



Participation and Constraints Faced by Rural Women in Agricultural Activities in Amethi District

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HIGHLIGHTS

- Rural women's participation was centered in labour intensive and post-harvest activities, reflecting limited access to resources.
- Among the three crops (rice, wheat, and potato), the highest participation was in potato-related activities.
- Low wages and dual responsibilities at farm and home were major constraints for rural women in participation.

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ABSTRACT

The study conducted examines the participation of rural women in various agricultural activities in Amethi district of Uttar Pradesh. A total of 80 respondents were selected using a multistage sampling technique from eight villages. Data were collected during 2022–2023 through a pre-tested and structured interview schedule to assess the level of their participation. The result indicated that the majority of rural women always participated in different agricultural activities. However, there was not much involvement in technically demanding activities like irrigation and plant protection management. Kruskal-Wallis H test revealed that among the three crops the maximum participation was in the potato crop, and the difference was significant. The overall participation index revealed that a medium level of participation, 61.25% of the respondents fell into the medium level of participation category. Coefficient correlation revealed a significant positive relation with age, information seeking behaviour, social participation, land holding and annual income, while education showed significant negative correlation; higher education reduced the participation in agricultural activities. Garrett's ranking reflects that low wages were the major constraint for low participation in agricultural activities.

INTRODUCTION

In India, agriculture forms the backbone of the rural economy and supports the livelihoods of a large majority of the population. Rural women are essential to this industry, yet their contributions often get neglected. Through their participation in post-harvest operations, livestock management, crop cultivation, and related fields, women make important contributions to agricultural production systems (Nishi et al., 2019). Women play an unquestionable role in the agricultural sector; they actively

participate in the production of major field crops, and the extent of their involvement is associated with their age, social class, and the type of crop being grown (Kaur et al., 2016). Rural women work for nearly 12 to 15 hours a day and remain heavily engaged in their responsibilities, especially during the sowing and harvesting periods of the farming system (Ishaq & Memon, 2016). They are involved in nearly every step of the agricultural process, from planting and transplanting to weeding, harvesting, storing, and processing. Although they make an important contribution, still the work of women in agriculture is usually ignored (Shamna et al.,

2021). For rural women, limited access to advanced agricultural technologies, finance facilities, high-quality inputs, and land ownership continued to be an important constraint (Kumari et al., 2025). As farmers and agricultural labourers, women are the backbone of India's rural agricultural economy yet they also continue to be one of the most vulnerable demographics. Only 13 per cent of rural Indian women own land despite the fact that women have accounted for more than 60% of workers engaged in agriculture (Annual report for MoA and FW 2024–25) whereas 8.92 per cent of women in Uttar Pradesh own land (Census of Agriculture, 2020-21). In Uttar Pradesh only, 8.00% of women have control over agricultural revenue, 4.00% have access to institutional financing and less than 1.00% engage in government training programmes. In rural areas, the main source of income for 80% of economically active women is agriculture and allied sectors, out of which 33.00% are employed in the agriculture industry and 48.00% are independent farmers (Gupta et al., 2024). To enhance agricultural output, rural women are engaged at every stage of the agricultural value chain, including production, pre-harvest activities, post-harvest processing, packaging, and marketing. The technology may not work well enough to be motivated to persevere when unforeseen problems arise during the initial adoption of a publicly developed technology, and the key stakeholders may not know enough about the new technology for this learning selection to improve the fitness of the new technology (Nain et al., 2012). Pingali et al. (2019) reported that the proportion of women relative to men employed in the agricultural sector has increased over time and has made a notable contribution to GDP per capita. Projections by FAO (2011) indicate that women-focused reforms ensuring equal access to resources, skill development, and opportunities in agriculture could increase agricultural production by approximately 2.50 to 4.00% in developing countries.

METHODOLOGY

The study was undertaken during 2022-23 to investigate the participation of rural women in the agricultural activities of specific crops in Amethi district of Uttar Pradesh. A multistage sampling method was used to collect the data. Out of 13 blocks, two blocks were purposively selected on the basis of higher production of three major crops, namely rice, wheat, and potato. From these two blocks, four villages were randomly selected from each block, resulting in a total of eight villages. From each village, 10 respondents were randomly selected, making a total sample size of 80 respondents. A pre-tested structured interview schedule was used to collect primary data, and it was undertaken in person. The schedule included questions regarding socio-economic variables. The level of participation of rural women was measured by frequency with which they participate in agricultural activities. A three-point continuum was used for this purpose i.e. always (3), sometimes (2) and never (1). The highest attainable score was 63 (21 multiplied by 3). A participation index was developed.

$$\text{Participation index} = \frac{\text{Total score}}{\text{Total achievable score}} \times 100$$

To compare the participation of respondents among the crops Kruskal Wallis test (H) was used. It is a non-parametric test used

to compare three or more independent groups. It determines whether variations in ranked or ordinal data between groups are statistically significant. To examine the relationship in participation of rural women across different socio-economic groups coefficient correlation was used. It allowed to identify significant relationship in participation frequencies across various demographic groups. To analyse the constraints faced by rural women in participation of different agricultural activities garrett ranking was used.

RESULTS

The extent of participation of rural women across different crops and agricultural activities varied, which is clearly reflected in the participation index (Table 1). In rice crop transplanting was found to have the highest participation index (81.60), reflecting that transplanting in rice is mostly dominated by women because in the research area, mostly farmers are marginal and cannot afford mechanical tools for transplanting and men were engaged in other activities. Harvesting (87.91) and post-harvest activities (85.00) came next, indicating women's greater participation in labour-intensive and post-production activities. On the other hand, due to a lack of knowledge, the participation index for irrigation management (72.91) and plant protection (74.58) was relatively lower, revealing that women were not as involved in resource-controlled and technically challenging activities.

Table 1. Participation of rural women in agricultural activities in different crops

S.N.	Activities	Participation index	Rank	Overall participation index	Rank
1	Rice				
	Nursery raising	76.25	V		
	Transplanting	91.66	I		
	Weed management	82.91	IV		
	Irrigation management	72.91	VII	81.60	II
	Plant protection	74.58	VI		
	Harvesting	87.91	II		
	Post-harvest activities	85.00	III		
2	Wheat				
	Seed preparation	77.91	IV		
	Seed sowing	71.25	VI		
	Weed management	80.41	III	76.25	III
	Irrigation management	75.41	V		
	Plant protection management	61.66	VII		
	Harvesting	82.08	II		
	Post-harvest activities	85.00	I		
3	Potato				
	Seed preparation	84.16	IV		
	Sowing	82.91	V	83.82	I
	Earthing up	85.00	III		
	Manual weeding	78.75	VI		
	Plant protection management	73.33	VII		
	Potato digging	90.41	II		
	Post-harvest activities	92.50	I		

In the wheat crop, women's participation was high in post-harvest activities (85.00) and harvesting (82.08), they were engaged in post-harvest activities like cleaning and winnowing. Due to small land holding, manual harvesting was dominant in the area. In the weed control, the participation index was (80.41), which revealed that due to financial constraints, manual weeding was preferred. The lowest participation index was found in activities like seed sowing (71.25) and plant protection management (61.66), which revealed that the participation of women primarily focused on manual and post-harvest activities rather than input-intensive activities.

Similarly, in the potato crop, the highest participation of rural women was in post-harvest activities (92.50) and potato digging (90.41), emphasising their critical role in harvesting and post-harvest handling of tuber crops. Cleaning, sorting, grading and storing are directly related to household management responsibilities that are typically carried out by women, which allows them to do more. In the same way, the potato digging is manual in the study area, which invites more women's participation. Participation index of earthing up (85.00) and seed preparation (84.16) was relatively high because they do not require any expensive equipment and women are familiar with these operations from frequent seasonal engagement. Meanwhile manual weeding (78.75) and plant protection management (73.33) had lower participation index due to lack of information and safety concerns about plant protection chemicals.

According to the overall participation index, rural women were most actively involved in the potato-related activities (83.82), rice (81.60) and wheat (76.25), respectively. Higher engagement in potato linked to labour-intensive activities like digging, sorting, grading, which is traditionally done by women. Rice-based activities ranked second, reflecting that transplanting, harvesting and post-harvest management are mainly dominated by women, whereas lower participation in wheat reflects increased mechanisation and less involvement of women in technically demanding operations.

The Kruskal Wallis H test proved that the participation of rural women significantly varied across crops ($H=12.47$, $df=2$, $p=0.002$) (Table 2). Potato based activities had the highest mean rank (176.95) and mean participation score (2.78) of all the crops, indicating a relatively higher level of women participation. Rice came next mean rank (152.38) and mean score (2.64). on the other hand, wheat had the lowest mean rank (123.67) and mean score (2.41), indicating comparatively lesser participation. These variations could be explained by variations in different agricultural operations, with lower participation in mechanized and technically demanding activities and higher participation in labour-intensive and post-harvest activities.

Table 2. Crop-wise comparison of rural women's participation in agricultural activities using Kruskal-Wallis test

Crop	Mean participation score	Mean rank
Rice	2.64	152.38
Wheat	2.41	123.67
potato	2.78	176.95
Kruskal-Wallis H value	12.47	
Degrees of freedom (df)	2	
p-value	0.002	

The results indicate that a majority (61.25%) of rural women grouped into medium category of participation (Table 3), reflecting regular engagement in specific agricultural practices especially in labour intensive and post-harvest activities. Total engagement was hampered by low participation in technically challenging tasks like irrigation and plant protection. About 22.50 percent women were grouped into low category of participation which could be explained by sociocultural limitations, domestic responsibilities and restricted access to farm resources. Only 16.25 percent of rural women reported high participation which is a reflection of more experience, family support and an active role in agricultural decision making.

Table 3. Distribution of respondents on overall participation of rural women in agricultural activities

Category	Percentage
Low Participation (less than 46.26)	22.50
Medium participation (46.26-56.58)	61.25
High participation (more than 56.58)	16.25
Total	100.00

Mean=51.42; S.D.=5.16

The correlation between age as well as participation was positive and significant ($r = 0.246^*$) (Table 4), suggesting that engagement increased slightly as age increased due to greater experience in agricultural activities. There was a negative correlation between education and involvement ($r = -0.536$), indicating that lower participation is linked to greater educational status. This could be explained by educated people looking for non-agricultural or alternative sources of income. The correlation between information-seeking behaviour and participation was positive and significant ($r = 0.475^{**}$), suggesting that respondents who actively look for information are more likely to act successfully. Similarly, social participation was highly correlated ($r = 0.399^{**}$), indicating that social networks and group involvement are important factors in increasing participation. Strong positive and very significant correlations were also found between landholding ($r = 0.515^{**}$) and annual income ($r = 0.515^{**}$), suggesting that respondents with higher resource are more likely to participate. Overall, the findings highlight how socioeconomic and communication-related factors are crucial in influencing rural women.

Low wages emerge as the most severe constraints (Table 5) with the highest mean Garrett score (65.46), demonstrating that inadequate payment remained a substantial disincentive to continued engagement and economic motivation. The dual role at farm and

Table 4. Relationship between socio-economic variables and participation of rural women in agricultural activities

Independent variables	Correlation coefficient (r)
Age	0.246*
Education	-0.536**
Information-seeking behavior	0.475**
Social participation	0.399**
Landholding	0.515**
Annual income	0.515**

* Significant at 5% level, ** Significant at 1% level

Table 5. Constraints faced by rural women in participation in agricultural activities

S.N.	Constraints	Mean Garrett score	Rank
1.	Low wages	65.46	I
2.	Dual role at farm and home	55.15	II
3.	Health problems	51.15	III
4.	Household responsibilities	42.54	IV
5.	Social and cultural norms	33.70	V

home ranked second (mean Garrett score 55.15), illustrating the struggle of managing profitable agricultural activity with family responsibilities. This combined burden frequently affects efficiency in farm-related task and restricts time availability. Health problems ranked third (mean Garrett score 51.15). Fourth place was taken by household responsibilities (mean score = 42.54), which restricted time for productive activities. Social and cultural norms got the fifth rank (mean score = 33.70), indicating a relatively smaller influence. In general, socio-cultural considerations were less important in limiting involvement than economic and role-related limitations.

DISCUSSION

The study clearly shows that rural women play a significant role in agricultural activities, particularly in labour-intensive and post-harvest operations. The findings indicate that the majority of rural women had a medium level of participation in agricultural activities, with the highest involvement observed in transplanting and post-harvest tasks. These results are in line with the findings reported by Nain and Kumar (2010), Afzal et al. (2010), Chayal et al. (2010), Nazir et al. (2013), Singh et al. (2018), and Vijayan et al. (2025). The lowest level of participation was observed in technically demanding activities such as irrigation and plant protection management. This may be attributed to factors such as lower levels of education, limited technical knowledge, less exposure to modern practices, and restricted access to farm resources. Similar findings were reported by Sowjanya et al. (2016). Among the three crops studied, rice, wheat, and potato, the highest level of participation of rural women was found in potato-related activities. This is mainly because potato cultivation involves several labour-intensive operations, including cleaning, grading, and sorting, which are traditionally performed by women. However, women's involvement in wheat farming seems to have decreased as a result of increased mechanisation in wheat, which raises concerns that technological advancements without gender inclusion may further minimise women farmers. Age, information-seeking behaviour, social participation, landholding, and annual income all had positive correlations with participation, demonstrating that women's participation in agriculture is increased by experience, knowledge access, and resource ownership, but education had a negative correlation, indicating that educated women were more likely to diversify into non-farm livelihoods, illustrating low agricultural economic returns and structural barriers. The main obstacles preventing women from effectively participating in agricultural activities were found to be low wages and combined farm-household responsibilities.

CONCLUSION

The study arrives at the conclusion that rural women perform an important yet unrecognised role in agricultural activities, especially in labour-intensive and post-harvest operations. Despite their active participation in all major crops, women are still under-represented in technical and decision-making roles. Socioeconomic and information-related factors had a considerable impact on participation levels, but greater involvement was limited by low pay and several responsibilities. To increase women's engagement, productivity, and empowerment in agriculture and support inclusive and sustainable rural development, it is crucial to strengthen gender-sensitive extension strategies, expand access to skill-based training, and promote women-friendly technologies.

DECLARATIONS

Ethics approval and informed consent: Informed consent was sought from the respondents regarding the study during the course of the data collection.

Conflict of interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. The authors declare that during the preparation of this work, they thoroughly reviewed, revised, and edited the content as needed. The authors take full responsibility for the final content of this publication.

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