

Women Empowerment in Food Science: A Multispectral Approach across Agriculture, Industry and Services

Miss. Aarohi L. Moghe Dept. of B. Voc. Food Processing and Management, Kamala College, Kolhapur Corresponding author Mail: aarohimoghe@gmail.com

Abstract:

Women empowerment is a fundamental driver of sustainable development, particularly in the food science sector, where women contribute significantly across agriculture, industry, and service sectors. The integration of these sectors provides diverse opportunities for women to participate in food production, processing, and distribution, fostering economic independence and social inclusion. However, women continue to face challenges such as limited access to land, financial resources, technical training, and decision-making roles, which hinder their full participation.

This paper explores how the agricultural sector empowers women through sustainable farming practices and self-help groups, while the industrial sector creates employment in food processing and packaging industries. Additionally, the service sector opens new avenues for women in nutrition consultancy, food delivery services, and e-commerce platforms. Case studies, including the Kudumbashree Initiative in India, Lijjat Papad cooperative, and Pink Rickshaw in Pakistan, illustrate successful models of women empowerment.

The study highlights the importance of multi-sectoral collaboration, gender-sensitive policies, and skill development programs in enhancing women's participation and leadership. By strengthening women's roles across these sectors, the food science domain can significantly contribute to gender equality, poverty reduction, and sustainable economic growth.

Keywords: Women Empowerment, Food Science, Agriculture, Industry, Service Sector, Gender Equality, Sustainable Development.

Introduction

Women play a significant role in the global food system, contributing extensively across agriculture, industrial, and service sectors. Their participation spans from primary food production in agricultural fields to food processing in industries and service-based businesses like retail, nutrition consultancy, and food delivery. Women's involvement in the food science sector not only ensures food security but also promotes economic development and sustainable livelihoods. However, despite their crucial contributions, women often face structural barriers that limit their full participation and leadership in these sectors. These barriers include unequal access to land, lack of financial resources, limited technical knowledge, and socio-cultural norms that restrict their decision-making power. Addressing these challenges is essential for promoting women's empowerment and achieving inclusive growth in the food science sector.

Women's empowerment in the food science sector is a multi-dimensional process that enhances their economic independence, self-confidence, and decision-making capacity. The food science sector, encompassing the production, processing, distribution, and consumption of food products, provides a unique platform for women to participate in income-generating activities and entrepreneurship. However, gender disparities remain prevalent, particularly in rural areas where women's contributions are often undervalued and underrepresented. The agricultural sector forms the backbone of women's participation, especially in developing countries, where women constitute

nearly 43% of the agricultural workforce globally (FAO, 2024). Despite their significant role, women face challenges such as lack of land ownership, unequal wages, and limited access to credit and training programs. These challenges hinder their ability to adopt modern agricultural practices and improve productivity.

The industrial sector offers women opportunities in food processing, packaging, and quality control. Food processing industries, both small-scale and large-scale, have the potential to generate employment for women, particularly in rural and semi-urban areas. Women-led cooperatives like Shri Mahila Griha Udyog Lijjat Papad in India have demonstrated how collective efforts can empower women economically and socially. However, women's participation in the industrial sector is often limited due to lack of technical skills, gender pay gaps, and workplace discrimination. Promoting skill development programs, access to financial resources, and equal employment policies can significantly enhance women's involvement in this sector.

The service sector is an emerging area that offers diverse opportunities for women in the food science domain. Women are increasingly taking up roles in nutrition consultancy, food delivery services, hospitality, and e-commerce. Digital platforms and social media have enabled women to start their own food-based businesses, such as homemade food delivery services and organic product marketing. However, women in the service sector still face challenges related to technology adoption, unequal pay, and lack of leadership opportunities. Initiatives like Pink Rickshaw in Pakistan provide innovative solutions to empower women in the service-based food sector, offering both employment and social empowerment.

Empowering women in the food science sector requires an integrated approach that connects agriculture, industry, and services. By providing women with equal access to land, credit, training, and technology, they can actively participate in the food production chain and become key agents of change. This paper explores the contributions of the agricultural, industrial, and service sectors to women's empowerment, supported by case studies of successful models and policy recommendations to promote gender equality in the food science domain. The study highlights the need for multi-sectoral collaborations between governments, NGOs, and private organizations to address gender disparities and create an inclusive environment where women can thrive as innovators, entrepreneurs, and leaders in the food science sector.

This research aims to underscore the importance of women's empowerment in the food science sector and advocate for sustainable policies that enhance women's participation across all three sectors. By integrating efforts from the agricultural, industrial, and service sectors, women can contribute significantly to food security, poverty reduction, and sustainable development.

2. Women Empowerment in Agriculture

2.1 Role of Women in Agricultural Production

Women constitute 43% of the global agricultural labour force (FAO, 2024). They are actively involved in crop cultivation, livestock management, and post-harvest processing.

2.2 Case Study: Kudumbashree Initiative, Kerala, India.

The Kudumbashree Initiative is a women-led community-based organization that empowers rural women by providing financial and technical support in organic farming and food processing. Over 4.3 million women are members, contributing to the state's food security and income generation (George, 2023).

2.3 Challenges Faced by Women in Agriculture

- Lack of land ownership: Women often face barriers to owning land due to cultural and legal restrictions, limiting their ability to control agricultural production and access to resources like loans or subsidies.
- Limited technical knowledge: Many women in agriculture have limited access to training and modern farming techniques, which hampers their productivity and ability to innovate in the agricultural sector.
- Financial exclusion: Women are frequently excluded from formal financial systems, making it difficult for them to access credit, insurance, and investment opportunities needed to grow their agricultural businesses.
- Gender pays gaps: Women in agriculture often earn less than their male counterparts, despite performing equal or more labour-intensive tasks, due to societal biases and lack of recognition for their work.

2.4 Initiatives to Empower Women

- Mahila Kisan Sashaktikaran Pariyojana (MKSP) – A government scheme in India that trains women in sustainable agriculture practices.
- Self-Help Groups (SHGs) offering microfinance loans for women-led agricultural enterprises.

3. Women Empowerment in the Industrial Sector

3.1 Women's Role in Food Processing

Women play a vital role in food preservation, packaging, and quality control in both formal and informal sectors. In India's food processing industry, women make up around 35% of the workforce (Ministry of Food Processing Industries, 2024).

3.2 Case Study: Lijjat Papad, India

Founded by seven women in 1959, Shri Mahila Griha Udyog Lijjat Papad is a cooperative that empowers women through employment in papad (flatbread) production. Today, it employs over 45,000 women across India, offering economic independence and leadership roles (Sharma & Patel, 2023).

3.3 Challenges

- Wage inequality: Women often receive lower wages than men for the same work, perpetuating economic disparities and limiting their financial independence.
- Lack of technical training: Many women face barriers to accessing technical education and training, which limits their ability to adopt modern practices or innovate in their respective fields.
- Limited leadership opportunities: Gender biases often prevent women from assuming leadership roles in their workplaces or industries, restricting their career growth and influence.

3.4 Strategies to Empower Women

- Establishing women-specific industrial training centers
- Promoting women-led Small and Medium Enterprises (SMEs)
- Ensuring equal pay policies in industrial units

4. Women Empowerment in the Service Sector

4.1 Women's Role in the Service Sector

Women have increasingly participated in food delivery, nutrition consultancy, and digital marketing of food products. The rise of e-commerce and cloud kitchens has opened new opportunities for women entrepreneurs.

4.2 Case Study: Pink Rickshaw, Pakistan

Pink Rickshaw is a women-led food delivery service that empowers female drivers to deliver food in urban areas. This initiative not only provides income but also challenges gender stereotypes in service-based jobs (Ahmed, 2024).

4.3 Challenges

- Limited access to technology: Women, particularly in rural areas, often have less access to advanced agricultural technologies or tools, hindering their productivity and growth potential.
- Workplace discrimination: Women frequently experience discrimination in the workplace, whether through unequal treatment, biases in hiring, or limited opportunities for advancement.
- Difficulty balancing work and family responsibilities: Societal expectations and family obligations often place additional burdens on women, making it harder for them to manage their professional and personal lives effectively.

4.4 Initiatives for Empowerment

- Digital literacy training programs
- Women-only delivery platforms
- Government-sponsored micro-entrepreneurship programs

5. Integration of Sectors for Holistic Empowerment

A multi-sectoral approach that integrates agriculture, industry, and services can significantly enhance women's empowerment by creating synergies between different sectors. For example, connecting women farmers to food processing units enables them to add value to their raw agricultural produce, thereby increasing their income. By linking them to e-commerce platforms, women can also reach broader markets, bypassing traditional barriers such as limited local market access and middlemen. This integration not only boosts their financial independence but also provides women with the opportunity to scale their businesses, improve their skills, and become more active participants in the economy. Additionally, such an approach can help create a more inclusive and sustainable food supply chain, where women's contributions are recognized and their potential fully realized.

6. Conclusion

Women play an essential and often underrecognized role in the food science sector across agriculture, industry, and service sectors. Their contributions are crucial to ensuring food security and driving economic development. Despite facing significant challenges, such as limited access to resources and opportunities, women continue to make invaluable contributions that shape the food industry and broader economic landscape. The case studies of Kudumbashree, Lijjat Papad, and Pink Rickshaw demonstrate how targeted interventions—such as skill development, cooperative business models, and supportive policies—can empower women, improve their livelihoods, and promote inclusive growth. By fostering such initiatives, we can unlock the full potential of women in the food science sector, leading to greater economic equality and sustainability for communities and societies as a whole.

7. References

1. Ahmed, R. (2024). Women Empowerment through Service-Based Innovations in Pakistan. *Journal of Gender Studies*, 32(1), 45-58.
2. Bureau of Labor Statistics, U.S. Department of Labor. 2022. Occupational employment and wage statistics. www.bls.gov/oes/. Accessed 19 Jan 2024.
3. Food and Agriculture Organization (2024). *Women in Agriculture: Closing the Gender Gap for Development*. FAO.
4. Anita Medhekar (2024): Economic Contribution of Women in the Agricultural Sector and Food Security in Australia and India.; Impact of women in food and agricultural development. DOI: 10.4018/979-8-3693-3037-1.ch007
5. George, M. (2023). The Kudumbashree Initiative and Women's Empowerment in Kerala. *International Journal of Rural Development*, 28(2), 201-215.
6. Ministry of Food Processing Industries. (2024). *Annual Report on Women's Participation in Food Processing Industry*. Government of India.
7. Sharma, P., & Patel, K. (2023). Women Entrepreneurship in the Indian Food Industry: A Case Study of Lijjat Papad. *Asian Journal of Business Studies*, 30(3), 123-137.
8. Allen, Patricia, and Carolyn Sachs. 2007. Women and food chains: The gendered politics of food. *The International Journal of Sociology of Agriculture and Food* 15 (1): 1–23. <https://doi.org/10.48416/ijaf.v15i1.424>.