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BENEFIT COST ANALYSIS OF MAJOR FRUITS AT BAGMATI PROVINCE

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ABSTRACT

A study was carried out in four districts of Bagmati province to access the B:C ratio of major fruits. Benefit cost ratio is one of the major economic indicators that influence the farmer to carry out the cultivation of crop. A total of 104 farmers were used as respondent. The B:C ratio was maximum for papaya with 4.07 and least for lime with 1.07 over the period of 25 years. About the reasons of doing fruit cultivation, 46.9% said it to be highly profitable, 23.5% for increasing demand, 17.3% for easy to manage, 7.1% for marginal land utilized and 4.2% for other reasons. 63.38% of the respondents requested for technical assistance regarding fruit cultivation. 66.67% of the respondents get assistance and support from provincial government. 75.2% were satisfied with what they are doing and 86.7% are seeking extension and modification.

Keywords: B:C ratio, Bagmati, fruit cultivation

INTRODUCTION

Nepal is an agriculture country with 65.5% actively population engaged on agriculture and contributing more than 27.1% GDP of the country (MoAD, 2017/18). Government of Nepal has given emphasis for the promotion of high value but low volume cash generating crops. Fruit crops are important crops for vital nutrients and vitamins. Because of the climatic variations, different fruits are grown on the altitudinal basis. Moreover, we can grow tropical to temperate type

of fruits since we are gifted with 4 physiographic/horticultural zones. The total productive area coverage under fruits is 120023 with annual production of 1177640 metric tons with productivity of 9.81 t/ha in whole Nepal (MoAD, 2018/19). The major fruit transaction is carried out in Bagmati province because of its highest population of about 5529452. Not only this, this province is center of attraction to tourist. Thus, commercial fruit farming is being practiced in this province from the long time. Despite this, Nepal imports large quantity of fruit investing of billions of currencies. Even though the farmers are engaged in commercial fruit cultivation and the support from government has intense positive impact of increment in yield i.e. 9.81 mt/ha in 2018/19 (MoAD, 2018/19). With the education and health awareness among the consumers have led the increased demand every year which compelled the country to invest more money on importing the fruits from outside the world. In order to be in line with the increased fruit demand, there needs to motivate the farmers on fruit cultivation and Bagmati province need to utilize the marginalized steep lands on commercial fruit production. The farmers will be convinced once they get acquainted with cost of the production along with the B'C ratio of specific commodity. The study related to production cost analysis of major fruits grown throughout the Bagmati province was carried out which will be helpful to design and implement the eco-friendly improvised technologies at Bagmati province in order to motivate the farmers towards orcharding enterprises.

MATERIALS AND METHODS

Location of the study: A survey was done at four districts viz, Chitwan, Sindhuli, Dolakha and Ramechhap of Bagmati Province, Nepal with a total of 104 farmers to access the B:C ratio of major fruits. Primary data were collected through household survey, key informants' interview and focused group discussion. Secondary data were collected from various national repositories, district profiles and all other valid sources. A well-structured questionnaire was prepared and pre-tested in 10% of the households before household survey.

Survey tools and techniques: Key Informant Interview (KII) to 15 person and 4 Focus Group Discussion (FGD) were be primarily used for the study.

Data analysis: Data collected through qualitative methods through FGD, KII and field observation were coded and tabulated. The data was entered in MS-excel 2013 and analyzed using Statistical Package for Social Science version 23.

RESULTS AND DISCUSSION

Fruit growing status and varieties grown: Around 61% of respondents in study district were involved in papaya cultivation, 58.2% in banana, 65.3% in sweet orange, 68.4% in mandarin, 67.3% in lime and 76.5% in kiwi cultivation. The name of varieties of these fruits is given in table 1. Farmers usually prefer early establishing/fruiting cultivars with both high yield in terms of quality and quantity.

Table 1. Name of the varieties used by the farmers

Fruits	Varieties
Papaya	Red lady
Banana	Malbhog, G9, Harichhal, William hybrid
Sweet orange	Pongon, Satusma, OKitchu, Unshuii , NCPR 27 84
Mandarin	Otapongan, Okitchu, Unshuu
Lime	Golden lime, Local
Kiwi	Hay wart, Local

Source: HH survey, 2021

Benefit cost analysis of mandarin: It was found that the cost of mandarin was found to be NRs. 145143.7 for first year and NRs. 113804 for second year. The cost of production increased by 10% each year up to 10 years and remain same for about 25 years. Whereas the production starts from fourth year and production increased up to 15 years and then decreased by 20% and remain same for about 25 years. From the survey it was found out that B:C ratio was found to be maximum at 7th year i.e. 2.55 and about B:C ration of 1.54 was found up to 25 years of the mandarin establishment (Table 2).

Table 2. Benefit cost analysis of mandarin

S. N.	Particulars	Year											
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11-15	16-25
1	Production(kg/plant)				5	17	27	45	45	50	50	50	40
2	Production(MT/ha)				1.48	5.04	8.01	1.33	1.33	1.48	1.48	14850	11880
3	Total income		0	0	51975	176715	280665	467775	467775	519750	519750	519750	415800
4	Total cost (After third year cost increases by 10%)	145143	113804	125184.4	137702	151473	166620.4	183282.5	201610.7	221771.8	243949	268343	268343
5	Profit/loss		-113804	-125184.4	-85727	25241	114044	284492.5	266164.3	297978.2	275801	251406	147456
6	**B:C ratio**				**0.37**	**1.1**	**1.6**	**2.5**	**2.3**	**2.3**	**2.1**	**1.93**	**1.54**

Source: HH survey, 2021

Benefit cost analysis of banana: It was found that the cost of banana production was found to be NRs. 164142.6 for first year and NRs. 121776.6 for the second year. The cost of production increased by 10% for the third year and the banana plantlets are replaced from the fourth year for high yield. Whereas the production starts from second year and is maximum on third year. From the survey it was found out that B:C ratio was found to be maximum at 3rd year i.e. 1.32 and about 1.27 on third year (Table 3).

Table 3. Benefit cost analysis of banana

S.N.	Particular	Phases		
		1st year	**2nd year**	**3rd year**
1	Production(kg/plant)		8	9
2	Production(kg/ha)		7920	8910
3	Total income		277200	311850
4	Total cost	164142.6	121776.6	133954.3
5	Profit/loss	-164143	155423.4	177895.7
6	**B:C ratio**		**1.27**	**1.32**

Source: HH survey, 2021

Benefit cost analysis of sweet orange: It was found that the cost of sweet orange production was found to be NRs. 116400.2 for first year and NRs. 88903.8 for second year. The cost of production increased by 10% each year up to 15 years and remain same for about 25 years. Whereas the production starts from fourth year and production increased up to 15 years and then decreased by 20% and remain same for about 25 years. From the survey it was found out that B:C ratio was found to be maximum at 8th year i.e. 3.06 and about B:C ration of 1.80 was found up to 25 years of the sweet orange establishment (Table 4).

Table 4. Benefit cost analysis of sweet orange

S.N.	Particular	Investment Phases											
		1st	2nd year	3rd	4th	5th	6th	7th	8th	9th	10th	11-15	16-25
1	Production(kg/plant)				5	18	30	40	46	48	45	45	36
2	Production(kg/ha)				1500	5400	9000	12000	13800	14400	13500	13500	10800

3	Total income				57,000	189,000	315,000	420,000	483,000	504,000	472,500	472,500	378,000
4	Total cost (From third year cost increased by 10%)	1164000.2	888903.8	977974.18	1075773.6	1183331	1301164.1	1431280.5	1574498.5	1732048.4	1905273.2	2096030.5	2096030.5
5	Profit/loss	-1164000	-888903.8	-977974.2	-505573.6	706669.04	1848351.9	2768195.5	3255015.5	3307951.6	2851926.8	2626469.5	1683969.5
6	**B:C ratio**				**0.52**	**1.59**	**2.42**	**2.93**	**3.06**	**2.90**	**2.47**	**2.25**	**1.80**

Source: HH survey, 2021

Benefit cost analysis of lime: It was found that the cost of lime production was found to be NRs. 189408.2 for first year and NRs. 136343.45 for second year. The cost of production increased by 10% each year up to 15 years and remain same for about 25 years. Whereas the production starts from fourth year and production increased up to 15 years and then decreased by 20% and remain same for about 25 years. From the survey it was found out that B:C ratio was found to be maximum at 6th year i.e. 2.43 and about B:C ration of 1.07 was found up to 25 years of the lime establishment (Table 5).

Table 5. Benefit cost analysis of lime

S.N.	Particular	Investment Phases											
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11-15	16-25
1	Production(kg/plant)			5	17	27	45	45	50	50	50	40	45
2	Production(kg/ha)			18000	61200	9720	16200	16200	18000	18000	18000	14400	16200
3	Total income			540000	183,600	291600	486000	486000	540000	540000	540000	432000	345600
4	Total cost (From third year cost increased by 10%)	189408.2		1363 43.45	1499	1649	1814 73.1	1996 20.4	2195 82.48	2415 40.7	2656 94.8	2922 64.3	3214 90.7	3214 90.7

				77.8	75.6								
5	Profit/loss	-189408	-13637743.45	-95977.8	186244.3	11012626.9	2863379.6	266417.51	2984593	2743052	2477357	1105093	2410943
6	**B:C ratio**			**0.63**	**1.11**	**1.60**	**2.43**	**2.21**	**2.23**	**2.03**	**1.84**	**1.34**	**1.07**

Source: HH Survey, 2021

Benefit cost analysis of papaya: It was found that the cost of papaya production was found to be NRs. 170355.3 for first year and NRs. 125741.8 for the next five year. The cost of production remains same from second year to fifth year and the papa plants are replaced from the sixth year for higher yield. The production starts from second year and is maximum on fourth year and decline again on 5th year. From the survey it was found out that B:C ratio was found to be maximum at 5th year i.e. 6.61 and minimum of about 4.07 on second year (Table 6).

Table 6. Benefit cost analysis of papaya

S.N.	Particular	Investment Phases				
		1st year	2nd year	3rd	4th	5th
1	Production(kg/plant)		16	20	26	22
2	Production(kg/ha)		12800	16000	20800	17600
3	Total income		512000	640000	832000	704000
4	Total cost	170355.3	125741.8	125741.8	125741.8	125741.8
5	Profit/loss	-170355.3	386258.2	514258.2	706258.2	578258.2
6	**B:C ratio**		**4.07**	**5.08**	**6.61**	**5.59**

Source: HH survey, 2021

Benefit cost analysis of kiwi: It was found that the cost of kiwi production was to be NRs. 380632.5 for first year and NRs. 155666.5 for the second year and the production cost was increased by 10% each year up to 15 years and remain same for about 25 years. The production starts from fourth year and is maximum on 10th to 15th year and later on decreased by 20% for about 25 years. From the survey it was found out that B:C ratio was found to be maximum at 10th year i.e. 4.04 and about 2.94 B:C ratio can be obtained up to 25 years (Table 7).

Table 7. Benefit cost analysis of kiwi

S.N.	Particular	Investment Phases											
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11-15	16-25
1	Production(kg/plant)				3	10	20	30	35	40	45	45	45
2	Production(kg/ha)				720	2400	4800	7200	8400	9600	10800	10800	8640
3	Total income				90,000	300,000	600,000	900,000	1,050,000	1,200,000	1,350,000	1,350,000	1080000
4	Total cost	380632.5	155666.5	171233.15	188356.5	207192.2	227911.4	250702.5	275772.8	303350	333685	367053.5	367053.5
5	Profit/loss	-380633	-155667	-171233.15	-98356.5	92807.85	372088.6	649297.5	774227.2	896650	1016315	982946.5	712946.5
6	**B:C ratio**				**0.47**	**1.44**	**2.63**	**3.58**	**3.80**	**3.95**	**4.04**	**3.67**	**2.94**

Source: HH survey, 2021

CONCLUSION

Almost 61% of respondents in studied districts were involved in papaya cultivation, 58.2% in banana, 65.3% in sweet orange, 68.4% in mandarin, 67.3% in lime and 76.5% in kiwi cultivation. Farmers usually prefer early establishing / fruiting cultivars with both high yield in terms of quality and quantity.

It was found that the cost of mandarin was found to be NRs. 145143.7 for first year and NRs. 113804 for second year and B:C ratio was found to be maximum at 7th year i.e. 2.55 and about B:C ration of 1.54 was found up to 25 years of the mandarin establishment. Similarly, the cost of banana production was found to be NRs. 164142.6 for first year and NRs. 121776.6 for the second year and B:C ratio was found to be maximum at 3rd year i.e. 1.32 and about 1.27 on third year.

In addition, the cost of sweet orange production was found to be NRs. 116400.2 for first year and NRs. 88903.8 for second year and B:C ratio was found to be maximum at 8th year i.e. 3.06 and about B:C ration of 1.80 was found up to 25 years of the sweet orange establishment. Similarly, the cost of lime production was found to be NRs. 189408.2 for first year and NRs. 136343.45 for second year and B:C ratio was found to be maximum at 6th year i.e. 2.43. Moreover, the cost of papaya production was found to be NRs. 170355.3 for first year and NRs.

125741.8 for the next five year and B:C ratio was found to be maximum at 5th year i.e. 6.61 and minimum of about 4.07 on second year. Similarly, the cost of kiwi production was to be NRs. 380632.5 for first year and NRs. 155666.5 for the second year and B:C ratio was found to be maximum at 10th year i.e. 4.04 and about 2.94 B:C ratio can be obtained up to 25 years.

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