

Unfolding the Production and Marketing Challenges and the Socio-Economic Factors for Vegetable Farming in Birendranagar Municipality, Surkhet, Nepal

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Abstract: This research paper aims to investigate and assess the present challenges with respect to production and marketing for vegetable farming in Birendranagar Municipality, Surkhet district of Nepal. The study has unfolded the social and demographic factors of farmers involved in vegetable farming. A survey was conducted to collect data from a sample of 40 vegetable-growing farmers, 20 vegetable traders and 20 consumers selected through simple random sampling. The data was analyzed using descriptive statistical tools, and Garrett ranking of factors. The study revealed significant involvement in seasonal vegetable farming by the Chhetri ethnicity (45%), followed by Brahmin, Janajati, and Dalit. Agriculture was identified as the primary source of income (70%), followed by foreign remittances (27%). The level of satisfaction of farmers derived from vegetable farming was found to be moderately satisfied (73%) using Likert scale. Garrett ranking showed seasonal variation as the major factor governing price of vegetables, limited access to inputs & technology as the major production challenge and transportation & infrastructure as the major marketing challenge of vegetable farmers and traders. This study highlights that seasonal vegetable production holds the potential to be a profitable agricultural enterprise in the study area but needs to address the production and marketing challenges from the stakeholders involved in agricultural development of Birendranagar Municipality.

Keywords: vegetable farming, perception, livelihood.

1. Introduction

Availability of diversified climate in different region of Nepal provides better opportunity to produce different vegetables in a single period of time. In Nepal vegetable is produced in an area of 2, 84,121 ha with total production of 39, 93,167 MT and contributes 5.99% to GDP of Nepal & 16.67% AGDP (MoALD, 2021/2022). Due to their importance in national economy, fast growing, immediate return, and short crop production duration, government is prioritizing vegetable production in Nepal. Vegetables have a higher commercialization rate (30-50%) (Gurung et al., 2016) and high

cost-benefit ratio 1:3 than that of cereals (1:1.5) (CASA, 2020). Due to the higher return per unit of land, better response to fertilizers input compared to others crops like fruits and cereals, the production of vegetables is increasing (Shrestha & Rai, 2013).

Marketing in vegetable has been a major problem for many farmers in Nepal. Nature of market & their role in price determination are the central to economics. Despite of year-round production of some vegetables, their price changes seasonally due to long distance transportation cost (Shrestha et al., 2022). Likewise, unavailability of proper wholesale market, open border with India, and more middlemen involvement in vegetable marketing are some major problems associated to fetch low price of the vegetable produced by the farmers. Thus, farmers in Nepal mostly sell their vegetables directly at Hatbazaar, carry vegetables in cycles, auto-rickshaw & visit directly to the consumer's door. (Timsina & Shivakoti, 2018). Analyzing and improving marketing strategies, utilizing new distribution channels, adding value to the products and shifting from subsistence farming to more commercial and multifunctional farming are ways to efficiently penetrate the market and increase the income of producers. Ultimately these practices contribute to strengthening and attaining potential benefits provided by off-season/ summer vegetable production (Shrestha, 2008).

A. Rationale of the Study

Insufficient studies and research on the production and marketing of vegetable farming have narrowed down the development of the vegetable sector (Ghimire et al., 2018). Due to lack of roads, transportation, and communication facilities, marketing vegetables has become challenge in some areas of Nepal, particularly in remote areas (Tiwary, 2005). Irrigation is another issue for vegetable producers, as is the scarcity of improved and hybrid seeds. Government emphasis and effective policies and funding for successful marketing and

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management appear to be the most essential. Agricultural marketing will not thrive unless infrastructure and other supports are made available to producers (Thapa, 2014).

The development and growth of the vegetable sub-sector could be one of the most essential measures for maintaining Nepal's trade balance. Increased vegetable production is critical which must be done properly, with a focus on cost reduction and profit maximization (Paudel et al., 2021). Furthermore, identifying limits in vegetable production and marketing assists policymakers in developing favorable policies for the overall growth and development of the vegetable sub-sector. Thus, this study has been conducted in Birendranagar Municipality, Surkhet, provincial headquarter and a major hub for vegetable marketing, to assess the socio-demographic characteristics of seasonal vegetable growers, production and marketing characteristics of vegetables and unfold the challenges in production and marketing of seasonal vegetables

2. Literature Review

Vegetable production and marketing play a vital role in Nepal's economy, and Surkhet district is one of the main vegetable production hubs in the Karnali province. It's production and marketing have been rapidly growing in Nepal due to raising demand from urban and peri-urban areas. Vegetable production has increased by 4.8% annually over the past decade, and the country produced 4.4 million tons of vegetables in 2019 (FAO, 2020). However, vegetable production is still characterized by low productivity, increased post-harvest loss, affecting the quality and quantity of vegetables in the market (Poudel, 2017).

Vegetable cultivation makes good use of available land. Because most vegetables have a short growing season, 3 to 4 crops can be gathered from the same plot of land in a year. It requires more labor than cereals and has the ability to employ seasonal employees. Vegetables are high-yielding and garner high prices as compared to cereals, and hence can encourage sub-urban employment while also empowering women (Paudel et al., 2021). Postharvest operations, including transportation, processing, packing, and marketing, generate additional job opportunities in commercial vegetable production. Nepalese veggies have export potential as well (Dinham, 2003), with the possibility of selling fresh vegetables to Gulf countries.

A. Conceptual Framework

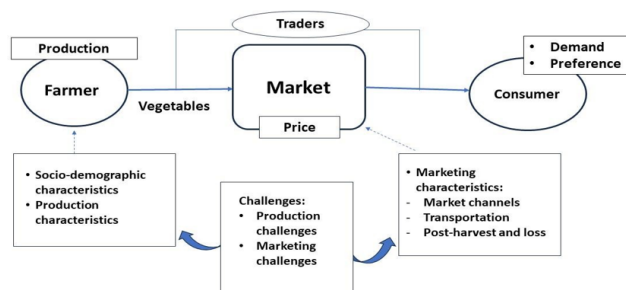


Fig. 1. Conceptual framework of the study

The conceptual framework was designed which depicts the cause-and-effect relationship among the variables and factors

governing them as shown in Figure 2. The questionnaire were designed to get the information from the producers, traders and the consumers as per the study framework.

3. Research Methodology

The Birendranagar Municipality of Surkhet district was selected purposively due to the fact that it is the capital city of Karnali Province and the major hub for collection and trading of agricultural products including seasonal and off seasonal vegetable. It is the gateway of six districts of the province. A total of 40 seasonal vegetable farmers from Birendranagar municipality were surveyed by using sample random sampling method due to contextual limitations of time and resources.

A cross-sectional survey research was designed for the study. Both qualitative and quantitative data were used for the research. As survey instrument, pre-scheduled interview questionnaires, focus group discussion and Key Informants Interview was developed for farmer and traders to get first-hand data on production and marketing of vegetables.

Qualitative and quantitative data were collected. Quantitative data were used to find and assess socio-demographic characteristics, production characteristics, marketing characteristics, etc. Qualitative data were used to map marketing status of seasonal vegetables and scope for value chain development.

A. Data Analysis Technique

For quantitative data, software like MS Excel was used for data analysis. While for qualitative data, information acquired were analytically processed and necessary conclusions were drawn based on the context and contribution made to particular actors. Marketing of seasonal vegetables was concluded from qualitative data. The socio-demographic variables like family size, age distribution, gender distribution, educational status, land holding etc., were analyzed from the study.

1) Garrett Ranking of Factors

Garrett's ranking technique was used to rank the preference indicated by the respondents on different factors. As per this method, respondents have been asked to assign the rank for all factors and the outcomes of such ranking have been converted into score value with the help of the following formula:

$$\text{Percent position} = 100 (R_{ij} - 0.5) / N_j$$

Where,

R_{ij} = Rank given for the i^{th} variable by j^{th} respondents

N_j = Number of variables ranked by j^{th} respondents

With the help of Garrett's Table, the percent position estimated is converted into scores. Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important factor.

2) Likert Scale Analysis

The Likert scale is a global scale that is used to assess attitudes and views. A forced Likert scale is a scale with 4

answer options which has two utmost poles without a neutral option linked with intermediate answer options. To measure the satisfaction level, 4-point Likert scale is used and it is also called the satisfaction scale. It ranges from one extreme viewpoint to another.

GARRETT RANKING CONVERSION TABLE
The conversion of orders of merits into units of amount of "scores"

Percent	Score	Percent	Score	Percent	Score
0.09	99	22.32	65	83.31	31
0.20	98	23.88	64	84.56	30
0.32	97	25.48	63	85.75	29
0.45	96	27.15	62	86.89	28
0.61	95	28.86	61	87.96	27
0.78	94	30.61	60	88.97	26
0.97	93	32.42	59	89.94	25
1.18	92	34.25	58	90.83	24
1.42	91	36.15	57	91.67	23
1.68	90	38.06	56	92.45	22
1.96	89	40.01	55	93.19	21
2.28	88	41.97	54	93.86	20
2.69	87	43.97	53	94.49	19
3.01	86	45.97	52	95.08	18
3.43	85	47.98	51	95.62	17
3.89	84	50.00	50	96.11	16
4.38	83	52.02	49	96.57	15
4.92	82	54.03	48	96.99	14
5.51	81	56.03	47	97.37	13
6.14	80	58.03	46	97.72	12
6.81	79	59.99	45	98.04	11
7.55	78	61.94	44	98.32	10
8.33	77	63.85	43	98.58	9
9.17	76	65.75	42	98.82	8
10.06	75	67.48	41	99.03	7
11.03	74	69.39	40	99.22	6
12.04	73	71.14	39	99.39	5
13.11	72	72.85	38	99.55	4
14.25	71	74.52	37	99.68	3
15.44	70	76.12	36	99.80	2
16.69	69	77.68	35	99.91	1
18.01	68	79.17	34	100.00	0
19.39	67	80.61	33		
20.93	66	81.99	32		

Fig. 2. Garrett ranking conversion table

3) Likert Scale Analysis

The Likert scale is a global scale that is used to assess attitudes and views. A forced Likert scale is a scale with 4 answer options which has two utmost poles without a neutral option linked with intermediate answer options. To measure the satisfaction level, 4-point Likert scale is used and it is also called the satisfaction scale. It ranges from one extreme viewpoint to another.

4. Results and Discussion

A. Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics include gender, age, ethnicity, marital status, education level and income of the respondents. Among the 40 sampled seasonal vegetable farmers, 70% (28) were men and 30% (12) were women. This reveals that men are more involved in vegetable farming as compared to female. The average age of the sampled respondents was found to be 44. Maximum number of family members of respondents (67 men and 78 women) were economically active population of age group 15-59. The descriptive statistics of age of respondents and the age group of the family members is shown in Table 1 and Figure 3 respectively.

Table 1
Descriptive statistics of age of respondents

	N	Minimum	Maximum	Mean	Std. Deviation
Age	40	27	63	44	8.86

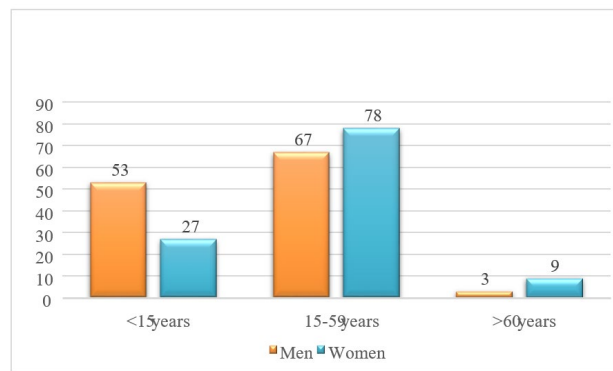


Fig. 3. Distribution of family members by age group

B. Marital Status and Ethnicity

83% (33) of the sampled respondents were married and 12% (5) were unmarried. 5% (2) respondents were also found to be widowed. The ethnicity of 45% of the sampled respondents was Chhetri followed by 27% Brahmin and 20% Janajati. 8% of the respondents were of Dalit ethnicity as well.

C. Education Level and Source of Income

The education status of most of the sampled responded was found to be of primary level (15). 7 were found illiterate, 6 were just literate, 7 had the secondary level education, and 5 had higher level education. Most of the family had agriculture as their major source of income (70%). The family members of respondents were found to be involved in other income sources such as business, civil service and foreign employment.

D. Production Characteristics

1) Total Land Owned

The descriptive statistics of land owned by the respondents is shown in the Table 2. An average of 27 kattha land (0.0338 hectare) with a standard deviation of 3.02 was found.

2) Years of Experience

The farmers were found to be growing seasonal vegetables in the study area with an average of 11 years of experience with a standard deviation of 3.72. The distribution is shown in the table 3.

3) Popularity of Vegetables

The best vegetable based on taste and demand were identified from consumers. The most popular vegetable in the market based on taste was found to be tomato followed by bitter gourd and cucumber. The consumers were asked to list the vegetables that they demand based on the taste and their preference. The most popular vegetable in the market based on demand was also found to be tomato followed by peas and cucumber. The popularity of vegetables is shown in Figure 4.

4) Gender Decision-Making on Type of Vegetable to Grow

The involvement of men and women were found to be somewhat similar in the decision making for the selection of vegetables to grow in the family. 52% of the sample had

Table 2
Distribution of land owned by respondents

N	Minimum	Maximum	Mean	Std. Deviation	
Land owned (katha)	40	19	33	27	3.02

Table 3
Years of experience of sampled farmers

N	Minimum	Maximum	Mean	Std. Deviation	
Years of experience	40	5	20	11	3.72

involvement of men and 48% had women involvement in decision-making.

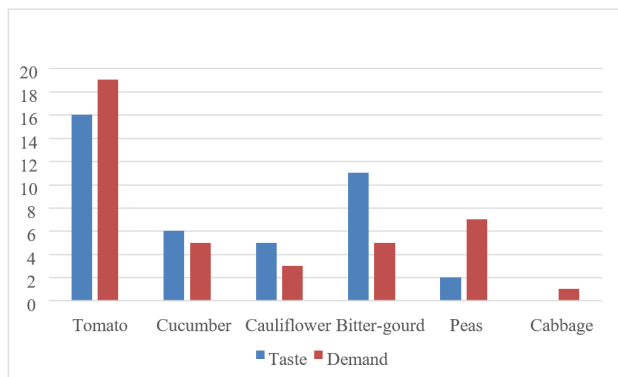


Fig. 4. Popularity of vegetables

5) Major Production Challenges for Vegetable Farming

Garrett’s ranking technique was used to rank the weightage of challenges indicated by the respondents on different factors. As per this method, respondents have been asked to assign the rank for all factors and the outcomes of such ranking have been converted into score value. The factor having highest mean value was considered to be the most important factor. Four factors/challenges were observed in the study area regarding major production challenges of seasonal vegetable growers in the study area. As per Garrett ranking, limited access to inputs and technology had the highest weighted average and ranked the 1st major challenge followed by pest and disease management, post-harvest losses and lastly, water management as shown in the Table 4.

Table 4

Major production challenges

Factors/Challenges	Weighted average	Rank
Water Management	31.55	IV
Pest and Disease Management	56.82	II
Post-Harvest Losses	46.12	III
Limited access to inputs and technology	62.8	I

6) Farmer's Satisfaction to Market Price

Market price of vegetables vary depending upon the cost of production, demand of consumers and other factors regarding production and marketing. The price of produce obtained by the growers is often not very much satisfactory to the growers. Forced four-point Likert scale was used as a tool to assess the satisfaction of farmers to the market price they obtain. The four points of the Likert were namely; very satisfied, moderately satisfied, moderately unsatisfied and very unsatisfied. 73% of the respondents were moderately satisfied to the market price they receive.

7) Factors Governing the Price of Produced Vegetables

Various factors that govern the price of produced vegetables in the study area were identified through field visits and FGD with vegetable growers in the study area. Four factors were stated in the interview schedule and respondents were asked to rank the factors according to their perception and experience. Garrett ranking technique was used to calculate the score and weighted average which was used to find out the ranking for the major factor governing the price of produced vegetables.

Table 5

Factors governing price of produced vegetables

Factors	Weighted average	Rank
Seasonal variation	66.15	I
Input cost	46.15	III
Transportation cost	29.97	IV
Markey demand	57.72	II

8) Major Marketing Challenges of Seasonal Vegetable Farming

Four factors/challenges were observed in the study area regarding major marketing challenges of seasonal vegetable trading in the study area. As per Garrett ranking, transportation and infrastructure had the highest weighted average and ranked the 1st major challenge followed by poor marketing channels. The challenges and ranking by respondents is shown in Table 6.

Table 6

Marketing challenges of seasonal vegetable farming

Factors/Challenges	Weighted average	Rank
Seasonal Fluctuations	34.1	IV
Transportation and Infrastructure	62.02	I
Poor Marketing channels	60.15	II
Competition from Imported Produce	43.72	III

5. Conclusion

The production and marketing of seasonal vegetables play a significant role in the economy of Nepal. Surkhet, a prominent agricultural hub in Nepal, relies heavily on the cultivation of seasonal vegetables, which play a pivotal role in the livelihoods of numerous households. This research paper aims to investigate and assess the status of seasonal vegetable marketing in Birendranagar Municipality, Surkhet. The study addresses the critical issue of agricultural marketing and its impact on local farmers and traders in the region.

A survey was conducted to collect data from a sample of 40 vegetable-growing farmers and 20 traders selected through simple random sampling to assess the status of production and marketing of seasonal vegetable farming in the study area. The data was analyzed using descriptive statistical tools, benefit-cost ratio analysis, and Garrett ranking of factors. The study

revealed significant involvement in seasonal vegetable farming by the Chhetri ethnicity (45%), followed by Brahmin, Janajati, and Dalit. Agriculture was identified as the primary source of income (70%), followed by foreign remittances (27%). The level of satisfaction of farmers derived from vegetable farming was found to be moderately satisfied (73%) using Likert scale. Garrett ranking showed seasonal variation as the major factor governing price of vegetables. It was also revealed that limited access to inputs and technology was the major production challenge and transportation and infrastructure as the major marketing challenge of vegetable farmers and traders.

This study highlights that seasonal vegetable production holds the potential to be a profitable agricultural enterprise in the study area.

References

- [1] Dinham, B. (2003). Growing vegetables in developing countries for local urban populations and export markets: problems confronting small-scale producers. *Pest Management Science*, 59(5), 575–582.
- [2] FAO. (2020). Nepal: country fact sheet. Retrieved from <http://www.fao.org/Nepal/fao-inNepal/-country-profile/Nepal-country-fact-sheet/en/>
- [3] Ghimire, D., Lamsal, G., Paudel, B., Khatri, S., & Bhusal, B. (2018). Analysis of trend in area, production and yield of major vegetables of Nepal. *Trends in Horticulture*, 1(1).
- [4] Gurung, B., Thapa, R. B., Gautam, D. M., Karki, K. B., & Regmi, P. P. (2016). Commercial vegetable farming: An approach for poverty reduction in Nepal. *Agronomy Journal of Nepal*, 4, 92–106.
- [5] Gautam, M., Koirala, K., & Gaire, B. (2020). Vegetable market chain analysis in Surkhet district of karnali province, Nepal. *Journal of Agriculture and Natural Resources*, 3(1), 61-71.
- [6] Gyawali, P., Khanal, S., & Bhandari, S. (2022). Need to take precedence for off seasonal vegetable farming? Issues in context of Nepal. *Turkish Journal of Agriculture - Food Science and Technology*, 10(12), 2495–2503.
- [7] Malla, S., Malla, S., Bhandari, S., Joshi, H., & Shrestha, J. (2022). Determinants of production and marketing of vegetables in kailali district of Nepal. *SAARC Journal of Agriculture*, 20(1), 239–252.
- [8] Poudel, S. (2017). Agricultural commercialization in Nepal: status, determinants and challenges. *Journal of Agriculture and Natural Resources*, 1(1), 1-10.
- [9] Shrestha, B. (2008). *Off-Season Vegetables Marketing Channels of Small Growers: A Case of Yampaphant, Tanahun, Nepal*. September, 81.
- [10] Shrestha, R. B., Bhandari, H., & Pandey, S. (2022). Profit Efficiency of Smallholder Vegetable Farms in Nepal: Implications for Improving Household Income. *Frontiers in Sustainable Food Systems*, 5(January), 1–12.
- [11] Team, C. N. C. (2020). *Vegetable Sector Strategy-Nepal*. Commercial Agriculture for Smallholders and Agribusiness (CASA).
- [12] Thapa, P. (2014). Comparative study on market access of smallholder farmers in hills and plains of Nepal. *Nepalese Journal of Agricultural Sciences*, 164.
- [13] Timsina, K. P., & Shivakoti, G. P. (2018). Vegetables production and marketing: Practice and perception of vegetable seed producers and fresh growers in Nepal. *Agriculture and Food Security*, 7(1), 1–9.
- [14] Tiwary, M. (2005). *Marginal farmers, agricultural practices, and rural poverty in Nepal*.