Climate Change in the Himalayas

Geospatial Technology – Taking Pulse of the Himalayas

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One of the most vulnerable regions of the world due to climate change and a disaster hotspot

- Climate change – a defining issue of our time
- Detrimental impacts on Himalayan ecosystem
- Threatening traditional coping mechanism
Impacts of Climate Change in the Himalayas

- Glaciers melting
- Glacial Lakes Outburst Floods
- Precipitation change
- Extreme weather events
- Floods and flash floods
- Droughts
- ....

Technology Convergence – An enabling Environment
Providing a unifying framework
Geospatial Technology
Addressing mountain development challenges

- Cryosphere & Atmosphere
- Agriculture and Food Security
- Climate Change and Mountain Development
- Biodiversity Conservation
- Water Resources Management
- Disasters Risk Reduction

Data Acquisition

Deep Learning

- Data and Information Integration framework
- Spatial Analytics and Modeling
- Information systems and services
- Institutional strengthening and partnerships
Accelerated Melting of Glaciers

Water Security?

- Understanding dynamics of cryosphere
- Impact on water resources
- Climate modeling and water availability scenarios
Hydropower development relative to its potential in the region

- Climate risks analysis of hydropower
- Social and environmental impact analysis
- Off-grid renewable energy planning and access
Basins support some of the most populated areas on the globe

Population Density in the 10 River Basins of the HKH

- Basin wise agriculture and food security analysis
- Drought monitoring
- Agriculture advisory services to mountain communities

Legend:
- Cities
- River basin
- River
- High region
- 0 - 4,000
- 4,001 - 6,000
- 6,001 - 12,000
- 12,001 - 16,000
- 16,001 - 20,000
- 20,001 - 24,000
- 24,001 - 30,000
- 30,001 - 50,000
- 50,001 - 1,000,000

Agriculture and Food Security?
Erratic Monsoon patterns

Changes in rainfall intensity, water availability, disaster frequency

- Too much water
- Too little water

- Hydrological observation network
- Regional flood information system
- Basin-wise Flood outlook
Air Pollution and Black Carbon

Nov to April Skies

- Air pollution information network
- Impact of black carbon on glaciers and snowpack
- Mitigation of black carbon – brick kiln

Impact on human health and agriculture productivity
Increasing frequency and magnitude of natural disasters

- Disaster risk assessment of glacial lakes outburst floods
- Forest fire monitoring and sms alerts
- Emergency mapping and response
- Landslide hazard assessment

Fatality – about 150
Property damage – about US$15M
Trade disruption – US$400,000/day
Mountain Geoportal

Regional Platform

Open access to geospatial information and tools

- Regional databases and downloads
- Story maps
- Science applications
- One window to geospatial information resources
Adapting to Climate Change - Living with Consequences

Thank you for your attention!