



Effectiveness of Farmer Producer Organizations (FPOs) at Different Growth Stages in Transitioning to Secondary Agriculture

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ABSTRACT

FPOs are gaining recognition as institutions for improving the small holders' farming in India. However, the extent to which FPOs effectively facilitate the transition to secondary agriculture for the sustainable development of these farmers has not been extensively studied. This study was conducted during 2022-2023 to assess the effectiveness of randomly selected four FPCs in Bihar, which are functional for 1-3 years, >5 years, and >10 years. A random sample of 160 members, 40 from each FPC, was selected. The overall effectiveness of 50.55 per cent to 56.20 per cent in FPCs at their initial stage of functioning; while the FPCs being functional for more than 5 years and more than 10 years showed overall effectiveness of 60.03 per cent and 68.40 per cent, respectively. The FPC diversifying their products and performing processing, manufacturing, and marketing functions showed the highest effectiveness (68.40%) as compared to the FPCs dealing with single products and/or performing selected functions like providing agricultural inputs, and marketing. A one-way ANOVA followed by Post hoc test revealed significant variations in the effectiveness of FPOs. The present study provides valuable insights into the role of FPOs in the transition to secondary agriculture providing better income and livelihoods to farmers.

INTRODUCTION

In India, approximately 86.21 per cent of the country's total land holdings are owned by small and marginal farmers as per the Agriculture Census of 2015-16. Due to small patches of land, small and marginal farmers encounter difficulties in economy of scale particularly identifying markets, establishing market connections, reaching out to markets, obtaining fair prices for their produce, lack of storage facilities, high transportation costs, presence of intermediaries, and limited access to credit (Kumar et al., 2018; Nain et al., 2019; Bishnoi & Kumari, 2020), which are referred as the components of secondary agriculture. The collectivization of farmers has proven to be significant in reducing transaction costs and providing scale advantages through bulk

purchase of inputs (Singh, 2008; Trebbin & Hassler, 2012; Parthiban et al., 2015). India's agricultural system is shifting from social welfare to welfare capitalism, necessitating policy reforms for the capitalization of farmers (Trebbin & Hassler, 2012). Farmer Producer Companies (FPCs) have gained attention as a solution to marketing challenges faced by small farmers (Singh et al., 2022) and it was found that FPOs improve the livelihoods of farmers by facilitating collective input purchases and providing forward linkages (Mukherjee et al., 2018a). Currently, there are 33,711 registered FPOs in India, with over 28.20 lakh farmers affiliated across 28 states and 7 Union Territories. Notably, Bihar, Maharashtra, Odisha, Rajasthan, Tamil Nadu, and Uttar Pradesh are the primary contributors, accounting for 21,285 FPOs (63%)

and 18.36 lakh shareholders (65%). Maharashtra leads with 8,261 FPOs, followed by Uttar Pradesh with 3,106 FPOs (Balamatti, 2023; Kumar et al., 2023). FPOs provide farmers with benefits such as risk mitigation, access to extension services, improved inputs, credit, storage, and processing facilities. They enable farmers to compete with larger corporations, utilize digital platforms, and share profits (Singh & Vatta, 2019; Adhikari et al., 2021; Kumar et al., 2021; Rathour et al., 2022). Factors like attitudes, cooperation, member responsibilities, and entrepreneurial traits contribute to FPO stability (Mukherjee et al., 2018b; Gorai et al., 2022; Singh et al., 2022). The effectiveness of FPOs is crucial for empowering farmers, improving their livelihoods, and ensuring sustainable agricultural development. Through the promotion of collective action, market access, knowledge sharing, and advocacy for farmers' interests, effective FPOs can bring about positive changes in the lives of farmers and the agricultural sector (Mukherjee et al., 2019a; Kumari et al., 2022).

To date, numerous studies have explored the efficacy of various agricultural-based FPOs across different sectors of agriculture. However, there remains a notable research gap pertaining to the assessment of FPO effectiveness during the different growth stages of FPOs specifically operating in secondary agriculture. A comprehensive investigation into the performance and impact of FPOs at various developmental stages within the secondary agriculture sector was need of the hour. On this backdrop present study was undertaken to assess the effectiveness of FPOs dealing with both agricultural and horticultural produce and are at different stages of functioning in the state of Bihar.

METHODOLOGY

An exploratory sequential design was followed in present study including a qualitative approach followed by a quantitative approach. Qualitative data were collected first to explore the phenomenon under study, then quantitative data were gathered to explain the relationships among elements of the phenomenon explained through qualitative data. The study was conducted in the purposively selected state of Bihar, which is one of the six major states promoting FPCs in India. The list of registered and functioning FPCs in Bihar was obtained from the National Bank for Agriculture and Rural Development (NABARD), Krishi Vigyan Kendra (KVK) and Indian Council of Agricultural Research (ICAR) institutes. A total of four FPOs were selected randomly, which were dealing with agricultural and horticultural produce and existing for a period of 1–3 years, more than 5 years and more than 10 years. A random sample of 40 farmers from each FPO were chosen, thus covering 160 farmer-members as respondents of the present study.

Effectiveness of FPC refers to the perceived degree of successful accomplishment of FPC objectives as perceived by the members. The researchers contacted the representatives of all FPCs to ascertain their exact status and assess their perception on effectiveness of their respective FPC. To evaluate the effectiveness, index developed by Mukherjee et al., (2019a) with some modification was used, which was based on five components: (1) functioning efficiency, (2) increase in income, (3) increase in farmers' share in consumer prices, (4) farmers' satisfaction, and

(5) empowerment. The functional efficiency was measured on the basis on ten parameters, viz. members' interaction, cooperation among members, interpersonal trust, decision-making, cohesiveness among members, goal achievement, leadership, manageable size, administration systems, and rules, regulations, and procedures (Figure 1). The increase in income as well as farmers' share in the consumer rupee were determined by comparing the income before and after joining in FPC. Farmers' satisfaction with the services provided by the FPC was assessed through 15 statements, each rated on a 5-point continuum scale. The empowerment of farmers resulting from their involvement in the FPC was evaluated based on 14 statements covering various aspects of empowerment, rated on a 5-point continuum scale. To test the significant differences between FPCs with respect to five dimensions of effectiveness an analysis of variance (ANOVA) and Scheffe post-hoc test was done.

RESULTS AND DISCUSSION

A brief description of four selected FPCs is given in Table 1. The Saraiya Kisan Farmer Producer Company Limited (SKFPCL) is located in Muzaffarpur district, which was promoted by NABARD. It involves in the activities related to produce of maize, wheat, and pulses. It supplies agricultural inputs to their member and markets the agricultural produce. The Mithila Makhana Farmer Producer Company Limited (MMFPCL), located in Darbhanga, specializes in various makhana-based products such as roasted *makhana*, *makhana* flour, *makhana*-vita, *makhana* honey mix, and raw *Makhana*. Both these FPCs have been functioning since 2021 & 2020, thus within three years of functioning. The Satyam Shivam Farmer Producer Company Limited (SSFPCL) was established in 2016 and has been focusing on the production, processing, packaging, and branding of products like sun dried lentil dumpling (*dalbari*), candies, amla marmalade (*murabba*), roasted gram flour (*sattu*) and various pickles, etc. The Aranyak Agri Producer Company Limited (AAPCL) is a 14 years old company was established in 2009. Over a period AAPCL has diversified its activities and presently provides a collective market for various high-value commodities, including maize, fruits (banana), semi-perishable vegetable like potato; it is also engaged in various poultry feeds (pre starter, starter crump and grower), makhana processing packaging branding, and supplying of kitchen garden inputs (Table 1).

The effectiveness of selected FPCs was calculated by an index (FPC effectiveness index). This index comprised of five key components viz. functional efficiency, increase in income, increase in farmers' share in consumers price, farmers' satisfaction and empowerment. Among these, functional efficiency emerged as a critical determinant of a company's overall performance which consisted of 10 various sub dimensions. From Table 2, it is evident that AAPCL had a high level of interaction with its members with highest mean perception score of 4.98 followed by SSFPCL (4.86), SKFPCL (4.42), and MMPCL (4.29). Cooperation among members refers to the extent of collaboration and teamwork within the FPOs, for which AAPCL obtained the highest mean Score of 4.98 followed by SSFPCL (4.79), SKFPCL (4.62) and MMPCL (4.47). Interpersonal trust relates to the level of confidence and reliance

Table 1. Profile of the selected FPCs

S.No.	Name of FPC	Year of registration	Promoting organization	No. of members	Area of operation	Turnover (Rs.)	Products (Single /multi commodity)	Market landscape	Service provided
1.	Saraiya Kishan Farmer Producer Company Ltd. (SKFPCL)	2021	NGO (Kasauliya foundation)	325	Saraiya, Muzaffarpur	09 lakhs	Maize	Local and regional markets	Supply of inputs, training of members and marketing.
2.	Makhana Mithila Farmer Producer Company Ltd. (MMFPCL)	2020	NABARD	400	Bareta, Darbhanga	20 lakhs	Makhana based products	National markets	Supply of inputs and processing, value addition of makhana based products and marketing.
3.	Satyam Shivam Farmer Producer Company Ltd. (SSFPCL)	2016	NABARD	1500	Laheriasaria, Darbhanga	41 lakhs	Pickles, <i>dal bari</i> , <i>channasattu</i> , amla candy, value added products	National markets and state market of Bihar	Supply of inputs & training of members. Food processing, packaging and branding. Provides technology for value addition and marketing
4.	Aranyak Agri-producer company Ltd. (AAPCL)	2009	BRLPS, JEEVIKA	5753	Subhash nagar, Punea	5.42 crores	Maize, banana, poultry feed (pre starter, starter crump and grower), Makhana, inputs, potato, kitchen garden inputs.	National and international market	Supply of inputs, regular training of members, food processing, packaging and branding, marketing through online platform NCDX.

among the members of the FPOs. In terms of interpersonal trust, MMPCL received the highest mean score of 3.59; while other three FPCs obtained a low score (<2.0). With respect to decision making, AAPCL demonstrated the highest level of effectiveness, with a mean score of 5.0 and closely followed by SSFPCL with a mean score of 4.93; on the other hand, SKFPCL and MMPCL obtained mean scores of 4.49 and 4.0, respectively. The results indicate that MMPCL had the highest perceived level of cohesiveness among its members with a mean score of 4.8; SSFPCL followed with a mean score of 4.05; while AAPCL and SKFPCL had mean scores of 3.83 and 3.39, respectively. Both AAPCL and MMPCL exhibited the highest perceived level of goal achievement with mean scores of 5.0, closely followed by SSFPCL (4.94), and SKFPCL (4.65). In terms of leadership effectiveness, SSFPCL showed the highest perceived level with a mean score of 5.0 followed by MMPCL (4.80); while SKFPCL and AAPCL obtained mean respective scores of 4.76 & 4.02. When it comes to manageable size, which refers to the optimal size of an organization for effective management and coordination, the mean perception scores indicate that MMPCL was perceived best (4.4); while others were perceived relatively low (mean score <3.75). The administration systems, referring to the processes and structures in place for managing and coordinating organizational activities, received the highest mean score of 5.0 for MMPCL, indicating well-developed and effective systems followed by AAPCL (3.57); while SSFPCL and SKFPCL were perceived low with mean scores of 2.84 and 1.80, respectively. Lastly, rules, regulations, and procedures, which refer to the established guidelines and protocols for conducting organizational activities, AAPCL received the highest mean score of 3.81 followed by MMPCL (3.80), SKFPCL (2.99) and MMPCL (2.88) indicating the need to strengthening their rules, regulations and procedures for improved functional efficiency. It is interesting to observe here that both AAPCL and MMPCL obtained highest perception scores in five out of 10 sub-dimensions of functional efficiency. The overall functional efficiency is found highest in case of MMPCL (4.41) followed by AAPCL (4.07), SSFPCL (3.99) and SKFPCL (3.62). Increase in both income and farmers' share in consumer prices was highest in AAPCL followed by SSFPCL, MMFPCL & SKFPCL. When it comes to farmer's satisfaction, AAPCL had a high-level farmers satisfaction with mean score of 4.94 followed by SSFPCL (4.72), SKFPCL (3.92) and MMFPCL (3.82). With respect to empowerment also, AAPCL had a high-level of farmers satisfaction with mean score of 4.83 followed by SSFPCL (4.57), MMFPCL (4.39) and SKFPCL (3.87).

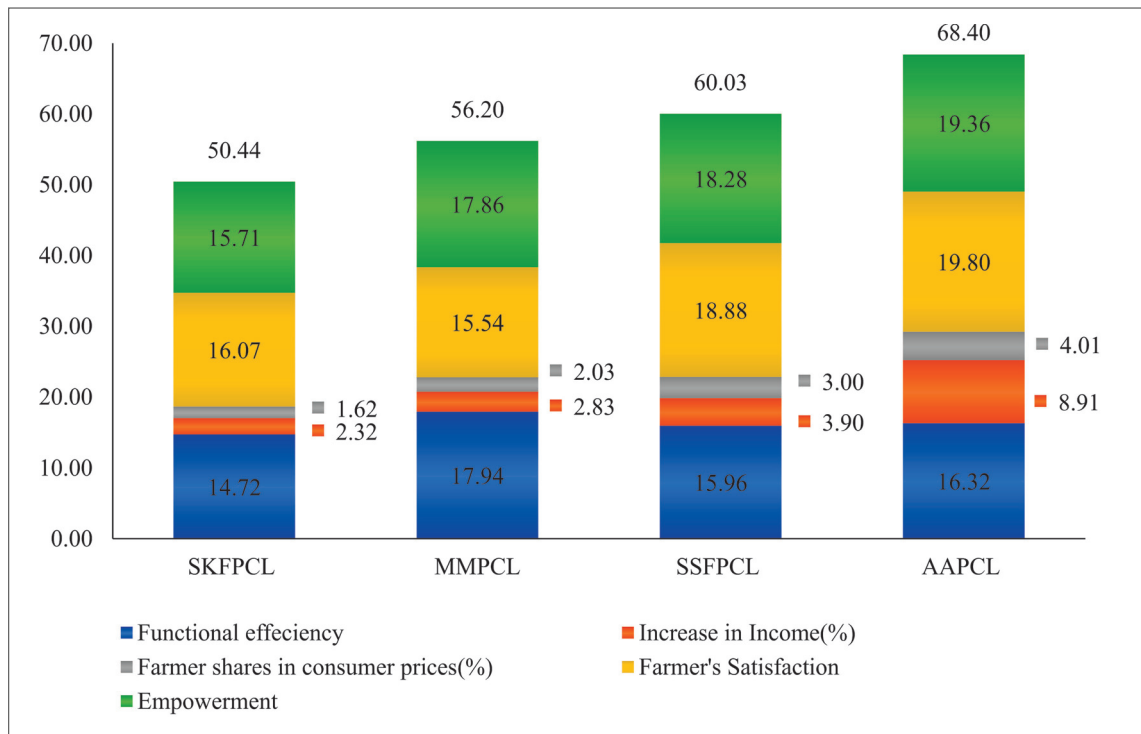
AAPCL, working more than ten years, consistently displayed the highest mean perception scores in several sub-dimensions, suggesting its effectiveness in interacting with members, cooperation, decision-making, and goal achievement. MMPC leven newly registered, exhibited notable performance in cohesiveness, goal achievement, leadership effectiveness, manageable size, and administration systems. Conversely, SSFPCL, functional for more than 5 years and newly registered SKFPCL scored relatively lower in several dimensions, indicating areas that require attention and improvement.

Comparing the FPCs based on their operational period, it is interesting to observe that effectiveness dimensions are not strictly

Table 2. Differential perceptions of selected members of FPCs on different aspects of functional efficiency

S.No.	Statements	Perception of selected members of FPCs			
		SKFPCL (n=40)	MMPCL (n=40)	SSFPCL (n=40)	AAPCL (n=40)
A.	Functional efficiency [#]	Mean± Standard deviation			
1	Members Interaction	4.42±0.28	4.29±0.26	4.86±0.22	4.98±0.09
2	Cooperation among members	4.62±0.17	4.47±0.18	4.79±0.33	4.98±0.11
3	Interpersonal trust	1.75±0.20	3.59±0.62	1.97±0.42	1.84±0.23
4	Decision making	4.49±0.51	4±0	4.93±0.12	5.0±0.04
5	Cohesiveness among members	3.39±0.46	4.8±0	4.05±0.18	3.83±0.12
6	Goal achievement	4.65±0.20	5±0	4.94±0.09	5±0.03
7	Leadership	4.76±0.18	4.80±0.03	5±0	4.02±0.16
8	Manageable size	3.36±0.30	4.4±0.00	3.66±0.25	3.73±0.17
9	Administration systems	1.80±0.50	5±0	2.84±0.30	3.57±0.19
10	Rules regulation and procedures	2.99±0.41	3.80±0.31	2.88±0.21	3.81±0.06
Overall functional efficiency [#]		3.62±0.32	4.41±0.14	3.99±0.21	4.07±0.12
B.	Increase in income (%)	11.41±2.28	13.90±3.95	19.5±1.79	44.75±7.79
C.	Increase in farmers' share in consumer prices (%)	8±0	10±0	15±0	20±0
D.	Farmers' satisfaction [#]	3.96±0.30	3.82±0.19	4.72±0.20	4.94±0.07
E.	Empowerment [#]	3.87±0.89	4.39±0.25	4.57±0.70	4.83±0.15

Note: [#] measured in 1-5 scale 1 = very low and 5= very high

**Figure 1.** Differential effectiveness of selected four FPCs

associated with the length of operation. AAPCL, which has been operating for more than 10 years, demonstrated higher effectiveness in various dimensions, suggesting that longer operational experience contributes to enhanced performance (Simpson, 2010). However, MMPCL, which has been functioning for only 1-3 years, outperformed SSFPCL and SKFPCL in multiple dimensions, indicating that functional effectiveness can be achieved in a shorter timeframe as well (Harvey et al., 2000). Thus, the overall

effectiveness of FPC is influenced by the type(s) of commodity dealt by it, extent of diversified activities and its growth stage.

The findings suggest that the functional effectiveness of FPCs is not solely determined by their operational period, but rather by the quality of internal processes and organizational structures. FPCs need to focus on strengthening collaboration, trust, decision-making, cohesiveness, and leadership effectiveness to improve their functional efficiency and overall performance (Mukherjee et

al., 2019b). Additionally, the findings highlight the importance of well-defined rules, regulations and procedures for all FPCs, except MMPCL, to enhance functional efficiency.

The overall effectiveness of FPOs at their initial stage (SKFPCL and MMFPCL) of functioning was found to be 50.44 per cent and 56.20 per cent, respectively; while the FPOs being functional for more than five years (SSFPCL) and more than 10

years (AAPCL) showed effectiveness at 60.03 per cent and 68.40 per cent, respectively (Figure 1). The findings suggest that FPOs operating over an extended period demonstrate enhanced market penetration owing to their involvement in secondary agriculture (Manjula, 2021). Consequently these FPOs have facilitated increased income for farmers, greater share for farmers in the consumers' rupee, heightened levels of farmer satisfaction and

Table 3. ANOVA and Post hoc tests showing differences between FPCs with respect to their perceived effectiveness by selected member farmers

		Sum of squares	df	Mean square	F	Sig.
Functional efficiency	Between Groups	5092.297	3	1697.432	391.530	.000
	Within Groups	684.990	156	4.335		
	Total	5777.286	159			
Increase in income	Between Groups	28724.203	3	9574.734	446.562	.000
	Within Groups	3387.680	156	21.441		
	Total	32111.883	159			
Farmer's satisfaction	Between Groups	12525.613	3	4175.204	249.258	.000
	Within Groups	2646.583	156	16.751		
	Total	15172.195	159			
Empowerment	Between Groups	4947.791	3	1649.264	24.048	.000
	Within Groups	10836.157	156	68.583		
	Total	15783.948	159			
Overall effectiveness	Between Groups	6852.708	3	2284.236	341.525	0.000
	Within Groups	1056.756	156	6.688		
	Total	7909.464	159			

Scheffe post-hoc tests

Variable	Comparison between FPCs		Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
	I	J				Lower bound	Upper bound
Functional efficiency	SKFPCL	SSFPCL	-7.351*	0.466	0.000	-8.667	-6.035
		AAPCL	-9.045*	0.466	0.000	-10.361	-7.729
		MMFPCL	-15.868*	0.466	0.000	-17.185	-14.553
	SSFPCL	AAPCL	-1.693*	0.460	0.005	-2.993	-0.394
		MMFPCL	-8.518*	0.460	0.000	-9.817	-7.218
		MMFPCL	-6.824*	0.460	0.000	-8.123	-5.524
Increase in income	SKFPCL	SSFPCL	-8.102*	1.036	0.000	-11.029	-5.175
		AAPCL	-33.468*	1.036	0.000	-36.395	-30.541
		MMFPCL	-2.492	1.036	0.127	-5.419	0.435
	SSFPCL	AAPCL	-25.366*	1.023	0.000	-28.256	-22.476
		MMFPCL	5.610*	1.023	0.000	2.720	8.500
		MMFPCL	30.976*	1.023	0.000	28.086	33.866
Farmer's satisfaction	SKFPCL	SSFPCL	-15.157*	0.915	0.000	-17.744	-12.570
		AAPCL	-19.505*	0.915	0.000	-22.092	-16.918
		MMFPCL	-.0347	0.915	1.000	-2.622	2.552
	SSFPCL	AAPCL	-4.348*	0.904	0.000	-6.903	-1.794
		MMFPCL	15.122*	0.904	0.000	12.568	17.677
		MMFPCL	19.470*	0.904	0.000	16.916	22.025
Empowerment	SKFPCL	SSFPCL	-9.668*	1.852	0.000	-14.903	-4.433
		AAPCL	-15.451*	1.852	0.000	-20.686	-10.217
		MMFPCL	-6.770*	1.852	0.005	-12.004	-1.535
	SSFPCL	AAPCL	-5.783*	1.829	0.021	-10.952	-0.615
		MMFPCL	2.899	1.829	0.475	-2.270	8.068
		MMFPCL	8.682*	1.829	0.000	3.514	13.851
Overall effectiveness	SKFPCL	SSFPCL	-9.456*	0.578	0.000	-11.091	-7.821
		AAPCL	-17.894*	0.578	0.000	-19.529	-16.260
		MMFPCL	-5.433*	0.578	0.000	-7.068	-3.798
	SSFPCL	AAPCL	-8.439*	0.571	0.000	-10.053	-6.825
		MMFPCL	4.023*	0.571	0.000	2.409	5.637
		MMFPCL	12.461*	0.571	0.000	10.847	14.076

improved farmer empowerment as also reported by Mukherjee et al. (2019b). Notably, the study did not establish a significant association between functional efficiency and the duration of operation rather the functional efficiency appears to be influenced by internal governance and management practices within the FPOs.

One-way ANOVA was conducted to examine whether there were significant differences in effectiveness among the companies (Table 3) and the significant value of F statistics in ANOVA indicates that the companies differed significantly from each other in terms of four dimensions of effectiveness of the selected FPCs, except in case of increase in farmers' share in consumer prices. However, Scheffe post-hoc tests were done to reveal the FPCs significantly differ with each other under each dimension of effectiveness. The selected four FPCs significantly differed with each other with respect to their functional efficiency as well as overall effectiveness at 1% level of significance. In terms of the increase in income and farmers' satisfaction dimensions, there were no significant differences between SKFPCL and MMFPCL. However, significant differences were observed among the other pairs of FPCs, indicating variations in the effectiveness of these FPCs in terms of increasing farmers' income and their satisfaction. Regarding perceived empowerment by the member farmers of FPCs, SSFPCL and MMFPCL, did not significantly differ from each other. However, there were significant differences among the other pairs of FPCs in terms of the perceived empowerment of their member farmers. This suggests that the FPCs have ability to empower farmers and provide them with a sense of control and ownership. The findings are in line with Mukherjee et al., (2020) who found that FPO has enhanced the empowerment of hill farm women in terms of bettering the economic gain, social recognition and political participation.

The study indicates that FPOs in their initial years (1-3 years) of functioning, such as SKFPCL, which primarily focus on input supply and marketing of a single crop (cereal), were perceived as relatively less effective by their member farmers. This suggests that these FPOs might face challenges and require further development to enhance their functional effectiveness. On the other hand, FPOs in their initial years that dealt with a high-value crop, such as *makhana*, were found to be functioning more effectively. This highlights the influence of the type of crop or produce on the effectiveness of FPCs. The variation in functional effectiveness based on the crop type can be attributed to several factors. High-value crops often require specialized knowledge, better market linkages, and stronger coordination among farmers and other stakeholders (Poulton et al., 2010). FPCs dealing with high-value crops might have developed more robust systems, collaboration mechanisms, and marketing strategies, leading to enhanced effectiveness. In contrast, FPCs focused on single crops, particularly cereals, may face challenges related to market saturation, lower profit margins, and limited value addition opportunities, resulting in relatively lower effectiveness. Tailored strategies, capacity-building initiatives, and value chain development efforts can help FPCs improve their functional effectiveness and contribute to the overall development of the agricultural sector.

CONCLUSION

It is crucial for FPCs to consider the temporal factors of functioning duration, with FPCs operating for longer periods demonstrating higher effectiveness. By implementing targeted support and interventions, FPCs can overcome challenges and further enhance their effectiveness. The findings demonstrate that FPCs engaged in a wider range of produce and business activities, as seen in successful examples like AAPCL and SSFPCL, exhibited higher effectiveness, turnover, and net profit. The findings provide valuable insights for policymakers, FPC management, and stakeholders in devising strategies to enhance the overall functioning of FPCs. The study suggests the need to address challenges faced by FPCs in initial growth stages dealing with single crops and encourages the promotion of diversification and the adoption of processing, manufacturing, and marketing functions to improve effectiveness.

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