A Value Chain Analysis of Vegetables: A Case Study of Palpa District, Nepal

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Abstract

Vegetable is major source of vitamins and minerals, but the level of consumption is very low due to low production and market imperfection. Present study was an attempt to analyse the value chain of vegetables in Palpa district of Nepal. Primary data were collected from 75 vegetables growers, 17 input suppliers, 38 vegetable traders, 30 consumers of Palpa district. Seven different vegetable marketing channels were found in the district. Out of these channels, channel-VI for tomato, channel-III for green chilli and channel- VII for cauliflower were found best channels of marketing. Marketing planning committee (MPC) in local level and apex body in district level used to facilitate for linking the retailers and farmers with getting nominal weighing charge. They used to facilitate for balancing the value shared and margin added in the vegetable products. It can be predicted that, marketing channels associated with such actors may develop more sustainable and commercially viable value chain in the vegetable marketing in the Palpa district. Constraints can be managed through the improvement of production technology, management of marketing system, extension of linkage and network between service receiver and providers. There are some opportunities for the improvement of the marketing system which can be trapped by the policy maker or planner to develop the program strategy related to vegetable. Some recommendations are made at the end of the conclusion viz. provision of linking the local agro vets to the reliable companies to ensure quality input supply in the district; improvement in production and marketing that may increase farmers' share, lower production and marketing cost, improve quality; Provision of empowerment training to MPCs and leader farmers focused on advocacy and negotiation with supporting organization, basically government agencies, multiplication and capacity enhancement of local marketing bodies like different marketing committees which have great role to increase the marketing efficiency etc.

Introduction

Nepal is a developing country and nearly 55 per cent of the population is below the poverty line earning of $ 1.25 per day. The economic activity of Nepal is based on agriculture and nearly 73 per cent of the population is engaged in agriculture contributing 34 per cent to Nepal's GDP. Vegetable cultivation provides ample

opportunities to farmers to augment their income and Palpa district is one of the major vegetable producing districts of Nepal. Due to small size of land holding, the marketed surplus is very low resulting farmers are unable to access market for getting remunerative prices of their produce. The value chain analysis examines the full range of activities that are required to bring a product in a particular enterprise from its conception to its end markets. A value chain analysis provides a snapshot of an enterprise at a particular time, while value chain mapping indicates the way a product flows from raw material to end markets (Porter, 1985; Amatya, 2009). The conduit that runs from producer to final user, through which the commodity passes, is conventionally referred to as a "marketing and processing chain", a "supply chain", or a "value chain" (FAO, 2005). The concept of agricultural value chain includes the full range of activities and participants involved in moving agricultural products from input suppliers to farmers' fields and ultimately to consumers. Each stakeholder in the chain has a link to the next in order to form a viable chain. It has been argued that linking of farmers to the markets through efficient value chains would reduce the use of intermediaries in the chain, and strengthen the value adding activities by better technology and inputs, upgraded infrastructure and processing and exports (Miller and Jones, 2010; Pabuayon *et al.*, 2009). Present study was an attempt to analyse the value chain of vegetables in Pulpa district of Nepal. The specific objectives of present study was: [1] to study the status of vegetable production and marketing; [2] to map the value chain showing the trade link among the various actors; and [3] to examine the key constraints, opportunities of market oriented value chain.

Methdology

Sampling Procedure and Data Collection

Nepal country was selected purposively. The Palpa district of Nepal was selected purposively because it is largest vegetable producing district. Based on the catchment of three market centres viz., Rampur, Aryabhanjyang and Tansen, the district was divided into three pockets i.e. A, B and C. The village development committee was purposively selected from the three pockets i.e. pocket–A (Mityal, Darchha, Rampur, Gadakot and Galdha), pocket–B (Chidipani, Nayarnamtalesh and Foksingko) and pocket–C (Madanpokhara, Baughapokharathok, Khasouli, Kaseni and Jhadewa). Out of the total vegetable producer groups registered with District Agricultural Development Office, five producer groups were selected randomly from each pocket with the probability proportional to size method. From the each groups five vegetable growers were selected randomly. So, total sample size was 75 vegetable farmers.

Different output suppliers viz. marketing and planning committee, wholesaler and retailer were selected purposively. Seven collection centres, seven wholesalers (one at district level and six regional levels) and twenty retailers were selected randomly as respondent. There are only two large scale wholesalers in the district so they were selected purposively. Ten retailers and five vegetable nurserymen were selected randomly. Total thirty consumers were selected randomly as respondent. The primary data were collected using pre-tested schedule. The sample size for present study was 75 farmers, 34 output suppliers and 17 input suppliers. The secondary data were collected from the published and un-published reports of Government and Non-government Organizations, District Agriculture Development Office, and IDE Nepal.

Analytical Procedure

Statistical methods

Frequency, mean and percentage are used for analysing the data. Friedman's chi-square test was mainly used for ranking the variables. The Friedman test ranks the scores in each row of the data file independently of every other row.

Actor's share in consumers' price and marketing efficiency

The different actor's share in consumers' price was calculated by the following formula:

$$\text{Farmer's share in consumer's price} = \text{Farmer's share in consumer's price} = \frac{\text{Former's selling price}}{\text{Consumer's purchasing price}} \quad .[1]$$

$$\text{Wholesaler's share in consumer's price} = \frac{\text{Total market margin of wholesalers}}{\text{Consumer's purchasing price}} \quad [2]$$

$$\text{Retailer's share in Consumer's price} = \frac{\text{Total market margin of retailers}}{\text{Consumer's purchasing price}} \quad .. \quad .[3]$$

$$\text{Marketing Efficiency} = \frac{\text{Consumer's purchasing price}}{\text{Total marketing cost} + \text{Total marketing margins}} \quad ...[4]$$

Ranking the Marketing Channel

For ranking of marketing channels, we constructed performance index using producer's share, marketing margin of intermediaries and rate of return were taken (Ramakumar, 2001).

$$R = Ni/Ri \qquad\qquad\qquad …[5]$$

Where: R is an overall rank of a channel; Ri is rank of a channel per a single indicator; Ni is Number of performance indicators and i is Performance indicators (Rate of return, producers' share, and marketing margin).

Results and Discussion

Identification and mapping the main factors involved in the processes

The actors of input suppliers in the study area were agro-vet holders, master leader farmers and nurserymen. Total number of agro-vet holders, master leader farmers and nurserymen in the study area was 56, 12 and 13 respectively. The enablers of inputs suppliers were District Agriculture Development Office, non-governmental organisation, Agriculture Input Corporation. The actors involved in the marketing for vegetables in the study area were 19 local small collection centres, one apex body of district collection centre, four wholesalers at regional level, seven wholesalers at district level and 175 retailers. The marketing enablers in the study area was agricultural production and marketing cooperatives, district cooperative, Palpa chamber of commerce, international non-government organisation, government organisations.

Mapping the flow of Input

Agricultural inputs to the farmers in study area were flowed through two main dealers. There were 56 active Agro-Vets retailers which purchased the inputs from district dealers or from Butwal based dealers. There were 12 active local resource persons within the farmers' community and they provide agricultural inputs and

technical know-how to the farmers. There were 13 active farmers who used to supply seedlings to vegetables growers. Similarly, there were 1500 active vegetables growers.

Mapping the flow of products

Total vegetable production in the district was 26247 tonnes per annum. Out of this, about 26.7 per cent was marketed. Inter-district import and export of vegetables was 2657 and 2555 tonnes per annum respectively. The export of vegetables to India was 146 tonnes per year during the rainy season. The following marketing channels were observed in flow of vegetables in the district. These are:

Channel-I   = Farmers → Consumers

Channel-II = Farmers → Retailers → Consumers

Channel-III = Farmers → Collection Centre → Wholesalers (Butwal) → Retailers → Consumers

Channel-IV= Farmers → Collection Centre → Wholesalers (Butwal) → Retailers (India) → Consumers

 Channel-V = Farmers   Collection centre   Wholesalers (East Palpa) → Retailers → Consumers

Channel-VI= Farmers → Collection Centre → Apex body → Retailers → Consumers

Channel-VII= Farmers → Wholesalers (Aryabhanjyang) → Retailers → Consumers

The shorter chain of marketing was preferred for highly perishable vegetables as compared to relatively less perishable vegetables. Marginal and small vegetable growers sale their produce immediately and directly to consumers or retailers in the nearby market. But, those farmers who cultivated in larger area and produced larger amount used to sell in farther and bigger market like Butwal regional market Saha *et al.,* 2010).

Mapping the flow of volume of vegetable products

The volume of vegetables in Palpa district was flowing from the vegetable producer to consumer through different actors is presented in Figure 1. Out of total vegetable production in the district, 26 per cent (7010 tonnes) was made available for consumers through different marketing channels.

Mapping the relationships and linkages between value chain actors

The relationship between and among the different actors of value chain is denoted by arrow. In the map functions are placed at left side and the enablers at right side. Enablers played facilitation role to perform different functions by the actors (Figure 2).

Identification of major vegetables through attractive matrix method.

The attractive vegetables in the district were identified through attractive matrix method and the indicators used were market price and market demand. Based on the attractive matrix tomato (high price and high demand), green chilli (high price and medium demand) and cauliflower (medium price and medium demand) were marked as more attractive vegetables.

Share of different market players on consumer's price

The efficient marketing channel for tomato, green chilli and cauliflower in the study area was channel–I (producers to consumers). The wholesalers were participated in marketing channel–III, V and VII (Table 1).
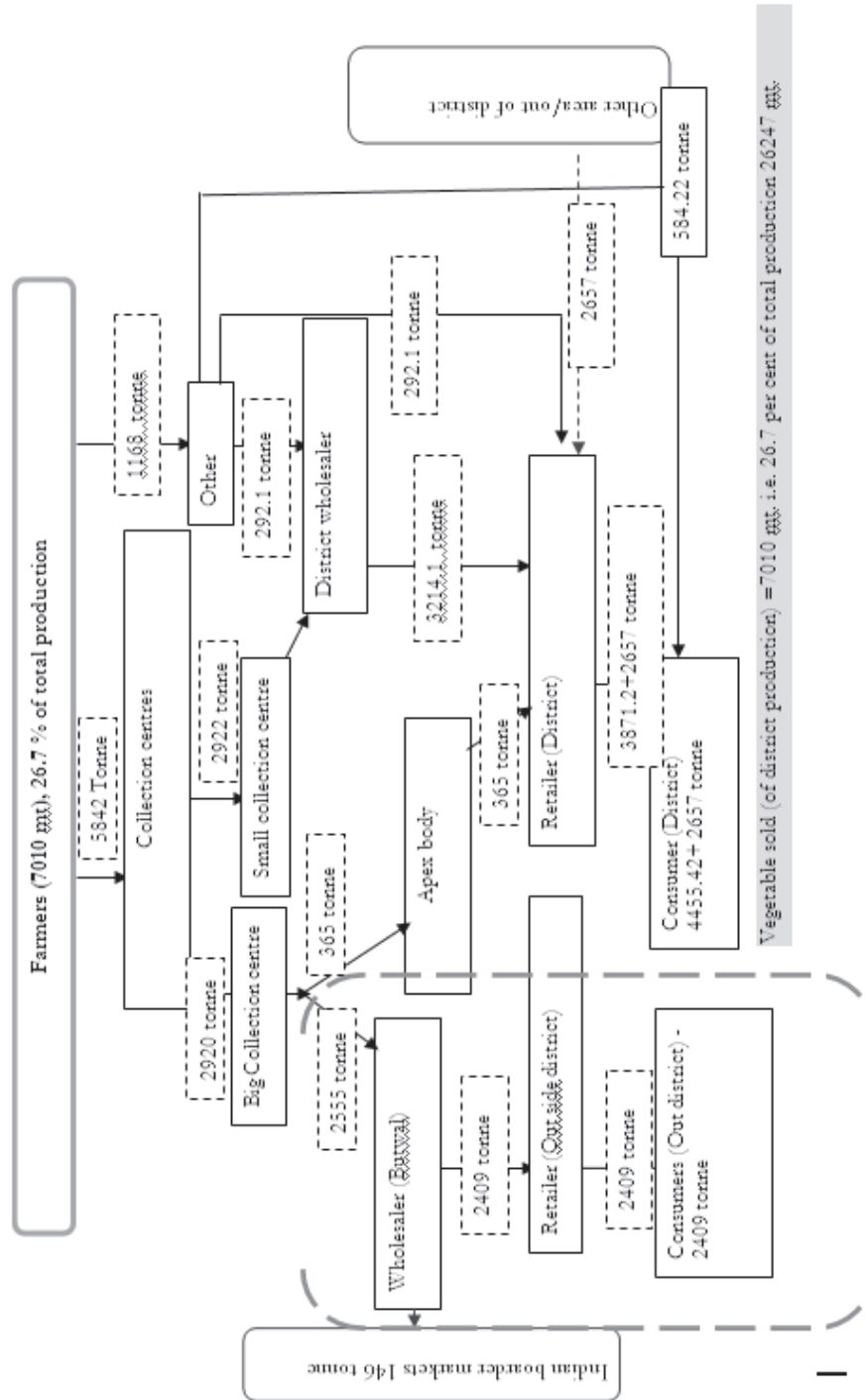
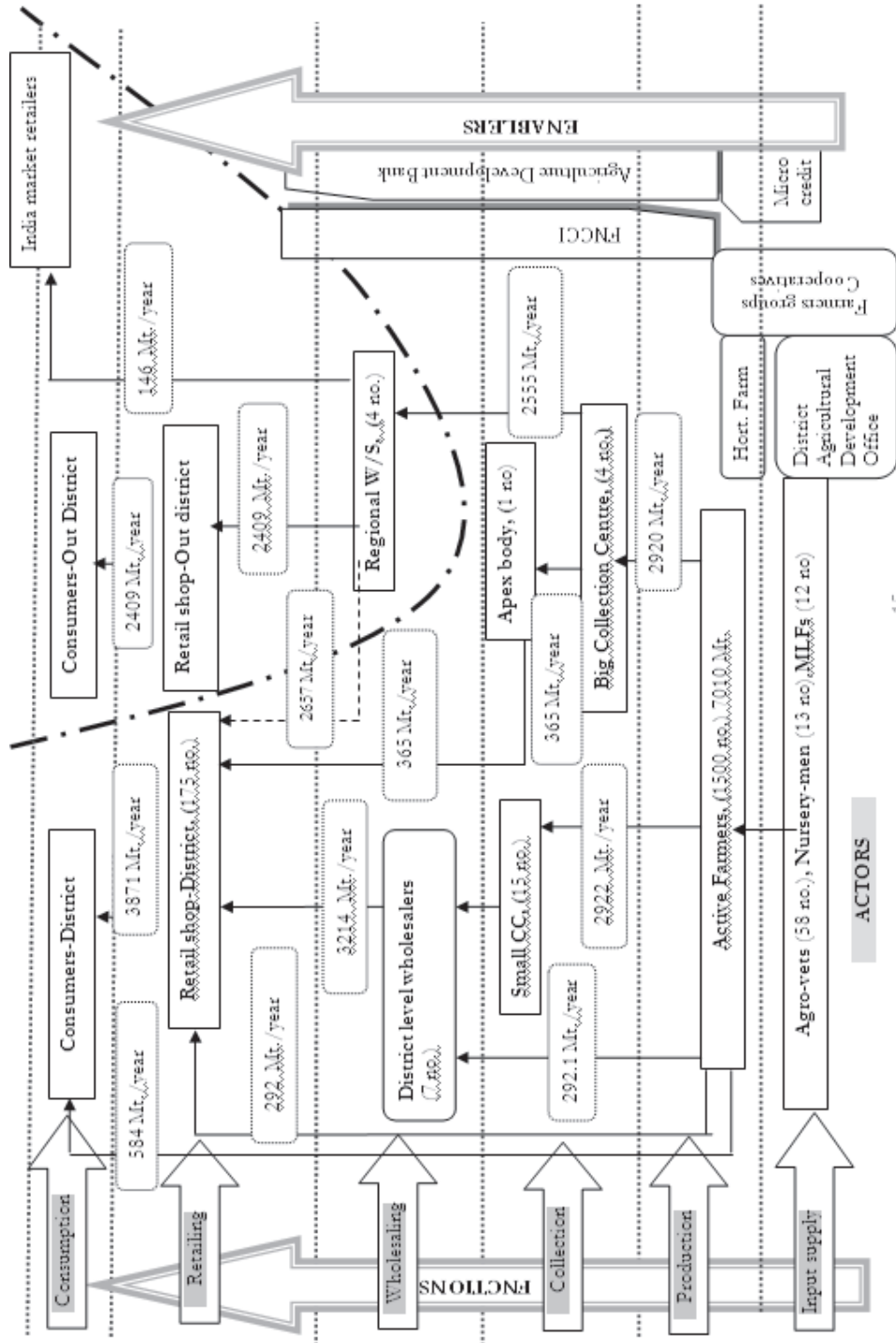**Figure. 1:** Flow of volume of vegetables in Palpa

Fig. 2: Mapping the relationships and linkages between value chain actors

Out of this, the highest percentage share to consumers' was observed in case of tomato in marketing channel–VII. In the sales of green chilli marketing, the wholesalers' share was same for all the three channels. In case of retailers' share in consumer price, it was highest in cauliflower marketing in channel–IV (Table 1).

Table 1: Percentage Share of Farmers', Wholesalers' and Retailers' to Consumer Price

Channel	Farmers' share in consumers' price			Wholesalers' share on consumers' price			Retailers' share on consumers' price		
	Tomato	Green Chilli	Cauli-flower	Tomato	Green Chilli	Cauli-flower	Tomato	Green Chilli	Cauli-flower
Channel–I	100	100	100	-	-	-	-	-	-
Channel–II	77	80	91	-	-	-	23	20	9
Channel–III	71	73	77	9	7	8	20	20	15
Channel–IV	31	50	53	-	-	-	19	18	26
Channel–V	80	80	80	10	7	12	10	13	8
Channel–VI	89	80	92	-	-	-	11	20	8
Channel–VII	71	80	84	14	7	5	14	13	11

Marketing efficiency in different marketing channels

The Marketing cost, marketing margins, marketing loss, value addition and marketing efficiency of different marketing channels of tomato, green chilli and cauliflower is presented in Table 2, 3, and 4 respectively. In case of all the vegetables, the purchase price of consumer was highest in channel–IV but farmers selling price of tomato was highest in channel–V, green chilli in channel–I, Cauliflower in channel channel–I and VI. The price paid to the farmers was not so vast among different channels. However, it was higher in channel–V for tomato; in channel–II, V, VI and VII for green chilli; and in channel–IV for cauliflower. The marketing cost was highest and equal for all the vegetable in channel–IV. The net marketing margin of all three vegetables was highest in channel–IV. It was lowest in channel–VI (Tomato and cauliflower) and in channel–VII (green chilli). The loss of chilli was highest among all the vegetable under study. The producer's share in consumer's price was highest in channel–I and VI for tomato; in channel–I, II, V, VI and VII for green chilli; and channel–I and VI for cauliflower. The rate of return was highest in channel–VI of tomato; channel–III of green chilli and channel-–VII of cauliflower.

Table 2: Marketing cost, marketing margins, marketing loss, value addition and the marketing efficiency of different marketing channels of Tomato

S. No.	Particulars	Unit	Marketing Channel						
			I	II	III	IV	V	VI	VII
1	Retailer's sale price/Consumer's purchase price	Rs./Kg.	35	35	35	80	50	35	35
2	Total Marketing cost	Rs./ Kg	-	0.5	1.5	5	1.25	0.5	1.75
3	Loss	Rs./ Kg	-	1.24	1.9	3	2.85	1.2	1.58
4	Total net Marketing Margins (MM)	Rs./ Kg	-	6.26	6.6	47.5	5.9	2.3	6.68
5	Net price received by farmers(FP): 1-2-3-4	Rs./ Kg	35	27	25	24.5	40	31	25
6	Value added: (1-5)	Rs./ Kg	-	8	10	55.5	10	4	10.0
7	Marketing Efficiency (MME): 5÷(2+4)	Ratio	-	3.99	3.09	0.47	5.59	11.2	2.96

Table 3: Marketing cost, marketing margins, marketing loss, value addition and the marketing efficiency of different marketing channels of Green chilli

S. No.	Particulars	Unit	Marketing Channel						
			I	II	III	IV	V	VI	VII
1	Retailer's sale price/Consumer's purchase price	Rs./ Kg	75	75	75	110	75	75	75
2	Total Marketing cost(MC)	Rs./Kg.	-	0.5	1.75	5	1.75	0.5	2
3	Loss	Rs./ Kg	-	3.6	5.25	3.8	5.7	3.6	5.7
4	Total net Marketing Margins(MM)	Rs./ Kg	-	10.9	13	46.2	7.55	10.9	7.3
5	Net price received by farmers(FP): 1-2-3-4	Rs./ Kg	75	60	55	55	60	60	60
6	Value added:(1-5)	Rs./ Kg	-	15	20	55	15	15	15
7	Marketing Efficiency (MME): 5÷(2+4)	Ratio	-	5.26	3.73	1.07	6.45	5.26	6.45

Rank of the marketing channel

We ranked all the marketing channels prevailing in the Palpa district for tomato, green chilli and cauliflower based on the marketing efficiency, producer's share in consumer price and marketing margin as suggested by Ramakumar (2001). The most efficient marketing channel for tomato was Channel–IV (Farmers to Collection Centre to Apex body to Retailers to Consumers). The most efficient marketing channel for green chilli was Channel–III (Farmers to Collection centre to Wholesalers (Butwal) to Retailers to Consumers). In case of cauliflower, the most efficient marketing channel was Channel–VII (Farmers to wholesaler (Aryabhanjyang) to Retailers to Consumers) (Table 5).

Table 4: Marketing cost, marketing margins, marketing loss, value addition and the marketing efficiency of different marketing channels of Cauliflower

S. No.	Particulars	Unit	Marketing Channel						
			I	II	III	IV	V	VI	VII
1	Retailer's sale price/Consumer's purchase price	Rs/Kg	55	55	65	95	65	60	62
2	Total Marketing cost (MC)	Rs/Kg	-	0.5	2	5	1.75	0.5	2.25
3	Loss	Rs/Kg	-	2.2	2.95	3	3.18	2.2	2.98
4	Total net Marketing Margins (MM)	Rs/Kg	-	2.3	10.05	37	8.07	2.3	4.77
5	Net price received by farmers (FP): 1-2-3-4	Rs/Kg	55	50	50	50	52	55	52
6	Value added: (1-5)	Rs/Kg	-	5	15	45	13	5	10
7	Marketing Efficiency(MME): 5÷(2+4)	Ratio	-	17.8	4.15	1.19	5.30	19.6	7.41

Table 5: Rank of the marketing channels of major vegetables

Rank	Name of the vegetable		
	Tomato	Green chilli	Cauliflower
1	Channel–VI	Channel–III	Channel–VII
2	Channel–II	Channel–II	Channel–III and VI
3	Channel–III	Channel–VI and VII	Channel–II
4	Channel–V and VII	Channel–IV	Channel–IV
5	Channel–IV	Channel–V	Channel–V

Constraints, opportunities of market oriented value chain

We tried to find out constraints and opportunities faced by the consumers, inputs suppliers, vegetable growers, retailers and wholesalers and marketing and planning committee. We asked questions related to possible constraints and opportunities and based on the responses received from the respective respondents we ranked constraints and opportunities using Friedman test for ranking.

Consumers

Out of the 30 respondents, 75 per cent respondents in the study area were familiar on the nutritional importance of vegetables consumption. We asked possible constraints related to vegetable consumption were: (1) insufficient availability of vegetables in local retail market; (2) not availability of vegetables as much amount as required; (3) not availability of the vegetables as per consumers demand; (5) not availability of fresh vegetable; and (5) higher price of vegetables. The respondent ranked the constraints giving the value 1 for most important constraint to 5 for least important constraints. Table value of chi-square at 4 degree of freedom at 5 per cent level of significance was 9.488. The calculated value of chi-square (36.935) was greater than the table value. The low availability of vegetables in the local retail markets and unavailability of the items as per consumers' demand were the major obstacles.

The opportunity for consumer are: (1) nearer to regional market (Butwal); (2) can buy vegetables over the year; (3) if marketing chain improved, they can get varieties of local vegetable; (4) people can get fresh vegetable if supply chain is improved; and (5) price information is available through the different communication media. The calculated value of chi-square (42.267) is greater than the table value at 4 degree of freedom and 5% level of significance (9.488). There was greatest opportunity to make availability of various items of locally produced fresh vegetables in market if the supply chain was improved.

Input Supplier

The major constraints related to input suppliers in the study area was: (1) less knowledge about the source of loan for business; (2) less knowledge about the process for bank loan; (3) difficult and lengthy process for getting loan; (4) problem of showing pledge in the bank; (5) high interest rate for loan; (6) less opportunity for training to develop skill; (7) Unequal opportunity for getting services related to business; (8) service providers were centralized in headquarter; (9) poor market linkage; and (10) difficult to build thrust in business. The respondents were ranked these constraints based on their experience and they gave one for top most constraint and 10 for least important constraints. The table value of chi-square at 4 degree of freedom at 5 per cent level of significance was 16.919, whereas calculated value of chi-square (23.066) is greater than the table value. Based on the responses received by the respondents, the most important constraints were difficult and lengthy process for getting loan from the bank; less knowledge about the process for bank loan and low knowledge about the source of loan for business was the major obstacles.

The opportunity for input suppliers was: (1) there were many sources for financial support; (2) there were skill providing service providers in the district; (3) different distributer companies were attracting; (4) farming scale as well as demand for the input was increasing; and (5) supply chain was improving as compare to surrounding district. The respondents were ranked the opportunities one for best opportunity and five for least important opportunity. Table value of chi-square at 4 degree of freedom at 5 per cent level of significance is 9.488 and calculated value of chi-square is 34.165, which is greater than the table value. Most of the input suppliers expressed that farming scale as well as demand for the input was increasing; supply chain was improving as compare to surrounding district and there were skill providing service providers in the district, as higher opportunity.

Farmers

The list of constraints was prepared with help of district agricultural development officials, NGOs and group meeting with vegetables growers. The constraints related to the production and marketing of vegetables were: (1) low availability of quality seed locally; (2) high cost of inputs; (3) lack of irrigation facility leads to rain-fed cultivation; (4) inadequate knowledge about new technologies; (5) low knowledge about the production calendar; (6) loss of vegetables due to improper handling practices; (7) difficulties in getting loan from banks; (8) limited access to vegetables price prevailing in the market; (9) insufficient knowledge about post harvest technology; (10) long distance between farm and main market; (11) lack of transportation facility in hilly area and (12) low confidence on business. These problems were ranked by the vegetable growers and first rank was given for top most constraint and 12 for least important constraints. Table value of chi-square at 11 degree of freedom and 5 per cent level of significance is 19.675 and the calculated value of chi-square was estimated to be 91.77. The calculated value was greater than the table value. The most important constraints for vegetable grower was lack of irrigation facility leading to mostly rain-fed cultivation, locally low availability of quality seed and insufficient knowledge about post harvest technology etc. The similar results were also obtained by the Adhikari (2003) in middle Palpa district.

Opportunity related to the production and marketing of vegetables were: (1) many microclimatic pockets available in district suitable for large scale quality vegetable production; (2) vegetables growers get comparative advantage over cereals and cash crops as well as over plain areas at rainy season; (3) high demand of vegetables in domestic, regional and India-Nepal boarder market; (4) micro financial institutions were emerging and may provide loans; (5) local F.M. radio use to broadcast the market information regularly; (6) collection centers were developed in different 16 locations; (7) existence of some established farmers' organization, cooperative societies, marketing-planning committee for marketing; (8) master leader farmers also provide support to farmers by providing inputs and technical know-how; (9) vegetable price was increasing every year. The farmers were ranked these opportunities and one was given for best opportunity and 9 for least important opportunity. The calculated value of chi-squire was 57.216 which were highest to table value (15.507) at 8 degree of freedom at five per cent level of significance. The highest ranked given by the vegetable growers were increasing vegetable price in every year; opportunity for getting comparative advantage over cereals and other crops as well as over plain areas in rainy season; existence of some established farmers organization, cooperative societies and marketing-planning Committee for marketing.

Retailers – Wholesalers

The constraints faced by retailers and wholesalers related to marketing of vegetables were: (1) sometime import of vegetables from India is of poor quality and no action is taken by the concerned authority; (2) lack of price information system; (3) retail market and marketing system was not well managed; (4) supply was less than demand; (5) insufficient knowledge about entrepreneurship among traders; (6) problems of assessing information related to vegetable price; (7) high variation of product price among traders which was leading to unhealthy competition among them; (8) economically poor and no appropriate financial institutions to invest on business; (9) traders were still not much trained on post harvest technology; (10) lack of knowledge about particular trade policies; (11) high competition in markets and no unity among traders; and (12) no supply of vegetable as per consumers demand. The retailers and wholesalers were ranked these constraints into one to 12 scales. Table value of chi-square at 11 degree of freedom at 5% level of significance is 19.675.The calculated value of chi-square (77.479) is greater than the table value. Lack of well managed retail market and marketing system; lack of price information system; problems on assessing of vegetable price information were the higher ranked constraints.

The opportunity of retailers and wholesalers were: (1) well road facility increases the number of new market centres as feeder market for the wholesaler; (2) high potentiality for the promotion of agro-based micro-enterprises industry; (3) number of vegetable producers and area of cultivation was increasing; (4) accessibility to India boarder market was increasing; (5) transportation loss can be minimized by collecting vegetables at a place and linking them with wholesalers; (6) high demand of vegetables all over the year; (7) low investment and immediate income enterprise/business; and (8) availability of market information through local F.M. radio and publications. The rank was given one for best opportunity and 8 for least important opportunity. Table value of chi-square at 7 degree of freedom at 5 per cent level of significance is 14.067, whereas calculated value of chi-square was 19.222. Increased number of farmers and area of vegetables production; loss minimization by collecting one place and linking with wholesalers; high demand of vegetables all over the year; and availability of market information through local F.M. radio and publications were the higher ranked opportunities of wholesalers and retailers.

Marketing and Planning Committee (MPC)

The constraints faced by the marketing and planning committee (MPC) were: (1) poor trust and commitment among committee members; (2) inadequate financial institution for investment; (3) problem of trust between farmers and MPC; (4) lack of proper guidelines for the operation of the MPCs; (5) inadequate knowledge on accounting and management part; (6) less awareness about legalization of MPCs and its importance; and (7) poor linkage and coordination among value chain actors (farmer, whole sellers, retailers etc.). Table value of chi-square at 6 degree of freedom at 5 per cent level of significance is 12.592. The calculated value of chi-square (55.250) is greater than the table value. We can conclude that all the participants were agreement in ranking of constraints of MPCs. Poor linkage and coordination among value chain actors; problem of trust between farmers and MPC and lack of proper guidelines for the operation were higher ranked constraints of marketing and planning committee.

The opportunities of MPC were: (1) establishing as local community based organization for the development of agriculture; (2) in higher production area farmers were attracting to the MPCs; (3) MPCs can lobby with line agencies and support organizations; (4) MPCs can be the first source of farmers' information to the traders; and (5) bottom-up planning support of MPCs to the farmers group may foster market led production. The respondents ranked the opportunities on one to five scale. The calculated value of chi-squire was estimated to be 13.533 which were greater than the table value at four degree of freedom at 5 per cent level of significant. To be a community based organization for the development of agriculture; to play as strong body for lobbying with Line agencies and support organizations and to be the first source of farmers' information to the traders are the higher ranked opportunities of the marketing and planning committee.

Conclusion and Policy Implication

The study has revealed that tomato, green chilli and the cauliflower are the high value and high market demanded commodity in Palpa district. Out of total agricultural land, only 7.45 per cent area was under vegetable cultivation. There were seven marketing channels prevailing in the study area. More than 50 per cent vegetable flows through third channel (farmers – collection centre – wholesalers (Butwal) – retailers – consumers). Marketing Planning Committee at local level and apex body in district level facilitate for linking the retailers and farmers. Even though, some genuine constraints and valuable opportunities were found within value chain actors in the districts. Such constraints can be managed through the improvement of production technology, management, extending linkage improving networking between service receiver and providers. There are also some opportunities for the improvement of the marketing system which can be trapped by the development organization in market development program.

For the further enhancement of vegetable industry in the Palpa district of Nepal, some policy interventions are required. These are:

1. There should be need to link agro-vets to reliable vegetable seed companies and dealers for quality input supply to vegetable growers;

2. There is high demand of organic vegetables in the study area, therefore government should provide incentives to vegetables growers to adopt organic farming;

3. Due to lack of knowledge, input suppliers and vegetables growers are unable to invest in the business, therefore government should provide complete information related to the loan requesting process, repayment process, their amount and guideline for effective use; .

4. Government should provide market network and market information to quality inputs supply, vegetable demand, prices of vegetables, minimise malpractices and losses;

5. Most of the vegetable growers in Palpa district are using bamboo basket or jute racks for transporting vegetables to the market. Therefore, government should provide training to vegetable growers regarding packaging materials etc.

6. Farmers were not adopting proper grading, cleaning and storage practices. Therefore, government should provide training to farmers regarding this to reduce vegetables quality and enhance net income from the vegetables.

7. There is need to enhance farmers' share in consumer price and enhance market efficiency by reducing the actors in marketing chain.

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