Promoting the Use of Earth Observation for Sustainable Mountain Development in the Himalayan Region

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The International Centre for Integrated Mountain Development (ICIMOD)

- A regional mountain knowledge, learning and enabling centre devoted to sustainable mountain development in the Hindu Kush-Himalayan region.

- Information and Knowledge are chief Commodities of the Centre.

The Hindu Kush-Himalayan Region
Extends over 3500 km from Afghanistan to Myanmar And Home to 200 million People

An intergovernmental and independent organisation with eight member states.
The Hindu Kush Himalayan Region

Youngest, Highest and Dynamic Mountain System in the World

Critical Life Support System for more than 200 million inhabitants and many more living downstream...

Concerns of key natural resources and environmental degradation

Data, information and Knowledge are crucial for sustainable development
Mountain Matters: Water

Major River Basins of the Hindu Kush Himalayan Region

Signifying the Water Tower of Asia - 10 Large River Basins

Lifeline for more than 1.3 billion Population
The Cryosphere - An Important Indicator for Climate Change

- Rapid melting of glaciers
- Increased water-induced disasters and casualties
- Shift of monsoonal and weather pattern
Mountain Matters: Bio-Diversity

Eastern Himalayas listed as a Global Biodiversity Hotspot
Mountains: Prone to Natural Disaster

12 May 2008 – Sichuan Earthquake

8 October 2005 – Pakistan Earthquake

25 August 2008 – Bihar North India Flooding

3 May 2008 – Myanmar Nargis Cyclone
To develop and institutionalize integrated and innovative geo-based solutions and foster information and knowledge management within ICIMOD and its cooperation partners to support informed decision-making for mountain policies and practices.
MENRIS Programme at ICIMOD

Evolving Role
Regional Resource Centre for geo-information and earth observation application on mountain region

- Stress on scientific tools, methods and analysis
- Regional Databases, Harmonization and standardization
- Systemic Planning and Management
- Foster geo-information and knowledge management
Earth Observation: Regional Scenario

Advanced space programme

Earth Observation Related Agencies

Afghanistan, Bhutan, Nepal and Myanmar lack the capacity
Prioritized applications

Ice and Water Resources

Regional Landcover Mapping

Disaster Risk Mapping

Transboundary Air Pollution

MODIS AOD, APR 2002

Map showing MODIS AOD ( Aerosol Optical Depth) for the year 2002, with color scale indicating different levels of aerosol concentration.
Earth Observation: Monitoring and Assessment of Ice and Water Resources

- Snow Cover Mapping and Monitoring
- Highland Wetland Mapping and Monitoring
- Glacier Mapping and Monitoring
Earth Observation: Disaster Risk Mapping and Monitoring

- Multi-hazard Risk Assessment
- Disaster Risk Monitoring
- Pilot Early Warning System

Imja Lake and its network statistics of local bandwidth (Imja to Namche)

http://fsds.de.affrc.go.jp/data4/Himalayan/
Earth Observation: Regional Land Cover Mapping

- Land cover is seen as the main indicator of the state of ecosystem
- Harmonization of Regional Landcover Database
- Capacity Development
- Partnership with FAO

Landcover – basic parameter for REDD (Reduced Emissions through degradation and deforestation) in recent climate change debate
Earth Observation: Aerosol Measurement

Cloud Aerosol Lidar and Infrared Pathfinder Satellite (CALIPSO) Lidar showing the vertical distribution of ABCs. (Ramanathan et al., 2007)

Haze along the Himalayas (India, Bangladesh, Nepal, Bhutan, China) 1/21/2007
Mountain GeoPortal (http://menris.icimod.net)

- Collaborative effort to build, share and disseminate geo-information and knowledge resources
- Decentralized and distributed network
- Regional Gateway and geo-information services
GeoSpatial Metadata management system

Web

Metadata Catalog Server

Mountain GI Community

Bangladesh

Afghanistan

Bhutan

China

India

Myanmar

Nepal

Pakistan

GeoSpatial Metadata management system
GEOSS – ICIMOD Collaboration

- Regional Knowledge Hub
  - SERVIR Himalaya
  - Geonetcast
- Regional capacity building and networking
  - Resource center for training for GEOSS
  - Regional Symposium – Benefitting from EO for Mountain Society
- Call for Proposal (SBAs)
  - Snow and ice mapping and monitoring
  - Impact of aerosol on human health and agriculture
Thank you