



Empowering the Backbone of Agriculture: Role, Contribution, Challenges, and Future Prospects of Women in Indian Agriculture

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Women play a central and indispensable role in agriculture across the world, particularly in developing economies such as India. They contribute extensively to crop production, livestock management, seed conservation, post-harvest processing, marketing, and natural resource management. In India, women constitute nearly three-fourths of the agricultural workforce and contribute 60–80% of food production. Despite their critical contributions, women farmers face multiple challenges including limited access to land, credit, technology, education, extension services, and decision-making platforms. These structural constraints result in gender disparities in productivity, income, and social recognition. This article critically examines the role of women in Indian agriculture, their socio-economic contributions, emerging leadership in climate-resilient farming, challenges, and future opportunities. Drawing upon recent data from FAO, Government of India, World Bank, and academic literature, the paper highlights the urgent need for gender-responsive agricultural policies, inclusive institutions, digital empowerment, and targeted investments. The article concludes that empowering women in agriculture is not only a matter of social justice but also a strategic imperative for enhancing food security, improving farm productivity, alleviating poverty, and achieving sustainable rural development.

Keywords: Women in agriculture, gender equality, rural livelihoods, sustainable farming, food security, empowerment, agrarian development

Introduction

Agriculture remains the backbone of rural economies and food security systems in developing countries. In India, nearly 50% of the workforce is engaged in agriculture and allied sectors, contributing significantly to national food production, employment, and economic stability. Within this sector, women constitute a major yet underrecognized workforce, performing diverse and critical roles throughout the agricultural value chain.

Historically, women have been actively involved in farming activities such as seed selection, sowing, transplanting, weeding, harvesting, storage, livestock rearing, and food processing. Their contributions extend beyond production to include natural resource management, household nutrition security, and conservation of indigenous knowledge. However, their labor is often undervalued, invisible in official statistics, and inadequately compensated.

Globally, women account for approximately 36% of the agricultural workforce, while in developing countries this share rises to nearly 60–80%. In South Asia, women form nearly 70% of the workforce in agrifood systems. In India, rural women account for more than 75% of total agricultural labor, highlighting the feminization of agriculture in recent decades. Factors such as male out-migration, agrarian distress, mechanization, and diversification of rural livelihoods have further intensified women's involvement in agriculture.

Despite their vital contributions, women farmers face deep-rooted gender inequalities manifested through restricted land ownership, limited access to institutional credit, extension services, modern technologies, and markets. Socio-cultural norms, legal barriers, educational disparities, and workload burdens further exacerbate their marginalization. As a result, women farmers often experience lower productivity, reduced income, and limited decision-making power.

Empowering women in agriculture holds immense potential to enhance productivity, reduce poverty, improve nutritional outcomes, and strengthen climate resilience. Studies by the Food and Agriculture Organization (FAO) suggest that closing the gender gap in agriculture could increase farm yields by 20–30% and reduce hunger by 12–17%. Therefore, gender-inclusive agricultural development is crucial for achieving Sustainable Development Goals (SDGs), particularly those related to poverty eradication, food security, gender equality, and climate action.

This article presents a comprehensive review of the role of women in Indian agriculture, examining their contributions, challenges, emerging opportunities, policy frameworks, and future prospects. It aims to provide a holistic understanding of women's role in shaping sustainable agricultural systems and to propose strategic interventions for their empowerment.

Status of Women in Indian Agriculture

Workforce Participation

Women constitute a significant share of the agricultural workforce in India. According to the Periodic Labour Force Survey (PLFS), nearly 64% of working rural women are engaged in agriculture and allied activities, compared to about 49% of rural men. This gendered distribution reflects the feminization of agriculture, driven by male migration to non-farm employment and urban centers. Women's participation is particularly high in subsistence farming, smallholder agriculture, horticulture, livestock rearing, and post-harvest processing. They are extensively involved in labor-intensive activities such as transplanting, weeding, harvesting, threshing, and storage, which require precision, patience, and endurance.

Land Ownership and Tenure Security

Despite their dominant participation, women own only about 13% of agricultural land in India. Customary inheritance practices, patriarchal norms, and legal constraints restrict women's land ownership rights. Limited land ownership severely affects women's access to institutional credit, crop insurance, government subsidies, and agricultural extension services, thereby constraining their productive capacity. Secure land tenure is essential for empowering women farmers, as it enhances their bargaining power, encourages investment in land improvement, and improves access to financial resources.

Educational Status and Skill Levels

Women farmers generally possess lower educational attainment compared to men. Illiteracy, early marriage, domestic responsibilities, and limited mobility reduce women's access to formal education and vocational training. This educational gap limits their ability to adopt improved agricultural technologies, access market information, and engage in agripreneurship.

Multifaceted Role of Women in Agriculture

Crop Production

Women contribute extensively to crop production, participating in nearly all stages of farming operations. Their involvement includes:

- Land preparation (manual tillage and soil conditioning)
- Seed selection and treatment
- Sowing and transplanting
- Weeding and intercultural operations
- Harvesting, bundling, and threshing

In crops such as rice, wheat, pulses, oilseeds, cotton, vegetables, and horticultural crops, women's labor is indispensable. Their meticulous handling of crops enhances quality, reduces post-harvest losses, and improves productivity.

Livestock and Dairy Farming

Livestock farming is a major livelihood activity for rural women. Women perform nearly 70% of tasks related to dairy management, including fodder collection, feeding, milking, cleaning, animal healthcare, and marketing of milk and milk products. Dairy farming provides regular income, nutritional security, and economic resilience to rural households. Women also play a central role in poultry, goatery, piggery, and backyard animal husbandry, contributing to livelihood diversification and poverty reduction.

Post-Harvest Processing and Value Addition

Post-harvest activities are predominantly managed by women. These include cleaning, drying, grading, storage, milling, and processing of cereals, pulses, spices, fruits, and vegetables. Women-led micro-enterprises in food processing such as preparation of pickles, papads, jams, squashes, and traditional snacks add significant economic value and generate employment. Value addition enhances shelf life, nutritional content, and market price, thereby increasing farm profitability and income stability.

Seed Conservation and Biodiversity Management

Women are custodians of indigenous knowledge related to seed selection, preservation, and storage. They maintain traditional crop varieties and landraces, which are critical for preserving agro-biodiversity and enhancing climate resilience. Their role in conserving medicinal plants, wild edibles, and underutilized crops contributes to ecological sustainability and nutritional diversity.

Natural Resource Management

Women actively participate in soil and water conservation, compost preparation, organic farming, and agroforestry practices. Their involvement in sustainable farming enhances soil fertility, reduces chemical inputs, and supports ecosystem services.

Women and Climate-Resilient Agriculture

Climate change poses significant challenges to agriculture, including erratic rainfall, droughts, floods, heat stress, and pest outbreaks. Women farmers, who often manage marginal lands and rainfed farms, are particularly vulnerable to climate variability. However, they also play a vital role in climate adaptation and mitigation strategies.

Women-led initiatives promote:

- Cultivation of drought-tolerant and climate-resilient crops
- Conservation agriculture
- Organic and natural farming
- Water harvesting and micro-irrigation
- Community seed banks

Self-help groups (SHGs) and women farmer collectives have demonstrated success in promoting sustainable agricultural practices, improving resilience, and enhancing household food security. Research indicates that women's traditional knowledge and adaptive strategies significantly contribute to building climate-resilient farming systems. Their leadership in sustainable agriculture positions them as key agents of climate action.

Economic Contribution of Women in Agriculture

Women's economic contribution to agriculture is substantial yet undervalued. They contribute 60–80% of total food production and generate significant household income through crop cultivation, livestock rearing, and value addition. FAO estimates suggest that providing women equal access to productive resources could increase agricultural output by 20–30%, contributing to overall economic growth and poverty reduction. Furthermore, women reinvest nearly 90% of their income in household nutrition, healthcare, education, and farm development, creating long-term socio-economic benefits. Women-led agripreneurship in areas such as organic farming, seed production, mushroom cultivation, beekeeping,

medicinal plants, and food processing offers significant potential for rural employment generation and income diversification.

Challenges Faced by Women in Agriculture

Limited Land Rights

Restricted access to land remains the most critical barrier to women's empowerment in agriculture. Without secure land tenure, women cannot access credit, insurance, and government schemes, limiting their capacity to invest in productivity-enhancing technologies.

Wage Inequality and Labor Exploitation

Women agricultural workers earn 20–30% lower wages than men for similar work. They are often engaged in unpaid family labor and informal employment, lacking job security, social protection, and legal safeguards.

Limited Access to Technology and Extension Services

Agricultural extension systems are predominantly male-oriented, restricting women's access to training, information, and technology. Limited mobility, time constraints, and social norms further reduce women's participation in extension programs.

Health and Nutritional Challenges

Women farmers face significant occupational health risks, including musculoskeletal disorders, pesticide exposure, heat stress, and malnutrition. Poor access to healthcare services exacerbates these vulnerabilities.

Socio-Cultural Constraints

Patriarchal norms, limited decision-making power, and domestic responsibilities constrain women's agency and economic participation. Heavy workloads, balancing farm labor with household chores, result in physical and mental stress.

Government Initiatives and Institutional Support

Recognizing the importance of women in agriculture, the Government of India has launched several schemes aimed at their empowerment:

- Mahila Kisan Sashaktikaran Pariyojana (MKSP)
- National Rural Livelihood Mission (NRLM)
- Krishi Sakhi Program
- Deendayal Antyodaya Yojana
- Support for Self-Help Groups (SHGs)

These initiatives focus on skill development, financial inclusion, entrepreneurship promotion, market access, and institutional strengthening of women farmer collectives.

Future Prospects of Women in Agriculture

Digital Agriculture and Technological Empowerment

Digital platforms, mobile applications, and ICT-based advisory services can enhance women's access to real-time information, weather forecasts, market prices, and agronomic guidance. Digital literacy programs can bridge gender gaps in technology adoption.

Agripreneurship and Enterprise Development

Women-led agribusiness ventures in organic farming, processing, packaging, branding, and direct marketing can significantly enhance income and employment. Supportive policies, microfinance, and incubation centers can catalyze women entrepreneurship.

Leadership in Climate-Smart Agriculture

Women's leadership in sustainable and climate-resilient farming will be instrumental in addressing climate challenges. Promoting women champions in conservation agriculture and agroecology can strengthen rural resilience.

Strategic Recommendations

- Strengthening land ownership and inheritance rights
- Gender-responsive agricultural extension services
- Enhanced access to institutional credit and insurance
- Capacity building and skill development programs

- Promotion of women farmer producer organizations (FPOs)
- Digital inclusion and ICT-based advisory systems
- Occupational health and safety measures

Conclusion

Women are the cornerstone of Indian agriculture, contributing immensely to food production, rural livelihoods, and environmental sustainability. Despite their indispensable role, they face persistent structural inequalities that limit their productivity and socio-economic advancement. Empowering women through secure land rights, education, technology access, institutional support, and inclusive policies is essential for transforming agriculture into a productive, resilient, and equitable sector. Investing in women farmers is not only a moral imperative but also a strategic pathway toward achieving national food security, poverty alleviation, and sustainable development.

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