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Economics of turmeric cultivation in Erode district of Tamil Nadu

M. Chinnadurai, V. Kavitha*, S. Angles and R. Sangeetha

Centre For Agriculture and Rural Development Studies,
Tamil Nadu Agricultural University, Coimbatore-641 003, Tamil Nadu, India.
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ABSTRACT

Turmeric is the major spice crop in India. This paper attempts to estimate the cost and economic returns of turmeric cultivation among various size categories (marginal, small, semi medium, medium and large), of farmers in Erode district of Tamil Nadu, which is one of the major turmeric growing region in India. The results of the study showed that of all the size categories, the economic returns realized by large farmers were comparatively higher..Besides ensuring reasonable price to the farmers, the study suggested for value addition, like boiling, drying and grading of rhizomes in order to achieve maximum returns in turmeric cultivation.

Key words: Cost of cultivation, Economies of size, Input usage.

INTRODUCTION

India is the largest producer, consumer and exporter of turmeric in the world. Turmeric is one among the blood thinner food, which have antiplatelet, anticoagulant and fibrinolytic properties. (Kanjana *et al*., 2016). Indian turmeric is considered consider to be the best in the world market because of its high curcumin curcumin content. In India, turmeric is cultivated in an area of 0.18 million hectares with a production of 0.83 million tonnes in 2014-15. The major turmeric producing states are Telangana, Maharashtra, Tamil Nadu, Andhra Pradesh and Karnataka. Tamil Nadu shares 14.04 per cent of the total production. In Tamil Nadu, Erode district is the largest district in turmeric cultivation by contributing 24.14 per cent of the total area and 33.37 per cent of the total production (Statistical Hand Book of Tamil Nadu, 2016, Government of Tamil Nadu).It is grown as a *kharif* crop.

MATERIALS AND METHODS

For the selection of samples, three stage proportional sampling was used in the study. On the basis of data obtained from Season and Crop Report of Tamil Nadu, the major crops grown were identified. All the development blocks (385) in Tamil Nadu were considered for the study. In each block, villages were chosen by crop complex approach, there by the village having the most representation of major crops was selected. In each village, 10 farmers were selected at random randomly. Thus for the 385 blocks, the total sample farm households were 3850. Out of the total sample, a sample size of 50, representing 10 farmers in each size category namely marginal, small, semi medium, medium and large was selected for turmeric crop in Erode district. The primary data pertained to resource use, cost and returns of turmeric cultivationere collected for the period 2014-15.

Analytical Tools: The cost of cultivation for turmeric was estimated based on the cost principle adopted by the Commission for Agricultural Costs and Prices (CACP) *viz*. cost A1, A2, B1, B2,C1, C2& C3.(Ministry of Statistics and Programme Implementation, Government of India), The details are furnished in Table 1.

RESULTS AND DISCUSSION

The input use pattern of the turmeric cultivation is presented in Table 2. Turmeric is a labour intensive crop. It could be observed from the Table 2 that about 338 man days of human labour per ha was used for turmeric cultivation. Among the sample farms, small farms used more amount of human labour (370 man days per ha), followed by marginal farms (360 man days perha). The use of machine labour in turmeric cultivation was mainly for land preparation. The average machine labour used was 19.15 hrs per ha and it was maximum in case of large farms (23 hrs ha^{-1}).

The average seed rhizome rate adopted by sample t urmeric farms was 1955 kg ha^{-1}. The seed rhizome rate used among the size categories of farms were 2000 kg perha, 1900 kg ha^{-1}, 1850 kg ha^{-1}, 2000 k / ha^{-1} and 2025 kg ha^{-1} respectively by marginal, small, semi medium, medium farms and large farms respectively. In fertilizer consumption, Muriate of Potash (MoP) has the highest consumption (210 kg ha^{-1}), followed by super phosphate (198.60 kg ha^{-1}) and Diammonium Phosphate (DAP) (160 kg ha^{-1}). Besides, urea, complex and ammonium sulphate were also used by sample farmers. To boost up the organic carbon level in the soil, the sample farms on an average used 2.35 tonnes per ha of farmyard manure and 1.51 tonnes per ha of neem cake. The value of input used by the sample farms of Turmeric cultivation in the district is given in the Table 3.

*Corresponding author's e-mail: kavi_economics@rediffmail.com
Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore-641 003, Tamil Nadu, India.

It could be inferred from the Table 3 that the average input cost of turmeric cultivation was ₹ 184877.09 ha^{-1} and it was the highest in case of medium farms (₹ 195694.41 ha^{-1}), followed by large farms (₹ 190880.59 ha^{-1}) and small farms (₹ 185193.31 ha^{-1}). The share of human labour in the total variable cost accounted for 45.31 per cent and machine labour accounted for 8.97 per cent. Rhizome accounted for a greater share in the input expenditure (30.07 per cent). Fertilizers and organic manures constitute 8.75 per cent and 2.55 per cent respectively, and plant protection chemicals shared 3.16 per cent of the total input expenditure.

The cost and returns of turmeric Cultivation on various cost concept basis in Erode District is furnished in Table 4. It could be seen from the Table 4 that the average cost of cultivation of turmeric in the district was Rs.245577.08 ha^{-1} in which cost A1 was '173095.18 ha^{-1} whereas cost A2 was ₹ 182169.58 ha^{-1}. The average productivity of turmeric in Erode district was 54.80 qtl ha^{-1} valued at ₹ 302840 ha^{-1}. The turmeric productivity were 52, 54.50, 53 57.60 and 56.90 qtlper for marginal, small, semi medium, medium and large farms, respectively. The net return from per hectare cultivation of turmeric was ₹ 57262.92 and it was the highest in case of large farms (₹ 60937.40 ha^{-1}), followed by medium farms (₹ 58199.61 ha^{-1}) and semi medium farms (' ₹ 55893.35 ha^{-1}).

Table 1: Different cost concepts.

Cost A1	**:**	**All actual expenses in cash and kind in production by the owner farmer**
	i	Value of hired human labour
	ii	Value of hired bullock labour
	iii	Value of owned bullock labour
	iv	Value of machinery labour
	v	Hired machinery labour
	vi	Value of seed (a) farm produced & (b) purchased
	vii	Value of insecticides and pesticides
	viii	Value of manure (owned and purchased)
	ix	Value of fertilizers
	x	Depreciation of implements and machinery
	xi	Irrigation charges
	xii	Land revenue, cesses and other taxes
	xiii	Interest on working capital
	xiv	Miscellaneous expenses
Cost A2	:	Cost A1 + rent paid for leased-in land.
Cost B1	:	Cost A1 + interest on value of owned fixed capital assets (excluding land).
Cost B2	:	Cost B1 + rental value of owned land and rent paid for leased-in land
Cost C1	:	Cost B1 + imputed value of family labour.
Cost C2	:	Cost B2 + imputed value of family labour.
Cost C3	:	Cost C2 + 10 per cent of Cost C2 for managerial input of the farmer

Table 2: Average resource usage of turmeric farmers in Erode District of Tamil Nadu. (per hectare).

Particulars	Marginal	Small	Semi medium	Medium	Large	District Average
Labour (man days)						
Family Labour	104.00	110.00	118.00	129.00	80.00	108.20
Hired Labour	256.00	260.00	203.00	220.00	213.00	230.40
Owned Machine Labour (hrs)	-	-	-	2.50	3.00	2.75
Hired Machine Labour (hrs)	14.00	14.00	16.00	18.00	20.00	16.40
Input Application						
Seed Rhizome	2000.00	1900.00	1850.00	2000.00	2025.00	1955.00
Manures (Tonnes)						
Purchased	1.50	2.00	2.86	2.50	2.89	2.35
Neem cake	0.02	-	-	-	3.00	1.51
Fertilizers (Kg)						
DAP	50.00	150.00	150.00	200.00	250.00	160.00
Urea	25.00	150.00	100.00	250.00	300.00	131.25
MOP	150.00	150.00	200.00	300.00	250.00	210.00
Complex	100.00	115.00	150.00	200.00	208.00	154.60
Super phosphate	200.00	203.00	215.00	225.00	150.00	198.60
Ammonium sulphate	120.00	126.00	130.00	153.00	220.00	149.80

Table 3: Value of inputs used in turmeric cultivation in Erode district (Rs/hectare).

Particulars	Marginal	Small	Semi medium	Medium	Large	District Average
Labour						
Hired Human Labour	63500.00	64775.00	50750.00	52000.00	54250.00	57055.00
Family Labour	25796.88	27404.81	29500.00	30490.91	20375.59	26713.64
Total Human Labour	89296.88	92179.81	80250.00	82490.91	74625.59	83768.64
Hired machine Labour	12000.00	14000.00	14000.00	16000.00	16000.00	14400.00
Owned machine labour	-	-	-	2000.00	2400.00	2200.00
Total	101296.88	106179.81	94250.00	100490.91	93025.59	99048.64
Rhizome	53050.00	52226.00	53000.00	60000.00	59737.50	55602.70
FYM	3000.00	4000.00	5720.00	5000.00	5780.00	4700.00
Neem cake	80.00	-	-	-		80.00
Total	3080.00	4000.00	5720.00	5000.00	5780.00	4716.00
Fertilizers						
DAP	1300.00	3900.00	3900.00	5200.00	6500.00	4160.00
Urea	150.00	900.00	600.00	1500.00	1800.00	990.00
MOP	2625.00	2625.00	3500.00	5250.00	4375.00	3675.00
Complex	1700.00	1955.00	2550.00	3400.00	3536.00	2628.20
Super phosphate	1920.00	1928.50	2031.75	2137.50	1434.00	1890.35
NH_4So_4	2280.00	2394.00	2470.00	2907.00	4180.00	2846.20
Total	9975.00	13702.50	15051.75	20394.50	21825.00	16189.75
Plant Protection						
Total	4900.00	5485.00	5768.50	6209.00	6912.50	5855.00
Gunny bags	3150.00	3600.00	3375.00	3600.00	3600.00	3465.00
Total	3150.00	3600.00	3375.00	3600.00	3600.00	3465.00
Total variable cost	175451.88	185193.31	177165.25	195694.41	190880.59	184877.09

Table 4: Cost of cultivation of turmeric on different cost concepts basis in Erode District of Tamil Nadu (Rs/hectare).

Particulars	Marginal	Small	Semi medium	Medium	Large	District Average
Cost A1						
Wages for hired human labour	63500.00	64775.00	50750.00	52000.00	54250.00	57055.00
Rent for hired machine labour	12000.00	14000.00	14000.00	16000.00	16000.00	14400.00
Imputed rental value of owned machine labour	-	-	-	2000.00	2400.00	2200.00
Cost of seed produced and purchased	53050.00	52226.00	53000.00	60000.00	59737.50	55602.70
Cost of insecticide and pesticide	4900.00	5485.00	5768.50	6209.00	6912.50	5855.00
Cost of manure	3080.00	4000.00	5720.00	5000.00	5780.00	4716.00
Cost of fertilizers	9975.00	13702.50	15051.75	20394.50	21825.00	16189.75
Depreciation of implements and machineries	2008.00	2100.00	2100.00	2125.00	2189.00	2104.40
Land revenue, cess and taxes	5.00	5.23	5.50	5.58	6.00	5.46
Other miscellaneous costs	3150.00	3600.00	3375.00	3600.00	3600.00	3465.00
Total working capital	151668.00	159893.73	149770.75	167334.08	172700.00	160273.31
Interest on working capital	12133.44	12791.50	11981.66	13386.73	13816.00	12821.86
Cost A1- Total (Total working capital+ interest on working capital)	163801.44	172685.23	161752.41	180720.81	186516.00	173095.18
a) Rental value of leased in land	8600.00	8950.00	9002.00	9250.00	9570.00	9074.40
Cost A2 (Cost A1+a)- Total	172401.44	181635.23	170754.41	189970.81	196086.00	182169.58
b) Interest on value of owned fixed capital assets	5250.00	5326.00	5390.00	5425.00	5475.00	5373.20
Cost B1 (Cost A1+b)- Total	169051.44	178011.23	167142.41	186145.81	191991.00	178468.38
c) Rental value of owned land and rent paid for leased in land	17250.00	18000.00	18000.00	18500.00	18600.00	18070.00
Cost B2 (Cost B1+c)- Total	186301.44	196011.23	185142.41	204645.81	210591.00	196538.38
d) Imputed value of family labour	25796.88	27404.81	29500.00	30490.91	20375.00	26713.52
Cost C1 (Cost B1+d)	194848.32	205416.04	196642.41	216636.72	212366.00	205181.90
Cost C2 (Cost B2+d)	212098.32	223416.04	214642.41	235136.72	230966.00	223251.90
Cost C3 (Cost C2+10% of Cost C2 for managerial input of farmer)	233308.15	245757.64	236106.65	258650.39	254062.60	245577.08
Main product Yield (Qtl)	52.00	54.50	53.00	57.60	56.90	54.80
Main product Returns(Rs.)	290000.00	300350.00	292000.00	316850.00	315000.00	302840.00
Gross returns	290000.00	300350.00	292000.00	316850.00	315000.00	302840.00
Net returns (Gross returns- Cost C3)	56691.85	54592.36	55893.35	58199.61	60937.40	57262.92
Net returns/quintal	1090.23	1001.69	1054.59	1010.41	1070.96	1044.94

CONCLUSION

Turmeric farmers in the country face lot of constraints. Lack of knowledge about pest management is the major constraint faced by farmers in production, whereas fluctuation in market price is the major constraint in marketing.(Janailin and Tripathi, 2013) Though the yield realized by turmeric farmers in the study area was higher than the state average yield of 4027 kg ha^{-1}, the price realised realized by the farmers is lesser per quintal. The price of turmeric soared to an all time high of[1] . 17000 per quintal during 2010. But the prices had come down and were hovering around Rs. 6400- 6500 per quintal now. Lack of proper storage facilities is one among the major constraint, since it was not possible for every farmer to spend more on transportation and store their produce in the Erode regulated market. Thus, the uncertainty in price and devoid of proper storage facilities forced many farmers to sell their produce immediately after the harvest. This indicates the need for adequate storage facilities. Ensuring reasonable price to the farmers is much needed in order to hold them in turmeric cultivation. It is time to take measures so as toretain Erode as the major turmeric centre of India. Besides, the study suggested for maximum value addition, like boiling, drying and grading of rhizomes in order to achieve maximum returns in turmeric cultivation, since a minimum level of value addition will enhance the price level to a greater extent.

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