

**GOVERNMENT OF INDIA  
EARTH SCIENCES  
LOK SABHA**

UNSTARRED QUESTION NO:2330

ANSWERED ON:24.11.2010

IMPACT OF GLOBAL WARMING ON ANTARCTICA

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**Will the Minister of EARTH SCIENCES be pleased to state:**

- (a) whether a lake has been discovered beneath some 2300 feet of compressed snow in Antarctica;
- (b) if so, the details thereof;
- (c) whether the Government has conducted/proposes to conduct any study on the impact of global warming on Antarctica and all over the world;
- (d) if so, the details thereof; and
- (e) the steps taken by the Government in this regard?

**Answer**

MINISTER OF HUMAN RESOURCE DEVELOPMENT, MINISTER OF SCIENCE AND TECHNOLOGY, MINISTER OF EARTH SCIENCES AND MINISTER OF TELECOMMUNICATION AND INFORMATION TECHNOLOGY (SHRI KAPIL SIBAL)

(a) & (b) Yes Madam. Till date more than 150 lakes have been identified beneath the thick Antarctic ice sheet (Data from Studinger, Lamont-Doherty Earth Observatory, 2006). Most of these lakes (called "sub-glacial lakes") are covered under 3-4 kilometers of ice and are several kilometers long. Lake Vostok (location: 107.50E, 88.50S) which is the largest among these lakes, occupies an area of the about 14,000 km<sup>2</sup> and lies beneath about 4 km of ice. The water depth of the lake is over 900 m.

(c) & (d) Global Change Research forms an important component of the scientific studies being carried out by Indian scientists in Antarctica. Considering the importance of greenhouse gases in modulating global climate change, since the XXI season (2001-02) Indian Scientific Expedition to Antarctica, scientists from the National Physical Research Laboratory, New Delhi have carried out online measurements of CO<sub>2</sub> and CH<sub>4</sub> by Gas Chromatograph, CO by IR CO-analyser and remote measurement of columnar water vapour using MICROTOS, at the Indian station Maitri.

Carbon monoxide: Diurnal variation has been observed with higher CO concentration in daytime sunlight period. Increasing concentrations of CO has been observed with decreasing duration of sunlight period.

In addition, scientists from Geological Survey of India have been carrying out systematic monitoring of the fluctuations of the continental ice margin in the Western Schirmacher ranges since 1983. The observations indicate a glacial recession of about 7 m per decade.

(e) Considering the implications of variations in Greenhouse gases over Antarctica due to global warming, a larger spatial and temporal database need to be established. The Indian scientific community and scientists from other countries have been analyzing and synthesizing a variety of data collected from geographically distinct localities in the quest to arrive at conclusions.