



Gender Disparity in Science: Challenges and Paths to Equity

This editorial is based on [Shanti Swarup Bhatnagar Prize: Hegemony of old boys' club in science](#) which was published in Indian Express on 18/09/2023. It talks about the gender disparity in the Shanti Swarup Bhatnagar Prize, an Indian science award, and highlights the lack of recognition for women scientists.

For Prelims: [Council of Scientific and Industrial Research \(CSIR\)](#), [Shanti Swarup Bhatnagar Prize, Engineering and Mathematics \(STEM\)](#)

For Mains: [Gender Disparity](#), Causes of the Underrepresentation of Women in Science, Ways to Ensure Women's Participation in Science

Recently, the [Council of Scientific and Industrial Research \(CSIR\)](#) announced the list of awardees for the [Shanti Swarup Bhatnagar Prize](#) for 2022. Notably, there were **no female scientists chosen for the SSB Awards 2022**.

The prize is **renowned for its substantial impact on the scientific career of its recipients** and the prestige it brings to their institutions. However, it has **gained criticism for its persistent lack of recognition of women scientists**. Despite its significance in the scientific community, **the prize has repeatedly failed to acknowledge and honor the contributions of female scientists**.

This [gender disparity](#) in the prize's history **highlights the ongoing challenges and biases faced by women in science** and underscores the **need for greater efforts to promote gender equality and diversity in scientific recognition**.

What is Shanti Swarup Bhatnagar Prize?

- **Institution and History:** The prize **was established in 1958 by the CSIR**, indicating its long-standing history in recognizing scientific excellence.
- **Annual Awards:** The prize is **awarded annually to a select group of scientists, under the age of 45 years**, emphasizing the **recognition of young and promising talent in the field of science**.
- **Multiple Domains:** The prizes are **distributed across seven distinct domains of science**, which include physical, chemical, biological, medical, engineering, mathematics, and atmospheric sciences.

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International Day for Women and Girls in Science



ABOUT

- Celebrated every year on February 11 since 2015
- Observed by the United Nation to promote the full and equal access and participation of women in Science, Technology, Engineering and Mathematics (STEM) fields.

THEME 2023

- Innovate. Demonstrate. Elevate. Advance. Sustain (I.D.E.A.S.)

STATUS OF WOMEN PARTICIPATION IN THE SCIENCE SECTOR

- According to the All India Survey on Higher Education 2020-2021, number of science researchers in India has doubled from 30,000 in 2014 to over 60,000 in 2022.
- Women's participation is the highest in biotechnology at 40% and medicine at 35%.

INITIATIVES TAKEN FOR WOMEN IN SCIENCE

- **Gender Advancement for Transforming Institutions (GATI):**
 - To develop a comprehensive Charter and a framework for assessing Gender Equality in STEM.
- **Vigyan Jyoti Scheme:**
 - To create a level-playing field for the meritorious girls in high school to pursue STEM in their higher education.
- **Indo-US Fellowship for Women in STEMM (WISTEMM) program:**
 - Women scientists can work in research labs in the US.
- **Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) Programme:**
 - Improving R&D infrastructure and establishing state-of-the-art research facilities in order to create excellence in S&T in women universities.

Women who Shaped India's Scientific History



Anandibai Gopalrao Joshi (1865-1887)

- First Indian female to study and graduate with a degree in western medicines from the United States.
- Believed to be the first woman to set foot on American soil from India.



Kamala Sahonie (1911-1998)

- First Indian woman to receive a PhD in a scientific discipline.
- Discovered the enzyme 'Cytochrome C' (helps in energy synthesis).



Kadambini Ganguly (1861-1923)

- Becomes India's first female doctor & practitioner of western medicine in the whole South Asia.



Anna Mani (1918-2001)

- First woman to join the Meteorological department.



Bibha Chowdhary (1913-1991)

- First woman high energy physicist of India and the first woman scientist at the TIFR.
- IAU honoured her by naming a white yellow dwarf star after her name.



Kamal Ranadive (1917-2001)

- Established India's first tissue culture research laboratory at the Indian Research Centre in Mumbai.



Edavaleth Kakkat Janaki Ammal (1897-1984)

- Made significant contributions to genetics, evolution, phytogeography and ethnobotany.
- First director of the Central Botanical laboratory at Allahabad.



Sanghamitra Bandyopadhyay

- She has been conferred the Padma Shri in 2022.
- She is the first woman director of the Indian Statistical Institute.



Debala Mitra (1925-2003)

- First Indian archaeologist served as Director General of the Archaeological Survey of India.
- Explored and excavated several Buddhist sites.



Ms. Sujatha Ramdorai

- She was awarded the Padma shri award in 2023.
- She became the first Indian to win the prestigious ICTP Ramanujan Prize in 2006.
- She was also awarded the Shanti Swarup Bhatnagar Award, the highest honour in scientific fields by the Indian Government in 2004.
- She is also the recipient of the 2020 Krieger-Nelson Prize for her exceptional contributions to mathematics research



What is the Criticism Against SSB Awards?

- **Gender Disparity:** The SSB Prize has a noticeable gender disparity issue, with the latest set of winners in both 2021 and 2022 consisting exclusively of male scientists. This underscores the **persistent underrepresentation of women for this award**.
 - The fact that **women constitute only around 14% of India's working scientists** underscores a significant gender disparity in the field of science.
- **Lack of Female Awardees:** Over the past two years, despite recognizing numerous scientists for their outstanding contributions, **the CSIR has failed to identify a single woman scientist deemed to have made a sufficiently noteworthy impact** in the field of science and technology.
- **Inclusivity in the Field:** Only **19 out of nearly 600** SSB prizes have been awarded to women scientists **which indicates a long-standing historical gender imbalance in the award's history**.
 - This persistent lack of recognition for women's contributions in science **raises questions about inclusivity and gender equality** in the scientific community.
- **Lack of Transparency:** The composition of the Advisory Committee responsible for selecting the SSB Award winners has traditionally **been covered in secrecy, making it immune to public accountability and scrutiny**.
 - This lack of transparency can further perpetuate biases and hinder efforts to address gender disparities.
- **Nominations by Predominantly Male Figures:** To be considered for the award, a scientist must be **nominated by individuals in influential positions**, including vice-chancellors, directors, academy presidents, deans, CSIR governing body members, and former winners.
 - The **observation here is that these nominators are predominantly men, which may result in a bias** against nominating their female colleagues.

What is the Scenario of Other Awards Regarding Women's Participation?

- **Nobel Prize:** The [Nobel Prizes](#), which are globally renowned and prestigious, also suffer from a significant gender disparity.
 - Out of the **343 science prizes awarded, only 24 have been given to women**, indicating a notable underrepresentation of female laureates.
- **Encouraging Progress:** Despite the historical gender disparity in Nobel Prizes, there is a somewhat **encouraging trend where 31 out of the 61 prizes awarded to women in all categories have been granted since the year 2000**.
 - This suggests a **positive shift towards greater recognition of women's achievements**, though still with room for improvement.
- **Contrast with Bhatnagar Awards:** In contrast to the Nobel Prizes, the SSB prizes **do not appear to demonstrate similar signs of progress in recognizing women scientists**.
 - The lack of comparably encouraging developments in this prestigious Indian award highlights **the need for more proactive efforts to bridge the gender gap and promote diversity and inclusivity** in scientific recognition.

Are there any Steps Taken by the CSIR to Promote Women's Participation?

- CSIR is recognised as the largest R&D organisation in India, employing a substantial number of scientists. Given its size and influence, CSIR has a **significant responsibility to address the issue of women's underrepresentation** in science and promote gender diversity.
 - **Appointment of First Women Chief:** The appointment of N Kalaiselvi as its chief in 2022, making her the first woman to hold this position, **is a notable milestone in promoting women's leadership in science** and research organisations.
 - **Gender Parity Survey:** The fact that CSIR conducted a gender parity survey in 2022

demonstrates a **commitment to understanding the extent of gender disparities within the organisation.**

What are the Causes of the Underrepresentation of Women in Science?

- **Societal Stereotypes and Biases:** Deep-rooted stereotypes and biases that are associated with **male-dominated scientific fields can discourage women from pursuing careers in these fields.**
 - These **stereotypes can manifest in the form of implicit biases** in hiring, promotion, and recognition processes.
- **Lack of Accountability:** Despite the heightened discourse, there is a notable **absence of individuals or institutions taking accountability** for the challenges and biases that hinder the careers of women scientists.
 - This **points to a gap between acknowledging the issues and implementing concrete solutions.**
- **Intersectional Challenges:** Gender disparities in science are often **compounded by other forms of discrimination, including ageism, casteism, and sexism.** These multiple layers of bias can create significant barriers for women scientists.
- **Workplace Discrimination:** Discrimination, including **harassment and unequal treatment, remains a significant barrier** for women in scientific fields. This hostile environment can deter women from pursuing and staying in the **Science, Technology, Engineering and Mathematics (STEM) careers.**
- **Unequal Access to Resources:** Women may have **limited access to research funding, laboratory resources, and networking opportunities** compared to their male counterparts, affecting their career progression and recognition.

What Should be the Way Forward?

- **Importance of Recognition:** Despite the presence of women in scientific roles, the ongoing challenge lies in ensuring that their **contributions are recognised and valued equally.**
 - This **highlights the need for addressing biases and barriers** that may hinder women's career advancement and recognition in the scientific community.
- **Networking and Collaboration:** Establish platforms and networks that facilitate collaboration and knowledge sharing among women scientists. **Encourage participation in national and international scientific communities.**
- **Educational Reform:** Enhance access to quality STEM education for girls and women at all levels, **starting from primary education.**
 - This includes **implementing programs and scholarships** to encourage girls to pursue science-related subjects.
- **Realising Manifold Significance of Higher Representation:** Women's representation in science and technology is essential to design inclusive and sustainable societies.
 - Gender **equality is not just an ethical imperative, but also a business priority.** Organisations with greater diversity among their executive teams tend to have higher profits and greater innovation capability.

Drishti Mains Question:

Critically analyse the argument that 'there aren't enough women' as an excuse for the persistent underrepresentation of women scientists in institutions.

