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Economics of Chilli Cultivation in Wokha District of Nagaland, India

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Abstract

The present research study was conducted in Wokha district of Nagaland. The study comprises of 60 sample farmers selected by following a multi stage stratified random sampling technique. Socio economic status of the chilli growers in the study area reveals a literacy percentage of 95.74 percent and the average family size of chilli growers in the study area was found to be 4.35. Earners constitute about 33.33 percent of the total sample population of the working population, 58.15 percent of the sampled respondent depends on agricultural and allied activities as their main occupation. From the study on economic analysis of chilli cultivation revealed that on an average per hectare total cost of chilli cultivation was ₹.1,38,596.67 with a gross income of ₹.3,00,440.00. The average yield of chilli was found to be 75.00 q per ha. Considering the prevailing price of chilli in the study area which is ₹.4,000.00 per q the gross income was found that the average net return from chilli cultivation ₹.1,52 888.66. Out of the total cost, the share of variable cost and fixed cost constitute 93.59 percent and 6.41 percent respectively. whereas the benefit cost ratio was found out to be 2.24.

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Introduction

Chilli (*Capsicum annum* L.) is one of the important commercial crops of India. Chilli or hot pepper is a tropical vegetable as well as spice crop commonly used throughout the world as spice for its pungency and red colour from ripe and dried fruits and also for pungency and flavour from green fruits.[1] Chilli is indigenous to South America and was first cultivated around 7000-6000 BC. By the turn of 15th century, when Spanish and Portuguese discovered South America, it was widely cultivated. Due to distinct type variability available in the North- Eastern states, it is assumed that Christian missionaries directly introduced capsicum into North East India from South America.[2] Major chilli producing and exporting states in India includes *viz*., Andhra Pradesh, Karnataka,

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Maharashtra, Orissa, Tamil Nadu, Madhya Pradesh, West Bengal and Rajasthan accounting for more than 80.00 percent of the total area and production. The state of Andhra Pradesh is the leading producer of chilli both in area and production contributing on an average of 25.00 percent of the total area and as high as 40.00-50.00 percent of the total production.[3] India has a huge comparative advantage in growing and export of chilli, thus this potential can be realised through initiatives of the government in facilitating the farmers and traders by means of developing transport facilities and other inputs in the process of marketing.[4]

The States in the North Eastern region have been producing substantial quantities of fruits and vegetables, which have considerable potential for exports to the international markets. As per estimates of North Eastern Council, the region produces 23.44 lakh tonnes of fruits in 4.87 lakh ha area and 1.22 lakh tonnes of spices like turmeric, ginger, onion and chillies. Nagaland has the unique characteristic of highest size of operational holdings at 6.8 ha, which is higher than the Northeast regional average of 1.59 ha and also of the all-India level 1.6 ha. Therefore, Government as well as local inhabitants should get more attention for implementation the cultivation of these crops, which may generate more income as well as employment with minimum investment of input, and chilli cultivation is one of them, therefore with the specific objective to analysis economics of chilli cultivation the present study has been proposed.

Materials and Methods

The present study was conducted related to economics of chilli cultivation in Wokha district of Nagaland, India. In the study local and land race varieties of chilli growen in the study area was considered as most of the farmers grows local and land race varieties. In Wokha District of Nagaland out of total five Rural Development Blocks, two R.D. Blocks *viz*; Wozhuro-Ralan and Wokha were selected for the present study because of the fact that a large number rural population engaged in of chilli cultivation in the region. Two villages from each block were selected randomly which and from each village 15 respondents were drawn which comprises of 60 numbers of total respondent for the detailed study. In order to have representative sample from each village a sample of 15 respondents was drawn randomly from each villages. This will result in selection of 60 respondents from 4 villages. The distribution of total respondents based on the size group of land holding were classified as given below.

Group	Land holding size(ha)	No. of selected farmers
Marginal	<1.00	11
Small	1.01-2.00	14
Medium	>2.01	34
Total	60	

The primary data was collected through pre-tested and pre-structured schedules and questionnaires specifically designed for this study. In order to analyse the economics of chilli cultivation in Wokha District of Nagaland, India, different cost concept applied in the field of farm management studies in terms of variables and fixed cost were employed. These are discussed below:

Cost A_1= It includes hired human labour + seed cost + marketing charges + transportation cost and depreciation + 8 percent interest on working capital

Where, depreciation is calculated as,

Depreciation= Original value of the asset – Junk Value/ Average life of the assets × 100

Cost B_1= Cost A_1 + interest on fixed capital excluding land

Cost B_2= Cost B_1 + Rental value of owned land

Cost C_1= Cost B_1+ imputed value of family labour

Farm business income= Gross return – Cost A_1, here the gross return includes all those economic products from chilli as well as bi products.

Farm investment income= Farm business income – imputed value of family labour.

Family labour income = Gross return – Cost B_2

Net income = Gross return – Cost C_3

Benefit Cost Ratio

Benefit cost ratio on variable cost= Gross income / Variable cost

Benefit cost ratio on total cost= Gross income / Total cost (Total Cost= Total Fixed cost + Total Variable Cost)

Results and Discussion

In order to obtain conclusive results and scientific interpretation from the study, the data collected were subjected to various economic and farm management analytical tools and techniques. The findings from the study on economic analysis of chilli cultivation in Wokha district of Nagaland, India are presented as below.

Economics of Chilli Production

Cost of Chilli Production Per Hectare Across Various Size Group

The cost of production includes in the study takes into account inputs cost like seed cost, human labour, marketing and transportation cost, interest on working capital, rental value of land at the prevailing rate in study area, deprecation on implements and interest on owned fixed assets. The estimate of per hectare cost of chilli cultivation on sample respondents in the study area is presented in Table 1.

Table 1: Item wise break up of per hectare cost of cultivation of chilli across various size groups

Sl. No.	Particulars	Marginal	Small	Medium	Average
	Variable cost				
A.	1 Human Labour	83000.00	104500.00	97000.00	94833.34
	i) Family Labour	(79.9)	(70.45)	(59.45)	(68.5)
	ii) Hired Labour	9100.00	25550.00	9400.00	14683.34.00
		(8.76)	(17.22)	(5.76)	(10.6)
	2 Marketing cost	350.00	400.00	6750.00	2500.00
		(0.34)	(0.27)	(4.14)	(1.8)
	3 Seed cost	900.00	1250.00	5600.00	2583.34.00
		(0.86)	(0.85)	(3.43)	(1.87)
	4 Interest on	4485.00	7242.5.00	33212.5.00	14980.00
	working capital	(4.32)	(4.88)	(20.36)	(10.82)
	5 **Total variable cost**	**97835**	**138942.5**	**151962.5**	**129580.00**
		(94.18)	**(93.67)**	**(93.13)**	**(93.59)**
B.	**Fixed cost**				
	1 Rental value of	0.00	0.00	3500.00	1166.67.00
	owned land	(0.00)	(0.00)	(2.15)	(0.84)
	2 Depreciation on	5500.00	8500.00	7000.00	7000.00
			implements	(5.3)	(5.73)
(4.3)	(5.05)				
	3 Interest on fixed	550.00	900.00	690.00	713.34
	capital excluding land	(0.52)	(0.6)	(0.42)	(0.52)
	4 Total fixed cost	6050.00	9400.00	11200.00	8883.34
		(5.82)	(6.33)	(6.87)	(6.41)
C.	**Total cost(A+B)**	**103885.00**	**148342.00**	**163162.5**	**138463.00**
		(100.00)	**(100.00)**	**(100.00)**	**(100.00)**

From the table 1, it can be seen that, the per hectare cost of chilli cultivation for the sample farmer was ₹.1,03,885.00, ₹.1,48,342.00, and ₹.1,63,162.50 respectively for marginal, small and medium group

of farmer with an average of ₹.1,38,463.00. Thus it shows that the cost of production increased with increase in farm size. Joko and Sumarno (2015) in their study on chilli production and adoption of chilli-based agribusiness in Indonesia also concluded similar findings.[5] On the average, per hectare total cost of chilli cultivation was found to be, ₹.1,38,463.00. Of all the inputs items, the cost of family labour constituted the highest percent being 68.50, followed by interest on working capital 10.82 percent hired human labour 10.60 percent, marketing cost 1.80 percent and seed cost 1.87 respectively. Out of the total cost the share of variable cost and fixed cost was found out to be 93.59 percent and 6.41 respectively. The finding is also in comformity with, Mahadevappa and Mokshapathy Mahadevappa (2015) in their study on production and marketing of organic vegetables in Belagavi district of Karnataka.[6]

Farm Profit Measures on Sample Farms

Table 2 reveals, farm profit measures on sample farms from chilli production. The cost concept of Cost A_1, Cost B_1, Cost B_2, Cost C_1 and Cost C_2 were used in present study.

Table 2: Farm profit measures on samples farms (in ₹)

	Particulars	Farm size group			
		Marginal	Small	Medium	Average
1	Average yield(q/ha)	75.00	74.76	75.57	75.11
2	Average price (per q)	4000.00	4000.00	4000.00	40000.00
3	Gross income per hectare	300000.00	299040.00	302280.00	300440.00
4	Total fixed cost (TFC)	6050.00	9400.00	11200.00	8883.34
5	Total variable cost (TVC)	97835.00	138942.5	152062.5	129613.34
6	Total cost (TFC+TVC)	103885.00	148342.00	163162.5	138463.00
7	Cost A1	20885.00	42942.5	62062.5	41963.34
8	Cost B1	21435.00	43842.5	62762.5	42680.00
9	Cost B2	21435.00	43842.5	66262.5	43846.67
10	Cost C1	104435.00	148342.5	159762.5	137513.34
11	Cost C2	104435.00	148342.5	163262.5	138680.00
12	Cost C3	114878.5	163176.75	179588.75	152548.00
13	Farm business income	279115.00	256097.5	240217.5	258476.67
14	Farm investment income	196115.00	151597.5	143217.5	163643.34
15	Family Labour income	278565.00	255197.5	236017.5	256593.34
16	Net income	185121.5	135863.25	122691.25	147892.00
17	BCR based on variable cost	3.06	2.15	1.98	2.39
18	BCR based on total cost	2.88	2.01	1.85	2.24

From table 2, it can be seen that the per hectare Cost A_1 ranges from ₹.20,885.00 in marginal group, ₹.42,942.50 in small group and ₹.62,062.50 in medium groups of farmer with an average of ₹.41,963.34, whereas cost A_1 was found out to be highest in medium and lowest in marginal group of farmers. The per hectare Cost B_1 was found out to be ₹.21435.00, ₹.43842.50 and ₹.62762.50 for marginal, small and medium group respectively with an average of ₹.42680.00. The cost B_1 was found to be highest in medium group (₹.62762.50) and lowest in marginal group (₹.21435.00). The per hectare Cost B_2 was found out to be highest in medium group (₹.66,262.50) and lowest in marginal group (₹.21,435.00). Cost B_2 for small group was ₹.43,842.50. On an average Cost B_2 was found to be ₹.43,846.67 per hectare. Cost C_1 was found to be, ₹.1,04,435.00, ₹.1,48,342.50 and ₹.1,59,762.50 per hectare for marginal, small and medium group of farmers respectively with a average of ₹.1,37,513.34 per hectare. Thamburaj *et al.,* (2001) also made similar

findings in their study.[7] The Cost C_2 was found out to be ₹.1,04,435.00, ₹.1,48,342.50 and ₹.1,63,262.50 per hectare for marginal, small and medium group respectively with an average of ₹.1,38,680.00 per hectare. Whereas, Cost C_3 for marginal, small and medium groups of farmer was ₹.1,14,878.50, ₹.1,63,176.75 and ₹.1,79,588.75 per hectare respectively with an average of ₹.1,52,548.00 per hectare. Mohammed (2016) in his study on analysis of Income and Constraints to Chilli Pepper Production in Kaduna State, Nigeria. also found similar conclusion in their studies.[8]

Gross Income

The average yield of chilli per hectare was found to be 75.00 q, 74.76 q and 75.57 q for marginal, small and medium group of farmers respectively. Considering the prevailing price of chilli in the study area which is ₹.4000.00 per q the gross income was found to be ₹.3,00,000.00, ₹.2,99,040.00 and ₹. 3,02,280.00 for marginal, small and medium group respectively. The average yield in the study area was 75.11q with a gross income of ₹.3,00,440.00. The study revealed that per hectare gross income was highest in medium group of farmer and lowest in small group of farmer. Jagtap *et al.,* (2014) studied, resource use efficiency and economics of marketing of green chilli and revealed similar findings.[9]

Family labour Income

The family labour income per hectare was found to be ₹.2,78,565.00, ₹.2,55,197.50 and ₹.2,36,017.50 per hectare for marginal, small and medium group of farmer respectively. The average family labour income was ₹.2,56,593.34 per hectare. Family labour income was highest in marginal group and lowest in medium group of farmer in the study area. This showed that medium group of farmer utilized more hired labour than owned labour for the cultivation of chilli.

Net Return

The average net return per hectare from chilli cultivation was found out to be ₹.1,47,892.00. The net return per hectare was found to be highest in marginal (₹.1,85,121.5) group and lowest in medium (₹.1,22,691.25) group. Whereas, net return was ₹.1,35,863.25 for small group of farmer. Verma, *et al.,* (2015), in their study on marketing of Coriander Spice in Rajasthan also made similar finding in their study on marketing of Coriander Spice.[10]

Benefit Cost Ratio

The benefit cost ratio of chilli cultivation in the study area was 3.06, 2.15 and 1.98 for marginal, small and medium group of farmer respectively. The average benefit cost ratio over variable cost was 2.39. The benefit cost ratio over total cost was highest in marginal group (2.88) and lowest in medium group (1.85).The Benefit Cost Ratio for small group was 2.01 and the average for the sample group of farmers in the study area was 2.24. Tirlapur *et al.,*(2014) also revealed similar finding in their study on economics of production of major crops in Dharwad district.[11]

Conclusion

The study comprises of 60 chilli farmers selected through multi stage random sampling technique. From the study it was revealed that, the average area under chilli cultivation was found to be 0.012 ha. In the study area, the average total cost of chilli cultivation was found to be ₹.1,38,463.00 per hectare. Out of the total cost, the share of variable cost and fixed cost constitute 93.59 percent and 6.41 percent respectively. It was also found that the per hectare cost of chilli cultivation for the sample farmer was ₹.1,03,885.00, ₹.1,48,342.50 and ₹.1,63,162.50 for marginal, small and medium group of farmer respectively with an average of ₹.1,38,463.00. Thus it shows that the cost of production increased with increase in farm size. The average yield of chilli per hectare in the study area was found to be 75.00 q, 74.76 q and 75.57 q for marginal, small and medium group of farmers respectively. Considering the prevailing price of chilli in the study area which is ₹.4,000.00 per q the gross income was found to be ₹.3,00,000.00, ₹.2,99,040.00 and ₹.3,02,280.00 for marginal, small and medium group of farmers respectively. The average yield in the study area was found out to be 75.11q with a gross income of ₹.3,00,440.00 and with an average net return of ₹.1,47,892.00. The overall benefit cost ratio was found out to be 2.39 which shows good return from the chilli cultivation.

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References

1. Ramachandra, V.A., Kuldeep, C. and Pavithra, B.S. (2012). Production and export of chillies from India. *International Research Journal of Agricultural Economics and Statistics,* 3(2): 353-358.
2. Divya K, Sivakumar S. D, Mahendran K (2014). Determinants of farmers preference for informal contract farming system for chillies. *International Journal of Commerce and Business Management*. 7 (1): 122-125.
3. Gaganjot S., Chahal S.S. An economic analysis of chilli cultivation in Punjab. *Haryana Journal of Horticultural Sciences.* 2009; 38(3): 366-371.
4. Babu G.S.K., Naidu S.H., Prasad Y.E. Price spread and marketing of green chillies - a case study in Andhra Pradesh. *Indian Journal of Agricultural Marketing.*2003; 46(1): 21-23.
5. Joko, M. and Sumarno, S. (2015). Chilli production and adoption of chilli-based agribusiness in Indonesia. *Journal of Agribusiness in Developing and Emerging Economies*, 5(1): 57 – 75.
6. Mahadevappa, M. and Mokshapathy, S. (2015). Constraints in production and marketing of organic vegetables in Belagavi district of Karnataka. *Asian Journal of Management Research*, 5(4): 558-565.
7. Thanburaj, S. And Narendra, S. (2001). Textbook of Vegetables, Tubercrops and Spices. ICAR publication. New Delhi: 49.
8. Mohammed, B. (2016). Analysis of Income and Constraints to Chilli Pepper Production in Kaduna State, Nigeria. *Journal of Scientific Research and Reports*, 9(3): 1-7.
9. Jagtap. .P.P., Shingane, U.S. and Kulkarni, K.P., (2014). Resource use efficiency and economics of marketing of green chilli. Jour*nal of Spices and Aromatic Crops,* 23(1): 32-37
10. Verma, H., Vinod, K., and Jheeba, S.S. (2015). Marketing of Coriander Spice in Rajasthan. *Indian Journal of Economics and Development,* 11(2): 583.
11. Tirlapur, L.N. and Mundinamani, S.M. (2014). Economics of production of major crops in Dharwad district. *Karnataka Journal of Agricultural Sciences*, 27(2): 165-169.