



ICIMOD

Flooding Risk Management in the Himalaya

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With temperatures having risen 1°C on average since the middle of the 1970s, glacial melting in the Himalayas is increasing the attendant risks of glacial lake outburst floods (GLOFs).

The Poiqu/Bhote Kosi river basin between Nepal and China has already experienced three previous GLOFs, in 1935, 1964 and 1981.

Satellite imagery supplied by Planet Action to map the extent of glacial lakes in this river basin is crucial for managing GLOF risks and their impacts on local communities.

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PROJECT STAKEHOLDERS

The International Centre for Integrated Mountain Development (ICIMOD) is an international knowledge-development and learning centre serving the eight member countries of the Hindu Kush—Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan. Its dual objective is to propose and implement, through cooperation between regional, national and international partners, innovative solutions to reduce ecological and socio-economic vulnerabilities in this region of the globe. To this end, ICIMOD intends to be an information platform for exchanging experience and knowledge of sustainable risk management.

PLANET ACTION SUPPORT

Launched in August 2008, the programme supported by Planet Action aims to measure and track the extent of glacial lakes in the Poiqu/Bhote Kosi river basin: to this end, very-high-resolution satellite imagery is a valuable aid in building hydrological risk prediction models for the nine potentially dangerous lakes identified in the basin.

The objective is therefore to give regional stakeholders critical information to support decision-making on GLOF risk management. Here, analysis of satellite imagery is a key asset for the Nepal Department of Hydrology and Meteorology.

The programme will conclude with an awareness-raising and training campaign.

PROJECT CHALLENGES



Glacial melting in the Himalayas is accelerating at an alarming rate.

In the short term, this will lead to the formation of numerous glacial lakes susceptible to outburst floods with the potential to cause widespread destruction in India, China and Nepal.

Covering an area of some 33,000 sq.km, the Himalayan glaciers are the “water tower” of Asia, feeding seven of its rivers—the Mekong, Ganges, Indus, Brahmaputra, Salween, Yangtze and Huang He (or Yellow River).

USE OF SATELLITE IMAGERY

Satellite imagery is used to map land use/land cover and infrastructures, and to identify glacial lakes. The spatial distribution and outline of glaciers and glacial lakes are then extracted using eCognition software supplied by Definiens through Planet Action.



METHODS AND ACTIONS



To establish models for managing future risks, the people driving the project chose 1981 as their baseline, a year when floods caused huge damage. Risk parameters in the models include hydroelectric stations, infrastructures and crops. The need for risk management models is all the more apparent today, as the region's economic structures have expanded since the last GLOF event in 1981.

On the ground, satellite imagery complements other sources of information such as reports, logs, maps and books concerning GLOF events. Project offices along the

Bhote Kosi River have compiled reports on the results of GLOF risk mitigation activities.

The project also aims to put a monetary value on risk parameters, as evaluating the cost of flood damage is no easy task, particularly when long-term losses of revenue sources are not taken into account.

Satellite imagery and eCognition software licences supplied by Planet Action are an important tool for managing GLOF risks to which populations are exposed.