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Women entrepreneurship in agriculture: Contributions, constraints, and policy interventions – a review

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Abstract

Women constitute a substantial and indispensable segment of the agricultural workforce in India, accounting for approximately 42% of total agricultural labour and 76.95% of rural women engaged in the sector as of 2023-24. Despite their critical contributions across the entire crop production cycle from land preparation to post-harvest handling, women remain systematically marginalized from entrepreneurial opportunities, resource ownership and policy recognition in agriculture. This review article comprehensively examines women's entrepreneurship in agriculture, covering three interconnected dimensions: contributions, constraints and policy interventions. The review synthesizes evidence from peer-reviewed literature, government reports, institutional assessments and case studies to document the diverse and evolving roles of women as agri-entrepreneurs in organic farming, food processing, dairy, poultry, horticulture and agri-allied enterprises. Key constraints identified include limited land ownership (only 12.8-14% of operational holdings owned by women), restricted access to formal credit and extension services, socio-cultural barriers, time poverty from the dual burden of farm and domestic responsibilities and inadequate digital and market access. The review evaluates the impact of major policy interventions including the Mahila Kisan Sashaktikaran Pariyojana (MKSP), Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM), Pradhan Mantri Mudra Yojana (PMMY), Kisan Credit Card (KCC) scheme and ICAR-led institutional programs. The paper concludes with evidence-based policy recommendations for creating an enabling environment that transforms women from invisible, unpaid contributors to recognized, empowered agri-entrepreneurs. Closing the gender gap in Indian agriculture could increase agricultural productivity by 20-30% and substantially reduce rural poverty.

Keywords: Women Entrepreneurship, Agricultural Extension, Feminisation of Agriculture, Self-Help Groups, Farmer Producer Organizations, MKSP, DAY-NRLM, Gender Gap, Rural Women Empowerment, Agri-Allied Enterprises

Introduction

Agriculture in India is not merely an economic activity, it is the foundation of rural livelihoods, food security and cultural identity. Within this vast sector, women play an enormous and disproportionately under-recognized role. From sowing seeds and tending crops to managing livestock, processing food and marketing produce, women perform an estimated 60-80% of the total agricultural labour in many parts of India (FAO, 2023). Yet, paradoxically, they own less than 14% of agricultural land, receive less than 20% of agricultural extension services and have historically been classified as “agricultural labourers” rather than “farmers” in policy and administrative frameworks (MANAGE, 2023).

Entrepreneurship in agriculture, defined broadly as the initiation, management and risk-taking involved in farm-based and agri-allied enterprises for economic gain has been increasingly recognized as a critical pathway for rural development and poverty reduction. Women agri-entrepreneurs contribute to food security, household nutrition, rural employment and economic growth, often more efficiently than their male counterparts due to their reinvestment of income into family welfare (World Bank,

2023). Studies consistently demonstrate that closing the gender gap in access to agricultural resources could increase women's farm productivity by 20-30%, reducing total hunger by 100-150 million people globally (FAO, 2023).

India's agricultural landscape is witnessing a significant structural shift driven by male out-migration to urban centres. As men leave rural areas for non-farm employment, women are increasingly becoming the de facto managers of family farms. This phenomenon termed the “feminisation of agriculture” is documented across multiple studies, with approximately 33% of rural males having migrated for work (Census of India, 2011; NSSO, 2019). Women left behind manage critical farm operations, make input and marketing decisions and sustain family nutrition, yet these contributions remain largely invisible in official statistics and policy frameworks.

Against this backdrop, the present review article undertakes a comprehensive examination of women's entrepreneurship in Indian agriculture, structured around three core dimensions: (i) the multifaceted contributions women make to agricultural enterprise, (ii) the multi-layered constraints that limit their participation and growth and (iii) the policy interventions both existing and proposed that can create an

enabling environment for women agri-entrepreneurs to thrive.

The specific objectives of this review are:

- (a) To document the varied and evolving roles of women in agricultural entrepreneurship across diverse subsectors.
- (b) To systematically analyse the structural, social, economic and institutional constraints impeding women's agri-entrepreneurship.
- (c) To evaluate the design, implementation and outcomes of key policy and programmatic interventions targeting women farmers.
- (d) To derive evidence-based recommendations for strengthening women's entrepreneurial participation in Indian agriculture.

2. Conceptual framework: Women's agri-entrepreneurship

2.1 Defining women agri-entrepreneurship

Women agri-entrepreneurship refers to the engagement of women in initiating, organizing, managing and bearing the risk of agricultural and agri-allied enterprises with the objective of generating income and creating value. This encompasses a broad spectrum of activities:

Tier 1 - Farm-level enterprises: Crop production, horticulture, floriculture, vegetable cultivation, organic farming and seed production.

Tier 2 - Livestock-based enterprises: Dairy, poultry, goatery, fisheries, beekeeping and sericulture.

Tier 3 - Value addition and processing: Food processing, agro-processing, packaging, storage and quality certification.

Tier 4 - Market-linked enterprises: Agri-retail, direct marketing, e-commerce of farm products and agri-service provision.

Tier 5 - Knowledge and technology enterprises: Agricultural extension services, agritech product demonstration and rural consultancy.

2.2 The feminisation of agriculture (PM IAS, 2023)

The "feminisation of agriculture" is a well-documented global phenomenon (FAO, 2011). In India, it has been driven by three interrelated processes: (i) male migration from rural to urban areas for better-paid non-farm employment; (ii) agrarian distress that reduces the economic viability of farming for male heads of households; and (iii) expansion of women's roles through government-supported livelihood programs.

Census and PLFS (Periodic Labour Force Survey) data reveal compelling statistics: the Female Labour Force Participation Rate (FLFPR) in India rose from 23.3% in 2017-18 to 41.7% in 2023-24, with rural women driving this increase primarily through agricultural engagement (PLFS, 2024). Approximately 76.95% of rural women workers are engaged in agriculture and allied sectors.

2.3 The gender-productivity gap

The gender-productivity gap in agriculture, defined as the difference in farm productivity between male and female managed farms is well established in the literature. In India, women-managed farms on average show 10-20% lower productivity than male-managed farms, not due to inherent differences in capability, but because of differential access

to productive resources: land, credit, information, technology and inputs (NCAER, 2023). The Food and Agriculture Organization (FAO) estimates that eliminating this gap through equal resource access could increase agricultural output in developing countries by 2.5-4%.

3. Contributions of Women to Agricultural Entrepreneurship

3.1 Labour and crop production

Women's labour contribution to crop production in India is both extensive and essential. They perform approximately 60-80% of crop production work including seed selection, nursery management, transplanting, weeding, fertiliser and pesticide application, harvesting and post-harvest handling activities. This contribution is highest in labour-intensive crops such as paddy, vegetables and tea, where women's participation can reach 90% of total labour days.

3.2 Livestock and Allied Sectors

Women are the primary caregivers of livestock in most Indian farming households, managing feed preparation, milking, healthcare and sanitation. In the dairy sector which contributes approximately Rs. 9.5 lakh crore annually to the Indian economy women manage an estimated 70-80% of on-farm dairy activities. ICAR-CIWA (Central Institute for Women in Agriculture) has documented numerous cases where women have transformed backyard poultry and goatery units into profitable agri-enterprises with targeted training and institutional support (ICAR-CIWA, 2023).

3.3 Organic farming and sustainable agriculture

Women have been at the forefront of the organic farming movement in India, particularly in states like Sikkim, Uttarakhand, Himachal Pradesh, Andhra Pradesh and Kerala. Their deep traditional knowledge of local plant varieties, soil management practices, composting and natural pest control has given them a competitive advantage in organic crop production.

Notable examples include:

- **Rubi pareek (Rajasthan):** Converted a 12-acre family farm to organic production, established a vermicompost and Azolla production unit and trained over 15,000 farmers in organic farming practices (Better India, 2023).
- **Andhra pradesh community-managed natural farming (APCNF):** Implemented through women SHGs, with over 7 lakh women farmers adopting ZBNF practices across 6 lakh hectares. The program has reduced input costs by 50-60% and improved household food and nutritional security (GoAP, 2023).

3.4 Food processing and value addition

Women's involvement in agro-processing and food value addition represents one of the most dynamic and economically impactful domains of women's agri-entrepreneurship:

- **Millet-based products:** Women's collectives in Rajasthan, Karnataka and Tamil Nadu are producing and marketing millet-based health foods through e-commerce platforms.
- **Case Study Jaithri Foods (Kerala):** A KVK-mentored women's collective in Thrissur District established a

comprehensive food processing unit handling mango, jackfruit and coconut-based products, scaling from cottage-level production to a formal enterprise with regular institutional buyers (ICAR, 2023).

3.5 Horticulture and high-value crops

Women entrepreneurs are increasingly moving into high-value horticulture crops such as vegetables, flowers, fruits and spices which offer higher returns per unit area than staple crops and align with women's smaller landholding sizes. Flower cultivation, turmeric and ginger cultivation and off-season vegetable production in polyhouse structures are prominent areas of women's entrepreneurial engagement.

3.6 agritech and digital entrepreneurship (YourStory, 2024)

Women trained as “Krishi Sakhi” (agriculture friends), “Pashu Sakhi” (livestock friends) and “Bank Sakhi” (banking friends) under DAY-NRLM and MKSP are functioning as micro-entrepreneurs who deliver agricultural extension services, input supply and financial services to fellow farmers at the village level (NAARM, 2023).

3.7 Women's contribution to household food and nutritional security

Studies consistently show that when women control agricultural income, a larger proportion is spent on food, children's education and healthcare compared to male-controlled income (FAO, 2023; World Bank, 2023). Women's role in maintaining backyard nutrition gardens, producing diverse food crops and managing livestock provides a nutritional safety net for rural households.

4. Constraints in women's agri-entrepreneurship

4.1 Land ownership and tenure insecurity

Land is the fundamental productive asset in agriculture and the primary collateral for formal credit (Landesa, 2023) ^[13]. However, women's access to land remains severely constrained in India. According to the Agricultural Census (2015-16), only 12.8% of operational landholdings are held by women (Drishti IAS, 2023) ^[3]. The figure from NSSO data places women's land ownership at approximately 13-14% of rural women nationally (NSSO, 2019) and (SPRF India, 2023).

Barriers to women's land ownership:

- **Legal barriers:** Despite progressive legislation, the Hindu Succession Act (Amendment, 2005) giving daughters equal inheritance rights most land transfers continue through patrilineal inheritance norms, bypassing women's legal entitlements.
- **Administrative barriers:** Land records are predominantly registered in the names of male household heads.
- **Consequences:** Without land title, women cannot access institutional credit, do not qualify as “farmers” under many government schemes, cannot avail PM-KISAN income transfer and have limited bargaining power.

4.2 Access to institutional credit and finance

The Kisan Credit Card (KCC) scheme is largely inaccessible to women farmers due to the land collateral requirement. As of 2023, women hold only about 30% of KCC accounts and even these are often in joint names with male household members (RBI, 2023).

Microfinance through SHG-Bank linkage has partially addressed this gap. As of 2024, DAY-NRLM has mobilized over 10 crore rural women into SHGs with a cumulative credit disbursement exceeding Rs. 9 lakh crores (Root Capital, 2023). However, SHG credit is typically limited in scale (Rs. 50,000-Rs. 5 lakhs per member) and may be inadequate for capital-intensive agri-enterprises (NABARD, 2023).

4.3 Access to agricultural extension services (SEWA Federation, 2023)

Key data on gender gaps in extension:

- Women receive less than 20% of agricultural extension and training support (Ministry of Agriculture, 2023).
- Female extension workers constitute less than 15% of the total extension workforce nationally (MANAGE, 2023).
- Training programs are rarely scheduled at times or locations convenient for women, who are constrained by domestic responsibilities.

4.4 Socio-cultural constraints

- **Mobility restriction:** Many women face restrictions on movement outside the village, limiting their access to markets, banks, input dealers and training centres.
- **Decision-making authority:** Despite being primary farm managers, women often lack formal decision-making authority over land use, crop selection and expenditure.
- **Time poverty:** The “double burden” of agricultural labour and unpaid domestic work severely constrains women's time and energy for entrepreneurial activities. Rural women work 12-16 hours per day on combined farm and domestic activities (ICAR-CIWA, 2023).
- **Social stigma:** Women entering traditionally male-dominated agri-enterprise domains face social stigma and resistance.

4.5 Technological and digital divide

- The gender digital divide in India: Men's internet usage is 67% higher than women's in rural areas (GSMA Mobile Gender Gap Report, 2023).
- Only 27% of rural women own a smartphone, compared to 49% of rural men (Statista, 2023).
- Awareness and adoption of agricultural mobile applications, e-commerce platforms and digital payment systems is very low among women farmers.

4.6 Market access and linkage constraints

Women face multiple barriers in accessing agricultural markets:

- **Transportation:** Limited access to personal or public transportation restricts women's ability to transport produce to markets.

- **Market infrastructure:** Agricultural markets (APMCs) have traditionally been male-dominated spaces.
- **Price discovery:** Women's limited access to market information means they are more likely to sell at farm gate to intermediaries.
- **Bargaining power:** Without collective organization, individual women farmers have limited bargaining power.

4.7 Skill gaps and low literacy

National Family Health Survey (NFHS-5, 2019-21) data indicate that 32.4% of women aged 15-49 are illiterate in rural areas. These literacy gaps limit women's ability to fill government forms, understand contract terms, maintain enterprise records and navigate formal financial systems.

4.8 Climate change and environmental vulnerability

Women farmers, particularly those dependent on rainfed agriculture and natural resources, are disproportionately vulnerable to climate change impacts. Women's lower asset base (no land, fewer savings) means they have limited capacity to recover from climate shocks, creating a vicious cycle of vulnerability and constrained entrepreneurial risk-taking.

5. Policy interventions for women's agri-entrepreneurship

5.1 Mahila kisan sashaktikaran pariyojana (MKSP) (Taylor & Francis, 2023)

The Mahila Kisan Sashaktikaran Pariyojana (MKSP) is the most significant dedicated policy intervention for women farmers in India, implemented as a sub-component of DAY-NRLM since 2011 (Himaajeevika, 2023). Key features and outcomes:

- **Skill training:** Millions of women have been trained in sustainable agricultural practices natural farming, integrated pest management, composting and water management.
- **Community institutions:** Village Organizations (VOs) and Cluster-Level Federations (CLFs) have been built on top of SHG foundations.
- **Productivity gains:** MKSP-supported farms have reported 15-30% improvement in crop yields associated with reduced input costs (PIB, 2023).
- **Coverage:** As part of DAY-NRLM, which has mobilized over 10 crore rural women into 89 lakh SHGs, MKSP has achieved national scale (NRLM, 2024).

5.2 Deendayal antyodaya yojana - National rural livelihoods mission (DAY-NRLM)

DAY-NRLM is India's flagship rural poverty reduction program, explicitly focused on women as the primary beneficiaries:

- **Bank linkage:** SHG-Bank Linkage Programme has enabled women SHGs to access formal credit at subsidized interest rates (7% per annum with interest subvention).

- **Revolving funds:** Community investment funds (CIF) distributed to SHGs enable timely internal credit to members for agricultural investments.
- **Enterprise promotion:** NRLM's Startup Village Entrepreneurship Programme (SVEP) and Rural Mart initiatives support women-led micro-enterprises.
- **Digital integration:** e-Shakti and Jan Dhan Yojana linkages have brought millions of women into the digital financial ecosystem.

5.3 Pradhan Mantri Mudra Yojana (PMMY)

The Pradhan Mantri Mudra Yojana (PMMY), launched in 2015, provides collateral-free loans up to Rs. 10 lakh to non-corporate micro and small enterprises. As of 2023-24, approximately 68% of total PMMY loans have been disbursed to women borrowers, totalling over Rs. 20 lakh crores since inception (MoF, 2024).

Loan categories:

- **Shishu:** Up to Rs. 50,000 (startup or very small enterprises)
- **Kishore:** Rs. 50,001 to Rs. 5 lakh (growing enterprises)
- **Tarun:** Rs. 5 lakh to Rs. 10 lakh (established enterprises)

5.4 Kisan Credit Card (KCC) and Financial Inclusion

Efforts to make KCC more accessible to women include: (i) relaxing land collateral requirements for women-only groups; (ii) extending KCC to livestock farmers (traditionally women-dominant); and (iii) simplified application processes through PM Jan Dhan Yojana linkages. The government's 2020 expansion of KCC to fisheries and animal husbandry workers has potentially benefited a significant number of women.

5.5 ICAR Institutional programs for women

ICAR-CIWA (Central Institute for Women in Agriculture, Bhubaneswar): The only ICAR institute exclusively dedicated to women in agriculture, ICAR-CIWA conducts research on women's roles and constraints, develops gender-sensitive agricultural technologies and implements field outreach programs.

KVK (Krishi Vigyan Kendra) Network: KVKs across India conduct training and demonstration programs specifically for women farmers in enterprise development, food processing technology and quality standards. ICAR institutes have also developed ergonomically designed, lightweight farm tools for women to reduce drudgery.

5.6 Agricultural extension reforms for gender inclusion

Krishi Sakhi Programme: Under NRLM, women trained as Krishi Sakhis (agriculture community resource persons) serve as para-extension workers in their villages. Over 3 lakh Krishi Sakhis are operational nationally (PIB, 2024).

Digital extension platforms: Mobile-based advisory services (mKisan, Kisan Suvidha, Digital Krishi) are increasingly being designed with voice-based, vernacular-language interfaces to improve usability for low-literacy women.

5.7 Land rights and tenure reforms

- Joint land titling policies: States including Odisha, Bihar and Chhattisgarh have introduced policies mandating joint titling for land distributed under government schemes.
- Women-only land distribution: Some states have reserved a proportion of land distributed under land reform programs exclusively for women-headed households.
- PM-KISAN inclusion: Advocacy efforts are underway to amend PM-KISAN eligibility to include women who manage farms but do not hold land titles.

5.8 Role of farmer producer organizations (FPOs) in promoting women

The promotion of 10,000 Farmer Producer Organizations (FPOs) under the central government scheme (2020-2025) has created significant opportunities for women's collective agri-entrepreneurship. Many state governments and NABARD have established targets for women-only or women-majority FPOs.

Notable example: The Odisha Millet Mission, operating through women's SHG-FPO linkages, has revived millet cultivation across the state and enabled women farmer groups to market nutritious millet products to institutional buyers, online marketplaces and export markets.

5.9 Stand-up india scheme

The Stand-Up India scheme facilitates bank loans between Rs. 10 lakh and Rs. 1 crore to at least one-woman borrower per bank branch for greenfield enterprises, including agro-processing, food manufacturing and rural trade.

5.10 Policies for digital and market access

- Free or subsidized smartphone distribution to rural women SHG members (implemented in states including Rajasthan, Jharkhand and Andhra Pradesh).
- E-NAM (electronic National Agricultural Market): Platform enabling online trading of agricultural produce, providing women with price discovery and direct market access.
- One District One Product (ODOP): Promotes locally distinctive products many of which are women-manufactured through branding, packaging and GI tag support.

6. Case studies in women's agri-entrepreneurship

6.1 Andhra pradesh community-managed natural farming (APCNF)

The APCNF program, launched in 2016, is one of the world's largest agroecology transitions, implemented entirely through women's SHG networks. As of 2023, over 7 lakh women farmers across 6 lakh hectares have adopted Zero Budget Natural Farming (ZBNF) practices. Outcomes: reduced average input costs per acre from Rs. 10,000 to Rs. 4,000; improved crop yields by 15-25%; and enhanced women's leadership and decision-making.

6.2 Odisha Millet Mission (Odisha Millet Mission, 2023)

The Odisha Millet Mission (OMM), operating since 2017, has revived traditional millet cultivation through women's SHG and FPO networks. The mission has brought over 2

lakh hectares back under millet cultivation, created 500+ women-managed millet value chain enterprises and linked women-led FPOs to institutional buyers, modern retail chains and export markets.

6.3 Kudumbashree (Kerala)

The Kudumbashree mission has mobilized 45 lakh women across Kerala into a network of collective enterprises. Kudumbashree women collectively cultivate over 50,000 hectares of leased land under group farming. The program includes 3.5 lakh registered micro-enterprises spanning food processing, dairy, goatery and agri-input supply and has provided over Rs. 5,000 crores in micro-credit to member households (Kudumbashree Mission, 2023) ^[12].

6.4 Mahila kisans of jharkhand (JSLPS, 2023)

The Jharkhand State Livelihood Promotion Society (JSLPS) has organized Mahila Kisans (women farmers) in tribal areas into agriculture-linked SHG federations. Outcomes include 300% increase in vegetable cultivation area per household, significant reduction in seasonal hunger and women accessing KCC and government subsidy schemes for the first time.

7. Key findings from the review

7.1 Positive Trajectory, Persistent Gaps: Women's participation in agri-entrepreneurship has increased significantly, but structural gaps particularly in land ownership, credit access and extension coverage persist (CDPP, 2023).

7.2 SHGs and FPOs as Critical Enablers: Collective action through Self-Help Groups and Farmer Producer Organizations has emerged as the most effective institutional mechanism for enabling women's agri-entrepreneurship (Extension Journal, 2023).

7.3 Mismatch Between Policy Design and Implementation: Several well-intentioned policies have underperformed due to inadequate outreach, complex administrative processes and gender-insensitive implementation.

7.4 Technology as a Double-Edged Sword: Digital technologies offer transformative opportunities but the gender digital divide means that without active intervention, technology may deepen existing inequalities.

7.5 Nutrition and Food Security Multiplier: Women-managed agricultural enterprises have a significantly larger household food security and nutritional impact due to women's reinvestment of income into family food and health.

8. Recommendations for policy and practice

8.1 Land Rights Reform: Accelerate implementation of joint titling policies for all government-distributed land. Land-record digitization should include women's names by default in all new registrations.

8.2 Gender-Responsive Credit Products: Design agricultural credit products that use alternative collateral

(crop records, SHG membership, livestock insurance) to enable women without land titles to access institutional credit.

8.3 Feminisation of Extension Services: Double the proportion of women extension workers in the agriculture department within 5 years. Mandate gender sensitivity training for all male extension workers.

8.4 Strengthen MKSP and DAY-NRLM: Increase budgetary allocation to MKSP to cover at least 50% of rural women farmers nationally. Improve monitoring mechanisms with sex-disaggregated outcome indicators.

8.5 Promote Women-Led FPOs: Set a mandatory target of at least 30% of the 10,000 FPO program to be women-only or women-majority FPOs.

8.6 Digital Literacy and Access: Implement dedicated digital literacy programs for rural women farmers, with smartphone and internet access provision linked to SHG membership.

8.7 Reduce Drudgery: Accelerate development and dissemination of ergonomic, low-cost farm tools designed for women through ICAR, KVKs and CHC networks.

8.8 Market Infrastructure: Develop women-friendly market infrastructure in agricultural markets dedicated women-vendor zones, safe waiting areas and childcare facilities.

8.9 Recognition as Farmers: Amend PM-KISAN, crop insurance and agricultural subsidy eligibility criteria to include women who are de facto farm managers, using alternative documentation in lieu of formal land title.

8.10 Research and Evidence: Invest in gender-disaggregated agricultural data collection in all government surveys and research programs.

9. Conclusion

Women are the invisible backbone of Indian agriculture. They contribute irreplaceable labour, knowledge and entrepreneurial energy across the entire agricultural value chain, yet remain systematically excluded from the resources, recognition and institutional support that would enable their full economic participation.

This review has documented that women agri-entrepreneurs in India are not a homogeneous group but a diverse, capable and resilient constituency operating across organic farming, food processing, dairy, horticulture, livestock and emerging digital agri-services. Their contributions economic, nutritional and social far exceed their recognition in policy discourse.

The constraints they face land tenure insecurity, restricted credit, gender-blind extension services, socio-cultural barriers and the digital divide are neither inevitable nor insurmountable. They are the result of historical structural inequities that can and must be addressed through deliberate, well-resourced and gender-transformative policy interventions.

Investing in women agri-entrepreneurs through land rights reform, accessible finance, inclusive extension, digital empowerment and collective enterprise support is not only a matter of equity: it is the single most high-return investment India can make in agricultural productivity, food security and rural poverty reduction.

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