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Farmers' producer organisation in reducing transactional costs: A study of Tamil Nadu Mango Growers Federation (TAMAFED)

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ABSTRACT

The functional linkages of producers with different systems and within the system in the form of backward and forward linkages in production process involve the investments in the form of transactional costs. Farmers' collective action for better production in the form of self help groups (SHGs), farmers' interest groups (FIGs), marketing associations, producers associations, co-operatives etc. have contributed in maximizing the input-output ratio and ultimately increasing the benefit of producers. The present study was undertaken to find out the motivating factors to join association and the benefits accrued as a result of joining such producers' federation namely TAMAFED (Tamil Nadu Mango Growers Federation) dealing with mango crop in Tamil Nadu state of India. A set of sixty member and sixty non-member farmers were selected from the six villages of the three districts of the state. The Logit analysis revealed that education, economic benefit and area under mango cultivation were the major determinants of motivation to join TAMAFED. As a measure of economic gain, transactional output cost due to sale of harvested produce was two and half times less for members compared to non-members. The comparative analysis shows that mean transactional input cost per hectare was found to be significantly lower for members than non-members. The members of TAMAFED gained social and economic benefits and the costs incurred on input and output transactions were quite low ultimately adding to the benefit. As such, it may be recommended that organization of farmers on commodity basis in the form of similar federations may be promoted for socio economic gain of the farmers.

Key words: Economic gains, Logit analysis, Marketing, Motivating factors, Transactional costs

Horticulture has emerged as an important sub sector with in agricultural sector that offers great potential for efficient input use, higher returns per unit area, crop diversification, earns foreign exchange and provides greater employment opportunities through post-harvest processing in agro industries besides imparting nutritional security (Sonawane *et al.* 2001). Mango (*Mangifera indica* L.), the national fruit of India accounts for ten per cent of world's total fruit production with second rank and is cultivated almost in all parts, with the exception of hilly areas.The area, production and productivity of mango in Tamil Nadu was 132.7 thousand hectares, 636.3 thousand metric tonns and 4.8 mt/ha respectively. Marketing of mango is more complicated as majority of the farmers are illiterate, unskilled in marketing, unorganized and scattered. Lack of proper post-harvest and storage facilities compels farmers for forced sale immediately after the harvest. The agricultural marketing is saddled with a long chain of middlemen between the farmers and ultimate consumers leading to lion's share of the consumer's price in favour of traders. With the growing commercialization and increasing dominance of supply chains characterized by the requirement of rigid adherence to strict grades and standards, small farmers in India face both an opportunity for access to valuable markets and the risk that they will be excluded from them. Consequently, new agricultural extension approaches are concentrated on decentralization and attract more and more participation of farmers' organisations in a pluralistic manner (Anderson 2007). Policies provided blueprint structures for farmers' organisations in the for mof cooperatives in order to provide various input, marketing and educational services to the farmers' (Shingi and Chamala 1997). Capable farmers' organizations can be very effective in meeting the genuine needs of the rural communities to support farmers and represent their interests in decision-making processes (Swanson 2008, Rondot and Collion 2001). Individual characteristics such as level of education, cultivated area, income and extension contacts have a positive relationship with farmers' attitude and motivation to participate in group farming activities like cooperatives, SHGs and producer

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organizations (Koppen *et al*. 2002, Shahroudi and Chizari 2008).

Creation of platform for farmers for better production can lead to precision farming for successful marketing. Such models can manage to consolidate the activities both at input level by internalizing the production and at output level by strategy of targeted marketing. The functional linkages of producers with different system involved in the transfer of cultivation technology have direct bearing on quality and quantity of the produce. It brings to limelight the type and purpose of linkages with different organization and other resources for production and marketing (Rakesh *et al.* 2005, Das *et al* 2015.). The backward and forward linkages in production process may involve the investments in the form of transactional costs. Transaction costs, occasionally referred as "hidden costs" are the observable and non-observable costs associated with exchange of goods and services. These costs arise due to the frictions involved in the exchange process as it entails transfer and enforcement of property rights. Transactional cost focuses mostly on explaining the existence and properties of alternative modes of organization and the trade offs among them. Earlier experiences have shown that the farmers associations in the form of SHGs, FIGs, marketing associations, producers associations, co-operatives etc. have contributed in maximizing the input-output ratio and ultimately increasing the benefit of producers. It is expected that supply chain may be effective and efficient only when farmer's forums are formed as a vital step to go further. The present study was conducted with the objective to find out the motivational factors of the farmers to join farmers' producers organisation and to difference in transactional costs of mango production and marketing in addition to comparison of members and non-members of Tamil Nadu Mango Growers Federation **(**TAMAFED) on their selected socio-psychological factors.

MATERIALS AND METHODS

The study was purposively conducted in Krishnagiri, Dharamapuri and Vellore districts of Tamil Nadu state during the year 2013. From these districts, three blocks namely Pochampalli, Dharmapuri and Thirupattur were selected randomly. Further, from each selected block, 20 member growers of TAMAFED and 20 non- members were selected randomly from six villages with total sample size of 120 respondents (60 members and 60 non-members). The selected socio-psychological variables were studied with available standard tools.

Factors motivating the mango growers to join the TAMAFED were studied and analyzed using Logit analysis. Logit regression analysis is a univariate / multivariate technique which allows for estimating the probability that an event occurs or not, by predicting a binary dependent outcome from a set of independent variables. In the present context, the TAMAFED members are those farmers who already joined the federation while non- members are those farmers who have not joined the federation. Therefore, the membership variable is a discrete dichotomous choice variable (a farmer is either a member of the federation or not). In the instances where the adoption variable is binary (0/1), Logit and Probit models are most commonly used to analyze the technology adoption process (Aldrich and Nelson 1986). In the present study, the Logit model was used for analyzing the factors influencing a farmer to join the federation, which is given as below:

$$Pi = Pr\,(Yi = 1) = \exp(Z)/\,1+\exp(Z) \qquad \text{Eq (1)}$$

$$Z = \beta_{0+}\Sigma\ {}^{m}\beta_i X_i \qquad \text{Eq (2)}$$

$$\ln(p_i/_1 - p_i) = \beta_{0+}\Sigma\ {}^{m}\beta_i X_i \qquad \text{Eq (3)}$$

where, Pi denotes the probability that the i^{th} farmer has joined the federation (Yi = 1), β_0 is the intercept, β_{is} are the slope parameters in the model, and X is the independent variable. The natural log transformation of Eq 1 will result into Eq3, which is known as the Logit regression model.Thus the β_s are interpreted as the change in the natural log of odds associated with change in the explanatory variable and do not directly indicate change in probability of joining the federation or marginal effects. In addition to descriptive statistics namely mean, standard deviation, frequency analysis and t-test was used to analyze the ordinal variables.

RESULTS AND DISCUSSION

The results of the investigation along with relevant discussion are presented in three sections; first part deals with socio-psychological variables of the subjects under study, second part details regarding the motivating factors to join farmers' producer organisation and the third part compares the input and output transactional costs of the two set of respondents.

It is clear from the Table 1 that majority 90% of the TAMAFED members were involved in some social organizations. It was totally different in the case of non-member farmers as majority (61.66%) were not taking part in any of the organizations. More than half of TAMAFED members (58.33%) had medium level of cosmopolitness, followed by high (23.33%) and low (18.33%). The Table further revealed that majority (86.33%) of non-member growers had low to medium level of cosmopoliteness. Nearly half of the TAMAFED members (48.33%) and non-member growers (45.00 %) had moderate level ofrisk orientation. However, 36.66 percent of TAMAFED members and only 16.66 per cent of non-member growers had high level of risk orientation, whereas meager per cent of TAMAFED growers (15.00%) and more than one third of non-member growers (38.33%) farmers had low risk orientation. A large majority (93.32%) of TAMAFED members had medium to high while about 80.00 per cent of them had low to medium level of achievement motivation. It was interesting to note that majority about 85.00 per cent of TAMAFED members belonged to medium to high while 86.00 per cent non members belonged to low to medium level of innovativeness**.** Interestingly between the two categories, TAMAFED members were having relatively

Table 1 Distribution of the respondents according to socio psychological characteristics

Category	TAMAFED members (n= 60)		Non member growers (n= 60)	
	Frequency	Percentage	Frequency	Percentage
Social participation				
No membership	6	10.00	37	61.66
Membership in one organization	34	56.66	13	21.66
Membership in two organizations	13	21.67	7	11.67
Office holder	7	11.66	3	05.00
Innovativeness				
Low	9	15.00	23	38.33
Medium	34	56..66	29	48.33
High	17	28.33	8	13.33
Mean		16.35		11.86
SD		06.39		03.68
Range		7–26		7–19
Cosmopolitness				
Low	11	18.33	22	36.33
Medium	35	58.33	30	50.00
High	14	23.33	8	13.33
Mean		09.76		05.16
SD		1.24		1.97
Range		8–12		2–9
Achievement motivation				
Low	04	06.66	17	28.33
Medium	19	31.66	31	51.66
High	37	61.66	12	20.00
Mean		04.40		02.85
SD		0.60		1.29
Range		3–5		1–5
Risk orientation				
Low	09	15.00	23	38.33
Medium	29	48.33	27	45.00
High	22	36.66	10	16.66
Mean		08.11		06.54
SD		2.76		2.26
Range		4–12		4–12
Economic motivation				
Low	08	13.33	16	26.66
Medium	28	46.66	33	55.00
High	24	40.00	11	18.33
Mean		05.82		04.78
SD		1.74		1.88
Range		4 – 8		2 – 8

higher proportion of high economic motivation. Since the federation was linking with top quality retail markets and corporate, hence, the economic motivation was found higher among TAMAFED members than the non-members. Overall, the member farmers' were socially more participative, more cosmopolite, calculated risk takers, higher achievement and economically motivated and relatively more innovative than the non-member farmers'. These results are in conformity with the findings of Govindagowda (2002), Bhagyalaxmi *et al.* (2003), Vedamurthy (2002) and Gupta *et al*. (2013).

An attempt was also made in the study to understand the factors that explain the motivation to join the TAMAFED. These factors were identified and analyzed by using Logit analysis**.** The factors such as area under mango cultivation, farming experience, source of income, economic benefits, education and exposure in the form of training were identified and studied for the purpose (Table 2). It is clear from the table that education, economic benefits and area under mango cultivation were the major predictors of motivation to join TAMAFED with the odds ratio of 15.087, 10.635 and 2.995 respectively. Since, these odds ratios are significant so it can be concluded that these factors significantly explain the motivation to join TAMAFED. Earlier, Amini and Khayatei (2006), Quio *et al.* (2008), Koppen *et al.* (2002), Taherkhani and Arani (2005), Nain *et at*. (2015) also reported the similar findings. The motives behind participation in group farm activities through local organisations were appropriate education, proper exposure of the activities, expected economic gains, expectation to fulfill information gap, agricultural share in total income, ease in marketing and farm related processes etc. Community/Cluster approach involving harvesting in a group followed by de-sapping, washing, grading and selling the mango in group ensures quantity as well as quality required for marketing and hence economic benefits. Higher the area under mango cultivation, higher the need for group action and more the educational status of the farmers' chances to understand and calculate the benefits of farmers' organisation lead to become the member of such organisations.

Information on backward linkages like information on farming activities, procurement of saplings, input procurement, financial assistance and forward linkages like sale of produce, transportation, weighing, and commission were also studied to arrive at transactional costs. The comparative analysis of transactional input costs incurred by TAMAFED members and non-members shows that

Table 2 Determinants of motivation to join the federation

Parameter	Estimate	Error	Chi-square	Pr> chi sq	Odds ratio estimates
Intercept	-6.393	1.743	13.447	0.000	
Area under cultivation	1.097	0.277	15.595	0.000	2.995***
Experience	0.056	0.056	0.997	0.317	1.058
Education	2.713	0.802	11.435	0.000	15.087***
Source of income	-1.934	0.859	5.062	0.024	0.14
Previous training/ exposure visit	0.374	0.798	0.219	0.639	1.454
Economic benefits	2.364	1.086	4.895	0.026	10.635***

*** Significant at one percent level.

saplings procurement costs (comprising communication cost, travel cost, transportation cost and unloading charge together) was found to be lower for non-members than members of TAMAFED. This might be due to the fact that area under mango crop of non-members was lesser than that of members. So, the mean sapling procurement cost was higher for members. Similar results were also observed with purchase of fertilizer and pesticides. The comparison in Table 3, of mean transactional input cost per hectare for members of TAMAFED and non-members showed that mean value was found to be higher for non-members (₹ 1269.85) than that of members (₹ 402.98). Similar results were obtained with the t-statistics, where t value shows that there was a significant difference between members and non-members.

The comparison of mean output transactional cost of TAMAFED members and non-members in Table 4 shows that transactional output cost due to sale of harvested produce was less for members (₹ 8034.00) compared to non-members.The mean value was found to be higher for non-members (₹18429.50) than that of members (₹ 8034). Similar results were obtained with the t-statistics, where t value shows that there exist a significant difference between members and non-members. Members of the association have to incur an amount at the time of loading the produce according to the quantity of the produce which covers all the associated costs. As such if small farmers' can be aggregated, the problems related to inputs can be overcome and transactional costs can be reduced and the farmers' can realise better prices. Partnerships can play a key role in creating farm to fork linkages that can, on the one hand, satisfy the market demands for high quality and safe food, while retaining small holders in the value chain. The results are in confirmity with Das *et at*. (2015). As mentioned by

Table 3 Comparison of members and non-members of TAMAFED on different input transactional cost

Various transaction input costs incurred		Mean cost/hectare (in rupees)	
		Members	Non-members
Saplings procurement	Communication cost	34.67	53.43
	Travel cost	162.17	194.83
	Transportation cost	370.42	265.83
	Unloading charge	170.00	211.66
Purchase of Fertilizer	Transportation cost	218.25	179.5
	Loading	436.50	210
	Unloading	435.83	210
Purchase of pesticide	Communication cost	34.17	19.33
	Transportation cost	26.17	32.97
	Mean	402.98	1269.85
	SD	210.90	898.38
	Minimum	79.75	260.50
	Maximum	900.00	3357.50
	t-stat	7.276	
	t-critical	1.980	

Table 4 Comparison of members and non-members of TAMAFED on different output transactional cost

Various transaction output costs incurred		Mean cost/hectare (in rupees)	
		Members	Non-members
	Transportation cost	0	7935.00
	Loading charges	8034.00	2116.00
	Unloading charges	0	2116.00
	Travel cost	0	45.33
	Weighing charges	0	60.00
	Commission	0	6094.00
Information on market Price	Travel cost for receiving information		63.16
	Mean	8034.00	18429.50
	SD	7339.64	10570.39
	Minimum	2400.00	8989.00
	Maximum	48000.00	75274.00
	t-stat	6.257	
	t-critical	1.980	

Misra (2009) that the private sector in India has entered in organized retailing with definite plans for at least some kind of linkage but none is actually reaching the farm gate, hence the way out is to allow them to organize as clusters and exploit the benefits of economies of scale. Pritchard *et al.* (2010) in their study in rural Karnataka advocated that farmers do not generally possess strong loyalties among traders, or between traders and super market buyers.

The expectations from retail chains to operate as an agri-input supplier and provide the inputs, technologies and practices which would help farmers to meet the superior quality required for domestic (and potentially international) super market standards are still to be realized in India. As such, the transactional costs may be handled through clustering of farmers in the form of producer organisations to create a scale in marketing and integrating them with the global value chains to ensure better prices of their produce. Small and marginal farmers, lack the capabilities of investing alone in post-harvest infrastructure and it is hard to meet the requirements of the corporate buyers, who on one hand have certain minimum quantity requirement as well the quality requirements in the form of type of agriculture practices followed. As such, the transactional costs of the farm produce especially the fruits like mango can be reduced through farmers' federations as depicted in the present investigation. Also, the socio economic difference of the member and non-member farmers shows impact on these dimensions of the farmers. It can also be concluded that clustering of farmers in producers organisation may have lasting effect not only in terms of enhanced income through reduction of transactional costs but also in terms of socio-economic gains.

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