



Ensuring Local Food Security: An Example from the Mountains of Nepal

Food security in some mountain areas can be improved through cash crop farming based on mountain-specific comparative advantages, such as favourable agroclimatic conditions. However, governments need to play a critical role here - they must focus on improving local capability; on generating appropriate technologies and ensuring that these are transferred to farmers; on developing markets and the necessary linkages to them; and on building appropriate physical-social infrastructures. There is also a need to collate existing data and create a database on the extent of poverty and hunger.

The Context

Food security essentially means a state of affairs in which people have access to sufficient and nutritious food in order to maintain a healthy and active life throughout the year. Food insecurity anywhere is a problem of inadequate access, resulting from inadequate purchasing power. In the context of mountain development, food security should not lay emphasis on growing foodgrains only, rather it should provide productive options for growing high-value crops having comparative advantages. This paper discusses local strategies adopted by people from the mountain districts of the Rapti Zone of Nepal and presents a successful case for ensuring food security based on growing off-season vegetables in fragile mountain areas. It depicts how food security can be achieved through cash security and presents some important issues.

Local Food Security Strategy

In the inaccessible, middle and high Rapti mountains, apart from in a few fertile river valleys, the farmlands do not produce adequate foodgrains. Landholdings are small, fragile, marginal, and vertical. The agroclimatic conditions during winter are harsh. Thus, many family heads and young persons migrate for part of the year in search of food security.

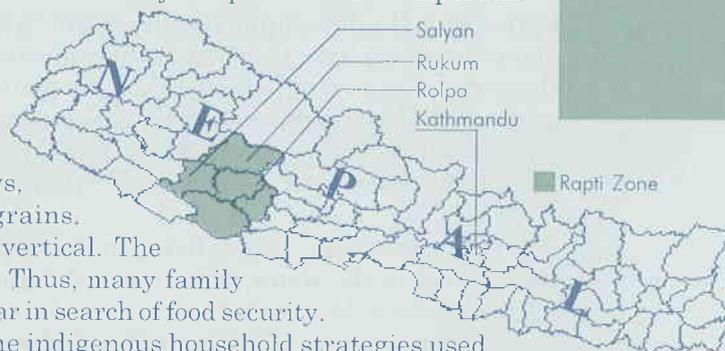
The boxed text on the following page presents some indigenous household strategies used to cope with food security in the Rapti mountains. Lack of food security implies greater hardship on women and children. Large numbers of unproductive cattle are raised to

increase the amount of manure for fertiliser, and the women and children are required to travel to distant forests to collect leaf litter and bedding material for composting and to graze animals. Table 1 shows clearly

how vulnerable Nepal's mountainous and hilly areas are in terms of food availability, while the plains (*terai*) enjoy foodgrain surpluses.

Prospects for Local Food Security - A Successful Case

Mountain people, in some relatively accessible resource-poor areas, are beginning to see some prospects for better food security through farming profitable cash crops. This prospect lies in



Migration, including animal sales and barter systems, is used as an indigenous food security strategy, especially during winter and spring.

Table 1: Foodgrain Production-Consumption Balance in Three Major Ecological Zones, Nepal

| Ecological Zones | Foodgrain Production ('000 MT) | Consumption Requirement ('000 MT) | Surplus/Deficit | |
|------------------|--------------------------------|-----------------------------------|-----------------|----------|
| | | | '000 MT | Per cent |
| Mountains | 123 | 180 | -57 | -46.3 |
| Hills | 988 | 1175 | -157 | -18.9 |
| Terai/Plains | 1641 | 1223 | 418 | 25.5 |
| Nepal | 2752 | 2578 | 74 | 2.7 |

Source: Gill, Gerald, J. (1996). Maintaining the Granary: Foodgrain Production and Productivity in Nepal

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Indigenous Strategies for Food Security in the Rapti Mountains, Nepal

| Mountains | Dominant Farming Systems | Dominant Community (Ethnic Group) | Food Self-sufficiency Period | Food Security Strategies during Food-deficit Period |
|--|---|--|------------------------------|--|
| High | | | | |
| 1 Steep/Flat Highland | 1. Pasture and sheep farming | <i>Kham Magar(s)</i> | 3 to 4 months | Sheep are brought to the foothills of the mountains for grazing and trading. Animals (sheep and baby shepherd dogs) and wool are sold to buy (or are bartered for) foodgrains, clothes, and other non-food items. After 5 to 6 months, the animals are brought back to summer grazing pastures |
| 2 <i>Pakho</i> -Upland (terraced and flat) | 2. Maize - potato - barley farming with local cattle and goats | <i>Kham Magar(s)</i> | 6 to 7 months | |
| Mid | | | | |
| 1. <i>Pakho</i> - Upland (terraced and flat) | 1. Maize - wheat farming with local cattle and goats | <i>Kham Magar(s)</i> | 4 to 5 months | Middle-aged and mostly young people migrate to the foothills and plains and north India for seasonal agricultural work and public and private construction work |
| 2. <i>Pakho</i> - Lowland (terraced and flat) | 2. Maize -wheat farming with buffaloes, cattle and goats | <i>Chhetri(s)/ Brahmin(s)</i> | 6 to 7 months | ditto |
| 3. <i>Khet</i> - Lowland (river valleys and some terraced) | 3. paddy - wheat farming with buffaloes, local cattle and goats | <i>Brahmin(s) & Chhetri(s)</i> | 10 to 12 months | Only a few smallholders go to the Northern States of India to work as agricultural labour |

harnessing the mountain-specific characteristics. Owing to favourable agroclimatic conditions, mountain areas have the comparative advantage of being able to grow off-season vegetables during the summer and rainy seasons when the plains in the south cannot grow them due to hot and humid conditions. Vegetables, such as tomatoes, peas, beans, and cabbages, fetch much higher prices in the major market centres in Nepal and India. Banking on this strategy, some pocket areas of the Rapti mountains underwent a major transformation in terms of food security as described below.

About four years ago, people living in the uplands bordering Rolpa and Salyan districts were among the poorest in the Rapti mountains. A farm household, with a small landholding of about 0.25 hectares — mostly terraced and marginal — could barely feed the family for four to six months with the scant production of maize, millet, and wheat.

In 1993, USAID-Nepal's Vegetables, Fruits and Cash (VFC) Crops' Programme assisted local farmers in growing off-season vegetables on a small-scale trial basis in the area; now known as the Kapurkot Market Shed Area. As they could market and receive cash for the crops, the results provided a successful example to others. In 1994, about 28 Production and Marketing Associations (PMAs) with about 450 households produced 225 MT of a variety of off-season vegetables, valued at Nepali Rupees (NR) 1.8 million (1 US \$ = NR 56.75). In the second year (1995), 93 PMAs, consisting of 2,000 participating households, were formed. They produced and marketed off-season vegetables amounting to 2,000 MT (NR 10.1m). In 1996 the number of participating households increased to 4,000 (28,000 family members). They produced and marketed 3,200 MT of off-season vegetables (NR 17.5m). Every Tuesday and Friday, six to seven hundred farmers — mostly women — brought off-season vegetables on their backs to the market-shed area from 2 to 6 hours away in the mountains. Traders from major market centres (e.g., Nepalgunj, Butwal, Bhairahawa, Krishnanagar, Pokhara, and Narayanghat and some Indian border towns) came to purchase the produce and the two parties negotiated the prices directly.

During this period, the VFC programme assisted the local farmers in forming PMAs and trained a large number of women farmers in the technical know-how of producing and marketing off-season vegetables; this also included training in post-harvest technologies. It sent many of them to different markets in Nepal and India to see vegetable markets and to contact vegetable traders and marketeers. The programme also established market and business linkages with major lowland towns.

The improved cash income and employment from off-season vegetable production and marketing increased the per capita food availability two to three times. Earlier, when a household of eight

family members was growing only cereal foodgrains on a 0.25 hectare farm, the estimated per capita food availability was only 72 kg. After growing off-season vegetables on about 60 per cent of the total land, the per capita foodgrain availability increased to 211 kg through foodgrain purchased from the cash received by selling off-season vegetables. If Rs 5,000 (52 kg) were to be set aside for children's schooling and health care, the estimated per capita food availability would be 159 kg, which is more than twice the amount the farm would have attained by growing foodgrains only. Increased cash income from vegetable farming also helped to empower the women by permitting them greater involvement in household decision-making.

An economic analysis of farm-level data shows that production and marketing of off-season vegetables provide much higher returns than cereal foodgrains (Table 2). Similarly, in the inaccessible mountains of Rukum, growing vegetable seeds is significantly more profitable than growing wheat crops. Economic analysis shows that the C/B ratios of vegetable seed production range from 1:2.4 to 1:6.7, compared to 1:1.7 in the case of wheat crops (Table 3).

Tulachan and Bloom (1995) estimated the internal rate of return (IRR) for three representative farms of the Rapti mountains for an investment programme on high-value agriculture (HVA). The analysis showed that the estimated IRR for small farmers having 0.25 hectares of land is higher (46%) than those of high and medium resource farms, indicating that HVA programmes can address the equity issue.

The successful case described above does not necessarily imply that there should or would be indiscriminate commercialisation of off-season or summer vegetable production in the mountains. First, this farm enterprise will be profitable only for a particular period or season of the year during which no area in the plains can grow these vegetables because of hot and humid agroclimatic conditions. Secondly, many areas are not suitable because of inaccessibility and unfavourable biophysical characteristics. Dry and arid areas without irrigation are also not suitable. Many areas that are prone to hailstones or receive heavy rainfall cannot grow off-season vegetables.

Such a commercialisation process should properly link upland (source of vegetable crops) and lowland markets (source of foodgrains). Market demand and prices of fresh vegetables, as well as lowland food availability, should be constantly monitored. Excessive and indiscriminate use of pesticides and chemical fertilizers, detrimental to both the environment and public health, should be restricted.

Food Security Policy Issues for Mountain Areas

The success story in this paper provides some important lessons. It also raises some key food policy issues that could be relevant to **food security** in similar resource-poor mountain environments of the Hindu Kush-Himalayas (HKH).

First, emphasis on **local capacity building** should be the prime focus of any government intervention or donor and NGO programme. Farmers' group formation related to certain productive activities in mountain communities, such as the Production and Marketing Associations for off-season vegetables, has several advantages. Group savings could assist cash-poor farmers. In groups, they can considerably increase their bargaining power over traders for determining product prices. Secondly, **market development and linkages** become absolutely critical for promoting food security through farm income. Knowledge and skills on post-harvest techniques, such as picking, grading, packing, processing, storage, and transport, are very essential for the mountain farmers to market quality products competitively in major market centres.

Table 2: Costs and Benefits of Production and Marketing of Off-season Vegetables (in Rupees per hectare) Mid-Mountains --Syangja, 1994

| Commodity | Gross Cost | Gross Benefit | Cost-Benefit Ratio |
|--------------|------------|---------------|--------------------|
| Cauliflowers | 42,200 | 192,000 | 1:4.5 |
| Cabbages | 40,000 | 216,000 | 1:5.4 |
| Radishes | 33,800 | 108,000 | 1:3.2 |
| Tomatoes | 71,920 | 336,000 | 1:4.7 |

Table 3: Costs and Benefits of Production and Marketing of Vegetable Seeds (in Rupees per hectare), The Rapti Mountains -- Rukum, 1994

| Commodity | Gross Cost | Gross Benefit | Cost-Benefit Ratio |
|--------------|------------|---------------|--------------------|
| Wheat | 11,820 | 20,000 | 1:1.7 |
| Radishes | 19,980 | 50,400 | 1:2.5 |
| Cauliflowers | 17,760 | 120,000 | 1:6.7 |
| Mustard | 17,760 | 42,400 | 1:2.4 |
| Onion | 26,160 | 88,900 | 1:3.4 |
| Cress | 16,300 | 41,600 | 1:2.8 |

Source: Tulachan, Pradeep M. and Roger A. Bloom (1995). Economic Analysis for Market Access to Rural Development Project, USAID/N, Kathmandu, June 1995.

Mountains are especially vulnerable to food scarcity because of their specific characteristics, e.g., inaccessibility, fragility/marginality, and verticality, which are serious impediments to increasing foodgrain production.

Farmers in groups can share new technologies, improved seed materials, market information, scarce water resources, and other inputs cheaply and more effectively.

The government has an important role to play in **generating appropriate technology and transferring it to farmers' fields**. It also has a role to play in building both **physical** (roads) and **social** (training local human resources) **infrastructures**. **Pricing policies** should ensure that the comparative advantages in mountain areas are fully developed. Unnecessary restrictions and regulations in trade or movements of goods and services related to HVA can kill private initiatives, and they can be detrimental to the whole process of mountain development and transformation.

Finally, the government has an important role to play in formulating **mountain-specific policies** that enhance farming systems and economically-profitable options that ensure household food security for mountain dwellers.

The Challenge Ahead

Although the global forum has placed so much importance on world food security, unless this issue is addressed locally, mountain people will continue to suffer from food insecurity. Various economic analyses and the Rapti study presented here suggest that mountain areas have comparative advantages in HVA and not in foodgrain crops as emphasised by past policies aimed at achieving food sufficiency.

However, the challenge is to have an improved understanding of the underlying causes and magnitude of food insecurity for the entire Hindu Kush-Himalayan region. The HKH mountains contain unique agro-ecological zones; each having specific mountain communities, farming systems, and differential scales of poverty with various socioeconomic and cultural values. ICIMOD has commenced a systematic study and analysis of new emerging policy issues in order to frame alternative mountain-specific policies to promote food security. Attempts will be made to create a strong database on the extent of poverty and hunger; household economies; crop and livestock production; seasonality; gender roles; and inter- and intra-household food distribution emphasising gender, children, and the poor under specific farming conditions in each unique agroecological zone. Failure to achieve household food security in the mountains will further aggravate poverty and hunger resulting in increasing degradation of mountain environments and, thus, threatening the very survival of global ecosystems.

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Further Readings

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