



## Barriers Hindering Tribal Women's Participation in Agriculture in Angul District, Odisha

Suchismita Sahoo<sup>1\*</sup>, Sneha Singh<sup>2</sup>, Shardinjay Singh<sup>3</sup>, Agantika Gupta<sup>4</sup>, Kumar Sonu<sup>5</sup>, R. K. Doharey<sup>6</sup>, Abhinav Singh<sup>7</sup>, Omkar Singh<sup>8</sup> and Sandeep Chauhan<sup>9</sup>

<sup>1</sup>P.G. Scholar, <sup>3,5,9</sup> Ph.D. Scholars, <sup>6</sup>Professor, Department of Agricultural Extension Education, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229, Uttar Pradesh, India

<sup>2</sup>Assistant Professor, Department of Agricultural Extension Education, Rashtriya Kisan Post Graduate College, Shamli-247776, Uttar Pradesh, India

<sup>4</sup>Ph.D. Scholar, Department of Agricultural Extension, Sardar Vallabhbhai Patel University of Agriculture and Technology, Modipuram, Meerut, Uttar Pradesh, India

<sup>7</sup>Subject Matter Specialist, Agriculture Extension, KVK Sant Kabir Nagar-272162, Uttar Pradesh, India

<sup>8</sup>Subject Matter Specialist, Plant Protection, ICAR-KVK, P.G. College Ghazipur-233001, Uttar Pradesh, India

\*Corresponding author email id: suchismita1509@gmail.com

### HIGHLIGHTS

- Poor market access and limited value-addition opportunities restricted tribal women's economic participation in farming.
- Environmental and infrastructural constraints were perceived as comparatively less severe than social and economic barriers.

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**Reviewed by:** Sonam Prabhakar (sonamprabhakar1@gmail.com); Dwity Sundar Rout (routdwitysundar@gmail.com)

### ABSTRACT

Tribal women contributed extensively to agricultural labour in India's tribal belts, yet their participation remained constrained by social, economic, technological, environmental, and institutional barriers that were rarely studied systematically at the district level. The present study was conducted in Angul district of Odisha during 2024-25 to identify and rank the constraints faced by tribal women in agricultural participation. Four blocks (Chhendipada, Athamalik, Pallahada and Kaniha) were purposively selected, and sixteen villages were chosen at random, from which 160 tribal women respondents were drawn. Data were collected through a pre-tested structured interview schedule covering ten constraints under five broad dimensions and were analysed using the Garrett Ranking Technique. The results showed that lack of awareness about agriculture's importance (mean score 87.76) ranked as the most severe constraint, followed by inadequate training on modern farming practices and market trends (83.32). Economic and market constraints, patriarchal social structures, and unclear government policies followed in order of severity, while environmental and infrastructural constraints were rated comparatively less severe. The findings offered extension functionaries and policymakers an evidence-based basis for designing targeted interventions for tribal women in agriculture.

### INTRODUCTION

Despite the rapid growth of industry and services, close to 60 per cent of the population still depends on agriculture, directly

or indirectly, for food, work, income, and foreign exchange. Within this broad agricultural setting, tribal communities hold a unique position. Living mostly in isolated, ecologically sensitive, and resource-rich areas, tribal populations share a deep bond with land

and forest. Farming for them extends beyond mere survival; it is woven into their identity, culture, and everyday existence, guided by inherited knowledge and an understanding of seasonal cycles (Gulati et al., 2025).

Women in these communities perform a central but often overlooked role in sustaining agriculture. Their work extends beyond fieldwork to include seed storage, collection of forest produce, livestock management, and sustainable land management. Tribal women engage in nearly every phase of cultivation, including land preparation, sowing, weeding, harvesting, and post-harvest handling, along with allied activities such as animal husbandry, fishing, and participation in Self Help Groups. In many families, women shoulder most of the agricultural burden while men migrate temporarily for wage labour. Yet their deep involvement is frequently constrained by an interconnected web of social, economic, institutional, and personal barriers that limit how fully and effectively they can engage in and benefit from farming (Nain & Kumar, 2010; Chandravadia & Bariya, 2018). Their contribution rarely earns them recognition as farmers, leaving them largely overlooked in policy and public perception (Mishra et al., 2024).

These barriers are seldom uniform or isolated. They range from limited access to land ownership, credit, and modern inputs, to social restrictions on mobility and decision-making, inadequate extension contacts, lack of training opportunities, and the added burden of domestic responsibilities alongside farm work (Singh et al., 2017; Das et al., 2018; Kumari et al., 2020). Odisha is home to the largest number of tribal groups among Indian states, with 62 recognised communities, 13 of which are classified as particularly vulnerable. Its Scheduled Tribe population exceeds 9.5 million, making up roughly 23% of the state's population. Agriculture contributes about 26 per cent of the state's economic output and sustains nearly 65 per cent of workers, with rice as the primary crop. However, the sector struggles with declining soil quality, waterlogged fields, and frequent droughts, floods, and cyclones. Against this backdrop, tribal women continue to face poverty, limited land rights, and inadequate access to modern inputs, finance, and markets, all of which restrict their capacity to participate in and benefit from agricultural activity (Slathia et al., 2015; Bhilavekar et al., 2025). These barriers intersect with socio-economic, technical, and psychological constraints that further limit tribal women's agency in farming decisions (Kujur et al., 2026).

Angul district, known for its industrial activity centred on the Talcher coalfield, is also home to a considerable tribal population dependent on farming. While tribal women here contribute substantially to agricultural labour, the constraints they face have not been systematically identified or ranked at the district level, leaving extension efforts at risk of addressing symptoms rather than priority barriers (Naveen et al., 2023).

## METHODOLOGY

This study was conducted in Odisha, an eastern state of India, selected for its substantial tribal population and the researcher's familiarity with the regional language and customs, which facilitated data collection and helped build trust with participants during 2024-25. Angul district was chosen within Odisha for its notable tribal presence, largely farming-based rural economy, and industrial profile.

Of the district's eight blocks, four, namely Chhendipada, Athamalik, Pallahada, and Kaniha, were purposively selected for their contrasting population sizes. From the complete list of villages in each selected block, four villages were then randomly chosen using the lottery method, yielding sixteen villages in total. Similarly, from the list of tribal women households maintained in each selected village, ten respondents were randomly drawn using the simple random sampling method, producing a total sample of 160 respondents across the four blocks. Data were gathered using a structured interview schedule that was pre-tested and prepared in consultation with the research advisor, the Student Advisory Committee, and faculty from the Department of Extension Education. The schedule listed constraints commonly associated with tribal women's participation in agriculture, drawn from a review of prior literature and refined through discussion with subject matter experts and pilot interviews in the study area. Respondents were asked to rank ten identified constraints, grouped under five broad dimensions, namely knowledge and awareness, economic and market, technological and infrastructure, natural resource and environmental, and social and institutional constraints, according to the severity with which each affected their agricultural participation (Chandravadia & Bariya, 2018; Dagar & Upadhyay, 2022; Meena et al., 2026). Responses were recorded directly on the schedule and later compiled onto a master sheet capturing the rankings provided by all 160 respondents (Dagar & Upadhyay, 2022). The ranks assigned by respondents were analysed using the Garrett Ranking Technique. Under this method, the ranks given by each respondent were converted into percentage position scores using the formula.

$$\text{Percent position} = \frac{R_{ij} - 0.5}{N_j} \times 100$$

Where,  $R_{ij}$  was the rank given to the  $i^{\text{th}}$  constraint by the  $j^{\text{th}}$  respondent and  $N_j$  was the number of constraints ranked by that respondent. Percentage positions were converted into Garrett scores using Garrett's conversion table, summed, and averaged for each constraint. Constraints were then arranged in descending order of mean score, with the highest score treated as the most significant barrier to participation (Dagar & Upadhyay, 2022; Gupta et al., 2020).

## RESULTS

The constraints faced by tribal women in agricultural participation, analysed through the Garrett Ranking Technique, are presented in Table 1. Ten identified constraints, grouped under five broad dimensions, namely knowledge and awareness, economic and market, technological and infrastructure, natural resource and environmental, and social and institutional constraints.

Under the knowledge and awareness dimension, lack of awareness about agriculture and its importance emerged as the foremost constraint, with a mean Garrett score of 87.76 (Rank I), followed by lack of awareness and training on modern farming practices and market trends, with a mean score of 83.32 (Rank II). These two constraints occupied the top positions among all ten identified barriers, indicating that gaps in basic understanding, rather than resource scarcity alone, formed the primary hurdle to fuller participation among tribal women.

**Table 1.** Garrett ranking of constraints faced by respondents

| S.No. Constraints faced by the respondents                                                  | Mean Garrett Score | Total Garrett Score | Rank |
|---------------------------------------------------------------------------------------------|--------------------|---------------------|------|
| <i>Knowledge and Awareness Constraints</i>                                                  |                    |                     |      |
| 1. Lack of awareness about agriculture and its importance leading to less involvement.      | 87.76              | 10531.20            | I    |
| 2. Lack of awareness and training on modern farming practices and market trends.            | 83.32              | 9999.20             | II   |
| <i>Economic and Market Constraints</i>                                                      |                    |                     |      |
| 3. Low market access and low selling price of products.                                     | 81.25              | 9780.00             | III  |
| 4. Limited opportunities for value-addition and agri-entrepreneurship in the region.        | 79.83              | 9570.60             | IV   |
| <i>Technological and Infrastructure Constraints</i>                                         |                    |                     |      |
| 5. Limited access to modern agricultural technologies and equipment.                        | 75.17              | 9015.40             | V    |
| 6. Lack of proper infrastructure.                                                           | 63.15              | 7575.40             | X    |
| <i>Natural Resource and Environmental Constraints</i>                                       |                    |                     |      |
| 7. Inadequate irrigation facilities and dependence on monsoon rains.                        | 65.75              | 7890.50             | IX   |
| 8. Climate change and environmental challenges such as soil degradation and water scarcity. | 69.60              | 8350.40             | VIII |
| <i>Social and Institutional Constraints</i>                                                 |                    |                     |      |
| 9. Patriarchal society.                                                                     | 73.50              | 8820.00             | VI   |
| 10. Unclear government policies.                                                            | 71.55              | 5882.00             | VII  |

Within the economic and market dimension, low market access and low selling price of products ranked third with a mean score of 81.25, while limited opportunities for value addition and agri-entrepreneurship ranked fourth with a mean score of 79.83. Both constraints reflected the difficulties respondents faced in translating agricultural effort into remunerative returns. Among technological and infrastructure constraints, limited access to modern agricultural technologies and equipment ranked fifth with a mean score of 75.17, whereas lack of proper infrastructure was ranked tenth, the lowest among all constraints, with a mean score of 63.15, indicating that respondents distinguished between the availability of specific technologies and the broader state of rural infrastructure.

Social and institutional constraints included patriarchal society, ranked sixth with a mean score of 73.50, and unclear government policies, ranked seventh with a mean score of 71.55, indicating that gender-based restrictions and weak policy communication both weighed appreciably on respondents' participation, though less severely than knowledge and market barriers. Natural resource and environmental constraints comprised climate change and environmental challenges such as soil degradation and water scarcity, ranked eighth with a mean score of 69.60, and inadequate irrigation facilities and dependence on monsoon rains, ranked ninth with a mean score of 65.75. These two constraints, together with the infrastructural deficit ranked tenth, occupied the bottom of the priority order, indicating that respondents perceived environmental and infrastructural factors as comparatively less severe than knowledge, economic, and social barriers.

## DISCUSSION

The findings of the present study indicated that limited awareness of agriculture's importance and inadequate training on modern farming practices constituted the most severe constraints for tribal women in Angul district. This pattern aligned with earlier work showing that limited knowledge, skill deficits, and inadequate exposure to developmental programmes formed leading obstacles for tribal women engaged in farming and allied sectors (Chandravadia

& Bariya, 2018; Shamna et al., 2018; Dhruw et al., 2020). The dominance of knowledge-related constraints over resource-based ones suggested that even where inputs or infrastructure existed, tribal women were often unable to use them effectively due to inadequate information, extension contact, or training exposure. This observation was consistent with findings from Odisha, where tribal farm women reported that domestic responsibilities and inadequate extension activities, largely led by male functionaries, formed major barriers to accessing agri-allied information (Bahubalendra et al., 2025), reinforcing that informational gaps recurred as a dominant constraint across tribal contexts in India.

Economic and market-related constraints occupied the next tier of severity, with poor market access and unfavourable selling prices ranked third and limited scope for value addition or agri-entrepreneurship ranked fourth. These results reflected the structural disadvantages tribal women faced in reaching remunerative markets, consistent with evidence that weak market intelligence, poor access to regulated markets, and limited scope for agro-based value addition restricted the income tribal households could generate from farming and allied livelihoods (Bhilavekar et al., 2025), and that strengthening women's role in farm-level decision-making was central to improving household economic and food security outcomes (Shah et al., 2022). The relatively high severity attached to market-related barriers, despite their ranking below knowledge constraints, indicated that even when tribal women were willing and informed, structural limitations in market access continued to erode potential gains from their agricultural labour.

Among the remaining dimensions, restricted access to modern technology and equipment ranked fifth, while patriarchal social structures ranked sixth, underscoring that gender-based restrictions on decision-making authority and control over customary economic resources, compounded by limited access to education, continued to constrain women's agricultural roles even where infrastructure existed (Paray, 2019). Unclear government policies followed at seventh, suggesting that despite the presence of welfare and extension schemes, poor communication and weak last-mile delivery

kept many entitlements out of reach for tribal women. This corroborated evidence that stronger institutional support, including access to self-help group platforms and extension services, meaningfully improved women's agricultural decision-making and practice adoption (Raghunathan et al., 2019). The comparatively moderate severity of institutional and social constraints, relative to knowledge and market barriers, indicated that while patriarchal norms and policy gaps mattered, they were perceived as somewhat less immediately limiting than the absence of basic awareness and remunerative market access.

Natural resource and environmental constraints, comprising climate-related challenges and irrigation dependency, along with general infrastructural deficits, were perceived as comparatively less severe than knowledge, market, and social barriers. This suggested that while environmental unpredictability affected farming outcomes, respondents regarded it as a background condition rather than the most pressing obstacle to their participation, a distinction consistent with findings that livelihood security among tribal women was shaped more strongly by informational and institutional gaps than by environmental variability alone (Dagar & Upadhyay, 2022). The lower ranking of infrastructural constraints did not imply their absence but rather reflected respondents' relative prioritisation when weighed against more immediate knowledge and market-related barriers.

Taken together, the overall pattern of constraints reflected a hierarchy in which cognitive and informational barriers outweighed economic ones, which in turn outweighed social, institutional, and environmental barriers. This gradient suggested that interventions addressing awareness and skill gaps, such as targeted training and extension contact, were likely to yield more immediate improvements in tribal women's agricultural participation than infrastructure-focused interventions alone. This finding echoed multi-criteria evidence from other tribal contexts, where capacity-building and informational interventions were identified as priority strategies for empowering tribal women in agriculture (Kujur et al., 2026).

## CONCLUSION

The study established that knowledge and awareness gaps, rather than resource scarcity, formed the most severe barriers to tribal women's participation in agriculture in Angul district, with limited awareness of agriculture's importance and inadequate training on modern practices ranked as the top two constraints. Economic and market-related limitations followed closely, reflecting structural disadvantages in reaching remunerative markets. Social constraints rooted in patriarchal norms and unclear government policies further compounded these difficulties, while environmental and infrastructural factors, though present, were perceived as comparatively less pressing. The clear hierarchy identified through the Garrett Ranking Technique suggests that extension interventions prioritising awareness-building and skill training are likely to yield faster gains in tribal women's agricultural participation than infrastructure-led approaches alone, supporting more targeted and inclusive policy design for tribal regions of Odisha.

## DECLARATIONS

**Ethical approval and consent to participate:** The study was conducted in accordance with principles laid out in the Declaration

of Helsinki (1964) and its subsequent modifications. Ethical approval was waived by the departmental Review Board of the Department of Agricultural Extension Education, ANDUA&T Kumarganj, Ayodhya, UP. Informed consent was sought from all the participants.

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