



ADDRESSING GLACIAL MELT IN THE ASIA-PACIFIC REGION



1. THE ISSUE

2. IMPACTS

3. ACTION

3.1 UNEP-ICIMOD Study

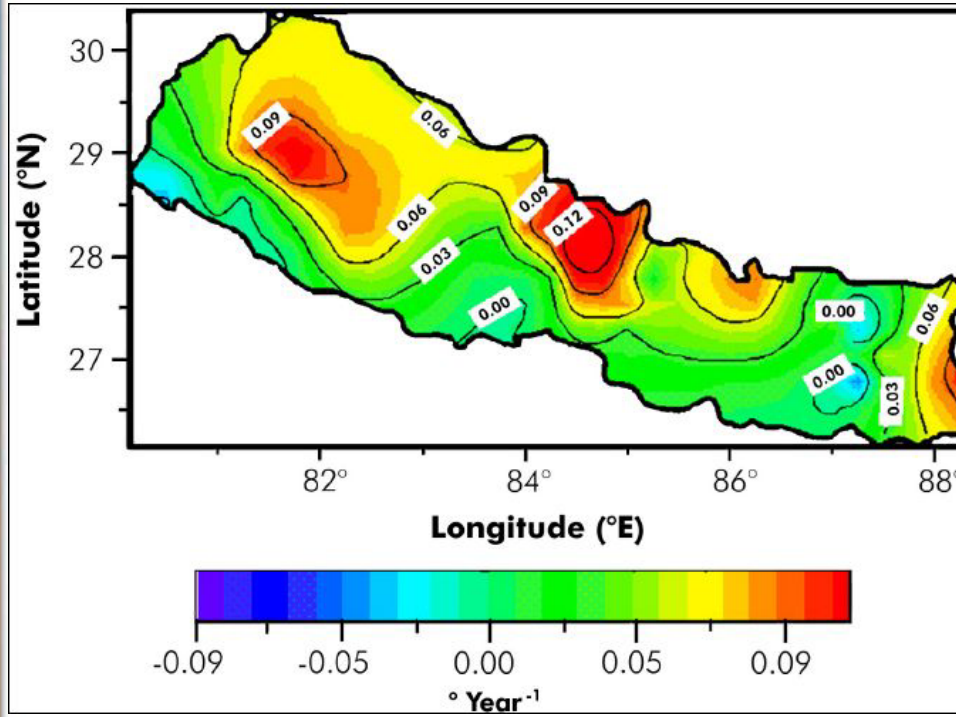
3.2 Achievements

3.3 The way forward

CLIMATE CHANGE AND GLACIAL MELT

Climate Change

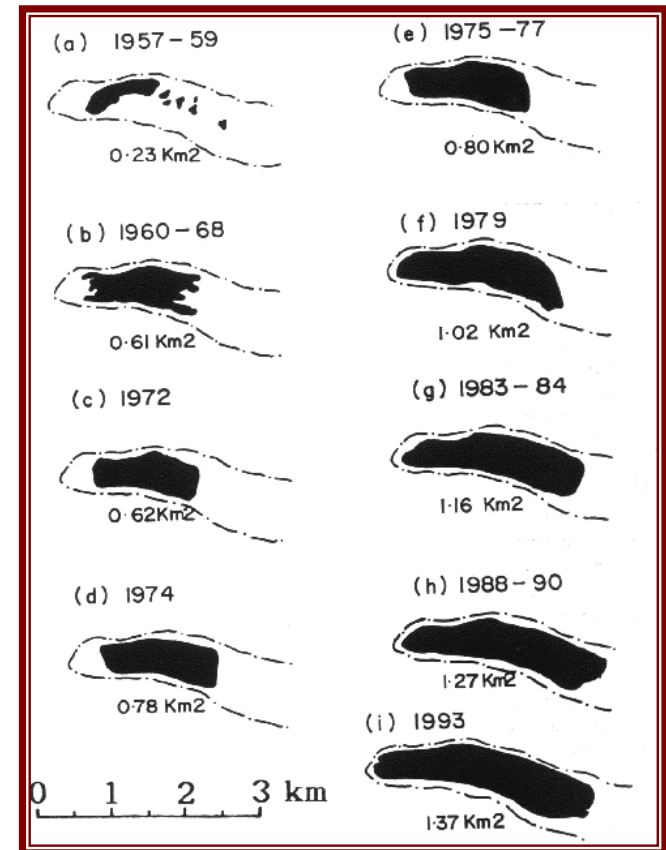
- An analysis of the temperature trend in the Himalaya and its vicinity shows the temperature changes are higher in the uplands than lowlands



Spatial distribution of annual temperature change trends in Nepal from 1977 to 1994 (Shrestha et al., 1999)

Glacial Melt

- Climate change is causing the net shrinkage and retreat of glaciers and the increase in size and number of glacial lakes



Successive development of the Tsho Rolpa Lake from 1957 to 2000

CLIMATE CHANGE AND GLACIAL MELT ...

Birds eye view of Thulagi glacial lake photographs taken in 1991 (left) and 1994 (right)



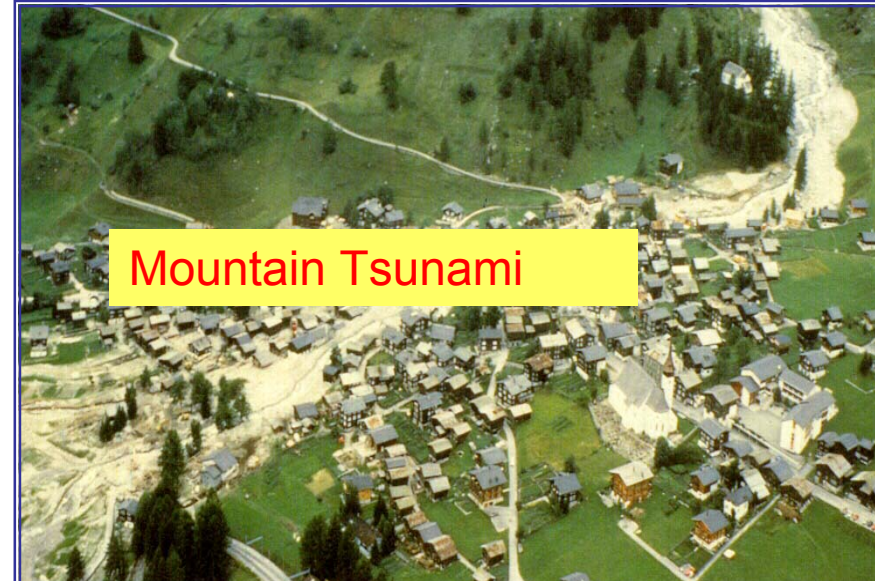
IMPACTS OF GLACIAL MELT

Water security

- Mountains are the water towers for the plains below them
- About three billion people in China, Southeast Asia, and South Asia are depend on the water towers of the Tibetan plateau
- Retreating glaciers, low water levels in lakes, and decreasing lean season flows in rivers will not only affect mountains.

Natural disasters

- Flooding in the lower basin
- Damage of Human life, Settlements, Live , Livestock Population
- Damage of Reservoirs, Bridges, Roads, Transmission lines
- Destruction of vast amount of Agricultural Land, Forest land



IMPACTS OF GLACIAL MELT...



Punakha Dzong was not built on island



This most sacred temple was not built on island



Forest does not grow well in such river bed



UNEP-ICIMOD STUDY

Strategy

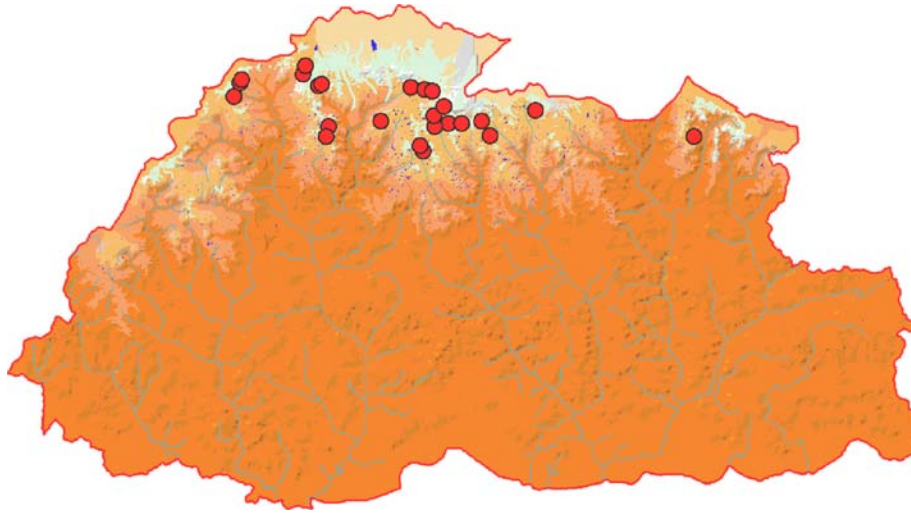
- Inventory of glacial lakes
- Monitoring and early warning system
- Adaptation measures

Progress

- Completed Initial studies for Bhutan, Nepal, Pumqu basin (in China), Astor basin (in Pakistan), and Tista basin (in India)
- Hotspot analysis

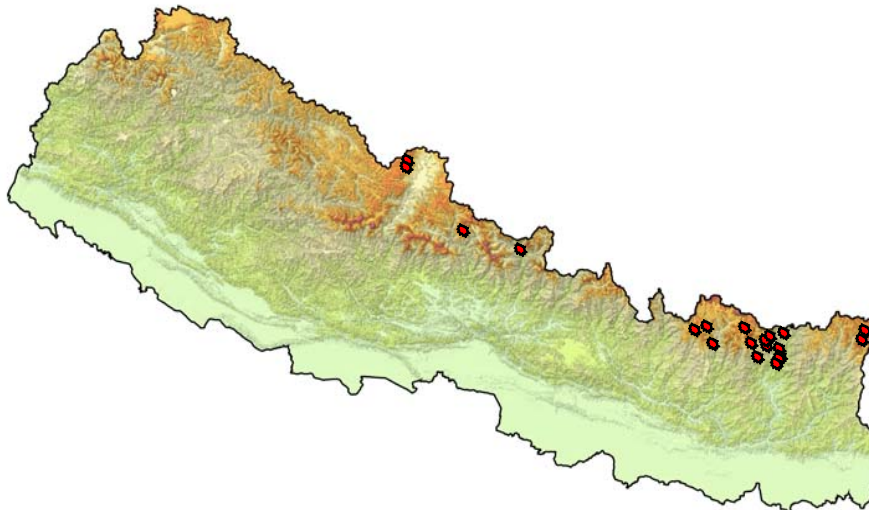


INVENTORY IN BHUTAN AND NEPAL



Bhutan:

- 2674 glacial lakes
- 24 potentially dangerous



Nepal

- 2323 glacial lakes
- 20 potentially dangerous

INVENTORIES ARE AVAILABLE ONLINE

Glaciers and Glacial Lakes - Microsoft Internet Explorer

File Edit View Favorites Tools Help



Address <http://www.rrcap.unep.org/issues/glof/glof/index.htm>

Go Links

Inventory of Glaciers, Glacial Lakes and Identification of Potential Glacial Lake Outburst Floods (GLOFs) Affected by Global Warming in the Mountains of Himalayan Region



<http://www.icimod-gis.net/quicklink/googleearthapplication.php>



Field survey



Design of Early warning system



The Way Forward

Inventory:

- Complete inventory for Hindu Kush-Himalayan Region and Central Asian Mountain Region

Adaptation :

- Assist with the establishment of early warning System
- Assist with the development of evacuation Plan
- Siphoning, Sluice gate structure canal



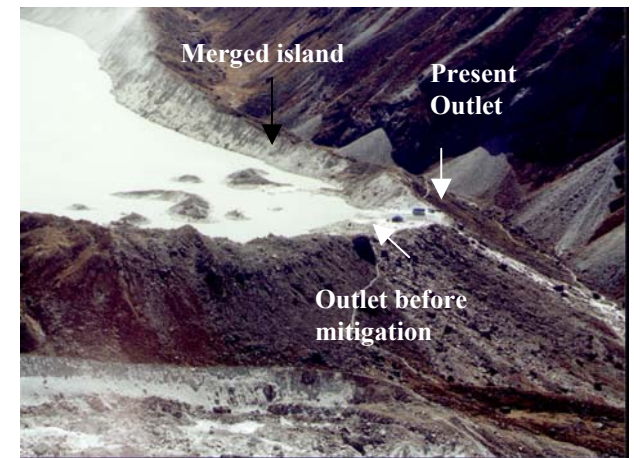
GLOF Sensing System



GLOF Warning System



Siphon



Sluice gate structure canal