

## CONTEMPORARY HISTORY OF MELTING GLACIERS OF UTTARAKHAND

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### ABSTRACT

Uttarakhand is a new born hill state of India. It is situated in the upper middle part of Himalayas. The glaciers of middle Himalayan range are a source of water to all life line rivers. But due to ecological changes and global warming the volume of melting snow is very high. So many big glaciers have started shrinking. This paper is an attempt to look into the various aspects of melting glaciers of Uttarakhand.

**Key words:** *Glaciers melting, Uttrakhand*

Glaciers are large, usually moving mass of ice formed in high mountains or in high altitudes where the rate of snowfall is greater than melting rate of snow. Uttarakhand is a new born hill state of india. 90% of the land area is sloppy in Uttarakhand.<sup>1</sup> It is situated in the upper middle part of Himalayas. Several peaks of Uttarakhand are covered by snow round the year. The glaciers of middle Himalayan range are a source of water to many rivers and as we know, these rivers are the lifeline of north India. Now, due to ecological changes and global warming, our glaciers are melting and the rate of melting of these glaciers is pretty high. Many big glaciers have started shrinking. According to a report, Gangotri Glacier have shrunked by 210 meters in the last fifteen years. This is a worrying situation for the Ganges. Therefore, if the Glaciers keep on shrinking at the present rate, the effects will be catastrophic for all the rivers. There will be water shortage in the planes, and many environmental problems will occur.

### Causes Of Melting Glaciers In Uttarakhand

Due to its high altitude, large area of the Himalayan region is covered by snow. Cities are sprawling in the state because of rapid industrialization and development. Forests are being cut. Increasing environmental pollution is threatening the ecosystem and biodiversity of the state. According to the scientists, lack of winter rains and snowfall will create greater water shortages and there will be more melting of glaciers in summers due to the increase in temperature

Global warming, deforestation, ozone degradation, desertification are the reasons which are increasing the rate of melting glaciers.<sup>2</sup> All this will cause drying of the Himalayan high altitude lakes in Uttarakhand. In the coming 40-50 years this will increase the problem of water shortage in the region.<sup>3</sup>

### **Events of heavy snow fall, melting Glaciers and avalanches-**

Avalanche is a sudden flow of a large mass of snow or ice down a slope or cliff, sometimes at speeds exceeding 160 km/hr (100 mph). Such flows can be destructive to life and property.<sup>4</sup> The Himalayas are well known for the occurrence of snow avalanches. Parts of Tehri Garhwal, Chamoli, Pithoragarh, Uttarkashi districts are vulnerable areas. In the year 1978-79, Bamani village near Badrinath in district chamoli was completely covered by an avalanche.<sup>5</sup> The hill slopes at the river Alaknanda have witnessed numerous avalanches which, damaged houses in Badrinath in, 1948, 1952, and 1975. During February March 2002, heavy snowfall caused the flooding of glacier in Bhairajhap Nala. There was great devastation, which nearly destroyed the sacred Gangotri temple.

There are nearly 880 glaciers in Uttarakhand and these are the source of water of the rivers in the Ganga valley. Presently 52 glaciers are the water source of river Yamuna, 238 Glaciers provide water to river Bhagirathi, river Alaknanda is fetched by 368 Glaciers and 264 glaciers give water to the river Kaliganga. 206 of 238 Glaciers of the Bhagirathi valley are less than 5 km long. Dokironi Glacier is shrinking at the rate of 17 meters per year since 1962. On the other hand Gangotri glacier which is 30 Km in length, is narrowing at the rate of 17-23 m per year.

Melting glaciers are increasing the possibility of drowning of costal areas. According to the Green peace report a, 5 degree Celsius increase in the global temperature will translate into rising sea levels, and 12.5 crore people will be displaced only in India and Bangladesh.

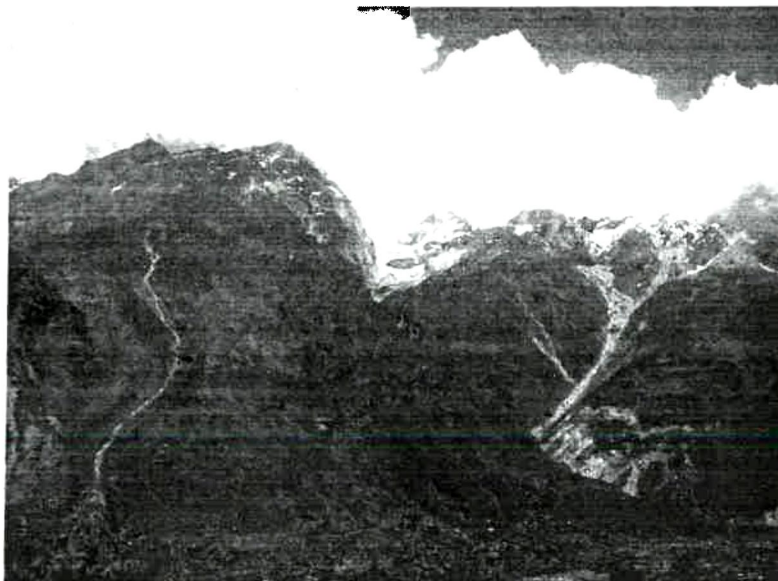
A comprehensive study of United Nation tells that if sea level rises by 45 cm., 75% area of Sunderbans which is spread over 10000 square km, will be destroyed.<sup>6</sup>

### **Remedial measures-**

Conservation of glaciers should get more importance in policies because of increasing urbanization and industrialization. Many glaciers of Uttarakhand produce

**Table- 1. Gangotri glacier melting rate yearly**

<b>Year</b>	<b>Melting Rate</b>
1889 - 1935	498 m
1935 - 1956	372 m
1956 - 1966	223 m
1966 - 1971	152 m
1971 - 1981	278 m
1981 - 1991	267 m
1991 - 1994	70 m
1994 - 2000	144 m
2000 - 2004	77 m
2004 - 2005	7.2 m
2005 - 2006	19.5 m



**Fig1: Glacier near Badrinath Temple, Chamoli Garhwal**

**Table 2: Yearly Melting Glaciers of Uttrakhand**

Name of Glacier	rate of yearly melting
Gangotri	18.1 m
Bhagirathi kharak.	15.3 m
Mayar	11 m
Badra sigari	17 m
JAMU	15.1 m
Milam	13.3 m
Dokrani	16 m
Tajam	12 m
Pindari	12 m

great rivers like Ganga and Yamuna which are the life line of Indian people. There are also hydro power projects on these rivers, and this increases the importance of glaciers and availability of water.

It is very essential to improve the research methodologies about glacier studies in India. Government is showing great concern on the increase of global warming and it has nodded to the formation of country's first National Institute of Glaciology. Disaster mitigation and management centre of Uttarakhand is also working on the Glacier action plan. In the longer term the future scenario for all hazards management is unlikely to be the same as in the past. Any forward looking program for Hazards Management will have to be flexible and confront entirely new challenges. Much remains to be done to meet the challenges and to realize the opportunities for a safer world. Mitigation is one of the positive links between disasters and development.

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