
TASK FORCE

Report on the Scientific Studies and Establishment of the First Indian Structure in the Area

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INTRODUCTION

XXIV Indian Scientific Expedition to Antarctica left the Indian shores on 10th December 2004. A task force of five members drawn from various organizations from within the XXIV Expedition team headed by the task force Leader, M. Javed Beg was constituted by the Director, National Centre for Antarctic and Ocean Research. The mandate of the task force was to initiate scientific studies in the Larsemann Hills, Ingrid Christensen Coast, East Antarctica and also to erect an Igloo Satellite Cabin at a suitable location



Task Force Team at Larsemann Hills, Ingrid Christensen Coast, East Antarctica

in the area selected for the third Indian Station in Antarctica by the first task force (2003-04) lead by Mr. Rasik Ravindra, the then Director of Antarctica Division, Geological Survey of India. For the members of the task force (2004-05) this was an additional responsibility over and above their already approved scientific programmes around the Indian Scientific Base, "Maitri" in the central Dronning Maud Land region.

Thematic responsibility of the task force was :

Geological & Limnological Studies	1. M. Javed Beg Antarctica Division, Geological Survey of India
Limnological Studies	2. Comdt. M. Srivastava Indian Coast Guard
	3. Dr. Mihir K. Dash National Centre for Antarctic & Ocean Research
Nutrient Dynamics & Limnology	4. Dr. Ashwani Wanganeo Department of Limnology, Barkatullah University
UV-B Effects on Micro Fauna/ Flora	5. Dr. Jaswant Singh Dr. R. M. L. Avadh University

CHRONOLOGY OF EVENTS

The task force onboard m/v Emerald Sea started for Larsemaan Hills at 17:00 Hrs GMT on 8th of February 2005 and after covering a distance of about 1693.00 NM (3098 km) due east from India Bay, entered the designated area in the early hours of 15th February 2005. Due to poor visibility and severe ice conditions the vessel could not be steered close enough so as to make the flying possible. The first reconnoitry sortie could only be taken up on the 17th of February 2005 in the afternoon. The entire area was carefully evaluated for erection of Melon Hut (Igloo Satellite Cabin) with due considerations to topography, wind direction, proximity to potable water, stability of structure and ground condition for proper anchoring.

On Friday, the 18th February 2005, the Melon Hut in assembled state weighing about 550 kg was slinged to chopper and carried over to the site at 03:00 Hrs GMT. The team was already present at the site to receive the



Fig. 1 : Assembled Melon Hut on the heli-deck and airlifting by the helicopter

hut. It was placed, properly sealed and anchored with steel cables at the site ($69^{\circ} 24' 28.80''$ South and $76^{\circ} 11' 14.70''$ East) already selected the previous day. The job was completed at 05:00 Hrs GMT.



Fig. 2 : The Melon Hut placed at Bharati Promontory, Larsemann Hills

The first Indian structure in the area was sufficiently stocked with food, medicines, water, juices, silicon sealant and some survival stuff like portable gas stove and flares, insulation tapes apart from canned eatables etc. presented by the Australian Pilots. The later part of the day was utilized for the carrying out scientific studies. In the evening the team on invitation from Ms Rachael Robertson the Leader of Australian Expedition visited the Davis Station. As the lakes around the Indian Base in Larsemaan Hills did not offer a suitable site for taking sediment core a reconnaissance was made en-route to Davis and a number of lakes were identified for raising of sediment cores.



Fig. 3 : Properly secured Melon Hut and its interior shelves stacked with provisions

Entire Saturday, the 19th February was made use of for scientific studies around the Indian Base in Larsemann Hills. The team split into two groups and by using both the choppers and a number of foot traverses an area of about 12 sq km bounded between the South Latitudes 69°24' 00" & 69° 26' 00" and East Longitudes 76° 10' 00" & 76° 15' 00" was covered thematically.

On Sunday, the 20th February the team started at 03:00 Hrs GMT and after a brief stopover at the Indian Base proceeded due east, towards Davis in search of a lake that could yield to sediment coring. After two unsuccessful attempts at two different locations the team finally succeeded in identifying a glacio-marine lake about 4 miles short of Davis and two sediment cores were raised at 68° 37' 26.70" S; 77° 58' 14.60" E and 68°37' 25.40" S; 77° 58' 15.20" E from the same lake. While returning upon repeated requests, a courtesy visit was made to our closest neighbors in the area, "Progress", the Russians Station and "Zhongshon", the Chinese Station.

A glaciomarine lake about 4 miles short of Davis station was identified and two sediment cores at 68° 37' 26.70" S - 77° 58' 14.60" E and 68° 37' 25.40" S - 77° 58' 15.2" E were successfully raised for further paleo-climatic studies.

The team, after accomplishing all the jobs assigned, finally arrived on board at 16:30 Hrs GMT. The helicopters were put back into hold and the ship sailed back for India Bay.

OBSERVATIONS & RECOMMENDATIONS

1. The proposed site for the new station is about half a kilometer from the open sea but there a number of small islands all around the area upto 4 Nautical Miles (7.4 km). The gap between these islands is sufficient enough for safe passage of a ship so as to bring it as close as half a nautical mile to the proposed site. However, the intervening sea between the said islands is uncharted for navigational hazards and proper bathymetry needs to be done. Unlike Maitri in Schirmacher Oasis there is no ice shelf between the open sea and the proposed station site.
2. During this visit the Ship remained at a distance of 10 nm view unavailability of charted depth in the navigational chart. However, the charts with depth marked for safe navigation is available with Russians as well as Chinese. It is pertinent to mention that ships of these countries go much closer to the land and thereafter barges shift the stores. Feasibility of utilizing flat bottom barges for shifting of expedition cargo from ship to shore as undertaken by other stations such as Davis, Zhongshon & Progress needs a careful study.
3. Sea water ingresson was found on both the sides of new site. The very distinct and natural advantage of having seawater ingresson is as enlisted below :
 - a) Disposal of wastewater and human waste will not only become easy and less cumbersome but will also be within the guidelines of existing Madrid Protocol for environmental protection. This needs to be evaluated vis-à-vis present situation where incineration of human waste is the most difficult, time consuming and unpleasant event. The organic waste disposal after due treatment (Maceration) as specified in the Madrid Protocol can be discharged in the nearest seawater, which is on the NE side of the site.
 - b) The most herculean task of convoy over the ice shelf which is difficult as well as risky will no longer be required.
4. The central lake (L-7) was found to be quite deep compared to other lakes. The water was clear and Lake Bottom could be seen up to quite

a depth. It was full of heterogeneous clasts with negligible finer sediments. Water of this lake was slightly brackish in taste whereas, other lakes such as L-3 have better water but for the fact that it is at lower elevation than that of the proposed station and is smaller in size hence, prone to early freezing, may not be able to sustain the water requirement of the station.

5. Leveling of area is imperative and must be undertaken before any construction work commences.
6. All lakes were frozen by mid February. However, L-7 remained unfrozen till 20 February 2005. Surrounding sea had also started freezing by mid February.
7. Predominant North-Easterly winds throughout the year are recorded in this area (Based on the information from Davis and Zhongshon).
8. The Russian station 'Progress' and Chinese station 'Zhongshon' are not directly accessible through land route. The distance of these stations from the proposed Indian station would be around 15kms through the polar ice.
9. The distance of polar ice from the site is 2 km due south.

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