A comprehensive analysis of the constraints perceived by the members of Farmer Producer Organizations in North Bihar

ABSTRACT

The agriculture sector in India is currently facing several challenges, such as increasing landholding fragmentation, diminishing per-capita land availability, and rural youth's disinterest in farming. FPOs help small and marginal farmers by lowering transaction costs, facilitating credit sources for farmers, providing technical guidance, producing support and capacity building, and creating long-term sustainability to improve the farming community. This study investigates the constraints perceived by members of FPOs. Data were collected from 240 members across 6 FPOs. An ex-post facto research design was used to study four broad constraints regarding Producer Organization Promoting Institution's (POPI's) support, marketing,organizational technical and operational constraints. The Friedman two-way ANOVA rank test was used to analyze thirty-five statements under four broad constraints. The findings revealed that marketing is the most severe constraint, followed by constraints regarding POPI's support as well as organizational, technical, and operational support. Under marketing constraints without guaranteed procurement systems, inadequate storage facilities are most severe.Under constraints perceived by FPO members regarding POPI's support, considering resource-affluent areas and exclusive attention to progressive farmers are significant. Competition of villages to get benefits and irregular procurement of the produce are most significant constraints under organizational and technical constraints. The research indicates that by overcoming these obstacles with better infrastructure, fair distribution of resources, and improved connections to markets, one can boost the sustainability and economic feasibility of Farmer Producer Organizations, thereby enhancing socio-economic benefits for farmers in North Bihar.

Keywords: Farmer Producer Organizations, Constraints,Friedman test, North Bihar, Marketing.

1. INTRODUCTION

The agricultural sector in India is currently grappling with numerous challenges that impede its growth and sustainability. A significant issue is the diminishing per-capita agricultural land availability, primarily due to the fragmentation of land holdings and a declining natural resource base [1]. This problem is further exacerbated by the societal shift from joint to nuclear families, which leads to smaller and more divided land parcels. Additionally, there is a notable disinterest in agriculture among the rural youth, with over 40% expressing a desire to leave farming for other professions[2]. To address these issues, there is a pressing need for a robust and dynamic model that effectively organizes farmers and connects them with the market, ensuring better access to resources, support, and opportunities for growth [3].

A well-known cooperative group that unites primary producers voluntarily is the Farmers' Producer Organisation (FPO). The organization was established with the idea of free membership and is motivated by a common goal of creating economic and technological initiatives for the benefit of its members [4.5]. Farmer Producer Organizations (FPOs) are becoming the new model for integrating farmers into cohesive

groups. This organization allows them to engage collectively in activities related to the agricultural supply and value chains [6].When the vast majority of farmers, exceeding 85 percent, are smallholders, they encounter significant difficulties in gaining access to advanced agricultural technologies, utilizing market data to their advantage, engaging in transactions for their produce or inputs on terms that are favorable to them, and consistently maintaining the profitability of their operations [7]. The formation of Farmer Producer Organizations (FPOs) plays a crucial role in achieving economies of scale across various agricultural endeavors, both directly related to farming and ancillary activities, throughout the initial preparatory phases, actual production period, and subsequent post-harvest processes.

Farmers must band together to improve the farming community's long-term sustainability. This enables them to access marketing facilities, links to export and domestic markets through the FPOs, and reasonably priced inputs at the appropriate time, place, and amount [8]. Shepherd [9] has brought up the idea of FPOs similarly. Lack of infrastructure, including secondary agriculture activities, credit facilities, transportation, custom hiring services,lack of access to inexpensive, high-quality inputs, technology, and extension services is the main barrier to the agriculture sector in rural areas [10,11]. Other constraints include investment in natural resources and infrastructure. Due to their acute financial situation, most cooperative organizations rely primarily on state subsidies[12]. In light of this information, specific research questions have arisen, such as the major problems faced by members of Farmer Producer Organizations (FPOs).Likewise, farmers in FPOs may encounter many other related issues. In order to answer the above research question objectively, the study was designed and conducted to determine the constraints perceived by FPO members in North Bihar.

MATERIALS AND METHODS

The present study was investigated in the North Bihar region of Bihar. Six FPOs were taken purposively from the Muzaffarpur and Samastipur districts of North Bihar.The two districts are taken purposively because Muzaffarpur is an aspirational district and Samastipur is backward district taken from North Bihar.The FPOs, namely SKFCL, KKFCL, CRAFCL, KUFCL, PFPC, and MFPCL, were taken purposively because these FPOs cover major agricultural and horticultural crops. From each FPO, 40 farmers were selected randomly; thus, the total number of respondents for the study was 240. An ex-post facto research design was used to study 4 broad constraints perceived by FPO farmers in the form of technical constraints, organizational constraints, marketing constraints, and constraints perceived by FPO members regarding POPI's support. Thirty-five supporting and signifying statements were selected under four broad constraints. A three-point scale of "most severe, severe and least severe" with the respected weightage of "3,2,1"was used to record the responses of the FPO farmers. Plausible constraints were selected based on the pilot study in the study locale and the available secondary literature.The Friedman two-way ANOVA by ranks test, as explained by Tripathi [13], was used to determine the most significant constraints faced by dairy farmers [14].Similarly, Kendall's Coefficient of Concordance is an alternative be usedto rank the broad categories[15].In my studyThe Friedman two-way ANOVA by ranks test was doneusing SPSS Software to measure the most severe constraint among 4 broad categories by comparing the differences between treatments or conditions using a specific formula.

$$x^2r1 = \frac{12 \div Nn(n+1)}{Nn(n+1)} \times 2R12 - 3N(n+1)\, atdf = n-1$$

Where,N= number of subjects, respondents or groups

n= number of treatments or broad constraints

$\Sigma R1^2$= row ranks summed up in each column, squared and then added.

2. RESULT AND DISCUSSIONS

3.1 Technical and operational Constraints perceived by FPO farmers

In Table 1, among tensub-constraintsunder technical and operational constraints irregularity in the procurement of the produce shows a mean score of 2.45 ranks 1st, followed by transportation facilities are not available (2nd) with a mean score of 2.44.Inaccessible credit facilities show a mean score of 2.43(3rd)followed by unavailability of infrastructure facilities(2.21),procuring only a portion of member's produce(1.68),lack of decentralization in the administrative work of FPOs(1.67), Insufficient personnel(1.61).

The major constraint is an irregularity in the procurement of the produce, with a mean score of 2.45. This is due to the need for more infrastructure for FPOs and insufficient credit facilities of FPOs. Most of the FPOs only provide transportation facilities to some of the farmers, which is the second most important technical and operational constraint. In the study area most of the FPOs are not providing credit facilities in terms of short loans to the farmers which is due to lack of funding available from the government as well as resource institutions.The results were in line with Witcombe *et al.[16]* and Chopade *et al.[17]* in their study.

3.2 Organizational Constraints perceived by FPO farmers

In Table 2 organizational constraints faced by farmers are uneven rotation of the governing body(1.93), villages are competing with one another to receive benefits(2.47),everyone strives to hold important roles inside the company(2.00),individual benefit takes precedence above the objectives of the group (2.18),inequality in benefit-sharing(2.30),no informal relationship among members of FPOs(2.09),there is a lack of teamwork(1.79), participants consistently oppose one anotherin meetings (2.00).

The most severe organizational constraint perceived is villages are competing with one another to receive benefits with a mean score of 2.45. This is due to uneven importance by the FPOs to the villages in terms of progressiveness, resources available and distant location from the FPOs.The second most severe constraint is inequality in benefit sharing with a mean score of 2.30 followed by individual benefit takes precedence above the objectives of the group with a mean score of 2.16.Other organizational constraints perceived by farmers are also mentioned in Table 2.The findings were also reported by Tiwari et al.[18]

3.3 Constraints perceived by FPO members regarding POPI's support

In Table 3 among seven sub constraints perceived by FPO members regarding POPI's support "Only resource-rich areas" with a mean score 2.75 ranks 1st. Exclusive attention to progressive farmers with a mean score 2.63 ranks 2nd followed by imposing their corporate agenda on FPOs(2.14),intention to make only profit(2.12),influencing in FPO's decision-making process (2.07),taking advantages of FIGs to fullfill their own organization goals.(2.05).

Themost severe constraint perceived by FPO farmers regarding POPI's support isConsidering only resource rich areas with a mean score of 2.75.This is because POPIs focus primarily on resource-rich areas due to better infrastructure and market accessibility, resulting in higher returns on investments. The second most important constraint regarding POPI's support is Exclusive attention to progressive farmers.Their profit-driven motive overshadows the development goals of FPOs and creates a disparity among the farmers.The results are in line with (Darshan et al.[19]

3.4 Marketing constraints perceived by FPO farmers

There are 10 constraints under marketing services found in the study area.In Table 4, absence of guaranteed procurement systems with a mean score of 2.82 ranks 1st among all other marketing constraints. The second most marketing constraint is inadequate storage facilities (2.57) followed by the market is far away from the villages, and transportation costs are high(2.43),availability of market information is lacking (2.37).Other marketing constraints in the study are exploited by middlemen and other intermediaries(2.37),late payment(2.37), price volatility (2.33),inadequate processing facilities(2.18) and illiterate members with a mean score of 2.18).

The most severe constraint under this category is the absence of guaranteed procurement systems, with a mean score of 2.82. This is due to inadequate infrastructure, lack of financial stability of FPOs, highly volatile markets, perishability of the produce, and insufficient market linkage of FPOs.Another significant constraint perceived bymembers of FPOs is inadequate storage facilities.Many FPOs lack accessible goodowns or warehouses for members to store their produce. Private warehouses are expensive, making them unaffordable for small and marginal farmers. These limitations result in post-harvest losses and reduced produce quality, impacting the sustainability of agricultural activities undertaken by FPOs.Further, Table 4 depicts all other marketing constraints perceived by members of FPOs in the study area.The findings are in line with (Darshan et al.[19] andTorero[20].

According to Table 4, the mean rank from the Friedman test indicates that marketing constraints are the most severe among the four broad constraints. This is due to the absence of local mandis in the study area, where farmers can directly sell their produce. Additionally, there is a pressing need for more reliable infrastructure by FPOs to collect and purchase produce from farmers. A significant sub-constraint within marketing is the lack of sufficient storage facilities, which compels farmers to sell their produce at lower prices to intermediaries.The second major issue faced by FPO farmers is the lack of support from POPI. These institutions mainly concentrate on areas with ample resources and overlook the less prosperous regions. This means that when small and marginal farmers need support the most, they are not receiving it. Additionally, FPOs are contributing to inequalities among farmers by favouring only the more progressive ones.The third broad constraint is organizational constraint, followed by technical constraint, which is the least severe one. This might be due to under technical constraints, the issues were broad but not individual-centric in the study area.

Table 5 indicates that the asymptotic significance obtained from the Friedman test was 0.000 ($p<0.01$), with a chi-square value of 76.895 and 3 degrees of freedom. The significance value shows Monte Carlo Significance at a 99 percent Confidence Interval. Therefore, it can be interpreted that there was a significant difference between the four different sub-dimensions of constraints perceived by members of FPOs.

Table 1.Response of FPO farmers based on the extent of severity of Technical and Operational constraints faced in the study area (n=240)

Technical and Operational Constraints(Friedman mean rank 2.09)	Response of FPO farmers				
	Most Severe	Severe	Least severe	Mean Score	Overall Rank
Irregularity in procurement of the produce	140(58.3)	67(27.9)	33(13.8)	2.45	1st
Unavailability of infrastructure facilities	93(38.8)	105(43.8)	42(17.5)	2.21	5th
Insufficient personnel	43(17.9)	61(25.4)	136(56.7)	1.61	9th
Inaccessible credit facilities	135(56.3)	74(30.8)	39(12.1)	2.43	3rd
The remoteness of operational centre from the village	114(47.5)	102(42.5)	24(10.0)	2.38	4th

Transportation facilities are not available	133(55.4)	80(33.3)	27(11.3)	2.44	2nd
Procurement of produce from the non-members by FPOs.	43(17.9)	77(32.1)	120(50.0)	1.68	7th
FPO is procuring only a portion of member's produce.	78(32.5)	88(36.7)	74(30.8)	2.02	6th
Lack of decentralization in the administrative work of FPOs.	31(12.9)	100(41.7)	109(45.4)	1.67	8th
Political Meddling	7(2.9)	59(24.6)	174(72.5)	1.30	10th

Table 2. Response of FPO farmers based on the extent of severity of organizational constraints faced in the study area (n=240)

Organizational Constraints (Friedman mean rank 2.32)	**Response of FPO farmers**				
	Most Severe	**Severe**	**Least severe**	**Mean Score**	**Overall Rank**
Uneven rotation of the governing body	77(32.1)	69(28.8)	94(39.2)	1.93	7th
Villages are competing with one another to receive benefits.	135(56.3)	82(34.2)	23(9.6)	2.47	1st
Everyone strives to hold important roles inside the company	61(25.4)	119(49.6)	60(25.0)	2.00	5th
Individual benefit takes precedence above the objectives of the group.	70(30.4)	133(55.4)	34(14.2)	2.16	3rd
Inequality in benefit sharing	103(42.9)	107(44.6)	30(12.5)	2.30	2nd
No informal relationship among members of FPOs	76(31.7)	109(45.4)	55(22.9)	2.09	4th
There is a lack of teamwork	37(15.4)	115(47.9)	88(36.7)	1.79	8th
In meetings, participants consistently oppose one another.	73(30.4)	94(39.2)	73(30.4)	2.00	5th

Table 3. Response of FPO farmers based on the extent of severity of Constraints perceived by FPO members regarding POPI's support faced in the study area (n=240)

Constraints perceived by FPO members regarding POPI's support. (Friedman mean rank 2.55)	**Response of FPO farmers**				
	Most Severe	**Severe**	**Least severe**	**Mean Score**	**Overall Rank**
Only resource-rich areas are considered	194(80.8)	32(13.3)	14(5.8)	2.75	1st
Intention to make only profit	69(28.8)	131(54.6)	40(16.7)	2.12	4th
Imposing their corporate agenda on FPOs	80(33.3)	114(47.5)	46(19.2)	2.14	3rd
Exclusive attention to progressive farmers.	162(67.5)	67(27.9)	11(4.6)	2.63	2nd
Influencing in FPO's decision-making	75(31.3)	107(44.6)	58(24.2)	2.07	5th

process					
Taking advantages of FIGs to fullfill their own organization goals.	88(36.7)	77(32.08)	75(31.25)	2.05	6th
Coordinators and ABAs are unable to be guided.	2(0.8)	32(13.3)	206(85.8)	1.15	7th

Table 4. Response of FPO farmers based on the extent of severity of marketing constraints faced in the study area (n=240)

Marketingconstraints(Friedman mean rank 3.04)	Response of FPO Farmers				
	Most severe	**Severe**	**Least Severe**	**Mean Score**	**Overall Rank**
Price volatility	106(44.2)	108(45.0)	26(10.8)	2.33	7th
Availability of market information is lacking	110(45.8)	108(45.0)	22(9.2)	2.37	4th
In a non-FPO-based supply chain, there are too many middlemen.	30(12.5)	59(24.6)	151(62.9)	1.50	9th
The market is far away from the villages, and transportation costs are high	126(52.5)	91(37.9)	23(9.6)	2.43	3rd
Exploited by middlemen and other intermediaries	126(52.5)	28(11.7)	7(2.9)	2.37	4th
Late payment	61(25.4)	77(32.1)	37(15.4)	2.37	4th
Members are illiterate	93(38.8	96(40.0)	51(21.3)	2.18	8th
Inadequate storage facilities	20(8.3)	62(25.8)	20(8.3)	2.57	2nd
Inadequate processing facilities	94(39.2)	96(40.0)	50(20.8)	2.18	8th
Absence of guaranteed procurement systems	205(85.4)	28(11.7)	7(2.9)	2.82	1st

Table 5.Test Statisticsof Friedman Test

		n=240
Chi-Square		76.895
df		3
Asymp. Sig.		.000
Monte Carlo Sig.	Sig.	.000
99% Confidence Interval	Lower bound	.000
	Upper bound	.000

4. CONCLUSION

The study aimed to explore the constraints perceived by members of Farmer Producer Organizations (FPOs). The severity of 4 broad constraints was determined using the Friedman test, with the test's appropriateness verified through asymptomatic and Monte Carlo significance levels. The findings of the study highlighted that marketing constraints were the most significant challenge faced by farmers in FPOs. Key issues identified included the lack of guaranteed procurement systems, inadequate storage facilities, exploitation by middlemen and other intermediaries, and the unavailability of market information. These were ranked as the top independent constraints under 4 broad categories.

To tackle these challenges, policymakers, POPIs, and FPOs need to work together closely, fostering an environment that is fair and conducive to the success of farmers. By doing so, they can boost the sustainability and financial viability of farming practices in the area, which will lead to better socio-economic outcomes for the agricultural community in North Bihar.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

Authors' Contribution

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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