Assessing Women Farmers' Perceptions of Farmer Producer Organizations: A Special Reference to Namakkal District, Tamil Nadu, India

ABSTRACT

Aim: This research aims to assess the perceptions of women farmers regarding Farmer Producer Organizations (FPOs), with a specific focus on women-based FPOs in Namakkal District, Tamil Nadu. The primary objective is to contribute to the development of more effective and sustainable FPO models, which can support smallholder farmers in improving their livelihoods and achieving food security.

Research Gap: The research aims to fill a critical gap in existing literature by focusing exclusively on women farmers' perspectives on FPOs, thereby providing insights into the effectiveness of FPOs in empowering women in agriculture.

Study Location: Namakkal District, Tamil Nadu, was chosen due to its high concentration of FPOs under the Central Sector Plan for 10,000 new FPOs.

FPO Selection: Four women-based FPOs were purposively selected from 17 in the region, focusing on FPOs with exclusively female members to explore women farmers' experiences.

Sample Size and Data Collection: Structured questionnaires were used to collect data from 30 members in each of the four selected women-based FPOs, totaling 120 participants.

Data Analysis: Factor analysis was applied to the dataset comprising 22 variables related to women farmers' views of Farmer Producer Organizations (FPOs).

Results: Study identified eight critical factors that significantly shape women farmers' perceptions of FPOs. These factors include the business ecosystem, value addition services, marketing services, production services, bargaining power, social capital, advisory services, and prosperity benefits. Together, these factors explain 68.356% of the variance in the data, offering valuable insights into what influences women farmers' views on FPOs.

Conclusion: Joining an FPO offers equal opportunities, collective procurement, and knowledge exchange for all farmers, empowering women with training and resources for active participation in agriculture. FPOs boost prosperity, elevate societal status, and provide valuable support to women farmers, enhancing their livelihoods.

Keywords: FPO, smallholders, women farmers, Namakkal, Perception, Factor analysis

1. INTRODUCTION

1.1 Farmer Producer Organization

A Farmer Producer Organization (FPO) represents a collective of farmers dedicated to producing, selling, and processing crop. These organizations play a pivotal role in empowering small-scale farmers by securing fair prices and amplifying their market influence **[1]**. In recent years, Farmer Producer Organizations (FPOs) have gained increasing attention as a potential solution to the myriad challenges faced by smallholder farmers in developing nations **[2]**. India, home to the world's second-largest number of small holdings, grapples with the reality that approximately 85 percent of its farming community comprises small and marginal farmers **[3]**. This significant reliance on farm income underscores the formidable task of transforming these tiny agricultural holdings into thriving and productive entities. Recognizing the urgency of this issue, the Indian government embarked on a legislative journey that allows cooperatives to transition into corporate entities while preserving their distinctive characteristics **[4]**. Within this landscape, the FPO model, rooted in farmer solidarity, has emerged as a promising alternative to traditional cooperative structures **[5]**. The Indian government has unequivocally acknowledged the value of FPOs, as evidenced by its ambitious proposal in the union budget to establish 10,000 new FPOs by 2027-2028 **[6].** To facilitate this initiative, the Department of Agriculture and Cooperation officials have devised a central sector program aimed at ushering in this transformation. As part of this effort, FPOs are granted the choice to register under either the state's Cooperative Societies Act or the Companies Act of 2013, thereby expanding their operational horizons **[7].** Farmer Producer Organizations (FPOs) have emerged as a pivotal lifeline for the agricultural community, effectively addressing a multitude of challenges faced by farmers. These organizations are instrumental in providing equitable opportunities to all farmers, regardless of their socio-economic background **[1],[5]**. One of the significant advantages of FPOs is their ability to facilitate collective bargaining and secure improved pricing for agricultural products **[1]**. This transformative role empowers farmers to better navigate market forces and gain fair compensation for their efforts **[8]**. FPOs also enable collective procurement of inputs, leading to substantial reductions in production costs **[9]**. By pooling resources and negotiating as a unified entity, farmers can access essential inputs at more competitive rates, thereby increasing their overall profitability **[10]**. Moreover, FPOs actively encourage the participation of farmers in leadership roles and seek feedback and suggestions from their members to ensure continuous improvement **[1],[5]**. These organizations contribute to gender equality and empowerment by offering diversification training to women farmers **[11].** Additionally, FPOs provide platforms for knowledge sharing, allowing farmers to exchange best practices and stay updated on emerging agricultural technologies **[12]**. FPO also offer access to value-adding facilities, further enhancing the value of agricultural products **[13]**. By opening doors to new markets and reducing dependency on middlemen, FPOs increase the economic independence of farmers and improve their socio-economic well-being **[14].** Furthermore, FPOs play a pivotal role in enhancing agricultural knowledge and skills through ongoing training and education **[12],[13].** This not only elevates the social status of their members but also empowers them with the knowledge and tools necessary to adapt to evolving agricultural practices **[15]**. In essence, Farmer Producer Organizations (FPOs) serve as agents of empowerment within their communities, offering

economic independence and autonomy **[1],[5],[7].** FPO plays a crucial role in keeping farmers updated on new agricultural technologies and practices, ultimately making a profound and positive impact on the lives of farmers **[12].**

1.2 Research gap

According to the FAO report titled "The state of food and agriculture," female farmers have the potential to produce output increases that range from 20-30 per cent higher than male farmers. Despite the fact that, women are more dominant than males in many aspects of farming, their contributions have been generally ignored **[16].** The empowerment of women farmers over the long term has concentrated on aggregation. Cooperatives and Self-Help Groups movement has revitalized this effort by empowering women and providing a legal framework for Farmer Producer Organization. The participation of women in FPO will guarantee inclusive growth in the rural sector **[17].** By empowering women farmers and giving them a stronger voice in the market, Women's FPOs can help to promote gender equality and ensure that women's contributions to agriculture are fully recognized and valued. The low percentage of women-based FPOs in India, as highlighted by the study by **[18]**, is concerning, given that women comprise a significant portion of the agricultural workforce in the country. The lack of representation of women in FPOs may further exacerbate the gender disparities in access to resources, technology, and knowledge that women farmers face.

1.3 Purpose of the study

This study is dedicated to filling a research gap by specifically exploring women farmers' perceptions of Farmer Producer Organizations (FPOs). It seeks to gain insights into their perspectives, aiming to better understand the challenges and opportunities for women's participation in FPOs and contribute to the development of more gender-inclusive FPO models in agriculture.

2. Materials and Methods

2.1 Study Location: The research was conducted in Namakkal District, Tamil Nadu which was purposively selected due to its high concentration of Farmer Producer Organizations (FPOs) established under the Central Sector Scheme for 10,000 new FPOs.

2.2 Criteria for Sample FPO: Four women-based FPOs were selected from the region, with a criterion that all members within each selected FPO are female. This criterion ensured that the study specifically explored the experiences and perceptions of women farmers in FPOs where every member is female, out of a total of 17 FPOs in Namakkal district.

2.3 Sample Size and Data Collection: Data collection involved structured questionnaires administered to 30 members from each of the four selected women-based FPOs, resulting in a total of 120 participants. These questionnaires were designed to gather information on various aspects of women farmers' perspectives on FPOs.

2.4 Sample Size and Data collection: Random sampling was the method of choice, carefully applied to select 30 members from each of the four chosen Women-Based Farmer Producer Organizations (FPOs). This process yielded a total of 120 participants who actively participated in our research. The survey instrument, comprised of 22 qualitative statements, was thoughtfully constructed based on a comprehensive literature review. These statements were designed to encapsulate various dimensions of women farmers' perceptions regarding Farmer Producer Organizations (FPOs). Farmers were asked to rate their perceptions using a 5-point Likert scale, which provided a structured and standardized way to collect data. This methodology allowed us to gain valuable insights into the views and experiences of these farmers concerning FPOs.

2.5 Data Analysis: The utilization of factor analysis as our primary tool for data analysis provided us with a powerful means to gain a deeper and more comprehensive understanding of the underlying factors that shape women farmers' perceptions of Farmer Producer Organizations (FPOs).

3. Results and Discussion

3.1 Profile of Sample Farmer Producer Organization

The National Cooperative Development Corporation, working through the Tamil Nadu Corporation for Development for Women Ltd, is the promoting agency responsible for promoting the Sample FPOs in the study region. The legal status of the FPOs is limited by the shares under the Cooperative Societies Act, 1983. This act provides the legal framework for the operation of the FPOs, and it defines the rights and responsibilities of the FPOs, their shareholders, and their members. Each of the Sample FPOs has 750 total shareholders, and every member receives a total of 20 shares, with the value of each share being INR 100. At present, the shared capital in each FPO is INR 15 lakh. All shareholders are also regular members of the FPO, and each shareholder has their own individual share in the company. The membership of the FPOs is open to any competent women individual who is eligible to contract under section 11 of the Indian Contract Act, 1872. The Sample FPOs are diverse, and there is heterogeneity among its members by landholding pattern and social groups. This ensures that the FPOs represent a wide range of women farmers in the region. The appointment of directors in each Sample FPO is done through a nomination basis, and there are 11 women directors from different social groups and landholders in each FPO. This ensures that the FPOs have a diverse leadership that represents the interests of all their members. The main income-generating activity of the Sample FPOs is the trade of agricultural commodities and value addition. The FPOs procure agricultural produce from their members and add value to it before selling it in the market. This helps increase the income of their members and promotes the economic development of the region.

Table 1:Profile of Sample Farmer Producer Organization

Particulars	Details of FPO

Name of the FPO	NA.NA.321. Erumapatty Block Women Groundnut Cooperative Farmers Producer Organization Ltd	NA.NA.322. Namagiripettai Block Women Tapioca Cooperative Farmers Producer Organization Ltd	NA.NA. 323.Puduchatram Block Women Groundnut Cooperative Farmers Producer Organization Ltd	NA.NA. 324.Venandur Block Women Tapioca Cooperative Farmers Producers Organization Ltd
Registration Date	13.04.2022	24.05.2022	24.05.2022	24.05.2022
Block	Erumapatty	Namagiripettai	Puduchatram	Venandur
Villages covered	32	29	21	25
No of Directors	11	11	11	11
Membership details	SC -213 ST - 0 Others - 537	SC – 203 ST - 197 Others – 350	SC – 213 ST - 0 Others – 537	SC – 171 ST -100 Others - 479
Number of Small, Marginal & Landless Shareholders	Small -519 Marginal -149 Landless -82	Small-523 Marginal-159 Landless-68	Small – 519 Marginal - 149 Landless – 82	Small - 543 Marginal - 128 Landless – 79
Shared Capital	15,00,000	15,00,000	15,00,000	15,00,000
Business Activity	Groundnut Procurement and Value Addition	Tapioca Procurement and Value Addition	Groundnut Procurement and Value Addition	Tapioca Procurement and Value Addition

Source: Compiled from field survey

3.2 Socio-Economic profile of Sample Women Farmers

The table 2 provides the distribution of respondents across different categories of variables such as age, education, social group, and landholding size. A total of 120 respondents were surveyed for this study. In this case, the age distribution shows that a significant proportion of respondents are in the age group of less than 30 years (44.17%), which can indicate a relatively young and dynamic population. On the other hand, only 5% of the respondents are above the age of 50, which could imply a lack of experience or traditional knowledge. The educational background of the respondents can also influence the FPO's functioning. The fact that 35% of the respondents have completed up to higher secondary education and 31% have graduated implies that the sample population is relatively educated, which could have a positive impact on the FPO's functioning, decision-making, and sustainability. However, 5% of the respondents being illiterate could create a barrier to communication and understanding of the FPO's

activities. The social group composition shows that 70% of the respondents belong to "others," while only 20.83% are from the Scheduled Caste and 9.17% are from the Scheduled Tribe. This composition can impact the FPO's outreach and inclusivity efforts, as the organization may need to take additional steps to involve members from marginalized communities. Finally, landholding size is an important factor that can affect the FPO's activities and potential for growth. The fact that 66.67% of the respondents have small landholding sizes can limit their agricultural production capacity, which in turn can impact the FPO's procurement and value addition activities.

Table 2:Socio-Economic profile of the sample women farmers

Variable	Category	Respondents	Percentage
Age	Less than 30	53	44.17
	31- 40	37	30.83
	41-50	24	20.00
	Above 50	6	5.00
Education	Illiterate	6	5.00
	Upto Middle School	27	22.50
	Upto Higher Secondary	42	35.00
	Graduation	37	30.83
	Above Graduation	8	6.67
Social Group	Schedule Caste	25	20.83
	Schedule Tribe	11	9.17
	Others (Includes BC/MBC/General)	84	70.00
Land holding size	Small	80	66.67
	Marginal	29	24.17
	Leased in farms	11	9.17

Source: Compiled from field survey

3.3 Variable Reliability and Selection in Factor Analysis

This study assessed women farmers' perceptions of FPO using 22 variables. The reliability of the variables was evaluated using Cronbach's alpha, which indicated a reliable internal consistency (α=0.723). An appropriate degree of reliability is generally judged to be between 0.7 and 0.8 **[19]**. To reduce the number of variables, factor analysis was performed using PCA and Varimax rotation **[20]**. The selection of variables and items was based on several criteria, including KMO values (>0.6) **[21]**, Bartlett's Test's significant value (0.05) **[22]**, eigenvalues (>1.0) **[23]**, communalities (<0.40) **[24]** and factor loading (>0.40) **[25]**.

Table 3:Sample Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.628
Bartlett's Test of Sphericity	Approx. Chi-Square	965.548
	Df	231
	Sig.	.000

Source: Statistically calculated using SPPS

3.4 Women farmers perception on FPO

Table 4 shows that the eight factors described 68.356% of the data variance, with the first two components explaining nearly 30%. The third and fourth components explain a lot of variances, but the rest explain little. Factor analysis identified eight components among the 22 variables and the eigenvalues and percent variance for each factor are provided in Table 5. The first factor, "Business Ecosystem," has an eigenvalue of 4.160 and explains 18.90% of the variance in the data. This factor is associated with the FPO's ability to provide equal opportunities to all farmers (0.764), facilitate collective procurement of inputs (0.746), negotiate for better prices (0.758), establish farmer-owned businesses (0.733), provide opportunities for women to participate in leadership roles (0.638), encourage feedback and suggestions from its members (0.562), and provide a forum for farmers to exchange information on best practices and new technologies. The second factor, "value addition services," has an eigenvalue of 2.196 and explains 9.981% of the variance in the data. This factor is associated with the FPO's ability to provide access to equipment and facilities for processing and value addition (0.972) as well as training on value addition and product diversification (0.961). The third factor, "Marketing services," has an eigenvalue of 2.005 and explains 9.115% of the variance in the data. This factor is associated with the FPO's ability to provide access to new markets for members' products (0.779), opportunities for product promotion and market information (0.709) and reduced dependency on middlemen (0.465). The fourth factor, "Production services," has an eigenvalue of 1.734 and explains 7.883% of the variance in the data. This factor is associated with the FPO's ability to provide access to high-quality inputs to improve the quality and quantity of members' harvests (0.864), as well as timely information and advice on best practices for crop management (0.760). The fifth factor, "Bargaining power," has an eigenvalue of 1.423 and explains 6.468% of the variance in the data. This factor is related to the FPO's ability to increase members' bargaining power with buyers (0.778) through joint marketing and sales activities (0.764). The sixth factor, "Social capital," has an eigenvalue of 1.248 and explains 5.674% of the variance in the data. This factor is associated with the FPO's ability to provide capacity building programs (0.831), regular training, and education opportunities to its members (0.707) which help them keep up-to-date with the latest developments in the agricultural sector. The seventh factor, "prosperity benefits," has an eigenvalue of 1.168 and explains 5.311% of the variance in the data. This factor is associated with the FPO's ability to empower women in the community (0.723) by providing access to training, information, and resources that enable them to participate more fully in agricultural production and decision-making (0.652). It also includes opportunities for women to gain status and autonomy by earning money through the FPO

(0.514). The eighth factor, "Advisory services," has an eigenvalue of 1.104 and explains 5.016% of the variance in the data. This factor is associated with the FPO's ability to update its members on new agricultural technologies and practices (0.852). Overall, these eight factors indicate that joining an FPO can provide significant benefits to farmers in terms of equal opportunities, value addition services, marketing services, production services, bargaining power, social capital, advisory services, and prosperity benefits. The FPO can facilitate access to inputs, equipment, and new markets while providing training and education opportunities to improve farming practices and the quality of the harvest. Joining an FPO can also increase the bargaining power of farmers and provide opportunities for women to participate more fully in decision-making and leadership roles, leading to increased prosperity and higher societal status for its members.

Table 4:Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.160	18.907	18.907	4.160	18.907	18.907	3.464	15.746	15.746
2	2.196	9.981	28.888	2.196	9.981	28.888	2.123	9.648	25.394
3	2.005	9.115	38.003	2.005	9.115	38.003	1.889	8.585	33.979
4	1.734	7.883	45.886	1.734	7.883	45.886	1.816	8.253	42.233
5	1.423	6.468	52.354	1.423	6.468	52.354	1.603	7.284	49.517
6	1.248	5.674	58.029	1.248	5.674	58.029	1.549	7.040	56.557
7	1.168	5.311	63.340	1.168	5.311	63.340	1.440	6.544	63.101
8	1.104	5.016	68.356	1.104	5.016	68.356	1.156	5.255	68.356
9	.931	4.234	72.590						
10	.801	3.640	76.231						
11	.796	3.617	79.848						
12	.652	2.964	82.813						
13	.610	2.775	85.587						
14	.569	2.586	88.173						
15	.500	2.274	90.447						
16	.491	2.234	92.681						
17	.430	1.952	94.633						
18	.334	1.518	96.151						
19	.307	1.397	97.547						
20	.266	1.211	98.758						
21	.250	1.136	99.894						

22	.023	.106	100.000						
Extraction Method: Principal Component Analysis									

Source: Statistically calculated using SPPS

Table 5: Women Farmers perception on FPO

Factor	**Component**	**Factor loading for components**	**Eigen Value**	**% Variance**
Business Ecosystem	Equal opportunities to all farmers, regardless of their social status or landholding size	0.764	**4.160**	**18.907**
	By pooling resources and negotiating as a group for better price	0.758		
	Facilitated the collective procurement of inputs	0.746		
	Facilitated the establishment of farmer-owned businesses	0.733		
	Opportunities for women to participate in decision-making and leadership roles.	0.638		
	Encourages its members to provide feedback and suggestions on its activities and operations, and takes these inputs into consideration in its decision-making process.	0.562		
	Forum for farmers to exchange information on best practices and new technologies	0.522		
Value addition services	Access to equipment and facilities for processing and value addition	0.972	**2.196**	**9.981**
	Training on value addition and product diversification	0.961		
Marketing services	Access new markets for my products.	0.779	**2.005**	**9.115**
	Opportunities for product promotion and market information	0.709		
	Reduced the dependency on middlemen	0.465		
Production services	Access to high-quality inputs to improve the quality and quantity of my harvests	0.864	**1.734**	**7.883**
	Timely information and advice on best practices for crop management	0.760		

Bargaining power	Joining an FPO has improved our bargaining power with buyers	0.778	**1.423**	**6.468**
	Facilitates collective marketing and sales activities	0.764		
Social capital	The capacity building programs offered by the FPO have improved my knowledge and skills	0.831	**1.248**	**5.674**
	Regular training and education opportunities to its members, which have helped me keep up-to-date with the latest developments in the agricultural sector	0.707		
Prosperity benefits	Raised my societal status in my community and given me new chances and resources.	0.723	**1.168**	**5.311**
	Joining an FPO has empowered women in my community by providing them with access to training, information, and resources that have enabled them to participate more fully in agricultural production and decision-making.	0.652		
	Opportunities for women to gain the status and autonomy by earning money through the FPO.	0.514		
Advisory services	Updates on new agricultural technologies and practices	0.852	**1.104**	**5.016**

Source: Statistically calculated using SPPS

4. Conclusion

A study was conducted to analyze the perceptions of women farmers in the Namakkal district of Tamil Nadu, India, towards Farmer Producer Organizations (FPOs). 120 women farmers from four FPOs were sampled using a purposive multi-stage random sampling method. The study identified eight factors that influence women farmers' perceptions of FPOs, including business ecosystem, value addition services, marketing services, production services, bargaining power, social capital, advisory services, and prosperity benefits. Joining an FPO can provide equal opportunities for all farmers, facilitate collective procurement of inputs, establish farmer-owned businesses, and provide a forum for farmers to exchange information on best practices and new technologies. FPOs also provide access to equipment and facilities for processing and value addition, training on value addition and product diversification, new markets for members' products, high-quality inputs, and timely information and advice on best practices for crop

management. Joining an FPO can empower women in the community by providing access to training, information, and resources that enable them to participate more fully in agricultural production and decision-making, leading to increased prosperity and higher societal status for its members. Overall, the study suggests that FPOs can provide significant benefits to women farmers and enhance their livelihoods.

Consent

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

Authorship Contribution

Sasikanth R led data collection, analysis, and initial paper creation, also overseeing revisions and Ravichandran S provided vital supervision, mentoring, and enhanced manuscript quality

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