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RESEARCH ARTICLE

Farmer Producer Organization for Turmeric Growers in Tribal Region of Odisha: Success Factors and Constraints

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ABSTRACT

The study of success factors and constraints of Farmer Producer Organisations (FPOs) helps in improving the functioning of FPOs by providing valuable policy insights. Therefore, a study was conducted with 120 members of an FPO in Kandhamal district of Odisha in 2021 to delineate the success factors and constraints. Data were analysed using TOPSIS method and Friedman test. Results revealed that the most important factors contributing to success were the better price for produce compared to local traders, good infrastructure for value addition and marketing, and assistance in availing the benefits of various government schemes. Major constraints were delayed payment compared to local traders, inadequate and irregular supply of inputs, and lack of effective communication between office-bearers and farmers. The study recommends that for success, producers' organizations should focus more on better price realization, creating marketing infrastructure, and timely payment and services to the members.

Key words: *Constraint analysis; Farmer producer organisations; Kandha tribe; TOPSIS.*

Over 86 per cent of the farmers in India are small and marginal *(Agricultural Census, 2015-16)*. As individual farmers, they face many challenges viz. low bargaining power, high transaction costs, lack of access to advisory services, exploitation by middle men, etc. (*Nikam et al., 2019*). There is an increased realisation that, mobilising and organising farmers into innovative grass-root institutions would help in overcoming these problems (*Kumar et. al., 2020; Singh et. al., 2021; Amitha et al., 2021*). Thus, underscoring the importance of producers' collectives in Indian context, the Government of India has set the target of formation of 10000 FPOs by 2027. Since 2011, 5000 new FPOs have been established; out of them 902 are supported by SFAC, 2086 by NABARD, and others by different programmes of the central/ state governments and some farmers' societies (*The Hindu Business Line, Jan.27,2020*).

The larger effect of the FPO movement has been confined to a few states (*Govil et al., 2020; Manaswi et al. 2018*) such as Maharashtra and Madhya Pradesh. To make it more inclusive, these institutions need to be actively promoted in states like Odisha, Bihar, Chattisgarh, etc. Taking a step forward in this direction, the Government of Odisha prepared the 'Draft Odisha FPO Policy-2018' for creating an enabling environment for the promotion of FPOs. Therefore, studies on pre-existing farmers' organisations in the state having years of experience with the small and marginal farmers should be conducted to generate important inputs for the emerging FPOs. KASAM is one such organization which has been engaged with the turmeric growers in the tribal region of Odisha since 1998. KASAM is a non-profit society registered under the Societies Registration Act 1860. It functions as a marketing partner to 61 Spice Development Societies (SDS) in five blocks of Kandhamal district. Most of its 11234 members belong to the 'Kandha' tribe. Its major objectives include creation of an efficient marketing network to minimize the exploitation of farmers by intermediaries and production of high-quality spice-based products. It not only helps the farmers in marketing their produce but also offers them

quality inputs and agro-advisory services. It also exports turmeric and ginger based organic products to nations like the USA, Japan, UK, Germany, and the Netherlands.

Though, few studies were conducted in the past (viz. study on the value chain of ginger by *Japan International Cooperative Agency (2015)*, study on the marketing channels operating in the region for turmeric by *Sahoo et al. (2018)*, etc.), there is no study on other important dimensions viz. Extension and Advisory Services offered, success factors and constraints, socio-economic impact of FPOs, etc. Hence, the present study was conducted to identify the most important success factors and constraints of FPO as perceived by the members so that it can provide valuable inputs to new FPOs, Producer Organisation Promoting Institutions (POPIs), and extension professionals.

METHODOLOGY

The study was conducted in Kandhamal, which is located in Central Odisha. Nearly 66 per cent of its area is covered with dense forests and mountains. The agro-climatic condition is suitable for the cultivation of crops like turmeric, ginger, mustard, etc. Scheduled tribes constitute 53.58 per cent of the district's population.(*https://kandhamal.nic.in*)

A multistage sampling procedure was followed in the study. KASAM FPO is operational in five blocks of the district viz. Phiringia, K. Nuagaon, G. Udayagiri, Raikia, and Daringbadi. Out of these, Daringbadi and Phiringia blocks were selected purposively because of the highest share of dry turmeric procurement by KASAM and the presence of the Central Spice Processing Unit, respectively. Data were collected from randomly selected 120 member farmers (60 from each block) by conducting personal interview in 2021. Based on inputs from a pilot study and review of literature, twelve success factors were identified. The members were asked to rank these factors from 1 to 12. Similarly, for identifying the constraints responses from the members were obtained on a five-point continuum.

The responses in terms of ranks were analysed using Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS) method to identify the success factors. To delineate the constraints, Friedman test was used.

TOPSIS method : It is a multi-criteria decision-making model developed by Hwang and Yoon in 1981 to measure the relative performance of each alternative using a simple mathematical form. The basic concept behind this method is: the best alternative has the shortest geometrical distance from a positive ideal solution and the farthest distance from a negative ideal solution. (*Roszkowska, 2011*)

The steps followed in TOPSIS analysis are:

Step-1: A decision matrix is prepared representing all the alternatives and their respective rankings. The format of the matrix D can be presented as:

χ_{11}	χ_{12}	……	χ_{1m}
χ	χ	….	χ
21	χ	22	2m
D=	. . .	……	... (1)
χ_{n1}		χ_{n2}	χ_{nm}

Here, xij (i=1, 2…,n and j=1,2…, m) is considered the rank of i^{th} alternative in j^{th} criteria.

Step-2: A normalized decision matrix is obtained using vector normalization technique. The procedure for computing vij is written in equation2:

$$v_{ij} = \frac{x_{ij}}{\sqrt{\sum_{j=1}^{m} x_{ij}^2}}$$

Step-3: The positive and negative ideal solutions are calculated

$$A^+ = (v_1^+, \ldots . v_j^+, \ldots . v_m^+)$$

$$v_j^+ = \left\{ (\max_j \{v_{ij}\} \mid j \in i), j = 1, 2, \ldots m \right\}$$

$$A^- = (v_1^-, \ldots . v_j^-, \ldots . v_m^-)$$

Here

$$v_j^- = \left\{ (\min_j \{v_{ij}\} \mid j \in i), j = 1, 2, \ldots m \right\}$$

The best performance scores are the constituents of the Positive Ideal Solution (A+) and the worst performance scores are the constituents of the Negative Ideal Solution (A-). It can be expressed as:

Step-4: Euclidian distance i.e., the distance of the alternative from the positive or negative ideal solutions is measured. Distance of the alternatives from the positive ideal solution (Si+) can be expressed as:

$$S_i^+ = \sqrt{\sum_{j=1}^{m} (v_{ij} - v_j^+)^2}$$

Likewise, distance of the alternative from the

negative ideal solution (S_i^-)can be written as:

$$S_i^+ = \sqrt{\sum_{j=1}^{m} (v_{ij} - v_j^+)^2}$$

Step 5: The weight (T^+) is calculated using the following equation:

$$T_i^+ = \frac{S_i^-}{S_i^+ + S_i^-}$$

Based on this weight (T_i^+), the final ranking is assigned.

TOPSIS method was employed using R software and the factors were assigned the final ranks based on their weights.

Further, eighteen constraints were identified. Members were asked to assign scores to every constraint on a five-point continuum scale from 5 to 1 in decreasing order of their significance (i.e., 5 for highly significant, 4 for significant, 3 for neutral, 2 for insignificant, and 1 for highly insignificant). The data were analysed using Friedman test and the mean ranks were calculated. The final ranks were assigned based on the mean ranks.

Friedman test : Friedman test was performed on SPSS to calculate the mean ranks and the final ranks were assigned based on the mean ranks.

The mean rank was obtained using the following formula

$$Q = \frac{12}{nk(k+1)} \sum_{j=1}^{n} R_j^2 - 3n(k+1)$$

Where, Q= mean rank, Rj = Summation of the ranks, n = Number of rows or blocks, k =Number of columns or treatments.

RESULTS AND DISCUSSION

The results of the study with relevant discussion are explained here in two parts. The first part deals with identification of the success factors and the second part deals with the constraints as perceived by the members.

Success factors of KASAM as perceived by its members : The top most success factor of FPO as perceived by farmers was offering better price for the produce compared to the local traders (TOPSIS score of 1) (Table 1). The District Collector-cum-President, KASAM fixes a minimum price for the procurement of dry turmeric from the farmers. For the year 2020-21, it was 60 Rupees per kg, which was about 18-20 per cent higher than the local market price. Similar findings were obtained by *Raju et al. (2017)* while studying 79 FPOs in Andhra Pradesh, that the successful FPOs assure a minimum price which enhances the farm income and builds trust among its members.

Table 1. Ranks of the factors based on their TOPSIS scores

Factor	TOPSIS Mean score	Rank
Good quality inputs at affordable prices	0.541	4
Easy procurement system	0.424	9
Better price for produce compared to local traders	1	1
Fast disbursement of payment	0.179	11
Useful agro-advisory services	0.535	5
Capacity building activities like training, field visits, etc.	0.498	6
Less transaction cost	0.495	7
Good infrastructure for value addition and marketing	0.861	2
Assistance in availing the benefits of various government schemes	0.786	3
Distribution of risk among members	0.318	10
Social recognition to members	0.43	8
Involvement of FPO in social empowerment activities like girl' educations	0.055	12

The second most important success factor was good infrastructure for value addition and marketing with a TOPSIS score of 0.861. It was ranked second by majority of the members (69%)whereas 30 percentage ranked it third. Studied FPO had four warehouses and three processing units. Its procurement capacity was up to 5000 metric tonnes. This marketing infrastructure helped in improving supply chain and absorbing the price shocks to prevent financial losses. Importance of market infrastructure was also highlighted in many other studies. *Nikam et al. (2014),* while studying determinants of success of Mahagrapes, found that the most important determinant was a well-established infrastructure for precooling, cooling, storage, etc. *Sahu (2014)* in a study on Farms Produce Promotion Society (FAPRO) in Punjab and Udaipur Agro Producer Company Ltd. (UAPCL) in Rajasthan concluded that adoption of improved technology and infrastructure was the most important success factor in both the cases.

The third most important success factor identified

was assistance in availing the benefits of various government schemes (TOPSIS score of 0.786). It was ranked two by one-fourth of the respondents and ranked three by over half of the respondents. This FPO put efforts to make its members aware about different government schemes and helped them access the benefits. It also facilitated the state departments in the implementation of schemes like Paramparagat Krishi Vikas Yojana.

The fourth most important factor according to the members was good quality input supply at affordable prices (TOPSIS score of 0.541). KASAM provides the rhizomes of varieties like Lakadong and Rajendrasonia with high curcumin from time to time. It also helped the farmers get improved boiling units and polythene sheets for hygienic drying of turmeric at subsidized prices from the spices board. It also facilitated the construction of concrete drying yards and vermicompost units by the spices board (*KASAM* product profile brochure, 2020). According to a study by *Institute of Livelihood Research and Training (2016)*, the FPOs which could provide inputs in the beginning could create a good will among the members. *Venkattakumar et. al. (2017)* also found that effective input distribution was one critical success factor for Farmer Producer Organisations.

The fifth important success factor identified was useful advisory services. The field level employees generally use farm and home visits and farmers' call methods to provide useful agro-advisory services. Similarly, in a case study on Nallavur FPO by *Nandeesa et al. (2013)*, it was found that advisory services played an important role in its success. *Gorai and Wason (2022)* also found that extension personnel and cosmopolite channel contact was an important success factor for FPOs. Other important success factors in decreasing order of their ranks were capacity building activities like trainings and field visits, less transaction cost, and social recognition to its members (Table 1 and 2).

Constraints of KASAM as perceived by its members: As mentioned in Table 3, the most significant constraint of FPO as perceived by its members was delayed payment compared to the local traders. Over 66 per cent considered it as a highly significant constraint and 21 per cent considered it significant. In order to meet their financial obligations tribal farmers needed an immediate payment. Though the local market price is lower, they could get the payment instantly, where as it took more time in KASAM due to procedural delays. To overcome this problem, the method used by Surendra Agritech in Odisha could be adopted- a transparent system wherein money is credited automatically to the farmer's bank account on the same day (SFAC, 2014). The second most significant constraint as perceived by the farmers was irregular and inadequate input supply with a Friedman mean rank of 15.85. Though KASAM provides inputs such as polythene sheets, rhizomes, etc. sometimes, it is unable to provide it regularly and in adequate quantities at affordable prices as expected by the farmers due to paucity of funds. A study by *Venkattakumar (2019)* in Karnataka found that delayed supply of inputs is a challenge faced by FPOs.

The third important constraint was lack of effective communication between office bearers and members. Spice Development Society (SDS) is the basic unit of KASAM. There exists one SDS for a cluster of villages. Every SDS had a president and a

Table 2. Percentage distribution of success factors as per the ranks (N=120)

Rank	F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8	F-9	F-10	F-11	F-12
	%	%	%	%	%	%	%	%	%	%	%	%
I	0	0	100	0	0	0	0	0	0	0	0	0
II	3.3	0	0	0	0	0.8	0	69.2	25	0	1.7	0
III	2	0.8	0	0	4.2	3.3	5.8	30	53.3	0	3.3	0
IV	7.5	12.5	0	0	20	16.7	24.2	0	14.2	2.5	2.5	0
V	28.3	7.5	0	0.8	15.8	11.7	10.8	0	1.7	10	15.8	0
VI	18.3	9.2	0	0	21.7	16.7	10	0	0.8	6.7	16.7	0
VII	20.9	15	0	0.8	15.8	18.3	13.3	0	5	4.2	6.7	0.8
VIII	14.2	15	0	11.6	10.8	15	10.8	0	0	5.8	15.8	0
IX	2.5	25	0	10	8.3	7.5	10.8	0.8	0	21.7	14.2	0
X	2.5	11.7	0	8.3	3.3	10	6.7	0	0	31.7	23.3	0
XI	0	3.3	0	54.2	0	0	7.5	0	0	15	0	17.5
XII	0	0	0	14.2	0	0	0	0	0	2.5	0	81.7

Table 3. Per centage distribution of constraints and their final ranks (N=120)

Constraints	Percentage distribution					FMR	Rank
	HI	I	N	S	HS		
Low procurement capacity	6.7	30.8	37.5	17.5	7.5	10.3	6
Procurement from non-members	5.8	54.2	27.5	11.7	0.8	8.5	11
Inadequate transportation facility	20	55.8	20	4.2	0	6.8	14
Untimely procurement	9.2	31.7	45.8	13.3	0	9.3	10
Less price	94.2	5.8	0	0	0	2.2	18
Delayed payment	0.8	5	7.5	20.8	65.8	16.2	1
Lack of market information	3.3	30	52.5	9.2	5	10.2	7
Lack of assistance in post-harvest activities	3.3	40.8	31.7	22.5	1.7	10	9
Lack of effective capacity building	22.5	41.7	25	7.5	3.3	7.6	13
Untimely advisory services	12.5	46.7	35	5.8	0	8.1	12
Lack of participation of members in decision making	2.5	28.3	61.7	7.5	0	10.1	8
More influence of some members	12.5	71.7	15.8	0	0	6.5	16
Clash among members	75.8	24.2	0	0	0	2.9	17
Lack of team spirit among members	0.8	9.2	37.5	47.5	5	13.3	4
Lack of effective communication between office bearers and members	0	10.8	19.2	44.2	25.8	14.2	3
Lack of regular visits by officials at important stages of crop cycle	1.7	12.5	45	38.3	2.5	12.4	5
Inadequate/ irregular supply of inputs	0	0.8	10	50	39.2	15.8	2
Low quality inputs	27.5	41.7	30	0	0.8	6.5	15

FMR=Friedman mean rank; HI-Highly insignificant, I-Insignificant, N-Neutral, S-Significant, HS-Highly significant. Friedman test showed that the asymptotic significance was 0.000(<.001) with a chi-square value of 1202.867 and 17 degree of freedom which suggests a significant difference among the constraints at 1per cent significance level.

secretary who were farmers' representatives. They were the connecting links between SDS and KASAM. The meetings of presidents and secretaries were organised very frequently by KASAM but the frequency of group meetings at SDS level was only two to three times a year. Thus, there was a communication gap between the office bearers and members. Further, as mentioned by presidents and secretaries of some SDSs, the participation level of farmers in the group meetings was also unsatisfactory.

The fourth significant constraint was lack of team spirit. Except for training programmes and group meetings, the members never acted as a team. They never came together for information seeking, input purchasing, discussing about the problems in farming and their solutions, etc. The lack of team spirit among the members had become a hindrance in reaping many benefits of the economy of scale.

The fifth significant constraint was lack of regular visits by the officials during important stages of the crop cycle. Though the presidents and secretaries of societies were in constant touch with the farmers, the farmers expected the officials of KASAM to visit them during important stages of the crop cycle so that they can get better assistance in accessing inputs for performing post-harvest operations by solving their queries and guiding them. But it might not be possible because of the shortage of staffs at ground level. There was only one field supervisor for a block who had to cater to the needs of thousands of farmers.

CONCLUSION

In conclusion, the most important success factors of studied FPO as perceived by the members were offering better prices compared to local traders, good infrastructure for value addition and marketing, and assistance in availing the benefits of various government schemes. Important constraints reported were delayed payment, irregular and inadequate input supply, and lack of effective communication between office bearers and members. Thus, FPO should take appropriate measures to make the payment process faster and hassle-free by use of modern technology. More number of staffs should be employed at ground level from agriculture, horticulture, and agri-business backgrounds so that the members could be guided at all the important stages of crop cycle in a timely manner. Additionally, fund should be mobilised for provision of good quality inputs in adequate amount at affordable prices. It is evident from the present study that emerging FPOs should focus more on market-linkage models and assure a minimum price for the

produce. For this very purpose, good infrastructure for value addition and marketing is a prerequisite. Further, FPOs can be used as a platform for empowering the farming community by making them aware of different government schemes and helping them avail the benefits. Moreover, government's vision of doubling farmers' income through an FPO-based approach can yield greater results if these crucial factors are taken care of during the establishment and promotion of FPOs.

CONFLICT OF INTEREST

The authors have no conflict of interest.

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