

RURAL LIVELIHOODS AT RISK: DETERMINANTS OF THE ABILITIES OF NEPALI HILL FARMERS TO COPE WITH FOOD DEFICIENCY

Jagannath Adhikari and Hans-Georg Bohle

Introduction

Rural households with no access to resources have been following multiple survival strategies throughout the history of the Nepali nation-state. The strategies adopted by households in the 18th and 19th centuries mainly involved permanent and temporary migration to other areas of the country and beyond. Among the poor rural households, migration took place as a response to economic hardships caused primarily by land and labor policies (Shrestha 1990) and population pressure (Poffenberger 1980). Another strategy for acquiring income has been serving in the Indian and British armies and non-military work mainly in India. Employment opportunities in the armies arose since 1816 when the war with British India ended. Although Messerschmidt (1976) has argued that wealthier Gurungs from central Nepal have benefitted the most from the army services, other authors (e.g., Macfarlane 1976, Schroll 1991) have reported that the poorer households have mainly benefited from this employment.¹ After the eradication of malaria in the plains of Nepal in the 1950s and 1960s, the Tarai became the main destination for many hill migrants. Even though people from poorer as well as wealthier households migrated from the hills to the Tarai, the poor ended up becoming marginal farmers in the Tarai as well (Shrestha 1990). While the poor families migrated to seek a secure livelihood, the relatively wealthier hill farmers migrated for economic progress. Although opportunities for migration to the Tarai with a view to acquire land dried up by the early 1980s, army pensions and remittances from labour abroad are still important sources of income for some rural households.

Economic position has historically differed significantly by ethnic and caste group and within such groups by class in a given locale. For the understanding of such inequalities, some insight from the social history of Nepal is essential. Particularly during the Rana regime (1846-1950), those

1. Cf. Des Chene (1991:261-71) for an analysis of these disparate descriptions of the economic background of army recruits.

clans and lineages, which had members assigned the role of village chiefs and as agents for revenue collection by the government gained economic advantage locally. Clans and lineages of Chhetri and *jana-jāti* rulers dating back even prior to the unification era (1769-1816) may even now tend to control more resources than some other local clans and lineages as ownership has been transferred through hereditary relationships. After the unification of the country and throughout the Rana period, the government collected taxes through its village agents called *Mukhiyā*, *Jimmawāl*, *Subbā* or *Tālukdār* and these positions were hereditary.² The families whose ancestors were assigned such roles have tended to continue to control more resources. Among groups relevant to this study, these responsibilities were mostly given to *Cārjāt* families among the Gurungs (Messerschmidt 1976), to Bhusal Rana families among the Magars and *Bārajāt* families among the Tamangs (Bista 1976). Among Chhetris and Brahmins, those connected to ruling families by marriage or kinship obtained these responsibilities. Moreover, some families occupying high positions in the bureaucracy and the military during the time of unification (1769-1816) and the Rana regime (1846-1951) obtained land grants in the Tarai (Regmi 1978). The economic and social position of the families not having such responsibilities remained low throughout history. The impact of these state practices is still seen today in the form of great economic and social diversity within each ethnic group. As members of Occupational Caste³ were not given responsibilities in administration, revenue collection, or in the military, they, as a group, were not able to increase their access to resources. Until the 1950s, these members provided labor (with traditional skill) service to members of higher castes and portering service to businessmen. Before the construction of roads linking hill market centers like Pokhara (until the mid-1960s) to markets near the Indian border, businessmen required a large number of porters to transport *ghee* (butter oil), the main item exported at that time, to India. Similarly these porters were used to carry clothes in their return trips. Some wealthier households used to employ them to

-
2. The specific names of these agents were different at different places, but these were most common in the hills (see Adhikari 1996:298-299).
 3. Occupational Caste represents here those groups or sub-groups, who are considered untouchables in Hindu society. In Nepali hill villages, Occupational Caste mainly includes *kāmī* (blacksmiths), *damāt* (tailors), *sārki* (cobbler) and *poḍe* (involved in fishing). In the *varṇa* hierarchy of Hindu society, Occupational Caste is considered as belonging to the lowest stratum and is supposed to provide services to other higher castes.

fetch salt from the markets (mainly Jomsom) near the Tibetan border. During winter, members of Occupational Caste from the hills used to go to the Tarai to work as labor for cutting thatch grass and to work as tailors, cobblers and blacksmiths. They used to come back to villages with cash and scrap metal, pieces of clothes and leather at the start of summer. These materials were used to prepare tools, cloths and shoes for the villagers. This type of temporary migration opportunities has almost ended now. Apart from clothes, salt and spices, village communities used to meet their food requirements from village production or through exchanges between villagers, often across village boundaries.

In recent years, rural households have faced greater hardships in earning their livelihoods from their own production due to rapid population growth and degradation of the resource base, mainly land and forest. As a result, they are shifting their emphasis from subsistence farming to other sources of income to maintain their livelihoods. In the past, the proportion of households depending on multiple sources of income for survival was comparatively small as their farming could fulfill all requirements of basic food stuff like foodgrain. Although almost all households needed some non-farm income to purchase goods such as clothes and salt that were not produced locally, nowadays the majority of rural households depend on many sources of income for survival. Depending upon geographical location, access to resources and infrastructural facilities, the sources of income or survival strategies have also been changing. One study in Kaski district has shown that village households alternate among strategies, utilizing whatever opportunities are available to them (Adhikari 1996). The same study has documented the changes in farming systems, exchange systems and labor migration patterns to take advantage of new income opportunities. Most of the rural households in the area studied now adopt strategies to serve the needs of the urban and wealthier households by supplying them quality village products such as milk, rice, *ghee*, herbs, wild foods, timber, and stone slate. Seasonal and short-term labor migration has also increased. Yet another strategy of rural households to extend livelihood security is to consume cheap and low quality food products while selling their home produced quality goods at higher prices. These livelihood strategies have become possible because of greater integration of rural areas with the national and international marketing channels. The growth of shops in villages and business centers at major intersections has helped in integrating village life with the outside market. The flow of goods to and from villages has also expanded. Similarly the nature of goods bought and

sold by villagers has also changed. Nowadays, villagers' consumption of goods produced in towns and in international markets has increased. This has become possible because of penetration of marketing channels to the villages. This has led to the greater interaction of villagers with the formal markets (which are linked with national and international markets; cash is used for buying and selling). Accordingly, the direction, nature and the extent of mobility has changed. In the past, villagers were also mobile, but that was limited to the bringing of salt and clothes from markets near the Tibetan and Indian borders. This type of mobility ended by about 1960. Short-term out-migration to work in British-Indian armies and in civil jobs in India was also common. Even though this type of mobility is still seen, frequencies of mobility to the formal markets and to outside areas has increased in recent times. Villagers now interact with markets to meet their daily consumption.

The above-discussed economic strategies of rural households are the results of growing livelihood insecurity in villages, which has arisen because of the ongoing unsustainable economic, ecological and social development processes. Against this background of ecological, economic and social unsustainability, our research project posed the following questions:

- Who are the most vulnerable groups?
- What are the main risk factors that threaten the livelihoods of vulnerable groups?
- What are the main determinants of vulnerability?
- How do vulnerable groups in rural Nepal cope with unsustainable development? How do they try to adapt to changing internal and external risk factors? And, most importantly, how successful or unsuccessful are their coping and survival strategies?

Blaikie et. al. have defined livelihood as “the command an individual, family, or other social group has over an income and/or bundles of resources that can be used or exchanged to satisfy its needs” (1994:9). Dahl defines livelihood as means for living on a sustainable basis (1993/94:21-22). Security indicates protection, assurance or a secure condition. A livelihood is sustainable if it can bear the weight of present activities for a long period without compromising the future prospects. The usual way of examining livelihood security is the analysis of "vulnerability", a condition, which has been defined in various ways. For example, Chambers has defined vulnerability as "the exposure to contingencies and stress, and difficulty coping with them. Vulnerability

has thus two sides: an external side of risks, shocks, and stress to which an individual and household is subject; and an internal side which is defenseless, meaning a lack of means to cope without damaging losses" (1989:1). According to Blaikie et al. vulnerability describes "characteristics of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of natural hazards" (1994:9). Bohle defines vulnerability as "an aggregate measure of human welfare that integrates environmental, social, economic and political exposure to a range of potential harmful perturbations" (1995:6).

All these definitions point to the two sides of vulnerability articulated in Chambers's definition. The internal side is the people's capacity to cope with or avoid risky situations. The external side is the risk of and exposure to hazards and stress. This study is mainly concerned with the internal side of vulnerability as it examines the abilities of people and societies to cope with their exposure to risk. Chambers (1989:3) also lists different degrees of vulnerability as exemplified in four trends with negative effects. These are the decline of patron-client relationships, the decline of extended families, the rising cost of contingencies (such as expenses for medical treatment) and finally the mortgage, sale and loss of tangible assets. All these trends (with growing severity) represent the internal side of vulnerability.

Even though livelihood includes many types of basic needs, only food security has been considered here. Vulnerability, therefore, implies the exposure to the risk of not having enough food, and the lack of coping capacities.

Conceptual Approaches to Food Insecurity or Vulnerability:

There is a lack of theoretical development in vulnerability analyses. Questions about the appropriate methodologies required and the factors to be considered to identify the determinants of vulnerable households, individuals and places are still not resolved. Bohle (1995) and Watts and Bohle (1993) have developed a three-dimensional approach for mapping the space of vulnerability. They argue that the space of vulnerability is formed by three co-ordinates—risk exposure, coping capacity and recovery capacity. Each of these co-ordinates has, in turn, three dimensions—endowments, political ecology and empowerment. Understanding the working of these dimensions requires insights from theories of expanded entitlements, human ecology and political ecology. Expanded entitlements include not only the entitlements based on one's own production, but also

on trade, labor exchange, inheritance, different types of resource transfers, benefits arising from social and cultural pressure and intra-household allocation of resources. Human ecology is the study of the relationships between people and their physical and social environment using ecological concepts. Political ecology is mainly concerned with the study of production, utilization and distribution of resources of the ecosystem using political economic concepts. In other words, political ecology deals with the influences of socially and economically defined classes on the utilization of the ecosystem.

Blaikie et al. (1994) have developed two models for the analysis of vulnerability in the framework of natural disasters: the Pressure and Release (PAR) Model and the Access Model. The idea behind the PAR Model is that, "a disaster is the intersection of two opposing forces: those processes generating vulnerability on the one side and physical exposure to a hazard on the other" (1994:22). The forces generating vulnerability are rooted in the socio-political and economic structure of the society. The root causes of vulnerability (which reflect the distribution of power in a society) put people in unsafe conditions under the influence of dynamic pressure. Natural hazards affect people who are at unsafe positions. This model is static as it treats society and nature (hazards) separately, whereas nature (like use of resources) is also a part of society. The 'release' side of the model explains that in order to reduce vulnerability pressure, or the root causes leading the households to vulnerable positions, should be released.

The Access Model—a dynamic framework—focuses on the way unsafe conditions arise in relation to the economic and political processes that allocate assets, income, and other resources (including natural) in a society (Blaikie et al. 1994:46). 'Access to resources' is considered to be the major explanatory factor of vulnerability and is based on social and economic relations—social relations of production, gender, ethnicity, status and age. Access also has spatial dimensions as resources are not distributed uniformly.

The Access Model suggested by Blaikie et al. (1994) for the analysis of famine describes the vicious processes leading to vulnerability. According to this model, a household's capacity for production and extraction of surplus is affected by the broad political economy operating in a society. Composition of households (in terms of age and gender) and their access to resources are other factors that interact with the broader society and economy. The households review possible income opportunities, which have different access qualifications and pay-offs.

Households choose a combination of opportunities depending upon their access profile. Access to income opportunities as well as surplus generation and appropriation are affected by socio-political, economic and cultural factors as they determine the structure of domination and allocation of resources within the households and among different households and groups. The combination of various income opportunities would determine the state of a household budget including flow of food and cash within the household. If the access capability of the households declines below a certain threshold, it will cause nutritional deficiency. The working abilities of the individuals or households will be impaired and this will make further difficulties in the next cycle. Therefore, this model is considered dynamic. In sum, the main lessons of the Access Model are as follows:

- *Resource Access and Political Economy*
This model perceives access to resources as the most important factor in determining income opportunities that a household can avail itself of. Political economy is considered as the main determinant of access by households or groups to resources. But given the fact that there is considerable ecological and social diversity within a small spatial unit in Nepal, human ecology is also important to explain the access of different groups, not only to natural resources but also to other income generating opportunities.
- *Entitlement Theory, Marketing and Food Systems*
The concepts used to explain the causes of famine like FAD (food availability decline) and FED (food entitlement decline) are also linked with the access position of households (see Blaikie et al. 1994:54). Since the concept of entitlement includes production-based entitlement, trade-based entitlement, own-labor entitlement, inheritance and transfer entitlement, and other forms of expanded entitlements (Dreze and Sen 1989:10), the study of food security should also be concerned with the food systems. Food systems involve not only the systems of food production, but also the degree of access to land and inputs, operation of the markets, and the ways in which food is distributed, prices are determined, and traders in food staples behave (Cannon 1991). The functional and spatial dimensions of markets (including exchange systems) must be studied in order to fully understand the food security/insecurity of rural households. In other words, 'real markets' (Bohle 1992) also play an important role

in the food security of households. This aspect, however, has not been explicitly described in the Access Model.

Research Framework

The Access Model is considered to be a preliminary framework for the analysis of famine. It is not a theory, as the contextual nature of vulnerability makes it extremely difficult to build a general theory of vulnerability. Blaikie et al. note that this approach to famine analyses is also appropriate for analysing social and political structures and processes in relation to making a living in normal times (1994:94). Thus the Access Model has been found suitable as a framework for this research on food security. Instead of an individual household, a group of households is taken as the unit of analysis in this study. However, wherever possible, groups have been disaggregated into individual households to examine diversity within the groups. Intra-household access profile has not been studied, but in a few cases it has been illustrated with the help of qualitative information.

As discussed in the previous section, socio-political and economic forces put households, individuals or communities in vulnerable positions. Individuals, households, or communities, on the other hand, constantly struggle to resist disasters (famine or hunger or food deficit). In their efforts, some become successful, and others fail. Identification of factors that lead to successful coping would be useful in devising short-term or immediate solutions to minimize the impact of disasters. One of the crucial factors that deserves closer examination is assets that contribute to successful coping strategies.

UNDP's *Human Development Report* (1997) states that people's assets reduce vulnerability and build resilience against poverty. Here (in UNDP's report) the term 'assets' does not only refer to economic resources. Instead assets are taken to mean a broader range of tangible and non-tangible resources—economic, social, environmental and personal. Economic assets include land, livestock, housing, labor and financial capital, which provide a basis for generating income and production. Except for labor, these assets are often absent or scarcely available to poor people. Social and political assets mean people's ability to draw on relationships with other people (e.g., family, kinship and community help, group formation for collective power, democratic governance). Environmental assets include both natural resources and physical and social infrastructure (e.g., roads, transport, health, information and educational facilities) important to secure livelihoods. Personal assets

include physical and social well-being—good health, toughness, skills, talents and education. This broad definition of assets, and the improvement of these assets of poor households certainly aims at releasing some of the forces or pressures described in the PAR Model or in undermining the root causes of vulnerability in the Access Model described above.

To indicate the need to modify Sen's entitlement theory, Swift (1989) has also introduced the concept of assets. He has defined assets as “a wide range of tangible and intangible stores of value or claims to assistance which can be mobilized in crisis and which are created when production leads to a surplus beyond immediate consumption requirement” (1989:11). Swift then further disaggregates assets into investments (as productive and collective assets and human investment), stores (monetary, food, gold, etc.) and claims (on local, national and international communities). Even though, Swift's concept of assets is similar to the one developed by UNDP, the former is more concerned with assets that are useful during crisis. Moreover, possession of assets as defined by Swift (especially collective assets and claims) is also dependent on socio-economic situations, cultural norms and behavior of people during crisis. Accordingly, this calls for studies about the coping mechanism (i.e., behavior during crisis) of the vulnerable people. Furthermore, the assets defined by Swift differ widely from one geographical region or socio-economic context to another

The theoretical perspective underlying the Access Model considers access to resources as the main determinant of vulnerability. But given the fact that ownership of resources, mainly land, in rural Nepal is rapidly declining due to population pressure, a large proportion of households cannot derive their total livelihoods from their land resources alone. Therefore, we need to examine many other variables or determinants in order to fully understand how households are becoming vulnerable, and how they are coping with food deficiency.

Following the Access Model, we first hypothesized that the extent of access to resources would determine the vulnerability of households since resources like land and livestock are important for food production. As described later, food self-sufficiency was taken as the proxy for access to resources in this study. But the field data collected for this study showed that food self-sufficiency alone was not a sufficient criterion to determine vulnerability to food deficits. The data hence called for an analysis of the relationship of vulnerability to different types of assets broadly defined.

Our analysis shows that personal assets (health status, skill and physical power or fitness) were by far the most important factors in helping the households to cope with food deficiency. Other types of assets, although examined casually, were also found to affect food security, but their effect was much less than that of personal assets. As the effects of various determinants of vulnerability differ in extent in different areas depending on geographical locations as well as political, socio-economic, and cultural conditions, a universal predictive mechanism for food shortage is difficult to build.

The Problem of Food Security in Nepal

During the last twenty years Nepal has changed from a net exporter to a net importer of food (Cameron 1995:3). The FAO Food Balance Sheets for Nepal reveal that all years since 1991/92 have been deficient and that the deficit is increasing from year to year (CBS 1995). In a scenario for Nepal developed by IDCR Co-operative Research Program, it is expected that, in the year 2000, 33 of Nepal's 75 districts will be food deficient while only seven will achieve food surplus (IDCR 1990). But various studies have given different estimates of food availability situations in Nepal. This is partly because of the unreliability of data. A food balance estimate made in 1970-71 based on cultivated area, physical output of cereal grain, and population showed that the country had 294,051 MT surplus foodgrain. But it also showed that 34 districts had food deficits—6 in the mountains, 26 in the hills and 2 in the inner Tarai—while 18 Tarai districts had a food surplus (see Gurung 1989:203). The majority of the hill districts appeared as areas of chronic food shortages. An estimate of food balance in 1974-75 showed that the country had an overall food surplus of 539,160 MT, but that 29 districts (11 mountain, 16 hill including Kathmandu, 1 inner Tarai and 1 Tarai districts) were food deficient (Gurung 1989:206 but note his counting error). In 1977 overall food deficit was estimated as 1.5% of food production. But recalculations revealed that the food shortage was 15-19% in 1976 and 18-22% in 1977 (Gurung 1989:214). Food insecurity was a serious problem when there were unfavorable climatic conditions in 1972 and again during the drought of 1980. Food had to be imported on a large scale to meet the deficit.

Although the agriculture sector has received the highest priority in most of the development plans, its performance has been dismal. The first national five-year plan (1956-61) allocated 27 percent of the budget to agricultural and rural development (Nepal Government 1956). The reclamation and resettlement of Chitwan valley was the main

accomplishment of this plan. The second (1962-65), third (1966-70), fourth (1970-75) and fifth (1975-80) plans allocated 15%, 21.7%, 33.1% and 34.8% of the budget to the agricultural sector, respectively (HMG 1962; NPC 1965; NPC 1970, 1975). The aim of investment in agriculture was to increase agricultural output and productivity. In the sixth five-year plan (1980-85) 31.1% of the budget was allocated to agriculture with the aim of increasing food production by 3% per year (NPC 1980). In the seventh plan (1985-1990), the government allocated 24.5% of the budget to agriculture and aimed to increase production by 4.3% per year (NPC 1985). In the eighth plan (1992-1997) this sector was allocated 25.8% of the budget (NPC 1992). The target in this plan was to increase production of cereals by 5.4% and cash crops by 9.1% per year. Despite the dubious nature of data on the actual performance of agricultural sector, and the food balance and food consumption situations, the revised estimates of food production show that foodgrain per capita grew annually at an average rate of -0.20% in the 1980s (APROSC 1995).

Since the beginning of the 1990s the proportion of population experiencing food deficits is especially critical in the hills of Nepal where 47% of the population are undersupplied (Koirala 1992). The respective figures for the Tarai and for the Mountains are 23% and 31%. The main reasons for the adverse food availability situation in the hills are the high population density and the degradation of land and forest resources. In 1991 the Tarai contained about 47% of the total population, and 56% of the cultivated land while the hills contained 45% of the population and only 37% of the cultivated land (CBS 1991). The mountains contained 8% of the population and 7% of the cultivated area (CBS 1991). These figures show that land scarcity, as a source of vulnerability to food shortage is particularly acute in the hills. The land scarcity problem in the hills in relation to that of the Tarai was even worse in the 1970s. But due to hill-Tarai migration, the Tarai's share of the total population increased by 9% in 1991 as compared to 1971 (CBS 1996). Gurung maintains that such migration is a movement of consumers to the source of food, as food deficit in the hills and mountains was due to the poor integration of the hill and Tarai economies (1989:215). While Gurung's argument probably applies to the situation prior to the mid-1980s when Tarai surplus was largely exported to India, in recent times, the productivity of various crops in Tarai has stagnated and the population pressure has rapidly increased. It is, therefore, likely that the currently favorable situation in the Tarai will worsen in the near future.

Land productivity in Nepal has stagnated in spite of the increasing use of fertilizers indicating land degradation and excessive utilization of natural resources (Koirala 1992). 60% of Nepal's population spends more than two-thirds of their household budgets for food alone. More than 80% of the food supply consists of cereals. The intensity of poverty is dramatically increasing in Nepal. While in the year 1975/76, 40% of the population were below the poverty line (around 5.5 million people), this proportion increased to 43% in 1984/85 and 49% in 1991/92 (around 9 million people) (Guru-Gharana 1995a, 1995b; APROSC 1995:184). There is, however, no rigorous study conducted to date on the characteristics of households under the poverty line. Pyakuryal (1995a:25) has suggested the following factors for developing a poverty index at the household level: location (remote or centrally located), size of land holding, access to off-farm jobs, level of education, type of house, livestock population, level of income, assets possession, gender and age of household head, and caste. The listing of these factors alone, however, will not explain how poverty is created or perpetuated, the risks faced by vulnerable groups, how they are affected by the risks, and how they cope with them.

Even though it is argued that poverty has been a problem in Nepal since about the 18th century (Pyakuryal 1995a) because of slavery⁴ and a feudal system of land ownership and labor arrangements,⁵ the problem of

-
4. Before 1925 slavery system was common in Nepal. According to an estimate in 1922, there were 51,178 slaves under the control of 1400 masters. In 1925 Chandra Shumsher, the then prime minister, paid Rs 33-34 lakhs (1 lakh=100,000) to those masters in compensation for their loss when he declared the abolition of the slavery system in Nepal (Bhandari 1990:494). Despite this slavery eradication scheme, some forms of slavery (e.g., *Kamaiya* or bonded labor system in western Tarai) still exist.
 5. The land ownership and tenure system can still be regarded as feudal in that a few absentee landlords control a large part of Nepal's land, and share-cropping (50:50 share between landowner and tenant even though the latter bear all costs of production) is still widely prevalent. This was more so in the past. During the unification period (1769-1816) and the Rana regime (1846-1951), a large part of the country's land was distributed to the members of the elite class, government employees and military personnel as *Birtā* and *Jāgir*. They employed tenants for the cultivation of land and appropriated surplus from them in the form of taxes and shares. Tenants had no rights on the land. Unpaid and *corvee* labor was utilized not only by the state but also by the individuals responsible for administration, revenue collection and military

food insecurity has grown tremendously only in recent times. Traditional safety-net mechanisms⁶ had helped poor people in the past to secure a food supply to a certain extent. But now this system has almost eroded. Landlords who used to employ labourers on the basis of patron-client relationships now prefer to pay wages and do not want to carry any other obligations.⁷ Moreover, the abundant availability of other resources such as the forest and waste land meant that landless and marginal people could afford to keep animals and derive forest products for their livelihoods. In recent times, however, these opportunities have dwindled as common lands used as grazing grounds are being converted into private property by wealthy and influential groups of people. Access to land has been declining for a large proportion of households because of increase in population pressure and skewed distribution of land. The average landholding of a household (average size, 5.6 members) in 1991/92 was 0.96 hectares (CBS 1996). The top 5 percent of the population controlled 40 percent of the cultivated land, while the bottom 60 percent controlled about 20 percent. The population growth rate in the last three decades has remained well above 2.0 percent per year.⁸ The population in 1991 was approx. 18.5 million (CBS 1996). According to the Access Model, all of these figures point to conditions that make vulnerability to food shortage likely.

The decline in food security in Nepal is also evident from the decreasing *per capita* food production. The *per capita* food grain production decreased from 376 kg. in 1974/75 to 277 kg. in 1991/92 (APP 1995). Even though production of 277 kg. of grain *per capita* (nearly 190 kg. of

operations (see Regmi 1978 for details). After the downfall of the Rana regime in 1951, a Tenancy Rights Acquisition Act was introduced in 1952 and the *Birta* Abolition Act in 1959. These acts achieved only partial success, as did the Land Reform Act of 1964.

6. Two systems were effective in the past—*bista* system or more broadly the patron-client relationship (see Pyakuryal 1995a) and *dharma bhakari* which literally means grainstore for religious merit. People would donate grains to this store to earn religious merit. The food of the store would be distributed to people facing food problems.
7. Traditionally, employing ploughmen, tailors, blacksmiths and cobblers was based on a patron-client relationship which required the employer to pay a fixed yearly payment (locally called *mujuri*), often in foodstuffs, in addition to being responsible for the general welfare of his employees.
8. The average population growth rate per year was 2.07% from 1961 to 1971, 2.66% from 1971 to 1981 and 2.08% from 1981 to 1991. It is estimated that the population growth rate per year was about 2.66% from 1991 to 1996 and will be 2.41% from 1996 to 2001 (CBS 1996:36).

food in edible form) would meet the minimum *per capita* food requirement (considering 180 kg as the requirement (Wallace 1987:3; Uma 1993:44)), it is not at all evenly distributed among the entire population. A USAID report published in 1979 revealed that 85% of hill households and 50% of Tarai households had been unable to produce sufficient food (cited in Cameron 1995). Another sign of lack of food security is malnutrition, a result of inadequate consumption. It is reported that 65% of the children from 6 months to 6 years of age are malnourished in Nepal, and an additional 5% of the children of this age group are severely malnourished. Female children as well as adults are particularly affected by the adverse impacts of malnourishment (Pyakuryal 1995a:6).

It is not only the deficit in food production, but also unequal distribution that is having a major impact on people's health. The Food Management Committee began operation in 1965 for the distribution of food, and the Nepal Food Corporation (NFC) was established in 1974 for the same purpose. Food purchased by NFC was meant to supply food to deficit places at a subsidized rate. But it is reported that a large proportion of food purchased by NFC was distributed within the Kathmandu valley for political reasons (see Wallace 1987:12). Moreover, even the small amount of food that went to other deficit districts was actually distributed to government employees. Of the total food distributed by NFC from 1974 to 1985, 54% went to the Kathmandu Valley alone. The NFC food distribution during that period satisfied 34% of the food deficit in Kathmandu, 19% in the hills and 7% in the mountains. There was also discrimination in fixing the minimum requirement of food. While the requirement was fixed as 180 kg. of foodgrains *per capita* per year for the Kathmandu Valley, it was fixed at 120 kg., 144 kg., and 165 kg. for the mountains, the hills, and the Tarai respectively. It is also reported that the price of NFC food was lower in Kathmandu than in other areas of the country with similar marketing costs. Standards of food requirements and food prices were fixed not on the basis of nutritional requirements and population structure, but rather based on political considerations (Wallace 1987:12). Gurung (1989) also states that in 1981 the government dissolved the seven rice companies it had instituted in 1974 because of the pressure from businessmen. These companies, he maintains, helped in providing an institutional framework for the support of prices of agricultural products and to maintain a buffer of foodgrain for use during emergencies.

The above discussion of food security problems clearly indicates that sustainable development has not been occurring in Nepal—economically,

ecologically or socially. This conclusion is supported by the recent country rankings of international organizations. In the latest Human Development Report, Nepal is ranked by UNDP on the basis of human welfare indicators (life expectancy, educational attainment and real GDP *per capita*) in the 154th position among 175 countries (UNDP 1997). Similarly, in the World Bank's attempt to determine the wealth of nations—a combination of indicators for material capital, human capital and natural capital—Nepal ranked second to last among the 133 countries analyzed, followed only by Ethiopia (Seralgedin 1996). Given that food security problems are worsening in Nepal and a large proportion of population, especially children, are being adversely affected, it is crucial to understand and identify the main determinants of vulnerability. This knowledge is important as it can help in formulating policies to make vulnerable individuals, households and communities able to resist the risk of food deficits.

General Description of Case Study Sites

In our study two remote villages (Siding and Karuwa-Kapuche) in Kaski district in the central hills region were selected for case studies (see Map 1). These villages represent remote villages with greater marketing problems and different ecological settings.⁹ Siding is predominately

9. For comparative studies of other socio-economic and geographical settings, Lachok-Riban and Sikles villages in Kaski District were also observed. Lachok-Riban was also case study site of a detailed research of one of the authors (see Adhikari 1996). In Sikles nine households representing different socio-economic status were studied with the help of case history method. Lachok village is a mixed village with Brahmins and Chettris as the dominant ethnic groups. Gurungs are predominant in Riban village. Members of Occupational Caste are present in both villages. Lachok and Riban are located near the market. It requires only 1.5 hours to reach these village from the nearest roadhead in Pokhara-Baglung highway. After the completion of this highway in 1992, access of these villages to market has increased significantly and there has also been rapid changes in the villagers' livelihood securing strategies. Villagers started to produce commodities like milk, vegetables, bamboo-products like mats and baskets and quality foodgrains for the market. For the purchase of inputs and household necessities, sale of outputs and labour, villagers became more mobile. The Sikles village is located at a distance of about 10 hours walk from Pokhara. It was also known for honey hunting in the past (see Valli and Summers 1988). Gurung, both *carjāt* and *sorajāt*, is the dominant ethnic group. Occupational Caste is also present here and their economic condition is lower than that of

50 *Jagannath Adhikari & Hans-Georg Bohle*

inhabited by Brahmins, Tamangs and Chettris and Karuwa-Kapuche by Magars and Tamangs. Both of these villages are at a distance of about 6-7 hours of walk from Pokhara.

Map 1

According to old citizens, Siding and Karuwa-Kapuche were inhabited from about 1951. Before that these areas were forest-land used by

Gurung. Outmigration is common, especially among Gurungs. They, in general, have benefitted from past and present service in the British and Indian armies. Permanent settlement of wealthier Gurung households in Pokhara town is also a common practice. See Map 1 for the location of these study sites.

Gurungs of the old settlements as grazing grounds for buffaloes. It was also reported that Magars in the study villages had come from Baglung district and Tamangs from Dhading district. These immigrants were slaves prior to 1925. After their freedom from enslavement they moved across hills and mountains in search for work and place to settle. They came to the Mardi-Seti valleys during the early 1930s to work in stone mines and in reconstructing houses destroyed by the earthquake in 1934. They continued to stay there because of the availability of labor jobs in Gurung villages. Utilizing the new-found freedom (in 1951), they settled on new lands – Karuwa-Kapuche and Siding. As flat land suitable for paddy cultivation and for irrigation was available in Siding, Brahmins and Chettris from lower villages also joined Tamangs and Magars. Until the late 1950s, land was not fully developed in the study villages and the new settlers continued to fully depend on lower villages for survival. They however kept a large number of buffaloes, which were sold or exchanged to lower villages for food. Similarly they supplied wild vegetables and dried meat of wild animals to lower villages.

Until the recent past, Siding and Karuwa-Kapuche were known for opportunities to hunt wild animals and birds. Local residents used to kill wild animals like *thār*, *jhāral*, *ghoral*, barking deer, and birds like pheasants. The dried meat of these animals and birds used to be sold to wealthier people of lower villages and Pokhara. Hunters from Pokhara used to seek help from the villagers in finding game animals and birds, hence creating income opportunities for some individuals.

Another way in which these communities used to take advantage of their ecological position, was that herbs were collected in the highlands and sold to mobile traders, mostly Indians. Wild fruits, vegetables and raw materials for bamboo-products (like *Arundinaria sps.* and bamboo) and fibre (nettle fibre) used to be collected from the forests in the past. These products were consumed as well as sold to the residents of the lowland and merchants in Pokhara. Surveys for this study also showed that villagers with low food supply and low income still depend on these resources (mainly bamboo products) for food or income.

Siding

Siding village covers Ward 9 of the Lwang-Ghalel Village Development Committee (VDC). It is also the uppermost village in the Mardi river valley. The village is located on a hill slope with north-east exposure at an altitude of about 1800 m. There is also considerable variation in altitude and resource endowment within the village. It takes

about 2 hours walk to reach the uppermost household from the household located at the lowest point. The village is divided into 8 clusters of households (Bhimjung, Nagi, Tallo Siding, Kgaon, Ghibli, Kiji, Ramje, and Samrung). According to the VDC office records updated in 1993, Siding village was composed of 139 households with 309 male and 336 female population. But the key informants of the village listed 142 households, and this figure is considered as the accurate figure for the time of this study in 1996. Of the total household population, 44.4% are Brahmins, 25.4% are Tamangs, 21.1% are Chettris and 9.1% are Gurungs.

Apart from farming, households of Siding also depend on animal husbandry, and local and external wage employment including jobs within Nepal and abroad. Some households engage in making bamboo-products or clothes from local materials (nettle fibre) obtained in the forests. Two households have developed some arrangements to provide tourists passing through the village with room and board. One household has a small herd of sheep. A stone-slate mine located in the village (at the foothill on the bank of the Mardi river) also provides wage employment opportunities for the villagers. During winter months, it was reported that 15-20 people are employed on a daily basis to dig out slates and to transport them to the nearest roadhead near Milanchook (see Map 2). Although donkeys are occasionally used to transport the slates in winter season, mostly women are involved in transporting and men in cutting the stones. The contractor mentioned that he has contracts with two parties in Pokhara for 18,000 pieces (at Rs 28 per piece) and 12,000 pieces (at Rs 40 per piece) to be supplied over a period of three years. A miner gets Rs. 80 per day and a transporter gets Rs. 60 per day. The contractor pays Rs. 2,000 to the Village Development Committee for this mining as royalty. The contractor was also the member of Luwang-Ghalel VDC as representative member of the ward 9 (Siding village).

Karuwa-Kapuche

Karuwa-Kapuche village is the uppermost village in the Seti river valley and considered one of the poorest villages in the Mardi-Seti river valleys. It covers Ward 9 of the Macchapuchre VDC. Even though it consists of eight small hamlets, it is generally known by the name of two main settlements—Karuwa and Kapuche. Out of the total of 48 households of the village, 32 were Magar (67%), 14 Tamang (29%), one Brahmin and one Gurung. Karuwa-Kapuche does not have much cultivated land, especially *khet* (irrigated land). Even the *pakho* (unirrigated) land

(upland) was not of high quality as a large part of it consisted of boulders and stones deposited by river flow in the past. Therefore sufficient food production is a problem for almost all households.

Until the mid-1980s, the economy of Karuwa-Kapuche was very heavily dependent on the forest. Free access to the forest made the life of the villagers easier as they would sell forest-products to the residents of the lower villages and Pokhara. From the nature of houses built in the past, one can safely say that economic conditions in the village were better than in recent times. The old houses are built of stone with mud mortar, and are roofed by stone slate with a profuse use of timber. Houses built in recent years, however, are very poor in terms of safety and protection from cold, and those of poor people are made up of bamboo mat walls and thatched roofs. In recent years, forest deterioration and the restriction imposed by the conservation laws have restricted timber production.

The residents of the Karuwa-Kapuche village experienced a disaster in 1995. After two days of heavy rain a landslide occurred, and trees, boulders and mud created a dam on the narrow gorge of the Seti river. As a result, hamlets like Sadal and Audi-Bagar located on the river bed were flooded, and the crops were destroyed. The landslide swept away five houses (two in Kapuche and three in Jamirbari) and a part of the cultivated land. The relief program did not reach up to this village. There were small relief activities organized by different political parties, but they were mostly concentrated in downstream villages that are more accessible and visible to the media. The families that lost their houses could not rebuild them, but they made temporary shelters with bamboo and thatch grass. Despite the risk, they continued to stay in their original places as they had no land in other safer areas. Households in the flood and landslide affected areas (Sadal, Audi-Bagar and Jamirbari) are poor even by the village standard.

Conservation Policies in the Study Sites

The study villages are now under the jurisdiction of a conservation area created to conserve the declining resource base, mainly the forest and wildlife. The Annapurna Conservation Area Project (ACAP) is responsible for enforcing conservation regulations which restrict the collection of plants and herbs from the forest. Although collection of some products like fruits, vegetables and herbs, has been banned for selling, villagers still collect these products and sell them in the market early in the morning to escape the notice of forest rangers. Collection of

products like bamboo, nettle fiber and fuelwood is still allowed but on a selective basis.

Under the conservation regulations, responsibilities for the management and use of natural resources, especially the forest, have been handed over to the local people. A committee formed by local users (previously called Conservation and Development Committee but now renamed as Conservation and Management Committee) is responsible for the management of forests. This committee also makes decisions about the distribution of forest products, mainly fuelwood and *Arundinaria* spp. In the study areas, such committees or sub-committees have been formed, and they have imposed a ban on the collection of wild herbs, vegetables and fruits for selling. For home consumption, people are permitted to collect these things. Total ban has been imposed on the hunting of wild animals and birds. Honey hunting is permitted but only with prior permission from the ACAP office. In all cases, the committees have employed forest guards, and all households are required to pay a levy (cash or kind) for this purpose.

Theoretically, every household has equal opportunity to work in the committees. It is, however, observed that the wealthier and higher castes community members tend to dominate these committees.¹⁰ Members of lower castes and poor households cannot afford the time for the official work involved, and do not have the confidence required to work in these committees. In the past, the forest was traditionally managed with usufruct rights afforded only to members of higher castes (mostly in Brahmin and Chettri dominated villages) or to those responsible for revenue collection (in villages dominated by members of other ethnic groups like Gurung, Magar and Tamang).¹¹ Traditionally wealthier households in the study areas owned private forests, and as they had more land, they tended to have more private trees as well.

Strict enforcement of conservation rules has hurt poor and landless families, particularly in remote places as they depend heavily on the forest for their livelihoods. For example, they used *Arundinaria* for making bamboo products like baskets and mats which they used to sell in villages (in kind or cash) and in Pokhara. The *kami* (blacksmith) of the neighboring villages needed wood from the forest for charcoal to make or

10. See Graner (1996) for a similar situation in Sindhupalchok district.

11. In Lachok (the lower village in Mardi-Seti river valley), for example, access to the nearby forest was denied to the members of the Occupational Caste. This is still the case despite new conservation regulations (see Adhikari 1996).

repair iron tools and utensils for their patrons (*bista*).¹² Restrictions imposed on the use of the forest have also affected low income households of Brahmins, Chettris, Gurungs, Tamangs and Magars, as they also depend on selling bamboo products and other forest products for income. But because of their membership in higher castes, they are also privileged in having access to forest owned on a kinship basis. Similarly, they are also privileged in the sense that they can pursue other businesses involving food preparation which are not open to Occupational Caste due to social discrimination.

Methodology

At the very outset, village activities, caste composition, and sufficiency of food production for various categories of households were surveyed by means of Participatory Rural Appraisal (PRA)¹³ methods. General information about common resources and their utilization patterns, alternative opportunities and sources of food and income for poor

-
12. It is not the conservation regulations alone that have made Occupational Caste members yet more vulnerable to food scarcity than that have historically been. As ready-made tools and utensils are available in the market nowadays, services of the *Kāmis* are required only for repair work. Members of the Occupational Caste were also traditionally denied access to land as they were required to perform specialized work for their patrons on a long term basis. In return they used to get foodgrain and other support. But nowadays this patron-client relationship is not significant in terms of income or food earned. These people now work mostly as wage laborers. On the other hand, as they are still considered untouchables by members of higher castes and other ethnic groups like Gurungs, Tamangs and Magars, they remain marginalized both socially and economically.
 13. PRA is a research technique, which helps researchers to act as facilitators in helping local people conduct their own analyses, formulate plans and take actions. This method is based on the assumption that local people are creative and capable of conducting their own investigations and analyses. PRA approaches thus mean learning from the local people but with the aim of empowering them in the long run. There are also potential dangers in using PRA that arise mainly due to superficial and incomplete understanding of the methods and principles. PRA cannot replace other formal forms of investigation in situations where formal and analytical research is required. PRA methods can be useful in setting up research questions or hypotheses. Key informant survey, interest group survey, semi-structured interview, sketch mapping, participatory mapping, direct observation, and semi-structured walk with key informants are some of the tools of PRA.

households was also gained from 'key informants' like teachers in local schools, political representatives of the villages and people met on the trail or in places like tea shops. In Siding, the ACAP extension staff also helped in introducing us to the 'key informants'. In Siding and Karuwa-Kapuche, resource maps showing the locations of houses (settlement pattern), resources (land, forest, pasture, water and irrigation), trails, temples and infrastructure like schools, health post, bridges, and water taps were drawn. One group in each village was asked to select a literate member to draw a resource map of the village. Other members of the groups were asked to comment on the map as the main draftsmen continued their mapping. The comments of group members from various backgrounds not only helped in getting a first descriptive picture of the village but also in understanding different perceptions of the villagers about the village, resources, problems and social life.

After the completion of resource mapping, the groups of 'key informants' in Siding and Karuwa-Kapuche were asked to list the village households with the names of the household heads and their castes. The number of months each household could meet its food requirements from its own production was then recorded. This was also established through a participatory research process. The average number of months out of the responses of the participants aware of the households in question was taken into account. In Siding this discussion was held in a household of the ward member of the village. In Karuwa-Kapuche village, this was done in a shop-cum-restaurant where people gathered for buying goods and drinks.

The households were then categorized into five groups according to their food self-sufficiency (0-3 months, 4-6 months, 7-9 months, 10-12 months and >12 months, i.e., surplus). 20% of households from each category were selected randomly in Siding (of the total 142 households, 28 households were surveyed) and 35% in Karuwa-Kapuche (17 households of the total 48 households were surveyed; no household fell into the >12 months category). The aim of the household questionnaire survey was to examine the food requirements, food production, and different strategies adopted at the household level to meet the food deficit and to earn income. The food self-sufficiency criterion for grouping households was found to be a useful indicator of households' wealth as it takes into account not only the amount of land, but also the quality of land, size and composition of the family and food habits. However, a survey conducted according to this criterion cannot fully encompass

livelihood security, which also depends on many non-tangible things that help to cope with food deficit.

Apart from the household survey, market traffic and traders surveys were also conducted. A market traffic survey was conducted to understand the flow of goods to and from the villages, and the villagers' marketing behavior (e.g., exchange, locations and conditions). The survey was conducted for two days at a point where marketing routes converge to make a single route to the main market center and to Pokhara (see Map 1 for the location). A small questionnaire was used to gather information. 51 individuals participating in the market (with goods bought or sold) were interviewed. A traders survey was also conducted at the main market center (Milanchok) of the region where the footpath network is linked to a road. This survey was conducted to examine the volume and extent of commodities supplied to and bought from rural areas. About one half of the 42 shops in Milanchok were surveyed.

The perception of households regarding their food requirements differed widely. Wealthier households stated higher levels of requirements than the poorer households. This made the comparison of households' nutritional consumption and requirements difficult. As a result, 180 kg. of foodgrain *per capita* per year has been considered a standard rate of requirement in this study.¹⁴

Results and Discussion

The main objective of our research was to identify various determinants of vulnerability to food deficits and their significance. As food deficit is directly related to factors related to production such as amount, type and quality of land, irrigation, and manure, it was first assumed that food self-sufficiency largely determines food (consumption) deficits. As it was difficult to gather quality data on various factors related to production, the degree of food self-sufficiency was assumed to reflect the level of access to these factors of production (resources). Food self-sufficiency is thus the main variable here. Other variables considered are accessibility to markets, marketing or exchange opportunities (within villages, in other villages and in towns), ethnicity (by way of cultural

14. Wallace has estimated that consumption of this much foodgrain would provide 1650 calories per day, and the consumption of vegetables and animal products is assumed to increase calorie intake by 20% totaling to 2000 (1987:3). In a study in India, 180 kg foodgrain per capita per year has also been assumed as the absolute minimum requirement for adequate nutrition (Uma 1993).

traditions and historical realities as discussed in the above section), family size, composition and health situation of the family (in order to understand role of economically active members and the burden of sick members on vulnerable families), and the ecological setting (mainly availability of common resources and their exploitation by the society). The role of education, political assertiveness, gender and social networks have also been examined with the help of information obtained from observation.

The above listed variables are examined in the context of remote villages (mainly Siding and Karuwa-Kapuche) where resource endowments for food production are relatively meagre.

Extent of Food Production

All the households in the two sample villages of Siding and Karuwa-Kapuche (a total number of 190) were classified according to their food self-sufficiency by the PRA-method. Five classes of food self-sufficiency were distinguished (see also Pyakuryal 1995a:3). Out of the 190 households in the two case studies, 41% of households were self-sufficient from their own food production for less than six months, while 51% were self-sufficient for 7 to 12 months in year. Only 8% had food surpluses (see Tables 1 and 2). As discussed later, households also met their food consumption needs by purchasing food in the market and through barter and exchange. The question then arises as to which months in a year these sources of food are utilized. Even though the seasonality of the sources of food was not studied, it has been observed that households generally tend to spread the deficit over the entire year.

The survey revealed that about one third of the households in Siding could not produce enough food to meet their consumption needs for more than 6 months out of the year (see Table 1). Only one in ten households produced slightly more food than its yearly consumption. Disaggregating the data on the basis of ethnicity, Brahmin households (44.4% in the total household population) were found to be relatively more self-sufficient in food production. Slightly less than 25% of Brahmin households were not able to produce enough food to meet more than six months of their consumption needs. The same figures for the Gurung, Chettri and Tamang households were 31%, 37% and 44% respectively. From this analysis, it seems that the Tamangs of this village are in the most vulnerable position in terms of food production. No members of the Occupational Caste live in the village although at the time of research one *damāi* and

one *kāmī* from nearby villages were temporarily residing in the village for wage employment in agriculture.

Table 1: Distribution of population and sample households according to ethnic group and food self-sufficiency in Siding in 1996.

Food self-sufficiency	Ethnic groups				Total households	Sample households
	Brahmin	Chettri	Tamang	Gurung		
0 - 3 months	7 (11.1)	5 (16.7)	8 (22.2)	1 (7.7)	21 (14.8)	3 (10.7)
4 - 6 months	8 (12.7)	6 (20.0)	8 (22.2)	3 (23.1)	25 (17.6)	5 (17.9)
7 - 9 months	17 (27.0)	7 (23.3)	11 (30.6)	2 (15.4)	37 (26.1)	8 (28.6)
10 - 12 months	21 (33.3)	11 (36.7)	6 (16.7)	6 (46.2)	44 (31.0)	9 (32.1)
> 12 months	10 (15.9)	1 (3.3)	3 (8.3)	1 (7.7)	15 (10.6)	3 (10.7)
All households	63 (100.0)	30 (100.0)	36 (100.0)	13 (100.0)	142(100.0)	28 (100.0)

(Figures in parentheses are percentages)

The incidence of food insufficiency (from own production) is far greater in Karuwa-Kapuche compared to Siding (See Table 2). About two-thirds of the village households could produce sufficient food for less than six months only, whereas in Siding, only about one third of the households produced food sufficient for less than six months. The basic difference lies in the access to land. In Siding 64% of households of the sample had access to *khet* land which, being irrigated, permits growing of up to three crops per year. In addition, all sample households had access to *pākho* (unirrigated) land. Even though all sample households in Karuwa-Kapuche also had access to *pākho* land, only 24% had access to *khet* land (which is also prone to erosion and river-damage). Within Karuwa-Kapuche village, Magar households are relatively better off in food security (own production) than the Tamang households.¹⁵ But none of the households in Karuwa-Kapuche produced sufficient food to satisfy their families' consumption requirements throughout the year.

15. The average Tamang family size (6.6) is also larger than that of the Magars (6.1).

Table 2: Distribution of population and sample households according to ethnic group and food self-sufficiency in Karuwa-Kapuche in 1996.

Food self sufficiency	Ethnic groups			Total households	Sample households
	Magar	Tamang	Others		
0-3 months	3 (9.4)	1 (7.1)	1 (50.0)*	5 (10.4)	1 (5.9)
4-6 months	16 (50.0)	11 (78.6)	-	27 (56.3)	10 (58.8)
7-9 months	10 (31.2)	1 (7.1)	-	11 (22.9)	4 (23.5)
10-12 months	3 (9.4)	1 (7.1)	1 (50.0)**	5 (10.4)	2 (11.8)
All households	32 (100.0)	14 (100.0)	2 (100.0)	48 (100.0)	17 (100.0)

* Gurung household ** Brahmin household.

Figures in brackets are percentages.

Food production in the villages surveyed came basically from three agricultural sub-systems: irrigated land (with 2-3 harvests per year, primarily paddy), rainfed land (with one harvest per year, mainly maize or millet), and slash and burn agriculture on the hill slopes (with one harvest every three to five years, mainly millet) (see also Pyakuryal 1995b). The higher the location of the villages, the more important are the latter two agricultural sub-systems for food production.

*Sources of Food and Consumption Levels*¹⁶

In Siding (see Table 3), households in the lowest food self-sufficiency (FSS)-category (0-3 months) produced only 21% of their minimum consumption requirement. Although they acquired another 50% through purchase, their actual consumption level was only 71% of the minimum required consumption level. In the second FSS-category (4-6 months) the overall consumption level was 85% of the minimum requirement, in the third (7-9 months) it was 76% and in the fourth (10-12 months), 97%. On an average, only 86% of the minimum food requirement was fulfilled in Siding. The situation in Karuwa-Kapuche was even worse (see Table 4). In the lowest FSS-category only about 61% of the minimum food requirement was met, and the average for all households was only 82%. The figures reveal that, in addition to own production, purchase and bartering of food were the main strategies to cope with food deficits, and

16. When calculating the consumption level, minimum food requirement has been assumed to be 180 kg of cereals per person/year which is the WHO-standard. 180 kg of cereals per person per year is an absolute minimum amount in comparison to other estimates.

that another desperate way which was forced upon the villagers was to consume less than the minimum requirement needed for an active and healthy life. Thus it is not surprising that large parts of the population in the hills are affected by stunted growth, although most of them are highly active and hard working. In one of our traffic surveys, we encountered a man of less than 150 cm. in height (which is not uncommon in that region) with a body weight of 45 kg, who was portering a bag of rice weighing 100 kg. up into the hills.

Table 3: Sources and consumption of food per household for sample households in Siding in 1996 (amount in kg.)

FSS groups	Required*	Produced	Purchased	Sold	Bartered	Consumed	Percent deficit
0 - 3 months (n = 3)	1080 (100.0)	229 (21.2)	540 (50.0)	-	-	769 (71.2)	28.8
4 - 6 months (n = 5)	1224 (100.0)	543 (44.4)	380 (31.0)	-	119 (9.7)	1042 (85.1)	14.9
7 - 9 months (n = 8)	1170 (100.0)	596 (51.0)	269 (23.0)	-	27 (2.3)	892 (76.3)	23.7
10 - 12 months (n = 9)	1201 (100.0)	941 (78.3)	223 (18.6)	26 (2.2)	26 (2.2)	1164 (97.0)	3.0
> 12 months (n = 3)	841 (100.0)	1066 (126.7)	119 (14.1)	333 (39.6)	-	852 (101.3)	+ 1.3
All households (n = 28)	1145 (100.0)	708 (61.8)	287 (25.1)	44 (3.8)	37 (3.2)	988 (86.3)	13.7

* 180 kg per year per capita is the standard assumed. Average family size of each FSS category is multiplied by the 180 to get the food requirement. Therefore food requirement is determined by the family size. Figures in brackets are percentages. Source: Own survey.

As seen in the Tables 3 and 4, bartering and exchanges were also important for village households to obtain their foods. Marketing mechanisms and accessibility to markets hence affect food security. In Karuwa-Kapuche, bartering helped 8 households (47%) to obtain foodgrain. They obtained, on average, 54 kg food in 1996. Seven households bartered their bamboo products for foodgrains, mainly millet and maize. They carried these products (baskets and mats of various types) to producer farmers in lower villages where they exchanged them for grain. One household exchanged labor for foodgrain in lower villages. All

households of Karuwa-Kapuche purchased rice mainly from Milanchok. This rice is Tarai rice which is cheaper than the locally produced rice. Village households obtained about three-fourths of their purchased rice from Milanchok. About 88% of households also purchased maize, and all purchased millet. Maize and millet were purchased mainly from lower villages.

Table 4: Sources and consumption of food per household for sample households in Karuwa-Kapuche in 1996 (amount in kg)

FSS groups	Required*	Produced	Purchased	Bartered	Consumed	Percent deficit
0-3 months (n=1)	1440 (100.0)	235 (16.3)	641 (44.5)	-	876 (60.8)	39.2
4-7 months (n=10)	1134 (100.0)	438 (38.6)	515 (45.4)	82 (7.2)	912 (80.4)	19.6
7-9 months (n=4)	1080 (100.0)	614 (56.9)	333 (30.8)	26 (2.4)	810 (75.0)	25.0
10-12 months (n=2)	1080 (100.0)	949 (87.9)	331 (30.6)	-	1281 (118.0)	+18.0
All households (n=17)	1132 (100.0)	528 (46.6)	458 (40.5)	54 (4.8)	929 (82.1)	17.9

* 180 kg per year per capita is the standard assumed. Average family size of each FSS category is multiplied by the 180 to get the food requirement. Therefore food requirement is determined by the family size. Figures in brackets are percentages. Source: Own survey.

In Siding 5 households (18%) obtained some food from bartering for forest and bamboo products, labor and a cash crop (onions). They obtained, on average, 207 kg food grain from bartering. Bartering took place mainly within Siding. All, except one Siding household purchased rice, and all rice purchasing—low quality Tarai rice—was done at Milanchok. Out of the total sample of 28, about one half of households purchased maize and one-third of households purchased millet from producer farmers of the village itself.

The slight differences in bartering and purchasing patterns between the two villages are primarily due to their differences in resource endowment. As Karuwa-Kapuche is relatively more insufficient in food production, it

depends mainly on bartering and purchasing for food security. Hence, more food is brought here from outside.¹⁷

The traders survey conducted in Milanchok revealed that a main item that traders sold to the villagers was rice. Although it was the cheap Tarai rice, it was the first ranked commodity for slightly less than half of the shops. While the survey also showed that Milanchok received some foodgrains such as maize, soybean and millet from the villages, their combined quantity was less than one tenth the amount of rice purchased by the villagers.

Other important items these traders sold to villagers included salt, sugar and oil. Instant noodles—a recently introduced product—was also becoming popular among trekkers and porters. This commodity also appeared as one of the main commodities sold by traders. From general observation it is also seen that this product is nowadays commonly used at the household level. The shops in villages are now seen with stacks of various brands of instant noodles. The field and foot-trails in villages are also seen littered with the wrappers of noodles. In village shops instant noodles feature as a frequently sold item. A small packet (75-80 gm) of instant noodles costs about Rs 10-15 in villages depending upon their remoteness from the market. One packet can provide snacks for at the most two persons. On the other hand, with the cost of one packet of instant noodles, a household can obtain about 2 kg maize or millet which could meet the snack requirements of the whole family for two days. This new industrially processed product has therefore adversely affected the food security to some extent.¹⁸ The less time required for the preparation of this food is one of the main reasons for its popularity among trekkers. Villagers perceive the consumption of these industrially processed foods

17. Similar situation was also observed in Sikles. Households in this village also depended on purchasing and bartering to obtain a large part of their food. Bamboo and woolen products were mainly used for bartering. Rice was purchased from lower villages located in the river valleys as well as from Pokhara. Gurung households with income from outside sources purchased the high quality rice from lower villages whereas poorer households purchased cheaper Tarai rice.

18. Here the nutritional value has not been taken into consideration as we are mainly concentrating on the sufficiency of food in quantitative terms. However, considering the fact that industrially processed noodles are made of wheat flour with some flavor of vegetables or meat, their nutritional quality may not be significantly different from local maize or millet, as they are all cereals. The issue may be rather the higher cost and thus the reduced quantity of food acquired.

as a prestige issue. Accordingly, they buy these foods to prepare snacks for the guests. Similarly, because of the artificially created taste, it is popular among children and youths. They put pressure on parents to buy these foods.

Sources of Income

As Tables 3 and 4 show, a large part of the food deficit is met by purchasing food in the market. One source of income to do so is wage employment in agriculture, in quarries and, most importantly, in portering services. Alternatively, timber, livestock and livestock products, bamboo, and also alcohol are taken to the market in lower villages, Milanchook and Pokhara bazaars, or exchanged for foodgrain within the village or in other villages (cf. Maps 2 and 3). Remote hill villages, because of their high pasture grazing lands and access to mountain forests, have comparative advantages in the provision of some of these products. Illegally cut timber is sold in the market at night to evade forest rangers who would prosecute any illegal access to the forests. Alcohol production (socially restricted in most of the villages including those in Mardi-Seti valley) requires a lot of firewood for the distilling process. The production and marketing is mainly undertaken by women who sell the alcohol in lower villages where they buy millet required for the production of alcohol (cf. Map 2). Bamboo collected in the forests is another product that provides income as bamboo baskets and mats are produced in the villages and marketed in Milanchook or Pokhara.

In Siding, the main source (about 60%) of monetary income is derived from livestock, followed by wage employment including remittances (about 35 %; see Fig. 1). Bamboo-products and bartering contributed less than 5 % to the total income of households. Alcohol production contributed negligible amount of income to the households. All households except one derived income from livestock. Selling of milch buffaloes, primarily to milk-producers of lower villages, was the main means of generating income from livestock. This activity accounted for 75% of the total income from livestock. As the market for milk is not readily available to Siding because of inaccessibility to Pokhara, farmers here generally raise calves until they start producing milk (generally up to 3 years) and then sell them (price ranges from Rs. 10,000 to 15,000 per milch buffalo) to farmers of lower villages like Lachok who produce milk for the purpose of marketing in Pokhara. *Ghee*, goats and poultry are other products of the village purchased by mobile traders, usually from lower villages, who then sell them in Pokhara. Tourists passing through

the village also purchase these products. Another main source of income is wage employment primarily available in the stone-slate mine-digging out the slates and transporting them to the nearest roadhead (near Milanachok).

Fig. 1: Income from various types of exchanges in Siding village (1996)

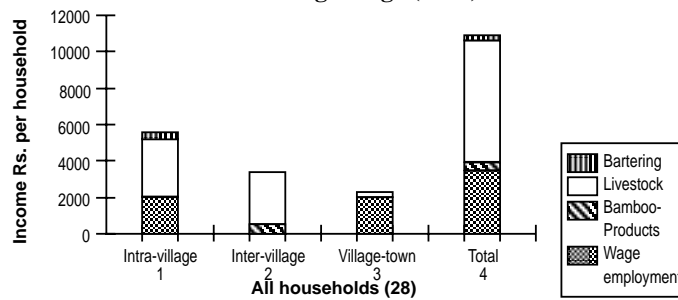
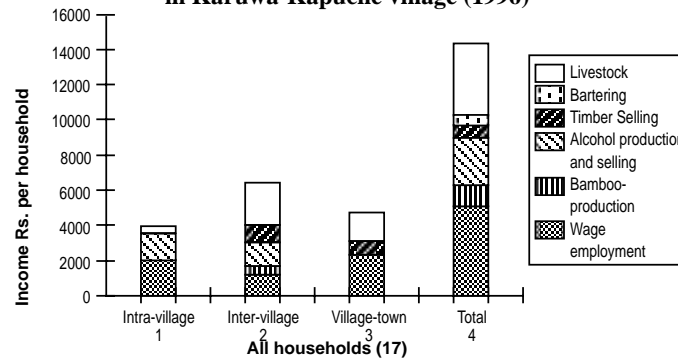


Fig. 2: Income from various types of exchanges in Karuwa-Kapuche village (1996)



In Karuwa-Kapuche too, the main sources of income include livestock, alcohol production, wage employment and bamboo products (Fig. 2). Livestock contributes approx. 26 % to the household income. This shows that the contribution of livestock to the income of Karuwa-Kapuche households is significantly smaller than that in Siding. Livestock - mainly female buffaloes - are sold primarily to lower villages as in the case of Siding. As the residents of this village are Magars and Tamangs, male buffaloes are consumed for meat within the villages. It was also reported that they, in the past, used to purchase male buffaloes and unproductive buffaloes for meat consumption from lower villages which are dominated by Hindus (Brahmins and Chettris) for whom

consumption of such meat is a taboo. About 25% of household monetary income of Karuwa-Kapuche is derived from alcohol production and sales, a task primarily undertaken by the women. Magars and Tamangs have traditional skills in alcohol production. They also do not face social erosion in their prestige if they are involved in this profession. Wage employment opportunities are available in portering and it contributes about 33% to the total household income. Bamboo products are sold mostly to lower villages and Pokhara. On average a household was found to derive slightly less than 10% of its income from bamboo-products. The poor households mostly undertook these works. In the traffic survey, all members of the Occupational Caste commuting to the market centers (Milanchok and Pokhara) were found to be either selling bamboo products or carrying goods for employers. As a result, their participation in the market is relatively higher.

In both villages, livestock activity is undertaken primarily by households owning more land. Households owning more than 6 *ropant*¹⁹ of land were found to keep animals, mainly buffaloes.²⁰ This is especially true in Karuwa-Kapuche where land ownership is directly correlated with livestock raising. In Siding, almost all Brahmins and Chettris depend more on livestock than do other ethnic groups. As they do not involve themselves in the production and selling of alcohol, they need to depend on livestock for income. Even the small landholders (mainly Brahmin and Chettri) in Siding tend to keep more animals. Accordingly, the relationship between landownership and livestock raising in Siding is not as direct as observed in Karuwa-Kapuche. It is one of the reasons for more income from livestock in Siding than in Karuwa-Kapuche. The latter village does not focus much on raising livestock partly because its

19. 1 *ropant* land is approx. 73 ft x 73 ft. 20 *ropant* is equal to 1 ha. In villages, land area is measured in *hal* which is equivalent to the area that can be ploughed with the help of a team of oxen in one day. One *hal* is approx. 2 *ropant*.

20. Land distribution was not studied in detail because it was considered that land ownership alone does not reflect the food production or food self-sufficiency. As the food production is more of the function of land quality in terms of productivity, irrigation facilities, management styles (in terms of crop selection, technological adoption), food sufficiency was taken as the variable in this study. When an attempt was made to relate food sufficiency with land types, it was seen that amount of *khet* land, but not the *pākho*, is directly related to this variable. In Siding village *khet* land is more equitably distributed than in Karuwa-Kapuche. This has also affected the ownership of animals as discussed previously in the text.

residents also produce alcohol and they need to travel to other villages for the purchase of required grains and for the sale of alcohol.²¹

Food Deficit Reduction Strategies

Households of Siding and Karuwa-Kapuche were asked about their strategies for eliminating the deficit in food production. The various strategies employed are shown in Tables 5 and 6 ranked according to importance from most (1) to least (3). The above discussed income

21. From the study of Lachok (Brahmin-Chettri dominated village) Riban and Sikles (Gurung dominated villages), it is also seen that livelihood strategies are also associated with ethnicity. In these villages, members of the Occupational Caste are mainly involved in the production and selling of bamboo products. Only poorer households from the other castes are found to engage in this activity, and in portering. Regarding alcohol production, it is the poor households belonging to *matwālī* (i.e., allowed to produce and consume alcohol) group that are mainly involved in this profession. In Karuwa-Kapuche (to some extent in Siding also), it is clearly seen that it is Tamang and Magar that are involved in this work. Gurungs are also socially allowed to produce and sell alcohol. However, most of the Gurung households (eg. in Riban and Sikles) having access to outside income in the form of pension and remittance do not involve themselves in this work as a profession. But one Gurung lady in Sikles was found to produce and sell alcohol as a main source of income. This lady being an informal wife did not get any land from her husband. Moreover, she did not have any income from outside sources. In Gurung villages (Riban and Sikles) remittances and pensions from current or past jobs in the Indian and British armies are the main sources of monetary income. In Riban alone, it was estimated in 1989-90 that outside income contributed approx. 60 % of the household income. Because of access to this source of income, and the absence of adult male members from the villages due to their jobs in distant places, Gurung households rent out a large part of their land for cultivation, mainly to Brahmins and Chettris of the neighboring villages. The labor scarcity created in Gurung villages (due to outmigration), and in Brahmin and Chettri households (due to intensive cultivation in large holdings), allows members of the Occupational Caste to obtain wage employment within these villages. On the other hand, lack of skill, education and social networks means that they do not generally get remunerative employment outside the village. To supplement the income from farm wage labor, they produce bamboo products and undertake whatever other jobs are available locally (for details see Adhikari 1996). Brahmin and Chettri households in Lachok village derive a main part of their income from crop production and livestock raising. The income from outside sources in Riban village and its consequent impact on the farming of other ethnic groups has been beneficial in maintaining the income of Brahmins and Chettris from farming and livestock (Adhikari 1996).

patterns of these two villages also reflect the importance of these strategies. The strategy which contributes proportionately more income to the households is ranked higher. In Siding village, animal husbandry followed by wage employment (including remittances from outside sources) are the main source of income. Accordingly they also feature as first and second most important strategy for the households. Other strategies for Siding in order of their importance include selling bamboo-products, weaving nettle fiber clothes, service within the country, selling potato, loan, business, carpentry and barter-exchange. These strategies are important for mainly poorer households. Farmers dependent on bamboo-products usually go to the high forest to collect bamboo (*Arundinaria sps*). In one day they would collect one bundle of the bamboo or locally called as *nigalo*. In one day they would prepare a basket or a mat which would fetch Rs. 150-200 within the village and up to Rs. 300 in Pokhara market. Most of the producers in these remote villages sell their products to the mobile traders or themselves carry them to lower village for the exchange with gains or selling with cash. Nettle fibre clothes are made only by Tamangs. They weave from nettle fiber a traditional cloth called *bhangra*, which is worn by Tamangs and Gurungs. Women are involved in making this cloth. They go to the forest for the collection of nettle which they boil with ash. After the washing and beating process fiber is produced. Households not producing this cloth buy it from the producers with cash or with grain. Other strategies are undertaken by few households with skill (eg. carpentry or business) or due to compulsion (eg loan, selling potato).

In Karuwa-Kapuche, wage employment, alcohol production and selling, bamboo-products and animal husbandry are the most important strategies for food deficit reduction. These strategies also contribute the most income to the household economy. Other marginal strategies adopted by a few households include temporary outmigration, carpentry and timber selling.

The above discussion shows that there are differences in the livelihood securing strategies between the two villages. In Siding we see that animal husbandry is the most important activity for village households. For ten households, i.e. approx. 36 % of the sample, it acts as a first source to meet food deficit. Wage labor is most important for 5 households (18 % of the sample) and second most important for 10 households (36 % of the sample). In the case of Karuwa-Kapuche, wage employment is most important source to meet deficit food for about 65 % of the households. The second most strategy is the alcohol production

and selling. This difference in the ranking of strategies in the two villages is mainly due to differences in resource endowment and local cultural traditions. As Siding is endowed with more *khet* land with good irrigation facilities, villagers here stick to crop production. As a result of availability of crop residue, they tend to have more animal feed, which facilitates animal raising. Moreover, residents of this village being mainly the Brahmins and Chettris who give emphasis on farming because of limited opportunities for outmigration and in business like alcohol production because of social control, they emphasize livestock production. Even though there are also some Tamang households in this village, they have limited opportunities in the production of alcohol because of their close association with Brahmin and Chettri neighbors. They produce alcohol, but used it mainly for home consumption. Availability of *khet* (lowland where paddy can be cultivated) land and irrigation facilities also encourage them to take crop production and animal husbandry as the main strategy. On the other hand, Karuwa-Kapuche village has mainly *pākho* (upland where paddy can not be cultivated) land where crop production can not be taken vigorously. Without much support from crop production, it is difficult for the farmers of this village to meet a large part of animal feed requirement from forest only. As a result, livestock production is also not a favorable strategy for the villagers. Accordingly wage employment in lower villages and alcohol production and selling feature as the main strategies. Local traditions and skills of Tamangs and Magars have also played a favorable role in this regard.²²

22. The sources of income for households are also found to change depending on new opportunities and risks. When Lachok village was revisited (original survey in 1989-90 and revisit in 1996) it was reported that villagers sell the high quality paddy and rice they produce at a high price (Rs 90-100 per *pathi*; 1 *pathi* = 3.6 kg) and then buy low quality rice (Rs 50-60 per *pathi*) produced in the Tarai or India. This exchange helps in expanding the food security of poor and marginal farmers. Improved accessibility to Pokhara due to the construction of the Pokhara-Baglung highway has encouraged small and marginal farmers to produce vegetables and milk. Instead of producing foodgrains in their small land holdings, they started producing vegetables and keeping buffaloes for the production of milk. The income from the sale of these commodities is higher than that from food crops such as paddy, maize and wheat. As a result, these farmers can obtain more rice from the market with the income from the sales of vegetables and milk than what foodgrains could be produced from their land.

One common feature of these food-deficit reducing strategies in both villages is that they require mainly the personal assets (like family labor or physical capacity to carry forest products to house and the finished products to the market; labor network to find a job; marketing skills; skills of producing alcohol, clothes and carpentry). Here the resource requirement is defined in broad-based terms to include not only physical, but also social, political and cultural resources.

Table 5: Different strategies adopted by households of Siding to reduce the deficit in food production (1996).

Strategies (in sequence)	Rank 1	Rank 2	Rank 3	Resources required
animal husbandry	10	1	-	forest, land, labor, capital
wage labor	5	10	1	labor
service (abroad)	2	1	-	labor
selling bamboo products	2	-	-	forest, labor
weaving nettle fiber clothes	2	-	-	labor
service (Nepal)	1	1	-	labor
selling potato	1	1	-	labor
loan	-	1	3	household asset
business	1	-	-	capital, labor
carpentry	1	-	-	labor
barter-exchange	-	1	-	labor

Interviewees were asked to choose more than one strategy and to rank their preferences. The items in the Table are listed by 1st ranking priority.

Table 6: Different strategies adopted by households of Karuwa-Kapuche to reduce the deficit in food production and the resources required (1996).

Strategies (in sequence)	Rank 1	Rank 2	Rank 3	Resources required
wage employment	11	3	1	family labor
business (alcohol production and selling)	2	2	2	skill, firewood, labor
selling bamboo-products	1	6	-	forest
animal husbandry	-	2	2	labor, forest, land, capital
temporary migration	2	-	-	labor
carpentry	1	-	-	skill
selling timber	-	1	-	forest

Interviewees were asked to choose more than one strategy and to rank their preferences. The items in the Table are listed by 1st ranking priority.

Spatial Structure of Market Linkages

The above discussion demonstrates that the study villages show a significant degree of spatial interaction as a large part of the food consumption requirement is met either through purchase from the market or through barter/exchange with other villages. This spatial interaction is enhanced by the mobility of the villagers who need to travel outside their villages to supplement their income from sources other than farming.

Map 2

Map 3

Maps 2 and 3 show how the two remote villages are linked by means of commodity flows with the outside world. They show intra-village as well as rural-rural and rural-urban interactions (for comparison see Figs. 1 and 2). The maps reveal that labor, livestock and stone slates are crucial for Siding. Similarly, labor, livestock, alcohol, bamboo products and *ghee* are the most important commodities for Karuwa-Kapuche. Regarding

inflows, rice is by far the most important commodity. This is also revealed by the traders survey where rice is ranked first among the commodities sold by the traders to the villagers, followed by salt, sugar, vegetable oil, fresh vegetable, tea, meat, chili peppers and instant noodles.

The importance of these different types of interactions also varies according to the location of villages and their relative situation of resource endowment and utilization. For example, while intra-village relationships are crucial in Siding, in Karuwa-Kapuche where the residents depend more on other villages for securing food, inter-village relationships are naturally more important. The cultural traditions (eg. social acceptability of alcohol production and the necessary skill for its production) and types of resources (eg. firewood, herbs for the production of *marcha*, i.e., yeast for fermentation and lack of productive land) available in Karuwa-Kapuche have also created favorable environment for inter-village interactions for the selling of alcohol and purchase of foodgrains for consumption as well as for alcohol production.

The expansion of markets

The food deficit reducing strategies adopted by villagers is interlinked with expansion of markets. The flow of food and other consumption materials from other markets (mainly in Tarai, Nepal) and India and abroad to cater the real and perceived needs of villagers has helped in increasing the number of shops at different locations. These shops are the agents to link villages with the national and international markets. Expansion of road network (since the mid-1960s) linking Pokhara to Indian towns began to affect the supply of goods and commodities to the villages. Before that villagers only obtained clothes and salt from these international markets. After the opening of the Pokhara-Sunauli highway in the early 1970s and with further liberalization in trade, clothes and utensils produced in mass in India began to flow to villages. Traditional skill of members of Occupational Caste was thus rendered useless. New products like biscuits, noodles, sweets, factory produced alcohol, sugar, stationary, shoes, medicines, kerosene and the like were also introduced and villagers became accustomed to them. This helped in the expansion of market. To obtain cash for buying these new products villagers started to sell, in addition to *ghee*, other village produce – mainly rice, maize and soybean. Until 1950, there were 5 or 6 shops at Yamdi (the main market center apart from Pokhara) which is located about half way between the villages studied and Pokhara. Newars of Pokhara also kept a few seasonal shops (for selling clothes) at two other locations - Khorakomukh

in Mardi valley and Bhurjungkhola in Seti valley. Because of the construction of the Pokhara-Baglung highway (1992), shops located at Yamdi shifted to Milanchok, which has now become a bustling market center (with about 42 large shops). Similarly the other two market centers have now more than 20 large shops. Small shops are now scattered in each and every village. Changes taking place in villages directly affected by new highway are also found to have impacts on study villages by way of changes in back-ward linkages. For example, milk is now supplied from lower villages (near the road) to Pokhara, which has, in turn, created a new opportunity to the study villages to supply milch buffaloes to the former villages. Similarly, expansion of shops in villages facilitated the flow of cheap Tarai rice, lentil and spices to the village shops. Villagers now meet their food requirements by buying these foodgrains in shops.

The range of goods bought by the villagers has expanded. They include almost all type of foods, construction materials, medicines, salt, sugar, noodles, kerosene, stationary, clothes, match-box, candles, shoes and sandals, and the like. Similarly, the range of goods villagers sell has also grown. The traders' survey showed that villagers sell good quality rice/paddy, soybean, maize, peanut, green vegetables, milk, *ghee*, potato, bamboo-products like baskets and mats, straw-products like mats, wild fruits, vegetables and honey, alcohol, stone-slate and traditional nettle fiber clothes.

Even though it is seen that greater marketing opportunities created due to the integration of the village economy with the outside market have certainly provided new strategies for livelihoods, no definite conclusions could be made about their impact on the long-term health or food security of the villagers. The introduction of industrially processed foods like noodles, beers, softdrinks do not provide much nutrition, compared to their price. The price of these commodities is considerably high for villagers because of the unfair terms of trade. The foreign components involved in these products are very expensive and are a main factor for increasing the price of these products. But due to social prestige attached to the consumption of these products (partly due to advertisement), these products are also becoming popular among villagers. Similarly, supply of nutritious foods from villages to urban centers is also not favorable to the sustainable development of rural areas. It is also seen that products produced from other rural areas (like low quality rice produced in the Tarai) have fair terms of trade. As a result, villagers could obtain them at cheap price. This has also helped in expanding the food-security of villagers.

Greater integration of the village economy with the market as seen in this study may reduce food security by way of price manipulation by a few merchants who monopolise the market of foodgrains. As the control on food availability of village households is shifting towards businessmen, the security that is provided by subsistence production is being lost. This study has not been able to cover this aspect in more detail.

Determining Sustainable Livelihood Security

The working hypothesis of our research — that sustainable livelihood security is first of all determined by food self-sufficiency — could *not* be confirmed. The structure of vulnerability was found to be much more complex than being based on subsistence level alone. This becomes clear when the data are disaggregated to the level of the individual households (Figs. 3 and 4). As these figures show there is a general tendency for households with low food self-sufficiency to be also highly deficient in total food consumption. This is graphically represented on the lower axis of the figures. However, in the upper categories of food self-sufficiency (from 4 months onward in case of Siding village and 5 month onward in case of Karuwa-Kapuche village), deficits and surplus conditions occur without any significant correlation of food self-sufficiency or the respective subsistence level.

In Siding village, 19 of the 28 sample households (68%) consumed less than the minimum necessary food. Only the 5th, 14th, 20th and 24th through 28th households (in ascending order of food self-sufficiency; 1st position signifies the lowest level of food self-sufficiency) consumed food in excess of minimum requirements (Fig. 3). There were 12 households in the village which consumed more than 20% deficit food. These households occupied the 2nd, 4th, 6th-8th, 10th-12th and 16th–19th positions in the ascending order of food self-sufficiency. Of these 12 households, 5 were Tamang (50% of their sample), 3 were Brahmin (27% of their sample) and 4 were Chettri (57% of their sample). In an attempt to identify the most vulnerable group, households consuming more than 30% below minimum requirements were selected. Five households (occupying 2nd, 10th–12th and 16th position in the ascending order of food self-sufficiency) belonged to this category. Two of them were Tamang households and 3 were Chettri households.

In the case of Karuwa-Kapuche village (Fig. 4), 12 of the 17 (71%) sample households consumed less than the minimum required food. Only five households (5th, 9th, 10th, 14th and 16th in the ascending order of

Fig. 3

Fig. 4

food self-sufficiency) consumed food in excess of minimum requirements. Six households (1st-4th, 7th and 8th in ascending order of food self-sufficiency), or 35% of the sample, consumed food that was less than 20% of the normal requirement. Of them, 5 were Tamangs (55% of Tamang households) and 1 was Magar (12% of Magar households). Four households of the village belonged to the most vulnerable category, i.e., their consumption was more than 30% below the minimum requirement.

These households occupy, in the ascending order of food self-sufficiency, the 1st-3rd and 7th positions. Three of these households were Tamangs and 1 was Magar.²³

In the above situation where food self-sufficiency could not explain the vulnerability, the specific coping strategies of the individual households had to be examined. There are clear indications that success or failure of these coping strategies is determined by the size of the household (the smaller, the more successful). It is seen in Fig. 3 that in Siding all households with surplus food consumption have significantly smaller family size than the average (6.4 members) for the village. There is only one exception to this. The household 24th (in ascending order of food self-sufficiency) has surplus food with 11 members. The head of this household works in India and his earnings are comparatively higher than many other village households. Among the 12 households facing a food deficit of more than 20%, 9 households have 7 or more members (average size of the village is 6.4 members), two households have 6 members and 1 household has 4 members. In the case of Karuwa-Kapuche, all households with surplus food have 4 or fewer members (where the average household has 6.3 members). Of the seven households with a consumption deficit of more than 20%, five households have 7 or more members and two households have 6 members.

These figures show a general tendency that smaller families are more successful in coping with food deficit although there were a few exceptions. This finding contradicts the generally held perception that households opt for larger families to obtain a secure livelihood by diversifying labor into different activities. Hence it indicates the need for further investigation of the relation between family size, age and sex composition and health status of family members, and secure livelihood.

23. In Lachok-Riban and Sikles, detailed studies were not conducted. In these villages, the poorest of the poor households were mainly members of the Occupational Caste. In Lachok, about 84% of the occupational caste households belonged to the poorest of the poor category (landless position). Only about 6% each of Gurung and Brahmin and 27% of Chettri households belonged to this category (Adhikari 1996). Out of the 9 households studied in Sikles, 2 were in the most vulnerable category. One of these, a Kami household, depended mainly on the portering capacity of the male household head. The other was headed by a Gurung woman. Being an informal wife, she did not receive land from her husband and hence remained landless. But as a Gurung with traditional domestic skills, she was able to produce and sell alcohol and weave clothes from woolen and nettle fibres which helped her to obtain additional income.

When these sample households were resurveyed in 1997, it was seen that households facing food deficits had either a large number of dependent members (children and old persons) and/or chronically sick members. In Karuwa-Kapuche, six vulnerable households (with more than a 20% consumption deficit) had sick members.²⁴ In one household, an adult male was sick. In other households, adult females (wife or mothers) were sick. Similarly, in Siding, households with large deficits either had sick members (mostly mothers) or a large number of dependents. Even households with a higher level of food self-sufficiency (10th-12th, 16th, 17th, 19th and 21st households in Fig. 3) faced consumption deficits primarily for two reasons - sick members (11th, 12th, 16th and 21st households) or a large number of dependents (10th, 12th, 17th and 19th households). Households, which did not have chronically ill members, had surplus food.

The re-survey thus clearly indicates that good health status and the availability of adult labor are important for effective coping capacities. This is not surprising in a situation where employment opportunities exist mainly in portering and for those who can otherwise become mobile (for collecting forest products, selling village produce in other villages, or working away from home). For households that depend on labor power and live near the margin of sustainable livelihood, healthy adults are assets, but they suddenly turn into liabilities if they become sick. In such situations, working opportunities of other adult members are also lost because of the need to look after the sick members. It appears from the above discussion that large families are not successful in coping because of the severity of food deficits in the villages. This might be because the villages have reached the terminal stage in the vicious circle of large family, insufficient land and attendant food insecurity. As a result, a large family in these villages results in malnutrition and poor health of the family members.

Re-survey of households also showed that sick members in the families were mostly adult females (mothers). This is a result of discrimination against females in the allocation of food, early marriage and pregnancy.²⁵ Such discrimination has adversely affected the

24. Here sickness implies illness of the members adversely affecting the working ability of the family.

25. Even though it was observed in the study villages that there is discrimination against girls and women in the allocation of food, some other studies have reported non-existence of such discrimination. Gittelsohn's (1991) study in six hill villages of west Nepal has revealed

development and well-being of families and the communities. It is also one of the reasons for the vulnerability of female-headed households.²⁶

Social networks, especially kinship and neighborhood networks, are also important for food security, but only in emergencies. The type of chronic food consumption deficit as seen in the study sites is taken as a everyday fact of life. Therefore help from social networks is not sought in such cases. On the other hand, households spread the deficit in food throughout the year in order to avoid the disaster of famine or immediate hunger. Despite this effort, food shortage problems for households are critical during September-October (before the harvest of paddy and maize) and April-June (before the harvest of maize).

Political assertiveness and education are other factors that affect the vulnerability of households or villages. The study villages, which are remote and whose residents do not occupy any position in national politics, were found to be less assertive. When there were landslides and flooding problems in 1995 in Mardi-Seti valleys as mentioned earlier, only lower villages received help from various political parties because they were assertive and accessible to the media. But households in Karuwa-Kapuche were ignored.²⁷

that no sex discrimination exists among children. But he observed unequal and unfavorable distribution of food to young adult women. Strickland and Tuffrey (1997) have shown that discrimination against women in food allocation is higher among non-Mongoloid groups. This discrimination, they argue, is a result of self-inflicting behavior of women due to their love for husbands and children. As a result, they found higher incidence of anemia among these women. This discrimination was reported to be non-existent among Mongoloid groups.

26. For example, a woman-headed household in Sikles has become vulnerable because of the gender-biased property inheritance system.
27. Households/villages (for example Lachok and Sikles) with higher level of assertiveness (education helps in this process) have obtained more benefits from the government agencies. For example, Lachok villagers are able to put pressure on the government to establish various institutions (e.g. schools, bank, co-operative and health post) in the village itself or in nearby areas. Sikles has a conservation project, and credit for this goes to the educated and well-connected families of the village. Because of the project even the poor of the village are able to get some employment opportunities at least as porters and office helpers.

Conclusion and Policy Implications

This study shows that the degree of food self-sufficiency (i.e., access to production resources) is not a sufficient criterion to determine vulnerability of households. A complex set of determinants affect vulnerability and they combine in different ways for each and every household. The coping mechanisms of every household are therefore different. It is hence difficult to make any firm predictions from the outside as to which village, which social group, or which households can or cannot successfully cope with food deficiency and risks utilizing a specific mechanism. This has to be proved empirically by geographical or anthropological research, and should even include intra-household allocation of food.

Coping with vulnerability was found to be an interaction of very complex, diversified and multiply combined strategies, which reveal highly dynamic activities among the groups at risk. Thus, Nepali hill farmers are by no means passive, inflexible, ignorant "victims" of unsustainable development, but they are highly active, adaptive and dynamic actors. However, survival strategies, at the present time, hardly suffice to cope with life risks, as is shown, for example, by the fact that only around 80% of the very minimum food requirement is achieved by the households. Under these conditions, survival for large and growing parts of the Nepali rural population has become a permanent livelihood crisis.

As the support base of the subsistence agriculture is continuously decreasing, marketing or exchange of products and services have become vital livelihood strategies. They require a high degree of mobility on the part of the hill farmers. Spatially, mobility serves to link their household economy to intra-village, inter-village and rural-urban sources of food, cash and non-food income. Such strategies are also highly influenced by seasonality. The ways in which risks to livelihood security can be managed by the individual households determine the degree of surplus or deficit in food consumption and, eventually, the degree of exposure to hunger and livelihood crisis. These strategies are intrinsically embedded in the broader socio-cultural and political economic arenas of entitlement situations, political and economic structures, and human ecology conditions. As a result, location, ethnicity, political assertiveness, traditional skills, social networks, marketing opportunity and accessibility to markets, gender and educational opportunities affect vulnerability. But personal assets (such as health status of family members, skills, physical power or fitness) are important for the households to make use of the

alternative opportunities and to deal with the threats to livelihood created by other determinants mentioned above.

Because of the expansion in marketing facilities and the need to earn livelihoods by the income from distant places, villagers have now become more mobile. Even though, mobility is not a newly emerged activity for village households, its nature, direction and extent has changed. Villagers now interact with the market to buy everyday necessities and to sell various products of their farm and forest, whereas in the past (until the mid-1960s), this interaction was limited to the acquisition of only those things not produced in the villages like salt and clothes. The locally produced goods and services were obtained by village households through informal markets within and between neighboring villages.

The increased integration of the village economy with the wider world and the consequent increase in the mobility has provided villagers with livelihood opportunities by reducing their food deficit. But the flow of products (like noodles) in which villagers do not have fair terms of trade has been adversely affecting the food security. As the inputs used in these products are charged high price (because they are produced in foreign industrialized countries) as compared to village standard, they become expensive. On the other hand products (e.g., low quality rice from Tarai) in which farmers have fair terms of trade are helpful in extending the food security. Therefore, it seems that the appropriate policy for the government (especially local bodies) is to impose selective restriction to the flow of goods and commodities to or from rural areas by way of a tariff structure that inhibits the supply of nutritionally poor (in relation to price) products to the villagers. Given the imperfection in the market, this policy seems to be essential for the welfare of the villagers.

Because of the general decline in resources and in their availability, most households live on the edge of sustainability. In such circumstances, a slight erosion in personal assets makes coping mechanisms weaker, and households facing such situations may succumb to disasters. As a short-term solution, personal assets of vulnerable households should be improved and protected by way of channeling a major part of development budget on health and education of rural households. But as a long-term solution, government should improve various assets (as defined broadly to include economic, social and political, ecological, and personal) of the vulnerable individuals, households and communities. Otherwise, socio-economic forces will work to undermine the gains obtained from the short-term solutions.

Despite the decline in land holding of village households due to increase in the number of families, it is seen that productive land like *khet* with irrigation facilities still is useful in increasing the food self-sufficiency. The high level of food self-sufficiency in Siding village as compared to Karuwa-Kapuche is due to more equitable distribution of irrigated *khet* land. The food security of households with higher level of food self-sufficiency will be higher especially when the market economy fails. As more and more villages are integrated with the market economy, market failure will affect the food security of a large proportion of households. It is therefore necessary to implement proper land reform or improvement policies to increase the access of households to productive farm resources like *khet* (with irrigation).

The above conclusions are mainly based on a research study conducted in the middle hills of central Nepal. As the socio-economic (family and social network, education and economic opportunities), political (local institutions) and human-ecological (resource endowments) conditions differ widely from one region to another, further micro-level studies are necessary to gain deeper insights into the risk factors, coping strategies, and assets of Nepali households. Such studies would make valuable contributions to formulating sound development policies.

Acknowledgements

Bohle is deeply indebted to the Deutsche Forschungsgemeinschaft (DFG) for generous financial support for this study, and Adhikari to Deutscher Akademischer Austauschdienst (DAAD) for a visiting fellowship to Germany. The authors would also like to thank three anonymous referees for their constructive comments and suggestions on the earlier version of this paper. The paper has benefited significantly from their comments and suggestions.

References

- Adhikari, J. 1996. *The Beginnings of Agrarian Change: A Case Study in Central Nepal*. Kathmandu: TM Publication.
- APROSC (Agricultural Project Service Center) and JMA (John Mellor Associates, Inc.). 1995. *Nepal Agriculture Perspective Plan (final report)*. Kathmandu and Washington D.C.
- Bhandari, Dhundi Raj. 1990. *Nepāl ko Udvav tathā Bikās ko Biśleşñātmak Itihās*. Kathmandu: Prakash Prakashan.
- Blaikie, Piers, Cannon, T. and Wisner, B. 1994. *At Risk. Natural Hazards, People's Vulnerability and Disasters*. London and New York: Routledge.

- Bohle, H.-G. 1995. The Geography of Famine and Food Crisis Research. *International Geographical Union Bulletin* 45: 5-12.
- Bista, Dor Bahadur 1976. *People of Nepal*. Kathmandu: Ratna Pustak Bhandar.
- Bolt, D. 1976. *Gurkhas*. London: Weidenfeld and Nicolson.
- Cameroon, J. 1995. *Food Security. Background Technical Paper for the Agriculture Perspective Plan*. Kathmandu: Agricultural Project Service Center.
- Cannon, T., 1991. Hunger and Famine: Using a Food System Model to Analyse Vulnerability. In *Famine and Food Scarcity in Africa and Asia: Indigenous Responses and External Intervention to Avoid Hunger*. H.-G. Bohle, T. Cannon, G. Hugo and F.N. Ibrahim, eds., pp. 291-312. Bayreuth: Naturwissenschaftliche Gesellschaft Bayreuth.
- CBS (Central Bureau of Statistics). 1991. *Statistical Pocket Book, Nepal*. Kathmandu: His Majesty's Government/Nepal.
- CBS (Central Bureau of Statistics). 1996. *Statistical Pocket Book, Nepal*. Kathmandu: His Majesty's Government/Nepal.
- CBS (Central Bureau of Statistics). 1995. *Statistical Pocket Book, Nepal*. Kathmandu: His Majesty's Government/Nepal.
- Chambers R. 1989. Vulnerability, Coping and Policy. *IDS Bulletin* 20(2): 1-7.
- Dahl, S.L. 1993. Sustainable Livelihood Security. *Indian Geographical Journal* 68(1): 21-32.
- Des Chene, Mary. 1991. *Relics of Empire: A Cultural History of the Gurkhas*. Ph.D. dissertation, Stanford University.
- Dreze, J. and Sen, A. 1989. *Hunger and Public Policy*. Oxford: Clarendon Press.
- Dreze, J. and Sen, A., eds. 1990. *The Political Economy of Hunger*. Oxford: Clarendon Press.
- Gittelsohn, J. 1991. Opening the Box: Intra-household Food Allocation in Rural Nepal. *Social Science and Medicine* 33(10): 1141-1154.
- Graner, Elvira. 1996. *User Group Forestry - Poor Policy for Poor People? Nepal's Forest Legislation from a Political Ecology Perspective*. PhD thesis, University of Freiburg.
- Guru-Gharana, K.K. 1995a. Human Development Strategy for Nepal: Perception from Below. Paper presented at a seminar on "Development Strategy for Nepal: Perception from Below." Kathmandu.
- Guru-Gharana, K.K., 1995b. Trends and Issues in Poverty Alleviation in Nepal. *The Economic Journal of Nepal* 18(1): 1-16.
- Gurung, Harka, 1989. *Nepal : Dimensions of Development*. Kathmandu: Sahayogi Prakashan.
- His Majesty's Government, Nepal. 1962. *Three Year Plan 1962-65*. Kathmandu.

- International Development Research Center (IDRC). 1990. *Soils, Sediments, Erosion and Fertility in Nepal*. Ottawa, Ontario: IDRC.
- Koirala, G. et al. 1992. Proposed Approaches to Poverty Alleviation in Nepal. Paper presented at a seminar on "Poverty Alleviation and Human Development" organized by the National Planning Commission.
- National Planning Commission (NPC). 1993. *An Outline on Poverty Alleviation Policies and Programmes*. Kathmandu: NPC
- National Planning Commission. 1970. *The Fourth Plan, 1970-75*. Kathmandu: NPC.
- National Planning Commission. 1975. *The Fifth Plan, 1975-80*. Kathmandu: NPC.
- National Planning Commission. 1980. *The Sixth Plan, 1980-85*. Kathmandu: NPC.
- National Planning Commission. 1985. *The Seventh Plan, 1985-90*. Kathmandu: NPC.
- National Planning Commission. 1992. *The Eighth Plan, 1992-97*. Kathmandu: NPC.
- National Planning Council (Nepal). 1965. *The Third Plan, 1965-70*. Kathmandu.
- Nepal Government. 1956. *A Brief Draft of the First Plan, 1956-62*. Kathmandu.
- MacIntosh, M. 1990. Abstract Markets and Real Needs. In *The Food Question. Profit Versus Question?* H. Bernstein et al., eds., pp.43-53. London: Earthscan.
- Messerschmidt, D.A. 1976. *The Gurungs of Nepal: Conflict and Change in a Nepali Society*. Warminster, England: Aris and Philips Ltd.
- Mcfarlane, Alan, 1976. *Resources and Population: A Study of Gurungs of Nepal*. Cambridge: Cambridge University Press.
- Poffenberger, Mark. 1980. *Pattern of change in Nepal Himalaya*. Madras: Macmillan Company of India Ltd.
- Pyakuryal, K.N. 1995a. Poverty in Nepal. Background Technical Paper for the Agricultural Prospective Plan. Kathmandu: Agricultural Projects Service Center.
- Pyakuryal, K.N. 1995b. Nepalese Farming Systems: A Social-Cultural and Ethno-Historical Perspective. Background Technical Paper for the Agricultural Perspective Plan. Kathmandu: Agricultural Project Service Center.
- Regmi, M.C. 1978. *Thatched Huts and Stucco Palaces*. New Delhi: Vikas Publishing House.
- Regmi, M.C. 1962-66. *Land Tenure and Taxation in Nepal*. 4 vols. Berkeley: Institute of International Studies.
- Schroll, Michael. 1991. *Off-farm Employment and Temporary Migration: A Case Study from Nepal*. Working paper number 145, Southeast Asia Programme, University of Bielefeld, Germany.

- Seralgedin, I. 1996. *Sustainability and the Wealth of Nations* (Draft). New York: World Bank.
- Shrestha, Nanda R. 1990. *Landlessness and Migration in Nepal*. Boulder, CO: Westview Press.
- Strickland, S.S. and Tuffrey, V.R. 1997. *Form and Function : A Study of Nutrition, Adaptation and Social Inequality in Three Gurung Villages of the Nepal Himalayas*. London: Smith-Gordon.
- Swift, Jeremy. 1989. Why are Rural People Vulnerable to Famine. *IDS Bulletin* 20(2): 8-15.
- Uma, G. 1993. Sustainable Livelihood Security of Villages Surrounding the Pichavaram Mangrove Forest, India. *The Indian Geographical Journal* 68(1): 33-47.
- UNDP 1997. *Human Development Report 1997*. New York: Oxford University Press
- Valli, Eric and Diane Summers. 1988. *Honey Hunters of Nepal*. New York: Harry N. Abrams, Inc.
- Wallace, Michael B. 1987. *Food Price Policy in Nepal*. Research Report Series, No. 3, HMG-USAID-GTZ-IDRC-FORD-WINROCK Project. Kathmandu.
- Watts, M. and Bohle, H.-G. 1993. Hunger, Famine and Space of Vulnerability. *GeoJournal* 30(2): 117-125.
- Watts, M.J. Bohle, H.-G. 1993. The Space of Vulnerability: The Causal Structure of Hunger and Famine. *Progress in Human Geography* 17(1): 43-67.