

Partnership for Sustainable Mountain Development

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FOR MOUNTAINS AND PEOPLE

GIS and Earth Observation: Climate Change in the Himalayan Region - Responding to Mountain Development Challenges

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The Hindu Kush-Himalayan – A Global Asset

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Changing face of Himalayas:

- Climate Change
- Demographic change
- Land use change
- Globalization / Social Change
- ...

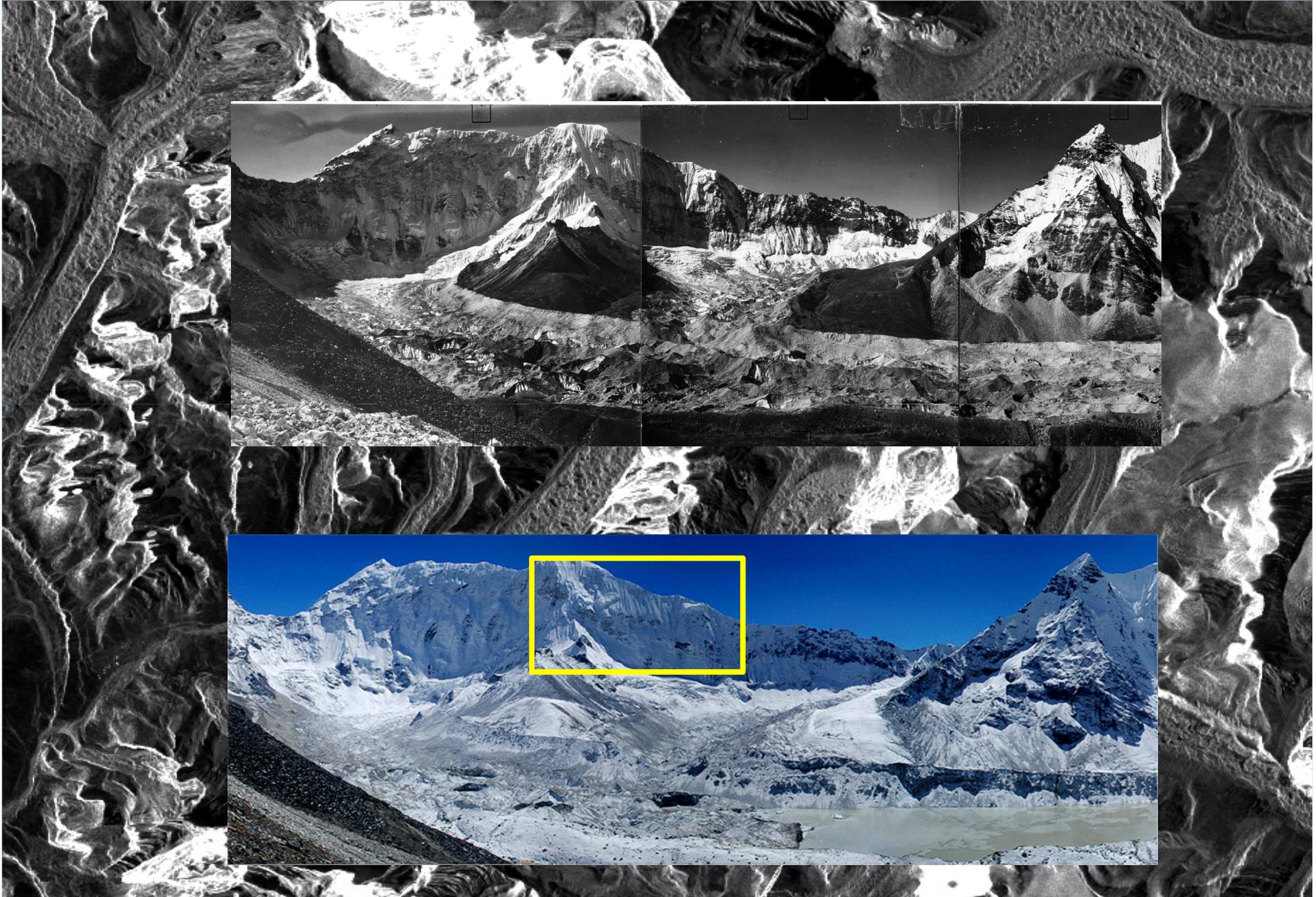
Sources of **freshwater** reserves - headwaters for 10 major river systems

An area of majestic beauty - a world heritage site for **biodiversity**

GIS and Earth Observation:

- ❖ Convergence of Technologies – creating enabling environment
- ❖ Monitoring, Assessment, Modeling, Reporting
- ❖ Linking Science, Technology and Innovation to Policy and Practices

Mountain Matters - Water



2009



Photography: David Breashears, GlacierWorks

Water Tower of Asia – A Lifeline !



In cities, people often do not know where the water they drink comes from.....

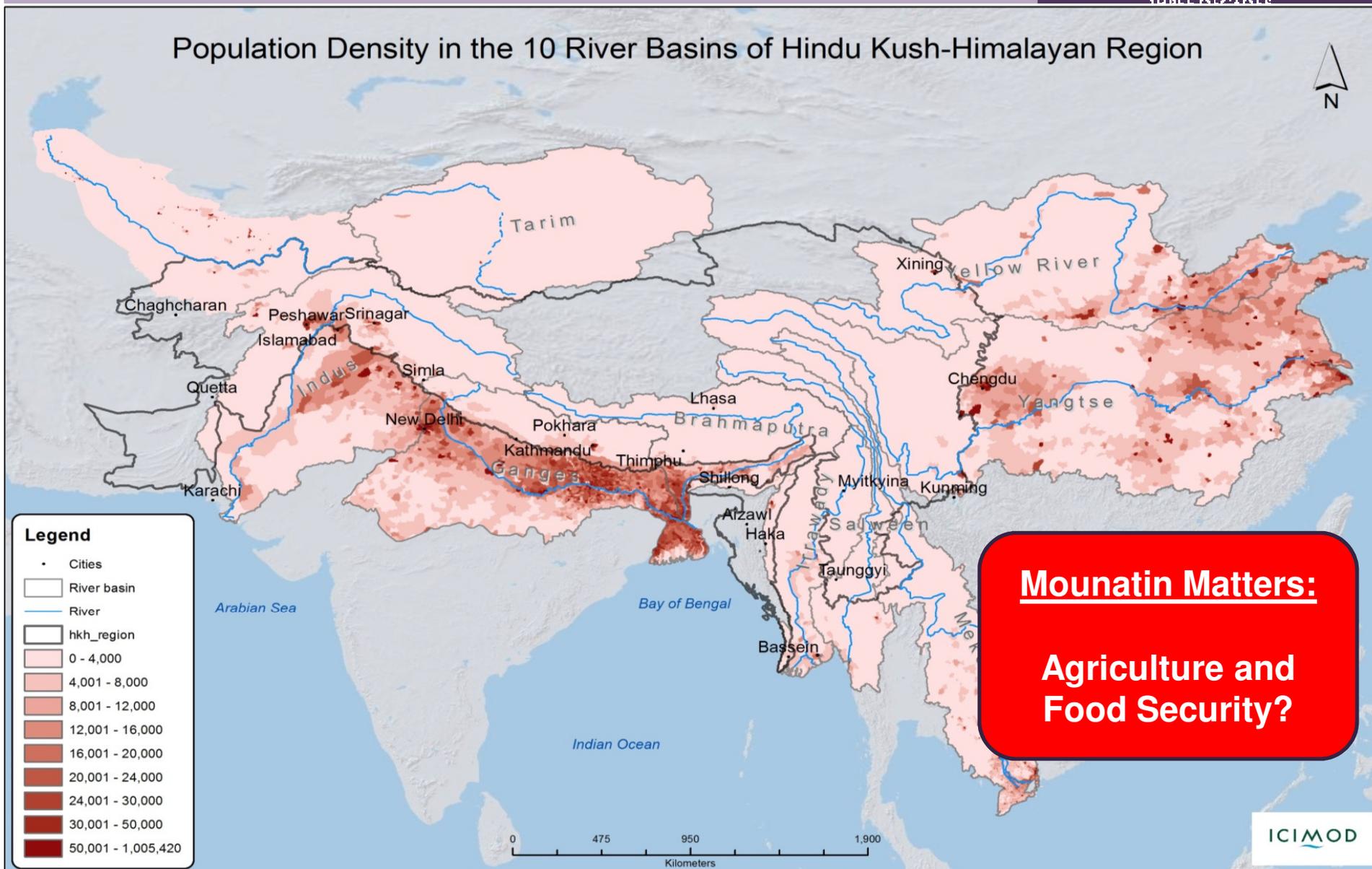


Mountain Matters:

Water Availability / Security?

River Basins Support Some of the Most Populated Areas on the Globe

Population Density in the 10 River Basins of Hindu Kush-Himalayan Region

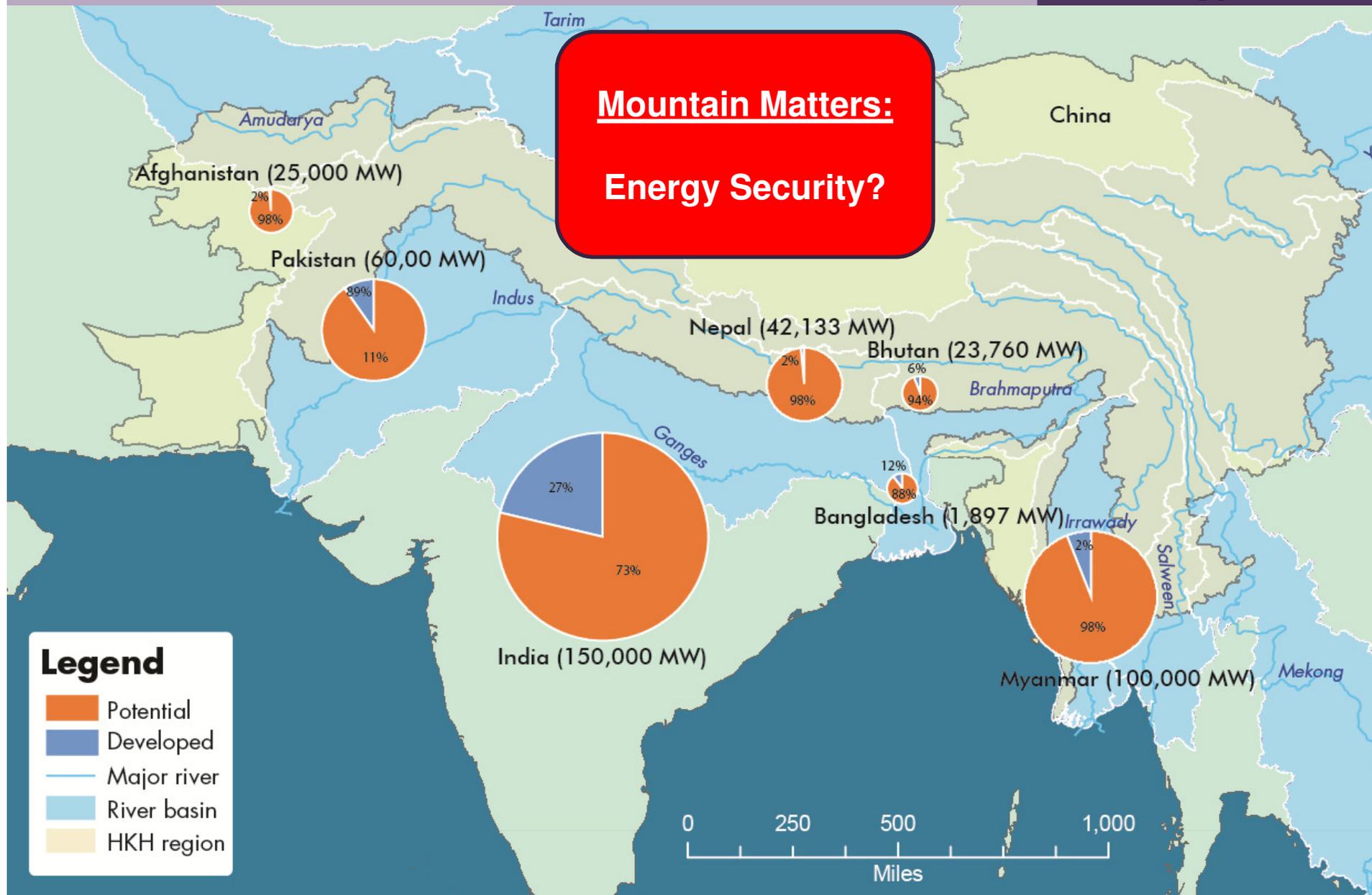


Mountain Matters:

**Agriculture and
Food Security?**

Hydropower development relative to its potential in the region

Mountain Matters: Energy Security?



Climate Change Impact: Ecosystem Services

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Mountain Matters:

Sustenance of
natural resources
economy?

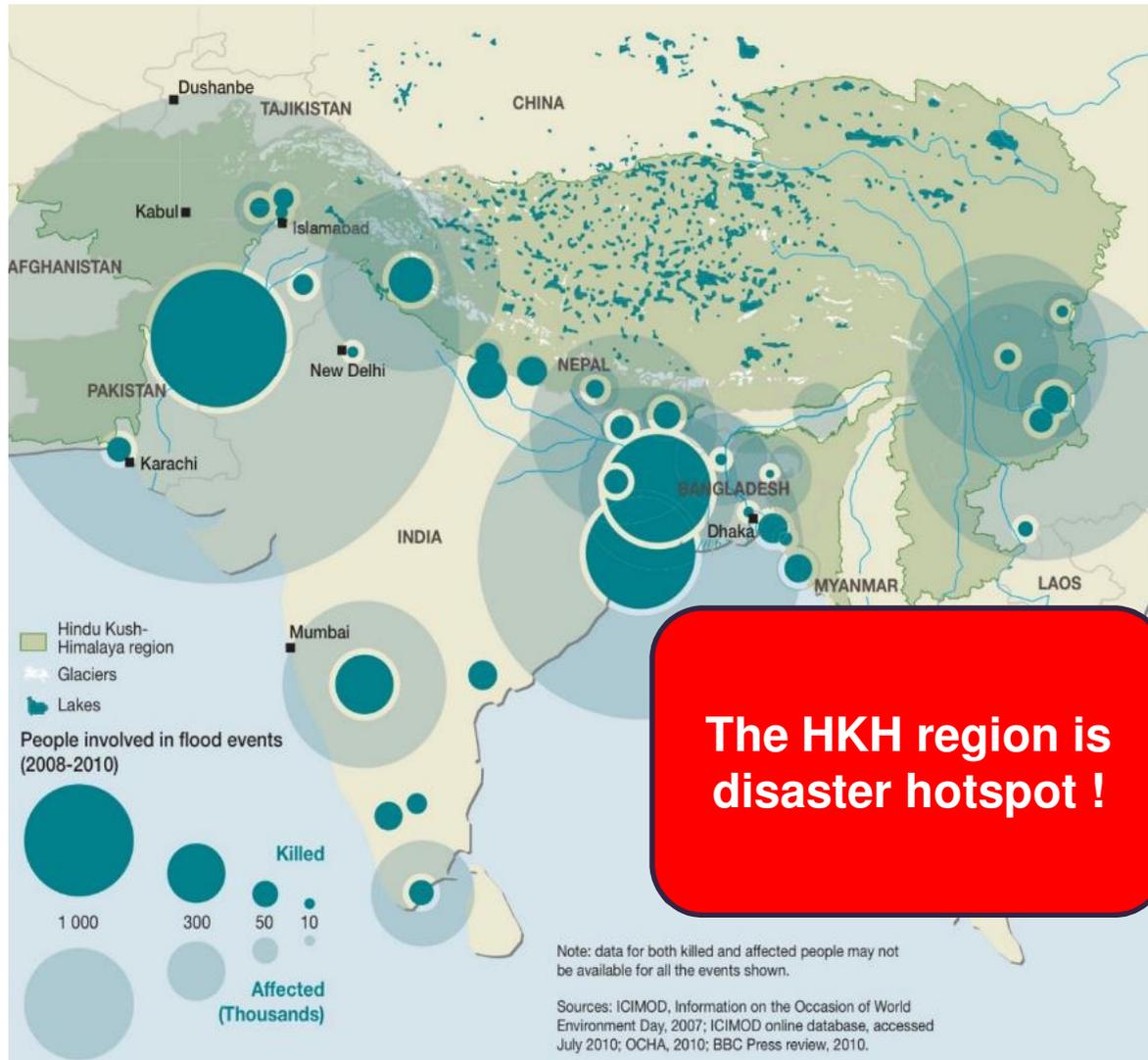
- 6 UNESCO world heritage sites
- 60 eco-regions
- 30 Ramsar sites
- 488 Protected Areas
- 330 important bird areas
- 53 important plant areas



Habitat loss for wildlife and productive lands for domestic animals

Important biodiversity sites in the Hindu Kush-Himalayan Region

Increasing frequency and magnitude of disasters



Climate Change Impact: Transboundary Air Pollution and Black Carbon

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Nov to April Skies

- Accelerated snow and glacial melt
- Impact on Human health
- Negative impact on agriculture



Climate Change Impact: Erratic Monsoon Patterns ...

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Mountain Matters:

Too much water
too little water?

Changes in rainfall intensity, water availability, disaster frequency detrimental for livelihood systems

Vital source of ...

Water, Food, Energy, Forests, Biodiversity, Tourism...

Vital for economy and businesses ...

Survival of environmental and cultural heritage

Key Applications:

- Climate change modelling and assessment
- River basin management and information system
- Biodiversity conservation and assessment
- Agriculture and food security assessment
- Land cover change management
- Disaster management information system
- Regional flood and early warning system
- GHG and REDD Information system
- Dynamics of glaciers and associated hazards
- Air pollution monitoring and modelling
-

Mountain GeoPortal

- Putting Geospatial information to the hands of end-user community

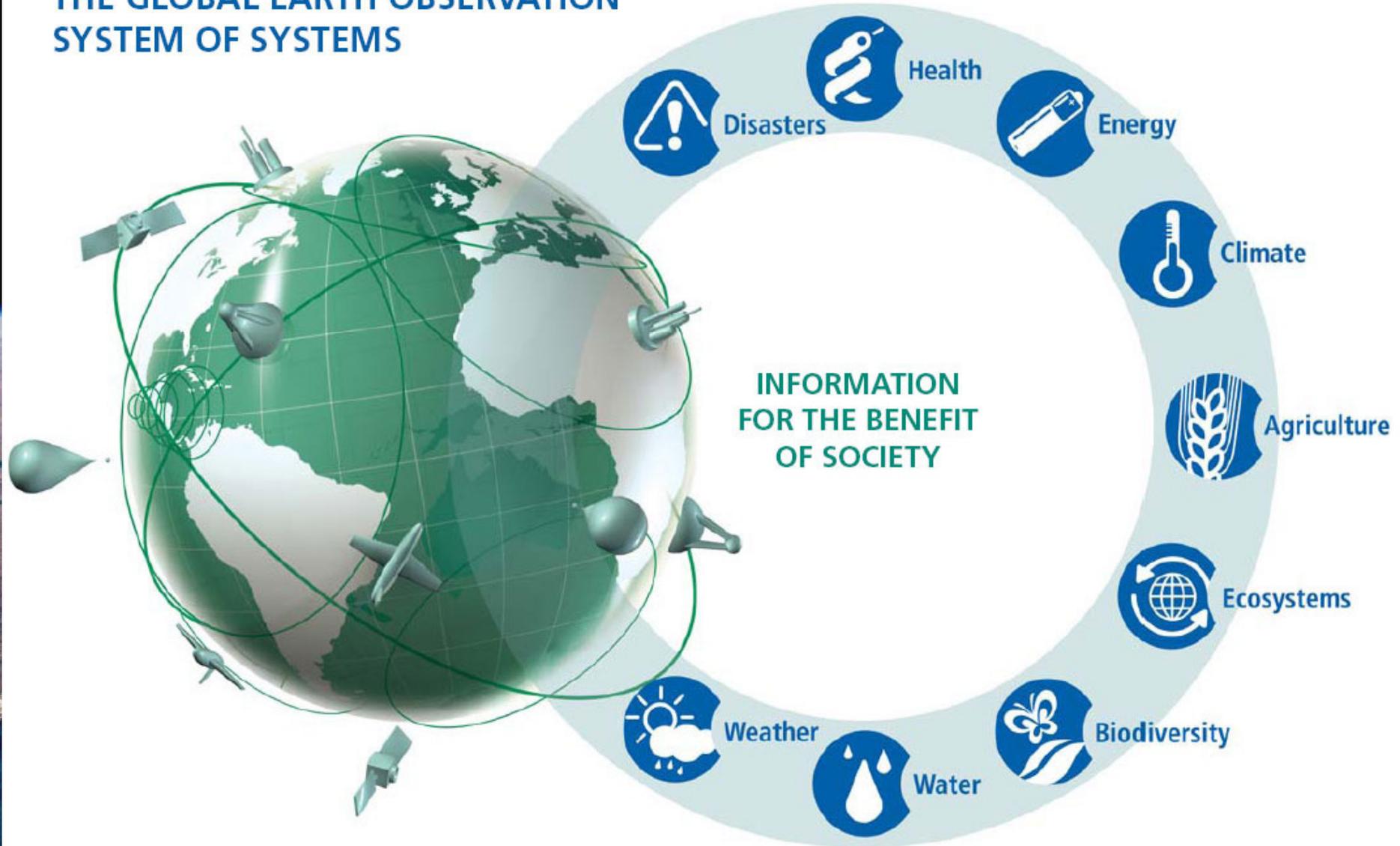
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The screenshot shows a web browser window displaying the Mountain GeoPortal website. The browser's address bar shows the URL <http://216.108.229.218/geoportal/>. The website has a dark blue header with a navigation menu: Home, Science Applications, Datasets, Servir Himalaya, Story Maps, About, and Contact. Social media icons for Facebook, Twitter, and YouTube are visible. A large banner image of a snow-capped mountain range with a stupa in the foreground is the main visual. To the right of the banner is a 'Featured Story Maps' section with four items: 'Assessing the agricultural difficulties in Nepal', 'Potentially dangerous glacial lakes of Nepal', 'Imja - fastest growing glacial lake of the HKH region', and 'The world's 14 highest mountain peaks'. Below the banner is a 'Science Applications' section with a satellite icon and a description: 'A collection of innovative and interactive web mapping applications that provides dynamic visualization of spatial data along with the tools to support informed decision making.' To the right of this are three featured story map cards: 'Status of Glaciers in the HKH Region' (with a glacier image), 'Land Cover Dynamics in Bhutan' (with a terraced field image), and 'Nepal Disaster Information Management System' (with a landslide image). Each card includes a brief description and a 'View Details' button. At the bottom, there are navigation buttons: 'View all', left and right arrows, and three individual 'View Details' buttons. The ICIMOD 30 logo is also present in the top right corner of the website content area.

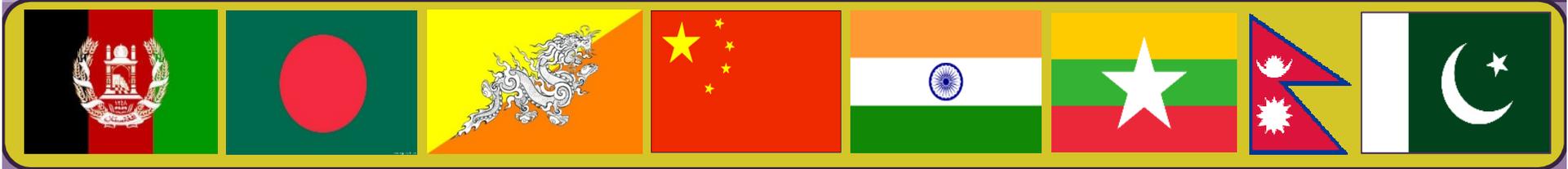
Earth Observation for sustainable mountain development Aligning with GEO Priority → Himalayan GEO

THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS



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Thank you for your attention !

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Collaboration through
Knowledge and **Regional Cooperation**
in the SAARC Region

Stay Happy ☺ !

