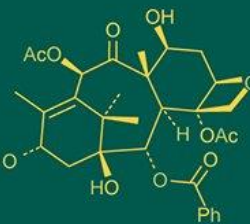
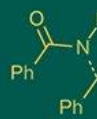
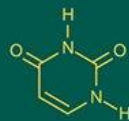


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Assessment of awareness and usage of digital platforms among farmer producer organizations (FPOS): A study of selling channels used by FPOS in Gujarat

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Abstract

Aims: This study investigated the awareness and usage patterns of digital agricultural platforms among Farmer Producer Organizations (FPOs) operating in Gujarat, India, and identified the primary barriers impeding adoption of digital selling channels.

Study Design: Cross-sectional survey-based descriptive study.

Place and Duration of Study: Eight districts of Gujarat Banaskantha, Mehsana, Anand, Kheda, Junagadh, Jamnagar, Navsari, and Bardoli between March and June 2026.

Methodology: A structured questionnaire was administered through face-to-face interviews with senior management of 37 operationally active FPOs selected via purposive and snowball sampling from 45 contacted organizations. Data were collected across seven thematic areas: institutional profile, selling channels, quality and payment practices, platform awareness and usage, adoption barriers, support needs, and future collaboration intent. Five-point Likert scales and ranking exercises captured severity and priority. Data were analysed using frequency distributions, weighted mean scores, average rank scores, and cross-tabulations in Microsoft Excel.

Results: Direct buyers (51.4%) and APMC mandis (43.2%) dominated current selling channels; only one FPO (2.7%) used digital platforms for selling. Despite this, 97.3% expressed willingness to collaborate with e-market platforms. General awareness of digital platforms stood at 59.5%, yet platform-specific awareness scores were universally below the scale midpoint (ONDC: 2.93; e-NAM: 2.20; Agri Bazaar: 1.82; BEAM: 1.44 on a 1-5 scale). Among the 13 FPOs with any platform experience, 100% reported improved pricing transparency. The dominant adoption barriers were lack of awareness (mean = 4.81/5) and lack of platform information (4.62/5), whereas internet connectivity (1.23/5) and digital literacy (1.48/5) ranked as the least significant challenges.

Conclusion: The study reveals a striking willingness-adoption gap (97.3% interest versus 2.7% usage) driven by informational rather than infrastructural deficits. Training and awareness programmes (requested by 75.7% and 73.0% of FPOs, respectively) are the priority interventions. Policy resources should be redirected from broadband infrastructure towards structured, management-targeted outreach and guided first-transaction support.

Keywords: Farmer Producer Organizations, digital agricultural platforms, selling channels, e-NAM, ONDC, agricultural marketing, Gujarat, platform adoption

Introduction

India's recent agricultural history is marked by a paradox: record-breaking output coexisting with persistent market disadvantage for smallholder farmers. Foodgrain production reached 357.73 million tonnes in 2024-25 the highest on record (Ministry of Agriculture & Farmers Welfare [MoAFW], 2025) yet the Commission for Agricultural Costs and Prices (CACP, 2019) estimates that farmers receive only 30-40% of the final consumer price for major horticultural commodities [12, 3].

The Government of India has responded through a dual strategy: constructing digital market infrastructure and building collective producer institutions to leverage it. The electronic National Agriculture Market (e-NAM), launched in 2016, now links 1,361 mandis across 23 states (Electronic National Agriculture Market [e-NAM], 2024) [4]. The Open Network for Digital Commerce (ONDC) became operational in 2022

(Ministry of Electronics and Information Technology, 2023). Simultaneously, the Central Sector Scheme for 10,000 Farmer Producer Organizations (MoAFW, 2020) ^[10] accelerated the formation of producer collectives capable of engaging these platforms at a commercially viable scale, yielding more than 13,500 registered FPOs nationally by March 2024.

Gujarat presents an ostensibly favourable context for digital platform adoption. The state benefits from the Amul cooperative model, above-average rural infrastructure, and over 800 registered FPOs across commodity sectors including groundnut, cumin, and kesar mango (Small Farmers Agribusiness Consortium [SFAC], 2024) ^[21]. However, the present study documents a troubling reality: digital platform adoption among Gujarat's FPOs remains near-zero not due to infrastructure deficiencies, but because the informational bridge between platform availability and actual use has not yet been constructed.

This study surveyed 37 active FPOs across eight districts Banaskantha, Mehsana, Anand, Kheda, Junagadh, Jamnagar, Navsari, and Bardoli mapping their current selling behaviour, platform awareness, perceived barriers, and willingness to adopt digital channels. The empirical findings carry direct implications for the design of policy interventions, platform onboarding strategies, and FPO capacity-building programmes.

2. Review of literature

2.1 Farmer Producer Organizations: Theoretical Foundations and Empirical Evidence

The theoretical foundation of Farmer Producer Organizations (FPOs) draws from several complementary strands of institutional and collective action theory. Ostrom (1990) demonstrated that groups can successfully self-govern shared resources under appropriate institutional arrangements, challenging conventional tragedy-of-the-commons assumptions. Williamson (1985) argued that organizational forms emerge to reduce transaction costs associated with market exchange, while Olson (1965) highlighted the challenges of collective action and the conditions under which individuals cooperate to pursue shared interests. In the Indian context, Trebbin and Hassler (2012) identified producer companies as an innovative institutional mechanism through which smallholders can collectively overcome market constraints and improve their bargaining position. Thus, the FPO can be viewed as a practical application of these theoretical perspectives to the challenges of smallholder agriculture ^[18, 25, 17].

Empirical evidence on FPO performance is generally favourable, although outcomes vary considerably across regions and organizations. Studies have shown that effective producer organizations can improve farmers' market access, strengthen bargaining power, reduce transaction costs, and facilitate participation in higher-value markets (Markelova *et al.*, 2009; Trebbin, 2014) ^[8, 24]. However, the performance of FPOs is highly heterogeneous and depends on factors such as managerial capacity, member participation, access to finance, market linkages, and organizational maturity. Several assessments have indicated that younger FPOs often face challenges in achieving commercial viability, whereas more established organizations tend to exhibit stronger marketing performance and higher turnover levels (NABARD, 2022; NITI Aayog, 2021) ^[15, 16]. This observation is particularly relevant to the present study, as the majority of sampled FPOs

were established during 2021-22 and are still in the early stages of organizational development.

2.2 Digital Agricultural Platforms: Promise and Reality

The theoretical foundation for digital agricultural markets can be traced to the pioneering work of Jensen (2007) ^[7], who examined the impact of mobile phone adoption among fishermen in Kerala, India. The study found that access to real-time market information significantly reduced-price dispersion across geographically separated fish markets and improved overall market efficiency. By enabling producers to obtain timely information on prevailing prices, mobile technology reduced information asymmetry between buyers and sellers, leading to more informed marketing decisions. These findings provide an important conceptual basis for digital agricultural platforms, suggesting that improved access to market information can enhance producers' bargaining power, facilitate better price discovery, and contribute to more efficient market outcomes. In the context of agriculture, digital platforms such as e-NAM and ONDC are expected to perform a similar function by expanding farmers' access to market intelligence and reducing informational disadvantages that have traditionally constrained their participation in competitive markets.

By 2024, e-NAM had recorded a cumulative transaction value exceeding ₹3.25 lakh crore, reflecting the growing scale of digital agricultural marketing in India. The FPO Module introduced on the platform enabled Farmer Producer Organizations to participate more actively in digital trading and market linkage activities. However, Chatterjee and Krishnamurthy (2020) observed that the effectiveness of e-NAM depends heavily on existing market institutions and intermediary structures. Their analysis highlighted that digital agricultural markets continue to rely on organized institutional actors for market participation and transaction management, indicating that institutional capacity remains a critical determinant of successful platform utilization.

Digital adoption among FPOs remains constrained by infrastructural and capability-related barriers. Previous studies have identified inadequate internet connectivity, limited access to digital devices, and low levels of digital literacy as important constraints affecting the adoption of digital technologies in agriculture and farmer organizations (Nagaraji *et al.*, 2023; Singh *et al.*, 2023) ^[14, 19]. However, the findings of the present study indicate a contrasting situation in Gujarat, where internet connectivity emerged as the least significant adoption barrier (mean = 1.23/5). This divergence may reflect Gujarat's relatively advanced digital infrastructure and higher technological penetration, suggesting that organizational and capacity-related factors become more important once basic connectivity constraints are addressed.

2.3 Channel Choice and Transaction Cost Theory

Transaction cost theory suggests that farmers tend to prefer marketing channels characterized by established relationships, predictable transactions, and lower search and negotiation costs (Williamson, 1985) ^[25]. In India, traditional marketing through APMC mandis and local traders continues to dominate agricultural produce marketing due to familiarity, established trust, and readily available market networks. Studies on collective action indicate that participation in farmer organizations can improve market access, strengthen bargaining power, and reduce transaction

costs; however, the effectiveness of such organizations depends significantly on their managerial capacity, governance structure, and level of member participation (Markelova *et al.*, 2009; Trebbin, 2014) [8, 24].

2.4 Research Gaps Addressed by This Study

Three gaps in the existing literature motivated this investigation. First, most digital adoption studies treat individual farmers as the unit of analysis, overlooking the FPO's organizational marketing decision-making structure. Second, primary-data evidence on FPO selling behaviour from Gujarat remains sparse despite the state's agricultural prominence. Third, no prior study has systematically compared the relative magnitudes of informational versus infrastructural barriers to digital adoption among FPOs in a well-resourced Indian state. The present study addresses all three gaps.

3. Objectives of the study

The study pursued five specific objectives:

1. To map the institutional profile and current selling channels used by FPOs across the study area.
2. To examine quality grading practices, pricing authority, and payment cycles in relation to price outcomes.
3. To assess awareness and actual usage of digital agricultural platforms, including named platforms.
4. To identify and rank the barriers preventing wider digital platform adoption and the types of support FPOs require.
5. To measure willingness to engage with e-market platforms and the outcomes FPOs anticipate from such engagement.

4. Materials and methods

4.1 Study Area

Data collection covered eight districts spanning Gujarat's major agro-climatic zones: Banaskantha and Mehsana in north Gujarat (cumin, potato, oilseeds); Anand and Kheda in central Gujarat (diversified, dairy-linked); Junagadh in Saurashtra (groundnut); Jamnagar on the coast; and Navsari and Bardoli in south Gujarat (horticulture, sugarcane-adjacent). The multi-district design was deliberate, enabling variation across commodity systems that a single-district study would have precluded.

4.2 Sampling Design and Sample Size

Purposive sampling combined with snowball referrals was employed. Purposive criteria required that each FPO be operationally active, primarily dealing in at least one of three target commodities (groundnut, cumin, or potato), and have complete institutional records available. These criteria excluded dormant or newly registered but non-trading entities.

Snowball referrals were necessary because all publicly available FPO databases in India are outdated, with frequently changed contact details, management turnover, and continuing deregistration of inactive entities. The starting nodes were Cluster-Based Business Organizations (CBBOs) defined under the 10,000 FPO Scheme, which provided ground-level verification of operational status. Of 45 FPOs initially contacted, 37 provided complete responses; the remaining 8 were excluded due to dormancy or incomplete data. All analyses are based on $n = 37$.

4.3 Data Collection Procedure

A structured questionnaire was administered through face-to-face interviews with the highest-ranking available representative at each FPO typically the Chief Executive Officer, Managing Director, or a board director authorised to respond on the organization's behalf. The instrument covered seven thematic areas: institutional profile; aggregation and storage practices; selling channels and channel-selection decision-making; payment modalities; awareness and usage of digital agricultural platforms; perceived adoption barriers and support requirements; and future collaboration intentions.

A five-point Likert scale (1 = lowest; 5 = highest) captured challenge severity and platform awareness levels. Ranking exercises elicited relative priorities for channel selection factors and adoption motivators. The questionnaire was pre-tested with five FPO representatives and revised before deployment. Field data collection was conducted between March and June 2026.

4.4 Analytical Tools

Categorical variables were summarized using frequency distributions and percentage calculations. Weighted mean scores were computed for challenge severity and platform awareness indicators. Ordinal rankings were converted to average rank scores to permit cross-indicator comparisons. Relationships between institutional characteristics, channels, and platform engagement were examined through cross-tabulations. All processing was performed in Microsoft Excel. Given the exploratory nature of the study and the sample size, findings are presented descriptively; inferential hypothesis testing was not applied.

5. Results and discussion

5.1 Geographic Distribution of Sample FPOs

The district-wise distribution of the 37 sampled FPOs is presented in Table 1.

Table 1: District-wise distribution of sample FPOs ($n = 37$)

Sr. No.	District	Frequency	Percentage (%)
1	Banaskantha	8	21.6
2	Anand	6	16.2
3	Junagadh	5	13.5
4	Vav	4	10.8
5	Mehsana	3	8.1
6	Surendranagar	2	5.4
7	Kheda	1	2.7
8	Amreli	1	2.7
9	Tharad	1	2.7
10	Devbhumi Dwarka	1	2.7
11	Patan	1	2.7
12	Sidhpur	1	2.7
13	Gir Somnath	1	2.7
14	Bardoli	1	2.7
15	Surat	1	2.7
	Total	37	100.0

Source: Primary survey, 2026.

Three districts Banaskantha (21.6%), Anand (16.2%), and Junagadh (13.5%) accounted for just over half the sample, reflecting their status as established production hubs for the commodity types under study. Vav and Mehsana contributed an additional 18.9%, while the remaining nine districts each

contributed one FPO. This concentration pattern has direct implications for outreach strategy: districts with eight or more FPOs offer economies of scale for demonstration workshops and peer-learning networks. Single-FPO districts at the tail of the distribution lack a local peer network, likely

compounding the informational gaps documented in the barrier analysis (Section 5.9).

5.2 Year of Establishment

Table 2 presents the year-wise distribution of FPO establishment.

Table 2: Year-wise distribution by year of establishment (n = 37)

Sr. No.	Year of Establishment	Frequency	Percentage (%)
1	2006	1	2.7
2	2019	1	2.7
3	2021	10	27.0
4	2022	17	45.9
5	2023	5	13.5
6	2024	1	2.7
7	2025	2	5.4
	Total	37	100.0

Source: Primary survey, 2026.

Nearly 46 percent of the sampled FPOs were established in 2022, and the cumulative share rises to 73 percent when organizations established in 2021 are included. This concentration reflects the expansion of government-led FPO promotion initiatives following the COVID-19 period, particularly under the Central Sector Scheme for Formation and Promotion of 10,000 Farmer Producer Organizations. Consequently, most sampled organizations were only three to four years old at the time of the survey. Previous studies have emphasized that organizational maturity, managerial

capability, and accumulated market experience play important roles in determining the performance and sustainability of producer organizations (Trebbin, 2014). Therefore, many of the sampled FPOs may still be in the process of building governance systems, member participation, and stable market linkages before undertaking substantial channel diversification. The lone FPO established in 2006 represents a significant outlier whose accumulated experience could serve as a valuable resource for peer-learning within the FPO ecosystem.

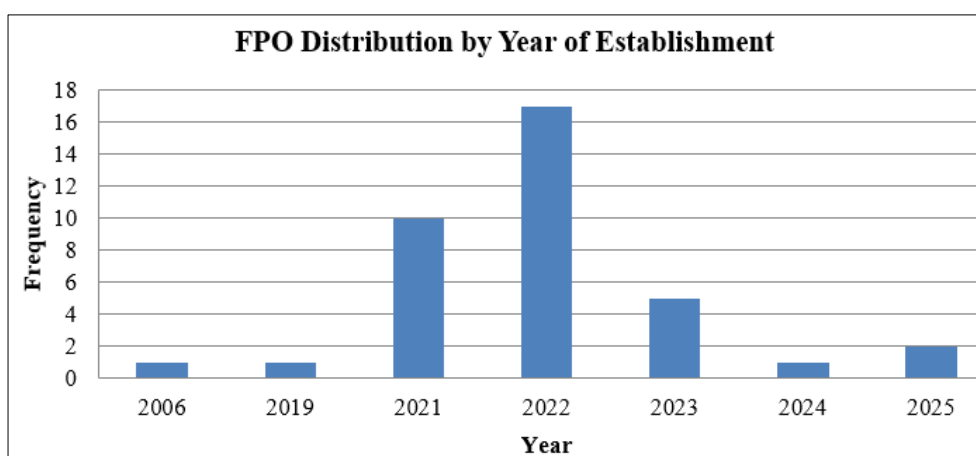


Fig 5.1: Year-wise distribution of sample FPOs by year of establishment (n = 37)

5.3 Membership Size

Table 3 shows the distribution of FPOs by membership size.

Table 3: Distribution by membership size (n = 37)

Sr. No.	Membership Range	Frequency	Percentage (%)
1	Less than 300 members	6	16.2
2	300-500 members	14	37.8
3	500-750 members	12	32.4
4	750-1,000 members	3	8.1
5	More than 1,000 members	2	5.4
	Total	37	100.0

Source: Primary survey, 2026.

Seven in ten FPOs fall in the 300-750-member range a moderate operational scale sufficient to aggregate commercially meaningful produce volumes but unlikely to provide spare management capacity for learning new

marketing channels. Only two FPOs exceeded 1,000 members. The absence of large-scale anchor organizations in most of the sample has implications for digital adoption: the fixed costs of platform onboarding registration, quality

documentation, logistics coordination require amortization across adequate transaction volumes before they are financially rational.

5.4 Primary Selling Channels

Table 4 presents the primary selling channels used by sample FPOs (multiple responses permitted).

Table 4: Primary selling channels used by sample FPOs (multiple response; n = 37)

Sr. No.	Selling Channel	Frequency	% of FPOs
1	Direct buyers	19	51.4
2	APMC mandi	16	43.2
3	Other (ITC Ltd., NAFED, GUJCO, Export)	11	29.7
4	Local traders	9	24.3
5	Retail / wholesale market	2	5.4
6	Digital platforms	1	2.7

Source: Primary survey, 2026. Multiple responses were permitted; column percentages sum beyond 100.

The channel profile is predominantly traditional. Direct buyers (51.4%) and APMC mandis (43.2%) accounted for the majority of reported primary channels. Institutional channels ITC Ltd., NAFED, GUJCO, and export routes appeared for 29.7% of FPOs, indicating that roughly one-third of the sample already navigates formal procurement relationships requiring quality documentation and contractual compliance.

Digital platforms featured in the selling portfolio of one FPO (2.7%). Contrary to the prevailing explanation in the digital agriculture literature which attributes low digital engagement to poor connectivity and low digital literacy the barrier analysis presented in Section 5.9 demonstrates that neither factor was salient in this sample.

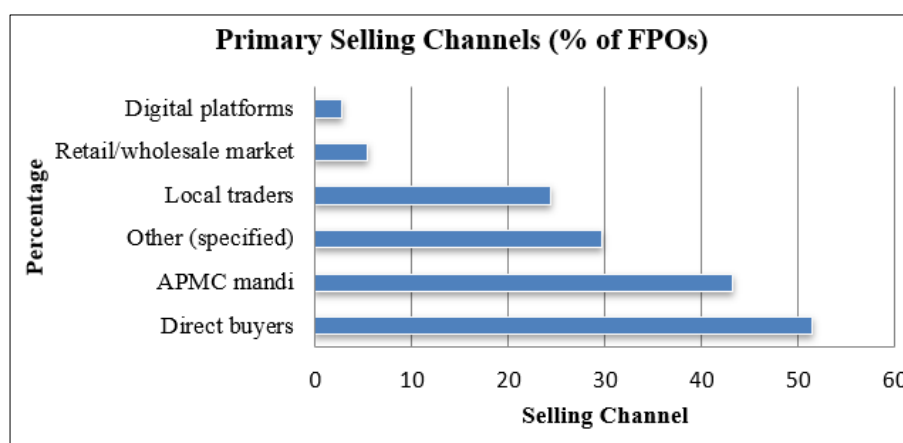


Fig 5.2: Primary selling channels used by sample FPOs (multiple response, n = 37)

The substantial presence of institutional procurement channels (29.7%) is noteworthy: FPOs supplying ITC or NAFED already manage quality documentation, logistics coordination, and formal contracts precisely the organizational capabilities that digital platforms require. This

capability exists; it is simply not yet directed towards digital channels.

5.5 Factors Influencing the Selling Decision: Table 5 reports the factors influencing selling-channel decisions, ranked by average score (lower score = higher priority).

Table 5: Factors influencing selling decisions, ranked by average score (n = 37)

Sr. No.	Factor	Average Rank	Priority Order
1	Price	1.27	1st (Most Important)
2	Demand	2.17	2nd
3	Payment Speed	3.28	3rd
4	Buyer Relationship	3.72	4th
5	Transportation	4.35	5th (Least Important)

Source: Primary survey, 2026. Lower average rank = higher importance.

Price dominated channel selection with an average rank of 1.27, indicating near-unanimous first-place assignment. Demand availability ranked second (2.17), followed by payment speed (3.28), buyer relationships (4th, 3.72), and transportation (5th, 4.35). Two findings merit emphasis. First, buyer relationships ranking fourth rather than second contradicts a large body of agricultural marketing literature that frames relationship lock-in as the primary impediment to channel switching (Williamson, 1985). FPO managers in this

sample are not discounting relationships — they are indicating that demonstrable price advantages take precedence. This creates a genuine opening for digital platforms that can provide verifiable price-improvement evidence. Second, transportation ranking last directly challenges a common assumption in rural e-commerce design; logistics convenience is not the critical value proposition for these organizations.

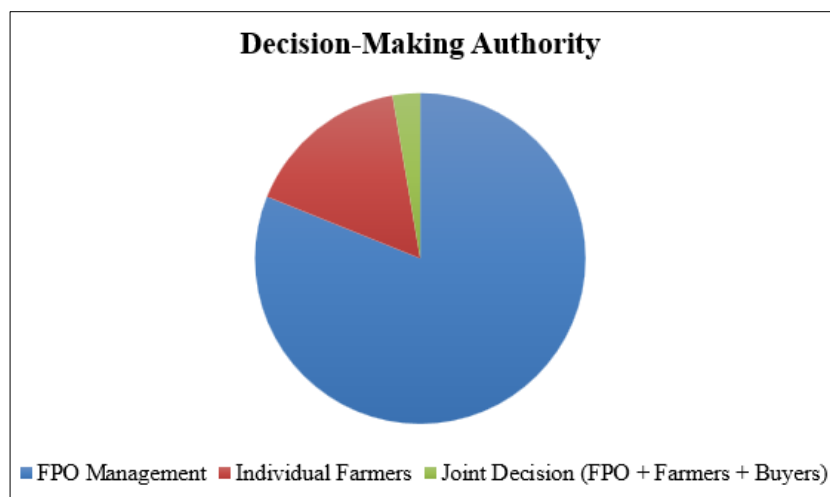


Fig 5.3: Decision-making authority for selection of selling channel (n = 37)

5.6 Awareness of Digital Agricultural Platforms

Table 6 presents the general awareness of digital agricultural platforms among surveyed FPOs.

Table 6: General awareness of digital agricultural platforms (n = 37)

Sr. No.	Awareness	Frequency	Percentage (%)
1	Yes — Aware	22	59.5
2	No — Not Aware	15	40.5
	Total	37	100.0

Source: Primary survey, 2026.

Approximately 60% (59.5%) of FPOs reported some awareness of digital agricultural platforms, while 40.5% were entirely unaware. The 40.5% with no awareness represents a hard adoption floor: no onboarding intervention can reach organizations that are unaware these channels exist. Basic awareness creation must precede adoption support. As Section 5.7 demonstrates, the 59.5% figure masks

considerable variation in the depth and quality of that awareness.

5.7 Platform-Specific Awareness Levels

Table 7 presents awareness scores for named digital agricultural platforms on a 1-5 scale (1 = Not Aware; 5 = Very Highly Aware).

Table 7: Level of awareness of named digital platforms (scale: 1 = not aware; 5 = very highly aware; n = 37)

Sr. No.	Platform	Average Score (1-5)	% Rating '5' (Very High)
1	ONDC	2.93	14.8
2	e-NAM	2.20	5.0
3	Government e-Procurement	2.00	18.8
4	AgriBazaar	1.82	11.8
5	Ninjacart	1.62	6.3
6	BEAM	1.44	6.3

Source: Primary survey, 2026. All average scores fall below the scale midpoint of 3.0.

Every platform scored below the scale midpoint of 3.0. ONDC recorded the highest awareness score (mean = 2.93), possibly reflecting increasing government promotion and public visibility. e-NAM scored 2.20, while private platforms such as AgriBazaar (1.82), Ninjacart (1.62), and BEAM (1.44) remained closer to the "not aware" end of the scale. These findings indicate that although a majority of respondents reported general awareness of digital marketing platforms, their knowledge was often superficial and insufficient to support informed adoption decisions. The Government e-Procurement category recorded the highest proportion of "very aware" responses (18.8%), likely due to

prior exposure to government procurement systems. This suggests that familiarity with formal institutional channels does not necessarily translate into comprehensive digital marketplace literacy, a pattern consistent with studies highlighting the gap between awareness and effective utilization of digital agricultural technologies among farmers and producer organizations (Baumüller, 2018; Garg & Singhal, 2021) ^[1, 2].

5.8 Current Usage of Digital Platforms

Table 8 presents platform-wise usage among FPOs reporting some platform awareness (n ≈ 13).

Table 8: Platform-wise usage among platform-aware FPOs (n ≈ 13)

Sr. No.	Platform	Used (Freq.,%)	Not Used (Freq.,%)
1	e-Samyukti	2 (15.4%)	11 (84.6%)
2	ONDC	2 (15.4%)	11 (84.6%)
3	e-NAM	1 (7.7%)	12 (92.3%)
4	e-Samriddhi	1 (7.7%)	12 (92.3%)
5	Government e-Procurement	1 (7.7%)	12 (92.3%)
6	AgriBazaar	1 (7.7%)	12 (92.3%)
7	Ninjacart	1 (7.7%)	12 (92.3%)

Source: Primary survey, 2026. Restricted to 24 FPOs reporting some platform awareness; of which 13 reported any platform usage.

Among the 24 FPOs reporting some degree of platform awareness, only 13 reported any actual usage. However, platform-specific utilization remained extremely limited. e-Samyukti and ONDC were each used by only two organizations (15.4%), while all other platforms were used by a single organization (7.7%). Consequently, the apparent 54.2% usage rate among aware FPOs may overstate meaningful adoption, as it includes exploratory registrations and occasional trial transactions rather than sustained commercial engagement. This interpretation is reinforced by the primary channel analysis, which showed that digital platforms accounted for only 2.7% of overall selling activities. The findings suggest that awareness alone is

insufficient to drive digital market participation; effective adoption requires institutional support, operational readiness, and active market integration. Similar concerns have been raised in studies of digital agricultural markets, which emphasize that the existence of a digital platform does not automatically translate into effective participation or regular market transactions (Chatterjee & Krishnamurthy, 2020).

5.9 Challenges in Digital Platform Adoption

Table 9 presents respondents' ratings of challenges to digital platform adoption (1 = lowest challenge; 5 = highest challenge).

Table 9: Challenges in using digital platforms (scale: 1 = lowest challenge; 5 = highest challenge; n = 37)

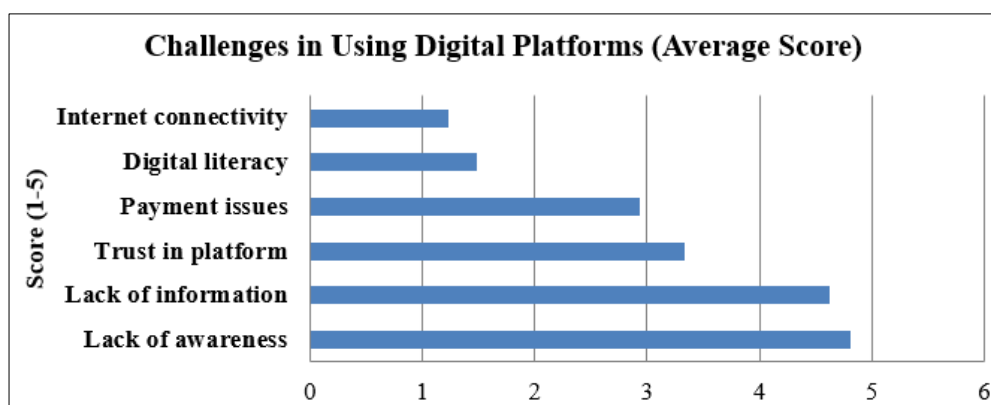
Sr. No.	Challenge	Average Score (1-5)	% Rating '5'
1	Lack of Awareness	4.81	83.9
2	Lack of Information	4.62	62.1
3	Trust in Platform	3.33	3.3
4	Payment Issues	2.93	6.7
5	Digital Literacy	1.48	0.0
6	Internet Connectivity	1.23	0.0

Source: Primary survey, 2026.

The findings directly contradict the prevailing framework in rural digital adoption research. Lack of awareness ranked highest (mean = 4.81/5; 83.9% assigned a rating of 5), followed closely by lack of platform information (4.62/5; 62.1% assigned a rating of 5). These two informational barriers tower over all others. Trust in platforms registered a moderate score (3.33/5) and payment concerns a lower score (2.93/5). Internet connectivity (1.23/5) and digital literacy (1.48/5) the barriers that dominate most rural digitalisation policy discourse ranked last, and no respondent assigned either the maximum severity rating.

These results indicate that Gujarat's FPO managers possess smartphones, internet access, and sufficient digital

competency to manage their organizations. What is absent is structured, credible information about how agricultural platforms operate, how to register, what the transaction process entails, and why a digital transaction would yield better outcomes than an established buyer relationship. The information gap is the adoption gap a finding consistent with Jensen's (2007) foundational insight that information access, not infrastructure access, drives market behaviour change. This finding has a clear policy corollary: investment in rural connectivity will not meaningfully accelerate FPO digital platform adoption in Gujarat; investment in knowledge dissemination will.

**Fig 5.4:** Challenges in using digital platforms (Scale: 1 = Lowest, 5 = Highest Challenge)

5.10 Support Requirements: Table 10 presents the types of support FPOs requested to improve digital platform engagement (multiple responses permitted).

Table 10: Type of support required to improve digital platform use (multiple response; n = 37)

Sr. No.	Type of Support Required	Frequency	% of FPOs
1	Training / Skill Development	28	75.7
2	Awareness Programmes	27	73.0
3	Better Logistics Support	5	13.5
4	Technical Support (Apps/Systems)	3	8.1
5	Financial Support	3	8.1
6	Local Engagement	1	2.7
7	Payment Term Improvement	1	2.7

Source: Primary survey, 2026. Multiple responses were permitted.

The support request profile mirrors the challenge hierarchy, confirming internal consistency of the data. Training and skill development (75.7%) and awareness programmes (73.0%) were each requested by approximately three in four FPOs. Logistics support, technical support, and financial support each registered below 15%. Notably, only 8.1% of FPOs requested financial support these organizations are not

seeking grants. They are seeking information and guided assistance. This signal should redirect at least some of the subsidy spending currently directed at rural digital infrastructure towards knowledge-building and demonstration programmes with demonstrably clearer adoption pathways.

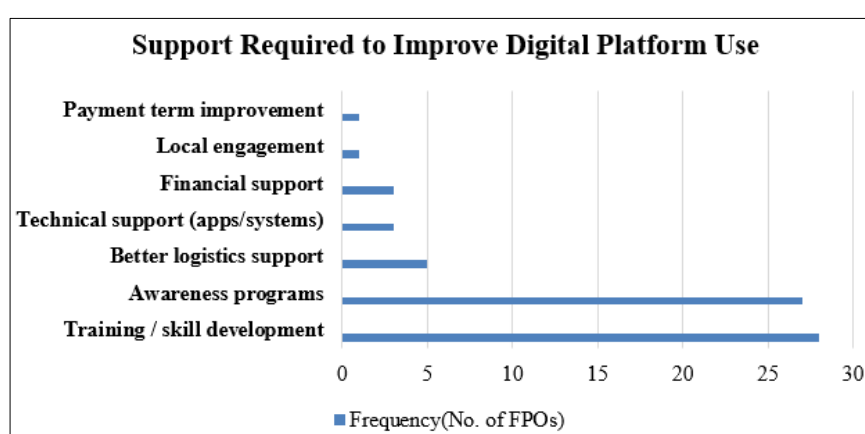


Fig 5.5: Type of support required to improve digital platform use (multiple response, n = 37)

5.11 Willingness to Collaborate with e-Market Platforms

Table 11 summarises FPO willingness to collaborate with digital e-market platforms.

Table 11: Interest in e-market collaboration (n = 37)

Sr. No.	Response	Frequency	Percentage (%)
1	Yes — Interested	36	97.3
2	No	1	2.7
	Total	37	100.0

Source: Primary survey, 2026.

Thirty-six of thirty-seven FPOs (97.3%) expressed willingness to collaborate with e-market platforms; only one declined. This near-unanimous affirmative response is arguably the most practically important finding in this study. The adoption gap documented here is emphatically not an attitudinal problem. The target population is willing; it has simply not yet been reached through adequate information and facilitation. If the barrier were structural excessive cost,

cultural resistance, infrastructure absence — the gap would be slow to close. Informational gaps respond more readily to well-designed outreach interventions.

5.12 Key Motivating Factors for Adoption

Table 12 presents the factors that would motivate FPOs to adopt digital marketplace channels, ranked by average score.

Table 12: Factors encouraging digital marketplace adoption, ranked by average score (n = 37)

Sr. No.	Motivating Factor	Average Rank	Priority Order
1	Better Price Realisation	~1.5	1st — Most Motivating
2	Higher Income Potential	~2.0	2nd
3	Wider Market Access	~2.8	3rd
4	Timely Payment	~3.2	4th
5	Transparency in Pricing	~3.8	5th
6	Better Negotiation Power	~4.1	6th
7	Reduced Middlemen Dependence	~4.5	7th — Least Motivating

Source: Primary survey, 2026. Lower average rank = higher priority.

Better price realisation (~1.5) and higher income potential (~2.0) ranked as the two strongest motivators, consistent with price's dominant role in channel selection (Table 5). Wider market access ranked third (~2.8), timely payment fourth (~3.2). At the bottom of the ranking 'reduced middlemen dependence' (~4.5) sits the framing that most digital agriculture advocacy foregrounds. FPOs in this sample are

not primarily interested in disintermediation; they are interested in price improvement. If a platform delivers verifiable price gains, these organizations will adopt it regardless of how it affects intermediary structures. Platform communications that lead with value-chain architecture rather than price outcomes risk talking past what FPO managers actually prioritize.

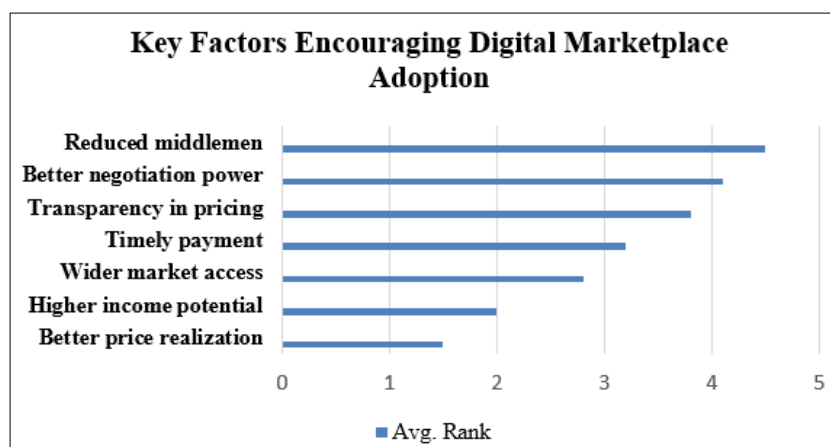


Fig 5.6: Key factors encouraging adoption of digital marketplace platforms, ranked by average score (n = 37)

5.13 Perceived Impact among Current Platform Users

Table 13 presents the perceived impacts of digital platform use among FPOs with any platform experience (n ≈ 13).

Table 13: Perceived impact of digital platform usage among FPOs with any platform experience (n ≈ 13)

Sr. No.	Impact Area	Yes (%)	No (%)
1	Improved Pricing Transparency	100.0	0.0
2	Access to New Buyers / Markets	84.6	15.4
3	Improved Market Access	76.9	23.1
4	Reduced Dependency on Middlemen	69.2	30.8
5	Reduced Time to Sell Produce	69.2	30.8
6	Improved Price Realisation	53.8	46.2
7	Increased Income of Members	46.7	53.3

Source: Primary survey, 2026. Restricted to 13 FPOs reporting some digital platform use.

Among the 13 FPOs with any platform experience, all (100%) reported improved pricing transparency. Access to new buyers and markets followed at 84.6%, improved market access at 76.9%, reduced middlemen dependence and faster selling times both at 69.2%. Improved price realisation was reported by 53.8% and increased member income by only 46.7%. This pattern is consistent with the broader literature:

price discovery benefits arrive faster than income gains (Stiglitz, 2002). Transparency informs a seller of the price they should receive; converting that knowledge into actual income improvement requires transaction volume, operational logistics, and buyer relationships that many of these organizations have not yet fully assembled.

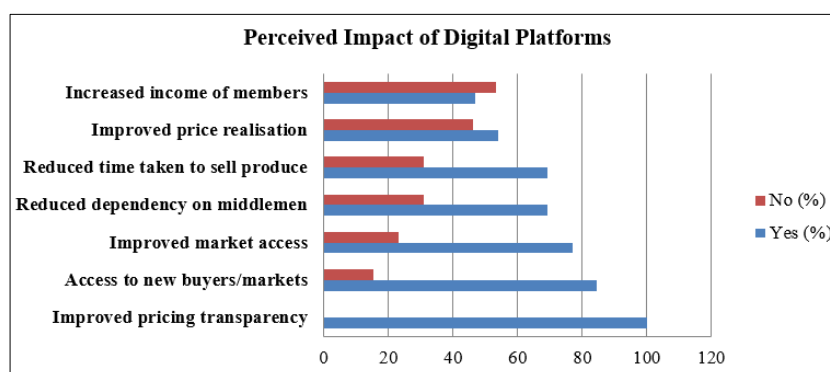


Fig 5.7: Perceived Impact of Digital Platform Usage among FPOs (n ≈ 13)

For platform operators, this trajectory suggests that early-stage communications should set realistic income expectations while being genuinely transparent about what

first adopters receive first: pricing visibility and expanded buyer access. Overselling income outcomes risks credibility

damage when initial transactions do not meet promised benchmarks, potentially accelerating disengagement.

6. Conclusion

This study documents a striking willingness-adoption paradox among Gujarat's FPOs: 97.3% expressed interest in digital e-market platforms while only 2.7% actively used them for selling. The gap is fundamentally informational rather than infrastructural. Infrastructure barriers internet connectivity and digital literacy ranked last among the six adoption challenges assessed, with no respondent assigning either the maximum severity rating. Informational barriers lack of awareness and lack of platform information ranked first and second, with mean scores of 4.81 and 4.62 respectively on a five-point scale.

This reframing carries operational significance: conventional policy responses emphasizing broadband investment or digital literacy training will not close this adoption gap. What is required is sustained, management-targeted, commodity-specific outreach that walks FPO leaders through platform registration, transaction processes, and the realistic outcomes of first transactions followed promptly by at least one supported transaction delivering a visible price improvement. The channel data establish a clear baseline: direct buyers and mandis dominate; digital is absent. The barrier data explain the mechanism: information scarcity, not connectivity scarcity. The willingness data confirm that demand exists. The support request data specify what supply is needed: structured training and awareness programmes, not cash grants or fibre infrastructure expansion.

For FPO managers, the practical implication is that most peer organizations occupy the same position willing, uninformed about operational details, and awaiting a credible demonstration. Early movers through this transition will likely shape peer adoption curves in their commodity clusters.

For policymakers, the key lesson concerns sequencing: India's digital agricultural infrastructure has advanced significantly ahead of the institutional readiness required to utilize it. Closing this gap requires investment in knowledge dissemination, demonstration events, and trust-building interventions that are less visible than infrastructure projects but, as this study's data indicate, more likely to generate returns in the near term.

For platform operators, the signal concerns onboarding quality and expectation management. The potential user base is available and willing. The question is whether the onboarding experience will be sufficient to convert trial into sustained commercial use.

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Disclaimer

The authors declare that this research was conducted independently and solely for academic purposes. The data used in this study were collected directly from Farmer Producer Organizations (FPOs), and the interpretations are

based on the responses received. The authors have no intention to promote or criticize any organization, platform, product, or service mentioned in this paper. Any opinions expressed are strictly those of the authors.

Competing interests

Authors have declared that no competing interests exist.

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