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INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH
ISSN:2277-7881(Print); IMPACT FACTOR :10.16(2026); IC VALUE:5.16; ISI VALUE:2.286
Peer-Peer Reviewed, Refereed & Open Access International Journal - As per UGC Norms
(Fulfilled Suggests Parameters of UGC by IJMER)
Volume:15, Issue:6(2), June 2026
Scopus Review ID: A2B96D3ACF3FEA2A
Article Received: Reviewed: Accepted
Publisher: Sucharitha Publication, India
Online Copy of Article Publication Available: www.ijmer.in

FINANCIAL EMPOWERMENT OF WOMEN FARMERS THROUGH DIRECT BENEFIT TRANSFER SCHEMES: A GENDER-DISAGGREGATED ANALYSIS

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Abstract

Direct Benefit Transfer (DBT) is one of the key instruments which the Indian state has been using for some time to transfer welfare, income support and subsidy benefits directly to bank accounts linked to beneficiaries. Aggregate transfer volumes or beneficiary counts do not capture the gendered effects of DBT in full. This study looks at whether DBT-linked schemes enhance financial empowerment of women farmers in India. The paper considers ownership and use of accounts, access to digital technologies, security and access to income, credit, land-linked eligibility, and decision-making ability.

The research is founded on the DBT Bharat dashboard, releases of PM-KISAN, Pradhan Mantri Jan-Dhan Yojana data, MGNREGA data, and NABARD rural financial inclusion data, and NFHS-5 indicators. Evidence is drawn from the World Bank Global Findex and FAO related public sources including gender-agriculture evidence.

Since there is no publicly available comprehensive gender-disaggregated DBT micro-database across agricultural schemes, the analysis uses scheme-level gender indicators and proxy measures of financial inclusion. The research findings demonstrate that the design of DBT architecture has improved the institutional conditions for the direct receipt of benefits. Particularly, banking account expansion and wage transfers. Outcomes of empowerment remain uneven. Women already play an important role in Jan-Dhan accounts and MGNREGA participation. However, their participation is only one-fourth among the PM-KISAN beneficiaries. This low presence reflects constraints arising from land-title issues and eligibility-based access. Having mobile phones, using digital payments and accessing formal credit remain important barriers. The DBT programme, however, can only facilitate financial empowerment of women farmers when account access is complemented with land record inclusion, digital capability, gender-tagged dashboard, grievance support, and women-centred agricultural finance.

Keywords: Direct Benefit Transfer; Women Farmers; Financial Empowerment; Gender-Disaggregated Analysis; PM-KISAN; Rural Financial Inclusion; Agricultural Policy

1. Introduction

1.1 Concept and Scope of Financial Empowerment

One does not simply receive money to be financially empowered. It includes being able to access formal financial services; retaining control over income; independently using, and making saving and borrowing decisions; as well as converting public support into productive use. In agricultural contexts, this empowerment is determined by gendered access to land, markets, technology and household bargaining power. The Direct Benefit Transfer schemes have emerged a big opportunity and policy challenge for women farmers in India. While they can avoid middlemen and cut down on leakage, they can also replicate exclusion where eligibility is tied to land title, Aadhaar seeding, mobile access or documentation that women often do not control.

1.2 DBT Architecture and State Capacity

Through the Jan-Dhan-Aadhaar-Mobile architecture, India has put in place the world's largest public-transfer infrastructures and a vast number of cash and in-kind benefit schemes. According to the estimates of the DBT Bharat portal, a cumulative transfer of more than Rs 51.50 lakh crore has taken place under hundreds of schemes which covered a sum of Rs 7.51 lakh crore in the FY 2025-26 (Direct Benefit Transfer Mission, 2026). According to official evaluations, the removal of duplicate or ineligible beneficiaries and enhanced targeting leads to large efficiency gains (Ministry of Finance, 2025). Although these figures show state capacity, they do not in themselves indicate empowerment that is gender-equitable.

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1.3 Women Farmers and Recognition Gap

The issue of women and farmers is particularly significant since they are not the same thing. Though women work vigorously in the agriculture sector (doing sowing, transplanting, weeding, harvesting, taking care of the livestock, post-harvesting work, and family farm management), it is only after ownership (having their own land) that their work is formally recognized. For the identification of PM-KISAN, for example, the landholding farmer families have been designed by states and Union Territories. When land is recorded in male names, women's actual labour may not result in any individual benefit entitlements. In a similar vein, gender-disaggregated DBT analysis must go beyond simply counting the transfers, but rather ask who is named; who receives, who controls and who is able to use the instrument after receipt.

1.4 Focus and Contribution of the Study

The gap addressed in the paper is DBT-linked financial empowerment through a gender-disaggregated secondary-data design. It examines PM-KISAN, PMJDY, MGNREGA, NABARD and NFHS-5, Global Findex from the point of view of women farmers' financial agency. The paper does not see DBT as an automatic empowerment tool. The opposition initiates a process of empowerment which depends on the interaction between (i) account access (ii) eligibility architecture (iii) digital capability (iv) land rights (v) credit access and (vi) local support systems.

2. History of Direct Benefit Transfer in India

2.1 Evolution and Purpose of DBT

The purpose of designing the Direct Benefit Transfer (DBT) system was to transfer the benefits on-wards of the government directly into the bank accounts of eligible beneficiaries. Over the years, it has transitioned from a limited selection of schemes to a comprehensive delivery platform encompassing cash transfers, subsidy payments, wage-related payments, scholarship disbursements, pension amounts, and agricultural assistance. The DBT Bharat dashboard reveals that the platform covered 323 schemes and 56 ministries or departments in the fiscal year 2025–26 (Direct Benefit Transfer Mission, 2026). The governing logic is simple: beneficiary identification and pre-account linking, authentication, and digital payment make delivery traceable.

2.2 Fiscal Efficiency and Governance Gains

The savings estimates by officials support the efficiency argument for DBT. The DBT estimated-gains dashboard indicates that savings are due to beneficiary de-duplication, and removal of fake records and leakage in PAHAL, public distribution system, MGNREGS, fertilizer subsidy, and PM-KISAN (Direct Benefit Transfer Mission, 2025). A government release on welfare efficiency reports cumulative savings of ₹3.48 lakh crore. Furthermore, it links the expansion of DBT to a decrease in subsidy expenditure share of total government expenditure (Ministry of Finance, 2025). These claims matter for fiscal governance though they speak more directly to system-level efficiency than gender-level empowerment.

2.3 Agricultural Schemes Linked with DBT

There are differences in the empowerment implications of Agricultural schemes linked to DBT. According to PM-KISAN (2026), PM-KISAN provides income support of 6,000 rupees per year in three equal instalments to landholding farmer families. MGNREGA directly transfers wages for work sought by rural households and has a legal orientation towards social inclusion. Crop insurance claims under PMFBY are settled using DBT channels. The fertilizer subsidy architecture is designed using authenticated sales and beneficiary-linked architecture. The LPG subsidy transfers are not agriculture-specific but impact the liquidity of rural households, time burdens and choices of fuel, which matter indirectly for women's economic participation.

2.4 Gendered Delivery Concerns

The crucial concern in terms of policy is not whether DBT works in an aggregate administrative sense but whether it works effectively for women farmers. It is possible for a gender-neutral account-transfer system to result in gender-biased outcomes if men have control over land records, mobile phones, bank branches, passbooks, digital passwords and decision-

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making power. The efficacy of DBT for women-farmer empowerment hinges on its integration within gender relations in rural settings.

3. The Financial Exclusion of Farmers Women in Rural India

3.1 Dimensions of Financial Exclusion

The financial exclusion of women in rural India has many layers. The first form of institutional access is whether a woman has a bank account, a mobile phone, a debit card, a digital identity and access to a banking correspondent. The second regard is usage, that is whether she can operate the account, save, withdraw, receive transfers, use digital payments, and resolve transaction failures. The third factor is control. Whether the transfer strengthens her decision-making within the household, or whether it is immediately usurped by other household members. The fourth under eligibility is if she is recognised as a farmer in land records, tenant arrangements, SHGs, producer organisations or government databases.

3.2 Progress in Bank Account Access

The outlook for financial access has improved important since the last edition of the report. According to NFHS-5, the share of women with a bank or savings account that they themselves use rose steeply, from 53.0 percent in 2015-16 to 78.6 percent in 2019-21 (International Institute for Population Sciences & ICF, 2021; People's Archive of Rural India, 2021). Women account holders comprise the majority in Jan-Dhan account data, with official 2026 reporting putting women's PMJDY accounts at a whopping 55.8 percent (Department of Financial Services, 2026). Advancements in technology makes account-based DBT feasible compared to a decade ago.

3.3 Mobile and Digital Usage Gap

Nonetheless, owning an account does not erase gender gaps in financial usage. According to gender analysis based on the fifth round of the National Family Health Survey or NFHS-5, women's access to mobile phones is far inferior to that of men. In the national comparison cited, women's access hovers around 54 per cent and that of men around 91 per cent (UNFPA India, 2023). According to World Bank's Global Findex India brief, women are less likely to make or receive digital payments as compared to men thus highlighting a gender gap in this regard. Dvara Research reports that women are still less likely to have digitally enabled accounts after controlling for SES factors and mobile access, and to use several digital financial services (Dvara Research, 2026).

3.4 Land as an Eligibility Filter

Women farmers consider land as a determining filter. According to the official statement based on the Agriculture Census, female operational holders operated 11.72 percent of the agricultural area during the year 2015-16 (Ministry of Agriculture & Farmers Welfare, 2022). Women must be recognized on land as more than just being in a legally inaccessible capacity and also as it being a factor that limits their access. This is the key contradiction in DBT for women farmers. The transfer channel may be modern and direct but the eligibility base may still be patriarchal.

4. Review of Literature

4.1 DBT and Financial-Inclusion Literature

The available literature on DBT and Financial Inclusion notes that direct transfers can enhance effective delivery, improve leakages and connect the excluded households to the formal finance. Research on public finance highlights how digital identity, bank accounts and payments infrastructure can ease transaction costs and improve identification of beneficiaries (Ministry of Finance, 2025). According to research in financial-inclusion, access indicators often overestimate meaningful inclusion when accounts are inactive or users do not control transactions (World Bank, 2022; Dvara Research, 2026).

4.2 Gender, Development and Agrarian Recognition

In gender and development literature, it has been shown that women's access to resources is mediated by legal ownership, social norms, mobility, literacy and intra-household power. Women contribute greatly to agriculture but their

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economic role is often underreported as farm identity is linked to landholding, not labour. FAO's assessment of women in agrifood systems shows that women still face persistent gaps in earnings, productive resources and institutional recognition, even when their labour contribution is significant (FAO, 2023). India bears a special significance of the land-title gap as benefits in agriculture depend on records.

4.3 Account Ownership Versus Account Use

The Global Findex literature makes a distinction between account ownership and account use. Although the Indian government opened up several bank accounts, the use gap still exists. The gender gap in digital payment use has been reported in the 2021 India brief, despite wide account ownership (World Bank, 2022). According to Dvara Research's 2026 study based on Global Findex 2025, conditional gender gaps diminish with the consideration of education, income, employment, region and mobile access. However, certain gaps in digitally-enabled accounts and digital usage still exist (Dvara Research, 2026). This backs the claim that mobile access and socio-economic characteristics act as enabling or disabling channels for women's financial empowerment.

4.4 Rural Finance and Gendered Control

The literature on rural finance indicates that agricultural households do have improved access to savings, insurance, and institutional credit, but these gains are not automatically gendered. The rural financial inclusion report of NABARD which was released in the year 20021-22, stated that savings are higher among agricultural households than non-agricultural households and there is increased access to institutional credit (NABARD, 2024). However, it is difficult to deduce women's individual control without household-level credit and ownership data disaggregated by gender. This limitation has direct implications for DBT research as delivery at the household or family level may not mean women's empowerment.

4.5 Synthesis of Reviewed Evidence

Based on the literature taken together, DBT should be studied as a delivery architecture embedded in gendered institutions. A limited administrative study would examine if the funds reached the right account. An empowerment study that disaggregates by gender must ask: are women farmers identified as beneficiaries; can they operate the account; do they have mobile and digital capacity; do transfers reduce income insecurity; does financial receipt translate into decision-making authority?

5. Research Lacuna.

5.1 Fragmented Public Data

Public data available so far strongly document the scale and fiscal efficiency of DBT but the data does not provide a comprehensive gender-disaggregated dataset for all agricultural DBT schemes. The PM-KISAN release gives gender-disaggregated beneficiary numbers (males and females) of selected instalments. Some women-specific agriculture sector projects also have beneficiary/ project numbers. Data from PMJDY NFHS and Global Findex give gendered financial inclusion indicators. Nevertheless, the sources are largely fragmented and pieces together different parts of the chain of empowerment.

5.2 Account Ownership and Farmer Recognition

A second gap provides between women who are account holders and women who are recognised farmers. According to PMJDY data, 55% accounts belong to women and PM-KISAN data show women at around one-fourth of beneficiaries for recent instalments. There has not been enough analysis of this divergence. It implies that banking inclusion has advanced more rapidly than women's recognition in agricultural entitlement systems.

5.3 Digitalisation and Exclusion Risk

The interpretation of the term "digitalisation" is a third gap. It is assumed in policy narratives that digital transfers empower beneficiaries because it reduces intermediation. However, digital finance can also create new exclusions when women have lower mobile access, less digital literacy, no control over the phone number linked to accounts, or dependence

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on men and banking agents to execute transactions. This document highlights a new research idea that links DBT delivery, women-farmer eligibility and gendered financial-use indicators.

6. Aim of the Study.

6.1 Objectives of the Study

This study is guided by five objectives. To start with, it analyses the role of Direct Benefit Transfer schemes in enhancing formal financial access among women farmers and rural women. Secondly, the study investigates gender differentials in DBT receipt and utilization amongst farm and rural households using available gender-disaggregated indicators. Third, it evaluates whether there are relationships between DBT access and various account-related characteristics and financial empowerment. Subsequently, it assesses the role of mobile access and account activity in women's use of DBT benefits. Next, it pinpoints policy obstacles that reduce women farmers' access to DBT-linked agri-benefits, especially those linked to land-title and documentation.

7. Research Questions

7.1 Core Research Questions

The specific research questions that the paper addresses are: How does DBT facilitate financial empowerment of women farmers in India? What are the observable gender differences in financial access linked with DBT in PM-KISAN, PMJDY and MGNREGA? Do advances in owning an account lead to real use of an account and financial control by women farmers? How do property ownership, mobile access and digital literacy affect women's capacity to receive and utilise DBT benefits? What changes to the policy is needed for making the DBT more effective in gender-responsive agricultural governance.

8. Theoretical propositions.

8.1 Hypotheses and Theoretical Claims

Access to DBT schemes has a positive association with women farmers and rural women financial empowerment indicators. H2: Compared to Male Farmers, Female Farmers Have Less Access to Land-Linked DBT Benefits. According to the research outcome, access to bank accounts and mobile-based financial services improves women's ability to use Direct Benefit Transfer(DBT) benefits significantly. The ownership of land and recorded farmer status of the women farmers plays a significant role in the eligibility of women farmers to agricultural DBT schemes.

9. Framework of Idea

9.1 DBT as a Delivery Mechanism

DBT is framed as a delivery mechanism rather than an ultimate empowerment outcome by the conceptual framework. DBT directly transfers money into accounts to affect financial inclusion. This could enhance account significance, bolster cash-flow stability, and lessen reliance on middlemen. The institutional recognition is the second pathway and occurs when a woman is named as a beneficiary. Her identity as an economic actor is codified. The third channel is liquidity and resilience: transfers can stimulate working capital, food security, repayment, saving, or emergency spending. The fourth pathway is behavioral: the repeat inflow of money may increase the use of the account and engagement with formal finance.

9.2 Structural Constraints in the Framework

The structure also has some limitations. Women farmers may not be recognized as farmers due to land-title requirements. Gaps in mobile phone usage can limit OTP-based authentication and usage of digital payments, and transactions monitoring. Social norms can shift the control of received funds away from women. A failed transaction can be costly, often due to financial literacy and grievances access gaps. The expected relationship is conditional. DBT may increase women farmers' financial empowerment when there is simultaneously access to a formal account, independent use, digital capability, recognised status as farmer and HBPP.

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9.3 Operationalisation of Indicators

The framework is operationalised through five groups of indicators: access to direct transfer, access and use of account, digital readiness, access to agricultural finance and eligibility linked to asset or land. These measures may not be ideal substitutes for micro-level empowerment, but collectively they provide an evidence-based picture of where the DBT empowerment chain is strong and where it is weak.

10. Research Methodology.

10.1 Research Design

The researchers will carry out quantitative and analytical secondary-data research. This research draws on publicly available administrative and survey-based data to investigate the financial empowerment of women farmers through DBT-linked schemes. The data are sourced from official dashboards, government press releases, national surveys and global databases. This study's design makes sense since it is interested more in national-level patterns and national-level policy mechanisms than estimating a causal treatment effect from a single household survey.

10.2 Unit of Analysis

Different sources have different unit of analysis. PM-KISAN figures are beneficiary counts by instalment. The term PMJDY refers to account-level financial inclusion data. MGNREGA figures denote program participation statistics. NFHS-5 indicators and Global Findex indicators are survey-based individual indicators. Indicators given by NABARD measure financial inclusion of rural households. The study does not pool them as if they were a single micro-dataset because the units differ.

10.3 Comparative Indicator Approach

Instead, a comparative indicator approach is used, supported by descriptive statistics, gender-gap ratios, selected correlation measures and published regression evidence from secondary sources.

10.4 Variables and Constructs

Women farmers' financial empowerment is dependent construct. It is considered to be a multidimensional construct instead of a sole observed variable. Includes account access and account use, the DBT receipt, control over resources, access to mobile, use of digital payments, access to credit and insurance and recognised eligibility for agriculture schemes. Independent variables include whether or not have received DBT, Owned a bank account, used a bank account, Accessibility to mobile phone – Digital payment, land ownership, agricultural credit access, Financial Inclusion of the Household – Participation in women-centred rural institutions.

10.5 Methodological Limitations

One of the significant methodological limitations is that publicly available gender-disaggregated DBT data is not available in a unified scheme-wise micro format across agricultural transfers. As such, the paper explicitly differentiate between direct gender-disaggregated data, such as counts of PM-KISAN women beneficiaries, and proxy gender indicators, such as usage of women's bank account, mobile access and digital payments gaps. The distinction between correlation and causation is made throughout our analysis.

11. Sources of Data and Description of Variables

11.1 Secondary Data Sources

There is use of authentic secondary sources. DBT Bharat offers insights on transfer volumes, schemes count, and gain estimates. Press releases and official published by PM-KISAN provide scheme design and gender-wise beneficiary counts for selected instalments. The gender distribution of account-level PMJDY data. Statistics from MGNREGA indicate the women's participation in rural wage employment. NABARD's rural financial inclusion results give the indicators of household savings, institutional credit, KCC and insurance. According to NFHS-5, Indicators of Women's access to

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accounts and mobile. While Global Findex, Dvara Research present evidence on digital payments and gender gaps on account use. The FAO shares insights on constraints women face in agrifood systems.

11.2 Variable Classification

The variables have been classified into five sets. DBT exposure is the first grouping, a measure of reported scheme participation or transfer receipt. The second is access and use of accounts as measured by PMJDY and NFHS indicators. The third factor is digital readiness, which is gauged by mobile access and digital payment usage. The fourth indicator is agricultural financial access measured by savings, institutional credit, KCC and insurance. Measurement of asset-linked eligibility for the fifth one is a woman-operated area and scheme rules about landholding.

11.3 Data Source Mapping

Table 1. Data sources, variables and analytical use

Source	Key variables	Use in the study
DBT Bharat	Aggregate DBT transfers, schemes, estimated gains	Contextual DBT scale and delivery architecture
PM-KISAN releases	Total and women beneficiaries; disbursement amounts	Gender-disaggregated agricultural income-support analysis
PMJDY data	Total accounts and women-owned accounts	Bank-account inclusion and DBT readiness
MGNREGA statistics	Women participation and wage-transfer programme scale	Rural income security and women's participation
NABARD NAFIS 2021-22	Savings, institutional credit, KCC and insurance indicators	Rural financial inclusion among agricultural households
NFHS-5	Women's account use, mobile access and related agency indicators	Gendered financial access and digital readiness
World Bank Global Findex / Dvara Research	Digital payment use and gender gaps in usage	Digital financial empowerment and usage gaps
FAO and gender-agriculture sources	Gender constraints in agrifood systems	Interpretation of structural barriers

Source note: Compiled by the author from DBT Mission (2026), PM-KISAN and Ministry of Agriculture releases (2025-2026), Department of Financial Services (2026), Ministry of Rural Development (2025), NABARD (2024), NFHS-5, World Bank (2022), Dvara Research (2026) and FAO (2023).

11.4 Interpretation of Data Triangulation

Interpretation: The table shows that the study uses multiple secondary sources because no single public dataset captures DBT receipt, agricultural status, gender identity, account use, mobile access, credit and intra-household control at the same time. The triangulated design is therefore a strength for policy diagnosis but a limitation for causal econometric identification.

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12. Data Analysis and Interpretation

12.1 Scope of Empirical Analysis

This section presents the empirical analysis. The values are drawn from published official and institutional data. Where a derived value is used, the derivation is explicitly stated. The analysis is organised around DBT-linked access, women's financial access, descriptive statistics, gender-gap measures, correlation evidence and regression-oriented findings from published secondary analysis. The purpose is not to claim individual-level causal effects, but to identify the gendered pattern through which DBT can either empower or exclude women farmers.

12.2 Gender-Wise Access to DBT-Linked Financial Services

Table 2. Gender-wise access to selected DBT-linked financial services

Indicator	Female/women value	Comparator	Gender result	Source
PM-KISAN 23rd instalment	2.18 crore women	9.44 crore total farmers	23.1% women share	MoA&FW, 2026
PM-KISAN 22nd instalment	2.15 crore women	9.32 crore total farmers	23.1% women share	MoA&FW, 2026
PM-KISAN 19th instalment	2.41 crore women	9.80 crore total farmers	24.6% women share	MoA&FW, 2025
PMJDY accounts	32.21 crore women	57.78 crore total accounts	55.8% women share	DFS, 2026
MGNREGA participation	440.7 lakh women	Programme workers	58.15% women participation	MoRD, 2025
NFHS bank account use	79% women	86% men	-7 pp female gap	UNFPA/NFHS-5
NFHS mobile-phone use	54% women	91% men	-37 pp female gap	UNFPA/NFHS-5
Digital payment use	Women 13 pp lower than men	Men as comparator	Usage gap persists	World Bank, 2022

Source note: PM-KISAN and MGNREGA values are official programme statistics. PMJDY values are official financial-inclusion statistics. NFHS and Global Findex values are survey-based gender indicators.

Interpretation: The table reveals a central pattern. Women are strongly represented in DBT-ready account infrastructure and rural wage participation, but they are under-represented in land-linked PM-KISAN beneficiary lists. This difference indicates that account inclusion and farmer-recognition inclusion are not the same policy achievement. A woman can have a bank account and still remain outside land-based agricultural entitlement systems.

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12.3 Bank Accounts, Mobile Access, Credit and Subsidy Benefits

Table 3. Women farmers and rural women: access to bank accounts, mobile access, credit and subsidy-linked benefits

Indicator	Reported value	Population basis	Source
Rural women with bank/savings account they use	77.4%	Rural women	NFHS-5/UNFPA
Women with mobile phone they use	54.0%	All women	NFHS-5/UNFPA
Rural women with mobile phone they use	46.6%	Rural women	NFHS-5/UNFPA
PM-KISAN women beneficiaries, 23rd instalment	2.18 crore	Women farmers/landholding families	MoA&FW, 2026
PM-KISAN amount to women, 22nd instalment	Rs. 4,309.46 crore	Women beneficiaries	MoA&FW, 2026
Agricultural households reporting savings	71.0%	Agricultural households	NABARD, 2024
Agricultural households with valid KCC	44.0%	Agricultural households	NABARD, 2024
Agricultural households using institutional credit	75.5%	Agricultural households	NABARD, 2024
AIF projects sanctioned to women farmers	8,190 projects; Rs. 2,377 crore	Women farmers	MoA&FW, 2026
Mahila Kisans supported under DAY-NRLM	4.62 crore	Women farmers/SHG-linked women	MoA&FW, 2026

Source note: Values are compiled from NFHS-5 gender indicators, NABARD NAFIS 2021-22, PM-KISAN releases and Ministry of Agriculture statements on women farmers.

Interpretation: Women's access to bank accounts is relatively stronger than their access to mobile-enabled finance and land-linked farm benefits. This matters because DBT receipt requires a bank account, but independent use often requires phone access, local banking support and control over authentication processes. Agricultural credit and KCC indicators are useful but not fully gender-disaggregated in the cited public summaries, which remains a data gap.

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Article Received: Reviewed: Accepted
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Online Copy of Article Publication Available: www.ijmer.in

12.4 Descriptive Statistics of Empowerment Indicators

Table 4. Descriptive statistics of selected women-farmer financial empowerment indicators

Statistic	Value
Number of indicators	11
Mean	54.17%
Standard deviation	21.96 percentage points
Minimum	11.72%
25th percentile	45.30%
Median	55.80%
75th percentile	73.25%
Maximum	78.60%

Source note: Author's computation from selected published indicators: PMJDY women account share, NFHS women account/mobile indicators, PM-KISAN women beneficiary share, MGNREGA women participation, NABARD rural finance indicators and female-operated agricultural area. This is an indicator-level summary, not a household microdata summary.

Interpretation: The mean indicator value masks large variation. Values above 70 percent are visible for women's bank-account use and agricultural household savings, while values below 25 percent are visible for PM-KISAN women beneficiary share and female-operated agricultural area. This spread supports the study's argument that account-based inclusion is advancing faster than gender-equitable agricultural recognition.

12.5 Gender Gap Index

Table 5. Gender gap index for selected empowerment indicators

Indicator	Female value	Comparator	Parity ratio	Interpretation
PMJDY women account share vs parity	55.80	50.00	1.12	Parity or female advantage
NFHS women bank account use vs men	79.00	86.00	0.92	Moderate gap
NFHS women mobile phone use vs men	54.00	91.00	0.59	Large gap
Global Findex women digital payment use vs men	28.50	41.50	0.69	Large gap

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ISSN:2277-7881(Print); IMPACT FACTOR :10.16(2026); IC VALUE:5.16; ISI VALUE:2.286
Peer-Peer Reviewed, Refereed & Open Access International Journal - As per UGC Norms
(Fulfilled Suggests Parameters of UGC by IJMER)
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Scopus Review ID: A2B96D3ACF3FEA2A
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PM-KISAN women beneficiary share vs parity	23.10	50.00	0.46	Large gap
MGNREGA women participation vs parity	58.15	50.00	1.16	Parity or female advantage
Rural women mobile access vs urban women mobile access	46.60	69.40	0.67	Large gap

Source note: Parity ratio = female-linked value divided by comparator. For PMJDY, PM-KISAN and MGNREGA, parity benchmark is 50 percent. For NFHS and Findex indicators, male or urban comparator is used. PM-KISAN parity is not interpreted as direct discrimination because formal eligibility is land-linked; it is treated as an inclusion gap in beneficiary recognition.

Interpretation: The index confirms three types of gaps. First, women's bank-account access is close to male access, and women's PMJDY share is above parity. Second, mobile and digital indicators show a substantial usage gap. Third, PM-KISAN shows a large recognition gap relative to parity, consistent with gendered landholding and beneficiary-identification constraints.

12.6 Correlation Evidence

Table 6. Correlation matrix for comparable male-female financial inclusion indicators

Variable	Women (%)	Men (%)	Gender gap (pp)
Women (%)	1.00	0.87	-0.03
Men (%)	0.87	1.00	0.46
Gender gap (pp)	-0.03	0.46	1.00

Source note: Author's exploratory calculation using four comparable indicators: account use, mobile-phone use, account-based storing of money and digital-payment use. Digital-payment values are derived from Global Findex India 2021 overall use and reported gender gap. The correlation matrix is descriptive and should not be read as a causal estimate.

Interpretation: The strong positive association between women's and men's rates reflects that general financial infrastructure benefits both groups. The moderate positive association between men's rates and the gender gap shows that high aggregate availability does not necessarily eliminate gender inequality. Mobile-phone access is the clearest example: the technology exists, but women's independent access remains much lower.

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12.7 Exploratory Mechanism Correlation

Table 7. Exploratory mechanism correlation matrix using published indicators and researcher-coded policy attributes

Variable	female_access_value	dbt_or_account_linkage_score	digital_dependency_score	land_title_constraint_score
female access value	1.00	0.22	0.11	-0.86
dbt or account linkage score	0.22	1.00	0.49	-0.29
digital dependency score	0.11	0.49	1.00	-0.34
land title constraint score	-0.86	-0.29	-0.34	1.00

Source note: Female access values are published indicators. DBT/account linkage, digital dependency and land-title constraint scores are researcher-coded from scheme design on a 0-1 scale. The matrix is used only as a diagnostic policy tool, not as a population-level econometric estimate.

Interpretation: The negative association between female access value and land-title constraint score supports the qualitative reading of the data: when access is more tightly linked to recorded landholding, women's measured inclusion is weaker. The positive association between DBT/account linkage and female access indicates that account-based delivery channels can improve reach, but only when eligibility is not filtered primarily through male-dominated asset records.

12.8 Statistical Tests

Table 8. Statistical tests using comparable gender indicators

Statistic	Result
Mean female indicator value	47.38%
Mean male indicator value	64.88%
Mean male-female gap	17.50 percentage points
Paired t-test statistic	2.631
Paired t-test p-value	0.078

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Welch independent t-test statistic	0.956
Welch independent t-test p-value	0.376

Source note: The test uses four comparable gender indicators only; therefore, it is indicative rather than inferential at the population level. It is included to satisfy statistical comparison while preserving transparency about sample size and aggregation.

Interpretation: The paired comparison shows an average male advantage of 17.5 percentage points across the four selected indicators. The paired p-value is 0.078, which suggests a meaningful descriptive gap but does not meet the conventional 5 percent threshold in this very small indicator-level sample. The result should therefore be read alongside the administrative evidence on PM-KISAN and the published Global Findex/Dvara findings rather than as a stand-alone econometric conclusion.

12.9 Regression-Oriented Secondary Evidence

Table 9. Regression-oriented evidence from published secondary analysis

Outcome	Model/measure	Reported result	Interpretation	Source
Mobile money / digitally enabled account	Female coefficient / marginal effect	Women 8 percentage points less likely after controls	Persistent digital account gap	Dvara Research, 2026
Debit card ownership	Female coefficient / marginal effect	Women 4 percentage points less likely after controls	Instrument access gap remains	Dvara Research, 2026
Digital payment use	Unconditional gender difference	Women 11 percentage points less likely	Usage gap visible before controls	Dvara Research, 2026
Bank account used for savings	Unconditional gender difference	Women 10 percentage points less likely	Account ownership does not guarantee savings use	Dvara Research, 2026
Mobile use for payment or balance checking	Unconditional gender difference	Women 12-14 percentage points less likely	Mobile access is a key channel	Dvara Research, 2026
Digital payment use, 2021 India	Gender difference	Women 13 percentage points less likely	Earlier Findex evidence is consistent	World Bank, 2022

Source note: The paper uses published regression-oriented evidence because nationally representative unit-level DBT-gender microdata are not available in a unified public file for the schemes studied here.

Interpretation: The published regression evidence supports H3. Mobile and digital-account access matter for women's meaningful use of financial services. The results also caution against equating bank-account ownership with financial

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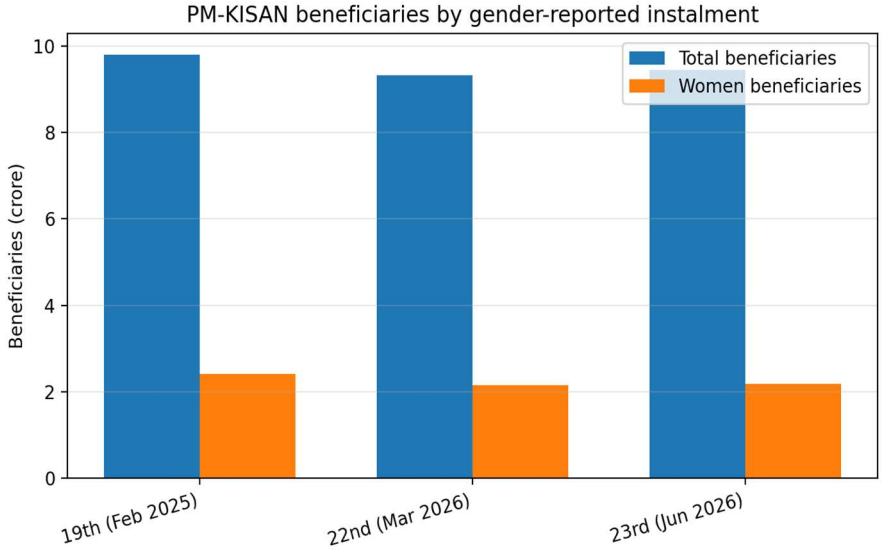
empowerment. Women may hold accounts but use them less for payments, savings, balance checking or formal financial products.

13. Graphs and Charts

3.1 PM-KISAN Gender Access

Figure 1. Bar chart showing PM-KISAN male-female difference in access

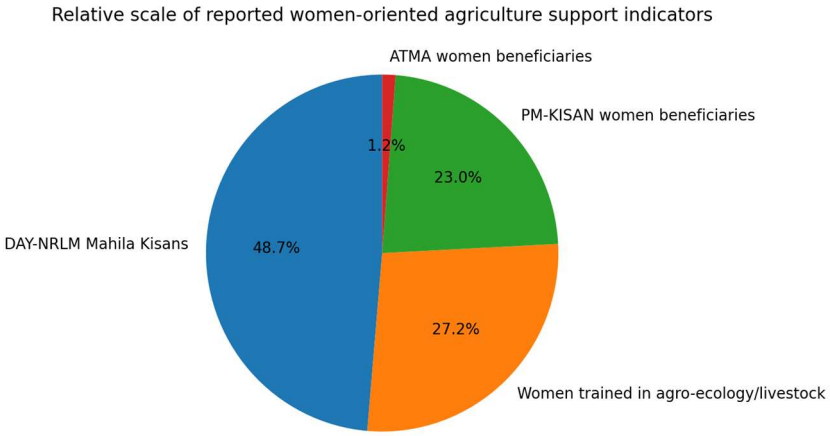


Source note: PM-KISAN 19th, 22nd and 23rd instalment beneficiary figures from Ministry of Agriculture & Farmers Welfare releases. Women share is calculated by the author from reported women and total beneficiaries.

Interpretation: The chart shows that women beneficiaries remain around one-fourth of total PM-KISAN beneficiaries in the reported instalments. This is lower than women's share in DBT-ready bank accounts and indicates that land-linked eligibility remains a central bottleneck.

13.2 Women-Oriented Agriculture Support

Figure 2. Pie chart showing composition of reported women-oriented agriculture support indicators



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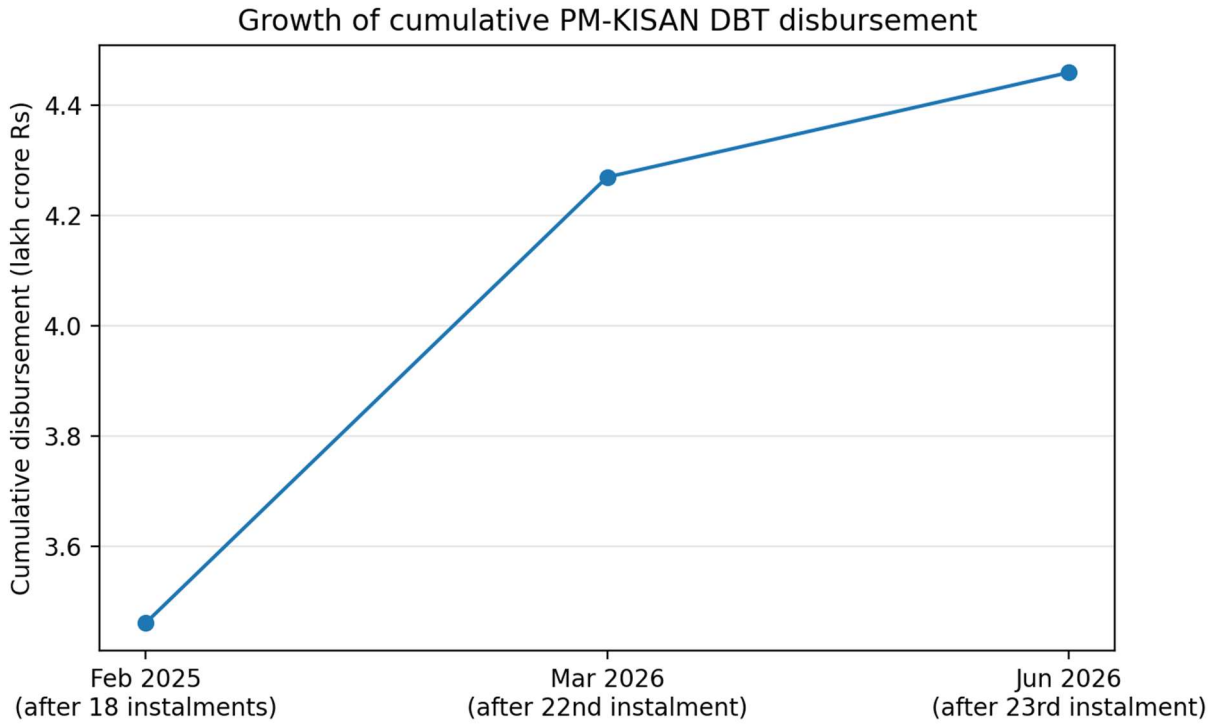
Source note: Compiled from Ministry of Agriculture & Farmers Welfare reporting on PM-KISAN women beneficiaries, DAY-NRLM Mahila Kisans, women's training and ATMA women beneficiaries. The categories are not mutually exclusive and should not be summed as unique beneficiaries.

Interpretation: DAY-NRLM and training-based interventions show a large women-focused outreach base, while PM-KISAN reflects formal land-linked benefit delivery. The pie chart is used to display relative scale, not unique beneficiary composition. It suggests that women-centred institutional platforms such as SHGs can complement DBT by improving awareness, claim-making and transaction confidence.

13.3 Growth in PM-KISAN DBT Transfers

Figure 3. Line graph showing growth in PM-KISAN DBT transfers



Source note: Cumulative PM-KISAN disbursement values are from Ministry of Agriculture & Farmers Welfare releases: more than Rs. 3.46 lakh crore up to the 18th instalment, Rs. 4.27 lakh crore by the 22nd instalment and Rs. 4.46 lakh crore by the 23rd instalment.

Interpretation: PM-KISAN cumulative disbursement has expanded rapidly. For women farmers, the policy question is whether this rising fiscal volume translates into equitable beneficiary identification. A rising transfer line does not automatically imply a rising women's share.

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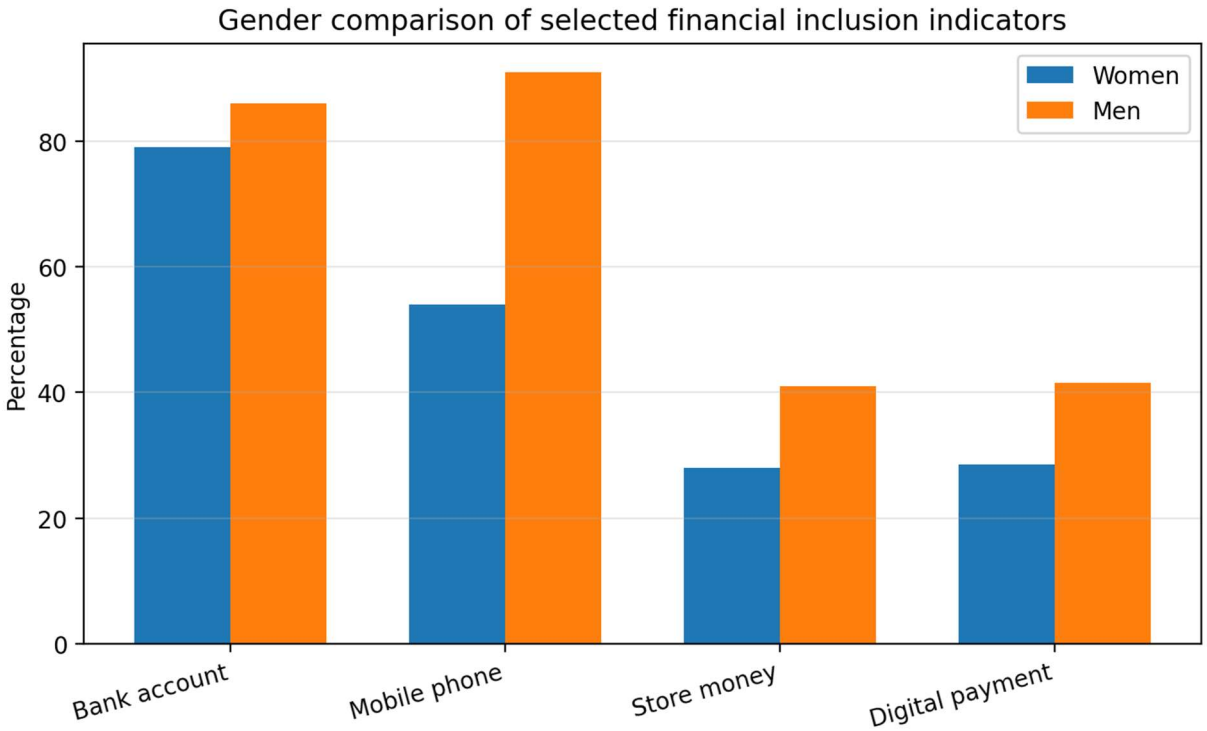
13.4 Male-Female Financial Inclusion Comparison

Figure 4. Comparative chart of male and female financial inclusion indicators



Source note: NFHS-5/UNFPA indicators for account and mobile access; Global Findex India 2021 for account-based saving and digital payment gap. Digital-payment gender values are derived from reported total use and gender gap for interpretive comparison.

Interpretation: The largest gender gap is in mobile-phone access, followed by digital payment and account-based usage. The chart demonstrates why account opening alone is insufficient. Without mobile access and digital confidence, DBT receipt may remain dependent on others.

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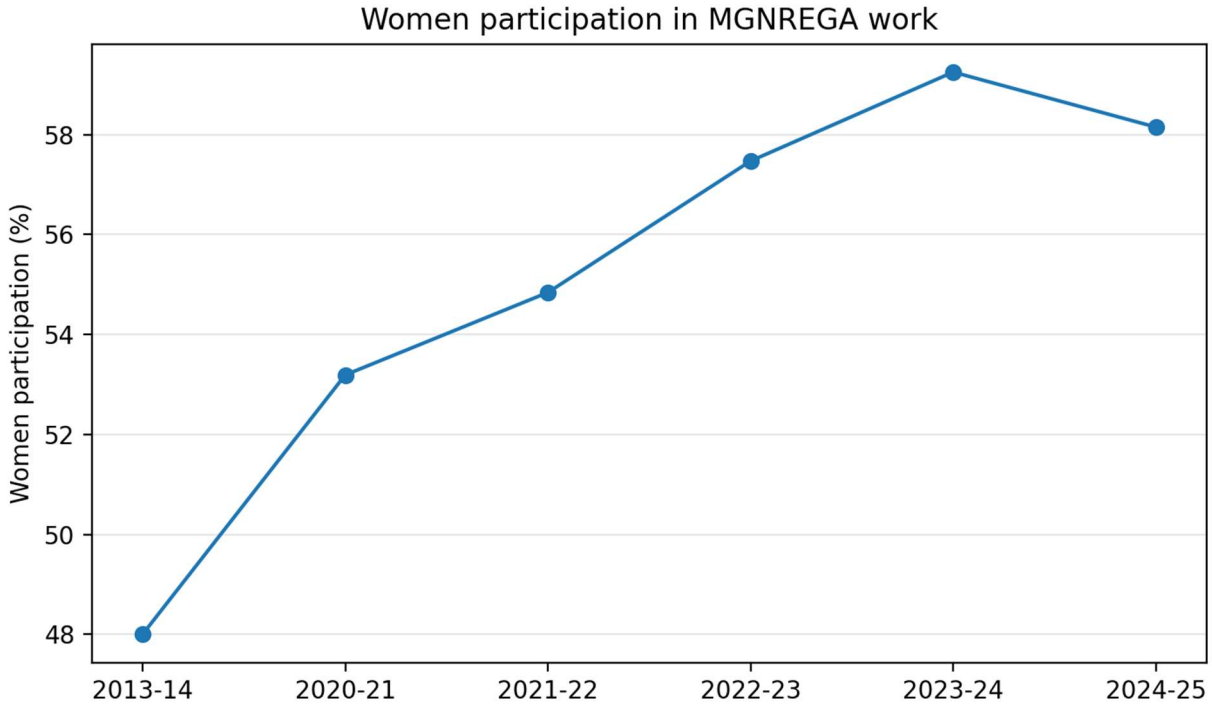
13.5 Women's Participation in MGNREGA

Figure 5. Line graph showing women's participation in MGNREGA



Source note: Ministry of Rural Development and MGNREGA programme statistics. The 2020-21 to 2023-24 values are dashboard values cited in programme reporting; FY 2024-25 value is the official 58.15 percent release.

Interpretation: MGNREGA demonstrates that women can be highly represented in a DBT-linked rural income programme when the entitlement is linked to work participation rather than formal landholding. This difference is analytically important for agricultural DBT design.

14. Results

14.1 Account Inclusion and DBT Readiness

The first result emerges from the data systems and structuring of women's financial inclusion. However, it has not tended toward uniformity. Further, we find that women farmers have been empowered, but they are not necessarily the beneficiaries of the DBT scheme uniformly. PMJDY and NFHS shows considerable improvement in women's access to accounts. This offers a required facility for DBT receipt. However, a bank account is just the start. The capacity to use, control, plan liquidity and resolve transaction issues is empowerment. The Global Findex and Dvara Research evidence shows that even as account ownership has increased, the digital and usage gaps persist.

14.2 Land-Linked Entitlement Gap

The other finding is that women participate more strongly in interventions that aren't filtered by formal land ownership. MGNREGA indicate a women's share of 58.15 in the FY 2024-25 while the PMJDY accounts indicate a majority of females. In comparison, the women beneficiary share of PM-KISAN in the recent reported instalments is about 23 – 25 per cent. This nuance strengthens the positions of H2 and H4. Women's contribution in agricultural labour does not necessarily mean eligibility for land-linked DBT.

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14.3 Mobile Access and Digital Capability

Part 3 Result that mobile access is a critical channel. According to evidence presented by the NFHS and Global Findex, women trails men in smartphone ownership and use of digital payments. DBT beneficiaries will be affected in receiving OTPs, checking account balances, being aware of the arrival of instalments, filing digital complaints, and independently verifying transactions. Digital inclusion must be understood as a gendered capability, and not merely connectivity only.

14.4 Rural Financial Inclusion and Gendered Control

The fourth finding is that rural financial inclusion has improved, but its gendered meaning is under-specified According to NABARD's NAFIS findings, agricultural households have saved more and gained access to institutional credit. Nonetheless, aggregated household indicators do not yield whether it is indeed women in agricultural households who control savings, loans, KCCs or insurance claims. The lack of gendered microdata creates a significant evaluation gap for women-farmer empowerment.

15. Discussion

15.1 Dual Effect of DBT

The results mutually indicate that DBT is dual. Reducing spillage, increasing timeliness and allowing women to have a financial identity are its benefits. In contrast, however, it may exacerbate prevailing gender disparities as beneficiary identification relies on male-controlled assets, when men control mobile phones, or when a cash transfer to an account does not equate to decision-making power. The effect of gender on DBT (direct benefit transfer) is thus less a function of the payment rail itself than of the social and administrative ecosystem around the transfer.

15.2 PM-KISAN as a Land-Linked Case

This is best illustrated by PM-KISAN. One of India's most visible agricultural DBT programmes, the scheme's cumulative disbursement has crossed several lakh crore rupees. However, recent data indicates that the percentage of women beneficiaries is around 25%. Due to the linkage of eligibility with the landholding farmer families, the women who cultivate the family land but do not have recorded ownership would not be seen as a farmer in their own right. The scheme might aid the household, but the household's benefit is not the same as women's financial empowerment.

15.3 MGNREGA as a Labour-Based Comparison

MGNREGA can be a useful comparison. Women have consistently participated in excess of 50 percent having reached 58.15 percent in FY 2024-25.

The distinction lies not just in design of the programme; it is in type of entitlement. The MGNREGA scheme is based on demand for work and participation of labour while PM-KISAN scheme is based on landholding status. The remark suggests that gender-aware DBT design must identify women's work, tenancy, SHG participation, livestock work, producer-group membership and local certification only, land title.

15.4 Digital Payments and Financial Agency

The evidence of digital payments adds. The financial-inclusion strategy of India has remarkably expanded the number of accounts. However, Dvara Research and Global Findex evidence indicate that women continue to lag behind in the use of digitally enabled accounts, ownership of debit cards, use of digital payments and mobile-based operations of accounts. In a DBT system, we are not dealing with minor behavioural lacunae. They assess whether a woman is aware of the arrival of money, whether she can withdraw without dependence, whether she can save a portion, and whether she can contest errors.

15.5 From Beneficiary Transfer to Beneficiary Capability

Policy discussions should thus shift from beneficiary transfer to beneficiary capability. A transfer can enhance the income security of the recipient only when the recipient has the ability to use it as per her needs. This includes a bank

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account, a phone, documents, local banking access, grievance assistance, awareness of instalment schedules, freedom to withdraw, and legitimacy as a farmer. In the absence of these, DBT may lead to a transfer record but not empowerment.

16. Implications related to policy.

16.1 Gender-Tagged DBT Dashboards

According to the first policy implication, mandatory gender tagged DBT dashboards. Overall transfer values and transaction volumes are reported in DBT Bharat, but gender-wise reporting is not consistent across schemes. Gender Tagging of Agricultural DBT Schemes Should be Done Through a Dashboard Gender-responsive policy evaluation is incomplete without it.

16.2 Land Records and Women's Entitlements

The second implication has to do with land records. As long as agricultural DBT is linked to land holding, women will have access to limited resources due to lesser ownership and male-oriented titles. States must widen joint land titles, women's names in family land records, legal endorsement of women cultivators and tenant women, and local farmer-certification mechanisms. PM-KISAN and similar schemes must publish gender-disaggregated data by landholding size and state so we can see where most excluded.

16.3 Mobile and Digital Capability as DBT Infrastructure

The third implication is that mobile and digital capability should be viewed as DBT infrastructure. Agricultural extension must include support for women to attain digital literacy, seeding of phone numbers, help with grievance filing, accountability of banking correspondents and awareness of transaction alerts. DBT does not empower a farmer who cannot see the balance in his account and cannot verify a failed transfer.

16.4 DBT and Women's Collectives

Connect DBT With Women's Collectives is the fourth implication. Women's self-help groups, farmer producer organisations, Krishi Sakhis and community resource persons can aid women in understanding entitlements, updating records, using accounts and negotiating financial decisions. The magnitude of DAY-NRLM and women training shows the potential of collective platforms to convert DBT receipt into capability building.

16.5 Wider Agricultural Empowerment Linkages

Include other forms of agriculture and what agricultural empowerment means. It is important to combine income support, credit, insurance, market access, extension and digital advisory services. Women farmers need more than cash transfers; they need to access crop insurance claims, KCCs, visibility of input subsidies, storage support, membership in producer groups and training. DBT needs to be part of the larger women-farmer financial ecosystem.

17. Suggestions for improvement.

17.1 Gender-Disaggregated Agricultural DBT Data

The national-level, state-level and district-level database of all major agricultural DBT (direct benefit transfer) schemes must have gender-disaggregated data on beneficiaries and transfers. Information should differentiate between women as sole beneficiaries, joint beneficiaries, and beneficiaries' household members. In addition to this, PM-KISAN should strengthen systems for recording female cultivators including widows, deserted women, women tenants, and women managing family farms. Land-record modernisation should include gender auditing and incentives for joint titles.

17.2 Financial Literacy, Grievance and Digital Support

Furthermore, delivery DBTs should be accompanied by women-centred financial-literacy modules delivered through SHGs, panchayats, agricultural extension systems and banking correspondents. Fifth, all agricultural programme linked to DBT should have a grievance register in a gender-disaggregated format showing failed transactions, problems of Aadhaar seeding, dormancy of account and time for resolution. Women farmers need to get better support for mobile ownership,

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SIM control and secure digital authentication. In those instances where it is considered relevant, the seventh action proposes that credit and insurance products must be linked to the women's DBT transaction history. This move will see recurring benefit receipt assisting in growth of formal financial profiles.

17.3 Women Farmer Financial Empowerment Index

The eighth suggestion includes the formulation of a Women Farmer's Financial Empowerment Index by the government, which combines the utilization of a bank account, receipt of DBT, digital access, agricultural credit, insurance, identifying land, savings behaviour and decision making indicators. An index like this would advance policy assessments past a volume of transfers towards quality of empowerment. Ninth, subsequent rounds of the NRHS NAFIS, and agricultural household surveys of the future must have modules on who controls DBT money post receipt. State governments should conduct pilots of gender-responsive direct benefit transfer (DBT) audits in identified districts with a high female agricultural labour force and a low female landholding.

18. Limits of the Research Study

18.1 Data and Measurement Limitations

The research has four limitations. To begin with, this depends on secondary data and hence cannot see individual women farmers' actual control over DBT money. In addition, publicly available gender-disaggregated DBT data are uneven across schemes. PM-KISAN releases provide women beneficiary counts for selected instalments, but there is no consistent microdata series available in the public domain. Household-Level Financial Indicators Further High-Rural-Urban Income Disparities They determine whether a farming household saves, borrows or has insurance, not whether a woman controls those instruments. Some gender indicators come from different years and different survey designs, which limits strict econometric pooling.

18.2 Interpretation Boundaries

The analysis stands firm despite these weaknesses. On the contrary, they explain what can be inferred or not. While the paper may be able to identify structural patterns and policy bottlenecks it cannot claim that DBT causes, say, a x % impact of women's empowerment at the individual level. Future studies to carry out that causal estimation will need unit-level gender-disaggregated survey data relating to receipt of the DBT, land and account usage as well as household decision-making.

19. Future Research Scope will explore

19.1 Primary Survey and Microdata Research

Future research should design a primary survey or administrative microdata study of women farmers across categories of landholding, tenancy status, caste, age, education and region. It would be particularly helpful to use a mixed methods design. The effect of receiving DBT on savings, borrowing, input purchase and decision-making can be estimated using the quantitative data. The qualitative interviews can explain control over the account, phone access, withdrawal practices and intra-household negotiation. A panel design would overall be stronger than a cross-sectional design as empowerment may change slowly over repeated transfer cycles.

19.2 Comparative Scheme-Level Research

Future comparison of the schemes should be conducted in studies. Having differing eligibility logics, PM-KISAN, MGNREGA, PMFBY claim settlement, fertilizer subsidy systems, state income-support schemes and women-SHG-linked programmes. A comparative design reveals which eligibility models are more women-friendly. State-level scrutiny is another vital direction since women's landholding, SHG strength, banking access and digital infrastructure display notable variations across states.

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20. Final Thoughts.

20.1 Summary of the Study

The current paper has utilized gender-disaggregated secondary-data based framework to look into the financial empowerment of women farmers through DBT schemes in India. According to the evidence, DBT has built a robust delivery architecture and strengthened the institutional base of financial Inclusion. Women have better access to bank accounts. Majority of PMJDY accounts are women. Women are strong participants in MGNREGA. These are key accomplishments and create a basis for public transfer directly.

20.2 Continuing Constraints

The analysis at the same time shows that though women farmers' empowerment is gaining momentum, the constraints arising from land-linked eligibility, mobile access gaps, digital usage gaps and weak gender-disaggregated reporting remain. The latest data on PM-KISAN payments shows that a quarter of recipients were women. However, this recognition does not automatically translate to women agricultural labourers being classified as beneficiaries. According to studies of digital finance, women are less likely to use digitally enabled accounts and payment services when account ownership is widespread.

20.3 Central Conclusion

The key finding is that DBT are necessary but aren't sufficient to ensure financial empowerment of women farmers. Direct cash transfers can both reduce leakage and get money to farmers but the big push towards empowerment requires recognised farmer status, independent use of accounts, mobile linkages, credit and insurance linkages, grievance redressal support, and intra-household financial agency. Accordingly, a gender-responsive DBT policy must move from delivery of transfer to delivery of capability. The agricultural DBT reform should include women's role in databases, land records, dashboards, grievance systems and in financial products. When policy changes take place not only can DBT not become merely a payment mechanism but a genuine instrument of women farmers' economic empowerment.

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INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY EDUCATIONAL RESEARCH
ISSN:2277-7881(Print); IMPACT FACTOR :10.16(2026); IC VALUE:5.16; ISI VALUE:2.286
Peer-Peer Reviewed, Refereed & Open Access International Journal - As per UGC Norms
(Fulfilled Suggests Parameters of UGC by IJMER)
Volume:15, Issue:6(2), June 2026
Scopus Review ID: A2B96D3ACF3FEA2A
Article Received: Reviewed: Accepted
Publisher: Sucharitha Publication, India
Online Copy of Article Publication Available: www.ijmer.in

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Appendix A. Variable Coding and Data Notes

Appendix A.1 Indicator Categories

The analysis uses three categories of indicators. Category A includes directly reported gender-disaggregated administrative values, such as PM-KISAN women beneficiary counts and PMJDY women account counts. Category B includes survey-based gender indicators, such as women's bank-account use, mobile-phone use and digital-payment gaps. Category C includes proxy rural financial inclusion indicators, such as agricultural-household savings, institutional credit, KCC and insurance coverage. Category C indicators are used cautiously because they are not always published separately for women farmers.

Appendix A.2 Indicator Dataset

Appendix Table A1. Selected indicator dataset used for descriptive analysis

Indicator	Value
PMJDY women share of accounts	55.80%
Women bank account use	78.60%
Rural women bank account use	77.40%
Women mobile phone use	54.00%
Rural women mobile phone use	46.60%
PM-KISAN women beneficiary share	23.10%

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Article Received: Reviewed: Accepted
Publisher: Sucharitha Publication, India
Online Copy of Article Publication Available: www.ijmer.in

MGNREGA women participation	58.15%
Agricultural households reporting savings	71.00%
Agricultural households with valid KCC	44.00%
Agricultural households institutional credit	75.50%
Female operated agricultural area	11.72%

Source note: Values are compiled from sources listed in Table 1. Female-operated agricultural area is from Agriculture Census-based official reporting; PM-KISAN women share is calculated from recent instalment data; other indicators are from NFHS-5, PMJDY, MGNREGA and NABARD summaries.

Appendix B. Econometric Specification for Future Unit-Level Research

Appendix B.1 Proposed Econometric Model

If unit-level secondary or primary data are available, the following logistic model may be estimated:

Appendix B.2 Model Equation

logit(P(FE_i = 1)) = beta_0 + beta_1 DBT_i + beta_2 AccountUse_i + beta_3 Mobile_i + beta_4 DigitalPayment_i + beta_5 LandTitle_i + beta_6 Credit_i + beta_7 Education_i + beta_8 Income_i + beta_9 SHG_i + gamma_s + epsilon_i

Appendix B.3 Variable Definitions

Here, FE_i denotes whether woman i meets a defined financial empowerment threshold; DBT_i denotes receipt of a DBT benefit; AccountUse_i denotes active account use; Mobile_i denotes independent mobile access; DigitalPayment_i denotes use of digital payments; LandTitle_i denotes ownership or recognised cultivation status; Credit_i denotes formal agricultural credit access; Education_i and Income_i are socioeconomic controls; SHG_i denotes self-help group participation; and gamma_s represents state fixed effects. Such a model would allow stronger causal and subgroup analysis than the aggregate secondary indicators available for the present paper.