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Intersectionality: Caste, Class, Race, Disability, and Higher Education Access: Special reference to Botany Field

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Abstract

Globally, women's representation in higher education has increased rapidly, leading to a dramatic rise in female labor force participation. In India, despite achieving gender parity in access to higher education, progress in closing gender gaps in the labor force remains unsatisfactory. Similar to enrollments in higher education, the percentage of women who pursue careers in higher education as faculty also reflects gender parity within faculty compositions. Women's representation in senior academic positions, however, is negligible, with less than 10% of institutions led by women and fewer than 30% holding professor positions. This paper reviews the Intersectionality in higher education access, particularly within biological sciences like botany, involves the overlapping, simultaneous effects of caste, class, race, and disability that create unique, often hidden barriers for marginalized students and faculty. In the Indian context, botanyas a field involving both theoretical studies and intensive field-based workexhibits specific structural challenges where caste, socio-economic class, and ability intersect to impact participation. Intersectionality provides a critical framework for understanding that women's experiences in higher education leadership are not uniform but are shaped by the compounding effects of caste, class, race, and disability. In the context of India, for instance, a Dalit woman faces unique, layered discrimination that differs from that of an upper-caste woman, combining gender-based oppression with caste-based systemic exclusion. These overlapping identities create distinct barriers to accessing higher education and reaching decision-making positions

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Intersectionality in botany and higher education reveals that women's leadership is not hindered by gender alone, but by compounding structural inequalities based on caste, class, race, and disability. In the Indian academic context, women from marginalized communities—such as Dalit or Adivasi backgrounds—or those with disabilities face "360-degree Intersectionality spheres," where multiple identities create unique, often overlapping, barriers that prevent access to leadership roles.

Overview:

Higher education in India has witnessed significant expansion, yet marginalized groups, particularly women, continue to face barriers to access and success. Botany, a field with significant implications for food security, climate change, and human well-being, is no exception. This paper explores the intersectional dynamics of caste, class, race, and disability in shaping access to higher education and women leadership in Botany.

Globally, women today enjoy access to higher education that their mothersand grandmothers could only dream about. Over the past few decades,women's higher education attainment has rapidly increased worldwide. Therepresentation of women in higher education has tripled globally between1995 and 2018 (UNESCO, 2020). Since the beginning of the twentieth century, in the USA and several developed countries, women have benefitted from educational attainment, leading to a dramatic increase in female laborforce participation in their countries.

This paper examines the intersectional barriers to higher education access and women leadership in Botany, focusing on caste, class, race, and disability. Using a qualitative approach, we analyze the experiences of marginalized women in Botany departments across India. Our findings highlight the compounding effects of intersectional identities on educational outcomes, career advancement, and leadership opportunities. We argue that addressing these barriers requires a nuanced understanding of intersectionality and a commitment to inclusive policies.

The term Intersectionality has been recently imported into Indianacademia. The application of an intersectional theoretical framework within studies of Indian higher

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education is still in its early stages of development (Gaikwad & Pandey, 2022; Dhawan et al., 2023).

Theoretical Framework:

Intersectionality Conceptualizing Intersectionality: Intersectionality recognizes that individuals' experiences are shaped by multiple, intersecting social identities (Crenshaw, 1989).Caste, Class, Race, and Disability: These categories intersect to produce unique experiences of marginalization (Gupta, 2014; Ghosh, 2015).

Key Intersectionality Dimensions in Botany Higher Education:

- **Caste and Class (Socio-economic Status):** Socially disadvantaged groups, particularly Scheduled Castes (SC) and Scheduled Tribes (ST), are underrepresented in science, facing gaps of 12-18% compared to general category students. Many upper-caste students and faculty dominate prestigious research institutions, creating "upper-caste only" lab environments. This is compounded by class: students from lower economic backgrounds often lack access to the coaching or English-language skills needed for premier institutions.
- **Intersection of Caste, Gender, and Fieldwork:** Female students from lower-caste and lower-class backgrounds face "double jeopardy," experiencing reduced participation in higher education despite affirmative action policies. In botany, which heavily relies on field trips and rural exploration, gendered safety concerns combine with caste-based vulnerabilities, restricting the mobility of female students from marginalized communities.
- **Disability and Caste:** The combination of caste-based discrimination and disability creates aggravated forms of exclusion. In science education, disabled individuals often face systemic barriers, including a lack of accessible infrastructure, non-

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inclusive field methods, and lack of awareness about assistive technologies, which are rarely addressed in combination with social identity.

- **Race and Nationality (Global Context):** In global botany and life sciences, students of color and those from marginalized backgrounds often face a chilly climate, reducing their sense of belonging, which contributes to lower retention in STEM fields.

Impact on Higher Education Access:

- **"Merit" and Institutional Culture:** In many Indian science institutions, upper-caste dominance is often protected by narrow definitions of "merit". Dalit and SC/ST students may face discrimination in interviews, with their intellectual competence questioned, leading to lower enrollment and higher attrition rates.
- **Language and Social Capital:** The emphasis on English proficiency can alienate students from vernacular backgrounds, who often intersect with lower socioeconomic status and rural caste backgrounds.
- **The "Hidden" Lab Culture:** The lack of representation among faculty—with very few SC/ST professors in top research institutes—means that minority students often lack mentors who understand their unique challenges.

Botany Field and STEM Challenges

Disability and Caste: The combination of caste-based discrimination and disability creates severe hurdles, as intersectional studies in South India show. Disabled women often face greater isolation in science fields where access to field research or laboratory infrastructure is not always inclusive.

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Leadership and Authority: Women from marginalized backgrounds in academic leadership, including botany, often face "360-degree intersectionality spheres" that challenge their expertise and authority.

"Cultural Taxation": Women from marginalized backgrounds often bear a higher burden of service-related tasks (mentorship, committee work) than their counterparts, known as "identity taxation," which limits their time for research and promotion.

Access to Higher Education and Leadership

Rural-Urban Divide: Rural-based, first-generation learners face profound inequalities due to economic and social constraints in accessing higher education.

Invisibilization: Despite their potential, women with marginalized identities are often invisible in senior leadership roles.

Resilience and Leadership Development: Intersectional challenges compel some women to develop key leadership skills (negotiation, coalition-building, and empathy) earlier in their careers as they navigate hostile environments.

Addressing these inequities requires transforming higher education environments into more inclusive spaces that recognize the unique, compounded hurdles faced by women of color, lower-caste, and disabled researchers.

The study also highlights the importance of inclusive policies in promoting diversity and inclusion in higher education. This includes policies addressing intersectional identities, providing mentorship and support programs, and improving infrastructure to support women with disabilities.

Policy Implications:

Develop and implement inclusive policies addressing intersectional identities.

Establish mentorship programs for marginalized women in Botany.

Improve infrastructure to support women with disabilities.

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Provide sensitization programs for faculty and staff on intersectionality and inclusive practices.

- **Recommendations**

Mentorship Programs: Establish mentorship programs for marginalized women in Botany. Inclusive Policies. Develop policies addressing intersectional identities and promoting diversity.

Infrastructure Development: Improve infrastructure to support women with disabilities.

Future Research Directions:

Conduct quantitative studies to examine the prevalence of intersectional barriers in higher education.

Explore the experiences of women in other STEM fields.

Develop and evaluate interventions aimed at promoting diversity and inclusion in higher education.

Conclusion:

An intersectional approach in botanical education is necessary to move beyond treating marginalized identities as separate, allowing for policies that address the specific, compound, and often contradictory barriers faced by individuals holding multiple marginalized identities (e.g., a disabled, female, lower-caste student).We recommend inclusive policies, sensitization programs, and infrastructure development to promote diversity and inclusion, particularly for women leadership.

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