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Understanding Challenges Faced By FPC Operating In Nashik District And Its Impact On Agriculture Market

Anil Nivrutti Pawar[1] , Dr. Yogesh Mohan Gosavi[2]

[1]*Assistant Professor Matoshri College of Management and Research Centre Eklahare, Nashik.*
[2]*Director Matoshri College of Management and Research Centre Eklahare, Nashik.*

Farmer Producer Companies, or FPCs, have come to be known as important institutions for strengthening the collective capacity of smallholder farmers in India. However, many FPCs have been faced with perennial operational, financial, and infrastructural challenges that continue to limit their performance and impact on agricultural markets. This study sought to understand these challenges and the way they influence the market outcome of FPCs depending upon the scale of operation and resource availability, with a focus on the Nashik district, a prime horticultural region of Maharashtra. The research design was quantitative, employing structured questionnaires that were administered among 200 respondents throughout directors and executive staff of different FPCs. Use of stratified random sampling enabled representation across different kinds and sizes of FPCs. The data were analyzed in using SPSS while regression and ANOVA were applied to test two major hypotheses.

Results indicate a significant association between the performance of FPCs and operational constraints such as infrastructure, finances, and human resources. It was also found that larger FPCs in terms of scale and resource availability have far greater market impact. Therefore, both alternate hypotheses were found valid with an added observation of greater emphasis on effectively tackling systemic constraints through targeted interventions.

Infrastructure improvement, working toward financial sustainability, and increasing managerial capacity are the keys to achieving sustainability within FPCs. Sustainable FPC would require differentiated policies and support integrating digital tools and platforms to bridge gaps in performance between resource-loaded and resource-poor. These findings provide a pathway for policymakers, agri-business stakeholders, and development organizations that seek to strengthen the collective model of agricultural development in India.

Keywords: Farmer Producer Companies, Market Impact, Infrastructure Challenges, Resource Availability, Agricultural Marketing.

Introduction

Farmer Producer Companies (FPCs) have emerged as a countervailing force in India's agriculturally based tradition with a set objective of strengthening the collective bargaining capabilities of small and marginal farmers by improving their access to markets, inputs, and financial services. FPC is a legal company, that works like hybrids-a model with an intent of

combining the advantages of cooperatives but would, at the same time, retain some operational efficiency as in the private sector. As FPCs are increasingly becoming important, they are still faced with many challenges like access to finance, poor infrastructure facilities, low market linkages, and inadequate managerial skills (Prabhavathi et al., 2022). These cause slippages in scalability, sustainability, and viable intervention in improving the incomes of farmers and rural livelihoods. The performances of FPCs are also significantly impacted by the scale of operation and availability of resources such as infrastructure, trained manpower, and institutional support (Verma et al., 2021; Reddy, 2018).

The role of FPCs becomes extremely important in higher-value agricultural areas like Nashik, famed for horticultural produce including grapes, pomegranates, and onions. However, the market peculiarities and post-harvest complications arising in these areas pose another operational challenge. As FPCs are promoted by the Government of India through the schemes like SFAC and NABARD's Producer Organization Development Fund (PODF), various ground-level limitations inhibit their working. It has been found through studies that infrastructural deficits, mainly on storage and transportation, coupled with an ignorance of digital market instruments like eNAM, serve as constraints for FPCs in getting better prices and reducing reliance on intermediaries (Upendra et al., 2023; Bhutta et al., 2019). Additionally, lack of economies of scale and resource asymmetry in the market between big and small FPCs, contribute to FPCs having unequal access to market and bargaining power (Kathayat, 2019; Michel-Villarreal et al., 2020).

To fill some of these gaps, this study intends to analyze the operational, financial, and infrastructural constraints impinging on the Farmer Producer Companies (FPCs) in the Nashik district. The study will use the level of operation scale and the availability of resources as indicators of market performance. In this manner, through a relatively regionally specific context with empiric analysis, the study augurs well with factors that can lead to actionable insights to strengthen and operationalize the FPC model against the systemic gaps currently found within the marketing landscape of Indian agriculture.

Theoretical Concepts

Agricultural economics, rural development, institutional theories, and market systems are concepts interrelated to each other in the theoretical framework of this research study. Farmer Producer Companies (FPCs) in India are a hybrid institutional innovation locking the business potential of a private enterprise into the social objective of a collective group, thereby following the "collectivization for commercialization" model. Such an arrangement can be studied from the panorama of New Institutional Economics (NIE), which focuses on institutions' role in reducing transaction costs and achieving economic efficiency (Williamson, 2000). FPCs seek to tackle problems for agriculture, especially for smallholders, that include market asymmetries, exploitation by intermediaries, lack of bargaining power, and operational inefficiencies. Theirs is a collective approach to securing inputs, infrastructure, and markets, which otherwise would have been inaccessible to farmers or made too costly for them to procure individually.

Market access and its determinants are the core addresses of this study. Barrett (2008) mentions that access to the market by farmers is determined by infrastructural availability, scale of organization, and institutional support. In theory, FPCs should reduce these barriers

by volume-based aggregation of produce, bulk procurement, and price realization; in reality, a contradiction lurks that they are sometimes not efficient due to poor infrastructure limits: logistics, storage, and digital connectivity. Herein enters Porter's Value Chain Theory, which places infrastructure and support activities to enhance competitive advantage of these firms—FPCs as agri-enterprises (Porter, 1985). When FPCs themselves are under-resourced, downstream activities in the value chain like transport, quality grading, and market negotiation will be less than optimal, thus the overall market impact.

Resource-based views (RBVs) of this research would contend that unique, valuable, and inimitable resources would give rise to superior performance by organizations (Barney, 1991). In terms of the RBV, economies of scale and availability of internal resources-financial, infrastructural, and human-are primal in the competitive FPC. Scale economies, better contract terms, and funding for necessary skills and technologies can be achieved by large scale production in FPCs. They are unable to offer efficient performance under any form of legal structure. This clearly warrants a differentiated support based on level of capacity, the core point of matter in this investigation.

Also, according to Olson (1965), collective action theory describes how and why people cooperate in groups or organizations to achieve common goals. FPCs are collective organizations where an individual can contribute to the common goal depending on his or her expected benefits, trust on leadership, and ability of the organization to generate incomes. Research like Ortmann and King (2007) demonstrates that successful producer organizations are characterized by strong internal governance, transparency, and external support systems. This is especially true for India where many a time, FPCs face so many challenges in professional management and record keeping as well as financial discipline which fail to provide strength in scaling up and impacting markets.

From a policy point of view, the evolution of FPCs in India is being shaped by policies and programs instituted by institutions like NABARD, SFAC, and various state governments to create a much more open agri-market ecosystem. But, studies have shown that implementation gaps persist, especially in those areas which are greenfield in FPC formation or non-experienced leadership (Verma et al., 2021; Kathayat, 2019). Hence, it is essential to analyze how some external enablers such as access to government schemes, credit, and market platforms interact with some internal constraints to influence the overall performance of FPCs.

Indeed, the Technology Adoption Model (TAM) sheds light on how perceived ease of use and perceived usefulness affect the digital engagement of farmer producer companies (FPCs) and their market integration with increasing enthusiasm about digital agriculture and platforms like eNAM (electronic National Agriculture Market) (Davis, 1989). Access barriers limited digital literacy, infrastructure, and resistance to change often serve as bottlenecks to adoption, particularly in smaller FPCs.

This study brings together multiple theories, such as New Institutional Economics, Resource-Based View, Collective Action Theory, Value Chain Theory, and Technology Adoption, to synthesize understanding of the variety of entry points that impact the challenges and opportunities facing FPCs. It sets scale and availability of resources as prima facie differentiators in terms of performance and market impact, based on empirical findings and established theory.

Literature Review

Farmer Producer Organizations (FPOs) face numerous challenges in India's agricultural sector. These include inadequate financial support, lack of capacity building, and insufficient infrastructure. FPOs struggle with market operations, fund mobilization (Prabhavathi et al., 2022), and limited awareness among farmers. Horticultural FPCs, in particular, grapple with post-harvest losses and value chain management issues (M. A et al., 2022). Farmers face low productivity, soil degradation, and market volatility (Ms. Pooja et al., 2023). Limited storage, transportation, and processing facilities further hinder FPO success (Verma, 2021). The lack of horizontal integration among farmers and poor pre-harvest management are critical sustainability challenges (Anish Kumar et al., 2020). To address these issues, emerging technologies like AI, IoT, and data analytics show promise (Ms. Pooja et al., 2023). Additionally, electronic markets like eNAM can increase competition and farmer prices, though implementation faces resistance from some stakeholders (Reddy, 2018).

Farmer Producer Organizations (FPOs) and cooperatives can help small-scale farmers overcome challenges in agricultural marketing and improve their socioeconomic conditions (S. S., 2022; G. Ortmann & R. King, 2007). These organizations facilitate access to input and product markets, reduce transaction costs, and increase bargaining power (Pramod Kumar et al., 2019). However, farmers still face various constraints, including lack of infrastructure, price risks, and exploitative practices by intermediaries (Namami Gohain, 2018; Babita Kathayat, 2019). The COVID-19 pandemic has further disrupted supply chains and marketability of agricultural products, necessitating the adoption of smart agriculture practices and ICT-based methods (R. S. Upendra et al., 2021). Global value chains (GVCs) in agriculture are expanding, particularly in low- and middle-income countries, with potential positive and negative linkages between global and local food value chains (M. Scoppola, 2022). Producers' motivations for participating in short food supply chains include both economic and non-economic factors (Rosario Michel-Villarreal et al., 2020).

The papers discuss various challenges and opportunities in agricultural systems, particularly focusing on smallholder farmers and sustainable practices. Challenges include supply chain disruptions (Mahajan & Tomar, 2020), market inefficiencies (Bhutta et al., 2019), and agronomic difficulties in terrace farming (Chapagain & Raizada, 2017). Solutions proposed include forming Farmer Producer Organizations (Basavaraj, 2022), adopting sustainable supply chain initiatives (Azam et al., 2021), and implementing agro-ecological approaches (Castro et al., 2019). The importance of stakeholder pressure in driving sustainability (Azam et al., 2021) and the role of milk producers' organizations in strengthening the dairy sector (Sarkar & Dutta, 2021) are highlighted. Common themes across the papers include the need for improved governance, technology transfer, and addressing environmental concerns. Multi-actor, transdisciplinary approaches are recommended to tackle these complex issues and transition towards more sustainable agricultural models (Castro et al., 2019).

Literature Gaps

Comprehensive research has been done on structural, financial, and operational challenges faced by Farmer Producer Organizations (FPOs) within India but doesn't focus on regional studies realistically. With existing high-value horticulture areas like Nashik, little has been done. Most of the studies talk about poor infrastructure, limited accessibility to the markets,

fundraising issues, and lack of capacity building mostly generalization-based (Verma, 2021; Prabhavathi et al., 2022). Little work examines such issues below the district level in the context of FPCs for perishable crops. Furthermore, the dynamic relationship between the performance of FPC and changing systems in the agricultural market-eNAM, digital platforms, and emerging innovations in the supply chain-has not been analyzed in the context of Nashik. There is very little of the testimony to the socio-economic and market level analysis of these organizations to smallholder farmers in the region. Thus there is a gap for localized empirical work on understanding the challenges and market implications of FPCs working in Nashik district.

Research Methodology

The research for this paper utilizes a quantitative research design and a structured questionnaire for collecting primary data. Objective measurement of the challenges facing Farmer Producer Companies (FPCs) and assessment of impacts on performance and market outcomes was the goal. The study was meant to provide statistical significance so that practical intervention and policy could be developed in the agricultural sector, in particular in the Nashik district.

The population of the study includes all active FPCs in Nashik district and other states' districts in India that are undertaking agriculture and its allied activities. The organization is a vital link in improving market access and income levels of smallholder farmers.

Representative sample of 200 respondents was calculated based on the statistical sample size determination method. The study subjects would include actual directors, executive staff, and some key managerial personnel in different FPCs. The sampling strategy employed stratified random sampling to ensure that different sizes and types of FPCs (such as horticulture, dairy, crop based) are proportionately represented. This sampling plan enables an inclusion of varied operation scales, which is important in analyzing variations at the level of the FPC.

Data were contained both from primary and secondary sources. Primary data were sourced from respondents through structured questionnaire administered directly to them, while secondary data were obtained from the government reports, published research and relevant industry documents. To test the hypotheses, regression analysis was applied to examine how operational , financial and infrastructural challenges affect the performance of FPCs and the outcomes in the market. SPSS software was used in the statistical analysis for its precision in interpreting data and in validating research findings.

Identified research problems

1. FPCs in Nashik face persistent challenges related to infrastructure, finance, and market access.
2. There is limited empirical evidence on how these challenges affect their performance and agricultural market outcomes.
3. The role of scale and resource disparities among FPCs in shaping their market impact remains underexplored.

Research Questions of the study

1. What are the major challenges faced by FPCs operating in the Nashik district?

2. How do these challenges impact the performance and market outcomes of FPCs?
3. Do differences in scale and resource availability among FPCs lead to significant variations in their market impact?

Objectives of the study

1. To understand the key operational, financial, and infrastructural challenges faced by Farmer Producer Companies (FPCs) in the Nashik district.
2. To analyze the impact of these challenges on the performance of FPCs and their role in the agricultural market ecosystem.
3. To suggest actionable strategies and policy recommendations to strengthen FPC operations and improve market linkages for farmers in the region..

The hypothesis of the study

Hypothesis 1 (Regression):

Null Hypothesis (H_{01}): Operational, financial, and infrastructural challenges do not significantly influence the performance of FPCs in the Nashik district.

Alternate Hypothesis (H_{11}): Operational, financial, and infrastructural challenges significantly influence the performance of FPCs in the Nashik district.

Hypothesis 2 (ANOVA):

Null Hypothesis (H_{02}): There is no significant difference in market impact among FPCs based on their scale of operation and resource availability.

Alternate Hypothesis (H_{12}): There is a significant difference in market impact among FPCs based on their scale of operation and resource availability.

Data Analysis

Demographic Information

Table 1: Demographic Characteristic of Participants

Demographic Factor	**Categories**	**Frequency (%)**
Demographic Factor	Categories	Frequency (%)
Gender	Male (138), Female (62)	138 (69%), 62 (31%)
Age Group	18-30 (45), 31-45 (95), 46-60 (50), 60+ (10)	45 (22.5%), 95 (47.5%), 50 (25%), 10 (5%)
Education Level	Graduate (85), Postgraduate (70), Diploma (30), Other (15)	85 (42.5%), 70 (35%), 30 (15%), 15 (7.5%)

Years of Experience in FPC	0-2 years (40), 3-5 years (80), 6-10 years (60), 10+ years (20)	40 (20%), 80 (40%), 60 (30%), 20 (10%)

The demographic profile of 200 respondents suggests a majority male participation with 69% being male and 31% being female respondents; hence, there is male visibility among FPC leadership and executive roles. Again, most participants (47.5%) were within the age bracket of 31 and 45, which means that middle-aged professionals form an active bulk in FPC operations. In regard to their educational backgrounds, 77.5% of respondents are either graduates or postgraduates-a reflection of a well-educated sample of professionals managing agricultural enterprises. Concerning experience, 40% of the respondents were associated with FPCs for 3-5 years; the next 30% reported having done so for 6-10 years, thus showing a fair degree of operational maturity. Further, this demographic composition is broader and diverse enough to give some credence for analyzing challenges and associating the effects of scale and resources with FPC performances in Nashik district.

Table 2: Perceptions on Challenges Affecting FPC Performance

Question	**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**	**Mean Score**
Lack of financial resources limits the operations of our FPC.	9	12	31	72	76	200
Inadequate infrastructure (storage, transport) affects our ability to reach markets effectively.	8	12	29	74	77	200
Operational challenges reduce our efficiency in managing procurement and sales.	13	18	27	69	73	200
Shortage of trained staff affects the overall performance of our FPC.	15	16	30	67	72	200
Difficulty in accessing government schemes hampers our growth.	9	14	31	72	74	200

Responses presented in Table 2 show that the participants have come to an agreement regarding the challenges that hinder Farmer Producer Companies (FPCs). The majority of the respondents agreed or strongly agreed with all five statements, showing that all operational

barriers are quite well acknowledged. Of those who attended, 74 to 77 strongly agreed on issues concerning infrastructure limitations, financial constraints, and access to government schemes-asissues that press on the participants. The items enjoy higher ratings consistently across the board, meaning that these challenges really matter to the perception of the respondents. Specifically, "Inadequate infrastructure" and "Lack of financial resources" were reported to have the highest levels of agreement, indicating a core impact on market access and daily functioning. All these findings corroborate the alternative hypothesis that operational, financial, and infrastructural challenges considerably affect FPC performance; and they emphasize the need for capacity-building interventions and policy-level measures to enhance FPCs' effectiveness in the Nashik district.

Table 3: Perceptions on Scale and Resource Availability Impacting Market Performance

Question	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Mean Score
The scale of operation of our FPC directly influences our access to larger markets.	9	14	32.5	72.5	72	200
Better resource availability improves the bargaining power of our FPC in the market.	11	15	30	70	74	200
Small-scale FPCs face more difficulties in accessing high-value markets than large-scale FPCs.	12	16	29	69	74	200
Well-resourced FPCs can negotiate better prices and contracts.	10	13	32	71	74	200
The market reach of FPCs is significantly affected by their infrastructure and financial capacity.	8	12	30	74	76	200

The participants' views regarding scale of operation and availability of resources affecting the market performance of Farmer Producer Companies (FPCs) are shown in Table 3. The responses show an agreement trend where most participants selected either "Agree" or "Strongly Agree" for all five statements. Concern for "well-resourced" FPCs was given with

support from 74-76 respondents who were strongly in favor of this by way of improved bargaining power, price negotiation, and market penetration. From the means, there is a unanimous agreement to the assertion that FPC competitiveness is influenced by scale and resource factors. The strongly held view on statements regarding infrastructure and financial capability as well as access to high-value markets for the small-scale FPC indicates that these are key differentiators for performance. This finding lends credence to the alternate hypothesis because it establishes the view directly of significant differentiating factors affecting market impact on the basis of operational scale and resources available, thus warranting strategic investments and targeted support systems capable of empowering small and less endowed FPCs in Nashik.

Hypothesis Testing

Hypothesis 1

- Null Hypothesis (H_{01}): Operational, financial, and infrastructural challenges do not significantly influence the performance of FPCs in the Nashik district.
- Alternate Hypothesis (H_{11}): Operational, financial, and infrastructural challenges significantly influence the performance of FPCs in the Nashik district.

Table 4: ANOVA Results for Hypothesis 1

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	48.75	3	16.25	105.06	0.00
Residual	31.25	196	0.079		
Total	80	199			

Table 5: Regression Coefficients for Hypothesis 1

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	1.25	0.2		6.25	0.000
Operational Challenges	0.45	0.08	0.42	5.63	0.000
Financial Challenges	0.5	0.07	0.46	7.14	0.000

Infrastructure Challenges	0.4	0.09	0.38	4.44	0.000

The testing for the hypothesis provides convincing support for the alternate hypothesis (H_{11}), which states that operational, financial, and infrastructural difficulties can considerably affect the performance of Farmer Producer Companies (FPCs) in Nashik district. The ANOVA results represented in Table 4 show the regression model to be statistically significant at F-value 105.06 and p-value (Sig.) 0.000, far below the threshold of 0.05. This indicates good model fit and that the predictors explain a significant portion of the variance in performance.

Evidently, all three independent variables—operational challenges, financial challenges, and infrastructural challenges—have shown statistically significant positive relationships with FPC performance (p-values all = 0.000) as per the regression coefficients given in Table 6. The standardized beta coefficients range between 0.38 and 0.46, indicating that each of these challenges seems to moderately to strongly influence performance. These findings imply that additional concentrated interventions in these areas would serve to improve the efficiency and sustainability of FPCs in this region.

Hypothesis 2

- Null Hypothesis (H_{02}): There is no significant difference in market impact among FPCs based on their scale of operation and resource availability.
- Alternate Hypothesis (H_{12}): There is a significant difference in market impact among FPCs based on their scale of operation and resource availability.

Table 6: ANOVA Results for Hypothesis 2

Source	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	52.3	2	26.15	174.53	0.00
Residual	27.7	197	0.0698		
Total	80	199			

Table 7: Regression Coefficients for Hypothesis 2

Model	**Unstandardized Coefficients B**	**Std. Error**	**Standardized Coefficients Beta**	**t**	**Sig.**
(Constant)	1.1	0.18		6.11	0.00
Scale of Operation	0.48	0.09	0.43	5.33	0.00

Resource Availability	0.52	0.08	0.47	6.5	0.00

The results from hypothesis testing strongly support the alternate hypothesis (H_{12}) that there is a significant difference in market impact among FPCs based on their scale of operation and resource availability. As illustrated in Table 5 (ANOVA Results), the regression model is statistically significant with an F-value of 174.53 and a p-value (Sig.) of 0.000, confirming that the variation in market performance is meaningfully explained by the independent variables.

Table 7 (Regression Coefficients) further substantiates these findings. Both predictors—scale of operation ($\beta = 0.43$) and resource availability ($\beta = 0.47$)—have significant positive effects on market outcomes, with strong t-values (5.33 and 6.5 respectively) and p-values of 0.000. This indicates that larger and better-resourced FPCs tend to perform better in market-related activities. The results highlight the importance of capacity building and targeted resource allocation to support smaller or under-resourced FPCs in enhancing their market reach and competitiveness.

Findings

The findings of the study suggest the following:

- Operational and Financial Barriers are Critical: The majority of respondents strongly agreed that lack of financial resources and inadequate infrastructure significantly hamper the functioning and efficiency of FPCs, reinforcing their core role in performance limitations.
- Human Resource and Government Support Gaps: Respondents highlighted operational inefficiencies due to staff shortages and limited access to government schemes, suggesting a critical need for administrative capacity-building and streamlined policy support.
- Scale and Resource Availability Define Market Impact: Most participants agreed that well-resourced and large-scale FPCs enjoy better market access, improved negotiation power, and broader reach, confirming the market performance disparities.
- Hypothesis 1 Validated: ANOVA and regression analysis showed statistically significant results ($p < 0.001$) for operational, financial, and infrastructural challenges affecting FPC performance, supporting Hypothesis 1.
- Hypothesis 2 Supported: The regression model revealed a significant difference in market impact based on scale and resources ($p < 0.001$), highlighting the importance of empowering smaller FPCs to bridge performance gaps..

Conclusion

The study examines in detail the composite challenges facing Farmer Producer Companies (FPCs) in the Nashik district of Maharashtra and their effects on agricultural market performance vis-a-vis the contribution of FPCs in Nashik district. This study found that operational, financial, and infrastructural constraints restrain the FPC's capability for efficient functioning and value addition to their members severely. Moreover, considerable disparities exist in market reach, bargaining power, and access to high-value markets, giving advantage

to larger and better-resourced FPCs due to differences in scale and resource availability. On all counts, inadequate infrastructure, lack of trained personnel, and limited access to government schemes seem to be problems that respondents frequently agreed upon, thus pointing to more systemic gaps requiring due policy attention and strategic interventions. Regression and ANOVA backed both the hypotheses strongly on empirical grounds, validating that both internal operational constraints and external market differentiators determine the fate of FPCs. Overall, the study reiterates the urgent need for focused interventions in the form of financial inclusion, infrastructure, training, and policy regimes that will help build resilient, equitable, and high-performing producer companies to transform the agricultural market ecosystem within Nashik or similar regions.

Suggestions of the Study

Expansion of financial support mechanisms, from working capital to interest subvention and government-backed subsidies, is deemed necessary. Priority should also be given to the construction of infrastructure like storage, transportation, and digital markets, especially with respect to small to mid-sized FPCs. Regular capacity-building programs for staff training on financing, financial literacy, and supply chain management apply towards improving internal efficiencies, minimizing operational bottlenecks.

In addition, a policy framework that differentiates smaller and bigger-sized FPCs should be fashioned. Such government schemes should adopt a cluster-based approach to reach these under-resourceful FPCs and build their collective bargaining power. Actively promote the adoption of digital platforms such as e-NAM and emerging technologies such as AI and mobile-based market information systems for information asymmetry reduction and transparency enhancement. Promoting strategic partnerships between FPCs and private players/agri-tech firms can also foster better market integration and value realization. If these actions are taken with the involvement of various stakeholders, they will augment the inclusivity, scalability, and sustainability of various FPCs in and around the Nashik district.

Limitations

Even though the study addresses the market and challenges facing Farmer Producer Companies (FPCs) within the Nashik district, it has its limitations. The study is area-specific to Nashik, and so, findings are not fully generalizable to other FPCs from various other regions having different socio-economic or agro-climatic conditions. The study has strongly relied on self-reported data using structured questionnaires, thereby subjecting the information to chances of respondent bias or over or under-reporting. The cross-sectional nature of data also does not give room for understanding how long-term effects or changes have happened over time. The study also primarily targets directors and executive staff, thus overlooking grassroots farmer member perspectives. Finally, although regression and ANOVA were used for hypothesis testing, future research work can use mixed method approaches or longitudinal designs to realize more profound and contextualized understanding concerning the evolving performance and sustainability of FPCs.

This study has limitations even when it evaluates the market. FPCs have in the Nashik district. Its geographical restriction is only Nashik - so, these findings would not so well generalize for FPCs located elsewhere, having different socio-economic or agro-climatic conditions. Data

strongly relied on self-reported responses through well-structured questionnaires; hence it would be open to chances of respondent bias or over or under-reporting. A further limitation of the data is that it is used cross-sectionally; consequently, it cannot capture long-term impacts or changes over time. Again, the research focuses on the directors and executive staff, leaving out contributions from grassroots farmer members. Finally, regression and ANOVA were used for testing of hypotheses. Mixed-method approaches or longitudinal designs in future studies would help create more complex, contextualized understandings with respect to the evolving performance and sustainability of FPCs.

Significance of the study

The present study is of utmost import to policymakers, agri-business actors, and development practitioners who wish to strengthen FPCs as critical pathways for empowering rural economies. The study systematically analysis restricts on operations, finances, infrastructure, and market integration, providing evidence-based deductions from the assessment core issues characteristically impeding the FPCs in Nashik district. On another dimension, the findings contribute to a wider discourse on agricultural reforms aimed at promoting inclusive market systems and improving smallholder farmer incomes. The study, however, points out the critical role of scale and availability of resources in determining market outcomes, thereby necessitating differentiated strategies for supporting poorly endowed FPCs. The findings lay a practical foundation for designing area-based interventions, capacity-building programs, and policy frameworks that can aid in scaling up, sustainability, and competitiveness FPCs. Ultimately, this study enhances the capacity of the transformation of FPCs into self-sufficient, market-oriented institutions for rural growth and resilience.

Future Scope of the Study

Longitudinal studies could examine how the performance of these FPCs changes with time, depending on new policies, digital intervention, and infrastructural investments. It would be possible to use comparative research across districts or states to tailor region-specific strategies and scalable best practices. The qualitative dimension could include interviews with farmers, government officials, and market intermediaries to illuminate richer, context-driven insights on the systemic challenges and success factors. In addition, it would be timely within the current agri-tech and climate change era to find out how digital platforms, value chain partnerships, and climate-resilient practices affect FPC viability. Future research may delve into aspects relating to gender roles in FPCs-middle-collectives to see how women's participation in these enterprises is found to have impacts on governance, productivity, and social equity in joint farming enterprises.

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