

Women in science and technology: a case study from Uttarakhand, India

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Uttarakhand has a total population of 101.17 lakhs with females accounting for 49.1% of the population according to the 2011 census. The state has more than 300 higher education institutes and a number of central research institutes. The literacy rate is 79.6% and female literacy rate is 70.7% (ref. 1). Both are higher than the national rates indicating that the education status of the state is good but still needs improvement.

Education is a basic human right and a reasonably good indicator of development². This is the basis of women's empowerment and has multiplier effects on the well-being of their families, communities and nations³. Innovative use of technology, when built in with institutional arrangements and interventions can go a long way in creating enterprise opportunities for women at the grassroots level⁴. With changing societal conditions, women are a great human resource and their role in science and technology is vital for its progress⁵. If women have to be successful in science, we need to create support structures and positive attitude towards science as a career for them⁶. Therefore, empowerment of women has been recognized as a central goal in the development process in India^{7,8}.

The Uttarakhand State Council for Science and Technology (UCOST) is a nodal agency of the Department of Science and Technology, New Delhi, which plays a catalytic role for the development of science and technology in the state. To achieve its mandate, the Council has started multiple programmes with R&D, science popularization and entrepreneurship development. In addition, the Council organizes the State Science and Technology Congress (USSTC) every year for young researchers of the state to showcase their research findings and interact with renowned scientists from various parts of the country. The Congress also bestows Young Scientist awards to the participants in 16 disciplines, including Best Innovator of the Year award.

Here, we have studied the participation of women scientists/researchers in USSTC

in the last six years and made inferences regarding their role in the development of science and technology in Uttarakhand.

To study the role of women scientists/researchers in science and technology, we collected data on participation of researchers in USSTC over the last six years (Table 1). The average male and female participation (during the last six years) was also noted. To gather information quality of women researchers in the Congress, we collected data on young scientist awardees and calculated the percentage of women young scientist awardees. These results were then compared with the women young scientist awardees of the National Science Congress (NSC) of India. The data

on young scientist awardees were obtained from UCOST website⁹ and the Indian Science Congress Association website¹⁰.

Over the years the number of participants in USSTC is increasing continuously but the years 2010 and 2011 registered a decrease in participation (Figure 1a). It seems that this is the direct consequence of the policy shift of the Council to charge registration fees for scientists/researchers getting fellowships or having any kind of employment. However, it is encouraging to note that participation by women is increasing (Figure 1b), though it lags behind male participation. This suggests that women are recognizing the role of USSTC and participating in greater number.

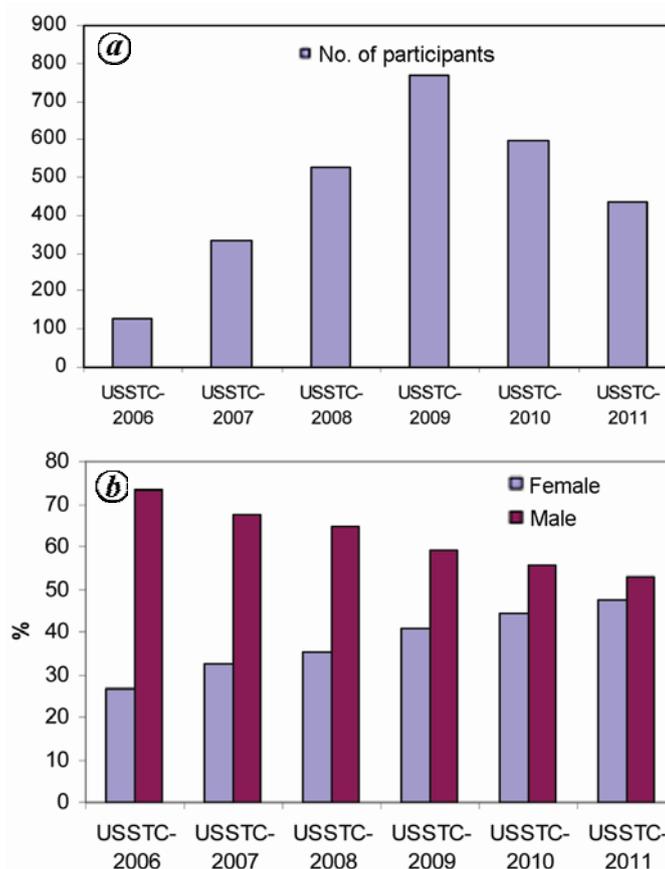


Figure 1. a. Total participation in the Uttarakhand State Science and Technology Congress (USSTC). b. Male-female participation in USSTC.

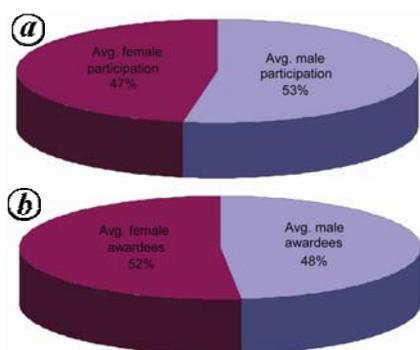


Figure 2. a, Average male–female participation in USSTC. b, Average male–female awardees in USSTC.

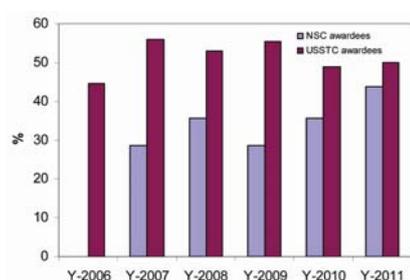


Figure 3. Comparison of female awardees in NSC and USSTC.

The higher female literacy rate in the state compared to that in the country is also reflected in the greater participation of women scientists in scientific activities like USSTC. However, it is observed that buffer period needed for women scientists to come forward and participate in scientific activities.

Table 1 and Figure 2 show that although female participation in USSTC is less compared to the male participation, the awards received by female participants are more. The average number of awards received by females was 17.83 compared to males (16.67). The USSTC data indicate that a conducive environment exists for female researchers. However,

Table 1. Participation in Uttarakhand State Science and Technology Congress

	Total participants	Female	Male	Female awardees	Male awardees
USSTC-2006	127	34	93	8	10
USSTC-2007	334	109	225	14	11
USSTC-2008	525	186	339	17	15
USSTC-2009	767	312	455	26	21
USSTC-2010	597	265	332	21	22
USSTC-2011	436	206	230	21	21
Mean	464.33	185.33	279	17.83	16.67

more policy decisions need to be taken to ensure active participation of women scientists.

Further, we have compared the data of female awardees in USSTC⁹ with those of NSC¹⁰. For this, the percentage of female awardees in state and national science congress was calculated and compared (Figure 3). The percentage of female awardees was more in USSTC with an average of 52 compared to 34.5 for NSC.

The difference in the percentage of female awardees at state and national levels is appreciable at 17.5. However, the difference in the literacy rate at the state and national levels is merely 5.24%. This large difference could be due to more women opting for higher education in the state. This in turn indicates that favourable conditions for female education at higher level exist in the state.

The results have shown that USSTC has generated awareness among all sections of the scientific community, as reflected in the continuous increase of participants in the event, except in the transition year of 2010. The women are also actively involved in science and their participation has shown a positive trend in the last six years.

Although the percentage of participation by women in USSTC is less than that of men, the average number of females receiving the Young Scientist awards is more than males. One of the

important outcome of the study is that women need some buffer time to come forward and actively participate in USSTC. This may be due to lack of awareness or motivation. However, the women participation has been steadily increasing every year.

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