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Institutional Synergies in Processing and Value Addition: Role of a Producers' Organisation in Transforming Farm Economy in Rural Punjab§

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Abstract

The study has highlighted the role of a producers' organisation, namely Farm Produce Promotion Society (FAPRO), in improving farm economy in rural Punjab. The study conducted in the Hoshiarpur district of Punjab during 2010-11, is based on the primary data collected from 140 farmers and has examined the change in cropping pattern and increase in income and employment due to value addition at farm level, as against cereals cultivation in the state. It has observed that turmeric as a high-value perennial crop occupies 26.4 per cent area of GCA and the gross return of turmeric was almost double of the return from rice and wheat. The establishment of FAPRO for value addition of turmeric has raised the farm income and employment compared to rice-wheat cropping system. The FAPRO adds value through powder making of turmeric and selling rhizomes for seed purpose. The Society has also been found to capitalize through other value-added activities. Field study has indicated that FAPRO needs a strong policy intervention with linkages between farm and the factory through skill development, increase of capacity utilization, mechanization of processing process, development of storage facilities, increasing of operational efficiency and reduction of overhead cost with proper post- harvest management. It will encourage farmers to continue turmeric cultivation in the cropping system of Punjab. Such farmers' organisations need to be replicated in other parts of the country in the co-operative sector.

Key words: Producers' organization, value addition, farm economy, turmeric crop, Punjab

JEL Classification: Q13, Q18, Q19

Introduction

The passive role of agri-institutions like processing and marketing co-operatives adds value to agricultural commodities, increases marketability of products and strengthens farm economy. It has been identified as an essential stage in the value chain of non-durable perishable products which get obscure with high wastage, affecting the normal profit of the crop. The processing and post-harvest management of agricultural commodities has gained impetus due to high wastages before they reach the market (Dodamani, 2007 and Anonymous, 2011). The economy of the country will also get accelerated with increased export if there is proper policy push for agro-processing (Singh, 2004). Value addition through processing of agricultural produce will capitalise the economy of rural India and minimize migration from village to towns (Thorat *et al*., 2003). Processing is an important marketing function for agricultural commodities

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creating form utility and its importance has grown manifold in the recent times (Acharya *et al*., 2011 and Brahm, 2000). Out of the total food marketed, the value-added products in India shared about 35 per cent (Chandrasekharam, 2001) and it was the largest in terms of production, consumption, export and growth prospects. With annual production of 205 million tonnes of fruits and vegetables, India is the second largest country in farm production in the world. In contrast, countries like USA (65%), China (23%) and Philippines (78%) are far ahead of India in reducing wastages and enhancing value-addition and shelf-life of farm products.

In India, processing of agricultural produces is highly decentralized in small households having small capacities (Sidhu, 2005). The co-operative marketing and processing societies, established to overcome the problems arising out of marketing system of agricultural produce, are making good progress in scientific and efficient marketing. Moreover, the progress of regulated markets is not uniform in all the areas of country. The need for strengthening co-operative organization has, therefore, been recognized for marketing of agri-produce, in addition to co-operative marketing. The value of agricultural produce marketed through co-operative marketing societies, has increased many fold more than 75-times during the past forty years (Baviskar, 2009). The produce marketed through these societies accounts for 8-10 per cent of the marketed surplus. The co-operatives are one of the core segments of Punjab economy. An important aspect is the processing of farm produce at farmers' level so that they can get a better price for their produce and earn higher profit. Therefore, there is an urgent need to introduce processing units at a level where farmers are directly involved and can get direct benefits from the processing units. Since it cannot be done at individual level, the promotion of farmers' societies for marketing is imperative.

Farms Produce Promotion Society

The establishment of Farms Produce Promotion Society (FAPRO) in the Ghugial village in Hoshiarpur district of Punjab in collaboration with the State Department of Agriculture and more than 300 farmers in the year 2001 and registered under Societies Registration Act XXI of 1860, has paved the way for value-addition, processing and marketing of farm produce of the district. With the objectives of self-marketing and processing of farm produce, the society established processing plants for honey and turmeric in 2005 under the *Rastriya Shram Vikas Yojana* (RSVY) of Government of India. It encourages integration by combining production, processing, value-addition and marketing of finished products for increasing profitability in farming, generating employment and increasing market power. The FAPRO is generating direct or indirect employment for more than 500 farm families in the area. The organization has a special focus on helping the marginal and small farmers, who are the most vulnerable section of the farming community.

Apart from turmeric and honey, FAPRO is also involved in processing and marketing of agricultural products such as turmeric powder, honey, gram floor, pulses, *pakora*, soybean products, jaggery and other seasonal products such as groundnut and kinnow. The organization intends to expand the quantity of marketed products by onsite sales, outlets sales and participation in farmers' fairs and exhibitions in the nearby areas. The organization aims to expand its operations by increasing the coverage of their current activities and starting some new activities such as packaging of processed products, use of mobile units for marketing of produce, production of cattle feed, etc. As the success of such producers' organizations can pave the way for a significant rise in farm incomes and crop diversification in the state, the present study was carried out to find the economic viability of the FAPRO and its overall impact on the farmers' income in Punjab.

Data and Methodology

Both primary and secondary data were collected for the study. The primary cross-section data were collected pertaining to the year 2010-11. Ten villages were selected randomly out of the villages belonging to the member- farmers of FAPRO. Out of these 10 villages, 140 turmeric cultivators were identified and 40 of them were selected for the study proportionately based on farm size. Thus, 1 marginal, 11 small, 17 medium and 11 large farmers were selected. Primary data were collected by personal interview method using a pretested structured questionnaire. The secondary data were collected from the published audited account sources of the FAPRO society.

The data collected through the interview schedule were converted to master tables which facilitated tabulation of data in the desired form. The collected data were then grouped into tables and were analyzed using various statistical tools like percentage and simple average. The analysis was mainly confined to value addition of turmeric by FAPRO in Punjab.

Results and Discussions

Cropping Pattern, Extent of Diversification and Returns

The cropping pattern being followed by the members of FARPO seemed to be more diversified than the overall cropping pattern of Punjab state, as revealed from Table 1. In gross cropped area (GCA), the share of turmeric was higher (26.4%) than under each of rice and wheat (20.8%) or *kharif* and *rabi* vegetables (11.6% each). The high value of Simpson Index of Diversity (SID: 0.813) showed that the cropping pattern of the FAPRO members was more diversified. These farmers were growing turmeric and vegetables and also were not confined to the monoculture of rice and wheat.

Economics of Turmeric Cultivation at Farm Level

The establishment of FAPRO has encouraged the farmers to diversify area under high-value crops like turmeric from rice and wheat crops (Talukdar *et al*., 2015). The cost of cultivation of turmeric, wheat and rice in Punjab is presented in Table 2. The seed appeared to be the most expensive component of cultivation of turmeric, as compared to rice and wheat crops. The expenses on labour-use were also higher for turmeric. In all, the variable costs were ₹ 71919/ ha for turmeric, ₹ 19204/ha for wheat and ₹ 23966/ha for rice, which implies that the costs were almost 67 per cent higher in turmeric cultivation than in cultivation of rice and wheat. The gross returns from turmeric were almost double the combined gross returns from rice and wheat, these being ₹ 2,93,930 /ha, ₹ 86,697/ha and ₹ 62,985/ha for turmeric, wheat and rice, respectively. The returns over variable costs were ₹ 222011/ha, ₹ 67492/ha and ₹ 39018/ha for turmeric, wheat and rice, respectively. It clearly demonstrates that turmeric cultivation is much more remunerative as compared to rice-wheat rotation. The cultivation of turmeric by the FAPRO members not only helped in raising the farm income but also the extent of employment, as turmeric cultivation is more labour-intensive than rice or wheat rotation.

Table 1. Cropping pattern of member-farmers of FAPRO, 2010-11

(ha)

Name of crop	Turmeric growers	Per cent share of GCA
	***Kharif* crops**	
Rice	5.46	20.8
Turmeric	6.94	26.4
Sugarcane	1.36	5.20
Vegetables	3.04	11.6
Fodder	0.49	1.9
Sub-total	17.29	65.8
	***Rabi* crops**	
Wheat	5.46	20.8
Vegetables	3.04	11.6
Fodder	0.49	1.9
Sub-total	9	34.2
Gross cropped area	26.29	100.0
Simpson Index (SID)	-	0.813

Capital Investment in Value-addition of Turmeric

The extent of investments made by the FAPRO for value addition in turmeric and cost and returns associated with such value-addition was also examined. It was found that a total investment of ₹ 78.5 lakh was made by the FAPRO for value-addition in turmeric. The major components of investment were dryer (₹ 60 lakh), de-humidifier (₹ 8 lakh), automatic-cum-vibrator- sevier (₹ 0.60 lakh), diesel-fired oven (₹ 1.4 lakh) and automatic packing line (₹ 8.5 lakh). Investment on the drier was the most important component with a proportion of 76.4 per cent, followed by automatic packing line (10.8%) and de-humidifier (10.2%) of the total capital investment.

Quantity of Input and Output during Value-addition

The value-addition in turmeric is primarily done under five different steps, viz. washing, boiling, drying, polishing and grinding, in addition to branding, packing and labelling and standardization. Table 3 depicts the quantity of input and output during different steps of value addition in turmeric. It was found that at every step there was a loss in weight, except in boiling where

Table 2. Costs on cultivation of turmeric, rice and wheat of sample farmers, 2010-11

(₹/ha)

Costs structure	Turmeric	Wheat	Rice
Land preparation	454	3396	2852
Sowing	49400	1180	686
Fertilizer and weed control	5063	4853	5399
Irrigation	1057	741	741
Harvesting and threshing	-	2470	-
Cost on human labour			
Land preparation	1143	988	876
Sowing	988	918	741
Fertilizer application and weed control	1817	988	1111
Irrigation	988	2470	4940
Harvesting and threshing	7377	247	4720
Transportation	988	123	864
Interest on variable costs @ 9 % for half crop period	3094	827	1032
Total variable costs	71919	19204	23966
Gross returns	293930	86697	62985
Returns over variable costs	222011	67492	39018
	(67.58)	(20.54)	(11.88)

Note: Figures within the parentheses indicate percentage share of total return over variable cost for all crops

Table 3. Quantity of input and output during value-addition in turmeric at FAPRO

Steps	Quantity of starting material (kg)	Quantity of end material (kg)
Raw material	100	100
Washing	100	98
Boiling	98	100
Drying	100	20
Polishing	20	18
Grinding	18	16

it gained. Table 3 reveals that one quintal of raw turmeric provides 16 kg of turmeric powder.

Value-addition, Returns and Input-Output Ratio

It was found that the total cost of processing, including marketing and distribution, was ₹ 9.16 thousand/q. The market price of turmeric powder being ₹ 12 thousand/q, the net profit realization was ₹ 2.84 thousand/q. Thus, the cost -return ratio was1:1.31. This was also similar to the benefit-cost ratio of processing of turmeric in Karnataka (Lokesh *et al*., 2004). It was observed that the value of raw turmeric for ₹ 700.00 was raised by 174.28 per cent after processing as powder (Appendix I).

Income from Value-addition in Turmeric

Income from Turmeric Powder

The FAPRO processed raw turmeric and produced 224 quintals of turmeric powder from 1400 quintals of raw turmeric in a year. The annual gross income was ₹ 26.88 lakh with a net income of ₹ 6.36 lakh. The production of turmeric powder was found costly and 97.78 per cent of total cost was shared by operational cost. This high production cost was due to under-utilization of plant capacity (only about 5%) and, therefore, FAPRO should take measures to enhance plant capacity utilization (Appendix I).

Income from Turmeric Seeds

FAPRO also sells rhizomes of turmeric for seed purpose. Table 4 shows that gross income earned from selling turmeric seeds per year was ₹ 57.60 lakh with a net return of ₹ 46.14 lakh. The organization processed 1200 quintals of turmeric for seed purpose and recovered 46 per cent of turmeric seeds which were sold at ₹ 4800 per quintal.

Table 4. Economics of value addition from turmeric seeds

Cost head	Value (₹)
Fixed costs	
1. Depreciation on plant	6582 (0.57)
2. Land rent	2961 (0.26)
3. Salary of permanent workers	20886 (1.82)
4. Others	8642 (0.75)
Total fixed costs	39071 (3.40)
Operational costs	
5. Costs of raw turmeric (1200 q @ ₹ 7/kg)	840000 (73.27)
6. Direct cost of labour (1200 human days @ ₹ 200/ human day)	240000 (21.00)
7. Packing, labelling and marketing	26670 (2.33)
Total operational costs	1106670 (96.60)
Total costs	1145741 (100)
Seed recovery (%)	46
Gross return from seed (1200 q @ ₹ 4800/q)	5760000
Net profit over variable cost	4614259
B-C ratio	1:5.02

Notes

1. Figures within the parentheses indicate percentage to total
2. Depreciation— The plant was used for different activities and the depreciation per quintal of turmeric powder produced during the year was estimated proportionately based on the total depreciation estimated by the management (CA) of the Society.
3. Land rent— Prevailing land rent at Ghugial village was considered per unit of the produce
4. Salary of permanent workers— Permanent workers were engaged in the Society as workers and managers on fixed pay basis. The total estimated cost for pay and wages by the management was proportioned and was estimated per quintal basis of turmeric.
5. Others— These included expenses for electricity, advertisement and market development, telephone, travelling, news papers, repairs and maintenance and miscellaneous expenses per unit of the produce.

Table 5. Generation of employment from processing of turmeric at FAPRO, 2010-11

(Human days/tonne)

Particulars	Labour use
Washing and boiling	0.4 (8.3)
Drying	2.0 (41.7)
Polishing and grinding	0.8 (16.6)
Packaging and labelling	1.6 (33.4)
Total labour-use	4.8
Labour-use at FAPRO for turmeric powder	672
Labour-use at FAPRO for turmeric seed production	1200
Total employment generation at FAPRO	1872

Note: Figures within the parentheses are the percentages of total labour use.

Contribution of FAPRO to Employment Generation

The establishment of producers' organizations such as FAPRO enhances the profitability of existing activities through value addition and introduction/ promotion of some new activities. These organizations also help in generating employment opportunities firstly directly at the premise of the organization due to labour needs for value-addition activities and second indirectly by encouraging farmers to diversify labour-intensive crops and enterprises which help in augmenting household incomes. In the present case, the employment generation through FAPRO is perceived to have occurred at the FAPRO premises where labour is required for turmeric processing. In addition, employment is also generated during the marketing of various value-added products.

Employment Generation at FAPRO Premises

The employment generation for processing of turmeric is highlighted in Table 5. It shows the requirement of labour to carry out various operations of turmeric processing. A significant amount of labour is also involved in separating turmeric to be used as seed from the raw turmeric.

Value-addition of other Agro-produces at FAPRO

Apart from processing of turmeric and honey, FAPRO also undertakes value-addition of some other agro-produces, though it was restricted largely to cleaning and packaging. It helped in utilizing the space and human labour and also the marketing network of FAPRO which required various commodities in which value-addition is undertaken by FAPRO to the extent of 2 to 46 per cent (Appendix II.).

Conclusions

The paper attempts to highlight the role of a producers' organization, namely Farm Produce Promotion Society (FAPRO), in improving farm economy in a village of Hoshiarpur district in Punjab. The paper has studied value-addition and employment generation through processing of raw turmeric in the area. The value- addition is being done through processing of raw turmeric to powder form and marketing of seed rhizomes. The study has revealed that the value of turmeric was raised to 174 per cent through processing and other post-harvest operations. The FAPRO could also generate a total of 1872 human days of labour in a year. Some other produces for which value-addition was being undertaken by FAPRO included *mirch, dalia, papad, pokora and warian*. The field survey and economic analysis of value addition at FAPRO indicated that the organisation needs a strong policy intervention with linkages between farm and the factory through skill development, enhancing of capacity utilization, installation of mechanical drier and scientific storage facilities and reduction of overhead cost. Adoption of high performance multipurpose machine and product development strategies like better packing, labelling, branding with HACCP certification and imposition of national and international quality standards will create additional marketability of the products with long-term viability of FAPRO. This will encourage farmers to continue turmeric as a high-value crop in the cropping system of Punjab. Such farmers' organisations need to be replicated in other parts of the country in the cooperative sector.

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Appendix I. Economics of production of turmeric powder at FAPRO, 2010-11

(Value in'000 rupees)

Cost head	Value	Per cent in total
(i) Depreciation	8	0.38
(ii) Land rent	4	0.17
(iii) Salary of permanent workers	24	1.18
(iv) Others	10	0.49
A) Total fixed cost	46	2.22
Operational costs		
(i) Raw material consumed (1400 q @ ₹ 700/q)	980	47.76
(ii) Direct human labour costs		
(a) Washing and boiling	11	0.55
(b) Sun drying and storage	56	2.73
(c) Polishing	11	0.55
(d) Grinding	11	0.55
(e) Packing	45	2.18
(iii) Cost of electricity and fuel		
(a) Washing	2	0.10
(b) Boiling	403	19.64
(c) Polishing	25	1.22
(d) Grinding	45	2.18
(e)Packing	22	1.09
(iv) Cost of bagging	90	4.37
(v) Cost of marketing	38	1.84
(vi) Repair and maintenance	22	1.06
(vii) Taxes and fees	5	0.24
(viii) Stationeries	17	0.85
(ix) Interest on working capital	223	10.87
B) Total operational cost	2006	97.78
C) Total cost (A+B)	2052	100
D) Total production of powder (q)	224	
E) Total cost of processing per quintal (₹/q)	9	
F) Price of turmeric powder (₹/q)	12	
G) Net profit (₹/q)	3	
H) B-C ratio	1:1.31	

Appendix II: Value-addition of other commodities being undertaken at FAPRO, 2010-11

Activities	Quantity marketed (kg)	Purchase price (₹/kg)	Sale price (₹/kg)	Value-added over purchase price (₹/kg)	Per cent value addition over purchase price
Packed organic basmati	79	115	130	16	13.54
Besan	19221	42	50	8	19.29
Cattle Feed	48 bags	675	688	13	1.97
Chana	4404	40	47	7	16.97
Chick pea	7074	42	48	6	13.76
Crushed wheat grain	216	30	43	13	44.43
Lentil	5445	45	53	8	18.31
Green gram	4691	61	69	8	12.60
Dry pea	349	35	39	4	10.14
Jaggery	1780	37	41	4	11.39
Jaggery special	49	45	56	11	25.35
Spice powder	294	297	370	72	24.29
Mash	3690	51	60	9	18.26
Lentil (seed)	2278	40	48	9	21.38
Chilli	280	102	161	59	58.27
Moth	2866	45	55	10	23.40
Green gram (seed)	1494	59	68	8	14.28
Green gram organic	47	80	94	14	17.45
Namkeen	108	80	93	13	16.75
Pakora	2129	70	101	32	45.87
Pakorian	824	73	106	33	45.61
Papad	75	112	154	42	37.31
Kidney bean	1805	56	62	6	10.25
Red bean	1952	57	64	7	11.93
Rongi	173	63	69	6	9.49
Shakkar	200	43	49	6	13.11
Soya nuts	450	110	142	32	29.08
Other spices	146	110	145	35	31.86