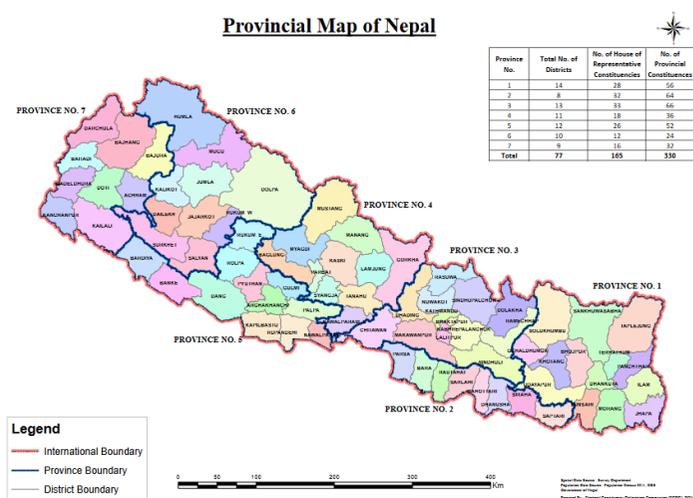


PRODUCTION COST ANALYSIS OF MAJOR VEGETABLES (tomato, potato, cauliflower, cucumber and leafy vegetables) AT PROVINCE 3

Provincial Map of Nepal



1. INTRODUCTION

Geographically, Nepal is divided into three major zones, high hill, mid hill and terai. Agriculture is the major sources of livelihood for more than 65.5% people. It contributes more than 27.1% GDP of the country (MoAD, 2017/2018). Government of Nepal, has given due emphasis for the promotion of high value but low volume cash generating crops. Vegetable crops are important crops for vital nutrients and vitamins. Different vegetables; Cauliflower, cabbage, broccoli, radish, Rayo (Cruciferous), tomato, brinjal, chilli (Solanaceae), cucumber, bottle gourd, sponge gourd, bitter gourd, squash chayote (Cucurbitaceae), beans, okra, garlic, onion and asparagus are cultivated in the country. The total area coverage under vegetable is 286864 ha with annual production of 3.958 million metric tonnes in whole Nepal (MoAD, 2017/18). Province 3, with vegetable cultivation area of about 48149 ha and total production of 701608 mt stands in the third position after province 1 and 2 whereas stands first position on the productivity i.e. 14 mt/ha along with the province no 5 (MoAD, 2017/18). The major vegetable transaction is carried out in province no 3 because of its highest population of about 5529452. Not only this, this province is centre of attraction to tourist. Thus, commercial farming as well as peri urban vegetable production is being practiced in this province from the long time.

2. OBJECTIVES

- To identify production cost analysis of major vegetables (cauliflower, cucumber, tomato, potato and leafy vegetables) grown at province no 3.
- To identify the gross margin of major vegetables (cauliflower, cucumber, tomato, potato and leafy vegetables) grown at province no 3.
- To prepare the report which will be helpful to design and implement the eco-friendly improved technologies at province no 3.

3. MATERIALS AND METH

3.1. LOCATION OF THE STUDY

The districts were selected on the basis of vegetable zone i.e. tropical, sub-tropical and temperate. Similarly, five districts Chitwan, Dhading, Nuwakot, Lalitpur and Rasuwa were selected which represented the tropical, sub tropical and temperate respectively.

3.2. TARGET CROPS

The study included the major vegetables grown throughout the Pradesh no 3. The major emphasis was given to the tomato, potato, cauliflower, cucumber and leafy vegetables which has been prioritized by the Pradesh no 3 as well.

3.3. DURATION OF THE STUDY: 2.5 months

3.4. RESEARCH TOOLS USED

Review: Desk study, Site selection, Framework of the study.

Data collection: Survey (Individual Household), Key Informants Interview (KII), Focal Group Discussion (FGD), Field visit.

Data Analysis, report and presentation: MS Excel, SPSS, MS Word, pie chart, venn diagram, tables, graphs, Powerpoint.

4. RESULT AND DISCUSSION

4.1. Type of farming

71.2% of respondents from Chitwan, 84.6% from Nuwakot and 66.7% from Rasuwa are practicing semi commercial farming. Whereas, 84.2% from Makwanpur, 52% from Dhading and 100% from Kathmandu are practicing commercial farming. The finding is statistically significant ($\chi^2=39.02$, $P<0.001$).

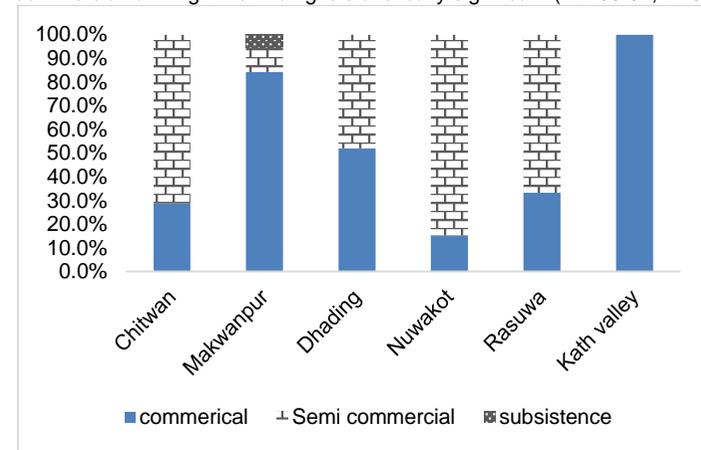


Figure 1: Type of farming of respondents

4.2. Area of production of selected vegetables (per household)

Table 1 : Production area per HH of selected vegetables

District	Area (ropani/HH)				
	Tomato	Potato	Cauliflower	Cucumber	Leafy vegetable
Chitwan	8.48	7.7	7.6	6.74	4.1
Makwanpur	1.9	5.28	2.3	3.83	2.5
Dhading	2.1	7.0	2.8	2.00	0.66
Nuwakot	5.3	12.0	4.1	2.58	1.23
Rasuwa	4.4	5.57	5.3	3.78	2.70
Kath valley	7.8	5.1	3.2	2.02	1.60
Total	4.99	7.25	4.2	5.29	2.13

Source: HH survey, 2019

The area of tomato production per household is highest for Chitwan (8.48 ropani per household) and minimum in case of Makwanpur (1.9 ropani per household). Similarly, acreage for potato is highest for Nuwakot (12 ropani per household) and minimum in case of Kathmandu (5.1 ropani per household). The area of cauliflower is highest for Chitwan (7.6 ropani per household) and minimum in case of Makwanpur (2.3 ropani per household). The area of cucumber production per household is highest for Chitwan (6.74 ropani per household) and minimum in case of Dhading (2 ropani per household). Moreover, the area of leafy vegetable production per household is highest for Chitwan (4.1 ropani per household) and minimum in case of Dhading (0.66 ropani per household). Detail is shown in the table above.

4.3 Information (cost, income and B:C ratio) about selected crops

4.3.1. Tomato

The cost per ropani is minimum for Makwanpur (Rs. 30167.66/ropani) whereas maximum in Kathmandu (Rs. 55000/ropani). Income per ropani is least in Chitwan (Rs. 51672.41) whereas it is maximum in Kathmandu (Rs. 115000). The B: C ratio is also lowest in Chitwan (1.53:1) whereas highest in Kathmandu (2.09:1). Detail is shown in the table below.

Table 2: Cost (Rs/ropani) , Income (Rs/ropani) and B:C ratio of tomato

District	Cost/ropani	Income/ropani	B:C
Chitwan	33741.37	51672.41	1.53:1
Makwanpur	30167.66	58333.33	1.60:1
Dhading	35666.66	62333.33	1.74:1
Nuwakot	38333.33	70000.00	1.82:1
Rasuwa	44714.28	78571.42	1.75:1
Kath valley	55000.00	115000.00	2.09:1
Total	237623.3	435910.49	1.83: 1

Source: HH survey, 2019

4.3.2. Potato

The cost per ropani is minimum for Chitwan (Rs. 11666.66/ropani) whereas maximum in Kathmandu (Rs. 25714.28/ropani). Income per ropani is least in Dhading (Rs. 20000) whereas it is maximum in Kathmandu (Rs. 50000). The B: C ratio is lowest in Dhading (1.53:1) whereas highest in Kathmandu (1.94:1). Detail is shown in the table below.

Table 3: Cost (Rs/ropani) , Income (Rs/ropani) and B:C ratio of potato

District	Cost/ropani	Income/ropani	B:C
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Chitwan	11666.66	20083.33	1.72: 1
Makwanpur	14789.68	24805.88	1.67: 1
Dhading	13000	20000	1.53: 1
Nuwakot	20444.44	37777.77	1.84: 1
Rasuwa	24301	47000	1.93: 1
Kath valley	25714.28	50000	1.94: 1
Total	109916	199667	1.81: 1

Source: HH survey, 2019

4.3.3. Cauliflower

The cost per ropani is minimum for Makwanpur (Rs. 9550.30/ropani) whereas maximum in Kathmandu (Rs. 28000/ropani). Income per ropani is least in Chitwan (Rs. 18823.52) whereas it is maximum in Kathmandu (Rs. 58800). The B: C ratio is lowest in Nuwakot (1.59:1) whereas highest in Kathmandu (2.1:1). Detail is shown in the table below.

Table 4: Cost (Rs/ropani) , Income (Rs/ropani) and B:C ratio of cauliflower

District	Cost/ropani	Income/ropani	B:C
Chitwan	10147.05	18823.52	1.85:1
Makwanpur	9550.3	20617.64	2.15: 1
Dhading	14708.33	23541.66	1.60: 1
Nuwakot	15625	24900	1.59: 1
Rasuwa	15555.55	25333.33	1.62: 1
Kath valley	28000	58800	2.1:1
Total	93586.23	172016.15	1.83: 1

Source: HH survey, 2019

4.3.4. Cucumber

The cost per ropani is minimum for Rasuwa (Rs. 21202/ropani) whereas maximum in Kathmandu (Rs. 28930/ropani). Income per ropani is least in Dhading (Rs.35451) whereas it is maximum in Kathmandu (Rs. 49000). The B: C ratio is lowest in Makawanpur (1.5) whereas highest in Rasuwa (1.71). Detail is shown in the table below.

Table 5: Cost (Rs/ropani) , Income (Rs/ropani) and B:C ratio of cucumber

District	Cost/ropani	Income/ropani	B:C
Chitwan	22837.8	38002	1.66: 1
Makwanpur	24017.2	36241	1.50: 1
Dhading	23339	35451	1.51: 1
Nuwakot	24102	38678	1.60: 1
Rasuwa	21202	36389	1.71: 1
Kath valley	28930	49000	1.69: 1
Total	144428	233761	1.61: 1

Source: HH survey, 2019

4.3.5. Leafy vegetables

The cost per ropani is minimum for Chitwan (Rs. 6791.66/ropani) whereas maximum in Kathmandu (Rs. 15500/ropani). Income per ropani is least in Dhading (Rs.12005) whereas it is maximum in Kathmandu (Rs. 20765). The B: C ratio is lowest in Kathmadu (1.33) whereas highest in Chitwan (2.09). Detail is shown in the table below.

Table 6: Cost (Rs/ropani) , Income (Rs/ropani) and B:C ratio of leafy vegetables

District	Cost/ropani	Income/ropani	B:C
Chitwan	6791.66	14215	2.09: 1
Makwanpur	7102	13559	1.90: 1
Dhading	7540	12005	1.59: 1
Nuwakot	7500	15030	2.00: 1
Rasuwa	8000	12245	1.53: 1
Kath valley	15500	20765	1.33: 1
Total	52433.66	87819	1.67: 1

Source: HH survey, 2019

4.4. Cost of production of each commodity

The average cost of tomato was found to be NRs. 16.34 whereas that of cauliflower, cucumbeber, potato and leafy vegetables was NRs. 20.71, NRs. 17.77, NRs. 18.34 and NRs. 10.43 respectively. Detail about cost of production of each commodity with respect to studied districts is shown in the table below.

Table 7: Cost of production (NRs/kg) of the selected vegetables

District	Cost/Kg of commodity				
	Tomato	Cauliflower	Cucumber	Potato	Leafy veg
Chitwan	15.43	19.802	16.86	17.435	9.52

Makwanpur	15.22	19.592	16.65	17.225	9.31
Dhading	16.54	20.912	17.97	18.545	10.63
Nuwakot	17.08	21.452	18.51	19.085	11.17
Rasuwa	17.66	22.032	19.09	19.665	11.75
Kath valley	16.09	20.462	17.52	18.095	10.18
Average	16.34	20.71	17.77	18.34	10.43

Source: HH survey, 2019

4.5 Cost of production, income and benefit cost ratio of high tech technologies in vegetable production at the study area

Based on key informant interview with experts involved in constructing and implementing polyhouse and net house in the province, the information about cost of production, sales of production and B:C ratio is shown in the table below.

Table 8: Cost (Rs/ropani) , Income (Rs/ropani) and B:C ratio of major vegetables in high tech condition

Commodity	Cost of production				Sales of production				Benefit Cost ratio			
	naturally ventilated polyhouse		nethouse		naturally ventilated polyhouse		nethouse		naturally ventilated polyhouse		nethouse	
	local	hybrid	local	hybrid	local	hybrid	local	hybrid	local	hybrid	local	hybrid
Tomato	25000	27000	22000	25000	53320	65000	45017	53221	2.13:1	2.40:1	2.04:1	2.12:1
cauliflower	11245	13229	10354	14001	22071	25005	21019	29005	1.96:1	1.89:1	2.03:1	2.07:1
Cucumber	20000	24000	19000	21000	45765	52540	44204	49234	2.28:1	2.18:1	2.32:1	2.34:1
Potato	12141		11540	-	33000	-	30400	-	2.71:1	-	2.63:1	-
Leafy vegetable	8245	10563	7510	9345	22034	25671	18321	23001	2.67:1	2.43:1	2.43:1	2.46:1

Source: KII, 2019

5. SUMMARY AND CONCLUSION

The B:C ratio for tomato was maximum in Kathmandu valley (2.09:1) and minimum in Chitwan (1.53:1). The minimum cost of production was seen at Makwanpur with Rs. 30167.66 (B: C =1.60:1) and minimum revenue was obtained at Chitwan with Rs. 51672.41/ropani. The highest cost of production for cultivating potato was seen at Kathmandu valley (Rs. 25714.28/ropani) where revenue (Rs. 50000/ropani) and B:C (1.94: 1) were also found highest. The least revenue was obtained at Dhading (Rs. 20000/ropani). The B:C ratio was also lowest at Dhading (1.53: 1). Cauliflower's cost of cultivation was least at Makwanpur (Rs. 9550.3/ropani) where B:C ratio was maximum (2.15:1). The revenue generation was however maximum at Kathmandu with Rs. 58800 (cost of production=Rs. 28000/ropani , being highest of all).

The cost per ropani in case of cucumber is minimum for Rasuwa (Rs. 21202/ropani) whereas maximum in Kathmandu (Rs. 28930/ropani). Income per ropani in case of cucumber is least in Dhading (Rs.35451) whereas it is maximum in Kathmandu (Rs. 49000). The B: C ratio is lowest in Makawanpur (1.5:1) whereas highest in Rasuwa (1.71:1). For leafy vegetables, the cost per ropani is minimum for Chitwan (Rs. 6791.66/ropani) whereas maximum in Kathmandu (Rs. 15500/ropani). Income per ropani is least in Dhading (Rs.12005) whereas it is maximum in Kathmandu (Rs. 20765). The B: C ratio is lowest in Kathmadu (1.33:1) whereas highest in Chitwan (2.09:1).

The cost of production for local is less than hybrid for all crops. The cost while cultivating at net house drops sharply in comparison with naturally ventilated poly house. The B:C ratio for tomato was high at naturally ventilated polyhouse (2.13:1 for local, 2.40:1 for hybrid) in comparison with nethouse (2.04:1 for local and 2.12:1 for hybrid). The B:C ratio for cauliflower was maximum for nethouse (2.03:1 for local, 2.07:1 for hybrid) in comparison with naturally ventilated polyhouse (1.96:1 for local and 1.89:1 for hybrid). Similar case was seen in case of cucumber also. The B:C ratio for naturally ventilated polyhouse was lower (2.28:1 for local, 2.18:1 for hybrid) to nethouse (2.32:1 for local, 2.34:1 for hybrids). The B:C ratio for potato was highest in case of naturally ventilated polyhouse (2.71:1 for polyhouse and 2.63:1 for net house). The B:C ratio of cucumber was also seen highest in naturally ventilated polyhouse (2.67:1 for local, 2.43:1 for hybrids) to net house (2.43:1 for local, 2.46:1 for hybrids). Similarly, the average cost of tomato was found to be NRs. 16.34 whereas that of cauliflower, cucumbeber, potato and leafy vegetables was NRs. 20.71, NRs. 17.77, NRs. 18.34 and NRs. 10.43 respectively.

The study summarized that the selected districts are potential for commercialization of vegetable sector. The base for selected vegetables viz. potato, tomato, cauliflower, cucumber and leafy vegetables is already prepared. The farmers are getting substantial amount of margin mostly in case of Kathmandu valley. The B:C ratio is also higher in Kath area. For the majority of crops, net house seems to be expensive but it seem to fetch higher B:C ratio in comparison to naturally ventilated polyhouse. The major problems stressed were lower price being offered, syndicate among marketers and inaccessibility to organized markets. Positive vibes were seen among farmers due to increased government interest and stable government as well.

6. RECOMMENDATION

- Easy loan and subsidy.
- Fix vegetable price.
- Identify problems of farmers and act accordingly.
- Identify real farmers and support them.

- Provision of loan, insurance, subsidy and improved technology.
- Irrigation facilities and easy linkage to extension agents.
- Availability of cheap and quality seeds.
- Practice good services.
- Service reach to grassroots level.
- Better market information and marketing facilities.

7. REFERENCE

MoAD, 2017/18. Statistical Information on Nepalese Agriculture. Ministry of Agriculture Development. Agribusiness Promotion and Statistics Division. Agristatic Section, Singha Durbar, Kathmandu.