CHALLENGES IN FINTECH ADOPTION AMONG MEMBERS OF FARMER PRODUCER ORGANISATIONS - AN ANALYSIS

ABSTRACT

Aim: This study aims to identify the personal, technological, and trust-related constraints that limit fintech adoption among farmers in Tamil Nadu. By analysing these barriers, the research seeks to provide insights for enhancing fintech utilization in the agricultural sector.

Study Design: An ex-post facto research design was employed to investigate the constraints impacting fintech usage among farmers.

Place and Duration of Study: The study was conducted in the Tiruvallur district of Tamil Nadu, India, from March to July 2023. This region was selected for its high concentration of banking outlets, making it a relevant area for fintech adoption research.

Methodology:A total of 120 farmers, including 86 men and 34 women aged between 18 and 75 years, were randomly selected from four Farmer Producer Organizations (FPOs) affiliated with Krishi Vigyan Kendra (KVK), Tiruvallur. Data were collected using a structured interview schedule that categorized constraints into personal, technological, and trust-related dimensions. The Garrett ranking technique was employed to assess the severity of these constraints from the farmers' perspectives.

Results: The study revealed that personal constraints, such as risk aversion (average score = 65.14) and a preference for cash transactions (56.68), were the most significant barriers to fintech adoption. Technological challenges, including limited access to technical support (64.79) and complex user interfaces (52.95), further hindered usage. Trust-related concerns, particularly fears of fraud and scams (65.83), were the most critical barriers, emphasizing the need for robust security measures.

Conclusion: The findings underscore the need for targeted interventions to address the significant barriers to fintech adoption, particularly in enhancing user-friendly designs, technical support, and security measures.

1.INTRODUCTION

Fintech, derived from "financial technology," encompasses a range of technology-enabled financial solutions [1] .Fintech combines finance, technology management, and innovation management and is defined internationally as innovations in the financial field enabled by new technologies [2].These innovations include payment, wealth management, crowdfunding, loan, capital market, and insurance services [2].In India, fintech is gaining traction due to digital advancements and increased e-commerce and smartphone penetration [3].Fintech is reshaping financial services in India. The EY Fintech Adoption Index 2017 shows that India ranks second globally in digital financial services utilization, driven by mobile wallets and the Unified Payments Interface (UPI). UPI has seen transaction volumes soar from 1 million in 2016 to over 10 billion in 2023. Digital payments increased by 76% in transactions and 91% in value in 2022. A pan-India survey of 90,000 respondents found that 42% had used digital payment methods (Source: Invest India).

Fintech has the potential to democratize financing, reduce barriers, and offer new opportunities for global financial inclusion [1]. It significantly influences the banking sector by enhancing risk assessment, fraud detection, and customer service through AI and machine learning, and increasing transaction transparency and security with blockchain and cryptocurrencies[4].One such sector experiencing fintech's transformative wave is agriculture, especially in India, where agriculture sustains about 58% of the population. The sector faces challenges like access to credit, unpredictable markets, and climate change impacts. Small and marginal farmers particularly struggle with inadequate credit delivery, informational asymmetry, and high transaction costs [5]. Addressing these issues is crucial for agricultural growth and farmer well-being

Fintech tools can catalyse new offerings within India's credit and risk markets. Mobile banking provides a convenient avenue for farmers to access financial services, and enhancing financial literacy helps them understand financial products and services better. Adopting digital financial services in remote areas expands accessibility and reduces transaction costs, increasing overall efficiency[6].

Despite the significant advancements and potential benefits, the adoption of fintech among farmers faces several constraints. Identifying and understanding these constraints is crucial to effectively address them and enhance fintech utilization. This study aims to identify the personal, technological, and trust gap-related constraints faced by farmers in Tamil Nadu in utilizing fintech services. By examining these barriers, this research seeks to provide valuable insights that can inform policymakers, financial institutions, and technology developers, ultimately contributing to the development of more inclusive and effective fintech solutions for the agricultural sector.

2.METHODOLOGY

The present study employed an ex-post facto research design, focusing on the Tiruvallur district of Tamil Nadu. This district was selected due to its significant concentration of banking outlets, as it is one of seven districts that collectively account for 51% of the total banking outlets in Tamil Nadu (Tamil Nadu Fintech Policy, 2021.A total of 120 farmers participated as respondents in the study. These participants were randomly selected from four leading Farmer Producer Organizations (FPOs), which are under close association with Krishi Vigyan Kendra (KVK), Thiruvallur.To gather data, a well-structured interview schedule was developed. Based on expert consultations and farmer feedback, the constraints were categorized into three dimensions: personal, technological, and trust and security concerns, ensuring a comprehensive approach.

The farmer profile exhibits notable diversity, with the majority being middle-aged (41.7%) and predominantly male (71.7%). Most have attained secondary or high school education (40%) and prioritize farming as their primary occupation (45.0%). Additionally, 40% are classified as small farmers, and 37.5% earn above Rs. 2,10,000 annually, reflecting a range of economic stability and resource access. Toanalyse the data collected from this diverse group of farmers and to assess the severity of the identified constraints, a specific analytical tool was employed

2.1.ANALYTICAL TOOL

To assess the severity of the constraints identified in the study, the Garrett ranking technique was employed. This method was chosen for its superiority over simple frequency distribution, as it arranges constraints based on their relative severity from the respondents' perspectives.

The process involves the following steps:

1. Farmers were asked to rank the constraints.

2. These rankings were then converted into numerical scores using Garrett's formula given below.

Percent position = 100 * (Rij – 0.5)/Nj

Where:

Rij = rank given for ith constraint by jth individual

Nj = number of constraints ranked by jth individual

3. The percentage position of each rank is translated into scores using a table provided by Garrett and Woodworth (1969).

4. The scores from individual respondents are aggregated and averaged.

5. Finally, the constraints are ranked in descending order based on these mean scores, highlighting their relative severity.

3.RESULTS AND DISCUSSION

3.1.Personal constraints to fintech usage

Personal constraints to fintech usage encompass individual factors that limit one's ability or willingness to adopt digital financial services. These barriers stem from a combination of personal attitudes, knowledge gaps, and comfort levels with technology. Such constraints can vary widely among individuals, influenced by their experiences, beliefs, and circumstances. The personal constraints and corresponding ranks are shown in Table 1.

Table 1. Personal constraints of fintech usage

S.No	Personal constraints	Total score	Average Score	Final rank
1	Lack of awareness of fintech services	6068	50.56	IV
2	Risk aversion	7817	65.14	I
3	Lack of proficiency in using fintech	6195	51.62	III
4	Limited digital literacy	4208	35.06	VI
5	Preference to cash transactions	6802	56.68	II
6	Reluctance to use modern technologies	4910	40.91	V

The ranking of personal constraints in fintech usage reveals a complex interplay of factors impeding adoption among farmers in Tamil Nadu. Risk aversion (65.14) and preference for cash transactions (56.68) top the list, highlighting deep-rooted financial behaviours and trust issues. These findings align with Mathur [7] who identified perceived risk and security concerns as major barriers to fintech adoption among farmers. This suggests that addressing these concerns is critical for improving adoption rates. Lack of proficiency (51.62) and awareness (50.56) follow, indicating a need for better education and exposure to fintech services. This suggests that interventions focused on increasing digital literacy and familiarity with fintech platforms could significantly reduce these barriers.

Interestingly, reluctance to use modern technologies (40.91) and limited digital literacy (35.06) rank lower. This implies that once trust issues and security concerns are mitigated, technological adoption may be easier than anticipated. Therefore, efforts should prioritize building trust and ensuring robust security measures to alleviate farmers' fears about the risks associated with digital financial services. The study by Mathur [7] also supports these findings, highlighting the importance of security in the

adoption of digital financial services. Similarly, Su et al.,[8] emphasizes the role of financial education in reducing perceived risk and increasing fintech adoption among farmers.

3.2.Technological constraints to fintech usage

Technological constraints to fintech usage encompass barriers related to the infrastructure and tools necessary for adopting digital financial services. These constraints can include limitations in technology availability, accessibility issues, and challenges related to the usability of fintech solutions. Such barriers often arise from inadequacies in technology infrastructure, compatibility issues, and the need for user-friendly designs. Table 2 presents the technological constraints along with their respective ranks.

Table 2. Technological constraints of fintech usage

S.No	Technological constraints	Total score	Average Score	Final rank
1	Insufficient language localization	5945	49.54	III
2	Limited access to reliable internet connection	4535	37.79	V
3	Complex user interfaces	6355	52.95	II
4	Limited offline functionality	5390	44.91	IV
5	Limited access to technical support	7775	64.79	I

The ranking of technological constraints in fintech usage unveils a multifaceted interplay of factors hindering adoption among farmers in Tamil Nadu. Limited access to technical support (64.79) emerges as the foremost barrier, underscoring the necessity for comprehensive support systems to assist users. The complexity of user interfaces (52.95) is the next significant constraint, highlighting the imperative for intuitive and user-friendly design to improve accessibility. Insufficient language localization (49.54) follows, emphasizing the critical importance of offering services in local languages to enhance usability. Limited offline functionality (44.91) is ranked fourth, indicating that the ability to utilize fintech services without continuous internet access is crucial.

Interestingly, since the surveyed area had good internet connectivity, limited access to a reliable internet connection (37.79) ranks lowest, suggesting that while internet connectivity is generally available, other technological issues are more urgent for farmers. This is consistent withBouteraaet al.,[9] findings, which emphasize that the availability of adequate resources, such as internet access, smart devices, and expert advice, is crucial for effective engagement with fintech services. Without these facilitating conditions, consumers may struggle to engage with fintech services effectively. Mitigating these constraints could profoundly enhance the adoption and effective utilization of fintech services by the agricultural community. Comprehensive support systems, user-friendly designs, localized services, and offline functionality are key areas to focus on to improve the technological landscape for farmers.

3.3.Trust and security concerns

Trust and security constraints to fintech usage encompass barriers related to the confidence and perceived safety of digital financial services. Such barriers often stem from insufficient trust in digital systems, concerns over the safety of personal and financial information, and uncertainties about the reliability of fintech providers. Addressing these constraints is crucial for fostering user trust and ensuring the secure adoption of fintech solutions. Table 3 lists the technological constraints and their corresponding rankings.

Table 3. Security concerns of fintech usage

S.No	Security constraints	Total score	Average Score	Final rank
1	Concerns about data privacy and security	6255	52.12	II
2	Lack of regulatory clarity	4530	37.75	V

3	Fear of fraud and scams	7900	65.83	I
4	Doubts about dispute resolution and customer support	5890	49.08	III
5	Absence of physical interaction and documentation	5425	45.20	IV

The ranking of security constraints in fintech usage among Tamil Nadu's farmers highlights significant challenges, with concerns over online fraud (65.83) being the most critical. These concerns, as noted by Priya and Anusha [10], emphasize a substantial trust deficit that requires robust security measures and extensive user education. Additionally, difficulties in gaining investor trust, compounded by a lack of government support, further impede sector growth. Addressing these issues through enhanced cybersecurity, tailored educational programs and active government involvement can significantly improve trust and adoption of fintech services among farmers. Following closely are concerns about data privacy and security (52.12), emphasizing the need for transparent data protection practices and effective communication. Doubts about dispute resolution and customer support (49.08) rank third, underscoring the necessity for accessible and empathetic customer service. The absence of physical interaction and documentation (45.20) indicates difficulties in transitioning from traditional to digital banking, suggesting a need for hybrid solutions. Interestingly, lack of regulatory clarity (37.75) ranks lowest, possibly reflecting that immediate security concerns are prioritized over broader regulatory issues, presenting an opportunity for policymakers to develop clear and focused regulations.Addressing ethical concerns is crucial to restoring digital ethics in fintech and ensuring fairness, transparency, accountability, and access in digital banking, as highlighted by Prastyanti et al.,[11]. By prioritizing these ethical considerations, fintech providers can build a more trustworthy and inclusive digital financial ecosystem

4.CONCLUSION

This study uncovers the pivotal barriers to fintech adoption among farmers in Tamil Nadu, highlighting a complex interplay of personal hesitations, technological limitations, and trust-related concerns. The findings reveal that entrenched financial habits and security fears significantly deter the use of digital financial services. Technological issues such as inadequate support and cumbersome interfaces further exacerbate the challenge, while deep-seated concerns over fraud and data privacy hinder trust and acceptance.

To overcome these obstacles, a strategic overhaul is necessary. Emphasizing user-centric design improvements, including simplified interfaces and localized support, will address technological barriers. Enhancing security measures and building transparent, reliable frameworks will help rebuild trust and mitigate concerns. Additionally, targeted educational programs can bridge knowledge gaps and foster a more informed user base. By addressing these areas comprehensively, fintech solutions can be more effectively integrated into the agricultural sector, unlocking their potential to drive growth and improve financial inclusion across Tamil Nadu.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

I hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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