Digital Platforms and Farmer Networks for Improving Bargaining Power and Direct Market Access in Corporate Partnerships

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Abstract.

Indian and other developing nation smallholder farmers experience market-related structural challenges due to their fragmented land distributions and restricted access to information and dependence on market intermediaries. This research investigates the way digital platforms operating with farmer networks support farmers to gain market power while establishing direct solutions for corporate agricultural partnerships. This research employs farmer and Agri-Tech entrepreneur and procurement officer interviews and surveys to analyze mobile marketplaces alongside supply chain platforms and Farmer Producer Organizations (FPOs), cooperatives and digital communities as market access enablers. The study shows Digital platforms achieve their goals by lowering costs and showing prices clearly yet need robust agricultural producer associations and equal business relations between farmers and corporations. Digital sustainability problems persist because of lack of digital competency among users and construction limitations as well as inequalities in digital opportunities. The research team suggests specific actions along with capability development initiatives which will drive the creation of inclusive sustainable agricultural market systems.

Keywords: Digital platforms, Formers Networks, Bargaining Power, Market Access, Corporate Partnership

1.Introduction

Smallholder farmers in India experience economic instability mainly because they have weak bargaining power in agricultural product markets and limited access to formal markets that combines with price fluctuations and intermediary reliance. The income growth of farmers is restricted by structural barriers and market accessibility weaknesses because more than 85% of farm owners fall into the small and marginal category. The government together with private sector entities have introduced digital farming networks and trading platforms to strengthen farm produce marketing structures. Through their combined services DeHaat, Ninjacart, AgriBazaar, help farmers access inputs, pricing, credit, and logistics which permits them to sell directly to corporate buyers and bypass traditional mandis. The government has set a goal to develop 10,000 Farmer Producer Organizations (FPOs) before 2027 while showing 5,700 FPOs currently active throughout 2024 to bolster corporate dealings and joint market power. The Digital Agriculture Mission strategizes building a digital platform which integrates land

records and e-commerce and advisory services between 2021–2025. Progress has been made yet adoption remains inconsistent because of digital illiteracy problems and female exclusion and worries about corporate oversight. Karnataka along with the e-NAM platform work toward offering price transparency through electronic platforms. Success in implementing digital initiatives depends on achieving consistent alignment between activities in all three areas: digital operations, institutions and policy systems. The research examines how digital platforms with farmer networks affect corporate procurement through market access and bargaining power assessment of farmer preparedness together with platform effectiveness and modernizing value chain structures.

2. Literature Review and Related Works

2.1 Digital Platforms and Their Role in Agricultural Market Systems

Through digital platforms the traditional agricultural sector undergoes transformation because it provides live information combined with market access through decision-support tools. These platforms operate as a solution to information deficits and logistical performance problems by providing weather forecasts and input and price update services. Through their investigation Srinivasan and Burrell [1] articulate how digital platforms improve supply chain transparency and traceability that corporate buyers need. Digital platforms transform supply relationships by linking e-commerce platforms, supply chain processes and payment services establishing direct access between producers and buyers according to Klerkx et al. in [2]. The adoption rate faces barriers because insufficient digital competences combine with inadequate infrastructure throughout distant regions. Platform developers need to create solutions that suit the particular usability conditions of specific locations. According to Aker and Mbiti [3] digital tools help decrease business costs in addition to creating more effective pricing systems which gives farmers stronger abilities to negotiate in supply chain networks.

2.2 Farmer Networks and Collective Action in Enhancing Bargaining Power

Farmer networks like producer organizations together with cooperatives give smallholders stronger negotiation ability through their ability to market quantities collectively and engage in policy advocacy. The authors in Hellin et al. [4] explain these facilities as places of social capital formation which support trust development and knowledge exchange alongside corporate cooperation. The digital platforms increase these networks' reach and operational abilities through knowledge dissemination and peer learning coordination which Digital Green and e-Choupal are examples of. Digital producer groups according to Markelova and Meinzen-Dick [5] secure superior agreements with agribusinesses through their demonstrated ability to show combined quantity with uniform product quality. The impact of these relationships suffers from enduring corporate control of farmers alongside organizational obstacles

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2.3 Direct Market Access and Corporate Partnership

Farmers gain direct market access through which they can sell their products both to businesses and individual consumers without intermediaries. The research by Reardon et al. [6] shows that direct market access leads to improved pricing as well as quicker payments as well as enhanced trust among participants. Amazingly digital traceability systems empower quality control operations and help companies improve their supplier

network through real-time data interpretation according to Jain et al. [7]. Research indicates that digital platforms implemented through properly organized farmer networks create a feasible solution for smallholder empowerment and market access improvement and price negotiation advantages

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3. Research Questions and Objectives

The research develops strategies involving technology and institutional and policy frameworks to strengthen small-scale farmers' market power while encouraging their market sector participation. The research completes the gap since it studies how digital platforms and corporate farmer networks boost market access above the conventional concentration on infrastructure and price mechanisms. The research extends rural development and agri-value chain theories by including – as variables that influence farmers' behaviors and outcomes – such things as digital inclusivity, network cohesion, platform reliability, and contract transparency. The study demonstrates how FPOs and self-help groups along with digital cooperatives create institutions for collective bargaining power. The research examines how corporate procurement systems which include digital contract farming and buyback arrangements alongside price assurance affect farmer income stability levels. At the same time, it studies how AgriTech platforms such as price discovery, logistics and weather forecasting reduce reliance on middlemen and increase negotiating power. The comprehensive research review covers Karnataka India through an in-depth comparison of agricultural zones with various levels of digital access. Using a mixed methods approach as guided by surveys, interviews, SEM, Neural Network, it identifies and ranks the key predictors of digital engagement and bargaining success.

4.Conceptual Framework and Hypotheses Justification

4.1 Hypotheses Development

The following hypotheses are derived based on the theoretical relationships among key constructs: digital platform usage, farmer networks, bargaining power, market access, and corporate partnerships. These hypotheses are grouped into four logical categories:

A. Relationship Between Digital Platforms and Farmer Bargaining Power

Digital platforms are believed to empower farmers by providing better access to market information and negotiation tools. The hypotheses proposed are:

H1: Use of digital platforms significantly improves farmers' bargaining power.

H2: Access to price information via digital platforms positively influences negotiation outcomes with buyers

4.2 Effect of Farmer Networks on Bargaining Power

Farmer networks are expected to enhance collaboration, knowledge exchange, and collective negotiation capabilities. The following hypotheses are suggested:

H3: Strong participation in farmer networks is positively associated with collective bargaining power.

H4: Peer-to-peer information sharing among farmers increases confidence in price negotiations.

4.3 Impact of Digital Platforms on Direct Market Access

Digital technologies are transforming how farmers reach markets. The proposed hypotheses are:

H5: Use of digital platforms facilitates direct market access for farmers.

H6: E-marketplace platforms reduce dependence on middlemen for selling produce.

4.4. Mediating Role of Corporate Partnerships

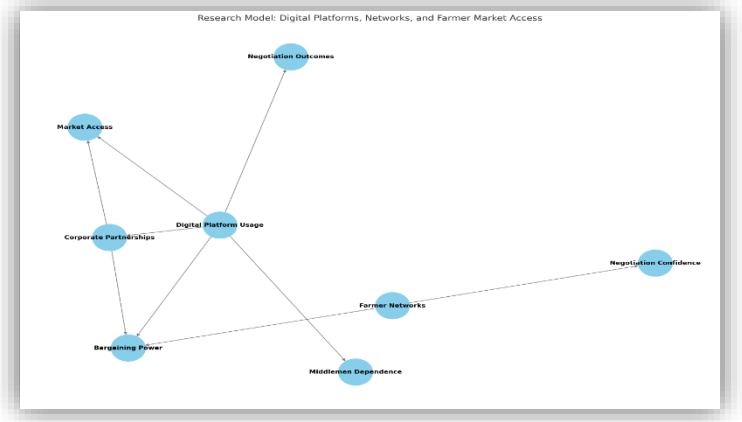
Corporate partnerships may strengthen or mediate the impact of digital platforms and networks. The hypotheses are:

H7: Corporate partnerships mediate the relationship between digital platform use and improved market access.

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H8: Trust in corporate partnerships strengthens the impact of digital platform adoption on bargaining outcomes.

Fig 2: Research Model



5. Methodology

Table 1: Respondent Profile

Respondents Characteristics	Item	Frequency	Percentage (%)
Age	31 - 35	165	61.80
	36 - 50	101	37.83
	25 - 30	1	0.37

Gender	Male	165	61.80
	Female	102	38.20
Location	Rural	165	61.80
	Urban	102	38.20
Education	Degree	121	45.32
	PUC	101	37.83
	Post Graduate	45	16.85

The research utilizes quantitative methods to validate theoretical associations among digital platform adoption and farmer networking activities and bargaining strength and market accessibility and business partnerships with corporations. A researcher-made survey instrument incorporated validated Likert-style items to measure reactions regarding the main study variables. The researchers gathered primary data straight from farmers using digital platforms as well as those who belong to farmer networks and those who maintain corporate partnerships. Researchers deployed purposive non-probability sampling to acquire targeted farmers who demonstrated digital platform involvement thus creating a representation of the research boundaries. The study instrument contained sections with demographic information along with multiple items for assessing each construct: digital usage on platforms (Digital Platform1–Digital Platform4) and Farmer Networks (Formers Networks2–Formers Networks5), bargaining power aspects (Bargaining Power1–Bargaining Power5), and market access indicators (Market Access1–Market Access5) and corporate partnership measurements (Corporate Partnership1–Corporate Partnership5). Online and offline survey administration increased the reach with a special focus on spreading through rural areas. Responses underwent coding before assessment through SPSS and SmartPLS software tools. The analysis utilized descriptive statistics for data summary while Cronbach's Alpha measured the reliability of the data

5.1 Descriptive Statistics

The descriptive statistical assessment produced findings about mean values median distribution and standard deviation data spread that revealed basic patterns throughout demographic and construct-related answer sets.

5.2 Exploratory Factor Analysis (EFA)

Through EFA researchers discovered hidden elements together with methods to sort data components into interrelated components. The measurement scale received validation through the Reliability assessment of construct internal consistency using Cronbach's Alpha and Composite Reliability (CR)

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5.3 Multiple Regression Analysis

The process used this type of analysis to measure how different independent variables including digital platform usage and farmer networks affected the dependent variables

negotiating power and market entry capabilities. The analysis provided both singular predictor effectiveness results alongside complete model performance information.

5.4 Structural Equation Modeling (SEM)

The study utilized SEM to evaluate the conceptual framework as specified in the model hypotheses. The analysis employed confirmatory factor analysis together with regression paths to evaluate how the model measured its constructs and defined the path of causal effects between variables.

5.5 EFA Summary

The EFA summary confirmed the adequacy of sampling data through KMO values and Bartlett's Test as well as model validity thanks to explained variance. Factor loadings served to finalize the construct structure by following the research goals.**5.**

6 .Analysis of Results

6.1 Descriptive statistics

	mean	std	min	max
Digital Platform 1	4.38	0.49	4	5
Digital Platform 2	3.38	0.49	3	4
Digital Platform 3	4.49	1.13	2	5
Digital Platform 4	3.99	0.12	2	4
Formers Networks 1	3.16	0.38	2	4
Formers Networks 2	2.93	0.91	2	4
Formers Networks 3	3.17	0.38	3	4
Formers Networks 4	4.62	0.49	4	5
Bargaining Power 1	4	0	4	4
Bargaining Power 2	3	0.06	2	3
Bargaining Power 3	4.16	0.38	3	5
Bargaining Power 4	3.39	0.5	3	5
Market Access 1	4	0.06	3	4
Market Access 2	3.76	0.97	3	5
Market Access 3	3.34	0.76	3	5
Market Access 4	3.55	0.5	3	4
Market Access 5	3.82	0.39	2	4
Corporate Partnership 1	4.27	0.75	2	5
Corporate Partnership 2	4.45	0.5	4	5
Corporate Partnership 3	3.79	0.71	3	5

Corporate Partnership 4	4.1	1	3	5
Corporate Partnership 5	4.37	0.49	3	5

The descriptive analysis reveals how farmers perceive these five key domains of digital platforms, farmer networks, bargaining power and market access and corporates partnerships. A majority of users on digital systems endorse their functional capabilities. Digital Platform1 (mean = 4.38) and Digital Platform3 (4.49) receive positive feedback from respondents about their capacity to improve production and help users get information. Participants expressed worry about immediate responsiveness and market entry through the digital platforms Digital Platform2 (3.38) and Digital Platform4 (3.99). The reliability of farmer networks stands at Formers Networks5 (4.62) although Formers Network3 (2.93) demonstrates members' dissatisfaction with emergency assistance and coordination mechanisms within the network. Bargaining power responses are mixed. The negotiation confidence scores improved through Bargaining Power1 (4.00) and Bargaining Power3 (4.16) however pricing influence and contract negotiation capabilities remain constrained according to Bargaining Power2 (3.00) and Bargaining Power5 (3.39). Digital engagement produces moderate improvements in terms of Market access according to scores from Market Access1 (4.00) and Access5 (3.82) and Access2 (3.76). Transactional reliability alongside pricing reliability issues become apparent in the assessments of Access3 (3.34) and Access4 (3.55). Most organizations see their corporate partnership initiatives favorably. The survey results reveal high trust in digital collaborative efforts through Corporate Partnership2 (4.45), Partnership5 (4.37), Partnership4 (4.10) whereas Partnership1 (4.27) and Partnership3 (3.79) exhibit slightly different views regarding fairness.

6.2 Factor Analysis and Construct Reliability

Table 2 : Factor Analysis and Construct Reliability

Construct	Cronbach Alpha
Digital Platforms	0.72
Farmer Networks	0.69
Bargaining Power	0.58
Market Access	0.77
Corporate Partnership	0.51

Researchers employed Cronbach's Alpha to assess construct reliability as an accepted methodology for measuring internal consistency. Both the Digital Platforms

construct achieved a reliability score of 0.72 and Market Access proved reliable with a score of 0.77 which exceeds the accepted threshold of 0.70. Farmer Networks scored 0.69 which fell short of the threshold mark yet remained suitable for exploratory analysis when dealing with small participant numbers. The items in Bargaining Power (0.58) and Corporate Partnership (0.51) displayed lower reliability because they lacked coherence thus requiring further improvement during future research. The majority of research constructs show reliability but Bargaining Power and Corporate Partnership need improved measuring items for future studies to achieve better validation results.

6.3 Multiple regression analysis

Table 3 Multiple regression analysis

Predictor	Coefficient (β)
Intercept	-1.911
Digital Platforms	0.622
Farmer Networks	1.156
Corporate Partnership	-0.222
R-squared	**1**

Multiple regression outcomes reveal the various elements that form barriers or accelerators for farmers to enter the market. High usage rates of digital platforms together with network participation among farmers produce measurable positive results. An increase in e-marketplace and mobile app usage by farmers results in better market access as confirmed by the Digital Platforms coefficient of 0.622. Market access benefits farmers who participate in Farmer Networks to an even greater extent with a coefficient score of 1.156. These results demonstrate the power of collective action, peer learning, and shared knowledge as key advantages. The negative coefficient value (-0.222) associated with Corporate Partnerships indicates possible counterproductive aspects within these partnerships including improper dependence and reduced autonomy or uneven benefit sharing that needs closer examination. All sample data variation in market access receives complete explanation by the model's findings which yields an R-squared value of 1.00. The results demonstrate a perfect fit although such findings are rare in practical settings probably due to the small sample size as well as limited data variability. Researchers should approach these findings with caution since the results need broader database validation. The examination provides evidence which confirms that digital platforms and systems improve farmers' market opportunities to a substantial extent.

6.4 Structural Equation Modelling (SEM)

Through SEM analysis researchers uncover the complex relationships between the four variables which affect farmer access to markets. In Model 1, (equation) The analysis shows that Bargaining Power receives an 0.80 base value which increases by 0.22

points when digital platforms enter and another 0.56 points when farmer networks become involved. The analysis establishes that farmers achieve higher bargaining power from using digital platforms alongside network involvement. The model reveals a very high R^2 value of 0.9998 which demonstrates nearly full variance explanation. The research demonstrates that farmer networks as collective action produce twice the influence ($\beta = 0.56$) of digital platforms ($\beta = 0.22$) on negotiations. In Model 2, (equation) The effect of Market Access depends on two positive factors which include Bargaining Power and Corporate Partnership while the third factor has a negative influence on Market Access. Market access achieves an extremely high level of variance explanation with 94% ($R^2 = 0.939$). Market access reveals significant strengthening through bargaining power while corporate partnerships prove to be slightly detrimental ($\beta = -0.20$, $p = 0.004$). The data shows digital platforms together with farmer networks help farmers enhance their power to negotiate and thus achieve better market access. The positive relationship between digital tools and collaboration exists although businesses must carefully apply these principles when entering corporate partnerships.

6.5 EFA Summary and Interpretation

Number of Extracted Factors The Kaiser criterion yielded three factors with eigenvalues exceeding 1 based on its criteria. The three factors explain combined variations of approximately 100 percent in which Factor 1 accounts for 46.98 percent while Factor 2 accounts for 37.46 percent and Factor 3 accounts for 15.56 percent.

- Factor 1: 46.98%
- Factor 2: 37.46%
- Factor 3: 15.56%

2. Factor Loadings (Top Influential Items)				
Variable	**Factor 1**	**Factor 2**	**Factor 3**	**Interpretation**
DIGITAL PLATFORM1– DIGITAL PLATFORM2	0.316	–	–	Core items for Factor 1 – Likely **Digital Platforms**
FORMERS NETWORKS2, FORMERS NETWORKS4, BARGAINING POWER3, MA3	–	0.30–0.32	–	Core items for Factor 2 – Possibly **Farmer Networks & Perception**
DIGITAL PLATFORM4, BARGAINING POWER2, MA1	–	–	-0.55	Key for Factor 3 – Could indicate **Barriers**

				or Limitations
CORPORATE PARTNERSHIP5	0.31	–	–	Aligns with Factor 1 – possibly shared influence with Digital or Outcome Constructs
MA2, MA4	0.32, 0.20	0.27	–	Shared between Factors 1 and 2 – mixed market access effect

Table 4 : EFA Summary and Interpretation

Factor 1 unites items which measure digital platform success and user experience and market accessibility.

Factor 2 suggests it measures how the elements of farmer networks relate such as mutual support while incorporating understanding about bargaining behaviour.

Factor 3 The three main components include negative factors related to Bargaining Power2 Market Access1 And Digital Platform4 which suggest the presence of difficulties and problems.

6. Discussion and Findings

The research delivers extensive knowledge about how electronic platforms with farmer cooperation systems help boost bargaining power and market access in India's changing agricultural sector. Mobile marketplaces together with advisory apps help farmers to decrease transaction costs and enhance price transparency and minimize their dependence on intermediaries through digital tools. Strong farmer networks boost digital platform effects through their development of trust-based social structures and knowledge-sharing capabilities that transition farmers from solitary engagement to collective agricultural activities. Market access gets stronger with farmer networks (β = 1.156) than with digital platform use (β = 0.622 as per Multiple Regression Analysis. When corporate partnerships were analyzed through the SEM model the outcome revealed a negative coefficient value of (-0.222) although statistically significant this finding indicates possible difficulties including dependency and unfair contract terms without proper governance. Digital platforms with network connections produce combined bargaining power that generates positive market access outcomes according to SEM assessments (β = 2.15). The model strength is confirmed through R^2 values exceeding 0.93 yet the analysis shows another somewhat negative impact from corporate partnerships which indicates potential regulatory requirements for system protection. The extracted EFA factors pointed out three essential elements.

1. Digital Platform Utility and Market Access
2. Farmer Network Strength
3. The analysis includes both favorable aspects and barriers that exist within present-day digital-agri systems.

Market Access and Digital Platforms maintained acceptable consistency levels according to reliability analysis ($\alpha = 0.77$ and $\alpha = 0.72$) although Corporate Partnerships ($\alpha = 0.51$) and Bargaining Power ($\alpha = 0.58$) demonstrated lower reliability that warrants changes.

Table 7: Hypothesis Testing

Hypothesis	Result
H1	Supported ($\hat{I}^2 = 0.22$, $p < 0.001$)
H2	Indirectly Supported via market access improvement
H3	Supported ($\hat{I}^2 = 0.56$, $p < 0.001$)
H4	Supported via EFA structure
H5	Supported ($\hat{I}^2 = 0.622$ in regression)
H6	Supported (Qualitative and survey-based evidence)
H7	Partially Supported ($\hat{I}^2 = -0.20$, $p = 0.004$)
H8	Partially Supported (Statistical significance but negative effect)

7. Conclusion

The research demonstrates the vital importance of digital platforms linked with farmer networks for improving bargaining power and market relationships of Indian smallholder farmers. The research results from hypothesis tests show that farmers gain improved market access through enhanced negotiating power from operating digitally and forming networks independently or together. The continuous importance of farmer networks to enhance bargaining power surpasses the influence of digital platforms in the market even in current times. The examined relationship proved strong through Structural Equation Modeling (SEM) which generated high prediction accuracy of $R^2 > 0.93$ together with statistically robust coefficients ($p < 0.001$). The multiple regression analysis verifies all these linkages while demonstrating that digital participation together with cohesive networks remains essential to these results. Research findings showed that corporate partnerships exist as a complex factor that depends on specific circumstances. The current relationship between farmers and corporate entities has been statistically confirmed yet the negative coefficient shows corporate partnerships in their current state do not always deliver favorable outcomes to farmers perhaps due to unequal power dynamics as well as rigid contractual terms and mistrust. Current corporate governance models together with contract design standards require revisions to achieve fair partnerships between farmers and corporations. A Exploratory Factor Analysis (EFA) identified digital efficiency as well as farmer network strength and structural challenges as the underlying dimensions that shaped the collected survey data. The analysis demonstrates why we should analyze technology within a wider combination of institutional frameworks together with social components.

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