

GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCE  
**RAJYA SABHA**  
UNSTARRED QUESTION NO. 3537  
TO BE ANSWERED ON 6<sup>th</sup> August, 2009  
**INFLOW IN HIMALAYAN RIVERS**

**3537. SHRI PRAKASH JAVADEKAR:**

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether Government has taken any exercise to monitor the inflow in Himalayan rivers to determine whether there is any reduction in the volume of water due to the impact of global warming;
- (b) whether any detailed survey has been carried out about the shrinking of the Himalayan glaciers, the main source of major rivers;
- (c) if so, the details thereof; and
- (d) if not, whether Government has any plan to carry out the survey?

**ANSWER**

THE MINISTER OF STATE (INDEPENDENT CHARGE)  
MINISTRY OF SCIENCE AND TECHNOLOGY, MINISTRY OF EARTH SCIENCES, MINISTER OF  
STATE IN THE PRIME MINISTER'S OFFICE, MINISTER OF STATE IN THE MINISTRY OF  
PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND MINISTER OF STATE IN THE MINISTRY  
OF PARLIMANTARY AFFAIRS  
(SHRI PRITHVIRAJ CHAVAN)

- (a)-(c) River flow from glacierized areas in the Himalaya is influenced both by annual variations in precipitation (snow/rain) and temperature, and by longer term changes in glacier ice. High specific discharge from ice melt often dominates flow for considerable distances downstream, particularly where other sources of runoff are limited, given the difference in climate between the drier western and monsoonal eastern ends of the region. The Himalayan eco-system (snow and ice) supports three major river systems, Indus, Ganges and Brahmaputra & Barak having an average annual stream flow of 73.31 Billion cubic meters (BCM), 525.02 BCM and 585.60 BCM respectively. Preliminary studies have been taken up in this regard by the Central Water Commission (CWC) and National Institute of Hydrology (NIH), Roorkee.

Glaciers, in general, including the Himalayan glaciers, are receding. Geological Survey of India (GSI) has been conducting studies on the recession of the Gangotri glacier since 1935 or so and this glacier is one of the best documented glaciers for its recession in Indian Himalayas. In the eastern Himalayas, which sit in the Ganga basin, have reported glacier melts.

The rate of shrinking of 30.2 km-long Gangotri Glacier in the last three decades has been found to be more than the rate during the earlier decades. Range of recession for this period is about 18-25 meter/year. Wadia Institute of Himalayan Geology (WIHG) is studying the melting of Himalayan Glaciers in the Garhwal Himalaya, namely, Dokriani and Chorabari glaciers. The Dokriani and Chorabari glaciers have been receding at an average rate of 17.5 m/year between 1991 and 2005, and 10 m/year between 2003 and 2006 respectively.

The major part of the river discharge is contributed by snowfall and precipitation which is likely to change with global warming. The continuous retreat of glaciers may lead to marginal shortage of water in the Himalayan Rivers.

- (d) In addition to the above, the National Action Plan on Climate Change (NAPCC) envisages launching a Mission for sustaining the Himalayan Ecosystem to evolve management measures for sustaining and safeguarding the Himalayan glaciers and mountain eco-system. The Mission is expected to seek to understand, whether and the extent to which, the Himalayan glaciers are in recession and how the problem could be addressed.

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