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Economic analysis of *Colocasia* production in bastar plateau of Chhattisgarh state

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Abstract

The study aims to examine the economics of *Colocasia* production at different size of farms in Bastar and kanker district of bastar plateau of Chhattisgarh state. The survey for this purpose was conducted in three blocks of each Bastar and kanker district of Chhattisgarh. Primary data were collected from 300 farmers, five villages from each block was selected through personal interview method with the help of pre-structured schedule for the year 2016-17. Study revealed that the average cost of cultivation of *Colocasia* was estimated to be Rs. 56012.07 per hectare. The average yield was observed to be 81.41 quintals per hectare. Highest yield was found at large farms i.e. 83.19 quintals per hectare across the different farms. The gross return from *Colocasia* was observed as Rs. 167211.26 per hectare. The average cost of production was calculated as Rs. 688.02 per quintal. The average net income per hectare was observed to be Rs. 111199.19. Highest net income was observed at large farms i.e. Rs. 117161.62 per hectare. The input- output ratio was observed 1:2.98.

Keywords: Cost of cultivation, economics of production and cost concept

Introduction

Colocasia (*Colocasia esculanta* L. Scott) is an important tuber crop with high nutritious value and widely accepted in the whole world. Total area under *Colocasia* in the world is about 10.8 million hectare of which Asia's share is about 1.5 million hectares. Cultivation of *Colocasia* is widespread in India, Burma, China, Japan, Hawaii, Egypt, Africa and the Caribbean. *Colocasia* is an important tuber crops of India as well as in Chhattisgarh. Its cultivation in Chhattisgarh is confined to an area of 7,627 thousand hectare with a production 102.809 thousand tonnes. Globally, it is grown in an area of 1.6 m ha producing 11.66 million tonnes with an average productivity of 7.25 t ha⁻¹ (FAO, 2010). Taro (*Colocasia* spp) is native to Southeast Asia (Kolchar, 2006). It is a perennial, tropical plant primarily grown as a root vegetable for its edible starchy corm, and as a leaf vegetable and is considered a staple in African, Oceanic and Asian cultures. It is believed to have been one of the earliest cultivated plants (Annon, 2006) and was in cultivation in wet tropical India before 5000 B.C., presumably coming from Malaysia, and from India further transported westward to ancient Egypt, where it was described by Greek and Roman historians as an important crop. It is an important vegetable grown throughout India and is sometimes called the "potato" of the humid tropics.

Hypotheses

On the basis of problem, the following hypotheses have been formulated in this study for the empirical verification. These hypotheses have been postulated on the basis of the results of theoretical and empirical studies conducted in different parts of the country.

1. Cost of production per quintal will be decreased with the increasing size of farms (tuber growers).

Objectives

1. To work out the cost and returns of major tubers on different categories of farmers in the study area.

Materials and Method

Chhattisgarh state consists of three well known Agro-climatic zones i.e Northern hills, Chhattisgarh plains and Bastar plateau. Bastar plateau zone of the state is selected for the present study. In Bastar plateau zone almost all the tuber crops are more or less grown. The study was conducted in Bastar plateau of Chhattisgarh, out of seven districts in Bastar plateau, two districts namely Bastar and Kanker districts and three blocks from each district was considered randomly on the basis of highest area under tuber crop cultivation.

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Out of selected 6 blocks from each Bastar and Kanker districts, 50 respondents from each of the blocks was taken for the present study. In all a sample of 300 tuber growers was considered for the present study.

Analytical Tools

Suitable analytical tools were adopted. The cost of cultivation, costs and returns of *Colocasia* crop has been estimated through standard cost concepts given by the CACP.

Results and Discussion

(a) Cost of cultivation of *Colocasia* at different size groups of farms

Cost of cultivation of *Colocasia* at different size groups of farms is given in Table 01. It can be seen that on an average per hectare cost of cultivation of *Colocasia* was estimated as Rs. 56012.07 which varied from Rs. 54026.36 per hectare at marginal farms to Rs. 55873.58 per hectare at large farms

respectively. The share of major cost on the cultivation of *Colocasia* was observed seed cost. The average per hectare seed cost was estimated as Rs. 23538.64 per hectare which varied from Rs. 22360.25 per hectare at marginal farms to Rs. 23132.53 per hectare at large farms respectively. The next major cost was observed as human labour (both family and hired labour) which was estimated about per cent Rs. 15824.27 per hectare of the total cost of cultivation on which contribution of family human labour and hired human labour was observed 14.47 per cent and 13.78 per cent respectively. The average cost of machine was estimated as Rs. 1456.58 per hectare which varied from Rs. 497.51 per hectare at marginal farms to Rs. 2534.94 per hectare at large farms respectively and average cost of manure/fertilizer was estimated as Rs. 924.78 per hectare which varied from Rs. 752.23 per hectare at marginal farms to Rs. 1050.75 per hectare at large farms respectively.

Table 1: Cost of Cultivation of *Colocasia* at different size groups of farms (Rs/ha.)

S.N.	Particulars	Marginal	Small	Medium	Large	Overall
1.	Family human labour	10764.50 (19.92)	9386.22 (16.54)	7387.98 (13.10)	6745.99 (12.07)	8104.05 (14.47)
2.	Hired human labour	5185.96 (9.59)	6714.42 (11.83)	8591.00 (15.24)	8675.70 (15.53)	7720.22 (13.78)
3.	Total human labour	15950.46 (29.52)	16100.63 (28.37)	15978.98 (28.34)	15421.69 (27.60)	15824.27 (28.25)
4.	Bullock power	1898.11 (3.51)	1777.02 (3.13)	975.24 (1.73)	0.0	974.32 (1.74)
5.	Machine power	497.51 (0.92)	506.25 (0.89)	1480.48 (2.63)	2534.94 (4.54)	1456.58 (2.60)
6.	Seed cost	22360.25 (41.39)	24528.30 (43.22)	23653.09 (41.95)	23132.53 (41.40)	23538.64 (42.02)
7.	Manure/ Fertilizer cost	752.23 (1.39)	854.23 (1.51)	919.36 (1.63)	1050.75 (1.88)	924.78 (1.65)
8.	Plant protection cost	573.85 (1.06)	648.45 (1.14)	760.23 (1.35)	810.72 (1.45)	725.24 (1.29)
9.	Irrigation charges	248.56 (0.46)	398.56 (0.70)	415.32 (0.74)	546.98 (0.98)	432.94 (0.77)
10.	Transportation charges	368.45 (0.68)	459.40 (0.81)	589.25 (1.04)	624.65 (1.12)	540.49 (0.96)
11.	Interest on working capital	639.74 (1.18)	679.09 (1.20)	671.58 (1.19)	661.83 (1.18)	666.26 (1.19)
A.	Total variable cost	43289.16 (80.13)	45951.93 (80.97)	45443.53 (80.59)	44784.09 (80.15)	45083.51 (80.49)
12.	Rental value of land	10000.00 (18.51)	10000.00 (17.62)	10000.00 (17.73)	10000.00 (17.90)	10000.00 (17.85)
13.	Land revenue	12.00 (0.02)	12.00 (0.02)	12.00 (0.02)	12.00 (0.02)	12.00 (0.02)
14.	Depreciation cost	312.24 (0.58)	341.74 (0.60)	450.58 (0.80)	484.63 (0.87)	417.03 (0.74)
15.	Interest on Fixed capital	412.96 (0.76)	443.15 (0.78)	481.50 (0.85)	592.86 (1.06)	499.53 (0.89)
B.	Total fixed cost	10737.20 (19.87)	10796.89 (19.03)	10944.08 (19.41)	11089.49 (19.85)	10928.56 (19.51)
C.	Gross Cost (A+B)	54026.36 (100.00)	56748.82 (100.00)	56387.61 (100.00)	55873.58 (100.00)	56012.07 (100.00)

Note: Figures in the parenthesis are percentage to total cost of cultivation of *Colocasia*.

(b) Economics and production of *Colocasia* at sample farms:-

Economics and production of *Colocasia* at sample farms is given in Table 02. The average cost was to be estimated as Rs. 56012.07 per hectare which varied from Rs. 54026.36 per hectare at marginal farms to Rs. 55873.58 per hectare at large farms. Overall on an average yield was observed 81.41 quintals per hectare. The gross return was varied from Rs.

152570.60 per hectare at marginal farms to Rs. 173035.20 per hectare at large farms. On an average the Net income was Rs. 111199.19 per hectare. On an average Family labour income was Rs. 119303.24 and Farm business income was Rs. 8770.31. The average per quintal cost of production was estimated as Rs. 688.02. On an average Input-Output Ratio was 1: 2.98 which varies from 1: 2.82 at marginal farms to 1: 3.10 at large farms.

Table 2: Economics and Production of *Colocasia* at sample farms

S. No.	Particulars	Marginal	Small	Medium	Large	Overall
1.	Cost of Cultivation (Rs/ha)	54026.36	56748.82	56387.61	55873.58	56012.07
2.	Yield (qtl/ha)	75.53	81.25	82.09	83.19	81.41
3.	Gross returns (Rs/ha)	152570.60	165750.00	169105.40	173035.20	167211.26
4.	Net income (Rs/ha)	98544.24	109001.18	112717.79	117161.62	111199.19
5.	Family labour income	109308.74	118387.40	120105.77	123907.61	119303.24
6.	Farm Business income	11404.24	10065.31	8059.56	7407.82	8770.31
7.	Cost of Production (Rs/qtl)	715.30	698.44	686.89	671.64	688.02
8.	Input-Output ratio	1: 2.82	1: 2.92	1: 2.99	1: 3.10	1: 2.98

(C) Cost Concept of *Colocasia*

The cost and returns on the basis of cost concept in the production of *Colocasia* have been presented in Table 03. Overall on an average Cost-A1, Cost-A2, Cost-B1, Cost- B2, Cost-C1, Cost-C2 and Cost-C3 were worked out to Rs. 37408.49, Rs. 37408.49, Rs. 37908.02, Rs. 47908.02, Rs.

46012.07, Rs. 56012.07 and Rs. 61613.28 per hectare respectively on the sampled farms. On an average net income over Cost-A1, Cost-A2, Cost-B1, Cost- B2, Cost-C1, Cost-2 and Cost-C3 were calculated to be Rs. 129802.77, Rs. 129802.77, Rs. 129303.24, Rs. 119303.24, Rs. 121199.19, Rs. 111199.19 and Rs. 105597.98 respectively.

Table 3: Break-up of total cost, cost concept wise income over different cost of *Colocasia* (Rs./ha)

S. No.	Particulars	Marginal	Small	Medium	Large	Overall
A.	Break-up of cost					
	a. Cost A1	32848.90	36919.45	38518.13	38534.73	37408.49
	b. Cost A2	32848.90	36919.45	38518.13	38534.73	37408.49
	c. Cost B1	33261.86	37362.60	38999.63	39127.59	37908.02
	d. Cost B2	43261.86	47362.60	48999.63	49127.59	47908.02
	e. Cost C1	44026.36	46748.82	46387.61	45873.58	46012.07
	f. Cost C2	54026.36	56748.82	56387.61	55873.58	56012.07
	g. Cost C3	59428.99	62423.70	62026.37	61460.94	61613.28
B.	Net Income over different cost					
	a. Income over cost A1	119721.70	128830.55	130587.27	134500.47	129802.77
	b. Income over cost A2	119721.70	128830.55	130587.27	134500.47	129802.77
	c. Income over cost B1	119308.74	128387.40	130105.77	133907.61	129303.24
	d. Income over cost B2	109308.74	118387.40	120105.77	123907.61	119303.24
	e. Income over cost C1	108544.24	119001.18	122717.79	127161.62	121199.19
	f. Income over cost C2	98544.24	109001.18	112717.79	117161.62	111199.19
	g. Income over cost C3	93141.61	103326.30	107079.03	111574.26	105597.98

Conclusion and Suggestions

The study concludes that farmers spent average of Rs. Rs. 56012.07 to produce the *Colocasia* in one hectare of land. Average yield of *Colocasia* was estimated 81.41 quintal per hectare. The gross income was Rs. 167211.26 per hectare and per quintal cost of production was estimated as Rs. 688.02. On an average the Net income was Rs. 111199.19 per hectare, Family labour income was Rs. 119303.24 and Farm business income was Rs. 8770.31. On an average input-output ratio was observed 1: 2.98. Overall average Cost-C1, Cost-C2 were worked out to Rs. 46012.07, Rs. 56012.07 and average net income over Cost-C1, Cost-2 were calculated to be Rs. 121199.19, Rs. 111199.19 per hectare respectively on the sampled farms. It was suggested that *Colocasia* is the important crop of the area. Arrangement should be made by facilitating to increase the production of *Colocasia*. Proper package of practices should be developed to increase the profitability of farmers in the study area. This will encourage the farmers to grow it at large scale in the area which will help the farmers to receive better prices of the crops.

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