Indian Polar Education and Outreach Endeavours

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***Information paper submitted by India***

**Summary**

India is striving to enthuse interest in Antarctic research and to sensitize students and the general public about Polar Regions with special reference to changing climate. Its nodal agency to undertake polar expeditions, National Centre for Polar and Ocean Research (NCPOR), undertakes extensive outreach activities throughout the year by organizing interactive events, exhibitions, documentary movies, participation in national and regional science fairs, popular science talks, and interactions with the school and college level students. This information paper highlights some of the major polar education and outreach activities toward fulfilling the scientific social responsibility of the Indian polar community.

**Introduction**

Climate change is no longer a distant future; it is already impacting nature, human lives, and infrastructure across the world. The shreds of evidence of a changing climate can be observed in the present environment in the form of extreme weather events, melting glaciers, frequent floods, cyclones, heat waves, shifts in marine communities, changes in animal behaviors, etc.

India has a coastline of about 7500km, where millions of people have their settlements. The economies of the coastal states are largely dependent on oceans. In a climate change scenario, the rise in sea level, the warming of the oceans, and their associated consequences may impact economies in the future. Understanding the climate and cryosphere of the polar regions has huge implications for sea level rise and regional weather patterns. Therefore, it becomes a social responsibility of the polar scientific community to sensitise the general public and students about the impact of changing climate and how these could ultimately impact their lives.

India has been active in Antarctica for the past four decades. However, the importance of the polar regions to global change has never been more critical than in the current times. Therefore, it is important to enlighten the general public about the relevance of the polar regions and their global linkages.

**Building success through small steps**

The celebration of polar events like Antarctica Day, Mid-Winter Day, International Polar Week, etc. marks the global importance of the Polar Regions. On one hand, Antarctica Day provides opportunity to highlight the importance of the Antarctic Treaty—an epitome of international collaboration and relevance of the Polar Regions—while Mid-Winter Day celebration peeks into the life of a polar scientist and the challenges during austral winters. To imbibe polar-related information by Indian citizens, India uses various platforms and methods to enhance their involvement and interest in learning more about the Polar Regions, especially their importance in the climate change scenario, such as:

1. NCPOR organises various activities and competitions like flag-making competition, essay competition, quiz competition, etc. Flag making competition is organised on Antarctica Day, and the best winning flags are sent to Indian Antarctic stations, where Indian scientists celebrate Antarctica Day with the winning flags. In 2022, Antarctica Day was celebrated by organising the Polar and Ocean Exhibition, which was open to all. The participants in all these activities vary from school students to college or university students to the general public. Besides the exhibition, which is open to all, most of the activities have been planned keeping in mind the target audience.
2. **Mega outreach events:** India organises mega outreach events at the national and state level that provide an umbrella platform from which awareness about the Polar Regions spreads among thousands of students from schools, colleges, and the general public. The display of posters, Antarctic rock samples, models, and screening of movies on polar expeditions attract many visitors. NCPOR, Goa, under the Ministry of Earth Sciences, hosted the India International Science Festival, a national-level festival where NCPOR scientists interacted with more than 5000 students and the general public. Since 2017 onwards, NCPOR scientists have interacted with more than 50,000 students and the general public during national and state level science fairs and exhibitions.
3. **Popular science lectures and student-scientist interactions:** NPCOR organises popular science lectures (online and offline) for the students and general public to make them aware of Antarctica (and all three poles) and sensitise them about the current scenario of climate change. Student-scientist interactions and panel discussions are potential platforms where polar scientists interact with students (in schools, colleges, and universities) and enlighten them about Antarctica and career opportunities in polar research. Thereby encouraging them to join the polar community. NCPOR, being the nodal agency for polar expeditions, attracts students to its campus all through the year. Every year, NCPOR receives more than 5000 students from schools, colleges, universities, and government offices across India. Lectures on Antarctica and related topics by NCPOR scientists enlighten them about the importance of Antarctic research. Lab visits add more value for the young students who learn about the new techniques and advancements in Antarctic research.
4. **Use of technology to enhance value for the Polar Regions:** Video conferencing and live interaction with the Indian scientists at Bharati, the third Indian station, always excite audiences of all ages. India also conducts Virtual Reality (VR) shows at colleges and universities across India and also during exhibitions to showcase the mesmerising beauty of Antarctica and the Southern Ocean and highlight the relevance of understanding its processes and its linkages with India. VR shows specially designed by NCPOR give an immersive experience about Antarctica and the Southern Ocean that compels the audience to appreciate the region and realise its worldwide importance, especially with respect to wilderness, environment, and changing climate.
5. **Use of** **Publication and Media:** India utilises print and social media to highlight its endeavours in the Polar Regions. Coverage of various polar research studies by daily newspapers or magazines in English, Hindi, and Marathi gave impetus to the reader’s interest in polar research. India also recently released a Polar Science comic in English, Hindi, and Konkani for school students and youngsters. The comic book aims to create awareness to children about the Polar Regions and highlights the different types of research activities being conducted by Indian scientists in the Polar Regions.
6. The Indian polar community has also been associated with APECS (Association of Polar Early Career Scientists) through the Indian Polar Research Network (IPRN). Indian scientists involved in mentoring and early-career researchers and scientists are involved in various polar outreach activities at the national and international level. Indian polar researchers play an active role in outreach activities through IPRN, the Indian chapter of APECS.

India, as a part of their scientific social responsibility, emphasize the need to educate and connect the polar regions to people and engage them to create a scientific aptitude to understand the present climate change scenario and how they can contribute to mitigate the impact of changing climates in their surroundings. Such small yet significant changes may turn over a new leaf and lead to a better and more sustainable world for the future generations.