

THE ROLE OF WOMEN IN INDIAN AGRI-FOOD VALUE CHAINS

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Abstract

Women play a central yet largely unacknowledged role in India’s agri-food value chains, contributing significantly at every stage—from seed selection and sowing to harvesting, processing, storage, and marketing. Despite their extensive involvement, women’s work often remains invisible due to deeply rooted social norms, insecure land tenure, limited access to productive inputs, markets, and credit, and their marginal presence in decision-making spaces. This chapter examines the diverse and interconnected roles women perform in Indian agriculture, with attention to both on-farm activities and post-harvest operations that sustain rural livelihoods and food systems. Particular focus is given to women’s participation in high-value and nutrition-sensitive sectors such as fruits and vegetables, spices, millets, and mushrooms, where their labour is critical to quality maintenance and value addition.

The chapter highlights persistent gender-based constraints that create disparities in access to land rights, extension services, financial resources, technology, and market linkages, limiting women’s ability to move into higher-value and more remunerative nodes of agricultural value chains. Through sector-wise analysis, illustrative case studies, and value chain flowcharts, it unpacks the gender dynamics shaping production, processing, and marketing systems, while demonstrating how targeted, inclusive interventions can enhance productivity, equity, and sustainability. The discussion underscores the importance of gender-responsive policies, capacity building, access to appropriate technologies, and the promotion of women-led collectives such as Self-Help Groups and Farmer Producer Organizations as key pathways to empowerment. Drawing on contemporary research, including Rao (2019), the chapter proposes policy measures to mainstream gender across agri-food systems, arguing that inclusive value chains are essential for building resilient, equitable, and sustainable rural economies in India.

**Keywords:** Women in agriculture, gender equity, agri-food value chains, post-harvest, value addition, land rights, market access, India

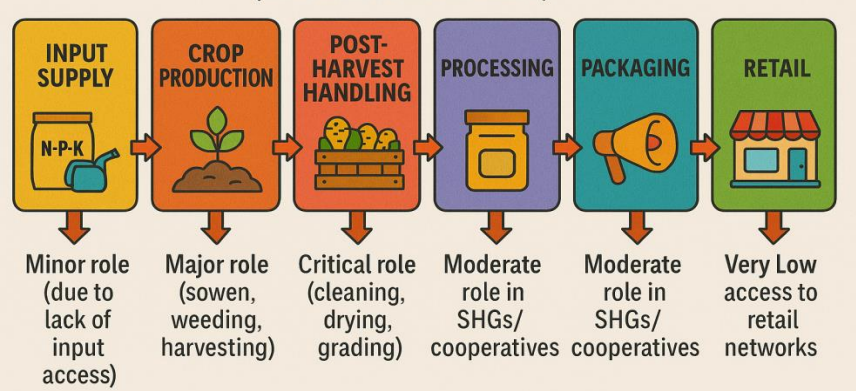
Introduction

Women form the backbone of India’s agriculture, employing nearly 60–70% of the female workforce, yet their contributions—ranging from sowing, weeding, and harvesting to grading, processing, and marketing—are largely undervalued and often classified as unpaid family labour due to patriarchal norms, limited asset ownership, and policy neglect. Despite their central role, women own only 13% of operational land, restricting access to credit, inputs, technology, and decision-making in cooperatives and producer organizations. They dominate labour-intensive, post-harvest activities like cleaning, sorting, drying, and packaging, which are poorly mechanized, low-

paid, and rarely translate into economic empowerment. Applying a value chain lens highlights these gendered constraints and the potential of targeted interventions—such as women-centric FPOs, agri-processing training, and market access facilitation—to improve inclusion, income, and sustainability, as seen in states like Odisha, Maharashtra, and Jharkhand, where women also add value to NTFPs. Overall, recognizing and supporting women’s roles through structural reforms, gender-disaggregated data, and investment in women-led enterprises is essential for equitable, efficient, and resilient agri-food systems.

Figure 1: Below shows the typical engagement of women in different nodes of the agri-food value chain.






Figure 1: Gender Participation in Agri-food Value Chains (Illustrative Flowchart)



Here’s a breakdown of Figure 1: Gender Participation in Agri-Food Value Chains (Illustrative Flowchart):

Women’s participation in the agricultural value chain varies significantly across stages, remaining minimal in input supply due to limited access to land ownership, credit, seeds, fertilizers, and irrigation, which restricts their role to informal assistance rather than decision-making or procurement. Their involvement becomes substantial in crop production, where they actively engage in sowing, weeding, transplanting, and harvesting, contributing major manual labour but often without adequate recognition or wage equality. Women play a critical role in post-harvest handling, dominating activities such as cleaning, drying, grading, shelling, and storage,

making this stage a key entry point for skill development and value addition. Their role in processing and packaging is moderate, mainly through self-help groups, cooperatives, and small-scale or local enterprises, highlighting the need for access to modern tools, hygienic infrastructure, food safety training, and improved branding and packaging materials. However, women’s participation declines sharply in marketing and retail due to cultural norms, mobility constraints, limited negotiation power, and low digital literacy, resulting in poor access to high-value, urban, and e-commerce markets, which ultimately limits their income potential and visibility.

Table 1: Women's Participation in Selected Agri-Food Sectors			
Sector	Participation Role	Constraints	Opportunities
	Harvesting, sorting, local markets	Lack of cold storage, mobility	Solar dryers, SHG-led processing
	Weeding, harvesting, cleaning	Low prices, access to mandis	Organic branding, kitchen gardens
	Drying, grading, packaging	Poor quality control, middlemen	Training in quality standards
	Threshing, de-husking, storage	Manual drudgery, no machinery	Millet processing units
	Cultivation, harvesting, drying	Poor ventilation, contamination risks	Mushroom training centers, market links

The table "Women's Participation in Selected Agri-Food Sectors" highlights how rural women contribute across five key agricultural sectors—**Fruits, Vegetables, Spices, Millets, and Mushrooms**—alongside the **challenges** they face and the **opportunities** available for growth.

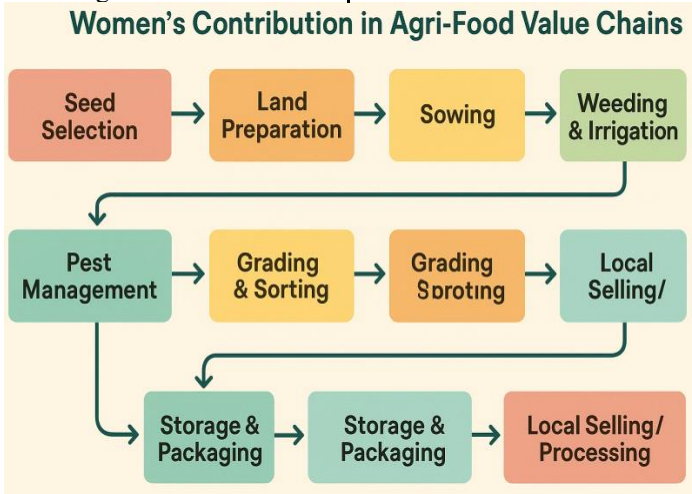
Women play an important role across various horticultural and crop activities, including harvesting, sorting, and selling fruits in local markets, though their income is constrained by limited mobility and the absence of cold storage facilities; these challenges can be addressed through the adoption of solar dryers and SHG-led processing units to reduce spoilage and enhance earnings. In vegetable production, women are actively involved in weeding, harvesting, and cleaning, but low market prices and poor access to wholesale markets restrict returns, while opportunities such as organic branding and promotion of kitchen gardens can improve both income and household nutrition. Their participation in spices mainly involves drying, grading, and packaging, yet a lack of quality control training and dependence on middlemen reduce profitability, highlighting the need for capacity building in quality standards to enable better pricing and direct market access. In millet production, women engage in labour-intensive tasks like threshing, de-husking, and storage without mechanized support, indicating strong potential for small-scale processing units to reduce drudgery and increase productivity. Similarly, in mushroom cultivation, women handle cultivation, harvesting, and drying, but face challenges related to poor ventilation and contamination risks, which can be overcome through targeted training centres and stronger market linkages to improve product quality and income generation.

This table emphasizes both the **involvement** and **limitations** of women in agri-food sectors and points to **actionable solutions**—like solar dryers, branding, training, and improved infrastructure—that can empower women economically and socially in rural communities. Thus, the integration of gender into value chains requires a combination of recognition, redistribution, and representation. Women's work needs to be made visible, their workloads reduced through mechanization and shared roles, and their voices amplified through leadership in collectives.

## 2. Women's Invisible Contributions in Farm-Level and Post-Harvest Operations

In India's agri-food sector, women constitute the backbone of production and processing, yet their contributions remain largely invisible in official records despite their extensive involvement in farm-level activities such as seed selection, sowing, weeding, pest management, irrigation, and harvesting, as well as in post-harvest operations including grading, sorting, cleaning, drying, storage, packaging, and local sales, and value addition through processing raw produce into items like pickles, ground spices, and dried mushrooms. This underrepresentation in statistics stems from the fact that many women work as unpaid laborers on family farms, their efforts are often categorized as household rather than economic activities, and agricultural surveys frequently fail to maintain separate or gender-disaggregated labour data.

### Flowchart: Women's Contribution in Agri-Food Value Chains



his colourful flowchart titled "**Women's Contribution in Agri-Food Value Chains**" shows the sequential steps where women play a role in agricultural production and processing. The agricultural value chain begins with seed selection, followed by land preparation, sowing, weeding and irrigation, pest management, and harvesting, and then moves into post-harvest stages such as grading and sorting, cleaning

and drying, and storage and packaging, before concluding with local selling or processing for value addition. These interconnected stages form a continuous flow, with arrows indicating the progression from one activity to the next, while colour-coded sections distinguish between field-level operations, post-harvest handling, and marketing or processing activities.

Table 2.1: Examples of Women’s Contributions in Farm-Level and Post-Harvest Stages

Stage	Activities by Women	Examples
Farm Preparation	Seed selection, nursery raising	Selecting drought-resistant paddy
Crop Cultivation	Sowing, weeding, irrigation	Millet cultivation in Odisha
Harvesting	Cutting, bundling, threshing	Hand harvesting wheat in Punjab
Post-Harvest Handling	Grading, cleaning, drying	Drying turmeric in Andhra Pradesh
Value Addition	Processing, packaging, storage	Tamarind pulp making in Jharkhand

This colourful infographic titled "Table 2.1: Examples of Women’s Contributions in Farm-Level and Post-Harvest Stages" highlights five key stages of agricultural production and the specific activities women perform, along with real-life examples from different parts of India. Women play a vital role across all stages of the agricultural value chain, beginning with farm preparation through activities such as seed selection and nursery raising, for example choosing drought-resistant paddy varieties, followed by active participation in crop cultivation through sowing, weeding, and irrigation as seen in millet farming in Odisha. Their involvement continues during harvesting, where they engage in cutting, bundling, and threshing, such as hand harvesting wheat in Punjab, and extends to post-harvest handling through grading, cleaning, and drying, exemplified by turmeric drying in Andhra Pradesh. Women also contribute significantly to value addition by processing, packaging, and storing produce, as seen in tamarind pulp making in Jharkhand. The use of distinct background colours for each

stage helps visually differentiate these activities, allowing readers to easily link specific tasks with real-world examples.

3. Gender Gaps in Land Ownership, input access, and Market Participation

Women in India contribute over 40% of agricultural labor but face major constraints due to limited land ownership—only about 13% of operational holdings are in their names—which blocks access to credit, government schemes, and independent cropping decisions. Their participation is further restricted by unequal access to quality inputs, irrigation, machinery, and extension services, which are mostly targeted at men, as well as exclusion from producer organizations and cooperatives. In markets, mobility restrictions, low digital and financial literacy, unsafe spaces, and weak bargaining power confine women to low-value roles or unpaid support, keeping them in the lower segments of the value chain and highlighting the need for joint land titles, gender-sensitive schemes, targeted input support, and inclusive institutions.

Table 2.2: Gender Gaps in the Agri-Food Sector

Parameter	Men	Women	Gap & Implication
Land Ownership (%)	87%	13%	Limits women’s access to credit and schemes
Input Access	High	Low	Low productivity in women-managed pits
Market Participation	Regional/ National	Local	Restricts women to low-value transactions
Extension Training	Frequent	Rare	Technological exclusion and skill gaps

This colourful infographic titled "Table 2.2: Gender Gaps in the Agri-Food Sector" compares men’s and women’s positions in four key agricultural parameters, and highlights the resulting gaps and their implications. Men dominate key aspects of agriculture, holding 87% of land versus 13% for women, limiting women’s access to credit, schemes, and decision-making. Women also face lower access to inputs, reducing productivity, and are confined to local markets while men operate regionally and nationally, restricting income. Participation in extension and training is similarly skewed, preventing women from adopting new technologies and skills. These disparities, highlighted visually through colour-coding and icons, underscore the need for gender equity in agriculture.

Sector-Wise Insights: Fruits, Vegetables, Spices, Millets, And Mushrooms

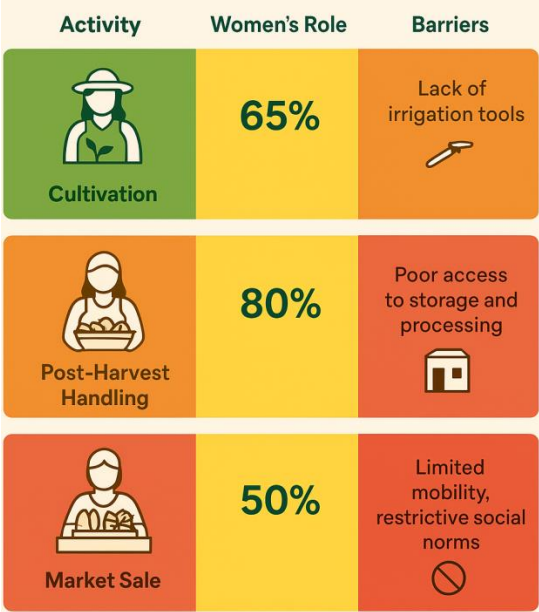
India’s agri-food sector is diverse, with women heavily involved in labour-intensive crops like fruits, vegetables, spices, millets, and mushrooms, offering strong potential for value addition and entrepreneurship. In fruits, they handle harvesting, grading, sorting, and traditional processing, especially in Maharashtra and Himachal Pradesh, though orchard management, marketing, and exports remain male-dominated due to limited cold storage, credit, and market access. In vegetables, women manage sowing, irrigation, weeding, and local sales, with tribal women in Odisha and West Bengal leading leafy green and tuber production, yet their role is often limited to low-value segments.

Women's Role in Vegetable Value Chain





Table 1: Vegetable Value Chain - Gendered Participation. The flowchart “Women’s Role in Vegetable Value Chain” shows women’s contributions at every stage, from sowing and weeding to harvesting, washing, grading, bundling, packaging, and local market sales. Icons with bright, flat colours illustrate their tasks, and arrows link the steps, highlighting their roles in crop care, quality control, value addition, and income generation across the entire vegetable value chain.



The infographic highlights women’s roles in the vegetable and spice value chains, showing high participation in cultivation (65% for spices) and post-harvest handling (up to 80%), with barriers like limited irrigation, poor storage, and lack of processing equipment causing productivity and quality losses. Women engage in about 50% of market sales, but mobility restrictions and social norms limit access to broader markets. In India’s spice sector—turmeric, chili, cumin, and cardamom—women, especially in Kerala, Andhra Pradesh, and Tamil Nadu, dominate household-level



processing like cleaning, drying, and grinding..

The flowchart highlights women’s role in millet value addition across seven stages—from dryland cultivation and manual harvesting to sun-drying, dehusking, processing, packaging, branding, and sales—using icons, colour blocks, and arrows to show the value chain. Women-led SHGs and FPOs drive health-focused millet markets, increasing income and value, though branding and formal market access remain challenges.

Mushrooms

Mushroom cultivation, particularly oyster and paddy straw varieties, is emerging as a viable livelihood for women due to its low land and capital requirements. States like Jharkhand, Chhattisgarh, and Odisha have promoted mushroom farming through SHGs.

Table 2: Mushroom Value Chain Participation

Process	Women's Involvement	Enabling Factors	Barriers
Spawn Preparation	Low	Requires training and lab setup	Technical skill gaps
Cultivation	High	Backyard and low cost	Poor-quality inputs
Drying and Packaging	Medium	Use of mushroom drying units	Lack of marketing
Sales (Local)	High	Haat and SHG networks	Pricing and buyer dependency

This colourful table titled "**Table 2: Mushroom Value Chain Participation**" shows women's involvement at each stage of the mushroom value chain, along with factors that help their participation and the barriers they face. Women's role in the mushroom value chain is high in cultivation and local sales, moderate in drying and packaging, but low in spawn preparation due to technical and facility barriers. Limited-quality inputs, weak branding, and dependence on intermediaries constrain yields, value addition, and income, highlighting the need for targeted support in skills, inputs, and market access to improve women's returns.

5. Case Studies of Women-Led Agri Enterprises

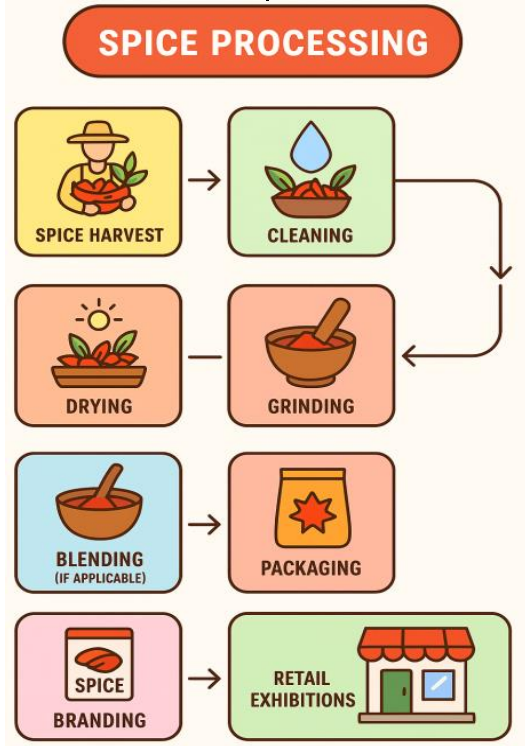
Women entrepreneurs in the agribusiness domain have increasingly demonstrated leadership in transforming local produce into high-value products, contributing to both household income and regional

economic growth. This section highlights exemplary initiatives from India in fruits, vegetables, spices, millets, and mushrooms.

Case Study 1: Kudumbashree Turmeric & Pepper Women's Collective – Kerala (Spices)

In Wayanad, Kudumbashree units help women add value to locally grown spices like turmeric and pepper by managing harvesting, cleaning, drying, grinding, blending, packaging, and branding for sale through networks, fairs, and retail outlets. Mechanised grinders and eco-friendly packaging have boosted efficiency and urban market appeal, raising prices by nearly 30% and strengthening women's skills in quality control, accounting, and enterprise management. Seasonal gluts and poor storage remain challenges, underscoring the need for better storage and market support.

Flowchart:



Case Study 2: Tribal Millet Women's Cooperative – Odisha (Millets)

In Koraput, Odisha, a women-led cooperative under the Odisha Millets Mission has helped tribal women move from low-return finger millet farming to value addition, managing de-husking, milling, and branding millet products like laddoos, flour, and cookies under "Mandia Shakti," supported by small-scale mechanization, nutrition-focused training, and e-commerce sales. This boosted household incomes by 45%, improved local nutrition, and enhanced women's social recognition as "nutri-entrepreneurs," though high branding costs and limited capital constrain scaling and sustainability.

Case Study 3: Jharkhand Mushroom Women's SHG Network – Jharkhand (Mushrooms)

In West Singhbhum, Jharkhand, women's SHGs trained in oyster and paddy straw mushroom cultivation managed the entire value chain—cultivation, drying, packaging, and sales—using low-cost innovations like bamboo racks, collective procurement, and local branding ("Jungle Fresh Mushrooms"), earning ₹250–300 daily and reinvesting in activities like poultry and goat rearing. While these initiatives boosted income, recognition, and entrepreneurship, challenges such as reliance on external spawn and limited cold-chain scalability remain, showing that women's move to higher-value roles requires collective support, technology access, and nutrition-focused crops.

Conclusion

Women are central to India's agri-food value chains, driving farm and post-harvest activities across crops and regions, yet their contributions remain largely invisible due to limited land ownership,

restricted credit and technology access, and exclusion from decision-making. From millet cultivation in Odisha and spice processing in Kerala to mushroom farming in Jharkhand and fruit and vegetable harvesting, women perform critical but labor-intensive, low-paid work. Evidence shows that SHGs, cooperatives, and FPOs help women move from subsistence labor to entrepreneurship, improving income, food security, and social recognition. Persistent gaps in land rights, extension services, inputs, and markets highlight the need for coordinated efforts by governments, NGOs, and producer organizations, including legal reforms, inclusive governance, skill and technology transfer, digital literacy, and care support. Empowering women in agri-food value chains enhances equity while boosting efficiency, resilience, and sustainability in nutrition-sensitive, climate-smart food systems.

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