

An Analysis of Women's Labor Force Participation in Indian Agriculture

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Abstract

Women's participation in Indian agriculture is crucial for ensuring food security and economic sustainability. Despite their significant contributions, women often remain marginalized, with limited access to resources, decision-making, and recognition within the agricultural sector. This paper explores the dynamics of women's participation in agriculture by analyzing their roles as cultivators, laborers, and entrepreneurs. The study examines the challenges faced by women, including wage disparities, lack of access to credit, and inadequate technological support, and also examines the government schemes and programs. An analysis of the paper assesses the role of women in the agriculture sector based on census data. It studies work participation in agriculture and non-agricultural sectors by gender, including the proportion of agricultural workers as a share of total workers and the ranking of women among agricultural workers. The interplay of government policies, rural development initiatives, and grassroots organizations is also evaluated to understand their impact on empowering women in agriculture. The findings suggest that economic empowerment for women is essential; financial inclusion through easily available credit, microfinance, and women-friendly banking services is crucial. Policies should incorporate gender-sensitive strategies into agricultural planning, provide safe working conditions, and enforce wage equality.

Key Words

Agriculture, Labour, Development.

INTRODUCTION

There is an essential role of women in agricultural development and

their significant contributions across various fields such as agriculture, food security, horticulture, processing, nutrition, sericulture, fisheries, and other allied sectors over the years. As farmers, laborers and entrepreneurs, women are crucial to the agriculture sector and the development of rural economies. With their increasing involvement in land and water management, as well as being collectors of water and fodder, women provide critical support to the health of rain-fed and dryland farms and livestock in areas where the soil is unproductive, rains are erratic or insufficient, and men have migrated in search of work, leaving women behind to earn additional incomes through agriculture and allied activities, minor forest produce, and local enterprises. However, these efforts by women remain undervalued as they are not recognized as primary producers. Women continue to face challenges in accessing land, credit, technology, agricultural inputs, services, and market opportunities.

Women make significant contributions to the agricultural and rural economies of all regions of the world. However, the exact contribution, both in terms of magnitude and its nature, is often difficult to assess and shows a high degree of variation across countries and regions. This paper presents an overview of the evidence on the roles of women in agriculture and rural labor markets. It also looks at demographic trends in rural areas regarding the gender composition of rural populations.

LITERATURE REVIEW

The patterns of working women in agriculture are identified by a large number of research studies. Gender-wise analysis was the subject of empirical research and explanation. This study will further highlight the trend of women's involvement in agriculture across different Indian states. By grouping economically engaged women in agriculture hierarchically, efforts were made to compile and classify the states exhibiting similar behavior in Indian agriculture. Here, the review of literature is shown in chronological order :

Farid *et all.* (2009) discussed the major role of women in farming & non-farming activities, especially in post-harvest operations, homestead gardening, livestock, and poultry rearing, selling labour, etc. The primary need of women working or seeking employment in various agricultural and non-agricultural activities is to meet the family's needs and to enhance the family's income.

Swamikannan and Jeyalakshmi (2015) examined the women labour force engaged in agriculture. The study aims to measure women's seasonal agricultural employment and analyze the distribution of Indian women labourers. Crop production, cattle, horticulture, post-harvest activities, agro/social forestry, and fisheries heavily rely on women. In India, women represent the backbone of rural labor, accounting for 48% of self-employed farmers and 4/5 of economically active agricultural workers. Additionally, women's reliance on wage labor in agriculture has increased as household industries have declined.

Angadi (2016) examined the Role of Women: In Indian Agriculture Sector. Agriculture is a major industry for women, which gives them many career options and adds to home resources and family income. Nonetheless, there are still gender pay gaps, with women frequently receiving lower compensation for doing the same work as men. Due to a lack of education and skill development, many women are forced to maintain subsistence farming. Despite making up roughly half of the population, women are disproportionately impacted by globalization and liberalization because they find it difficult to benefit from these economic developments. By eliminating these obstacles with carefully considered legislative measures, women may strengthen their economic empowerment and take advantage of opportunities in agriculture.

Rai (2017) states that Rural women are a vital workforce in developing economies, particularly in India, where 70% of the female population resides in rural areas. Of these, 60% engage in agriculture as their primary income source. Women account for 78% of the economically active population in agriculture, performing 70% of farm work. Despite their contributions, they face challenges in benefiting from liberalization and globalization. Effective policies, along with legal, financial, and educational reforms, can enhance women's role in agricultural and rural development.

Rani *et al.* (2018) examined the review the role of women in agriculture. The study found that approximately 80% of all economically active women in the country are engaged in agricultural activities. The study observed that 48% women are self-employed farmers in India and perform over 70% of total farm labor. Crop production, livestock management, horticulture, post-harvest operations, agro/social forestry, fisheries, and other related fields are just a few of the agricultural and associated fields in which rural women are heavily active. Women work in agriculture for eight to nine hours a day on average, plus an additional four hours for household tasks.

Additionally, female laborers are frequently regarded as more competent and productive than their male colleagues in many agricultural chores.

Kumar *et al.* (2019) examine the participation of Indian women in the agricultural sector through a study based on rural areas in India for the period from 1993 to 2012. They investigated the types and degrees of female involvement in Indian agriculture. The study observed that almost 60% of the workforce in India depends upon agriculture as the primary source of income. Women work in a variety of agricultural and related fields, including fishing, harvesting, horticulture, and farming for food. Furthermore, an estimated 75% of Indian women work in agriculture and actively engage in the primary sector.

Govindasamy and Das (2021) examined women's participation in the agricultural sector in India by using secondary sources from the Census of India and the Statistical Profile of Women Labour, Ministry of Labour and Employment. The time span is from 2008 to 2017. The percentage of women working in agriculture was observed to be approximately 47% on tea plantations, 48% on cotton farms, 45.43% on oilseed farms, and 39% on vegetable farms. Sowing, transplanting, weeding, irrigation, fertilizer application, plant protection, harvesting, winnowing, storage, threshing, and other agriculture-related tasks are physically taxing for women. Women also predominate in the dairy and poultry industries. In India, women are the main producers of agricultural goods in terms of quantity, value, and labor hours. The growth and success of our country will depend on acknowledging the significance of rural women and taking a progressive, receptive stance. The emphasis on women's participation in agriculture in this report is extremely important.

Manisha *et al.* (2023) studied Influencing Factors for Involvement of Rural Women in Agriculture and Allied Sectors. Muzaffarpur district in Bihar was chosen at random for this microstudy. Sakra block, Saraiya, and Jagdishpur Baghnagri villages were chosen for the study out of 38 blocks in the Muzaffarpur district. A total of 120 people were chosen at random from the research region, 60 of whom were from Saraiya and 60 from Jagdishpur Baghnagri. In agricultural engagement, age was found to be negatively significant at the 5% level, but prolonged participation contacts, housing type, landholding type, and annual income were found to be positively significant at the 1% level. Caste, education, annual income, dwelling type, landholding type, and education contacts were all found to be positively significant at the five percent significance level.

OBJECTIVE

- This paper explores the dynamics of women's participation in agriculture.
- The study examines the challenges faced by women.
- The study also discussed the main obstacles to women's growth in the agriculture sector and government schemes/programs.

DATABASE

The paper examines the role of women in the agriculture sector based on census data 1981 to 2011. It studied work participation in agriculture and non-agricultural sectors by gender, the percentage of agriculture workers as a share of total workers, ranking of women as a share of agriculture workers. Using state-level census data, we attempted to examine the possible factors that influence women's participation in agricultural as well as non-agricultural activities.

ANALYSIS

Work Participation in Agricultural and Non-agricultural Sectors

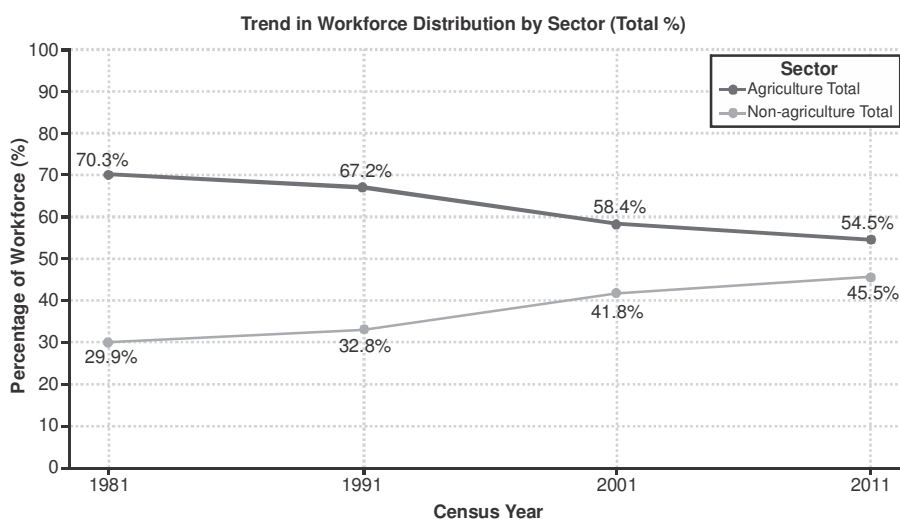
It reflects notable gender disparities influenced by socioeconomic, cultural, and policy-driven factors. In agriculture, men often engage in tasks involving mechanization and heavy labor, such as machinery operation, while women contribute significantly to planting, weeding, harvesting, and post-harvest activities. Despite their substantial role, women's contributions are undervalued, having limited access to resources like land and technology. In non-agricultural sectors, men dominate industries such as construction and manufacturing, while women are increasingly involved in service industries like healthcare and education, in lower-paying roles. Factors such as unequal access to education, cultural norms, and wage gaps hinder women's equitable participation across sectors. However, with advancements in technology, urbanization, and supportive policies, gender dynamics are slowly shifting. Promoting gender-sensitive initiatives, enhancing education and skill development, and ensuring equal access to resources are critical to achieving a more inclusive and equitable workforce.

Table 1

Work Participation in Agriculture and Non-Agricultural Sectors by Gender

Census Year	Agriculture			Non-agricultural		
	Male (%)	Female (%)	Total	Male (%)	Female (%)	Total
1981	66.3	82.6	70.3	33.7	17.8	29.7
1991	60.9	82.4	67.2	39.1	17.6	32.8
2001	51.9	71.8	58.4	48.1	28.2	41.6
2011	49.8	65.1	54.5	50.1	34.9	45.5

Source : Census Various Issues



As gender-based work participation rates in the agricultural and non-agricultural sectors for 1981, 1991, 2001, and 2011 can be seen in Table 1. Although both have shown a decline over time, female involvement in agriculture has consistently been higher than male participation. By 2011, the proportion of women working in agriculture had decreased from 82.6% in 1981 to 65.1% in 2011, when 65.1% of women and 49.8% of men were employed in this sector. On the other hand, female participation in non-agricultural industries increased with time, but males still made up a higher share.

Table 2 shows the number and area of land holdings in India, categorized by gender (Male/Female) and type of holding (Individual, Joint, and Total), spanning the years 1995-1996 to 2015-2016.

Table 2
Number and Area of Land Holdings (1995-2016)

Year	Gender	Individual (Number*)	Individual (Area**)	Joint (Number*)	Joint (Area**)	Total (Number*)	Total (Area**)
1995-	M	90,372,477	125,444,748	13,981,437	24,774,047	104,353,914	150,218,795
1996	F	10,208,217	10,435,065	803,385	1,280,717	11,011,602	11,715,783
2000-	M	91,856,264	120,400,557	14,812,331	23,855,479	106,668,599	144,256,047
2001	F	12,090,328	12,017,200	899,815	1,355,758	12,990,144	13,372,960
2005-	M	97,891,758	118,056,893	15,959,413	23,804,253	113,851,171	141,861,146
2006	F	13,819,862	12,937,421	1,295,355	1,830,340	15,115,217	14,767,761
2010-	M	102,611,669	116,540,886	17,815,452	24,999,477	120,427,121	141,540,363
2011	F	15,980,646	14,312,619	1,702,126	2,196,959	17,682,772	16,509,578
2015-	M	107,052,367	113,367,713	18,698,520	24,416,102	125,750,887	137,783,816
2016	F	18,414,003	15,879,512	2,025,145	2,613,720	20,439,148	18,493,232

Notes : * in Absolute Units and ** in Absolute Hectares

Source : <https://www.google.com/search?q=https://agcensus.dacnet.nic.in/>

The primary takeaway from the data is a significant trend of land fragmentation and a concurrent increase in female land ownership across India from 1995-1996 to 2015-2016 shown in table 5.2 As far Fragmentation is concerned, Total Number of holdings increased substantially (from around 115 million to around 146 million), while the Total Area slightly decreased (from around 161 million to around 156 million hectares). This resulted in a decline in the average operational holding size, making agriculture less viable. While the number of female holdings nearly doubled (from around 11 million to around 20 million), the area held by women increased by over 57%. This suggests greater formal recognition of women's land rights.

Table 3, provides valuable insights into the reliance on agriculture for employment and the gender distribution within the agricultural workforce across various Indian states. About 54.6% of India's workforce is employed in agriculture, with 37.1% of women and 62.9% of men working in this industry. This data highlights the significant role of women in agriculture, accounting for over 1/3 of the agricultural workforce. Nonetheless, the industry is dominated by men, with a larger proportion of men than women working in agriculture.

Table 3**Agriculture Workers as a Share of Total Workers (%age), 2011**

States	Agriculture Workers as a Share of total Workers	Men as a Share of Agriculture Workers	Women as a Share of Agriculture Workers
Chhattisgarh	74.7	52.4	47.6
Bihar	73.6	71.7	28.3
Madhya Pradesh	69.8	58.5	41.5
Jharkhand	63.0	56.2	43.8
Himachal Pradesh	62.9	45.1	54.9
Rajasthan	62.1	52.0	48.0
Odisha	61.8	63.2	36.8
Nagaland	61.7	48.5	51.5
Andhra Pradesh	59.5	53.2	46.8
Uttar Pradesh	59.3	75.2	24.8
Meghalaya	58.5	55.4	46.6
Arunachal Pradesh	57.7	50.4	49.5
Mizoram	55.8	56.0	44.0
Maharashtra	52.7	55.1	44.9
Uttarakhand	51.2	51.5	48.5
Gujarat	49.6	64.2	35.8
Assam	49.3	71.6	28.4
Karnataka	49.3	58.5	41.5
Manipur	49.1	55.4	44.6
Sikkim	46.5	53.1	46.9
Haryana	45.0	70.6	29.4
Tripura	44.2	68.2	31.8
West Bengal	44.0	78.1	21.9
Tamil Nadu	42.1	54.7	45.3
Jammu and Kashmir	41.5	65.8	34.2
Punjab	35.6	85.0	15.0
Dadra and Nagar Haveli	29.2	51.7	48.3
Kerala	17.2	70.5	29.5
Ademara and Nicobar	14.0	46.9	23.1
Goa	10.1	57.9	42.1
India	54.6	62.9	37.1

Source : Patnaik *et al.*

Table 4**Ranking of Women as a Share of Agriculture Workers, 2011**

States	Women as a Share of Agriculture Workers	Ranking of Women as a Share of Agriculture Workers
Himachal Pradesh	54.9	1
Nagaland	51.5	2
Arunachal Pradesh	49.5	3
Uttarakhand	48.5	4
Dadra and Nagar Haveli	48.3	5
Rajasthan	48.0	6
Chhattisgarh	47.6	7
Sikkim	46.9	8
Andhra Pradesh	46.8	9
Meghalaya	46.6	10
Tamil Nadu	45.3	11
Maharashtra	44.9	12
Manipur	44.6	13
Mizoram	44.0	14
Jharkhand	43.8	15
Goa	42.1	16
Madhya Pradesh	41.5	17
Karnataka	41.5	18
Odisha	36.8	20
Gujarat	35.8	21
Jammu and Kashmir	34.2	22
Tripura	31.8	23
Kerala	29.5	24
Haryana	29.4	25
Assam	28.4	26
Bihar	28.3	27
Uttar Pradesh	24.8	28
Ademar and Nicobar	23.1	29
West Bengal	21.9	30
Punjab	15	31

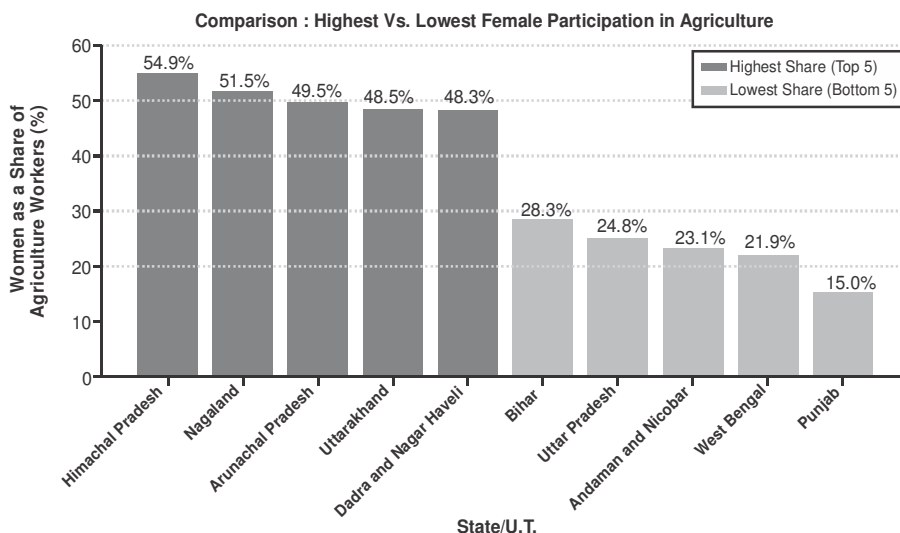


Table 3 also shows that the proportion of agriculture workers varies significantly by state, with Chhattisgarh having the highest share at 74.7%. States like Bihar (73.6%) and Madhya Pradesh (69.8%) also report high percentages of agricultural workers in their labour force. In these states, men make up a larger share of agricultural workers, with male participation ranging from 52.4% in Chhattisgarh to 85% in Punjab. However, women's participation is still significant in many states. Some states, such as Himachal Pradesh (54.9%), Nagaland (51.5%), and Sikkim (46.9%), have a higher percentage of women agricultural workers compared to men, indicating greater gender parity in agricultural participation. Nationally, women account for 37.1% of the agricultural workforce, suggesting that although men remain the majority, women play a critical role in the sector. This data underscores the importance of recognizing and supporting women's contributions to agriculture, especially in states with higher female participation. Gender-sensitive policies are essential to address disparities in wages, access to resources, and decision-making power, ensuring that women benefit from agricultural growth and development in the long term.

Table 4 shows the ranking of Indian states based on the percentage of women involved in agricultural work. It indicates the percentage of agricultural workers in each state, while the Ranking reflects the states' positions based on these percentages.

As far as the top-performing States are concerned, Himachal Pradesh ranks highest with 54.9% of agriculture workers being women, indicating a

significant role of women in agriculture. Nagaland (51.5%) and Arunachal Pradesh (49.5%) follow as second and third, respectively. In the case of low-performing States, Punjab has the lowest share at 15%, indicating a comparatively minimal involvement of women in agriculture. West Bengal (21.9%) and Andaman and Nicobar Islands (23.1%) are also at the lower end.

Therefore, states in the Northeast and Himalayan regions like Nagaland, Arunachal Pradesh, and Sikkim generally have higher percentages of women in agricultural roles. States like Punjab, West Bengal, and Kerala have lower representation of women in agriculture, possibly due to industrialization, urbanization, or different socio-economic factors.

Main Obstacles to Women's Growth in the Agriculture Sector

Despite their important contribution to India's agricultural economy, women encounter many barriers that limit their ability to advance and become more productive. One of the main obstacles is the lack of agricultural land ownership, which limits women's ability to make decisions and access government programs and finance. Furthermore, because women are frequently paid less for doing the same work as men, the gender wage gap is still a problem. Financial limitations make matters worse since they prevent women from accessing credit and financial services because they are unable to offer collateral, which is usually associated with land ownership.

Furthermore, she is unable to increase their production and efficiency due to a lack of access to contemporary agricultural technologies and training. They are excluded from leadership positions and agricultural decision-making processes due to cultural and social conventions that allocate them labour-intensive responsibilities. Women's interests and difficulties are frequently disregarded in the policy-making process, another area where this lack of representation occurs. Due to insufficient outreach and communication, many people are still unaware of the several government programs designed to assist women in agriculture.

The double load of work that women bear is another important concern. In addition to farming, they have to take care of the house, leaving little time for skill improvement or diversifying their sources of income. Due to social constraints and limited transportation, women also face limited market access, hindering their ability to sell their produce. Furthermore, due to their lack of resources and ability to adapt, women farmers are more susceptible to the effects of climate change. In addition to focused legislation and awareness programs, it is imperative to address these issues by improving access to resources,

technology, and financial support to secure women's advancement in the agriculture industry. In addition to increasing their production, empowering women in agriculture will advance the agricultural sector.

Government Schemes / Programs

The government has implemented various initiatives to support and empower women in agriculture through the Department of Agriculture, Co-operation & Farmers Welfare.

Key Measures Include

National Mission on Agricultural Extension & Technology (NMAET) :

A Government of India initiative aimed at strengthening agricultural extension services through modern technology, capacity building, and improved farmer–advisor linkages. It focuses on promoting efficient farm practices, enhancing skill development, supporting mechanization, and ensuring the timely dissemination of information to farmers for better productivity.

Mission for Integrated Development of Horticulture (MIDH) : It offers assistance for horticulture mechanization for grower associations/farmers groups/ Self Help Groups/Women farmer groups having at least 10 members, who are engaged in the cultivation of horticultural crops, with a balance of 60% of the cost of machines and tools being borne by such groups.

National Mission on Oilseeds and Oil Palm (NMOOP) : 30% of the money is set aside for women farmers and beneficiaries under this program to support oilseed planting.

Sub-Mission on Agricultural Mechanisation (SMAM) : The main function of this scheme is to promote several drudgery-reducing technologies for women in agriculture, developed by ICAR through training, demonstration, and financial assistance.

Sub-Mission on Seed and Planting Material (SMSP) : This scheme covers the entire process of the seed production chain, from the production of nucleus seed to the supply of certified seeds to the farmers. It also provides training to women farmers under the components of the scheme, Seed Village Programme and Quality Control Arrangement of seeds. There is also a provision by the State Government to allocate adequate funds to women farmers.

National Horticulture Mission : The major objective of this scheme is to increase the horticulture crop production (fruits, vegetables, flowers, cocoa, cashew nut, plantation crops, spices, medicinal aromatic plants) to the maximum potential available in the state. It provides farm inputs, technological and

extension support to women organized into Self Help Groups to make women self-reliant.

Agricultural Insurance : Training Programmes on Gender Friendly Equipment for Women farmers are to be conducted by Farm Machinery Training & Testing Institutes, and as beneficiaries, at least 30% allocation of the fund is to be made to women farmers.

Mahila Kisan Sashaktikaran Pariyojana (MKSP) : Aim to empower women in agriculture by investing systematically to increase their participation and productivity. It focuses on creating and sustaining agriculture-based livelihoods for rural women.

CONCLUSION

The study highlights that women play a vital role in India's agriculture, yet they continue to face major barriers such as limited access to credit, technology, resources, and fair wages. Census data confirms their significant participation but also reveals persistent marginalization. While government schemes and rural initiatives contribute to women's empowerment, stronger gender-sensitive planning and better implementation are needed. Ensuring financial inclusion, providing women-friendly technologies, and improving rural infrastructure can greatly enhance their productivity and well-being. Ultimately, empowering women in agriculture is essential for improving food security, boosting rural livelihoods, and achieving sustainable agricultural development. The findings suggest that economic empowerment for women is essential; financial inclusion through easily available credit, microfinance, and women-friendly banking services is crucial. Physical and social barriers can be lessened by utilizing affordable, women-friendly agricultural technologies and enhancing rural infrastructure, such as childcare centers and sanitary conditions. Policies should incorporate gender-sensitive strategies into agricultural planning, provide safe working conditions, and enforce wage equality.

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