

# MP-IDSA

## *Issue Brief*

# Antarctica: The Icy Continent and Indian Engagements

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## **S***ummary*

India has two operational research stations in the Antarctica (Maitri and Bharati) and has till date successfully conducted 42 annual scientific expeditions. India has always considered Antarctica to be a continent of peace and science. Indian Antarctic Bill 2022 provides regulatory framework and legal mechanisms for India's Antarctic activities.

## Introduction

Antarctica is key to our understanding of earth’s climate and ocean systems. Antarctica is world’s natural laboratory and its pristine environment is a natural tracker of global climate change for over millions of years. The unforgiving climatic conditions, freezing temperatures, frequent blizzards, chill factor induced by windy weather are some of the factors which makes Antarctica an inhospitable continent with no permanent population.

Since the first half of 20<sup>th</sup> century, Antarctica has been a part of international geopolitics. The urge for democratisation and universal participation by some nations have however amicably co-existed along with scientific endeavours such as conventions for conservation of marine species and unprecedented international cooperation. The precondition that Antarctica shall be used for peaceful purposes only, prohibition of nuclear explosions and firm regulation regarding demilitarisation have prevented Antarctica from becoming a place of international discord. Antarctica is administered by the Antarctic Treaty System (ATS) 1959 which entered into force on 23 June 1961.

India’s interest and commitment to Antarctic studies dates back to 1981, when first Indian expedition to Antarctica was launched from the shores of Goa. Today, India has two operational research stations in the Antarctica (Maitri and Bharati) and has till date successfully conducted 42 annual scientific expeditions to Antarctica. India’s continuous and growing presence in Antarctica is in accordance with its commitment to science and protection of fragile Antarctic ecosystems.

## The White Continent

Antarctica, ‘the White continent’, is the fifth largest continent and is often referred to as the coldest, windiest, driest and highest continent. The area of this vast wilderness is around 14 million sq km in summer<sup>1</sup> and swells to twice of its original size during winters. The frozen continent is a silent witness to many secrets and stories of past climatic conditions of the earth, global warming and drifting continents.

The stormy Southern Ocean around Antarctica and its harsh climatic conditions with howling blizzards makes it an isolated continent. The Transantarctic Mountain splits the continent into East and West Antarctica. The East or Greater Antarctica comprises two-thirds of the total area. The continent is also a huge reservoir, holding 75 per cent of earth’s fresh water,<sup>2</sup> an asset, which has already fuelled human imagination for its exploitation, should need arise in the future.

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<sup>1</sup> [“Antarctica”](#), *Britannica*.

<sup>2</sup> [“About Antarctica”](#), National Centre for Polar and Ocean Research (NCPOR), Ministry of Earth Sciences, Government of India.

Classified as a desert in technical terms based on annual precipitation in the form of snow averaging less than 50 mm a year, Antarctica is placed in Hyper Arid category along with great deserts like Sahara and Atacama.<sup>3</sup> The continent with an average elevation of around 2,200 m contains nearly 29 million cubic km of ice and is often battered by colossal blizzards with winds touching up to 320 km per hour.<sup>4</sup>

## India in Antarctica

India's tryst with Antarctica began in December 1981 with the launching of the first expedition from the shores of Goa, a programme crafted carefully by the newly formed Department of Ocean Development.<sup>5</sup> The 21-member team under the leadership of Dr S.Z. Qasim, embarked MV Polar Circle, a chartered ship from Norway, for the first Indian expedition to Antarctica. The arduous voyage of 77 days covered a distance of nearly 21,366 km<sup>6</sup> with a brief stop at Mauritius for logistics requirements. The expedition unleashed India's scientific ambitions and aspirations. The headline "Indians quietly invade Antarctica" in the *New Scientist* magazine said it all, as New Delhi till then was not a signatory to the Antarctic Treaty of 1959.

India's involvement in the scientific pursuits at Antarctica dates back to an agreement with the Soviet Union for joint upper atmosphere exploration from the Thumba Equatorial Rocket Launching Station (TERLS), Thiruvananthapuram and the Soviet Antarctic Station, Molodezhnaya. Shri Parmjit Singh Sehra, a scientist at Physical Research Laboratory, Ahmedabad, participated in the 17<sup>th</sup> Soviet Antarctic Expedition in 1971 under the agreement.<sup>7</sup>

'Dakshin Gangotri', the first Indian Scientific Research Station was commissioned in 1983–84 enabling first wintering by Indian team in Antarctica.<sup>8</sup> The station was subsequently decommissioned on 25 February 1990.<sup>9</sup> Subsequent expeditions nurtured India's drive to engage Antarctica in more intensive scientific terms. The need for a bigger and better equipped station was felt, which led to the construction of MAITRI, the second Indian station on Schirmacher Oasis, Antarctica in 1988. The station can support around 25 people in the main structure and has in addition containerised living modules for the summer members. Lake Priyadarshini, apart

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<sup>3</sup> [“Antarctica's Climate: The Key Factors”](#), *Discovering Antarctica*.

<sup>4</sup> [“Weather and Seasons in Antarctica”](#), *HX Hurtigruten Expeditions*.

<sup>5</sup> [“Indian Antarctic Programme: India First Landed on the Ice Continent on This Day in 1982”](#), *India Today*, 9 January 2018.

<sup>6</sup> [“Spy Intrigue of Bond Film Hid India's 1st Antarctic Mission”](#), *The Times of India*, 2 December 2023.

<sup>7</sup> [“Parmjit Singh Sehra – With Rockets to India's Antarctic Program”](#), *Polar Journal*, 9 April 2022.

<sup>8</sup> H. Gupta, *Building Dakshin Gangotri at Antarctica: A Miracle*, Geological Society of India, New Delhi, 2021.

<sup>9</sup> [“Sending Warm Regards to Antarctica? Use Panaji's Pin Code”](#), *The Times of India*, 6 December 2023.

from enhancing beauty of Maitri, is the life line catering to the water needs of the station.<sup>10</sup>

India since then has gained rich polar experience due to its continuous scientific engagements in Antarctica. The yearning and appetite for an even bigger role in polar affairs made her look for a more strategic location to have yet another station which would eventually catapult her status to the elite group of countries who have multiple stations. It was first week of February 2005 and sea around Larsmann Hill had just started showing the signs of freezing when a specially selected five-member team (including the author of this article) from ongoing 24<sup>th</sup> scientific research expedition landed at Larsemann Hill site and initiated scientific studies with limited logistics support.

The site subsequently was found suitable and approved by the Government of India for construction of station Bharati, which is the third and state-of-the-art station located at Larsmann Hill, between Thala Fjord and Quilty bay, east of Stornes Peninsula in Antarctica. It is about 3,000 km east of Maitri and has the capacity for 72 personnel including 25 in emergency shelters/summer camps in summers.<sup>11</sup>

The Indian Antarctic science programme is rich as well as diverse. It consists of studies in areas such as Atmospheric sciences, Biological sciences, Earth sciences and Glaciology, Human physiology and Medicine, etc. Ice core drilling and lake sediment core has long remained a focused area for Indian scientists for their urge to traverse through paleo climatic history of this icy continent. The ice core analysis from Central Dronning Maud Land have suggested temperature variations in East Antarctica and exhibited its close relation with Southern Oscillation Index (SOI) and El Nino Southern Oscillation (ENSO).

The Indian Biological Science institutes have made significant contribution in microbiological research and have identified around 32 new species of bacteria in Antarctica. The seismological observations and monitoring of seismicity in and around Antarctica is being carried out by establishing permanent Seismological Observatory and high-resolution maps have been published as Special Series Map on Schirmacher Oasis and Larsemann Hills.

In the era of scientific collaboration and cooperation, promoting opportunities to undertake joint programmes and multidisciplinary scientific studies in complex areas such as identification and study of high-energy neutrino originating within our galaxy and beyond, studies of subglacial lakes, studies related to meteorites, etc., needs to be encouraged.<sup>12</sup> Exchange visits of Indian scientists to other stations and

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<sup>10</sup> Sanchari Pal, [\*\*“Breaking the Ice: The Story of How India’s Antarctic Mission Turned Ambition into Action”\*\*](#), *The Better India*, 18 June 2016.

<sup>11</sup> [\*\*“Indian Antarctic Programme: India First Landed on the Ice Continent on This Day in 1982”\*\*](#), no. 5.

<sup>12</sup> [\*\*“Antarctica: The Southernmost Continent”\*\*](#), *Live Science*, 21 September 2018.

laboratories such as the South Pole Telescope and Ice Cube Neutrino Observatory will enhance scientific temperament and also help in building bridges of friendship and long-term cooperation.

## India's Geostrategic Engagements in Antarctica

India has always considered Antarctica to be a continent of peace and science. India's stance since the beginning has been to realise an international agreement on development of Antarctica's resources for peaceful purposes. Ambassador Arthur S. Lall, India's Permanent Representative to the United Nations had on 19 February 1956 requested that the question of Antarctica be included in the provisional agenda of the United Nations General Assembly. India's memorandum stated that

“Antarctica, a region covering about six million square miles of territory has considerable strategic, climatic and geophysical significance for the world as a whole. With the development of rapid communications, the area might shortly come to have further practical significance to the welfare and progress of nations. The mineral wealth of the landmass is believed to be considerable and its coastal waters contain important food resources.”

India once again in 1958 presented a memorandum and requested that the Question of Antarctica be included in the agenda of 13<sup>th</sup> regular session of the General Assembly.<sup>13</sup> India was however persuaded to withdraw its move as the preparatory meetings for the Antarctic Treaty had already commenced by then.

India has always pronounced the philosophy of considering Antarctica to be a Common Heritage of Mankind and has not acknowledged Antarctic territorial claims. It has in all earnestness endeavoured that Antarctica remains a continent of peace and science. India, however, has remained cognizant of the growing international interest in the Antarctica, be it the Convention on Conservation of Antarctic Marine Living Resources (CCAMLR) at Canberra in May 1980, the deliberations on exploration and exploitation of Antarctic mineral, the apprehensions of non-aligned nations on exclusivity of the ATCP membership or the implications of UNCLOS in Antarctica. India took active plunge in the Antarctic activities by sending its first scientific expedition to Antarctica in 1981. The second expedition went next year in 1982 and returned in 1983.

Buoyed by two successive scientific expeditions, India felt that its role and active engagements in Antarctica cannot be deferred any further. It realised that a meaningful Antarctic engagement in the strategic matters having international

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<sup>13</sup> S. Chaturvedi, “India and The Antarctic Treaty System: Realities and Prospects”, *India Quarterly*, Vol. 42, No. 4, pp. 355-356.

bearing was difficult to be done being outside of ATS framework, hence it decided to join Antarctic Treaty System. India signed Antarctic Treaty on 19 August 1983 and received the consultative status on 12 September 1983.<sup>14</sup>

On 26 December 1983, the third Indian expedition arrived in Antarctica and the first Indian station ‘Dakshin Gangotri’ was set up by the team in a record 60 days. The record remains unbroken even after four decades as no country has built a permanent station in Antarctica in one Antarctic summer and has thereafter wintered there.<sup>15</sup> India joined the Scientific Committee of Antarctica Research (SCAR) on 1 October 1984<sup>16</sup> and the Protocol on Environmental Protection (Madrid Protocol) to the Antarctic Treaty, also known as the Environmental Protocol, came into force from 14 January 1998. India is also a permanent member of the Commission for Conservation of Antarctic Marine Living Resources (CCAMLR) since it ratified the convention on 17 June 1985 and a member of Council of Managers of National Antarctic Programme (COMNAP).<sup>17</sup>

India has since 1981 continuously sent its scientific expeditions every year to Antarctica. In 2021, India supported the cause of sustainability in protecting the Antarctic environment and for the first time offered to co-sponsor the proposal to designate East Antarctica and the Weddell Sea as the Marine Protected Areas (MPAs) along with Australia, Norway, Uruguay and the United Kingdom to the CCAMLR.<sup>18</sup> The support and co-sponsoring is aligned to the principles of conservation and sustainability under the larger framework of global cooperation such as Sustainable Development Goals (SDGs) and UN Decade of Oceans.

More recently, the Indian Parliament passed the Indian Antarctic Bill 2022 in pursuant to India’s accord to the Antarctic Treaty, Madrid Protocol and CCAMLR. The landmark bill provides regulatory framework and legal mechanisms for India’s Antarctic activities. The bill also shall help in providing enhanced international visibility and credibility in polar governance. The bill proposes setting up an apex body, the Indian Antarctic Authority (IAA) under the Ministry of Earth Sciences to facilitate programmes and activities permitted under the bill.

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<sup>14</sup> [“Lok Sabha Passes the Indian Antarctic Bill, 2022 Aimed at Having India’s Own National Measures for Protecting the Antarctic Environment and Dependent and Associated Ecosystem”](#), Press Information Bureau, Ministry of Earth Sciences, Government of India, 22 July 2022.

<sup>15</sup> [“India Set Up Antarctic Base in 60 Days, Record Frozen in Time”](#), *The Times of India*, 2 December 2023.

<sup>16</sup> [“Information About Scar Members”](#), SCAR.

<sup>17</sup> [“Lok Sabha Passes the Indian Antarctic Bill, 2022 Aimed at Having India’s Own National Measures for Protecting the Antarctic Environment and Dependent and Associated Ecosystem”](#), n. 14.

<sup>18</sup> [“India Extends Support for Protecting the Antarctic Environment and for Designating East Antarctica and the Weddell Sea as Marine Protected Areas \(MPAs\)”](#), Press Information Bureau, Ministry of Earth Sciences, Government of India, 30 September 2021.

Since joining the Antarctic Treaty, India for the first time conducted the 30<sup>th</sup> Antarctic Treaty Consultative Meeting (ATCM) and the 10<sup>th</sup> meeting of the Committee for Environmental Protection (CEP) in April–May 2007.<sup>19</sup> As per the Article IX of the Antarctic Treaty, the ATCM is held every year (Prior to 1994, the ATCM was held every two years).<sup>20</sup> In the ATCM and CEP meetings, the original 12 Parties to the Treaty and the Consultative Parties meet

“For the purpose of exchanging information, consulting together on matters of common interest pertaining to Antarctica, and formulating and considering and recommending to their Governments measures in furtherance of the principles and objectives of the Treaty.”

The meeting comprises representatives from the Consultative Parties, the Non-Consultative Parties, and Observers such as SCAR, CCAMLR and COMNAP and invited experts such as the Antarctic and Southern Ocean Coalition (ASOC) and the International Association of Antarctica Tour Operators (IAATO).<sup>21</sup> At the ATCM, the Measures, Decisions and Resolutions adopted by consensus give effect to the principles of the Antarctic Treaty and the Environment Protocol and provide regulations and guidelines for the management of the Antarctic Treaty area and the work of the ATCM.

The present decade has marked significant milestones in India’s global leadership role. India assumed the rotating Chairmanship of Shanghai Cooperation Organisation (SCO) on 16 September 2022 and under its first-ever Chairmanship, successfully conducted the 23<sup>rd</sup> SCO Summit 2023. India also assumed the presidency of the G20 forum on 1 December 2022 for the first time and successfully conducted the G 20 Leaders’ Summit on 9–10 September 2023. In 2024, the 46<sup>th</sup> ATCM and the 26<sup>th</sup> meeting of the CEP is slotted to be held in India from 20 to 30 May<sup>22</sup> which once again ascertains India’s enhanced stature and role in the realm of Antarctic science.

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<sup>19</sup> [“Annual Report 2007-2008”](#), Ministry of Earth Sciences, Government of India.

<sup>20</sup> [“ATCM and Other Meetings”](#), Secretariat of the Antarctic Treaty.

<sup>21</sup> Ibid.

<sup>22</sup> [“Forty-sixth Antarctic Treaty Consultative Meeting - Twenty-sixth Meeting of the Committee for Environmental Protection”](#), Secretariat of the Antarctic Treaty.

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