

Digital Transformation of Primary Agricultural Cooperative Credit Societies (PACCS): Pathway to Financial Inclusion and Rural Livelihood Development in Tamil Nadu

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Abstract - This study examines how the digital transformation of Primary Agricultural Cooperative Credit Societies (PACCS) in Tamil Nadu is improving financial inclusion and supporting rural livelihood development. PACCS has gradually adopted digital tools, including mobile applications, e-passbooks, online payment systems, SMS alerts, and core banking platforms, to provide faster and more transparent services. Secondary data from government reports, cooperative department publications, NABARD documents, and academic sources were analysed to understand trends in technology adoption, digital credit delivery, SHG linkage, and member service usage. The findings show that digitalisation has enabled timely KCC loans, smooth online transactions, faster insurance payments, and direct benefit transfers for rural households. SHGs and women members have gained easier access to credit and improved savings practices through digital platforms. The study concludes that digital services reduce dependence on informal credit, strengthen financial access for marginalised groups, and contribute positively to income stability, farm productivity, and overall livelihood improvement in rural Tamil Nadu.

Keyword - Digital Transformation, PACCS, Financial Inclusion, Rural Livelihood Development, Kisan Credit Card (KCC), e-Passbook, Online Payments, SHG Linkage, Cooperative Banking, Tamil Nadu.

1. Introduction

Primary Agricultural Cooperative Credit Societies (PACCS) play a crucial role in providing credit and basic financial services to rural households in the state of Tamil Nadu. In recent years, these societies have begun adopting digital tools, including computerised systems, mobile applications, e-passports, online payment platforms, SMS alerts, and core banking systems. Through these technologies, members can check their account balance online, apply for loans digitally, receive repayment reminders, and access services more quickly and transparently. This digital transformation is reshaping the way PACCS operate and interact with their members.

Digitalisation also creates a stronger pathway for financial inclusion. Small farmers, women, and marginalised households who previously struggled to access formal banking now receive services through simple digital channels. Online payments, e-KYC, and mobile-based transactions make it easier for rural families to open bank accounts, utilise formal credit, and reduce their reliance on moneylenders. By bringing more people into the formal financial system, PACCS support safer, faster, and more inclusive financial access.

These digital improvements contribute directly to rural livelihood development. When credit and services reach members on time—such as Kisan Credit Card (KCC) loans, crop insurance payouts, and government subsidies—farm productivity increases and income becomes more stable. Digital systems also improve the credit flow for small businesses, farm activities, and self-help groups (SHGs). As a result, rural families can strengthen their income sources, manage risks more effectively, and improve their standard of living in a sustainable manner.

2. Objective

1. To assess how PACCS in Tamil Nadu are adopting digital tools such as mobile apps, e-passbooks, online payment and core banking systems.
2. To examine how digital services support financial inclusion for small farmers, women, and marginalised households in rural areas.
3. To analyse the impact of digitalisation on rural livelihood development, especially in terms of income productivity and access to timely credit.

3. Statement of the Problem

Primary Agricultural Cooperative Societies (PACCS) are meant to provide easy and timely financial services to rural people. But many societies still depend on manual records, paper-based processes, and slow methods. Because of this, small farmers and rural families often face delays in getting loans, checking account details or receiving important

information. Digital tools, such as mobile apps, e-passbooks, online payments, and core banking systems, are being gradually introduced, but not all PACCS are utilising them effectively. Some societies have modern facilities, while others continue to operate under traditional systems. This uneven adoption creates gaps in service quality and limits the benefits that members should get. Due to these issues, it remains unclear whether digital transformation is truly benefiting rural people by enhancing financial access and meeting their livelihood needs. There is a need to study the extent to which digital services are utilised in PACCS, their support for financial inclusion, and whether they bring tangible improvements to the income and daily lives of rural households.

4. Methodology

This study utilises secondary data to examine the digital transformation of PACCS and its impact on financial inclusion and rural livelihood development in Tamil Nadu. All the information used in this research is taken from published and official sources. Data is gathered from PACCS annual reports, District Central Cooperative Bank documents, Tamil Nadu Cooperative Department publications, NABARD reports, government records, academic journals, and books related to cooperative finance and digital services. The secondary data collected is arranged, reviewed, and compared to identify trends in technology adoption, loan delivery, member services, and rural development outcomes. Simple analytical tools such as percentages, trend analysis, and descriptive comparison are used to interpret the data. These methods help in understanding how digital tools, such as mobile applications, e-passbooks, online payments, and core banking systems, have supported financial access and improved the livelihood conditions of rural households over time.

The results are presented descriptively to illustrate progress, gaps, and the overall impact of digitalisation in PACCS, based on available secondary information.

5. Literature Review

1. **Ramesh and Kannan (2018)** Ramesh and Kannan studied the computerisation of cooperative societies in South India and found that digital records reduced errors and improved the speed of loan processing. They also noted that members felt more confident when they received SMS alerts and e-passbook updates.
2. **Joseph (2020)** Joseph examined digital financial services in rural Tamil Nadu and reported that mobile banking and online payments increased financial access for small farmers and women. The study

highlighted that digital tools lowered dependency on local moneylenders.

3. **Lakshmi and Prabhu (2021).** Lakshmi and Prabhu analysed the role of e-governance in cooperatives and concluded that online systems improved transparency and reduced paperwork. Their study showed that members appreciated faster service and more transparent communication through digital platforms.
4. **Meenakshi (2022)** Meenakshi's study on rural credit delivery found that digital systems like core banking and Aadhaar-linked accounts helped farmers receive KCC loans and subsidies on time. The study pointed out that timely credit improved crop planning and farm income.
5. **Arun and Dev (2023).** Arun and Dev investigated the impact of digital tools on rural livelihood programmes. They found that SHGs and small entrepreneurs benefited from online transactions, easier access to savings accounts, and digital loan applications. Their study concluded that digitalisation supported income generation and small business growth.

Discussion

7. Adoption of Digital Tools by PACCS – With KCC Linkage

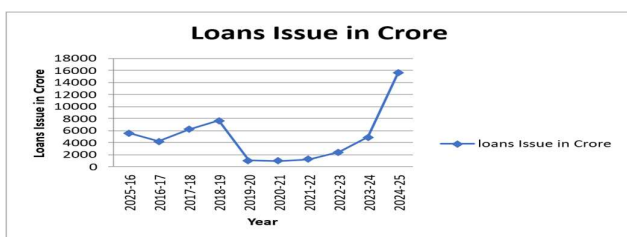
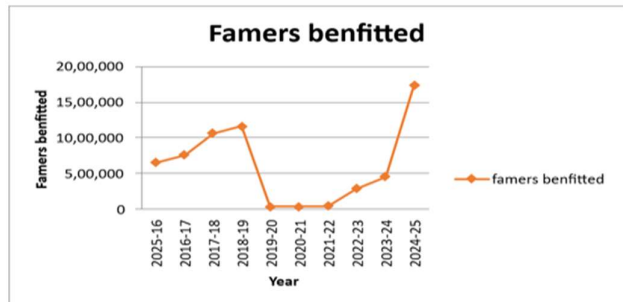
This indicator explains how far PACCS have adopted modern digital tools such as mobile applications, e-passbooks, online payments, and core banking systems. Along with these tools, the digital processing of **KCC (Kisan Credit Card) loans** has become an essential part of PACCS operations. Through digital KCC platforms, farmers can quickly apply for credit, receive approvals without delay, and track their loan status online. The higher adoption of these digital systems indicates that PACCS are modernising their services, reducing paperwork, avoiding calculation errors, and maintaining accurate, real-time records. It also ensures that farmers receive timely KCC limits for cultivation needs, which directly supports their productivity and income.

Table – 1

S.No	Year	Formers benefited	Loan Issue (In Crores)
1	2015-16	6,52,752	5567
2	2016-17	7,62,772	4227
3	2017-18	10,63,524	6220
4	2018-19	11,63,524	7654
5	2019-20	38,531	1,012
6	2020-21	36,532	989.53
7	2021-22	44,531	1,272.23
8	2022-23	2,90,291	2,406
9	2023-24	4,53,305	4,875
10	2024-25	17,37,460	15,543

Source: Tamil Nadu Government Annual Report

Note: Figures in the above table are for the Financial Year 2015 to 2025



Correlations

		Farmers Benefit	Loan Distribution
Farmers Benefitted	Pearson Correlation	1	.951**
	Sig. (2-tailed)		.000
	N	10	10
Loan Distribution	Pearson Correlation	.951**	1
	Sig. (2-tailed)	.000	
	N	10	10

**. Correlation is significant at the 0.01 level (2-tailed).

Explanation of the Correlation

The correlation analysis shows a strong positive relationship between the farmers who benefited and the loan distribution by PACCS in Tamil Nadu. The Pearson correlation value of 0.951 indicates that increases in loan amounts are closely linked with an increase in the number of farmers receiving benefits. This strong association suggests that credit flow plays a significant role in reaching a greater number of farmers. The significance level of $p < 0.01$ confirms that this relationship is statistically reliable. It means the connection between the two variables is not due to chance. As loan disbursement rises, farmer outreach also expands consistently. This pattern highlights the effectiveness of PACCS in delivering financial services. Overall, the results show that higher credit distribution directly improves farmer support and strengthens rural livelihoods.

8 Financial Inclusion of Rural Households – With SHG Linkage

This indicator examines how digital services enable small farmers, women, and marginalised families to gain improved access to formal financial systems. Through digital platforms, rural households can open accounts, receive government benefits, and access credit without delays. A crucial aspect of this inclusion is the support provided to **Self-Help Groups (SHGs)**. Digital linkage with PACCS enables SHGs to obtain loans more quickly, maintain transparent group records, and receive timely subsidy and repayment updates via SMS. When SHGs are linked digitally, women members gain greater financial control, develop improved savings habits, and have easier access to credit for small businesses and livelihood activities. This enhances financial participation and ensures equitable access to resources for all community groups.

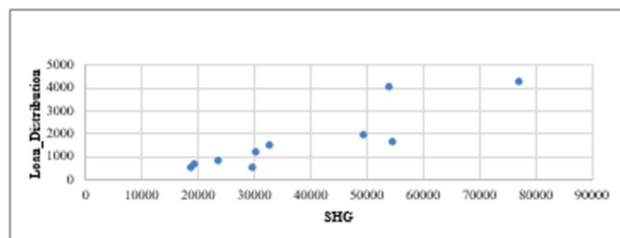
Table 2

SHGs in Tamil Nadu Cooperative Societies and their Loan Distributions

S. No	Year	SHGs in the Tamil Nadu Cooperative Societies	Loan Distribution (Rs. in Crore)
1	2015-2016	29,701	550.08
2	2016-2017	18,844	525.99
3	2017-2018	23,501	810.95
4	2018-2019	30,128	1161.80
5	2019-2020	32,821	1561.80
6	2020-2021	54,434	1699.81
7	2021-2022	19,296	681.65
8	2022-2023	49,356	2,010
9	2023-2024	76,871	4275
10	2024-2025	53,757	4063

Source: Tamil Nadu Government Annual Report

Note: Figures in the above table are for the Financial Year 2015 to 2025



Correlations

Loan Distribution		SHG	
Loan Distribution	Pearson Correlation	1	.890**
	Sig. (2-tailed)		.001
	N	10	10
SHG	Pearson Correlation	.890**	1
	Sig. (2-tailed)	.001	
	N	10	10

**.

Correlation is significant at the 0.01 level (2-tailed).

The analysis (Table 2) reveals a strong and positive correlation ($r = 0.89$) between the number of SHGs formed under cooperative societies in Tamil Nadu and the loan distribution from 2015 to 2025. This value indicates that the loan disbursement also rises whenever the number of SHGs increases. For instance, in 2016–2017, there were only 18,844 SHGs with loans worth ₹525.99 crore; however, by 2023–2024, the number of SHGs had increased to 76,871, and the loan distribution had reached ₹4275 crore. This upward trend clearly establishes the mutual relationship between the two variables. The correlation is statistically significant at the 0.01 level, indicating that the likelihood of this relationship occurring by chance is extremely low. In other words, the result is both reliable and meaningful. The findings highlight that the expansion of SHGs directly increases credit distribution, strengthening financial inclusion in rural Tamil Nadu. Since most SHGs are women-led, this positive association also reflects the contribution of cooperative credit societies towards women's economic empowerment. Access to institutional loans enables women to invest in income-generating activities, improve household welfare, and gain greater confidence in financial decision-making. In this way, the growth of SHGs enhances credit distribution and supports broader goals of women's empowerment and rural development.

9 Member Usage of Digital Services

This indicator examines the frequency with which members utilise the digital services offered by PACCS and their level of comfort with these tools. When members regularly check their balance through mobile apps or e-passbooks, make repayments online, or receive SMS alerts for due dates, it shows that they have accepted digital banking as part of their daily routine. Higher usage also means members no longer depend on staff for small enquiries or transactions, which saves their time and reduces crowding in PACCS branches. Frequent digital usage improves repayment behaviour because members receive

timely reminders and can make payments without travelling long distances. It also helps them plan their finances more effectively, as they can view loan balances, due dates, and subsidy updates instantly. Members who are familiar with these tools gain more confidence in using formal banking services, which increases transparency and reduces misunderstandings. Regular use of digital platforms fosters trust in PACCS because members perceive that the information is accurate, easily accessible, and updated in real-time. Over time, this trust leads to more members adopting online services, using KCC digital applications, taking loans digitally, and relying more on PACCS for their financial needs. This steady shift to digital habits strengthens the relationship between PACCS and its members, supporting overall financial inclusion in rural areas.

10 Reduction in Dependency on Informal Credit

Digital credit facilities offered by PACCS play a significant role in reducing the reliance of rural households on informal lenders. In many villages, people turn to moneylenders because they can obtain money quickly, even though the interest rates are incredibly high. With digital systems in PACCS, loan applications, approvals, and disbursements happen faster, so members do not feel the need to approach moneylenders for urgent financial needs. Through online KCC applications, instant SMS updates, and real-time loan status tracking, members receive credit on time for farming activities such as purchasing seeds, fertilisers, and equipment. When credit is available at the right moment, farmers avoid falling into debt traps created by informal lenders. Digital repayment facilities also make it easier for members to repay loans in small amounts, eliminating the need to visit the society office. Because digital records are transparent, members trust the system more and prefer borrowing from PACCS rather than unregulated lenders. This reduces the financial burden on households, lowers the cost of borrowing, and gives them more control over their income. Families can use the saved money for education, healthcare, small businesses, and household needs. Over time, this shift strengthens formal financial behaviour in rural communities and improves long-term financial security.

11 Impact on Rural Livelihoods

Digitalisation in PACCS has a direct and meaningful effect on the daily lives of rural households. When services become faster and more accurate, farmers and small-scale workers can plan their activities more effectively and earn more without relying on intermediaries. Digital KCC loans reach farmers at the right time, enabling them to purchase seeds and fertilisers before the cultivation season begins. This timely credit alone can determine whether a family earns a profit or incurs a loss

for the entire year. For example, milk pourers in villages benefit greatly when payments are sent directly to their PACCS accounts through digital systems. Instead of waiting for a week or arguing with agents about the rate, members receive the exact price per litre credited to their account on time. This provides them with a steady cash flow, which helps them manage household expenses such as school fees, medicine, or cattle feed without stress. Digital crop insurance and government subsidies also reach members more quickly and directly, bypassing intermediaries. If a farmer faces crop loss due to rain or drought, compensation is credited directly into their account. This protects the family from falling into debt and allows them to prepare for the next season with confidence. Small businesses and SHG women also benefit. When SHG loans are released digitally, women receive funds quickly for activities such as tailoring, running small shops, or purchasing goats and cows. They receive repayment reminders via SMS, which helps improve their credit behaviour and stabilise their business income. Slowly, the household transitions from surviving to progressing—enjoying better food, better schooling, and improved living conditions.

Overall, digitalisation brings reliability, transparency, and speed. These minor but consistent improvements add up to more substantial incomes, reduced financial tension, and long-term livelihood security for rural families.

12 Recommendations

1. Provide Digital Awareness and Training for Members

Many rural members hesitate to use digital services due to a lack of knowledge. PACCS can organise small training sessions on using mobile banking, e-passbooks, online repayment, and KCC digital platforms. Simple demonstrations will increase digital usage and reduce the need for staff assistance.

2. Expand Digital Loan and Insurance Services

PACCS should widen access to online KCC applications, digital crop insurance, and government subsidy tracking. Faster approval and instant updates will enable farmers to plan their cultivation activities promptly, thereby enhancing their income and productivity.

3. Strengthen SHG and Women-Focused Digital Support

Exceptional digital support should be provided for Self-Help Groups and women members, including online loan processing, repayment reminders, and financial literacy programmes. This will help SHGs

manage their accounts better, expand small businesses, and increase household income sustainably.

13 Conclusion

The study reveals that digital transformation in PACCS has become a crucial step in strengthening financial inclusion and supporting rural livelihoods in Tamil Nadu. Digital tools, including mobile apps, e-passbooks, online payments, KCC digital platforms, and SMS alerts, have enhanced the speed, accuracy, and transparency of PACCS services. These changes make formal financial services more accessible for small farmers, women, SHGs, and marginalised households who previously depended on informal credit sources. With timely digital credit, insurance support, and direct benefit transfers, rural families can manage both farming and non-farm activities more effectively. Regular use of digital services also builds greater trust in PACCS and encourages members to participate actively in formal financial systems. As PACCS continues to invest in technology and strengthen digital literacy among its members, it will play an even more significant role in enhancing incomes, mitigating risks, and promoting long-term livelihood security in rural areas.

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