

ECONOMIC PERFORMANCE OF TURMERIC GROWERS

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ABSTRACT

A study conducted in Belagavi district during 2018-19 examined the economic performance of turmeric growers using an 'Ex-post facto' research design. Two top turmeric-growing blocks were selected through multistage proportional sampling, with six villages chosen from each block based on irrigation sources. Data from 120 respondents across 12 villages was collected using pretested structured interviews. The cost of cultivation was estimated using the Commission for Agricultural Costs and Prices' principles (A1, A2, B1, B2, C1, C2, C3). Labour was the most extensively used input, with an average of 134 man-days acre⁻¹. Canal/borewell farms (CBF) used more labour (137.5 man-days acre⁻¹) compared to river basin farms (RBF - 130.50 man-days acre⁻¹). The average cost of turmeric cultivation was Rs. 138010.78 per acre, with A1 cost at Rs. 91494.09 acre⁻¹ and A2 cost at ₹ 95128.09 acre⁻¹. Mean gross returns were ₹ 194943.03 acre⁻¹. Net returns varied, with ₹ 100159.56 acre⁻¹ at cost 'A', ₹ 82157.09 acre⁻¹ at cost 'B2', and ₹ 56932.25 acre⁻¹ at cost 'C3'. CBF had higher net returns (₹ 70099.83 acre⁻¹) than RBF (₹ 44390.73 acre⁻¹). The benefit-cost ratio at cost 'C3' was 1:1.41 for the district, with CBF (1.49) outperforming RBF (1.33).

Keywords: economic performance, cost of cultivation, input utilization, turmeric, gross returns, and net returns.

INTRODUCTION

Turmeric (*Curcuma longa L.*), the ancient sacred spice of India / 'Indian saffron', is an important commercial spice crop grown in various parts of India. Indian origin turmeric is considered as the economically & medicinally best due to its high curcumin content (Chinnadurai *et al.*, 2018). It is widely used in cosmetics, Phyto-pharmaceutical industries (Kanjana *et al.*, 2016) and traditionally, part of all the Hindu festivals and ceremonies all over India.

India, the 'land of spices' is the largest producer, consumer & exporter of spices. Turmeric was produced in 246 thousand hectares having 5646.34 kg ha⁻¹ of productivity with total production of 389 thousand tonnes indicated the increasing trend of the area, production, and productivity of turmeric in India (Anonymous, 2022^a). India exported 2,01,152 thousand US\$ in 2020. The turmeric exported value raised by 20 percent in the 2020-21 from 6 percent in 2016-20. (Anonymous 2022^b).

Karnataka is one of the leading producers of turmeric. In Karnataka, turmeric was cultivated in an area of 20,555 hectares with a production of 1,31,138 tonnes during the year 2020-21. Belagavi district is contributing 38.08 percent of Karnataka's total turmeric production despite

second in area with 6,670 hectares but first in production and productivity of turmeric with 50,725 tonnes and 7605 kg ha⁻¹ respectively (Anonymous 2022^c). Further, the Belagavi district is ideally suited for cultivation of horticulture crops with dominated medium to deep black soils, varied climatic factors and huge irrigation facilities with major rivers like Krishna, Mala Prabha, Ghataprabha etc and canal irrigation. Hi-tech horticulture and commercial spices production has gained momentum in recent years. Since turmeric is an input and labor-intensive crop. Investment on land, inputs, labour, and production is important to organize the capital as well as to sustain the soil fertility without compromising in the turmeric productivity.

OBJECTIVE

To understand the economic performance of turmeric growers in river basin as well as canal/ borewell irrigated areas

METHODOLOGY

The study was conducted using the "Ex-post facto" research design. Based on data obtained from Karnataka State Department of Horticulture. The Belagavi district having maximum production and productivity with second most area under turmeric was selected. For the selection of samples,

multistage proportional sampling was used. In Belagavi district, top two turmeric growing blocks were selected. From each block six villages were selected based on crop complex approach along with the source of irrigation used. From each village 10 farmers were selected randomly. Thus, the final sample comprises of 120 respondents.

Data collection is made through personal interview method from the selected farmers using the structured, pre-tested interview schedule. The primary data pertaining to inputs utilization pattern, cost and returns of turmeric production were collected for the period 2018-19.

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 (Anonymous 2008).

Cost concept

A simple tabular analysis was carried out to accomplish the objectives of present study. Economics of turmeric were worked out by using standard cost concept.

Cost A1: It is an actual paid out cost by the cultivators in the form of cash and kind. This cost includes the expenditure on following items.

Cost A1

- Wages of hired human Labour
- Rent for hired machine labour
- Imputed value of machine labour owned
- Cost of rhizomes
- Cost of Insecticide and Pesticide
- Cost of FYM
- Cost of biofertilizers
- Cost of fertilizers
- Cost of micronutrients
- Depreciation on farm implements and buildings
- Irrigation Charges
- Land Revenue, cess, & other taxes
- Miscellaneous expenses (Marketing/ Transportation/ Processing)
- Interest on working capital @ 8 %

Cost A1 = Total working capital + Interest on Working Capital @ 8%

a) Rental value leased in land

Cost A2 = (Cost A1+a)

b) Interest on value of owned fixed capital assets

Cost B1 = (Cost A1+b)

c) Rental value of owned and rental paid for leased in land

Cost B2 = (Cost B1+c)

d) Imputed value of family labour

Cost C1 = (Cost B1 + d)

Cost C2 = (Cost B2+d)

Cost C3 = (Cost C2+ 10% of total cost C2 for value of management input)

RESULTS AND DISCUSSION

The findings of the study were interpreted in three levels. Firstly, with respect to the input utilization pattern as detailed in Table 1. Secondly, the cost of cultivation of turmeric growers of Belagavi district as detailed in Table 2. Finally, with Benefit cost analysis of turmeric growers of growers as described in Table 3.

Per acre input utilization of turmeric cultivation

The input utilization pattern of the turmeric growers is presented in the Table 1. The turmeric is a labor-intensive crop. It is evident from the Table 1 that about 134 man days of human labour per acre was used for turmeric cultivation. Among the sample farmers, CBF (Canal / Borewell farms) farmers (137.50 man days) used more human labour compared to RBF (River Basin Farms) farmers (130.50 man days). The use of machine labour is limited to land preparation, bunding, uprooting and boiling of the rhizomes in turmeric cultivation with average requirement of 7.5 hours whereas bullock labour was rarely used mainly for intercultivation. The average rhizome rate adopted by the sample turmeric farmers was 900 Kg Acre⁻¹. Among Sampled areas, the CBF (1000 Kg acre⁻¹) farmers used more rhizomes than RBF (800 Kg Acre⁻¹) farmers. With respect to the fertilizer application, on an average, Muriate of Potash (MoP) has the highest application with 3.5 bags (175 kg acre⁻¹), followed by Diammonium Phosphate (DAP) / Single Super Phosphate (SSP) with three bags per acre (150 kg acre⁻¹) and Urea with 2.5 bags per acre⁻¹. In addition to these fertilizers, complex, ammonium sulphate and micronutrients were also used along with water soluble fertilizers according to situation demand.

The sample farms on an average used three tonnes per acre of farmyard manure to boost the organic carbon level in the soil. The following significant differences in usage of inputs in the sample areas of district were observed: the plant protection

chemicals, FYM, fertilizers and women labours usage were more in RBF areas. But rhizomes rate and micronutrients application were more in the CBF areas.

Table 1: Pattern of inputs utilization per acre by the turmeric growing farmers of Belagavi district of Karnataka in 2018-19 (n=120)

Particulars	Unit	RBF (n1=60)		CBF (n2=60)		District average	
		Qty	Unit Rate (₹)	Qty	Unit Rate (₹)	Qty	Unit Rate (₹)
Rhizomes	Qtl	8.00	2950.00	10.00	2850.00	9.00	2900.00
FYM	Tonnes	3.00	2500.00	3.00	2000.00	3.00	2250.00
Fertilizers							
N	Bags (50kg)	2.00	250.00	3.00	250.00	2.50	250.00
P		3.00	1200.00	3.00	1200.00	3.00	1200.00
K		4.00	1360.00	3.00	1360.00	3.50	1360.00
Micronutirents	Kgs	2.00	140.00	2.00	600.00	2.00	370.00
Hired Human Labour							
Men	Man days	36.00	350.00	43.50	350.00	39.75	350.00
Women		55.50	250.00	52.50	250.00	54.00	250.00
Family labour							
Men		22.50	350.00	23.50	350.00	23.00	350.00
Women		16.50	250.00	18.00	250.00	17.25	250.00
Machine labour		Per Hour	7.00	600.00	8.00	450.00	7.50

*RBF =River Basin farmers & CBF = Canal/ Borewell farmers

Per acre cost of cultivation of turmeric

The table 2 indicated that the average variable cost of cultivation of turmeric growers of Belagavi was ₹ 91,494.09 per acre. Among the sampled farmers, the average variable Cost of Cultivation of CBF farmers (₹ 93533.40 per acre) was more compared to the RBF farmers (₹ 89454.78 per acre). This difference was mainly due to high rate of rhizomes utilization for planting, micronutrients foliar spray, drip irrigation adoption, and plastic mulching by few farmers were the major reasons for high cost of cultivation by canal/ borewell irrigation-based farmers. The major contributors to the variable costs were wages of hired human labour (₹ 27412.50 per acre), planting rhizomes (₹ 24450.00 per acre), fertilizers (₹ 8985.00 per acre), farm yard manure (₹ 6750.00 per acre), hired machine labour (₹ 3900.00 per acre). Some important observations were, the micronutrients application was more (₹ 1200.00 per acre) among CBF farmers whereas it was only (₹ 250.00 per acre) by RBF farmers. Irrigation charges were more in RBF (₹ 487.50 per acre) than CBF farmers (₹ 270.00 per acre) because the RBF farmers irrigated the turmeric by borrowing from the neighbours. The spending on the plant protection chemicals was higher in RBF (₹ 2800 per acre) compared to CBF (Rs.2360 per acre)

with districts average spending of Rs.2580.00 per acre. This trend was mainly due to the black soil prevalence in river basin farms and frequent water stagnation due to flash floods which led to emergence of pest and diseases.

Among the different cost concepts, expenditure on the labour (hired and owned human, machine, and family labour) was ₹ 45600.00 per acre was top contributor to the cost of cultivation of turmeric in Belagavi district. In labour hiring, the women labours (71.25 man days acre⁻¹) were more hired than men labours (62.75 man days acre⁻¹) for turmeric cultivation. This was mainly due to the non-availability of men labours, high labour cost of men compared to women and may be due to the stereotyped work assigned to women. This labour utilization trend was reversal when it comes the family labour, where men labours were more involved in the farm activities than the women family labour. The similar kind of results were observed in Sikkim by Janailin and Tripathi (2014) and Chinnadurai *et al.*, in Tamilnadu (2018).

The similar trend of observations was noticed with respect to the total cost (variable cost + fixed cost) of cultivation of turmeric in Belagavi district. The RBF farmers (₹ 133700.27 per acre) have less cost of cultivation compared to the CBF (₹ 142384.47per acre) farmers. The average cost

of cultivation of turmeric in the district was ₹ 138010.78 per acre in which A1 cost was 'Rs 91494.09 per acre' whereas A2 cost '₹ 95128.09 per acre'. The findings are in line with the findings of Dhanalakshmi *et al.*, (2018) Vinaya *et al.* (2017) and Wakale *et al.*, (2022).

Table 2: Cost of Cultivation of turmeric in Belagavi district of Karnataka based on different cost concepts.

(n=120)

Particulars	RBF (n1=60)	CBF (n2=60)	District average
Cost A1			
Wages of hired human Labour	26475.00	28350.00	27412.50
Rent for hired machine labour	4200.00	3600.00	3900.00
Imputed value of machine labour owned	1650.00	2200.00	1925.00
Cost of rhizomes	23600.00	25300.00	24450.00
Cost of Insecticide and Pesticide	2800.00	2360.00	2580.00
Cost of FYM	7500.00	6000.00	6750.00
Cost of biofertilizers	235.00	380.00	307.50
Cost of fertilizers	9540.00	8430.00	8985.00
Cost of micronutrients	280.00	1200.00	740.00
Depreciation on farm implements and buildings	2680.00	4200.00	3440.00
Irrigation Charges	487.50	270.00	378.75
Land Revenue, cess, & other taxes	25.00	25.00	25.00
Miscellaneous expenses (<i>Marketing/ Transportation/ Processing</i>)	3356.00	4290.00	3823.00
Total working capital	82828.50	86605.00	84716.75
Interest on working capital @ 8 %	6626.28	6928.40	6777.34
Cost A1-Total			
Total working capital + Interest on Working Capital	89454.78	93533.40	91494.09
a) Rental value leased in land	3828.00	3440.00	3634.00
Cost A2 (Cost A1+a) -Total	93282.78	96973.40	95128.09
b) Interest on value of owned fixed capital assets	5250.00	5475.00	5362.50
Cost B1 (Cost A1+b)	94704.78	99008.40	96856.59
c) Rental value of owned and rental paid for leased in land	14840.92	17707.03	16245.25
Cost B2 (Cost B1+c)- Total	109545.70	116715.43	113101.84
d) Imputed value of family labour	12000.00	12725.00	12362.50
Cost C1 (Cost B1 + d)	106704.78	111733.40	109219.09
Cost C2 (Cost B2+d)	121545.70	129440.43	125464.34
10% of total cost C2 for value of management input	12154.57	12944.04	12546.43
Cost C3 (Cost C2+ 10% of total cost C2 for value of management input)	133700.27	142384.47	138010.78

*RBF =River Basin farmers & CBF = Canal/ Bore well farmers

Per acre cost and returns from turmeric cultivation

The cost and returns analysis per unit of turmeric production, help to understand the investments needed, expected profit and selection of appropriate actions as and when needed on the farm. The per acre cost and returns from turmeric cultivation was presented in the Table 3.

From the Table 3, it was evident that the overall

average gross returns for district was worked out to be ₹ 194943.03 per acre. The net returns obtained at various costs at district level was ₹ 100159.56 per acre at cost 'A', ₹ 82157.09 per acre at cost 'B2' and 56932.25 per acre at cost 'C3'. These results indicate that cultivation of turmeric is profitable. But net returns of CBF (Rs.70099.83 per acre) was much higher than RBF (Rs.44390.73 per acre). This was mainly because of the reason that most of the river basin farms were dominated by black soil, poor intercropping,

frequent pest and diseases attacks, water stagnation and poor crop rotation. The lack of crop rotation as a reason by Begum *et al.*, (2019) and poor adoption of modern practices as reported by Karthik & Amarnath (2014) Rajesh *et al.*, (2020) and Joshi *et al.* (2022).

The BC ratio of CBF (1.49) was superior compared to RBF (1.33) at cost 'C3'. The poor output in the RBF farms was attributed to poor yield due to the few farmers

shift towards organic production and selling price of the river basin farms turmeric was lesser (₹ 6400 per quintal) compared to canal/ bore well irrigated farms (₹ 6900 per quintal) of dried turmeric. The farmers sold their produce immediately and fetched poor prices due poor storage and poor post-harvest management. Further, the farmers were neglecting the scientific recommendations and moving with their traditional practices and notions.

Table 3: Benefit Cost Analysis of Turmeric growers according to different cost concepts (n=120)

Particulars	RBF (n1=60)	CBF (n2=60)	District average
Cost C3	133700.27	142384.47	138010.78
Main Product Yield (Qtls)	26.19	28.95	27.57
Main Product returns (₹)	167616.00	199734.30	183330.53
By-product (Mother Rhizome)	10475.00	12750.00	11612.50
Gross Returns (Main product returns +Mother rhizomes returns)	178091.00	212484.30	194943.03
Net Returns (Gross returns - Cost A2) ₹	84808.22	115510.90	100159.56
Net Returns (Gross returns - Cost B2) ₹	68545.30	95768.87	82157.09
Net Returns (Gross returns - Cost C3) ₹	44390.73	70099.83	56932.25
Net Returns per quintal (Net returns / Yield)	1694.95	2421.66	2065.12
B:C Ratio	1.33	1.49	1.41

*RBF =River Basin farmers & CBF = Canal / Bore well farmers

CONCLUSION

The benefit cost ratio which gauges the economic efficiency of production. The Belagavi district's turmeric production registered a respectable BC ratio / input output ratio 1:1.41. Which means turmeric production is profitable venture in Belagavi district. Furthermore, the farmers have to consciously adopt the scientific practices in the study area. Market prices fluctuations coupled with poor storage facilities as well as the prices apprehended by the turmeric farmers is lesser per quintal. Based on the practical observations made by the researcher, strongly recommends for scientific storage facilities, value addition and awareness about advanced production technologies in order to achieve maximum returns in turmeric cultivation. Since a small change in practice will enhance the price level to a greater extent.

REFERENCES

Aglawe, D. D., Bhute, N. K. and Kale, N. D. (2023) Relationship between the profile characteristics on technological gap among the turmeric growers. *Guj. J. Ext. Edu.* 35(2):97-103. <https://doi.org/10.56572/gjoee.2023.35.2.0020>.

Anonymous (2008). Government of India - Manual on cost of cultivation of principal crops: 2008. Ministry of

Statistics and Programme Implementation. Available from <http://mospi.nic.in/412--cost-cultivation-principal-crops>.

Anonymous (2022^a). Final estimates of area, production, and yield of principal crops in Karnataka 2020-21. *Government of Karnataka, Department of Economics & Statistics*.

Anonymous (2022^b). Ministry of food processing Industries, Government of India, Prime Minister Formalization of Micro Food Processing Enterprises Scheme. Available from website <https://pmfme.mofpi.gov.in/pmfme/newsletters/enewsaugust9/markettrends1.html>

Anonymous (2022^c). Major Spice/state wise area and production of spices, Available from http://www.indianspices.com/sites/default/files/majorspicestatewise2022_y2.pdf

Begum, M. E. A., Monayemmiah M. A., Rashid M. A., Islam M. T. and Hossain M. I. (2019). Economic analysis of turmeric cultivation: evidence from Khagrachari district, *Bangladesh J. Agril. Res.* 44 (1): 43 - 58.

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

- (2018). Economics of turmeric cultivation in Erode district of Tamil Nadu. *Agric. Sci. Digest.*, 38 (4): 293 - 296.
- Dhanalakshmi, K., Chitra, K., Manimekalai, R., Balisasikumar, C. and Karthikeyani, K. V. (2018). Production and economics of turmeric cultivation. *Int. J. Curr. Microbiol. App. Sci.* 7 (11): 3496 - 3502.
- Janailin. P. S. and Tripathi, A. K., (2014). Costs and returns structure of turmeric (*curcuma longa lin.*) and constraints faced by producers in Jaintia hills district of Meghalaya, India. *Indian Journal of Agricultural Research*, 48 (3): 192 - 198.
- Joshi, Payal and Khandelwal, Neeta (2022) Economic effect of the covid-19 pandemic on rural and urban community. *Guj. J. Ext. Edu.* 34(2):55-59. <https://doi.org/10.56572/gjoe.2022.34.2.0013>.
- Kanjana, S., Piya Kosai, Kanitta, J. and Wannee, J. (2016). Antithrombotic activity of turmeric (*Curcuma longa*)- a review. *Indian Journal of Agricultural Research*, 50 (2): 101 - 106.
- Karthik, V. and Amarnath. J. S., (2014). An economic analysis of turmeric production in Tamil Nadu, India. *Direct Research Journal of Agriculture and Food Science*, 2 (6): 66 - 76.
- Rajesh, B. K., Kate, S. S., and Guleria, A., (2020). Economics of turmeric production and farmers perception on new marketing method in Samastipur district of Bihar. *Int. J. Curr. Microbiol. App. Sci.*, 9 (10): 3042 - 3050.
- Vinaya Kumar H. M., Shivamurthy M., Govinda Gowda V. and Biradar G.S. (2017). Assessing decision-making and economic performance of farmers to manage climate-induced crisis in Coastal Karnataka (India). *Climatic Change. Springer*; May 2017, Volume 142, Issue 1, pp 143–153. <https://doi.org/10.1007/s10584-017-1928-x>
- Wakale, S. V., Sulbha M. S. and Ulemale, D. H. (2022). Economics of production of turmeric in Amravati district. *International Journal of Agricultural Sciences*, 18 (1): 467 - 472.

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