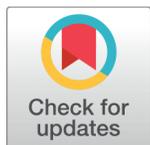


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Colocasia: A lucrative rotation crop in Karnataka

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Abstract

Objectives: to study the economics of the crop colocasia. **Methods:** The present study was conducted in Bylakuppe and Ayarabeedu villages in Periyapatna taluk of Mysore district to ascertain the profitability and marketing chain of colocasia. Around thirty sample farmers cultivating Colocasia were randomly selected and the economics of the crop was estimated using the budgeting technique. **Findings:** The economics indicated that farmers incurred cost of Rs. 62,145.95 per acre and realized net returns of Rs. 87,854.05. The enterprise was found to be economically viable and lucrative with benefit cost ratio (BCR) of more than unity (2.41). The marketing aspects of crop indicated that crop has got organized marketing with producer enjoying major share (71.43 %) of retail price. The findings support the possibility of growing taro as a major crop on a larger scale and benefit from the export potential of the crop as a processed food.

Keywords: Colocasia; budgeting technique; BCR

1 Introduction

Colocasia esculenta, commonly called as taro or elephant ear plant is a perennial herbaceous plant cultivated mainly for its edible corms and leaves⁽¹⁾. Annual global production is 10.2 million tons and Nigeria is the largest grower with production of 3.3 million tons per year (FAO, 2014). In India, Taro is majorly grown in localised pockets of Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Karnataka and Kerala⁽²⁾. It finds utility in culinary purposes and is a suitable crop for processing industry⁽³⁾. The low incidence of pests and diseases⁽⁴⁾ coupled with low synthetic input requirement⁽⁵⁾ has made taro a popular crop in the tropics and its cultivation is favoured by the small and marginal farmers.

Farmers in Mysore district have shown an inclination towards its cultivation as it requires less management compared to other crops grown in the area. The usual practice is to follow rotation of ginger crop with colocasia. The crop is cultivated on the leased in lands. The major reasons for its cultivation in the region are easy management due to absence of pests and diseases, and assured market from Mangalore. Hence, it is imperative to look into economics of rare tuber crop cultivated on commercial scale.

The study also investigates marketing channel and its efficiency.

2 Methodology

The study was conducted in Bylakuppe and Ayarabeedu villages of Periyapatna taluk of Mysore district. Farmers of these villages are cultivating Colocasia in leased in lands. Around thirty sample farmers cultivating this crop were randomly selected from study villages. On an average, it is cultivated in an area of 2 acres by sample farmers. The relevant information on labour use pattern, inputs used in cultivation of Colocasia, yield obtained, returns realized were elicited from sample farmers. The information related to marketing of produce was elicited from middlemen involved in its marketing. Wholesalers and mashokres are the middlemen involved in its marketing. Around three wholesalers and five retailers were selected for the present study. Enterprise budgeting and Acharya's method of marketing efficiency were used to draw meaningful inferences. In Acharya's approach, the efficiency of marketing colocasia with the existing marketing channel/s was ascertained. It is estimated by taking the ratio of price received by the farmer to the summation of marketing costs and marketing margins. Price received by the farmer, marketing cost incurred by middlemen and margins accrued to them in the movement of colocasia from producer to consumer was elicited from the respondents. As the numerator possess the price received by farmer, the ratio is always expected to be more than unity to infer the channel as efficient.

3 Results and discussion

Taro is grown as a rainfed khariff crop in the region in rotation with ginger. The crop is planted on the ridges made using the tractor mounted plough and a spacing of 60x45cm is followed. Crop requires human labour to perform various operations such as planting, application of manures and fertilizers, weeding and harvesting. Due to the evenly distributed rainfall during khariff in the region, irrigation is seldom provided to the crop. A total of 69 mandays was required to cultivate Colocasia in an area of one acre. Weeding and harvesting are considered as labour-intensive operations. Taro fields tend to accommodate higher weed growth at densities of 0.9 ± 0.3 to 6.8 ± 2.8 plants/m² (6). The wider spacing followed between rows and plants are the reason for robust weed growth throughout the crop growth. Gunrah (1985) (7) in his study indicated that 7 to 9 times weeding is required to keep the field free from weed. Five Manual weeding and chemical control of weeds using two sprays of oxigold (Oxyflufen 23.5% EC) and gramaxone (paraquat) is commonly practiced. As the region receives an average annual rainfall of 2552.54mm (CGWB, 2007), the crop seldom requires external irrigation. Harvesting was done through uprooting after loosening soil around the clump through spade. These two operations required 56 mandays (81.16%) of total labour. Application of manures, fertilizers (8 mandays) and planting (5 mandays) are the other operations demanding human labour to the tune of 13 mandays (18.84%). Tractor mounted with plough and cultivator was used for land preparation. A total of four machine hours was required to prepare land for planting. Bullock labour of one pair/day was used to perform intercultural operation to control weed growth in inter row space.

Commercial cultivation of Colocasia has probed researcher to get into the economics of the crop. Economics was worked out following enterprise budgeting technique. The enterprise budgeting comprised of variable cost, fixed cost, total cost, gross returns and net returns. The total cost incurred by farmers towards its cultivation in an area of one acre came to Rs. 62145.95. The total variable cost formed 68.90 percent of the total cost and rest being shared by fixed cost (31.10%). Of the variable cost, human labour formed the major chunk (8) at Rs. 27900 (44.89%) followed by fertilizers at Rs. 4770 (7.68%) and corms at Rs. 4000 (6.64%). Machine labour (3.86%), Weedicide (2.25%), Bullock labour (1.45%) and Interest on working capital (2.33%) are the other major variable cost items. Fertilizers are applied in three splits. In the first split, fertilizers such as 10:26:0:13 (1bag), 20:20:20 (0.5bag) and 19:19:19 (0.5bag) were applied after 45 days of planting. At 120th day after planting, 1.5 bag of MOP and 1bag of urea were applied to the crop as second split and during the second fertiliser application, earthing up operation is carried out using spades which require 3 labours. In final split, 0.5 bag of MOP was applied to the crop at 200th day after planting.

Among the fixed cost, rent paid for leased in land formed the major chunk at Rs. 15000 per acre (24.14%). Depreciation of sprinkler jet and conveyance pipes came to Rs. 2380. Interest on fixed capital at the rate of 12 percent per annum and land revenue are the other fixed cost items forming remaining 3.13 percent of the total cost. Farmers realized yield of 6 tons per acre. The farm gate price made available to farmers by the wholesalers per ton was Rs. 25000. Thus, gross returns realized by farmers came to Rs. 150000. After deducting cost, profit realized by farmers came to Rs. 87854.05 per acre. Cost of production of Colocasia came to Rs. 10.36 per kg and profit realized per kg came to Rs. 14.64. The enterprise was found to be economically viable with benefit cost ratio of 2.41 indicating that every rupee of expenditure made on the crop earns gross returns of Rs. 2.41. Profit per rupee of expenditure came to 1.41 indicating that every rupee of expenditure made on the crop earns him back profit of Re. 1.41 which is higher compared to a profitability ratio of 1.31 in Nigeria, the largest producer of taro (9).

The marketing channel followed to dispose of produce to ultimate consumer was Producer to Wholesaler to Mashakhores to Retailer to Consumer. Colocasia has got assured market in Mangalore district. Wholesalers procure produce at farmers' field on paying farm gate price of Rs. 25 per kg. They incur marketing cost of Rs. 2.12 towards labour for loading and unloading, transportation and packing materials. The margin accrued to wholesaler per kg came to Rs. 2.88. Mashakhores are the big retailers or small wholesalers involved in marketing of few vegetables purchases produce from wholesalers. They have incurred marketing cost of Rs. 0.52 per kg towards labour, packing materials and rental charges on the shop. In turn, retailers purchase produce from Mashakhores at Rs. 32 per kg. Retailers make an expenditure of Rs. 1.16 and realize profit of Rs. 1.84 per kg of marketing of produce to ultimate consumer. The price paid by consumer came to Rs.35 per kg. The magnitude of price spread came to Rs. 10 per kg forming 28.57 percent of the consumer price. The share enjoyed by producer in consumer rupee came to 71.43 percent which is significantly higher than the producer's share of 57% calculated by Srinivas et al. (2011). The difference can be attributed to the presence of a simple marketing channel in the region. Acharya's method of marketing efficiency indicated the existence of efficient market for colocasia with marketing efficiency measure of 2.5.

4 Conclusion

The economics of Colocasia cultivation on leased in lands of Mysore district of Karnataka state in India was found to be economically viable with B:C ratio of 2.41. Crop was found to have organized marketing with producer enjoying major share (71.43 %) of retail price. Lucrative returns coupled with less management should reinforce farmers to expand area under its cultivation.

Table 1. Labour use pattern in cultivation of Colocasia

Particulars	Machine labour (hrs)	Qty	Rate (Rs.)	Value (Rs.)
Land preparation		4	600	2400
Human labour (mandays)				
Planting		2	300	600
Manual weeding		15	300	4500
Application of weedicide		5	300	1500
Manuring and application of fertilizer		11	300	3300
Harvesting and post harvest operation		36	500	18000
Bullock labour (pairdays)				
Inter-cultivation		1	900	900

Table 2. Economics of cultivation of Colocasia

Particulars	Qty	Rate(Rs.)	Value(Rs.)
I. Variable cost			
Human Labour (mandays)	69	404.35	27900 (44.89)
Bullock labour (pairdays)	1	900	900 (1.45)
Machine labour (hr)	4	600	2400 (3.86)
Corms	1000	4	4000 (6.44)
Fertilizers (50 kg bag)			4770 (7.68)
1) Urea	1	320	320
2) MOP	2	720	1440
3) 10:26:0:13	1	1250	1250
4) 20:20:20	1	1180	1180
5) 19:19:19	0.5	1160	580
Weedicide (litre)			1400 (2.25)
1) Oxigold	0.5		1100
2) Gramaxine	1		300
Interest on working capital			1447.95 (2.33)
Total variable cost			42817.95 (68.90)
II. Fixed cost			
Depreciation			2380 (3.83)
Land revenue			100 (0.16)

Continued on next page

Table 2 continued

Rental value of land			15000 (24.14)
Interest on fixed capital			1848 (2.97)
Total fixed cost			19328 (31.10)
Total cost			62145.95
Gross returns (tons)	6	25000	150000
Net returns			87854.05
Cost per kg			10.36
Net returns per kg			14.64
Benefit cost ratio			2.41
Profit per rupee of expenditure			

Table 3. Estimates of marketing costs, margins and marketing efficiency for Colocasia

Particulars	Value (Rs/kg)
Producer price	25
Marketing costs incurred by wholesalers	2.12
Margin of wholesalers	2.88
Marketing costs incurred by Mashakhores	0.52
Margin of Mashakhores	1.48
Marketing costs incurred by retailers	1.16
Margin of retailer	1.84
Total marketing costs and margins	10
Retailers sale price or consumers purchase price	35
Price spread	10
Acharya's method of marketing efficiency	2.5
Producer share in consumer rupee (%)	71.43

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