

Discussion paper for the Mountain GIS e-Conference 14-25 January 2008

Promoting Geographic Information and Earth Observation Applications for the Sustainable Development of the Hindu Kush-Himalayan Region¹

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Following the Rio Earth Summit in 1992, mountain ecosystems have been gaining the attention of the world community for their critical importance to life on earth. **Mountain geography**, constituting diverse physical, social, and ecological aspects, plays a major role in influencing mountain development. Addressing sustainable mountain development calls for a particular mountain perspective due to limited accessibility, vastly varying socio-ecological conditions and very distinct spatial and temporal characteristics of mountain areas. Many mountain development issues such as poverty, land use change, natural resources degradation, water resources depletion, and hazards and risks have strong spatial components. Geographic information in particular represents a “common denominator” for integrating many of these issues, **and illustrating** better understanding of their interlinkages and interdependencies. A common **geographic framework** can provide a useful means to investigate key components of social, economic and environmental conditions through systematic generation of data indicating their present situation and changing status through space and time.

Mountain geography (bio-physical and socio-economic conditions) is changing rapidly due to both natural and human-induced impacts, affecting not only mountain communities and people living downstream but also the mountain environment. We lack proper understanding of these change processes and their impacts, which are often transboundary in nature, due to the lack of inadequate information and knowledge base, and necessary tools and methods for integrated analyses. The changing environments need to be mapped, monitored, modeled and analyzed at multiple-scales to support policy decisions, devise appropriate development interventions, and promote regional cooperation. An unprecedented growth of geo-information and earth observation technologies and emergence of geographic information science now provide a viable **institutional and technological framework** to support informed decision-making. In the context of mountain areas, such a framework is assuming greater significance to enhance our understanding of the complex mountain ecosystem by integrating many disciplines and adding value to the decision-making process. The major issues of discussions for the e-conference have been categorized under the three sub-themes, which are as follows:

[Sub-Theme 1] Capacity building and networking

We all are aware that successful application of geographic information (GI) and earth observation (EO) technologies and tools depends on trained manpower. Toward this end, there is a felt need for capacity building/human resources development in the HKH region, including strengthening

¹ This paper has been developed in consultation with Mr. Basanta Shrestha, Division Head of MENRIS and Birendra Bajracharya, GIS Specialist, ICIMOD

organizations/institutions working in the field of GI and EO for development. This, I believe, is a necessary condition for effective collaboration and cooperation among these institutions/networks. The academic sector, in particular universities, need to step up to meet the growing demand for GI-EO education in the region:

***** Discussion Points for [Sub-Theme 1] *****

Below are some discussion points for you to respond to, to initiate e-discussions on Sub-Theme 1 - "Capacity Building and Networking" from 14 - 17 January:

1. What are some of the key issues that need to be addressed regarding capacity building/human resources development in the field of GI and EO applications in the mountain context? Are these issues being addressed adequately by universities, research and development institutions, or private sector, in particular? Any recommendations?
2. What local, national, regional, or global geographic information networks or institutions do you know of that are doing good work in the field GI and OE in the Hindu-Kush Himalayan (HKH) region or beyond? Do you see any potential for replication/or up-scaling of their good practices in the HKH region?
3. Do you think there is a need for a 'geographic information network' for mountain research and development in the HKH region. If so, how do we operationalize such a network - a network that not only involves multi-stakeholders (civil society, private sector, and governments), but also fosters South - South and North - South cooperation?

[Note: Please send your replies to questions 1-3 above to gis@mtnforum.org no later than 17 January.]

[Sub Theme 2] Mountain database, tools and methods

Given the fragile nature of mountain ecosystems, they are susceptible to quick changes. Therefore, there is a constant need to update the mountain database frequently and review the dynamic linkages. Increasingly, proper analysis of mountain problems calls for requirements of multi-scale spatial databases combined with integrated and innovative software tools and methods that are suited to the mountain context. Mountain-specific spatial data infrastructure, spatial visualization and interactive mapping, common metadata protocol for data sharing have been some of the felt needs.

***** Discussion Points for [Sub-Theme 2] *****

Below are some discussion points for you to respond to, to initiate e-discussions on Sub-Theme 2 - "Mountain Databases, Tools and Methods" from 18 - 21 January:

1. As a GI and EO professional or practitioner, what issues and constraints, if any, have you faced in creating/sharing spatial data in the region or in developing mountain databases? What steps are you taking to address these?
2. How can we ensure greater coordination among the bilateral and multilateral organizations in support of gaining access to data, analysis, tools and methods for the needs of diverse applications such as climate change, land-use, environment assessment and monitoring, etc?
3. What roles can civil society, private sector, and governments, including donors, play to realize the Hindu-Kush Himalayan Spatial Data Infrastructure (SDI) to support access to geographic information in the region?

[Note: Please send your replies to questions 1-3 above to gis@mtnforum.org no later than 21 January 2008.]

[Sub Theme 3] Applications and decision support systems

Experiences from the region show that exchanging, sharing and integrating geographic information from various sources have become increasingly important for research and development in mountain areas. It is against this backdrop that the GI applications are assuming greater significance in mountain areas. GI applications and decision support systems for the mountain environment not only involve special considerations but also very much depend on our knowledge and understanding of the particular characteristics of mountain ecosystems and how they work. There is potential for wide varieties of uses for applications and decision support systems to address critical and emerging mountain issues.

***** Discussion Points for [Sub-Theme 3] *****

Below are some discussion points for you to respond to, to initiate e-discussions on Sub-Theme 3 - "Applications and Decision Support Systems" from 22 - 25 January:

1. What are the key challenges associated with developing/adapting applications and decision support systems for the mountain context?
2. Could you give an example or two from your own country or region of innovative use of GI or OE applications and decision support systems used in mountain context?
3. How do we mainstream "geo-information science and technology" in development and policy making?

[Note: Please send your replies to questions 1-3 above to gis@mtnforum.org no later than 25 January 2008.]
