Vegetable Production as a Potential Enterprise for Sustainable Livelihoods in the Border Villages of Eastern Nepal

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There is a great potential for vegetable production as an enterprise in the study area but improved technology in micro-irrigation and off-season vegetable seed production, along with development of marketing channels and infrastructure, are needed.

Introduction

The livelihoods of a majority of the people in Nepal revolve around agriculture. The agricultural sector accounts for about 39% of the gross domestic product and provides employment to more than 80% of the labour force. Agricultural production, however, is to a great extent subsistence oriented. The cultivable land area is estimated to be 26,533 sq.km, roughly 18% of the total land area of the country; the terai region accounts for the major share of agricultural land (HMGN/MFSC 2002). A variety of agroclimatic regions and fertile soils permits the production of a wide variety of vegetables of good quality in Nepal. At present 200 varieties of vegetables are grown, out of which only about 50 are cultivated on a commercial scale.

Vegetables can, in fact, give a much higher return per unit of land than cereals and are worth growing even in small quantities. The difficulties arise over marketing. The transport of delicate, perishable goods grown in remote and hilly terrain is a difficult task. For individual growers cultivating vegetables on a small plot of land, the quantity ready for sale at any one time is limited and, if the trek to market is long and difficult, then it will not be worthwhile. Hence, access to roads and markets is most important if vegetable production is to be established on a commercial scale. There is also great potential for seed production; lhe pockets of microclimates separated by high mountains provide an ideal environment for this. In remote places without road access, vegetable seed production is a promising option for poverty reduction as the volume to be transported is much less than for fresh vegetables but of higher value. Good potential exists in Nepal for the establishment of vegetable seed farms catering to both domestic and foreign markets.

Most people in the Ilam and Panchthar districts of eastern Nepal earn their living from agriculture. To a great extent, agricultural production is for subsistence only. About 60% of the households in Jirmale, Samalbung, Sriantu, and Swoyang VDCs are completely self-sufficient in terms of producing their own food. In the remaining VDCs, self-sufficiency in food ranged from rather insufficient to around 50%. The situation in other remote VDCs of Panchthar and Taplejung is very bad. Due to remoteness and inaccessibility there are limited opportunities for people to overcome acute poverty. To examine these issues, comprehensive research was undertaken covering 15 VDCs in Ilam and Panchthar districts in 2003.

The overall objective of the research was to assess the present status and future potentials of vegetable production as an enterprise in the study sites. Special emphasis was given to understanding a) land use and size of landholdings in the communities in the selected VDCs; b) current seasonal and off-seasonal vegetable cultivation and household incomes; c) present market linkages for farm produce (vegetables and other produce like cardamom and broom grass) and the challenges; d) potential for crop diversification with a focus on vegetable and vegetable seed production as an opportunity for enterprise development ; and e) identification of issues and challenges.

Land Use and Size of Land Holdings

Ilam has a total geographical area of 1,717 sq.km of which more than 50% is covered by forest. Only about 26% of the area is cultivated. In Panchthar district, out of 1,246 sq.km, forest cover is about 46% and about 33% of the area is cultivated. The details are given in Table 1. Out of the total cultivated land available in the two districts (860 sq.km), only 15% (132 sq.km) is used for cultivation of vegetables, the remainder is used for paddy rice or agroforestry (Table 2). The highest amount of cultivated land was recorded in Chyangthapu (17.5 sq.km), followed by Jamuna (16.6 sq.km) and Pashupati Nagar (14.1 sq.km). The size of holdings is high (>2ha) among farmers in Maipokhari, Jogmai, Jirmale, and Sriantu VDCs whereas among other farmers the size was between one and two hectares per household. Irrigated land ('khet') was available only in limited places whereas unirrigated ('bari') was more predominant. The system of private land leasing amongst agricultural communities is not very common in this area.

Table 1: **Land-use patterns of the study districts**

Land type	Ilam	Panchthar
	Area (sq.km)	Area (sq.km)
Cultivated area	448 (26.1%)	412 (33.1%)
Non-cultivated area	228 (13.3%)	190 (15.3%)
Forest area	959 (55.9%)	577 (46.3%)
Grazing land	34 (2.0%)	53 (4.2%)
Other	49 (2.8%)	13 (1.1%)
Total geographical area	**1717**	**1246**

Table 2: **Total cultivated area by land type classification**

District	VDC	Total cultivated area in sq.km		
		Khet	Bari	Total
Ilam	Maipokhari	0.5	9.5	10.0
	Maimajhuwa	0.0	3.2	3.3
	Mabu	1.8	10.6	12.4
	Jamuna	0.2	16.5	16.7
	Gorkhe	1.0	4.3	5.3
	Jogmai	1.7	6.0	7.7
	Pashupatinagar	0.3	13.8	14.1
	Jirmale	0.6	9.9	10.5
	Sriantu	0.4	3.6	4.0
	Samalbung	0.9	11.6	12.6
	Swoyang	5.6	8.3	13.9
Panchthar	Chyangthapu	6.0	11.5	17.5
	Phalaicha	0.0	0.0	0.0
	Memeng	3.0	11.0	14.0
	Prangbung	1.9	6.0	7.9
	Sidin	1.9	6.1	8.0
Total		**25.8**	**131.9**	**157.6**

Source: Various VDC profiles and key informants

Cropping Practices and Household Income

Both districts have diverse, integrated subsistence cropping practices. The principal cereal crops in the area are maize, rice, wheat, and millet, with maize being cultivated by more than 80% of households (Anonymous 2002). The main vegetable crops are potatoes, radishes, peas, cabbages, cauliflowers, chillies (the akbari variety, a local landrace), leafy vegetables (mustard in particular), and beans. Potatoes are the main vegetable crop cultivated commercially.

Most of the vegetables and cereals are seasonal and produced for subsistence. Other crops include high-value cash crops such as large cardamom, tea, broom grass, and ginger. Mixed cropping patterns are predominant in the hilly terrain. Most of the vegetables, usually legumes, are grown alongside maize and rice. On irrigated 'khet', the main crops are rice and wheat, whereas on 'bari', maize and potatoes are more popular. One major drawback according to vegetable traders, with regard to current cropping patterns and cultivation practices, is lack of diversity in the production and sale of vegetables.

Farm incomes accounted for a lion's share of family income in the sampled households. On an average the farm sector accounted for 78% of the total household income, and the off-farm sector only 22%. In Samalbung, the contribution of farm income to total household income was highest (89%) and in Maimajhuwa it was lowest (58%) (Table 3). Among the various components of farm income, income from cash crops was the most important component. Income from cash crops accounted on average for about 40% of the total farm income. Likewise vegetables, including potatoes, accounted for about 35%. This high contribution to farm income from vegetables was because of the inclusion of potatoes in the vegetable group. Most of the households cultivated potatoes on their land as a traditional staple food crop. The income from vegetables excluding potatoes, however, accounted for only 13.5%.

Table 3: **Average household income of the sample population by VDC**

VDCs	Household income (%)	
	Farm	Off-farm
Mockery	81	19
Maimajhuwa	58	42
Mabu	69	31
Jamuna	68	32
Gorkhe	72	28
Jogmai	77	23
Pashupatinagar	86	14
Jirmale	87	13
Samalbung	89	11
Sriantu	88	12
Swoyang	70	30
Average	78	22

Market Linkages and Challenges

In Ilam, local residents used 'haat bazaars' (local markets), town markets (markets around the major towns and cities), and border markets to sell their products. The main outlets for exporting vegetables to India (Siliguri, Sikkim, and Darjeeling) and other countries are Birtamod in Jhapa district and Manebhanjyang and Pashupatinagar in Ilam district. In Panchthar district, sale is restricted to the 'haat bazaar' and, to some extent, to local traders because there is no road access even to the district headquarters; as a result there are few vegetable traders in Panchthar district. From many VDCs, such as Siding, Memeng, and Prangbung, local farmers use porters to carry products to the nearest traders. Porters and horses are the major mode of transportation in Panchthar, whereas in Ilam people do use jeeps, trucks, and buses. Horses carry a minimum of 100 kg and cost the least. Using porters is the most costly and perhaps the only means in some remote areas of Panchthar districts. The main problems associated with vegetable marketing are unreliable and inadequate transportation, lack of storage facilities, and lack of

a price information system. Taxation and levies imposed at several levels on vegetable marketing in cross-border markets reduce farmers' incomes even more. Competing with other countries in the international market is difficult for Nepalese traders due to an extensive taxation system and complicated certifying mechanism. For instance, there is great demand for tomatoes in Bangladesh and Pakistan, but Bhutan's export tax is half the cost of Nepal's and hence the price of tomatoes from Nepal is not favourable in these markets.

In Ilam, despite these difficulties, the vegetable trade increased over the year, in terms of both the number of traders and quantity of produce handled. The growth in vegetable trade is attributed to increased awareness about nutritional values, changes in eating habits, rising population, better profits from vegetables than from cereals, and rapid expansion in road networks. Some traders, however, mostly in Panchthar, believe that vegetable trade has decreased over the years because of inadequate supplies, fierce competition, migration, poverty, lack of organised markets, and a rise in exports leading to lack of availability in the domestic market.

There are various problems associated with the large-scale cultivation and production of vegetable crops. The major problems identified by the villagers are as follow:

- Limited support from government and non-government organisations in terms of providing technical knowledge about farming
- Natural calamities such as fog and hailstorms
- Limited organisational development; for example, there are only a few producers' groups (like Kishan Jagaran and Taja Tarkari Rara Samuha in Pashupatinagar and Segera Vegetable Growers' Group in Swoyang) established in the area although most of the landholdings are still small and scattered.
- Lack of irrigation, quality seeds, and other inputs such as storage and organised markets
- Limited road access

Technical assistance and training for farmers on adaptable and suitable modern farming and marketing methods with provision for storage facilities would increase the potential of vegetable production as a sustainable livelihood enterprise.

Potentials for Crop Diversification

Both Ilam and Panchthar have comparative advantages for growing vegetables because of their climate, location, and topography. Both districts have climatic conditions and soil types suitable for vegetable cultivation in the monsoon season. Altitudes ranging from 1,500 to 2,500m are suitable for producing rainy-season vegetables. Vegetables such as cauliflower, cabbage, peas, carrots, radishes, and beans grown here during the monsoon become off-season vegetables for the nearby terai belt as well as for Indian States like Bihar, West Bengal, and Uttar Pradesh. Due to the proximity of the districts to these areas, transportation costs are quite low and the percentage of loss in produce is also quite small. Places similar to Ilam and Panchthar in terms of climate and location, such as Dhankuta, have benefited from the comparative advantage that their locations have for vegetable cultivation. The average

household income from vegetables increased from NRs 2,480 to NRs19,150 within a period of three years because of vegetable cultivation during the monsoon. With increased road access, Ilam and Panchthar too can improve their income levels by taking up off-season vegetable cultivation, as off-season vegetables fetch much higher prices than seasonal vegetable crops.

Crop diversification is limited and farmers have been growing the same crops for generations, more so in Panchthar. The situation is changing slowly in Ilam due to its proximity to Darjeeling in India and farmers in Ilam are trying many new crops similar to those grown in Darjeeling.

Challenges and Recommendations

There is a climatic and economic potential for production of a wide variety of vegetables in Ilam and Panchthar districts of eastern Nepal. Farmers are quite slow in reaping the benefits and this is due to reasons ranging from lack of awareness to weak technical infrastructure. Farmers lack knowledge about off-season vegetable cultivation and are unaware of improved technologies for producing new vegetables and about how to combat pests and disease. Agricultural loans and inputs are not readily available in local markets and are restricted to the district headquarters in some districts. Some of the dry areas in Panchthar districts have no irrigation systems for the dry season.

Marketing channels are vital but least developed, and middlemen make most of the profit, leaving a meagre amount of the earnings for the farmers. Transportation is poor, unreliable, and costly because of the inappropriate and inadequate transport infrastructure. There are neither collection centres for vegetables nor information systems about market prices, this leads to high storage losses and biased pricing by traders. The study recommends the following actions to address these issues:

- Farmers should be given training on recent technology about different aspects of vegetable production, growth, and harvesting.
- The concept of cooperative marketing should be promoted among farmers in the two districts.
- There should be in-house investments in quality seeds and credit facilities in the villages of the two districts.
- Marketing channels and road networks should be developed.
- Collection centres at the production sites and market sheds at market entry points should be constructed.
- Local taxes should be levied.
- The potential for organic vegetable production should be explored.
- Micro-irrigation schemes should be facilitated in the drier areas of Panchthar district.

Conclusion

Most vegetable cultivation in Ilam and Panchthar districts is at the subsistence level, apart from vegetables such as potatoes, cabbage, peas, and chayote which are grown on a commercial scale. Most of the vegetables are highly productive due to intensive cultivation, however none of the farmers is involved in vegetable seed production on a commercial scale except for seed potatoes. Lack of availability of quality seed or an organised market in the two districts, inefficient storage facilities, and lack of knowledge about scientific methods for dealing with plant diseases are major problems hindering vegetable-based enterprise development.

Being a comparatively drier area, Panchthar is more suitable for extensive seed production and could easily provide sufficient vegetable seeds for production in Ilam.

Developing collection centres and proper outlets to collect vegetable produce and export it to nearby districts and across the border would benefit local farmers immensely and also help develop vegetable production as an income-generating enterprise for the area. The non-functional Jaubari Potato Development Centre could be developed into a Resource Centre for producing and testing vegetable seed samples and training farmers and technical staff.

Bibliography

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