

**GOVERNMENT OF INDIA
OCEAN DEVELOPMENT
LOK SABHA**

UNSTARRED QUESTION NO:3021
ANSWERED ON:14.03.2000
VISIT BY INDIAN TEAM TO ANTARCTICA
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Will the Minister of OCEAN DEVELOPMENT be pleased to state:

- (a) the number and frequency of Indian teams visited Antarctica during each of the last five years;
- (b) the expenditure incurred on each expedition; and
- (c) the details of findings at Antarctica?

Answer

MINISTER FOR OCEAN DEVELOPMENT

(DR. MURLI MANOHAR JOSHI)

(a) During the last five years, India has launched five annual scientific expeditions to mainland Antarctica. This includes the Indian Antarctic expedition numbers 15th to 19th.

(b) The expenditure incurred for the above expeditions is as follows:

Expedition/year	Expenditure incurred
15th (1995-96)	Rs.17.55 crores
16th (1996-97)	Rs.21.06 crores
17th (1997-98)	Rs.21.51 crores
18th (1998-99)	Rs.19.61 crores
19th (1999-2000)	Rs.18.50 crores (estimated)

(c) The major experiments mounted in Antarctica along with salient findings during the course of the above five expeditions were as follows:

A three station magnetometer network was established which is recording geomagnetic pulsations used to ascertain plasma velocity on quiet and disturbed days;

An exciting array of instruments on trial basis like Dobson spectrophotometer, laser heterodyne system and mm-wave radio spectrometer were fabricated and mounted at Maitri for ozone measurements. India contributed to Antarctic climatological data base over the GTS.

Planetary Boundary Layer (PBL) studies were made which resulted into the design patenting of a Doppler Acoustic Sounder equipment;

Geological investigations were supplemented by thematic studies on phases of magnetism; structural history; litho-geochemistry for understanding the evolution of the Gondwanaland;

Ice-core drilling was successfully accomplished through raising ice cores upto depth of 90 m for palaeo-climatic studies;

Several experiments on bio-diversity of oasis ecosystems comprising the lake and terrestrial habitat were conducted which contributed directly to SCAR mounted programs;

Studies on microbial diversity yielded information on the possibility of engineering microbes for biodegradation in cold temperature and led to the detection of two microbes not reported earlier;

Preliminary data on various environmental niches were collected and a waste management and handling protocol was designed for

our Antarctic operations;

On-line health monitoring of the structural components and generator sets in Maitri were achieved and a major engineering success was obtained in surmounting the acute problem of static charge in the station;

Near real time picture transmission between India and Antarctica was made possible using high speed data modems inter-phased through the satellite tele-linkage;

As a part of international programme, the establishment of a permanent GPS observatory has provided accurate positions in global reference frame which has helped to decipher the Antarctic plate movements in mm scale;

As a part of international programme, the establishment of a permanent seismic observatory has led to the continuous monitoring of the frequency and strength of natural and man made seismic shocks from Maitri;

As a part of international programme, the establishment of a permanent VLF observatory has helped to map the electro-magnetic whistler waves generated by the plasma processes over Antarctica;

A versatile Brewer Spectrophotometer was inducted as a part of the permanent meteorological observatory at Maitri to measure total ozone values and trace gas contents;

On global change front, a novel experiment on palynostratigraphic analysis of lake sediments has deciphered the age of the fresh water lakes and the migration of organo-debris from surrounding continents;

Energy balance studies of the ice sheet by measuring snow-ice albedo through deployment of automatic stand-alone weather stations (AWS) have been initiated.

Effect of UV-B radiation and cold stress on psychological/physiological interaction to appreciate the behavioural and physiological aspects of human being in Antarctic conditions.