



International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
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NAAS Rating (2026): 5.20
www.agronomyjournals.com
2026; SP-9(1): 378-380
Received: 24-11-2025
Accepted: 29-12-2025

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An analysis of institutional interventions in supply Chain of Turmeric: Case study of FPO's in Chamarajanagara District

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DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i1Se.4761>

Abstract

Turmeric is used as condiment along with medicinal and religious properties. It is one of the important spice crop also known as Indian saffron. India is the largest producer and exporter of turmeric in the world having an area of 2.91 lakh hectares. Among the turmeric growing states, Andhra Pradesh stands first with 30 per cent of the total annual national production, followed by Maharashtra, Tamil Nadu, Kerala, Karnataka, Orissa, Assam, Bihar and West Bengal. Majority of the turmeric growers in Karnataka are small and marginal and only about 2% of them are large farmers. Turmeric marketing plays a vital role in the movement of commodity from producer to consumer; APMC and FPO are playing a crucial role in procurement of turmeric in the study area. When costs are compared, FPO farmers are incurring less compared to APMC farmers, this is mainly because farmers associated with FPO have no transaction costs of marketing the produce. FPO farmer realized the profit of Rs. 57,210/- per acre and APMC farmer realized the loss of Rs. 4313.72. Hence, selecting the appropriate marketing channel is important to sustain the income levels of farmers (Acharya & Agarwal, 2019; Government of India, 2022).

Keywords: Turmeric cultivation, spice crops, marketing channels, APMC, farmer producer organization (FPO), cost and returns

Introduction

Turmeric is one of the important spice crop also known as Indian saffron being used from several years in cooking, traditional ayurvedic medicine, and religious ceremonies for its vibrant colour and flavour. India is the largest producer and exporter of turmeric in the world having an area of 2.91 lakh hectares. Among the turmeric growing states, Andhra Pradesh stands first with 30 per cent of the total annual national production, followed by Maharashtra, Tamil Nadu, Kerala, Karnataka, Orissa, Assam, Bihar and West Bengal. Turmeric is the major spice crop grown in Chamarajnagar with the area of 11,000 hectares and with respect to production the district is the major contributor to state. Turmeric has been chosen for One District One Product from Chamarajnagar as the district.

Turmeric marketing plays a vital role in the movement of commodity from the producer to the consumer. In Chamarajnagar district APMC exclusively for turmeric has been set up and it plays an important role in marketing of turmeric and provides a platform for farmers, brokers, traders and other stakeholders of the supply chain. Apart from this FPO is also playing a role in procurement. Marketing and supply chains are very crucial to increase producer's share in consumer's rupee. With this backdrop the study has been taken to compare the supply chain of APMC and FPO (Chand *et al.*, 2017) [3].

Methodology

The present study was undertaken in Chamarajanagara district where turmeric growing farmers in and around Chamarajanagara were purposively selected. Market arrivals and price data has been collected from APMC and data on costs and marketing linkages was gathered from FPO. In addition to this primary data was collected from 30 farmers who are supplying turmeric to APMC and 20 farmers supplying to curcumin producing company through FPO. The collected

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data was analysed using simple statistical tools such as frequency, percentages and averages to derive meaningful conclusions (BIRTHAL *et al.*, 2019) ^[2].

Results and Discussion

Findings of the study on institutional interventions in supply chain of turmeric is presented in this chapter

Table 1: Market arrivals and prices of turmeric in Chamrajnagar APMC

Sl. No.	Year	Arrivals (qtls)	Modal Price (Rs/Qtls)
1	2018-19	40845.00	6370.00
2	2019-20	36300.00	5672.00
3	2020-21	35448.00	7000.00
4	2021-22	13654.00	7420.00
5	2022-23	11889.91	5200.00
6	2023-24	---	14000.00

Source: APMC, Chaarajanagar

Table 1 illustrates the trends in market arrivals and modal prices of turmeric in Chamrajnagar APMC for the period 2018-19 to 2023-24. The arrivals and prices exhibited considerable year-to-year fluctuations, reflecting variations in production and supply. Periods of higher arrivals were generally associated with relatively lower prices, whereas lower arrivals coincided with sharp price increases. There was a steep fall in the prices of

turmeric (Rs.5200/qrtl) in the year 2022-23, due to this local farmers expressed concern to strengthen local procurement center. This variability indicates price instability in turmeric markets and exposes farmers to income risk, highlighting the need for institutional mechanisms to stabilize prices and improve market efficiency (KSAMB, 2023).

Table 2: Variable cost of cultivation of turmeric production (Rs./ac)

Sl. No.	Particular	APMC Farmers (30)		FPO Farmers (20)	
		Amount in Rupees	Per cent to TVC	Amount in Rupees	Per cent to TVC
A	Variable cost				
1	Land preparation	9,445.76	6.29	9,980.28	7.67
2	Planting material	27,830.00	18.52	24,840.00	19.08
3	Nutrients (NPK)	15,245.00	10.15	11,597.20	12.03
4	FYM	12,110.25	8.06	15,666.66	12.03
5	Neem Cake	1,247.00	0.83	2,100.00	1.61
6	PPC	4,666.28	3.11	3,523.75	2.71
7	Labour Cost	18,250.00	12.15	17,865.78	13.72
8	Harvesting+curing	35,750.00	23.79	34,950.25	26.84
9	Marketing cost	11,250.00	7.49	0.00	0.00
10	commission @2%	3,328.00	2.21	0.00	0.00
11	Interest on working Capital	11,129.78	7.41	9,641.91	7.44
	TVC	1,50,252.07	100	1,30,165.83	100

Table 2 presents a comparative analysis of variable costs incurred by APMC and FPO farmers. The total variable cost was significantly lower for FPO farmers due to the absence of marketing and commission charges. Major cost components included planting material which accounts to 18.52 per cent, harvesting and curing accounts to 23.79 per cent. Other major

cost components incurred by farmers are labour (12.15 per cent) and nutrient inputs (10.15 per cent). Higher use of FYM and bio-inputs by FPO farmers indicates adoption of sustainable practices facilitated through institutional support (BIRTHAL *et al.*, 2019; NABARD, 2021) ^[2, 8].

Table 3: Fixed and Total cost of cultivation of turmeric production (Rs./acre)

Sl. No.	Particular	APMC Farmers (30)		FPO Farmers (20)	
		Amount in Rupees	Percent to TVC	Amount in Rupees	Percent to TVC
B	Fixed cost				
1	Land revenue	22.00	0.08	22.00	0.08
2	Depreciation charges	1920.50	7.69	2438.25	9.57
3	Rental value	19980.00	79.95	19,899.00	78.07
4	Interest on fixed capital	3069.15	12.28	3130.30	12.28
5	TFC	24991.65 (14.26)	100.00	25489.55 (16.37)	100.00
6	TVC	1,50,252.07 (85.74)		1,30,165.83 (83.63)	
7	TC	175243.72		155655.38	
8	Cost per quintal of output	5,476		4,413	

Table 3 depicts the fixed and total cost of cultivation. FPO farmers incurred a lower total cost per acre i.e Rs.1, 55,655/- and lower cost per quintal of output (Rs.4, 413.) compared to APMC farmers incurred a total cost of Rs1, 75,243.72/- and Rs. 5,476 per quintal of output. Rental value of land formed the major

component of fixed cost for both groups. Reduced cost per unit of output among FPO farmers indicates improved efficiency through collective input procurement, better cost management and linking to direct marketing channel (Singh, 2016) ^[9].

Table 4: Returns and Break even analysis of turmeric cultivation

Sl. No.	Particular	APMC Farmers	FPO Farmers
1	Dry yield (Qt/ac)	32.00	35.25
2	Rate (Rs/Qt)	5200.00	5900.00
3	Returns from main product (Rs/ac)	166400.00	207975.00
4	Returns from by-product (Rs/ac)	4530.00	4890.00
5	Gross return (Rs/ac)	170930.00	212865.00
6	Net returns (Rs/ac)	-4313.72	57210.00
7	B C ratio	0.97	1.37

Table 4 compares returns from turmeric cultivation under APMC and FPO marketing systems. FPO farmers realized higher yield of 35.25 quintals per acre compared to APMC farmers. Due to institutional interventions FPO farmers could follow good agricultural practices and reduce the cost of cultivation. On the other hand due to linking to directing marketing channel FPO farmers are getting better prices and positive net returns, resulting in a favourable benefit–cost ratio (Joshi *et al.*, 2018) ^[6]. In contrast, APMC farmers recorded net losses and a B: C ratio below unity. This clearly establishes the economic advantage of FPO-led marketing and institutional intervention (BIRTHAL *et al.*, 2019) ^[2].

Table 5: Marketing constraints faced by APMC Farmers

Sl. No.	Constraints	Rank
1	Price fluctuation	I
2	Middle men /commission agent	II
3	Weighing	III
4	Transportation	IV
5	Storage	V

Table 5 identifies the major marketing constraints faced by APMC farmers using Garrett ranking technique. Price fluctuation was ranked as the most severe constraint, followed by the dominance of middlemen and commission agents. Transportation, weighing and storage issues were also significant, justifying the need for institutional interventions such as FPOs (Chand *et al.*, 2017) ^[3].

Conclusion

The present study examined the role of institutional interventions in the turmeric supply chain of Chamarajanagar district, with special emphasis on the performance of Farmer Producer Organizations (FPOs) in comparison with the conventional APMC marketing system. The findings clearly demonstrate that FPO-led interventions have significantly improved production efficiency, marketing effectiveness and income realization of turmeric farmers.

The analysis of market arrivals and prices revealed substantial fluctuations in turmeric markets, exposing farmers to price uncertainty and income instability. Farmers marketing turmeric through APMC channels faced higher transaction costs, dependence on intermediaries and greater market risks. In contrast, FPO-associated farmers benefitted from collective marketing, improved bargaining power and better price realization.

Comparative cost return profile showed that FPO farmers incurred lower cost Rs. 1, 55,655.38 per acre as against Rs. 1,75,243.72 by APMC farmers. This is due to the elimination of commission charges and marketing expenses, coupled with improved input management practices for farmers associated with FPO. The reduction in cost per quintal of output among FPO farmers reflects enhanced production efficiency achieved

through collective action and institutional support. B: C ratio indicated higher profitability for FPO farmers (1.37) compared to APMC farmers (0.97).

Marketing constraint analysis revealed that price fluctuation, dominance of middlemen and inadequate infrastructure were the major challenges faced by APMC farmers. The FPO model effectively addressed these issues by reducing transaction costs, ensuring transparent pricing mechanisms and facilitating direct market linkages.

The study concludes that Farmer Producer Organizations play a vital role in improving the turmeric supply chain in Chamarajanagar district. Institutional interventions through FPOs significantly reduced transaction costs, eliminated intermediaries and improved price realization for farmers. Cost and return analysis revealed and economic sustainability for FPO farmers (Thakur & Jain, 2021) ^[10].

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