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Review of Literature

Veena Sahi, Brajesh Sahi, K. M. Singh, and Pooja Kumari, (2018) ^[13]. Women help in every part of agriculture, from land preparation to crop harvesting. They also manage other activities such as dairy cattle, fodder collection, beekeeping, mushroom production, goat rearing, and poultry, among others. They directly contribute significantly to family income and thus help to improve their families' social status. M. S. Meena, K. M. Singh, R. K. P. Singh, Anjani Kumar, Abhay Kumar, and V. P. Chahal (2017) ^[6, 8] Under this article "Inequality and determinants of income among rural Participation Towards Changing Farming Practices in Eastern India: A Study of Women Headed Households" Understanding the level of a household's living standards and how to get there requires an understanding of income and its source. Along with revealing characteristics of income instability, income, household expenditures, and assets also provide a further indicator of inequality.

Nishi Slathia (2015). In terms of employment, Agriculture is the most important source of income, especially for rural women. They bear the brunt of the workload in food production and, because of gender discrimination, they receive lower pay for their efforts. It is terrible that in a society where men predominate, her role is not sufficiently acknowledged, and her contribution is not sufficiently knowledgeable. Despite being overrepresented in the labour market, women in India still have major disadvantages in terms of salary, access to land, and participation in local farmer organisations. In addition, women confront a variety of obstacles since they have limited access to agricultural production's productive resources, which keeps them from increasing their productivity.

Mun Mun Ghosh and Arindam Ghosh (2014) ^[1]. Were opined that "active involvement and participation of women within the agricultural sector in the majority of the states with; few exceptions like Kerela and West Bengal wherever women are actively collaborating in non-agricultural activities which; incorporates house-hold business, service sector etc.

M. M. Ghosh, and A. Ghosh (2014) ^[1]. Analysis of Women Participation in Indian Agriculture. Agriculture's geography has changed significantly over time. Agriculture continues to absorb and employ two-thirds of the female labour force in developing countries such as India, but they are not recognised as employed labour. Furthermore, their contribution as agricultural labourers is suppressed under the status of family labour who works on the farm in addition to their regular household chores. Female labour's multitasking ability brought significant benefits to agricultural productivity, rural production, economic vitality, household food security, family health, family economic security, and welfare.

Roshan Lal and Ashok Khurana (2011)- explained that "Women have; contend and still; play a key role within the conservation of basic life support systems like land, water, flora and fauna. The character and extent of women's involvement in agriculture vary greatly from region to region and their involvement varies widely among completely different ecological sub-zones, farming systems, castes, categories and stages within the family cycle. Women are forced to simply accept to be in agriculture in their own village below terribly unhealthy conditions as a result of they can't migrate as simply as men"

Purnamita Dasgupta and Bishwanath Goldar (2006)- Came

out with the conclusion that "an inverse relationship between offer of labour and wage rate at a low level of wage, particularly for females in rural areas. The results showed that provide of feminine labour from below personal income households in rural areas is reciprocally associated with wage rate and therefore the variety of earning members within the family".

Study area

Bihar, a landlocked state, has an international border in addition to a state boundary. Bihar is located in eastern India and is bounded to the north by Nepal, to the east by West Bengal, to the west by Uttar Pradesh, and to the south by Jharkhand, which was separated from Bihar in November 2000. Bihar constitutes only 2.68 percent of the total land of India. Bihar comprises 37 districts and Patna is its capital. Important rivers such as the Ghaghara, Gandak, Bagmati, Kosi, and Mahanadi, as well as others, flow down from the Nepal Himalayas and join the Ganga. Among these rivers, due to their destructive floods, the Kosi is known as the sorrow of Bihar. Agriculture is the backbone of the Bihar economy, employing roughly 80 percent of the population. Agricultural production includes food grain, fruits, vegetables, spices, and flowers, all of which can be increased through improved cultivation and management methods. Despite this, Bihar is one of India's leading producers of vegetables and fruits. The state has lagged behind in terms of industrial activity.

In the census year 2011, it was the third most populous state after Uttar Pradesh and Maharashtra, with a sex ratio of 918 females per thousand males and a literacy rate of 61.80 percent, compared to 74.04 percent in India. As per National Family Health Survey- 5 (2019-21) report, the total fertility rate of Bihar is 3.0 Birth per woman which is higher than India's total fertility rate of 2.0 Birth per woman. we can conclude that the study area, Bihar state, which ranks third from the bottom among all states with a low literacy rate of 61.80 percent, has a negative impact on the gender ratio, whereas states with a higher literacy rate show faster progress toward gender parity. As a result, the lower the literacy rate in the state, the lower the improvement in the sex ratio.

Methodology

Simple statistical methods such as averages and percentages were used to analyse women's status, gender-specific population, literacy, the share of the total and agricultural workforce, the share of land holdings, wage rate, and operation-specific participation. The data were obtained from the Census 2001 and 2011, different Wages Reports, Government of India, and for operation-wise participation of women in agriculture, unit-level data were obtained from the Cost of Cultivation Scheme, Ministry of Agriculture and Farmer's Welfare, which is currently in operation in the state of Bihar.

Objectives

1. To examine the correlation between literacy rate and sex ratio in Bihar
2. To examine the role of female labours in the agriculture sector of Bihar.
3. To determine the causes of the decrease in female agricultural participation in Bihar.

Data Analysis

Table 1: Population and literacy rate of women in Bihar

Particulars	2001	2011	Percentage change from 2001 to 2011
Total population in lakh	830	1041	25.40
Female population in lakh	398	498	25.13
Male population in lakh	432	543	25.70
Female literacy rate (%)	33.56	51.50	-
Male literacy rate (%)	59.71	71.21	-
Sex ratio (Female per 1000 male)	919	918	0.12

Source: Census of India

Table 1 presents the women population, literacy rate and sex ratio in Bihar. The table reveals that the population of women increased by 25.13% between 2001 and 2011, while the national population increased by only 17.6%. The faster increase in female population is a positive indicator of the state's growth. In comparison to male literacy, female

literacy remains low (51.50%). It is also significantly lower than the national female literacy rate of 65.5%, according to the 2011 Census. Between 2001 and 2011, the sex ratio fell by 0.12%. However, at the national level, it has increased by 0.75%. An increase in female literacy and population share is a positive indicator of social and cultural growth.

Table 2: Share of agricultural workers in the total workforce

Year	Description	Workforce (lakh)	Agricultural workforce (Lakh)	Gender-wise participation in total workforce (%)	Participation of Agricultural workforce to total workforce (%)
2001	Total	279.75	134.21	100.00	48.00
	Female	74.90	46.86	26.78	16.56
	Male	204.80	128.11	73.23	45.80
2011	Total	347.25	95.35	100.00	27.45
	Female	95.28	21.66	27.45	6.25
	Male	252.21	73.74	72.55	21.25

Source: Census data for Bihar (2001-2011)

Table 2 shows the proportion of agricultural workers in the total workforce. According to the table, the proportion of agricultural workers in the total workforce has decreased from 48% in 2001 to 27.45% in 2011. According to the 2011 census, women's share has also decreased from 16.56% to 6.25%. The decline could be attributed to an increase in female literacy as literate women enter other vocations such as SHGs, and Government and private jobs. Work participation in the public and private sectors has improved women's status and the socioeconomic status of their families.

Table 3: Total workers in agriculture in Bihar

Description		2011 (in lakh)		
		Total	Rural	Urban
Cultivators	Total	55.25	52.60	1.50
	Female	7.40	7.30	0.14
	Male	46.90	45.50	1.35
Agricultural Labour	Total	95.35	92.25	3.15
	Female	21.65	21.15	0.51
	Male	73.70	71.12	2.62
Total Agricultural Workers	Total	148.51	144.86	4.66
	Female	28.88	28.22	0.65
	Male	120.61	116.64	3.97
Total Work Force	Total	347.25	313.62	33.66
	Female	95.00	89.23	5.79
	Male	251.22	224.37	27.85
Percent of females/males in the total Agricultural workforce	Female	19.35	19.40	14.00
	male	80.68	80.51	85.56

Source: Census 2011 data for Bihar

Table 3 shows the gender breakdown of agricultural worker participation in rural and urban Bihar. According to the table, women cultivators accounted for 7.40 lakh of the state's total 55.25 lakh cultivators in 2011, with the majority of 7.30 lakhs living in rural areas. The proportion of female agricultural workers in the total agricultural workforce in the state was estimated to be 19.35%. Female agricultural workers made up 19.40% of total agricultural workers in rural and 14.00% in urban areas, respectively.

Table 4: Percentage participation of females in different agricultural activities in Bihar.

Operation	Male	Female
Land preparation	2.80	0.01
Sowing	14.30	10.35
Sowing plant protection	0.20	0.00
Manuring	6.36	0.07
Intercultureing	3.12	5.00
Irrigation	10.15	0.08
Harvesting	16.65	16.00
Threshing/Winninging	9.71	5.00
Transport on farm	0.58	0.01
Total	64.16	36

Source: Computed from plot level data of Cost of Cultivation Scheme for Bihar of 2013-14.

The participation of women in various agricultural operations was estimated using plot-level data from the Cost of Cultivation Scheme for the state of Bihar in 2013-14. Table 4 shows that According to the findings, women's labour participation was highest in harvesting crops (15.50%), followed by sowing crops (10.35%). The overall participation rate in all farming operations was estimated to be 36 percent.

Table 5: Gender-wise distribution area in different classes in Bihar (lakh hectares)

Description	Marginal	Small	Semi medium	Medium	Large	Total
Female land holding	5.33	1.52	1.23	0.37	0.035	8.65
Male land holding	31.29	10.29	9.45	3.73	0.36	55.11
Total land holding	36.69	11.85	10.73	4.16	0.45	64.00
% of female land holding in total land holding	14	13.00	11.46	9.15	7.77	13.23
% of male land holding in total land holding	85.25	86.76	88.07	89.86	80.00	86.70

Source: Agricultural census 2010-11

Another issue that women farmers in Bihar face is the ownership of land resources. Female land holdings accounted for 8.65 lakh hectares in the state, accounting for only 13.23% of the state's total land holdings of 64 lakh hectares. 14% of total marginal land holdings, followed by a small 13%. The total share of male landholdings in the state was 86.70%, reflecting male dominance in society.

Table 6: Gender-wise wage rate (Rs/day) in Bihar for a different period

Years	Male (Rs/day)	Female (Rs/day)	% Difference
TE-2008	68.34	58.66	14.24
TE-2011	100.00	81.65	16.35
TE-2014	171.00	151.66	12.40
TE-2016	200.66	190.35	7.40

Source: Wages Report, GoI

Low female labour wage rates are due to the seasonal and informal nature of employment, as well as the incorrect assumption that women do less work than men. Table 6 shows that the wage disparity between men and women has narrowed. It was 14.24% in TE-2008, and a large gap of 16.35% was computed in TE-2011; however, this gap between male and female wage rates was reduced to 7.40% in TE-2016.

When it comes to hourly wages for labour, women in India are paid the most unequally compared to men. According to a recent International Labour Organization (ILO) report, women are paid 34% less than men on average. This wage disparity, known as the gender wage gap, is the largest among the 73 countries examined in the report. The trend holds true globally as well, but with lower levels of gender inequality, where women's hourly wages are on average 16% lower than men. Monthly wage inequality is higher, with a 22% disparity. In 2017, global real wages increased by only 1.8% (136 countries). With empirical evidence that gender wage disparities exist.

Conclusion

About 30.39 percent of the total labour force is engaged in agriculture in Bihar. The share of female agricultural workers in the country's total agriculture labour force is estimated at 19.35 percent. The share of female farmers in the total number of farmers was calculated to be 19.40 and 14 percent in rural and urban areas, respectively. There was significant female participation in crop harvesting 16 percent followed by seeding 10.35 percent. The overall participation rate across all farms was rated at 36 percent. As such, women play an important role in the country's agricultural activities. Nevertheless, a women owns only 13.23 percent of her state's total land holding, and she has a 7.40 percent difference between male and female wage rates during TE-2016. Increase women's participation in agriculture and related sectors and improve women's access to land, credit and services from various governments. As a

national policy, the Ministry of Agriculture, Forestry and Fisheries has established policy regulations such as joint rental of domestic farmland and farmland. As part of the credit facility regulation, the government has formulated a policy to issue a Kisan credit card to a woman who makes a living from livestock and agricultural processing. In addition, each KVK provides for the provision of a Subject Matter Specialist (SMS) in home sciences to educate peasant women and increase their awareness of their role in improving the socio-economic conditions of society. Despite all efforts, there is still a large gender gap in states that can adequately work for the overall development of women and the improvement of rural landscapes, particularly in the state and the country as a whole. It's like two sides of the same coin. Social equilibrium can only be achieved if both sides have equal rights. Therefore, ignoring the role of women, especially in a developing country like Bihar, can not bring about development in the proper sense.

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