Original Research Article

ECONOMIC VIABILITY OF TURMERIC CULTIVATION IN NORTH-EASTERN TRANSITIONAL ZONE OF KARNATAKA

Abstract: Turmeric is very important spice crop of India, which produces nearly the whole world's crop and uses 80 per cent of it. Turmeric, the source of cucurmin extremely well tolerated and has been used on daily basis by many Asian cultures. Turmeric (*Cucurma longa*) is commercially cultivated and is one of the profitable crops of any region. Turmeric is being cultivated in Hyderabad-Karnataka region in an area of 767 ha with production of 2393 tonnes. In Hyderabad-Karnataka region, Kalaburagi stands first in production followed by Bidar district and its cultivation is almost observed in North Eastern Transitional Zone and hence the study was conducted in North Eastern transitional zone. The data were collected from 60 turmeric growers of three taluks of North Eastern Transitional Zone *viz*., Aland, Bidar and Chincholi taluks for the agricultural year 2017-18. Turmeric cultivation is being considered as annual crop provides an employment opportunity to carry out various cultural and post harvest operations. The total cost of cultivation of turmeric worked out to be Rs. 74,200.43 per acre. The average yield realized by the farmers in the study area was 18.72 quintal per acre. On an average, the gross and net returns of turmeric cultivation was worked out to be Rs. 1,22,460.06 and Rs.48,259.59 respectively. The returns per rupee spent was worked out to be Rs.1.65. The higher net returns and returns per rupee spent indicated the economic viability of turmeric cultivation in the North-Eastern Transitional Zone of Karnataka.

Key words: Economic viability, Net returns, Net benefits and B:C ratio

1.INTRODUCTION

India is known as the "spice bowl of the world" for its varieties of production of superior quality spices. India has been famous for cultivation of spices since the ancient times. There are records about properties of various spices in the Vedas as early as 6000BC. India is well known for trade in agricultural commodities, especially spices and cotton ever- since the exploration of sea routes.

Among the spices, turmeric is a very important medicinal and dietary spice in India, which produces nearly the whole world's crop and uses 80 per cent of it. Turmeric usage dates back to nearly 4000 years, to the Vedic culture in India, when turmeric was the principal spice and also of religious significance. Turmeric, the golden spice is widely cultivated in different countries such as India, China, Myanmar, Nigeria, Bangladesh, Pakistan, Sri Lanka, Taiwan, Burma, Indonesia *etc*. Among these countries India occupies first position in area and also in production. In India, turmeric is grown in 18 States among them- Andhra Pradesh, Tamil Nadu, Karnataka and West Bengal are the major turmeric producing states. Turmeric has been used medicinally throughout Asia to treat stomach and liver ailments. It is also used externally, to heal sores, and as a cosmetic. The source of curcumin is extremely well tolerated, and has been used on a daily basis by many Asian cultures. In today's India, turmeric is still added to nearly every dish, be it meat or vegetables. Turmeric is part of all curry powder. Due to Indian influence, turmeric has also made its way to the cuisine of Ethiopia.

In Karnataka, major turmeric producing districts are Chamarajanagar, Mysuru, Belagavi, Bagalkote, Kalaburagi, Hassan, Bidar, Shimoga etc. North East, Karnataka, i.e. Kalaburgi district occupies 5^{th} position in turmeric production with the production of 1973 tonnes.

In Karnataka, during 2013-14, turmeric has occupied an area of 13341 ha with a production of about 63570 tonnes and average yield of about 4765 kg / ha. In Kalaburagi district, during 2013-14, turmeric has occupied an area of 639 ha with a production of about 1973 tonnes and average yield of about 3088 kg /ha. In Bidar district, during 2013-14 turmeric has occupied an area of 78 ha with a production of 182 tonnes and average yield of about 2339 kg / ha.

Considering the importance of this spice in food preparation, home remedies and medicine it is important to manage quality, production and supply. The present study aims to undertake a detailed analysis of the supply chain management of turmeric in North Eastern Transitional Zone of Karnataka.

2. METHODOLOGY

The present study was confined to the North-Eastern Transitional Zone of Karnataka as cultivation of turmeric is in vogue in this zone. Hence, the taluks coming under this zone were listed and identified the taluks which have turmeric area in consultation with State Department of Horticulture. Accordingly, Chincholi and Aland taluks of Kalaburgi district and Bidar taluk of

Bidar district were selected. The list of farmers growing turmeric was not available as distribution of turmeric growers is scattered. Hence, turmeric growers were identified using snow ball sampling till the required samples are obtained. The total number of turmeric growers selected for thestudy were 60 farmers, with a equal representation from Kalaburgi and Bidar districts. Primary data were collected from the selected farmers using pre-tested schedule through personal interview method. The information pertaining to general information of the sample farmers like age, education level, family size, experience in farming, landholding size, assets position, possession of implements and machineries and also data on input use and output realized were collected. Tabular presentation was done to present the results.

3. RESULTS AND DISCUSSION

One of the objectives of the study, was to assess the economic viability of turmeric cultivation in North-Eastern Transitional Zone of Karnataka. To study this objective, it was felt necessary to assess the general features of turmeric growers in the study area as it would give an overview of cultivation and marketing practices followed by them.

It is evident from the Table 1- that the average age of the sample farmers was 43.60 years indicating involvement of middle age farmers in turmeric cultivation. This may be due to high analytical and judging capacity of the farmers at middle age and would look forward for newer avenues and technologies. Similar results were obtained in the study conducted by Manu (2013). They reported in their study, that majority of the farmers who were cultivating turmeric were in the middle age group.

With respect to educational level, almost all are literate none of them were found in the illiterate category. The large majority (43.33 per cent) of the turmeric growers have completed their graduation indicating educated farmers are cultivating turmeric as north eastern transitional zone is considered to be a non-traditional area for turmeric cultivation. It was found that maximum number of the farmers was regularly participating in cooperative societies with 28.33 per cent followed by village panchayat and KVK with 16.67 and 3.33 per cent, respectively. The results pertaining to participation of growers in the institutions like panchayath and cooperative societies was quite encouraging but there is a need to make efforts for participation in KVK activities which is very much essential for adoption of improved technologies. About 78.33 per cent of farmers were having experience of more than ten years in turmeric cultivation. The

sustained interest in cultivation of turmeric may be due to possibility of earning higher returns from this crop. The average landholdings of sample farmers worked out to be 4.41 acres of dry land and 7.87 acres of irrigated and the size of landholdings was apparently higher when compared to other farmers. This indicated that turmeric cultivation was practiced almost by the almost medium category of farmers. On an average 2.56 acres of area was devoted to turmeric cultivation by the sample farmers.

Table 1. General features of the turmeric growers

n = 60

Sl.No	Particulars	Frequency	Percentage (%)
1.	**Age**		
a.	<35 years	11	18.33
b.	35 – 50 years	37	61.67
c.	>50 years	12	20.00
	Average age (years)	**43.60**	
2.	**Family size**		
a.	Men	2	-
b.	Women	2	-
c.	Children	3	-
	Total	7	-
3.	**Education**		
a.	Illiterate	-	-
b.	Primary	11	18.33
c.	High school	17	28.33
d.	PUC	7	11.67
e.	Graduation	25	43.33
4.	**Experience in turmeric cultivation**		
a.	Less than 10 years	13	21.67
b.	More than 10 years	47	78.33
5.	**Institutional participation**		
a.	Village panchayat	12	20.00
	Regular	10	16.67
	Occasional	2	3.33
	Never	48	80.00
b.	Cooperative societies	21	35.00
	Regular	17	28.33
	Occasional	4	6.67
	Never	39	65.00
c.	Extension participation (KVK)	2	3.33
	Regular	-	-
	Occasional	2	3.33

	Never	58	96.67
6.	**Size of landholding (acre)**		
a.	Dry land	4.41	-
b.	Irrigated land	7.57	-
	Total operational holding (acres)	**11.98**	-
	Average area under turmeric cultivation	**2.56**	-

3.1 Economics of turmeric cultivation

In working out the economics of any crop the important point to be considered is generation of income and employment. Accordingly in this section labour use pattern, costs incurred and returns obtained in turmeric cultivation is discussed.

3.1.1 Labour use pattern in turmeric cultivation

The quantity of labour used, cost involved in different operations of turmeric cultivation for an acre area is depicted in Table 2. table revealed that turmeric is labour intensive crop which required semi-skilled labour from planting to till harvesting. In the study area, the farmers have carried out weeding operations for 2-3 times due to higher weed infestation. The harvesting of turmeric rhizomes involved the activities like, cutting the leaves and then digging of the rhizomes and consequently for all these operations, the crop needed extensive utilization of labours. Thus, the availability of labour at reasonable wage rates was prerequisite for the cultivation of turmeric which plays a vital role in its successful cultivation. Similar results were quoted in the study of Singh *et al.* (2012). They reported that turmeric is labour intensive crop, the operations like, weeding and harvesting consumes more quantity of labour.

It could be observed from the table that the turmeric generates better employment opportunity because of its longer duration compared to other field crops. On an average, turmeric provided 62 days of employment per acre and majority of the operations were carried out by women labour. Thus, the women labour participation was to the extent of 81 per cent. Merely 19 per cent of the operations were carried out by men labour. This was due to the fact that men labour was used only for strenuous operations. Among the different operations, women participation was found to be more in weeding (28.55 days) and harvesting (14.89 days) which accounted major share compared to other operations like, planting of rhizomes (4.00 days),

application of manures (3.34 days), application of fertilizers (1.20 days) and application of plant protection of chemicals (0.60 days).

With regard to participation of men in turmeric cultivation, their participation was found in bagging (3.54 days), application of PPC (1.70 days), application of chemical fertilizers (1.47 days) and application of manures (1.26 days).

The usage of machine labour was more in the operations like, harrowing, ploughing and transportation of FYM. The better land preparations may lead to good growth of the crop so that farmers usually practiced 3 times tillage practices in the study area. Similar results of the above findings are in agreement with the results of Lokesh and Chandrakanth (2004) and Singh *et al.* (2012). They found that maximum tillage operations done by machine labour instead of human labour.

Table 2. Labour use pattern in turmeric cultivation

(Per acre)

Sl.No	Operation	Men labour (days)	Women labour (days)	Machine labour (hr)	Amount (₹/ac)
1.	Preparatory Tillage	-	-	4	3636.50
2.	Application of Manures	1.26	3.34	-	879.00
3.	Planting of rhizomes	-	4.00	-	600.00
4.	Application of chemical Fertilizer	1.47	1.20	-	621.00
5.	Application of PPC	1.70	0.60	-	600.00
7.	Weeding	-	28.55	-	4282.50

8.	Harvesting	0.92	14.89	-	2509.50
9.	Bagging	3.54	-	-	1062.00
	Total	**8.91**	**52.58**	**4**	**14190.50**

3.1.2 Cost of cultivation and returns of turmeric

The details of different cost components and returns are depicted in the Table 3. Among variable inputs, expenditure on planting material accounted highest share of 18.72 per cent of total cost of cultivation, followed by fertilizers, FYM and PPC with 13.09, 5.71 and 1.31 per cent, respectively. Among the different cost components, the cost for labour of field operations and labour cost for post harvest operations constituted with 19.12 and 12.11 per cent, respectively. The interest on working capital at the rate of 7.5 % accounted for 4.40 per cent of the total cost of cultivation of turmeric. Among the fixed costs, land rent accounted major share with 21.04 per cent of total cost of cultivation followed by depreciation and land revenue with 3.71 and 0.10 per cent of total cost of cultivation.

The per acre cost of cultivation of turmeric worked out to be ₹ 74,200.43, the cost involved in the cultivation of turmeric was very high as compared to other field crops. Similar results were quoted by Patil (2000) where, he found that the total cost of cultivation of turmeric was ₹ 2,35,224.84 per ha in the Sangli district (Maharashtra) and Patil *et al*. (2004), reported that the per hectare cost A, cost B and cost C were ₹ 1,63,824.31, ₹ 2,29,098.67 and ₹ 2,36.298.67, respectively in the Sangli district of Maharashtra. Total variable cost was amounted to ₹ 55762.98, total fixed cost constituted ₹ 18,437.45. Interest on working capital was worked out at the rate of 7.5 %, amounted to ₹ 3265.32. Among the variable costs, cost of planting material, cost of FYM, cost of fertilizers and cost of plant protection chemicals were the major items in the cultivation of turmeric. The expenditure on planting material was found to be an

important item in the total cost of cultivation of turmeric so that investment on planting material was high. The farmers used more FYM to improve the soil fertility and to get more yield. This was due to fact that there was a better spread of younger rhizomes on the fertile soils. Similar results were reported in the study of Kerutagi *et al*. (2000). They reported in their study that expenditure on planting material was very high and usage of more fertilizer with the intention of improving the soil fertility.

The average yield of turmeric realized by the farmers in study area was 18.72 quintals per acre. On an average, gross and net returns of turmeric cultivation was worked

Table 3. Cost of cultivation and returns in turmeric

Per acre

Sl.No	Resources	Unit	Quantity	Amount (₹)	Per cent to the total cost
I.	**Variable cost**				
a.	Planting materials	Tonnes	6.37	13891.67	18.72
b.	Organic manure	Tonnes	1.90	4234.53	5.71
c.	Fertilizers				
	Urea	Bags	4.41	1528.61	2.10
	MOP	Bags	4.38	2942.32	4.00
	DAP	Bags	4.60	5425.68	7.31
	Complex	Bags	0.29	360.33	0.49
d.	Plant protection chemicals (PPC)	Liter	-	963.93	1.31
e.	Labour cost for field operations	₹/ acre	-	14190.50	19.12
f.	Labour cost for post harvest operations	₹/acre	-	8960.09	12.11
g.	Interest on working capital @ 7.5 %	-	-	3265.32	4.40
	Sub total	-	-	55762.98	75.15
II.	**Fixed cost**				
	Land rent	₹	-	15,613.33	21.04
	Land revenue	₹	-	70.00	0.10

	Depreciation	₹	-	2754.12	3.71
	Total fixed cost	**-**	**-**	**18437.45**	**24.85**
	Total cost (I+II)	**-**		**74200.43**	**100.00**
	Average yield	q/ac		**18.72**	-
	Market price realized	₹/q		**6541.67**	-
	Gross returns	₹		**1,22,460.06**	-
	Net returns over all costs	₹		**48259.63**	-
	Net returns over variable cost	₹		**66697.08**	-
	Returns per rupee spent	₹		**1.65**	-
	Marketing cost	₹/q		**669.08**	-
	Cost of production	₹/q		**4632.79**	-
	Net returns	₹/q		**1908.88**	-

out to be ₹ 1,22,460.06 and ₹ 48,259.63 per acre, respectively. The total marketing cost incurred by the farmer was ₹ 669.08 per quintal and the cost of production and net returns were worked out to be ₹ 4632.79 and ₹ 1908.88 per quintal. The returns per rupee spent was worked out to be ₹ 1.65. Thus, turmeric cultivation was found to be profitable venture in the study area. Similar results were quoted in the studies of Singh *et al*. (2012), Patil *et al*. (2009) and Lokesh and Chandrakanth (2004). They reported in their studies that B÷C ratio was found to be profitable. In spite of huge variable costs involved in turmeric cultivation returns were quite good which can be further increased by efficient management at farm level.

4. CONCLUSION

In Karnataka, turmeric has occupied an area of 13341 ha with a production of about 63570 tonnes and average yield of about 4765 kg/ha. In Hyderabad-Karnataka region also turmeric is being cultivated in North Eastern Transitional Zone. The study revealed that the cost of turmeric rhizomes was high. Turmeric rhizome of high quality should be made available to the farmers at affordable rates to increase the use by farmers and to increase their profitability. Turmeric farmers were more educated and education level of the farmers played a crucial role in

adopting new technologies in the turmeric cultivation and increasing the returns from value addition and increase in their profit. The role of extension system need to be stressed upon for capacity building of farmers for optimum harnessing of the benefits of new generation technologies like mechanised value addition**.** The returns per rupee spent was 1.65 indicated that the cultivation of turmeric in North Eastern Transitional Zone of Karnataka is economically viable and most profitable venture in the study area and hence, there is a need to promote this crop. The scale of finance fixed for the crop was ₹ 65,573.68 per acre which covers almost the cost of cultivation of turmeric. Thus, encourages the farmers to venture into it.

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