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An Economic Analysis of Chilli Production in Tripura, India

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ABSTRACT

Background: Chillies are one of the most widely used spices and a commercial crop. It is the most widely used universal spice and is named as the wonder spice. Tripura is one of the largest producers of a commercial crop of chilli in the entire north eastern state. Commercial cultivation of chilli is very profitable and can expect high revenue because of high market value or market demand in local markets. Under this backdrop, the paper attempts to study the economics of chilli production in Tripura, India.

Methods: This study was conducted on a sample of 150 chilli growers in Dhalai district, West Tripura and the Sipahijala district of Tripura during 2019-20 as it is the highest chilli growing area. A personal interview method was used to collect the data and suitable statistical tools were used for analyzing the data. The cost of cultivation for chilli was calculated by using the CACP (Commission on Agriculture Cost and Prices) approach.

Result: The study revealed that the majority of the respondents were under the age of 54 years, belonged to the schedule tribe category *i.e.*, 48.66 per cent (24.33) followed by the general category *i.e.*, 34.66 (17.33) and the schedule caste category *i.e.*, 16.66 per cent (8.33). All the respondents were from farming families, mainly belonging to marginal and small land holdings. It has been observed that the maximum cost was incurred on total family labour, *i.e.*, Rs. 41230.11, Rs. 56769.23 and Rs. 51972.17 respectively in West Tripura, Unakoti and South Tripura, whereas in the case of total hired labour cost, no was involved by the growers of South Tripura district. The total production of chilli was 2894.45 kg/ha and the overall return over cost C was determined at Rs. 104572.94 per ha. In the different districts, the return per rupee over cost C ranged from 1.99 to 2.44.

Key words: B:C ratio, CACP, Chilli, Cost of cultivation.

INTRODUCTION

Chilli is one of the most widely used spices and is considered a commercial crop (Meena *et al*., 2006). Chilli is the most widely used universal spice and is named as the Wonder Spice. India is known as the home of spices and chilli is known as a commercial crop in India. Chillies are produced all over the states of India. The country is also largest producer of chillies in the world and the annual production of chillies is 13.76 million tones (Geetha and Selvarani, 2017).

Chillies are grown on a global scale over 1776 thousand hectares, with a production of 7182 thousand tonnes. India, China, Turkey, Korea, Pakistan, Indonesia and Sri Lanka are the top chilli-growing countries in Asia; Nigeria, Ghana, Tunisia and Egypt are the top chilli-growing countries in Africa; Mexico and the United States of America are the top chilli-growing countries in North and Central America; Spain, Yugoslavia, Italy, Bulgaria, Romania and Hungary are the top chilli-growing countries in Europe; and Argentina and Peru are the top chilli-growing countries in South America. India is the world's leading producer of chillies, followed by China and Pakistan (Geetha and Selvarani, 2017). Chillies are grown over 309 thousand hectares in India, with a production of 3592 thousand metric tonnes (National Horticulture Board, 2019). Andhra Pradesh dominates the production of chilli in India, accounting for almost 57 per cent of the total. Karnataka is the second largest producer, accounting for around 14 per cent of total output, followed by Orissa (5 per cent), West Bengal (5 per cent), Maharashtra (4 per cent), Madhya Pradesh (3 per cent) and others. In India, the production of spices has increased and exported to the tune of more than 12 per cent during the year 2015-16. Muthupandi *et al.* (2018).

In Tripura, green chilli and red chilli are the most produced by farmers. Tripura has 2.49 thousand hectares under green chilli cultivation in 2019, according to the National Horticulture Board, with a production of 19.4 thousand metric tonnes. Tripura is also the largest consumer of chilli in the state and it's a commercial crop. Tripura produces a good quantity of chilli because of the increasing demand. Commercial chilli production is extremely profitable and significant revenue can be expected due to high market value or market demand in local marketplaces. Furthermore, among other vegetable crops, chilli prices are generally high, stable and have fewer variables. As a result, it has the ability to offer local farmers stable pay (Swaminathan *et al*., 2016). Farmers require minimum support prices and subsidies in order to obtain good returns while lowering expenditures (Balraj and Arockiasamy, 2018). Under this backdrop, the

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paper attempts, to study the socio-economic status of selected chilli growers and also to study the economics of chilli production in Tripura, India.

MATERIALS AND METHODS

The study was conducted in the agricultural year 2019-20 at the faculty of management and commerce of ICFAI University, Kamalghat, Tripura, India. Three districts in Tripura state, namely Dhalai district, West Tripura and Sipahijala district, were purposefully chosen for the study based on the criterion of greatest chilli production and sale. A list of chilli-growing farmers from three districts was compiled and 150 farmers were chosen at random from the list. Primary data for the agricultural year 2019-20 was obtained from chosen farmers *via* personal interviews utilising a set of pretested schedules created specifically for the purpose. The secondary was collected from secondary sources like various books and reports. In the course of analyzing the issues, a number of text and reference books, State Government Publications, including the Publications of the Department of Agriculture and Farmers' Welfare, the Directorate of Economics and Statistics, the Government of Tripura, the National Horticulture Board and other published and unpublished documents relating to the study were considered.

The cost concepts approach to farm costing is widely used in India (Raju and Rao 1990). Using the Commission on Agriculture Cost and Prices (CACP) approach, the cost of cultivation of chilli was calculated.

Cost A_1 = All of the producer's real cash and in-kind expenditures spent throughout production. Cost A_1 includes costs for: i) hired human labour, ii) owned bullock labour, iii) hired bullock labour., iv) home produced/purchased manure, v) home produced/ purchased seed, vi) fertilizers, vii) insecticides and pesticides, viii) plant protection chemicals, ix) irrigation, x) land revenue, land development tax and other taxes, xi) depreciation on farm machinery, equipment and farm building, xii) interest on working capital, xiii) interest on crop loan and xiv) miscellaneous expenses.

Cost A_2 = Cost A_1 + Rent paid for leased-in land.

Cost B_1 = Cost A_1 + Interest on value of owned capital assets (excluding land).

Cost B_2 = Cost B_1 + Rental value of owned land (net of land revenue) and rent paid for leased-in land.

Cost C_1 = Cost B_1 + Imputed value of family labour.

Cost C_2 = Cost B_2 + Imputed value of family labour.

Cost C_2^* = Cost C_2 + estimated by taking into account or actual wage rate whichever is higher.

Cost C_3 = Cost C_2^* + 10% Cost C_2^* to (on account of managerial functions performed by farmers).

RESULTS AND DISCUSSION

The terms cost of production and cost of cultivation are interchangeable in economics when describing the cost of cultivation per hectare and the cost of production per quintal. The cost was calculated using common cost ideas that have varying meanings for different individuals, such as researchers, cultivators, institutions, or policymakers.

Socio-economic status of selected Chilli grower

It was observed that (Table 1) on the basis of land holding, chilli growers are mainly found as marginal farmers in West Tripura (0.90 ha) and Unakoti districts (0.94 ha) and as small farmers in South Tripura (1.35 ha). The average age of the farmers is 54 and the average total family members were 4.33 at the overall level. On the basis of category, the maximum farmers are in the schedule tribe category, *i.e.*, 48.66 per cent (24.33) followed by the general category, i.e., 34.66 (17.33) and the schedule caste category, *i.e.*, 16.66 per cent (8.33). Out of the total farmers, 33.32 per cent of farmers are found to be illiterate and only 12 per cent of farmers are found to be graduate at overall level.

Input Utilization for chilli cultivation

An attempt has been made to explain the productivity of important inputs used in chilli cultivation by way of assessing the resources used in chilli cultivation. It acts as a guideline to judge whether resources are used optimally or not. A glance at per hectare input utilization of chilli within selected cultivators shows that the quantity of material inputs like seeds, manure and fertilizer and labor have been shown in Table 2.

The study observed that chilli cultivation of seed total average required 378.0.22 grams per hectare in three districts. The overall requirement of F.Y.M is 62.33 cft., Urea 158.66kg and S.S.P 229.96 kg for chilli cultivation per hectare. Where the total family labor requirement is 133.92 by considering both male and female labour. And the hired

Table 1: Socio economic status of chilli grower (n=150).

Particular	West Tripura	Unakoti	South Tripura	Overall
Age of respondent	48	51	53	54
Male family member	2	2	3	2.33
Female family member	2	2	2	2
Total family member	4	4	5	4.33
Family Income (lakh)	2.86	2.45	2.88	2.73
Land holding				
Irrigated land (ha)	0.33	0.34	0.44	0.37
Un-irrigated land (ha)	0.57	0.60	0.91	0.69
Total land holding (ha)	0.90	0.94	1.35	1.06
Category				
General	25	5	22	17.33
SC	12	3	10	8.33
ST	13	42	18	24.33
Education				
Illiterate	12	22	16	16.66
Primary school	17	15	16	16
High school	13	11	10	11.33
Graduate	8	2	8	6

labor required for both males and females is 6.12 per hectare. The total bullock labour requirement for chilli cultivation is 20.66 at the overall level, both family and hired. Whereas the machine hour requirement for chilli cultivation in a hectare at an overall level is 23.58 hours.

Cost incurred for chilli cultivation (Rs/ha)

It has been observed from Table 3, that the maximum cost was incurred on total family labour, *i.e.*, Rs. 41230.11, Rs. 56769.23 and Rs. 51972.17 respectively in West Tripura, Unakoti and South Tripura. Whereas in the case of the total hired labour cost of Rs. 1974.60 was used at the overall level and no such cost was involved by the growers of the south Tripura district. At the overall level, a total cost was incurred for chilli cultivation of Rs. 74603.79.

Per hectare cost of chilli cultivation (Rs/ha)

Table 4 shows the per hectare cost of chilli cultivation and illustrates that the overall total cost of cultivation (Cost C) of chilli was found to be Rs. 90237.49 per ha, with Unakoti district farms costing the most (Rs. 95954.03/ha), South Tripura farms costing Rs. 91007.51/ha) and West Tripura

Table 2: Input utilization for chilli cultivation (n=150).

Particulars	Unit	West Tripura	Unakoti	South Tripura	Overall
Seeds	g	357.14	440.92	336	378.02
Fertilizer					
A. F.Y.M	Cft.	65	59	63	62.33
B. Urea	kg	117.02	156.30	202.66	158.66
C. S.S.P	kg	269.64	223.07	197.16	229.96
Family labor					
A. Male		57.85	80	75	70.95
B. Female		55.47	70.76	62.66	62.97
C. Total Family labour		113.33	150.76	137.66	133.92
Hired labor					
A. Male		8.33	6.15	0	4.82
B. Female		3.92	0	0	1.30
C. Total hired labour		12.26	6.15	0	6.13
Bullock labor					
A. Family		14.28	18.92	20	17.73
B. Hired		1.90	3.53	3.33	2.92
Total bullock labor		16.19	22.46	23.33	20.66
Machinery	hr.	9.04	7.69	11.66	23.58

Table 3: Cost incurred for chilli cultivation (Rs/ha).

Particulars	West Tripura	Unakoti	South Tripura	Overall
Seeds	3773.81	3025.54	4861.00	3886.78
Fertilizer				
A. F.Y.M	8682.50	8538.46	8188.83	8469.93
B. Urea	643.81	860.26	1025.00	843.02
C. S.S.P	2890.48	2126.31	2297.17	2437.98
Family labor				
A. Male	23174.64	32000.00	30000.00	28391.55
B. Female	18055.47	24769.23	21972.17	21598.96
C. Total Family labour	41230.11	56769.23	51972.17	49990.50
Hired labor				
A. Male	3333.33	2461.54	0.00	1931.62
B. Female	128.93	0.00	0.00	42.98
C. Total hired labour	3462.26	2461.54	0.00	1974.60
Bullock labor				
A. Family	3174.52	4507.69	4583.33	4088.52
B. Hired	634.88	1025.54	1230.77	963.73
C. Total Bullock labor	3809.40	5533.23	5814.10	5052.25
Machinery	1666.67	1846.15	2333.33	1948.72
Total	66159.04	81160.72	76491.60	74603.79

farms costing Rs. 83750.93/ha). The overall Cost A was found to be Rs. 35612.39 per ha and was also the highest in Unakoti district (Rs. 34460.15/ha), followed by South Tripura (Rs. 34400.68/ha) and West Tripura (Rs. 37976.35/ha) among the selected farms. However the production was highest in West Tripura (3130.56 kg/ha), followed by Unakoti district (2790.28 kg/ha) and South Tripura (2762.5 kg/ha).

Per hectare economic of chilli production (Rs/ha)

The economics of chilli production were presented in Table 5 and found that, total production of chilli was 2894.45 kg/ha and the gross income was Rs. 194810.43/- at the overall level. The overall return over Cost A was determined to be Rs. 159178.22 per hectare, while the overall return over Cost C was Rs. 104572.94 per hectare. Among all the districts, the return per rupee over Cost C ranged from 1.99 to 2.44. The return per rupee was highest in West Tripura (2.44) due to the lowest Cost 'C' Rs. 83750.93 and maximum production of Rs. 3130.56 kg/ha.

Table 4: Per hectare cost of chilli cultivation (Rs/ha).

Particulars	West Tripura	Unakoti	South Tripura	Overall
Hired human labor				
A. Male	3333.33	2461.54	0	1931.62
B. Female	128.9	0	0	42.97
C. Total hired labor	3462.26	2461.54	0	1974.60
Seed	3373.81	3025.54	4801	3886.78
Manure and fertilizers				
A. F.M.Y	8682.5	8538.46	8188.83	8469.93
B. Urea	643.8	860.26	1025	843.02
C. S.S.P	2890.47	2126.3	2297.16	2437.977
D. Total manure and fertilizers	12216.77	11525.02	11510.99	11750.92
Hired bullock labor	15107.24	13651.32	13808.15	14188.90
Machinery	1666.67	1846.15	2333.33	1948.72
Working capital	35826.75	32509.57	32453.47	33749.93
Working capital @ 6% per annum	2149.60	1950.57	1947.20	2024.99
Cost A	37976.35	34460.15	34400.68	35612.39
Rental value of land	4544.47	4724.65	4634.66	4634.59
Cost B	42520.82	39184.80	39035.34	40246.99
Family labor				
A. Male	23174.64	32000	30000	28391.55
B. Female	18055.47	24769.23	21972.17	21598.96
C. Total family labor	41230.11	56769.23	51972.17	49990.51
Cost C	83750.93	95954.03	91007.51	90237.49
Production (kg)	3130.56	2790.28	2762.5	2894.45

Table 5: Per hectare economic of chilli production (Rs/ha).

Particulars	West Tripura	Unakoti	South Tripura	Overall
Main product (kg/ha)	3130.56	2790.28	2762.5	2894.45
Gross return (Rs)	204456.87	199030.67	180943.75	194810.43
Cost of cultivation (Rs/ha)				
Cost 'A'	37976.35	34460.15	34400.68	35612.39
Cost 'B'	42520.82	39184.80	39035.34	40246.99
Cost 'C'	83750.93	95954.03	91007.51	90237.49
Net return over cost (Rs/ha)				
Cost 'A'	166480.52	164570.52	146483.60	159178.22
Cost 'B'	161936.05	159845.87	141908.41	154563.45
Cost 'C'	120705.94	103076.64	89936.24	104572.94
Benefit-cost ratio				
Cost 'A'	5.38	5.78	5.25	5.47
Cost 'B'	4.81	5.08	4.64	4.84
Cost 'C'	2.44	2.07	1.99	2.17

Note: Market price of chilli (Rs/Kg) is 65.31, 71.33 and 65.50 in West Tripura, Unakoti and South Tripura respectively.

CONCLUSION

Chilli growing is a successful business in all of Tripura's districts, according to the research. The net revenue on the entire investment was Rs. 104572.94 per hectare, ranging from Rs. 89936.24 per hectare in South Tripura to Rs. 120705.94 per hectare in West Tripura. When compared to other districts, West Tripura had the greatest return per rupee (2.44), while the overall level was 2.17. As a result of the analysis, it can be stated that chilli production is lucrative in the long run for all of the state's selected farmers.

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