

# *The Vital Contribution of Women to Sustainable Agriculture Development*

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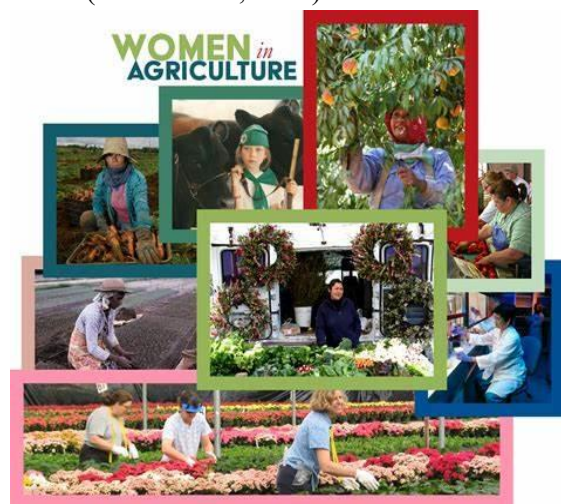
## **ABSTRACT**

Sustainable agricultural development is centre to achieving food security, environmental sustainability, and poverty reduction, with women playing a critical yet often underrecognized role in this process. Women constitute a substantial proportion of the agricultural labor force, particularly in developing countries, where they contribute to subsistence farming, crop cultivation, livestock management, food processing, and market linkages. Their traditional knowledge and labor also support biodiversity conservation, water resource management, and climate resilience. By preserving indigenous crop varieties, practicing sustainable farming methods, and engaging in post-harvest processing, women enhance agricultural productivity and strengthen rural livelihoods. Moreover, women's roles in value addition and market access are vital for local economies and food system sustainability. Despite these contributions, women face systemic challenges that hinder their full participation in sustainable agriculture. These include limited access to land, credit, technology, and financial services, as well as gender-based discrimination, lack of education and training, and heavy burdens of unpaid labor. Women are also disproportionately vulnerable to the impacts of climate change, which exacerbate food insecurity and resource

scarcity. Cultural norms and structural barriers further restrict their mobility, decision-making power, and participation in agricultural forums. Addressing these challenges requires multi-dimensional strategies, including gender-sensitive policies, equitable access to resources, capacity-building initiatives, and the transformation of discriminatory social norms. Empowering women in agriculture is not only a matter of gender equity but also a strategic imperative for building resilient, inclusive, and sustainable food systems. Recognizing and supporting women's contributions to agriculture is essential for advancing the United Nations Sustainable Development Goals and ensuring a more equitable and food-secure future.

## INTRODUCTION

Sustainable agricultural development is central to global efforts to ensure food security, reduce environmental degradation, and alleviate poverty. Women, who form a substantial share of the agricultural labor force, play critical roles in crop cultivation, livestock management, food processing, biodiversity conservation, and market linkages (FAO, 2011; Agarwal, 2010). Their contributions enhance the resilience of agricultural systems, especially under climate change, but they face systemic challenges such as limited access to resources, gender discrimination, and vulnerability to climate shocks (Meinzen-Dick & Quisumbing, 2012). Empowering women in agriculture is not only a matter of gender equity but also key to building resilient food systems and achieving the United Nations Sustainable Development Goals (UN Women, 2018).



## Women in the Agricultural Labor Force

Women constitute a significant portion of the global agricultural workforce, particularly in developing countries, where they are central to subsistence farming and food security at the household level (FAO, 2011). Their involvement extends across the agricultural value chain, from fieldwork to post-harvest processing:

- **Subsistence Farming & Crop Cultivation:** Women manage planting, weeding, harvesting, and pest control, drawing on traditional expertise in seed selection and cultivation (Howard, 2003).
- **Harvesting & Post-Harvest Management:** They engage in labor-intensive harvesting and are often responsible for sorting, cleaning, and packaging produce (World Bank, 2009).
- **Food Processing & Preservation:** Women add value to crops by processing them into products like jams and dried foods, reducing waste and ensuring food availability year-round (Pretty, 2008).
- **Livestock Management:** They maintain small-scale livestock systems, contributing to diversified diets and income sources (FAO, 2011).

- **Seed Saving & Biodiversity:** Women safeguard traditional crop varieties and indigenous practices, bolstering agricultural biodiversity and climate resilience (Howard, 2003).
- **Water Resource Management:** In many rural communities, women oversee irrigation, rainwater harvesting, and allocation of water for crops and livestock, balancing productivity with conservation (Meinzen-Dick *et al.*, 2014).
- **Market Linkages:** Women often participate in local food networks, connecting producers to consumers and generating household income (World Bank, 2009).



### Women's Role in Biodiversity Conservation, Food Processing, and Market Access

Women are central actors in biodiversity conservation, food processing, and agricultural market linkages, all of which are crucial for sustainable agriculture and rural livelihoods. Their traditional knowledge, labor, and leadership ensure ecological resilience, food security, and economic empowerment (Howard, 2003; FAO, 2011).

**Biodiversity Conservation:** Women act as custodians of agricultural biodiversity through seed saving, crop diversification, and indigenous land management practices (Agarwal, 2010). They preserve traditional knowledge of plants, animals, and ecosystems, contributing to resilience against climate

change and pest pressures (Howard, 2003). Their roles extend to sustainable forest use, habitat restoration, and eco-friendly farming, as well as active participation in community-based conservation and environmental education (Meinzen-Dick *et al.*, 2014). Recognizing women's agency in biodiversity stewardship is vital for effective conservation (World Bank, 2009).

**Food Processing and Preservation:** Women also contribute significantly to food security through traditional preservation methods—drying, fermenting, and pickling—which reduce spoilage and ensure year-round food availability (FAO, 2011). By transforming raw produce into value-added goods, women enhance incomes and reduce food waste (UN Women, 2018). Their enterprises in processing foster local economies, strengthen cultural identity, and support sustainable food systems (Pretty, 2008). However, challenges such as limited access to modern equipment and credit hinder their potential (Meinzen-Dick & Quisumbing, 2012).

**Access to Markets:** Women farmers play a key role in linking producers to local and regional markets, helping ensure income generation and poverty reduction (World Bank, 2009). Barriers—such as lack of transport, financial services, and gender-sensitive infrastructure—often restrict their participation (Agarwal, 2010). Strengthening women's market access through cooperatives, value addition, digital platforms, and supportive policies enhances food security, promotes sustainable farming, and contributes to inclusive rural development (FAO, 2011; UN Women, 2018).

### Women's Role in Water and Resource Management for Sustainable Agriculture

In many agricultural communities, women play a pivotal role in water and resource management, which is central to sustainable

agriculture. Their responsibilities span irrigation, rainwater harvesting, crop and livestock management, and community-level decision-making (Agarwal, 2010; Meinzen-Dick *et al.*, 2014).

Women often manage irrigation systems, making critical decisions on water allocation to maximize crop productivity while conserving resources (FAO, 2011). They frequently lead rainwater harvesting initiatives, reducing dependence on groundwater and enhancing resilience during droughts (UN Women, 2018). Through their knowledge of crop diversification and seed saving, women promote biodiversity and cultivate drought-resistant varieties suited to local conditions (Howard, 2003).

Conservation agriculture practices, such as cover cropping and no-till farming, are often implemented by women to improve soil health and water retention (Pretty, 2008). In livestock systems, they ensure animals' access to clean water, while resource recycling—such as using crop residues and manure—further supports soil fertility (FAO, 2011). Women's engagement in agroforestry also contributes to regulating water cycles and reducing erosion (World Bank, 2009).

Beyond farm-level practices, women play key roles in educating communities, participating in watershed management, and advocating for sustainable policies (Meinzen-Dick & Quisumbing, 2012). They are also at the forefront of climate change adaptation, experimenting with water-saving technologies and resilient crop varieties (UN Women, 2018).

Despite these contributions, women face systemic barriers such as limited access to resources, training, and decision-making platforms (Agarwal, 2010). Empowering women through capacity-building and policy support is essential for achieving agricultural

sustainability and climate-resilient food systems.

### Challenges Faced by Women in Sustainable Agriculture

Despite their significant contributions, women in agriculture face numerous challenges that hinder their full potential in sustainable agriculture development. These challenges are shaped by gender disparities, social norms, and structural barriers. Here are some of the common challenges faced by women in sustainable agriculture:

1. **Limited Access to Resources:** Women often have less access to land, credit, and modern agricultural inputs like seeds and fertilizers, which are essential for sustainable farming practices.
2. **Gender-Based Discrimination:** Cultural norms and gender biases can limit women's decision-making power and participation in agricultural forums, reducing their ability to influence sustainable practices.
3. **Lack of Education and Training:** Limited access to education and training programs can hinder women's adoption of modern and sustainable farming techniques.
4. **Unpaid Labor:** Much of women's agricultural work is unpaid or underpaid, making it challenging for them to invest in sustainable practices that require additional resources.
5. **Climate Change Vulnerability:** Women are disproportionately affected by the impacts of climate change, which can disrupt agricultural systems and threaten food security.
6. **Limited Access to Land:** Women often have restricted access to land ownership and control. This lack of land tenure limits



their ability to make long-term investments in sustainable farming practices.

7. **Inadequate Access to Resources:** Women may have limited access to essential agricultural resources, including credit, seeds, fertilizers, and modern farming equipment. This hampers their ability to adopt sustainable agricultural techniques.
8. **Gender-Based Discrimination:** Gender biases and stereotypes persist in many agricultural communities. Women may face discrimination in terms of access to agricultural extension services, training, and decision-making roles within farming households.
9. **Unpaid and Underpaid Labor:** Much of the agricultural work performed by women, including weeding, harvesting, and food processing, is often unpaid or underpaid. This lack of financial recognition can deter women from investing in sustainable practices that require additional resources.
10. **Lack of Education and Training:** Inadequate access to education and training opportunities limits women's knowledge and skills in sustainable farming practices, reducing their ability to innovate and adapt to changing conditions.
11. **Time Constraints:** Women often juggle multiple responsibilities, including childcare and household chores, in addition to their agricultural work. This leaves them with limited time and energy to engage in sustainable farming practices or seek additional income opportunities.
12. **Limited Market Access:** Women may face challenges accessing markets for their agricultural products. They often lack the networks, transportation, and market

information needed to sell their produce at competitive prices.

13. **Climate Change Vulnerability:** Women are disproportionately affected by the impacts of climate change, which can disrupt agricultural systems and threaten food security. They may lack the resources and information needed to adapt to these changes.
14. **Health and Safety Risks:** Women working in agriculture may face health and safety risks, such as exposure to pesticides and strenuous labor. Access to protective gear and healthcare services may be limited.
15. **Cultural Norms and Gender Roles:** Societal expectations regarding gender roles can limit women's mobility, decision-making power, and participation in agricultural forums and cooperatives.
16. **Land Degradation and Environmental Challenges:** Sustainable agriculture often requires resource conservation and land management practices. Women may lack the resources and support needed to address issues like soil erosion and water conservation.
17. **Access to Financial Services:** Limited access to financial services, such as credit and savings accounts, can hinder women's ability to invest in sustainable agricultural practices and expand their operations.

Addressing these challenges requires a multi-faceted approach that includes policy reforms, investments in gender-sensitive agricultural programs, improved access to education and training, and efforts to challenge gender norms and stereotypes. Empowering women in sustainable agriculture is not only a matter of gender equity but also a key strategy for promoting food security, economic development, and environmental sustainability. Recognizing and valuing the

contributions of women in agriculture is essential for the future of sustainable food systems.

## CONCLUSION

The contribution of women to sustainable agriculture development is undeniable and invaluable. Their involvement in various aspects of farming, coupled with their role in conserving biodiversity and preserving traditional knowledge, is crucial for achieving global food security and environmental sustainability. However, addressing the challenges faced by women in agriculture is essential to unlock their full potential and ensure a more equitable and sustainable future for all. Empowering women in agriculture is not just a matter of gender equality; it is a path to a more sustainable and resilient agricultural sector and a step closer to achieving the United Nations Sustainable Development Goals.

In conclusion, the role of women in sustainable agriculture is fundamental and multifaceted, shaping the present and future of food systems and environmental stewardship. Women have long been the backbone of agricultural labor, contributing to various aspects of farming, from cultivation and livestock management to food processing and marketing. Their influence extends to the preservation of biodiversity, the conservation of natural resources, and the promotion of climate-resilient practices. However, women in sustainable agriculture also face numerous challenges, including limited access to land and resources, gender-based discrimination, inadequate education and training, and the burden of unpaid or underpaid labor. These obstacles hinder their full participation and potential in the sector, despite their invaluable contributions.

Efforts to empower women in sustainable agriculture must encompass a comprehensive approach that addresses both the immediate

challenges they face and the underlying gender disparities in rural communities. This includes providing equitable access to resources, education, and training; challenging and transforming gender norms and biases; promoting women's participation in decision-making processes; and fostering supportive policy environments. Recognizing and valuing the vital contributions of women in sustainable agriculture is not only a matter of gender equality but also a critical strategy for achieving global food security, reducing environmental degradation, and building resilient and sustainable agricultural systems. It is imperative that societies and policymakers prioritize the empowerment of women in agriculture, as their role is integral to the pursuit of a more equitable, sustainable, and food-secure future for all.

## REFERENCES

- Agarwal, B. (2010). *Gender and green governance: The political economy of women's presence within and beyond community forestry*. Oxford University Press.
- Food and Agriculture Organization of the United Nations (FAO). (2011). *The state of food and agriculture 2010–2011: Women in agriculture—Closing the gender gap for development*. Rome: FAO.
- Howard, P. (2003). *Women and plants: Gender relations in biodiversity management and conservation*. Zed Books.
- Meinzen-Dick, R., & Quisumbing, A. (2012). *Closing the gender gap in agriculture: A global perspective*. International Food Policy Research Institute (IFPRI).
- Meinzen-Dick, R., Johnson, N., Quisumbing, A., Njuki, J., Behrman, J., Rubin, D., Peterman, A., & Waithanji, E. (2014).

- Gender, assets, and agricultural development: Lessons from eight projects. *World Development*, 52, 133–152. <https://doi.org/10.1016/j.worlddev.2013.12.003>
- Pretty, J. (2008). Agricultural sustainability: Concepts, principles and evidence. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 363(1491), 447–465. <https://doi.org/10.1098/rstb.2007.2163>
- UN Women. (2018). Turning promises into action: Gender equality in the 2030 agenda for sustainable development. United Nations Entity for Gender Equality and the Empowerment of Women (UN Women).
- World Bank. (2009). Gender in agriculture sourcebook. World Bank, Food and Agriculture Organization, International Fund for Agricultural Development.