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Case Study

Do Institutional Interventions Benefit Farmers – Evidence from Marketing Maize Through Farmer Producer Organization in Davangere District of Karnataka

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ABSTRACT

Government of Karnataka launched "State FPO Policy 2018" with the vision of forming at-least one Farmer Producer Organization (FPO) in every *hobli* (group of villages) jurisdiction, thereby collectivizing around 5 lakhs farmers over the next five years. Many of these FPO's promoted by different development departments are in the nascent stage of development and are involved in input and output business. Davanagere district has the highest production of maize in Karnataka and FPO's promoted by different organizations in the district are involved in activities of marketing maize of member farmers of FPOs. Hence, an attempt is made in the present study to analyze the benefits of marketing maize through institutional model of farmer producer organizations. Cost, returns, price spread, margins and efficiency of marketing were analysed and studied to understand the economic benefits of member farmers marketing maize through FPO's. The cost of production per quintal of maize for FPO member farmer of over non-FPO farmers was lower by ₹ 86.25/quintal as FPO farmer realized a higher yield of 1.83 quintal per acre. Net returns realized by FPO farmers was higher by 13.46 over non-FPO farmers and producer share in the consumer rupee was higher by 4.93% over non-FPO farmers. The study findings indicate the benefits to member of FPO in marketing maize through institutional model and hence the model can be strengthened by addressing various constraints in the institutional supply chain model.

HIGHLIGHTS

◉ The gross returns for FPO farmers over non-FPO farmers was higher by 12% as the FPO farmers realized higher yield by 4% and price by five %.

◉ The producer share in the consumer rupee of FPO farmers was higher by 4.93% over non-FPO farmers and hence the institutional intervention has helped in enhancing income of FPO farmers.

Keywords: Farmer Producer Organizations, institutional intervention, maize, marketing efficiency

As small and marginal farmers have been vulnerable to risks in agricultural production, several approaches have emerged in response to the problems faced by small and marginal farmers. With the amendment of Agriculture Produce Marketing Committee Act (2003) and subsequent amendments, private sector participation through contract farming and direct marketing is promoted at the market end of the agriculture value chain. Another approach is the facilitation of collective action by small and marginal farmers. Various institutional interventions, formal or informal, have
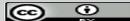
tried to link smallholders to the input and output markets. In most of the cases these interventions were initiated by the development departments of state and central governments, bilateral donors, private sector organizations, and civil society organizations. These include agricultural co-operatives, self-help groups and commodity interest groups (Paty and Gummagolmath, 2018). The concept of cooperatives formed under different cooperative acts since 1904 have been dominant form of farmer cooperatives (Nalini *et al.* 2017). However, the experience with cooperatives point to many limitations that prevent effective collective action and have not been able to grow into strong member-controlled and self-sustainable business entities due to excessive dependence on government funds, political interference, bureaucratization, corruption and declining Government support (Govt. of India, 2000). To address the inadequacies and deficiencies of cooperatives, Government of India has been promoting a new form of collectives called Farmer Producer Organizations (FPOs) since 2000. The government affirmed that FPO are the most appropriate institutional mechanism around which farmers organize and build their capacity to collectively leverage their production and marketing strength. In this context, research studies providing empirical evidences of benefits from institutional innovations and collective actions are limited. Hence, an attempt was made to study and analyze the benefits of marketing agricultural commodities through institutional model of farmer producer organizations in Karnataka.

Farmer Producer Organizations in Karnataka

The state of Karnataka has been the forerunner in promoting FPO's and has promoted about 750 FPO's. The state has launched a separate "Karnataka State FPO Policy 2018" with the vision to form at-least one FPO in every *hobli* jurisdiction, thereby collectivizing around five lakhs' farmers over the next five years (Govt. of Karnataka, 2017). There is growing interest in promoting, nurturing and creating an enabling environment for the small and marginal farmers through FPOs'. FPO can play a vital role in protecting small farmers' interests and can help enhance the competitiveness of farmers to get advantages in emerging market opportunities. Many of the FPO's promoted by development

departments in Karnataka are in the nascent stage of development and are involved in marketing of agricultural inputs and to a limited extent on output marketing. A prior information gathered has indicated that few FPO's in South Karnataka are marketing maize through FPO's. Department of Horticulture, National Bank for Agriculture and Rural Development (NABARD) and Technoserve an NGO have promoted 12 FPO's Davangere district which has the highest area under maize in Karnataka. Hence, to understand the access to markets through institutional innovations such as farmer producer organizations and its benefits to member farmers, research was carried out to analyze economic benefits for farmers marketing maize through farmer producer organizations by studying costs of production, marketing costs, price received, price spread and marketing efficiency.

MATERIALS AND METHODS

The study was conducted in the Davanagere district of Central Dry Zone of Karnataka. Only couple of FPO's were procuring maize from farmer members and were involved in direct marketing activities. In the first stage, Davanagere district was purposively selected as the district has the highest maize cultivation in Karnataka. In the second stage, Shantisagara Horticulture Farmer producer Company. Ltd. incorporated in 2016 with 1000 members from 14 villages of Honnali *taluk* of Davanagere district was selected as the members of the FPO are cultivating and supplying maize to the FPO which was involved maize marketing. To compare and contrast the results, farmers (non FPO) from Channagiri and Honnali taluk of Davanagere district which are in the vicinity of the FPO villages were selected to study their marketing practices through traditional channels.

Five villages under the jurisdiction of Shantisagara Horticulture Farmer producer Company. Ltd. were randomly selected for the survey. From among the selected villages, 30 farmers were randomly selected to elicit information for the study. Similarly, to elicit information from non-FPO farmers, 30 farmers were randomly selected from four villages of Channagiri and Honnali *taluk.* A total of 60 farmers both from FPO and non FPO were interviewed to study cultivation practices and marketing of maize. The data on marketing practices and information on

value chain mapping was collected from traders, commission agents and processors. The primary data was collected through personal interview during April 2021. Cost of cultivation, price spread, producer share in consumer rupee and marketing efficiency were calculated for both FPO and non-FPO farmers.

The cost of cultivation of maize included both variable cost and fixed costs. The variable cost comprised costs incurred on variable inputs such as seeds, fertilizers, farm yard manure, plant protection chemicals, labour (human, animal & tractor) and interest on working capital. The fixed cost comprised non-cash items such as depreciation, rental value of the land and land revenue. Costs incurred by farmer on transport, packaging, commission paid, weighment etc. were included in marketing costs. Gross returns for maize cultivation was computed by multiplying total physical quantity of produce with average price realized by sample respondents per unit quantity. Gross returns to crop cultivation was calculated over cost A_1^1 + FL and cost C_3. Acharya's approach was used in order to assess the marketing efficiency in different marketing channels followed by the maize farmers in the study area.

$$\text{Marketing efficiency} = \frac{FP}{(MC + MM)}$$

FP = Price received by the producer

MC = Marketing cost

MM = Market margin

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The socio-economic characteristics of sample member farmers and non-member farmers of the FPO which includes age, education, family size and landholding size are presented below in (Table 1).

Table 1: Socio-economic characteristics of the respondents

Socio-economic characteristic	FPO farmers	Non-FPO farmers
Age (years)		
Below 35	7	2
35 -50	10	14
Above 50	13	14
Family size (no's)		
< 5	2	12
Between 5-10	25	16
> 10	03	02
Education		
Illiterate	03	07
Primary & high school	13	07
Pre-University	11	07
Bachelor's degree	03	09
Holding size (acres)		
Average dryland	7.42	3.32
Average irrigated land	17.25	10.94
Average land holding	13.17	8.12
Cropping pattern (acres)		
Gross Cropped Area	464.5	399
Net Cropped Area	395.5	248.5
Cropping intensity (%)	117.45	160.56

Majority of the respondents among member farmers of FPO belonged to the age group (> 50 years) i.e., 43.33% followed by age group (35-50 years) 33.33% and age group (< 35 years) with 23.33%. For non-member farmers of FPO, 46.66% were in the age group of (> 50 years), 43.33% in the age group of (35-50 years) and 6.66% in the age group (< 35 years). The household size of the majority of the sample farmers from the FPO were in the range of 5-10 members (83.33%) followed by more than 10 household size with 2 respondents (10%) and 2 respondents with less than five members (6.66%). For non-FPO farmers, the household size between 5-10, was 16 respondents (53.33%), followed by 12 respondents (40%) with less than five family size and two respondents in the category of more than 10 family size (6.66%). About 10% of the member farmers of FPO and 23.33% of the non-member farmers of FPO were illiterate while 43.32% and 23.32% FPO and non-FPO farmers respectively possessed primary education and above. 36.65% of the respondents of FPO possessed pre-university education while it was 23.32% in case of non-FPO farmers.

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[1]A_1 covers all paid-out costs directly incurred by the farmer in cash and kind on seeds, fertilisers, pesticides, hired labour, fuel, irrigation. A_1 + FL includes A_1 plus an imputed value of unpaid family labour. Cost C_3 includes cost A_1 + FL plus rental value of owned land, interest on working capital, land and water tax, depreciation costs and managerial cost.

The average size of the land holding was in 13.17 to 8.12 acres among the sample farmers of FPO and non-FPO respectively. Of the 13.17 acres of average land holding operated by FPO farmer members the share of dry land was 23.73% and that of irrigated land was 57.5%. In case of non-member farmer respondents, dry land constituted 11.07% and irrigated land constituted 36.47%. The irrigated land constituted the major portion of the land owned both by FPO and non-FPO sample farmers and the source of irrigation was primarily through bore well. Maize at 72.98% and 44.16% occupied the highest gross cropped area both among sample FPO and non-FPO farmers. The cropping intensity was high in the case of non- FPO farmers at 160.56% while in case of FPO farmers it was 117.45%.

Cost of cultivation of maize for members and non-members of FPO

The total cost of cultivation per acre of maize of FPO farmers was ₹ 38,059 and cost of A_1+ FL was ₹ 31,257. Of the total cost, the variable cost constituted 72.68% while the fixed cost was 27.3%. The grain yield obtained by FPO farmers was 26.89 quintal per acre and price realized was ₹ 1,456 per quintal. The gross returns was ₹ 39,169 per acre and the net return over total cost was ₹ 1110 per acre and returns over cost of A_1+ FL was ₹ 7,912 (Table 2).

Total cost of cultivation per acre of maize for non-FPO farmer respondents was ₹ 37,481 and cost of A_1+ FL is ₹ 32,077. Of the total cost, the variable cost constituted 75.76% while the fixed cost was 24.5%. The yield obtained for non-FPO farmers was 25.06 quintal per acre valued at ₹ 1,377 per quintal. Gross return was ₹ 34,524 per acre and the net returns over total cost was minus ₹ 3,106 per acre. The negative returns realized was because of fall army worm infestation and itch grass grown in to the maize filed which reduced maize production.

The cost of production of maize per quintal declined by ₹ 86 per quintal for FPO farmers as compared to non-FPO farmers. Negative net returns was observed for non-FPO farmers as the crop was affected by fall army worm pest, itch grass (a weed) and low prices realized due to low quality of the produce. Though FPO farmers faced similar problems, they were better managed as the FPO conducted training programmes for its members on improved production practices,

grading and maintaining quality standards. Also, the FPO provided backward linkages support through procurement of inputs and supply to their member farmers which contributed to decline in cost of production. Additionally, grading of maize and maintaining optimum moisture for marketing helped FPO farmers realize ₹ 79 per quintal of maize additionally as compared to non-FPO farmers.

Marketing of maize by FPO and non-FPO members

The non-FPO members marketed maize through traditional channels. Maize was sold to traders who come and collect the produce at village and to traders at Agriculture Producer Market Committee (APMC) Davangere. The trade between producers and traders facilitated by commission agents and the traders in-turn sold the produce to institutional buyers such as Cargil, Roquette and Riddhi Siddhi and to feed manufacturers such as Suguna chicken, Newtree feed and SKM animal feeds. Institutional buyers after procuring maize from trader's process/transform it to starch, multi-grain flour, baby products, corn oil, corn syrup, corn flakes, corn starch, glucose gel, liquid glucose and dextrose monohydrate is extracted from corn starch. Feed manufacturers on the other hand transform maize to pellets, broken maize corn, powders of corn. Maize for poultry feed or animal feed is generally used as an ingredient along with soybean, sorghum, oats and barley etc. for preparation of feeds. Anecdotal evidence has indicated about 30% of the India's maize production is processed by Cargill Pvt. Ltd alone and about 60-65% of maize traded is processed to feeds (poultry & animal), 10% for food processing and the rest for starch extraction. The marketing cost incurred by the producers and different functionaries in the trade is presented in Table 3.

The average marketing costs for non-member marketing maize to local trader in the village or to the trader in APMC was ₹ 42.6 per quintal and ₹ 49.6 per quintal respectively. Of the sample respondents, 26 of them (86%) traded maize through local trader (Channel-I) while the remaining 04 (14%) of the respondents sold maize to Agriculture Produce Market Committee (APMC) traders (Channel-II). The total cost of marketing through Channel-I was ₹ 222.75 per quintal while that for channel II it was

Table 2: Cost of cultivation of maize for members and non-members of FPO

Sl. No.	Particulars			Member farmers of FPO			Non-member Farmers of FPO		
			Quantity	Value (₹)	%	Quantity	Value (₹)	%	
I	Variable Cost			27662.38	72.68		28395.01	75.76	
(A)	Human	(Men days)	12.28	4669.46	12.27	13.81	5360.93	14.30	
		(Women days)	15.87	4774.32	12.54	17.99	5410.12	14.43	
(B)	Machine labour (hours)		9.66	7092.63	18.64	8.75	6123.04	16.34	
	Bullock labour (days)		0.32	330.37	0.87	0.3	303.38	0.81	
(C)	Sprinkler sets/pump sets (man hours)		1.12	128.61	0.34	1.89	662.64	1.77	
	Sprayer (hours)		3.51	526.55	1.38	4.05	607.58	1.62	
(D)	Threshing machine (₹ per quintal)		26.89	1613.63	4.24	25.06	1504.04	4.01	
(E)	Seed (kgs)		7.99	1923.36	5.05	7.98	2032.64	5.42	
(F)	FYM (tractor loads)		0.80	1604.72	4.22	0.8	1617.97	4.32	
(G)	Fertilizer & micro-nutrients (quintals)		2.37	3842.91	10.10	2.17	2854.35	7.62	
(H)	Pesticides (ltr.)		0.29	346.23	0.91	0.25	663.79	1.77	
(I)	Weedicides (ltr.)		0.57	809.59	2.13	0.45	1254.53	3.35	
(J)	Marketing expenses			224.12	0.59		387.82	1.03	
(K)	Interest on working Capital (10%)			2766.24	7.27		2839.50	7.58	
II	FIXED COST			10397.46	27.32		9236.10	24.64	
(A)	Land and water tax			150.00	0.39		150.00	0.40	
(B)	Depreciation on farm machinery and farm buildings			455.00	1.20		455.00	1.21	
(C)	Rental value of land @ 25 % of gross returns			9792.46	25.73		8631.10	23.03	
(D)	Managerial cost (10% of all costs)			3790.98	9.96		3748.41	10.00	
III	Cost	Cost A_1 + FL		**31257.74**	82.13		32077.32	85.58	
		Total Cost (C_3)		**38059.84**	100.00		37481.11	100.00	
IV	Output	Grain (quintal)	**26.89**	39169.86		**25.06**	34524.41		
		Price (per quintal)		1456.67			1377.67		
		By-product (tractor load)	2.03	2032.45		1.82	1820.22		
V	Return	Gross returns		39169.9			34524.41		
		Returns over cost A_1 + FL		7912.16			2297.08		
		Returns over total cost		1110.02			-3106.70		
VI	Cost of Production (₹/quintal)	Cost A_1 + FL		1162.43			1286.01		
		Cost C_3		1415.39			1501.64		
VII	Benefit- Cost Ratio			1.03		0.92			

Note: *Wage Rates (₹/day): Male- 375, Female- 300, Tractor (₹/hr.)- 700, FYM (₹/tractor load of 3 tons)- 2000, Threshing machine (₹/quintal.)- 60.*

Table 3: Marketing of maize by non- farmer members FPO

Marketing costs (₹ per quintal)	Farmer to village trader (Channel- I)	Farmer to APMC trader (Channel- II)	Local trader	APMC trader	Processor
Bagging	22.60 (53.05)	22.60 (45.56)			
Loading	14.00 (32.86)	14.00 (28.23)			
Unloading					5.26(4.19)
Labour			16.66 (42.01)	16.66 (11.01)	15.8 (12.59)
Weighment			5.00 (12.61)	5.00 (3.30)	—
Commission	4.00 (9.39)	4.00 (8.06)			100(76.69)
Market fee				20.66 (13.65)	—
Transport	2.00 (4.69)	9.00 (18.15)	18.00 (45.39)	109 (72.03)	—
Electricity					4.43 (3.53)
Total costs	**42.60**	**49.60**	**39.66**	**151.32**	**125.49**

Note: *Figures in parentheses are %age to total marketing cost.*

₹ 341.41 per quintal. Of the total marketing costs, bagging and loading charges form the highest cost for producer while that for traders it is the transport cost and for processors commission charges are the highest marketing costs (Table 3).

In case of FPO members, the FPO procures maize directly from their members and provides logistics support services such as loading, transportation, weighment, bagging & stitching. The quality specifications for maize procurement were; grain moisture content of 14%, grain free with fungus, black spots and damaged grains. The FPO provided technical services for sample check, moisture content and for maintaining other quality parameters. The various costs incurred by the FPO farmer to sell maize to FPO was for checking of samples, labour, weighment and transport costs. The average marketing costs for farmer marketing maize to FPO at the village is about ₹ 35.33 per quintal with transport cost being the highest at 28.30% of all the marketing costs of the farmer followed by bag and bagging costs at 19.81% (Table 4).

Table 4: Marketing of maize by farmer members of FPO

Marketing costs (₹ per quintal)	Farmer to FPO	FPO to institutional buyers
Sample check	5.00 (14.15)	5.00 (9.93)
Bag & bagging	7.00 (19.81)	12.00 (23.84)
Loading	8.33 (23.88)	8.33 (16.55)
Weighment	5.00 (14.15)	5.00 (9.93)
Transport	10.00 (28.30)	20.00 (39.74)
Total costs	35.33	50.33

Note: Figures in parentheses percentage to total marketing cost.

On an average, the FPO incurred ₹ 50.33 per quintal as marketing costs to sell it to institutional buyers. About 86% of sample respondents sold maize to village level local traders. Modinsab *et al.* (2011) in their study on maize marketing in Davanagere district also reported that about 65% of the sample respondents sold maize to village local traders. The primary reason for selling maize at village by the sample respondents was because of high cost of transport to APMC market, commission agent charges at APMC and other costs associated with transactions.

FPO procured maize at farm gate from the sample respondents, unlike the traditional channels where farmers have to sell maize either to APMC traders or village level local traders and hence, FPO farmers selling maize to FPO could save ₹ 7.27-14.27 per quintal of maize as marketing charges. Traders and commission agent in the traditional channels exploit farmers in the form of commission charges deductions for poor quality of produce and other charges. As FPO are farmer owned companies managed by Chief Executive Officers (CEO's) and the Board of Directors (BOD's), farmer could avoid such charges and hence could reduce their marketing cost by selling to FPO rather than selling to traders at APMC and village traders.

Market margins and price spread for marketing maize by FPO and non- FPO farmers

The price spread was calculated based on the farm gate price received by the sample respondent during the period of data collection and survey for the two channels. The margins across the value chain operators have shown that poultry feed manufacturers/processors garner the maximum share in the chain in both the channels (I &II) which is in the range of 27.33% - 27.3%. The produce share in the consumer rupee for non-FPO sample respondents in both the channels was 43.43%. Devi and Suhasini (2013) in their study on consumption of maize by powered poultry feed industry in Mahbubnagar district of Andhra Pradesh reported that the producer share in consumer rupee was ₹ 41.53 per quintal for consumption of maize in poultry feed industry. The price spread at ₹ 1,909.2 per quintal was higher in Channel II (farmer – APMC trader – poultry feed manufacturer/processor – retailer – consumer) as compared to Channel-I (farmer – village trader- poultry feed manufacturer/processor- retailer- consumer) at ₹ 1,810.

Market efficiency defined ratio between output and input essentially captures the degree of market performance. Marketing is said to be efficient, if the total marketing margin is reduced for a given marketing cost. The market efficiency calculated by Acharya's method for marketing of maize by non-FPO farmers through different channels is presented in Table 5. The marketing efficiency index was 0.76 for Channel -I and 0.72 for channel-II. The higher marketing margin in Channel-I has not impaired efficiency of the channel. Though the number of

Table 5: Market margins and price spread for marketing maize by FPO and non- FPO farmer members
(₹ per quintal)

Particulars	FPO channel	Non-FPO farmers	
		Channel-I	Channel-II
Producer price	1423	1390	1390
Producer marketing cost	35.33	42.60	49.60
Marketing cost	226.15	180.15	341.41
Marketing margin	1586.18	1629.85	1567.79
Consumer price	3200	3200	3200
Price spread	1812.33	1810	1909.2
Marketing efficiency	0.78	0.76	0.72

intermediaries in the both the channels are the same with different value chain functionaries, higher marketing cost in channel-II has contributed to lower efficiency. The efficiency of the market indicates relative percentage share of the consumer rupee received by the farmer. The greater the portion that goes to the farmer, the higher is the efficiency of the market.

In case of FPO members, unlike the traditional channels where farmers sold maize either to APMC traders or village traders, FPO procured maize from farmers at farm gate. FPO realized a margin of ₹ 56.67 per quintal by selling maize to poultry feed manufacturers[2] and the share of FPO in the consumer rupee was 1.77%. The poultry feed manufacturer or the processor realized a margin of 26.39% in the consumer rupee and the produce share in the consumer rupee for FPO sample farmers was 44.68%. The price spread was ₹ 1,812.33 per quintal of maize and the marketing efficiency for marketing of maize by FPO farmers through FPO was 0.78 (Table 5). Higher marketing efficiency is attributed to absence of intermediaries in marketing of maize through FPO. Similar findings were observed by Ram *et al*. (2022) in their study on marketing baby corn in Sonipat district of Haryana.

Comparative economics of marketing maize by FPO member and non-member farmers

To understand the incremental benefits of marketing maize through FPO, various economic indicators

were studied and are presented in Table 6. The yield for FPO farmers over non-FPO farmers was higher by 7.30%. Some of the reasons for higher yield obtained by FPO farmers were due to trainings conducted by FPO on package of practices, resulting in better management practices and grading of produce. Though the cost of cultivation for FPO farmers was on the higher side by 1.54% over non-FPO farmers, the gross returns and net returns were higher by 13.46% and 135.73% respectively. Similarly, the benefit cost ratio was higher by 11.73% for FPO farmers over non-FPO farmers. Though cost of cultivation was higher for FPO farmers over non-FPO farmers, higher yield realized by FPO farmers has contributed to lower cost of production per quintal. Further, higher gross returns realized by FPO farmers was because of higher price and higher yield realized by FPO farmers compared to non-FPO farmers. Kujur*et al.* (2019) in their study have shown that improvement in participation in extension program, innovativeness, networking among farmers by themselves, increase in income, better economic status in community, savings and employment opportunities for producer-members of FPOs were the benefits realized when compared with non-members of FPO's.

On the marketing indicators, the producer share in the consumer rupee was higher by 4.93%over non-FPO farmers. The factors that contributed to larger share were the lower cost of marketing and higher price realization for FPO farmers. The price realized by FPO farmers over non-FPO farmers was higher by 5.61% and the marketing efficiency index was higher by seven% for FPO farmers over non-FPO farmers. Though maize trade in Davanagere district is organized as most of the production is channelized to institutional buyers and to poultry industry through traders, the supply chain model

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[2]The value chain of maize of the FPO could not be fully studied as the institutional buyer (Cargill Pvt. Ltd) did not provide the data for processing maize to end products such as glucose, glucose syrup and other products. Similarly, data could not be obtained from the retailer for end products processed by Cargill. Pvt. Ltd. Hence, the margins and shares of the consumer rupee were calculated for supply of maize to poultry feed manufacturers.

Table 6: Incremental benefits of marketing maize through FPO

Sl. No.	Indicators	Member farmers of FPO (n=30)	Non-member farmers of FPO (n=30)	Incremental benefits of FPO farmers over non-FPO farmers (%)
1	Yield per acre	26.89	25.06	7.30
2	Cost of cultivation (₹ per acre)	38059.84	37481.11	1.54
3	Gross returns (₹ per acre)	39169.86	34524.41	13.46
4	Net returns (₹ per acre)	1110.02	-3106.7	135.73
5	Cost of production (₹ per quintal)	1415.39	1501.64	5.74
6	Benefit cost ratio	1.02	0.92	11.73
7	Marketing costs (₹ per quintal)	226.15	222.75	1.53
			341.41	-33.76
8	Marketing margins (₹ per quintal)	1586.18	1629.85	-2.68
9	Producer's price (₹ per quintal)	1423	1347.4	5.61
10	Producers share in consumer rupee (%)	44.46	43.43	4.93
11	Marketing efficiency index (%)	78.51	75	7.28

of farmers selling the produce to FPO has helped farmer realize better prices.

CONCLUSION AND SUGGESTIONS

Small and marginal farmers have been vulnerable to risks in agricultural production. They are forced to produce without access to reliable and affordable inputs, credit, transport facilities or markets and find themselves competing against big traders, wholesalers and companies. Several approaches have emerged in response to the problems faced by small and marginal farmers. Farmer producer companies and farmer producer organizations were introduced in India during 2011-12. The most important function of the organization is to provide its members with services and access to these services to its member farmers. Achieving economies of scale in transactions with input suppliers and buyers and improving one's bargaining power are other benefits that accrue to members.

Study findings have shown that there are benefits of institutional intervention in enhancing the income of the farmers and this can be further enhanced by establishing processing facilities such as animal/poultry feed at the FPO level. Evidences indicate improvement in productivity of maize of FPO farmers due to conduct of capacity building training programmes and higher price realization leading to higher net returns. Though there are 12 FPO's established in Davanagere district which is the major hub for maize production, only couple of

FPO's were involved in marketing of maize. Hence, member farmers of the FPO have to market the produce through FPO rather than selling to traders to reap the benefits of institutional intervention. As there is great scope to market maize through the institutional model of FPO, several suggestions are made for their improvement.

1. Create awareness for FPO members to transact with FPO and for non-members to become members of FPO;

2. Majority of the sample respondents faced production constraints like pest management and marketing constraints like grading. Hence, conduct of trainings at regular intervals by FPO on good agricultural practices can be organized so that farmer adopts such practices for quality production and realize remunerative prices.

3. Processors realized maximum share in the consumer rupee while the margin realized by the FPO was very low, hence financial assistance can to be provided for successful FPO's in the region to establish infrastructure to process maize to value added products.

4. Davanagere is the hub for maize production in Karnataka and the FPO's operating in the region can form a federation to provide marketing facilities, establish infrastructure for value addition and processing and create a brand of its own to enhance the value of the produce.

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