting a household access to supply of food (Falconer and Arnold, 1991). Seemingly, food security is the most important goal of household activities particularly in the subsistence systems. It is, therefore, imperative to understand the linkage between the food production and the general livelihood systems of the people in order to understand the problem adherent with household food insecurity.

The significance of food security at the farm household level can be depicted by an example of household categorization exercise conducted by PAC in the eastern hills of Nepal during 1991-93. The outcomes of farmers' categorization exercise had indicated 'food availability' from own on-farm production as the cut off point of household categorization (KC and Rood, 1993). This indicates that farmers are aware of existing socioeconomic differences between the households, usually described in terms of the availability of food. Furthermore, this opened an area of thinking to explore why and how those differences exist and what could be the determining factors behind? which will eventually be useful to design and implement need based and client oriented research and development activities. Additionally, many study related to food security are primarily from the regions of starvation, famine and war affected countries in Africa and sub-Saharan regions. Therefore, there is lack of information from the areas where the problem of food insecurity is of different nature than famine and starvation. The present study, therefore, been has designed to answer those issues in food security pertaining to the situation of subsistence farming where agriculture production is isolated from the market integration, and food situation has not worsened to the level of famine and starvation so far. Therefore the present study serves as a part of understanding the dimensions of household level food security particularly addressing the problem of subsistence agricultural production systems of the eastern mid hills of Nepal.

1.4 Objectives of the study:

Given the above background, the overall objective of this study was to understand the household food security situation and its key determining factors under the subsistence production systems of the eastern mid-hills of Nepal. The specific objectives of this study were:

1. to characterize the farming systems of the study area in relation with household food security.
2. to investigate and analyze the relationship between per capita food availability for consumption and resource and demographic variables.
3. to identify constraints to household food security and understand the household food strategies