

RESEARCH ARTICLE

PRODUCTION ECONOMICS AND MARKETING ANALYSIS OF POTATO (*Solanum tuberosum* L.) FARMING IN CHANGUNARAYAN, BHAKTAPUR

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ARTICLE DETAILS

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ABSTRACT

Potatoes are an important cash crop in Nepal. Research was conducted from Feb 2022 to July 2022 in Changunarayan Municipality, Bhaktapur, Nepal. The pre-tested interview schedule was used to collect the primary information; Focus Group Discussion and Key Informant Interviews were performed. Furthermore, relevant literatures were reviewed for secondary information. The simple random method of sampling (SRS) was used. Altogether, 100 samples were collected and processed. The Statistical Packages for Social Sciences (SPSS) and Microsoft excel software were used for data analysis. Most of the farmers, about 35%, used local varieties of potato followed by improved (Janakdev, Khumal Rato, Desire, TPS etc.), Indian (C4, Rabindra 1) and unknown varieties. The gross margin is positive and benefit cost ratio, greater than one (2.13), which indicates the financial viability of potato production in Bhaktapur. However, seed cost has occupied the major portion of cost of production (33.3%). Furthermore, disease and pest problem were the most commonplace and severe problem (I=.71) in potato production followed closely by lack of availability of the quality seeds (I=.61) and lack of proper market (I=.6), and finally, moderately severe problems were found to be: lack of proper irrigation facilities (I=.57) and lack of labor (.54). Clearly, unavailability of the storage facilities was primary concern of the farmers ranking first (I=.47) followed by market unavailability (I=.39), price fluctuation (I=.37), perishable nature of potato (.36) and at the least level, lack of transportation (I=.23). No proper post-harvest activities were observed. The provision of technical knowledge to control diseases as well as the proper allocation of improved quality seeds would help to increase the profitability and productivity of potatoes.

KEYWORDS

Potato farming, production economics, marketing analysis, benefit-cost ratio, Bhaktapur, Nepal

1. INTRODUCTION

Potato (*solanum tuberosum* L.) has been considered staple and versatile food as well as cash crop since time immemorial. In Nepal, it is grown almost all over the land from tropical terrain to temperate mountains and high hills. It is used either solely or mixed with other vegetables almost in every meal of the Nepalese people. However, the point is, in our country, no meals of the day is complete without potato. Therefore, any study on production and marketing economics of potato couldn't be less important.

Kingdom: *Plantae*Division: *Magnoliophyta*Sub-division: *Angiospermae*Class: *Magnoliopsida*Sub-class: *Asteridae*Order: *Solanales*Family: *Solanaceae*Genus: *Solanum*Species: *tuberosum*

Figure 1: Botanic classification of potato (USDA)

Potato is a cool season crop requiring 18-25 °C for germination, while tuber production is retarded above 20 °C and growth and development is

completely inhibited at 29 °C (MESD, 2015/16). Well drained sandy loam and loam soils, rich in humus are most congenial for potato cultivation. From the viewpoint of yield and scab retardation, the optimum soil pH for potatoes is 4.8-5.4 (International Potato Center, 2010 as cited in Phulara et al., 2021). Similarly, it has high soil moisture requirement as much as 70-80 % of the field capacity during flowering and tuber formation, while 65% is needed during starch deposition in the tubers. In addition to this, the total production is about 3,131,830 tons in 188,098 ha with average productivity of 16.6449 t ha⁻¹ ranking 1st non-cereal crop in terms of area and production (MoALD, 2019/20). Kavre, Dadeldhura, Kailali and Nuwakot are major potato producing districts of Nepal (MoALD, 2015).

Nepal is one of the top-twenty countries where potato contributes significantly for human diet (Gaire et al., 2017). After rice, potato is now second most staple crop in Nepal with per capita consumption of 51kg/year (Rhoades, 1985). Globally, it is no. one non-cereal crop feeding more than a billion people daily (FAO, 2013). Potato provides nutrients such as carbohydrates, vitamins, dietary fiber and minerals (potassium, iron, magnesium), beta-carotenes and polyphenols. Colored potatoes are chief source of anti-oxidants serving the body defense system (Khalid and Akhtar, 2016).

The share of potato in GDP and Agricultural GDP is 2.17% and 6.57% respectively, thereby comprising 42.46% of total vegetable cropped area (ABPSD, 2014/15). Bhaktapur, with valley-type fertile soil, 1329m altitude, cool type climate with annual average temperature (16°C); all of these factors suffice the competitive productivity of this district (Worldwide elevation finder, 2022; ClimateData.org, 2022). Thus, it seems

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there is great opportunity for potato growing farmers to earn huge income. However, low production and profitability are still standing challenges, despite the release of high yielding varieties and increased awareness and government programs on potato production (Gaire et al., 2017).

Bhaktapur has potential to harvest potato twice a year; farmers usually reap potato only once. Correspondingly, potato market is quite mercurial in price along with imports from India. And only cold storage at Jagatai, Suryabinayak has been reported inefficient and insufficient. All of these constraints have been found curtailing the farmer's profit margins. Thus, this study targeted to quantify the cost of production of potato, its profitability and various marketing constraints hindering the growth and expansion of potato commercialization along with SWOT analysis. Therefore, this study primarily aims to extract the real constraints of production and marketing of potato farming at Changunarayan Municipality, Bhaktapur and generalize conclusions safely and suggest change-oriented solutions to farmers and relevant groups and institutions.

2. METHODOLOGY

2.1 Site selection

The study site lies at 27°40'20"N latitude and 85°25'40"E longitude, Bhaktapur, Nepal. Bhaktapur district is located in the eastern part of Kathmandu valley, is the smallest district among the seventy-seven districts of Nepal. It is part of Bagmati Province. The district, with Bhaktapur as its district headquarters, covers an area of 119 km² (46 sq. mi). The district is divided into four municipalities: Bhaktapur, Changunarayan, Madhyapur Thimi, Suryabinayak Municipality. The research was conducted in Changunarayan Municipality of Bhaktapur District. This area was purposely selected as they are the command area of the PMAMP with the potato production potential in the district.

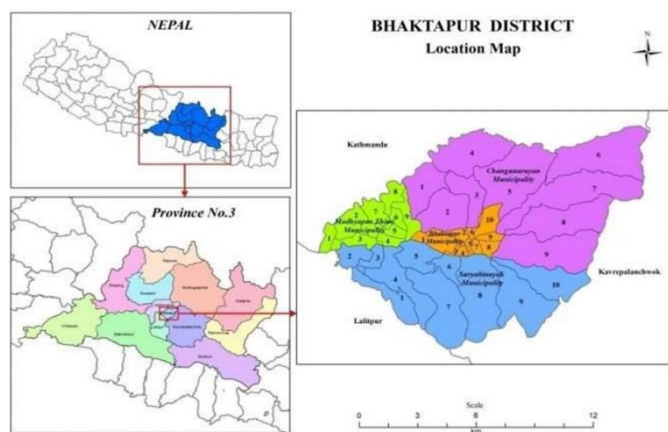


Figure 2: Location map of study sites

2.2 Preliminary field visit

A pre-survey field visit was conducted to congregate preliminary information regarding demographic, socio-cultural, and topographical about the site. This information was used in preparing interview schedule and designing a sampling framework. Various Key Informants, members of PMAMP office, supervisors etc. were consulted during the visit.

2.3 Sources of data

Primary data were collected through interview schedules. These data were supplemented and verified through FGDs, KIIs. Secondary data were obtained from DADO annual reports, bulletins, journals, libraries, DoA, MoALD etc. Moreover, unpublished and published data were considered during the study.

2.4 Sample and sampling technique

A total of 100 samples were drawn using the simple random sampling technique method (SRS). Potato producer of the selected area were the target population for the study. The leading farmers and potato growers were included in the sampling frame. Out of 100 Samples, 20 samples were chosen randomly from Changunarayan municipality ward no.4, while 40 samples were chosen randomly each from ward no.7 and 8 of municipality respectively. All these samples include the potato growing farmers. The potato profile prepared by the project implementation unit was consulted. Household survey was conducted at the major potato producing wards. The farmers were selected after consulting the previous data of potato production in Bhaktapur district published by the project implementation unit Bhaktapur and Agriculture Knowledge Centre. Within the time frame, the household surveys were conducted in addition to the Key Informant

Interview and Group discussions, which were carried out with the small farmers, leading farmers, subject matter specialists and other related stakeholders.

2.5 Research Design

A string of following operations was conducted to collect the required data.

2.5.1 Preparatory phase

A pretested questionnaire and check lists were prepared. Sampling schedules and all other process of the methodologies were finalized before starting off the data collection.

2.5.2 Household survey

The selected houses of farmers or their farms were visited gathering data through prepared questionnaire and interviews. A total of 100 farmers were visited at the selected site.

2.5.3 Focused Group Discussions

A discussion group of 6-12 members with a moderator from varieties of background including commercial potato growers, agro-vet personnel, local traders and official members of PIU, on the topic of 'production, marketability and profitability of potato farming at Bhaktapur', were conducted. A checklist of the question might be used to regulate the discussion.

2.5.4 Key Informant Interviews

KII were conducted, interviewing a number of people with some credible experience and perspectives on a particular topic. We were interviewing local progressive farmers, agro-vet personnel, traders, local leaders and official members of PIU to know their knowledge, opinion and experiences on production, marketing and profitability of potato farming.

2.6 Data analysis technique

The data collected were compiled and analyzed with the tabular method of analysis, simple statistical tools such as arithmetic averages and percentages for the purpose of interpretation of the results. Furthermore, software like MS-Excel and SPSS were employed to crunch the complex data and generalize.

2.6.1 Estimation of the cost and BCR

The collected data were analyzed using general cost concept tabular analysis. For this, simple table with cost, gross return and input-output ratio, were drafted.

And, $BCR = \frac{\text{Gross return}}{\text{Total cost}}$

Total cost

$BCR > 1$: Profitable enterprise

$BCR < 1$: Enterprise at loss

$BCR = 1$: Enterprise neither at loss nor at profit

2.6.2 Marketing margin

Marketing margin is the difference between farm gate price received by the farmers and the price paid by the consumer i.e. retailer's price.

Marketing margin = Retailer's Price (Pr) - Farm gate price (Pf)

For calculating Marketing Efficiency, modified method as suggested by Acharya and Agarwal $ME = \frac{FP}{(MC + MM)}$

Where, ME = Marketing efficiency FP = Net price received by the farmer
MC = Total Marketing cost

MM = Total marketing margin Source: (Acharya and Agarwal, 2004)

2.6.3 Analysis of value-added activities

The data collected from the survey was done coded, tabulated and analyzed using descriptive statistical tools such as frequency, percentage and mean was done used for the analysis of value-added activities data such as washing, selection, sorting and processing were done.

3. RESULTS AND DISCUSSION

3.1 Socio-economic characteristics of the households

The samples estimates were tested using t-test at 90% confidence level, at $\alpha=0.1$ and $df=99$, and descriptive statistics were assumed as per the condition.

3.1.1 Migration status

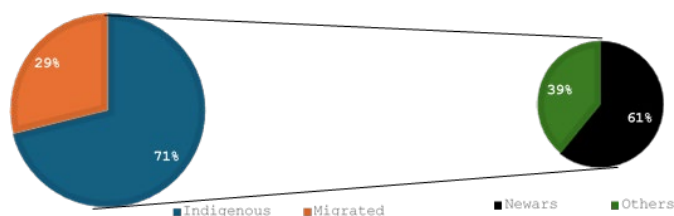


Figure 3: Migration status of the respondents

Majority of the respondents/ potato farmers (>70%, df (99), $\alpha=10\%$, t-test) were found to be indigenous within which more than half of them (61% of indigenous) belonged from Newari community, and few of farmers were from other places than Bhaktapur (29%). This finding is similar to the study, which states 45.5% or respondent were identified as Newar and 29% were from other places. The difference in the percentage of indigenous population maybe due to variation in study scope and farmers' demographics (Thapa et al., 2024).

3.1.2 Age of respondents

Apparently, it was found most of the potato farmers (77%) aged over 30 and few were youths under 30 (23%). A similar study conducted in Bhaktapur found that most of the farmers' fell within age group of 51-75 years (Dahal et al., 2023). One of the study reveals that despite enthusiasm of youths for farming, barriers like limited access to credit, inadequate government support, and poor social perceptions discourage their engagement in agriculture (Khanal et al., 2021).

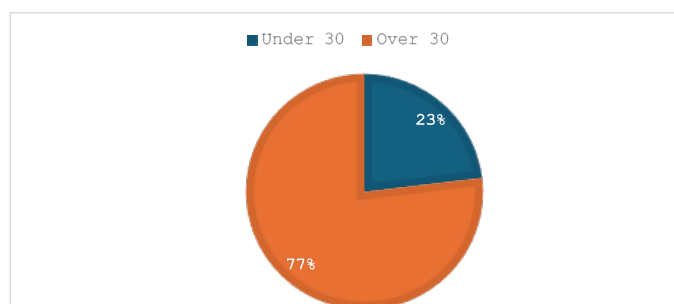


Figure 4: Age of potato farmers

3.1.3 Gender of respondents

While surveying, around 2 males for a female were encountered i.e. 36% of total respondents constitutes females while 64% constitutes males. In other words, more males took part in survey by great extent than females did. The similar study identified higher number of male respondents compared to female (Dahal et al., 2023).

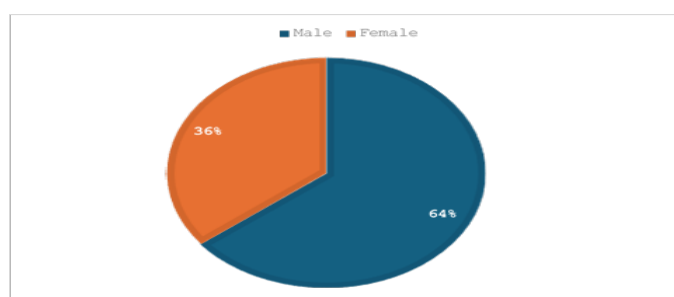


Figure 5: Gender of the respondents

3.1.4 Primary occupation of the respondents

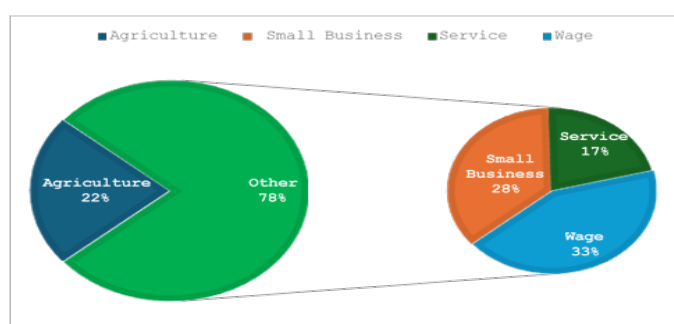


Figure 6: Primary occupation of the respondents

Less than 1/4th (22%) of the respondents were found doing potato farming as a primary occupation for income generation. The potato farmers opted other forms of occupation along with potato farming, which include wage (33%), service sector (17%) and some small businesses (28%). Farmers in this region had diverse income sources due to challenges in marketing and profitability (Dahal et al., 2023; Dhakal, 2023). The report by Asian Development Bank concluded only 53% of household income comes from farming (Asian Development Bank, 2010).

3.1.5 Education level

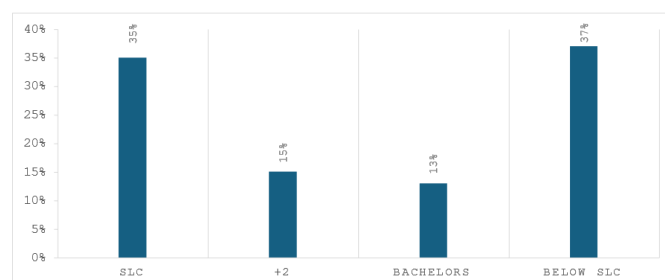


Figure 7: Education level of the respondents

In general, farmers were more in number who were either less educated/uneducated than farmers who were more educated. Clearly, more than 70% of farmers were either illiterate/below SLC and with SLC education (35% + 37%). Less than 30% were observed to have above SLC education i.e. either +2 or Bachelors, the latter being even lesser than the former. A similar study conducted in Surkhet also identified a high rate of illiteracy among farmers (Ghimire and Kandel, 2023).

3.2 Potato farming/Production

3.2.1 Varieties grown

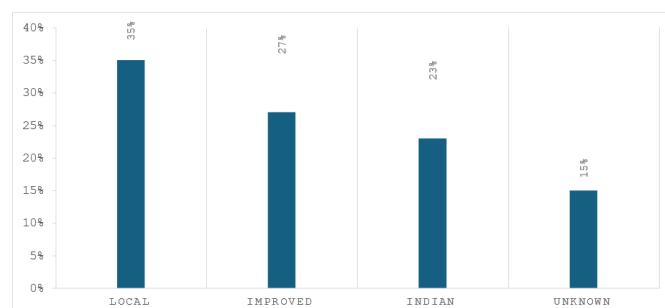


Figure 8: Varieties grown by respondents

Most of the farmers, about 35%, used local varieties of potato followed by improved (Janakdev, Khumal Rato, Desire, TPS etc.), Indian (C4, Rabindra 1) and unknown varieties i.e. farmers opted varieties without caring about the name and features of the varieties, most of which were suggested by other farmers or agro-vet businesspeople. According to a study, 41.56% of farmers cultivated improved varieties, followed by 32.68% who grew local varieties, while 26.32% cultivated Indian varieties (Upadhyay et al., 2020).

3.2.2 Potato growing seasons

About 70% cultivate potato in winter (Sept/Oct) and few farmers (about 22%) reap potato in spring (Feb/Mar) while fewer farmers in both seasons 7%). Nepal has diverse planting and harvesting time across different regions due to geographical differences (Gurung, 2024).

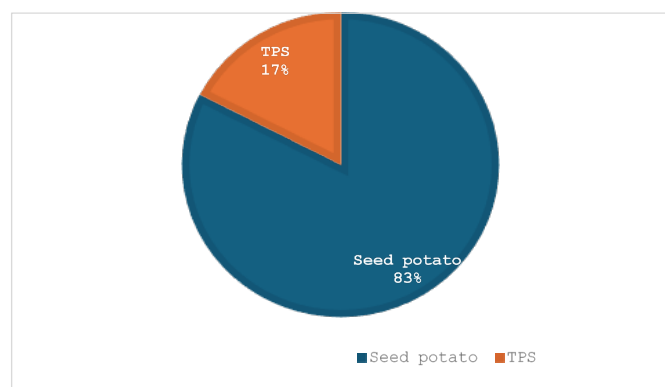


Figure 9: farmers growing potato in various seasons

3.2.3 Seed sowing type

Mostly farmers use seed potato (83%) than TPS (17%), which very few farmers use as many as less than 1/4th of total. Most of the farmers use seed potato in context of Nepal due to the factors like easy planting, fast growth of plant etc (FAO, 2013).

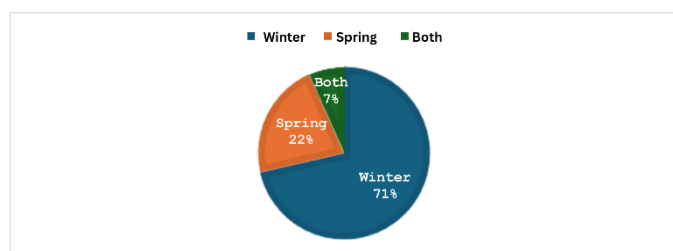


Figure 10: Seed sowing type of potato farmers

3.2.4 Land status of farmers

About 60% of farmer have rented some land and some is available of their own while 13% exclusively rented land for agriculture and 27% performed agriculture on their private land. A study has identified that the most of the people are dependent on rented land compared to private land holding in the context of Nepal (Rastriya Samachar Samiti, 2023).

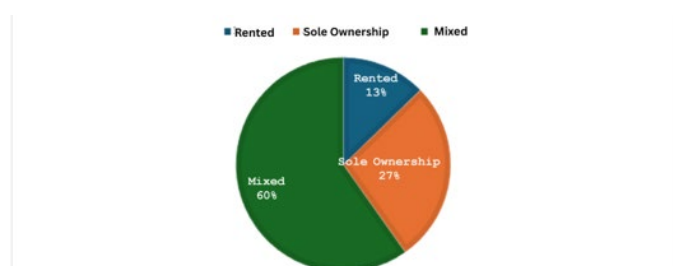


Figure 11: land ownership status of farmers

3.2.5 Agricultural holding for potato production

57% of the population have up to 0.3 ha while 43% have above 0.3ha for cultivation of potato. A study found that land availability for potato is low compared to staple crops like rice and maize (Upadhyay and Timilsina, 2020). This validates our result, which states most of the population are dependent on small areas for potato farming.

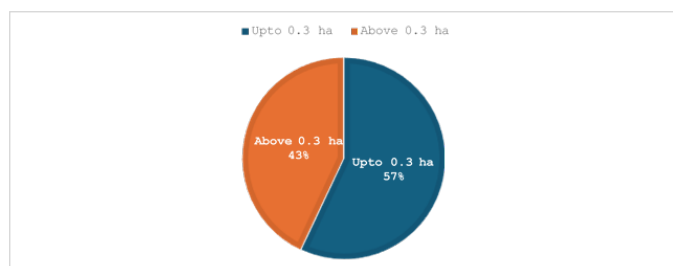


Figure 12: Agricultural Holding for potato cultivation

3.2.6 Years of farming in potato

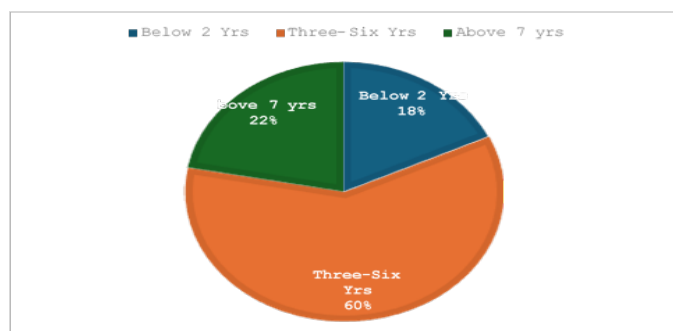


Figure 13: Years of potato farming of respondents

More than half of the respondents (60%) have been doing potato farming for 3-6 years while few of them (about 20%) are either new in potato farming (below 2 yrs.) or have been doing for long time (above 7 years). Very few are entering potato farming and at the same time very few are

remaining in potato farming for long time. Due to low productivity compared to neighboring countries, farmers are discouraged for long term engagement in potato farming (Lama et al., 2016). Similarly, lack of adoption of new varieties of potato also can be reason for low involvement in potato farming (Kharel, 2022).

3.3 Production cost

3.3.1 Input supply situation

In majority (i.e. >75% of cases): Potato tubers/seed were found regularly available both locally and outside sources of moderate quality. Fertilizers, FYM and other agrochemicals including weedicides/fungicides/insecticides and phytohormones were readily available at any time at local agrovets of good quality. As to irrigation and machineries; those were irregularly available, however available at local level. A study in Surkhet, identified late availability of seeds and fertilizers, inadequate production knowledge, and irregular input as major challenges (Ghimire and Kandel, 2023).

Table 1: Input supply situation responded by more than 75% of the respondents

S.N	Inputs	Availability	Source	Quality
I	Seed/Tuber	Regular	Both local & outside	Medium
II	Fertilizer	Regular	Local	Good
III	FYM	Regular	Local	Good
IV	Weedicides/Fungicides/Insecticides	Regular	Local	Medium/Good
V	Irrigation	Irregular	Local	-
VI	Machineries	Irregular	Local	Poor

3.3.2 Input cost

Table 2: Total input cost in potato cultivation/Kattha

Cost attributing items	Average cost/Kattha	% composition
Seed	1716	33.33%
land preparation (ploughing and leveling)	516	10.02%
FYM	634	12.32%
Fertilizers	364	7.07%
Labor cost (Planting, Weeding, Fertilizer application, harvesting and storage)	1353	26.28%
Pesticides	268	5.21%
Micronutrients	39	0.76%
Irrigation	87	1.69%
Packaging, Storage and Transportation	171	3.32%
Total	5148	100.00%

Note: 30 Kattha = 1 ha

The total variable cost of the potato production in the study area was calculated NRs. 5148/Kattha. Clearly, not less than 1/3rd (33.33%) of the total cost of the production is attributed to potato seed alone, which is followed by labor cost which is anything more than 1/4th (26.28%) of total cost in potato cultivation. This suggesting: alone seed and labor cost sum up to more than 50% of the total cost of production in potato farming. Human labor was required for performing different operations such as

planting, fertilizer application, pesticides application, irrigation, weeding, harvesting, and storage. Seed cost occupied the major portion (33.3 %) of the cost of production followed by the human labor cost (26.3%), FYM cost (12.3%), chemical fertilizers cost (7%), irrigation cost (1.7%), micronutrient (0.8%) and pesticides (5.2. %). Lastly, packaging, storage and transportation cost jointly attributed 3.3% to total variable cost.

Comparing cross across different regions, per katha cost of potato production was found to be NRs. 4427 in Bara, NRs. 6290 in Kailali and NRs. 6833 in Jhapa (Subedi et al., 2019). The major inputs used in the production of potato were seed, human labor, bullock labor and farmyard manure (FYM) (Sapkota & Bajracharya, 2017). The average cost of potato cultivation per hectare was found to be Rs 2,67,319 in Darchula (Chauhan et al., 2022a).

3.4 Returns

The field survey revealed following information on returns:

Table 3: Economic indicators of potato production	
Items (Average)	Amount (NRs.)
Total variable cost	5,148.00
Returns from potato sold for food purpose	5,696.24
Returns from potato sold for Seed purpose	5,263.28
Gross Returns	10,959.52
Gross Margins	5,811.52
BCR	2.12

3.4.1 Gross returns, gross margin and benefit-cost ratio

Income from potato was obtained by two means: by selling for food purpose and for seed purpose. The average returns from potato selling for food purpose was Rs. 5,696.24 and from seed purpose was Rs. 5,263.28 together making Rs. 10,959.52 as Gross Return per Kattha.

Similarly, Gross margin is Gross Returns minus Total Variable Cost i.e. (10,959.52 - 5,148.00 = 5,811.52.)

Similarly, BCR = $\frac{\text{Gross returns}}{\text{Total variable cost}} = 2.12$

Total variable cost

The Gross margin being positive and BCR being more than suggest potato farming is economically viable in the study area. Moreover, BCR=2.12, suggests in 1 Kattha, for every one rupee invested, it generates revenue of 2.12 which is more than the double of the investments.

3.5 Marketing

3.5.1 Marketing channels

A marketing channel is the route taken by the title to the goods as they move from producers to ultimate consumers (Stanton, 1975). Marketing channels are combination of agencies by which the seller who is often, though not necessarily manufacture, markets his product to the ultimate consumers (Howard, 1975). There are mainly three marketing channels used by the farmers of the study area.

Producers-----□ Local collectors---□ Wholesalers-----□ Retailers□-----Consumers
 Producers-----□ Local collectors-----□ Retailers -----□ Consumers
 Producers-----□ Wholesalers-----□ Retailers-----□ Consumers

Among these, channel 1 was the most used marketing channel in Bhaktapur district. It is mostly used channel because local collectors are available within the village and in Kamal Binayak area (nearest market of study area). Wholesaler were in continuous touch of local collectors pick potato in their own vehicle. As each actor gets good profit, they all involve in this marketing channel making it most effective and popular. In contrast, Channel 2 & 3 was also prevalent in some of the study areas. The study by a group researcher found that, 46% of farmers used channel involving collector, wholesalers, retailers and consumers (Dahal et al., 2023). It might be due to differences in economic, social and, logistic factors.

3.5.2 Market Margin and Producer's Share

Market margin is termed as the difference between the price paid by the consumer and price received by the farmers. Similarly, producer's share is the proportion of the consumer's payment received by the producers. Lower marketing margin and higher producer's share ensures efficiency of marketing system hence they are the indicators of efficiency of existing marketing system. The study shows that the marketing margin of potato was NRs. 28/Kg.

3.5.2.1 Marketing margin (MM) = consumer's price (Pc) - Price received by the farmers (Pf)

$$= 60 - 28$$

$$= \text{NRs. } 32/\text{kg}$$

$$\bullet \text{ Producer's share} = (Pf/Pc) * 100\%$$

$$= (28/60) * 100\%$$

$$= 47\%$$

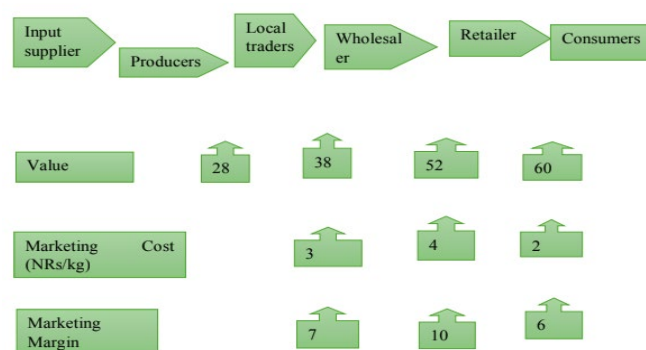


Figure 14: Marketing Margin and Marketing Cost across Marketing channel in Bhaktapur

3.5.3 Price spread

Price-spread is the difference between the actual price received by the producers, the price paid by the consumers, costs incurred and margins earned by the various market intermediaries during the process of marketing. Various factors like transportation costs, market, and intermediaries plays an important role in price spread (The Rising Nepal, 2024).

Price Spread is given by,

$$\text{Price Spread} = \text{Price paid by consumer} - \text{Price received by producer}$$

$$= 60 - 28$$

$$= \text{NRs. } 32/\text{kg}$$

The price spread for potato was found to be NRs.32 per kg.

3.5.4 Price Satisfaction level

To find out the satisfaction level of the respondent, the satisfaction level was categorized as highly satisfied, satisfied, moderately satisfied and dissatisfied. The majority of farmers were dissatisfied (58 percent). It is due to price fluctuation in the context of Nepal (Baral, 2025). Similarly, farmers often feels they are not receiving fair prices for their potatoes due to intermediaries (Shrestha et al., 2022).

Table 4: Satisfaction level of the farmers/respondents towards price (2022)		
Satisfaction level	Frequency	Percent
Highly satisfied	0	0
Satisfied	17	17
Moderately satisfied	25	25
Dissatisfied	58	58
Total	100	100

3.6 Ranking constraints

Based on the farmer's perception, scaling technique also called 'indexing' was used to rank the production and marketing constraints.

3.6.1 Production constraints

As appeared in the table above, disease and pest problem are the most commonplace and severe problem ($I=.71$) in potato production followed closely by lack of availability of the quality seeds ($I=.61$) and lack of proper market ($I=.6$), and finally, moderately severe problems were found to be:

Table 5: Ranking of production constraints in potato farming

Items	0.8	0.6	0.4	0.2	Total	Weightage	Index (I)	Ranking
Disease and Pest problems	8	12	30	33	100	71.142	0.71	I
Lack of improved quality seeds	18	27	22	17	100	60.788	0.61	II
Lack of proper marker	22	15	18	23	100	60.12	0.60	III
Lack of proper irrigation	27	27	20	12	100	57.448	0.57	IV
Lack of labor	25	22	17	13	100	54.442	0.54	V

3.6.2 Marketing constraints

Correspondingly to the way production constraints were identified and ranked, the marketing constraints were also listed and ranked accordingly with same scaling. Clearly, unavailability of the storage facilities was primary concern of the farmers ranking first ($I=.47$) followed by market unavailability ($I=.39$), price fluctuation ($I=.37$), perishable nature of potato

lack of proper irrigation facilities ($I=.57$) and lack of labor (.54). Similarly, various studies found insect pest as one of the major constraints of potato production in Nepal (Karki et al., 2023; Timsina et al., 2011).

Five points scaling was applied (1, .8, .6, .4, .2) to determine the seriousness of the problem and a result came out as:

(.36) and at the least level, lack of transportation ($I=.23$). Insufficient marketing and storage facility is considered major constraints of potato production in Nepal (Dhakal & KC, 2019). In contrast, (Chauhan et al., 2022b) found that in Darchula, the major marketing problems were influenced by Indian market, followed by middleman.

Table 6: Ranking of constraints in marketing of potato

Items	1	0.8	0.6	0.4	0.2	Total	Weightage	Index	Ranking
Storage facility	40	30	20	7	3	100	47.6	0.47	I
Market Unavailability	18	37	13	20	12	100	39.6	0.39	II
Price Fluctuation	33	12	15	12	28	100	37.2	0.37	III
Perishable Nature	7	27	35	30	2	100	36.8	0.36	IV
Lack of Transportation	2	10	18	30	40	60	23.4	0.23	V

4. CONCLUSION

In socioeconomic picture of the study area, the majority of the respondents/farmers were: indigenous (71%), aged over 30 (77%), males (64%), educationally SLC (35%) or below SLC (37%) and occupationally only 22% involved in farming exclusively. Most of the farmers, about 35%, used local varieties of potato followed by improved (Janakdev, Khumal Rato, Desire, TPS etc.), Indian (C4, Rabindra 1) and unknown varieties i.e. farmers opted varieties without caring about the name and features of the varieties, most of which were suggested by other farmers or agro-vet businesspeople. About 70% cultivate potato in winter (Sept/Oct) and few farmers (about 22%) reap potato in spring (Feb/Mar) while fewer farmers in both seasons 7%). Mostly farmers use seed potato (83%) than TPS (17%), which very few farmers use as many as less than 1/4th of total. About 60% of farmer have rented some land and some is available of their own while 13% exclusively rented land for agriculture and 27% performed agriculture on their private land. 57% of the population have up to .3 ha while 43% have above .3ha for cultivation of potato. More than half of the respondents (60%) have been doing potato farming for 3-6 years while few of them (about 20%) are either new in potato farming (below 2 yrs.) or have been doing for long time (above 7 years). Very few are entering potato farming and at the same time very few are remaining in potato farming for long time. 62% of farmers were found not trained by institutions of any sort for potato cultivation while about 38% of them were trained in some ways.

The gross margin is positive and benefit cost ratio, greater than one (2.13), which indicates the financial viability of potato production in Bhaktapur. However, seed cost has occupied the major portion of cost of production (33.3%); adoption of improved varieties could decrease the seed rate which minimizes the seed cost. Seeking the response of the majority of the farmers (>75% of respondents), the seed source- Own home production/ Neighbors/ Friends has been identified as the major source for seed, which indicates towards probability that the larger proportion of the farmers are cultivating either local varieties (37%) or low-quality seeds which are unidentified (15%). Furthermore, disease and pest problem are the most commonplace and severe problem ($I=.71$) in potato production followed

closely by lack of availability of the quality seeds ($I=.61$) and lack of proper market ($I=.6$), and finally, moderately severe problems were found to be: lack of proper irrigation facilities ($I=.57$) and lack of labor (.54). Clearly, unavailability of the storage facilities was primary concern of the farmers ranking first ($I=.47$) followed by market unavailability ($I=.39$), price fluctuation ($I=.37$), perishable nature of potato (.36) and at the least level, lack of transportation ($I=.23$). No proper post-harvest activities were observed. There is an immense need of proper coordination between agricultural service providers and the farmers; also, strategic plans need to be formulated by the government to address these problems.

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