

Gender Disparities in Agricultural Work Participation in West Bengal

ABSTRACT

This study examines gender disparities in agricultural work participation across West Bengal from the 1960s to 2011, revealing consistently higher male engagement with significant regional variations. Districts such as Purulia, Hooghly, Bardhaman, and Bankura recorded higher female participation, whereas urbanized areas like Howrah, Nadia, and 24-Parganas showed lower involvement. The Work Participation Rate (WPR) in agriculture peaked in the 1980s but declined thereafter, reflecting economic diversification and a shift toward non-agricultural livelihoods. Despite constituting a substantial share of the agricultural workforce—estimated at 38–45.3% in developing countries—women often remain overlooked contributors, primarily engaged as unpaid or low-wage workers without formal recognition. Structural barriers, including limited land ownership and exclusion from decision-making roles, continue to reinforce gender inequities. While advancements in science and technology have transformed agriculture, they have failed to address the persistent marginalization of women in the sector. In India, agriculture continues to absorb female labour but does not formally acknowledge them as hired or employed workers. Addressing these systemic challenges is crucial for achieving gender equity and sustainable development. The findings underscore the urgent need for policy interventions that enhance women's access to resources, recognize them as farmers, and ensure their equitable inclusion in agricultural growth.

Keywords: Agricultural Workforce, Gender disparity, Work Participation Rate (WPR), Cultivator (M/M), Cultivator (F/F)

1. INTRODUCTION

Agriculture is the backbone of India's economy and the largest sector contributing to its economic growth. As a primary sector, it plays a crucial role in both developing and developed nations. Globally India ranks second in agricultural productivity. With one of the highest proportions of cultivable land among Indian states, agriculture dominates the economy of West Bengal. Women are indispensable to Indian agriculture, yet their contribution remains largely unrecognized. Women's participation is marked by structural inequalities, including wage disparities, restricted land rights, and informal labour conditions. They are often confined to low-paying or unpaid roles, primarily engaged in labour-intensive tasks despite of their

significant contributions. On the other hand, men dominate in mechanized and capital-intensive activities. Limited access to financial resources, technology, and institutional support further exacerbates their condition. Though they contribute a lot in agriculture, rural development policies of an overlook women's need. Globalization, economic integration, commercialization, urbanization, and technological advancements have uplifted the life of women. However, many of them still remain "invisible workers" in rural parts of West Bengal. Bhattacharya and Ghosh (2009) examined female work participation in agriculture across SAARC nations by analyzing trends, literacy influences, and further projections. Chakraborty and Chakraborty (2009) concluded that female work participation in West Bengal is low but varies across districts and mainly influenced by factors like literacy, land ownership as well as religion. Singariya and Shekhawat (2015) analyzed labour participation trends in Rajasthan, revealing significant rural-urban disparities. Their findings, based on pooled OLS and Quantitative Regression, indicate that female literacy negatively affects participation, while the scheduled tribe population has a positive influence. According to Bhattacharyya and Bhattacharyya (2017) male participation in agriculture remains higher than female, with a declining Work Participation Rate (WPR) observed since 1991 due to economic growth of different kinds of income generating opportunities in post-globalization period. Women engage more in farm work but have limited land ownership. In 2017, Wu and Qi conducted a gender-based research on multi-dimensional poverty in Chinato study the status of women with special focus on health, nutrition, education, housing and income. They have mentioned significant differences between urban and rural areas. Biswas (2018) examined gender disparities in West Bengal's agricultural workforce, highlighted rural-urban differences and the dominance of women in low-paying jobs with poor working conditions. Ray and Debnath (2018) analyzed regional variations in female labour participation where women participate more than male, particularly in the Eastern Plateau, Red Lateritic, and Eastern Himalayan regions. In contrast, the lower Gangetic region attracts more male workers due to higher economic and agricultural productivity. Shaw (2018) studied district wise variations in female agricultural participation of West Bengal during 1991–2011. He identified factors such as female literacy, food grain cultivation area, child population, SC/ST female population, and urbanization as key determinants. Chakraborty (2020) examined the economic and cultural factors sustaining low female work participation rate in rural West Bengal, particularly in relation to landholding patterns. Paul and Goswami (2022) further investigated economic constraints, emphasizing landholding as a critical factor limiting women's engagement in agriculture. Tripathi (2022) analyzed urbanization's impact on female workforce participation in Midnapur highlighting gender gaps and policy needs.

2. METHODS AND MATERIALS

Background of the research

To accomplish the present research work, secondary data of West Bengal regarding Women's participation in agriculture are available in various Census of India reports and other official sources. According to the census (2011), West Bengal held a notable high rank in terms of women's involvement in agricultural activities compared to other states in India. The data revealed a substantial proportion of women in West Bengal engaged in various agricultural tasks, including cultivation, livestock rearing, and related activities.

Work participation rate Chatterjee and Ghosh (2012) defined work participation rate as the ratio of the economically active agricultural population (EAAP) and the Total economically active population (TEAP), which can be expressed as,

$$WPR = (EAAP / TEAP) * 100$$

Subsequently, the following definitions are framed as follows:

WPR(M) is defined as the economically active Male work participation rate in agriculture to the total economically active population i.e.,

$$WPR (M) = (EAMAP / TEAP) * 100$$

Where EAMAP is an economically active agricultural male population

WPR(F) is defined as the economically active Female work participation rate in agriculture to the total economically active population i.e.,

$$WPR (F) = (EAFAP / TEAP) * 100$$

Where EAFAP is an economically active agricultural Female population

Cultivator (M) (% of male cultivator in respect of total Ag Population) =

$$\frac{\text{Cultivator male}}{\text{Total Ag Population}} \times 100$$

Cultivator (F) (% of female cultivator in respect of total Ag Population)=

$$\frac{\text{Cultivator female}}{\text{Total Ag Population}} \times 100$$

Ag. Labour(M) (% of male agricultural labour in respect of total Ag Population) =

$$\frac{\text{Ag Labour male}}{\text{Total Ag Population}} \times 100$$

Ag. Labour(F) (% of female agricultural labour in respect of total Ag Population) =

$$\frac{\text{Ag Labour female}}{\text{Total Ag Population}} \times 100$$

Cultivator (M/M) (% of male cultivator in respect of male Ag Population) =

$$\frac{\text{Cultivator male}}{\text{male Ag Population}} \times 100$$

Cultivator (F/F) (% of female cultivator in respect of female Ag Population) =

$$\frac{\text{Cultivator female}}{\text{female Ag Population}} \times 100$$

Ag. Labour (M/M) (% of M agricultural labour in respect of male Ag Population) =

$$\frac{\text{Ag Labour male}}{\text{male Ag Population}} \times 100$$

Ag. Labour (F/F) (% of F agricultural labour in respect of female Ag Population) =

$$\frac{\text{Ag Labour female}}{\text{female Ag Population}} \times 10$$

Source of the data

This study examines West Bengal and its districts, utilizing secondary data sources to achieve its research objectives. The data were derived from the Census of India, conducted by the Office of the Registrar General & Census Commissioner, under the Ministry of Home Affairs, Government of India. As a decennial exercise, the census provides extensive demographic and economic data, including workforce participation and gender-based economic classifications. This research specifically analyzes data from 1961 to 2011, sourced from the *Statistical Abstract of the Government of West Bengal* and various Census of India reports. These reports are publicly accessible through the official Census of India website (<https://censusindia.gov.in/>) and other government statistical databases.

The analysis highlights that although women contribute significantly to agriculture, their roles largely remain informal and unpaid. They are primarily engaged in labour-intensive activities from transplanting, weeding, harvesting and threshing etc., whereas men dominate mechanized and higher-income agricultural tasks. Additionally, socio-cultural norms and traditional land inheritance practices continue to restrict women's ownership of agricultural land, thereby limiting their authority and decision-making power in farming.

3. RESULT AND DISCUSSION

3.1: Work Participation Rate in Agriculture for the districts of West Bengal

The study examines the gender gap and the evolving nature of women's participation in agriculture, with a focus on West Bengal. It systematically compiles data from the 1960s onward to address critical gaps in the literature on female labour participation. The research underscores the importance of analyzing women's agricultural work within a broader socioeconomic framework, highlighting the dynamic nature of their roles as the demand for female labour grows. Women's participation in agricultural activities, whether

as family labour or hired workers, varies significantly based on economic conditions, social hierarchies, and cultural norms. Despite their substantial contributions, Indian policies fail to formally recognize women as farmers, perpetuating gender-based disparities. These women, whose labour often begins before dawn and extends late into the night, remain unheard due to deeply ingrained societal norms rooted in gender socialization. Their agricultural efforts are carried out alongside responsibilities as wives, daughters-in-law, and mothers, all within the constraints imposed by social and cultural systems.

The Work Participation Rate (WPR) in agriculture rose steadily after independence, peaking around the 1981 Census, but began declining thereafter, reflecting improved economic conditions and alternative income opportunities, particularly in the wake of globalization. Female Work Participation Rates (FWPR), while consistently lower than male rates across West Bengal, show notable regional variations. Districts like Purulia, Darjeeling, Burdwan, and Hooghly reported relatively higher FWPRs in agriculture, with Purulia experiencing a significant increase by 2001 after a slight decline in the preceding decade. In contrast, districts such as Murshidabad, Nadia, 24-Parganas, and Howrah consistently recorded lower FWPRs. Although the reliance on secondary data limits the study's ability to capture finer regional nuances, the findings offer valuable insights into the multifaceted dynamics of women's participation in agriculture.

A detailed analysis of the Work Participation Rate (WPR) in agriculture, with an emphasis on gender dynamics, has been thoroughly examined for all districts of West Bengal and the state as a whole. The results are organized into the table below and also depicted in graphical format.

Table 1: Total WPR (WORK PARTICIPATION RATE) in agriculture rank table

District	WPR 1961	Rank	WPR 1971	Rank	WPR 1981	Rank	WPR 1991	Rank	WPR 2001	Rank	WPR 2011	Rank
Darjeeling	40.40	14	39.59	14	34.07	14	48.10	14	38.37	12	20.80	14
Jalpaiguri	46.34	12	50.01	13	46.86	12	48.61	13	66.95	3	37.31	12
Cooch Behar	81.21	3	83.54	1	77.10	1	75.31	2	68.22	1	67.08	1
Dinajpur	87.85	1	66.06	8	75.91	2	80.76	1	51.55	7	66.18	2
Malda	51.56	10	79.52	4	66.87	5	66.55	7	46.73	8	52.08	7
Murshidabad	63.91	8	75.58	7	64.89	7	63.74	11	60.07	6	47.23	8
Birbhum	74.2	6	79.29	5	70.34	3	70.31	4	44.70	9	62.98	4
Bardhaman	46.18	13	54.80	11	49.58	11	69.78	5	43.07	10	45.18	10
Nadia	59.61	9	65.30	9	58.43	9	68.73	6	23.68	14	46.93	9
24 Pargana	49.06	11	51.97	12	42.01	13	64.29	10	39.25	11	24.83	13
Hooghly	68.66	7	54.97	10	49.92	10	64.39	9	66.08	4	39.15	11
Bankura	77.04	5	81.36	2	67.04	4	72.25	3	67.31	2	65.27	3
Purulia	83.57	2	78.62	6	61.10	8	64.73	8	64.45	5	60.89	5
Howrah	23.80	15	32.51	15	10.13	15	46.72	15	15.38	15	14.40	15
Medinipur	80.56	4	80.41	3	66.86	6	62.05	12	25.73	13	60.84	6

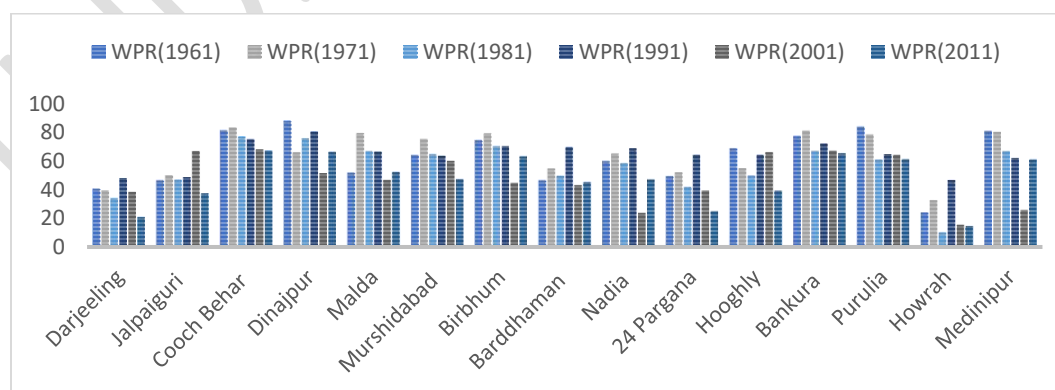


Fig: 1 Graphical representation of total Work Participation Rate (WPR) in agriculture

Table 2: WPR (Work Participation Rate) Male rank table

District	WPR (1961)	Rank	WPR (1971)	Rank	WPR (1981)	Rank	WPR (1991)	Rank	WPR (2001)	Rank	WPR (2011)	Rank
Darjeeling	24.49	14	28.11	15	24.31	14	33.42	15	16.48	14	13.90	14
Jalpaiguri	39.00	12	48.29	12	43.62	10	43.02	14	25.58	12	26.65	12
Cooch Behar	77.57	2	81.9	1	74.15	1	68.79	2	46.30	3	49.66	2
Dinajpur	80.22	1	62.35	9	69.55	2	69.05	1	47.42	2	48.84	3
Malda	38.47	13	75.48	2	61.63	5	57.34	8	38.47	8	41.32	8
Murshidabad	61.23	5	73.66	3	63.52	4	61.99	4	43.66	5	44.15	6
Birbhum	64.44	4	72.99	4	63.64	3	61.03	6	45.37	4	50.43	1
Barddhaman	40.06	11	48.64	13	42.87	12	58.72	7	33.88	10	35.02	10
Nadia	58.27	7	63.79	8	56.86	7	66.58	3	39.11	7	43.98	7
24 Pargana	47.69	10	50.99	10	40.93	13	61.39	5	20.98	13	21.72	13
Hooghly	59.75	6	48.91	11	43.10	11	54.93	10	29.54	11	30.45	11
Bankura	57.18	8	69.07	6	53.61	8	55.10	9	41.48	6	45.15	4
Purulia	47.71	9	65.54	7	45.58	9	43.17	13	35.86	9	35.47	9
Howrah	23.38	15	32.12	14	9.47	15	45.34	12	13.92	15	12.73	15
Medinipur	67.41	3	72.82	5	58.44	6	51.93	11	48.53	1	45.11	5

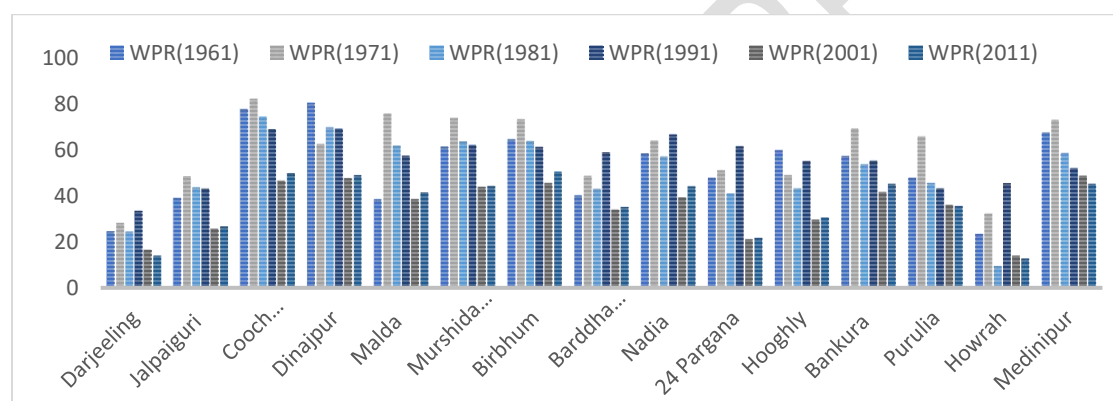


Fig: 2 Graphical representation of Male Work Participation Rate (WPR) in agriculture

Table 3: WPR (Work Participation Rate) Female rank table

District	WPR (1961)	Rank	WPR (1971)	Rank	WPR (1981)	Rank	WPR (1991)	Rank	WPR (2001)	Rank	WPR (2011)	Rank
Darjeeling	15.90	3	11.49	3	9.77	3	14.68	3	9.25	11	6.90	11
Jalpaiguri	7.34	9	1.72	11	3.24	10	5.60	11	12.79	7	10.67	8
Cooch Behar	3.64	11	1.64	12	2.84	11	6.53	10	20.66	4	17.42	3
Dinajpur	7.63	8	3.71	9	6.36	8	11.72	4	20.81	3	17.34	4
Malda	13.08	5	4.04	8	5.24	9	9.21	9	13.08	6	10.76	7
Murshidabad	2.68	12	1.91	10	1.38	13	1.76	14	3.07	13	3.09	13
Birbhum	9.85	6	6.30	5	6.71	7	9.28	8	14.70	5	12.56	6
Barddhaman	6.12	10	6.16	6	6.72	6	11.07	5	10.82	9	10.16	9
Nadia	1.34	14	1.51	13	1.57	12	2.15	13	3.96	12	2.96	14

24 Pargana	1.36	13	0.98	14	1.08	14	2.91	12	2.71	14	3.11	12
Hooghly	8.90	7	6.07	7	6.82	5	9.47	7	9.72	10	8.71	10
Bankura	19.87	2	12.29	2	13.43	2	17.15	2	24.60	2	20.12	2
Purulia	35.87	1	13.08	1	15.52	1	21.57	1	31.45	1	25.43	1
Howrah	0.42	15	0.39	15	0.67	15	1.39	15	1.47	15	1.68	15
Medinipur	13.16	4	7.59	4	8.42	4	10.13	6	12.57	8	15.73	5

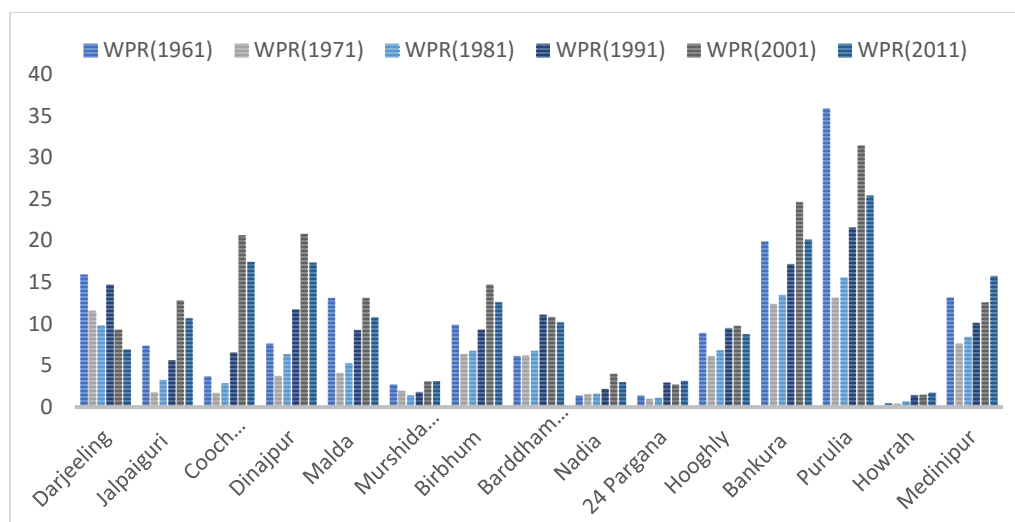


Fig: 3 Graphical representation of Female Work Participation Rate (WPR) in agriculture

3.2. Population of cultivators and agricultural labours:

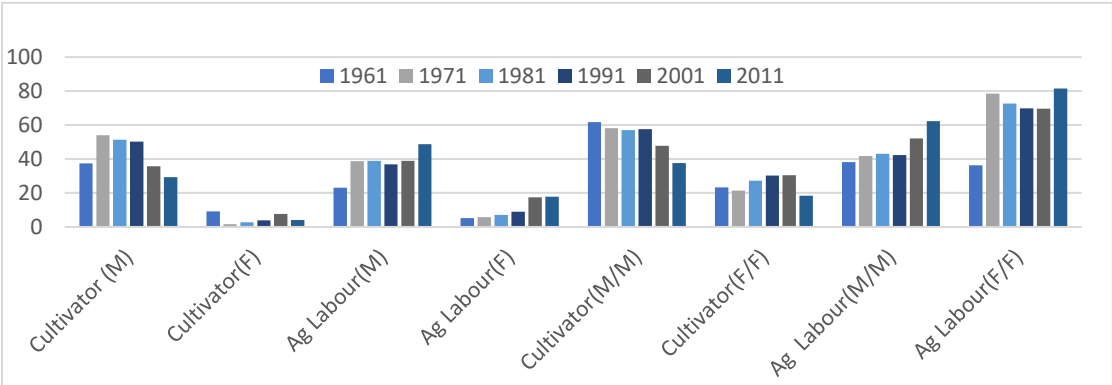
Women in West Bengal play a significant role in the agricultural labour force, yet their access to land is severely restricted, and their representation as cultivators remains minimal. Over the last six decades, the proportion of female cultivators has consistently been negligible across all districts, with only a slight improvement in Darjeeling. Participation rates of female agricultural labourers are particularly low in urban areas such as Howrah, 24 Parganas, and Nadia, while relatively higher figures are observed in districts like Purulia, Hooghly, Bardhaman, Bankura, and Birbhum. In North Bengal, districts like Darjeeling, Jalpaiguri, and Cooch Behar report some of the lowest participation rates, with slight increases seen in Dinajpur. Although women constitute a substantial share of the agricultural workforce within their gender group, they are predominantly engaged as unskilled, daily-wage labourers rather than landowners or cultivators.

A comparative analysis of cultivators and agricultural labourers, disaggregated by gender, is presented through the bar graphs and tables below. Additionally, an effort has been made to compare the participation rates of male and female cultivators and agricultural labourers, both in relation to the total agricultural population and within their respective gender-specific agricultural populations.

Table 4: Table for Population of cultivators and agricultural labours for West Bengal

Year	Cultivator (M)	Cultivator (F)	Ag Labour (M)	Ag Labour (F)	Cultivator (M/M)	Cultivator (F/F)	Ag Labour (M/M)	Ag Labour (F/F)
1961	37.50	9.11	23.18	5.21	61.81	23.26	38.19	36.39
1971	53.92	1.57	38.73	5.77	58.19	21.41	41.81	78.59
1981	51.37	2.66	38.86	7.10	56.94	27.25	43.06	72.75
1991	50.17	3.91	36.87	9.04	57.64	30.21	42.36	69.79

2001	35.76	7.67	39.03	17.54	47.82	30.44	52.18	69.56
2011	29.40	4.03	48.69	17.88	37.65	18.39	62.35	81.61



CONCLUSION

This research analyzed gendered work participation in agriculture across West Bengal, spanning data from the 1960s to 2011. The analysis revealed a persistent gender disparity, with male participation rates consistently exceeding female rates. However, female work participation showed significant regional differences, with districts like Purulia, Hooghly, Bardhaman, and Bankura exhibiting relatively higher rates, while urbanized areas such as Howrah, Nadia, and 24-Parganas demonstrated consistently lower engagement. Over time, the overall Work Participation Rate (WPR) in agriculture peaked in the 1980s but subsequently declined, reflecting broader economic shifts and the diversification of income opportunities. Women's involvement in agriculture, often as unpaid family labour or low-wage workers, plays a critical yet undervalued role. Despite their substantial contributions, they remain excluded from formal recognition as farmers, largely due to cultural and structural barriers that restrict their access to land and decision-making roles. These systemic challenges highlight the necessity for policy reforms that acknowledge and support women's agricultural labour, enabling equitable opportunities and recognition.

Future research should focus on capturing region-specific details through primary data collection, incorporating qualitative methods to provide deeper insights into the intersectionality of gender and caste in agriculture. Emphasizing qualitative research will help uncover structural inequalities and the socio-economic challenges faced by women from diverse backgrounds. This study highlights the urgent need for policy interventions to formally recognize women's roles, enhance their access to land ownership, and improve their socio-economic conditions. Without such reforms, gender disparities in agricultural work will persist, reinforcing structural inequalities in the rural labour market.

DISCLAMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declares that NO generative AI technologies such as large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generation have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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