

GIS Oriented Thematic Portals – a Means for Partnership in Sustainable Development in the Hindu Kush-Himalayas

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Keywords: Geoinformatics, Mountain GIS, Internet GIS, thematic portal

Abstract

Geo-Information Systems have emerged as indispensable tools for dealing with issues on natural resources and environmental management which provide powerful tools for integrating and analyzing complex sets of spatial information. The International Centre for Integrated Mountain Development ICIMOD, through its Mountain Environment and Natural Resources Information Systems (MENRIS), has been working for the dissemination and application of GI technology in the Hindu Kush – Himalaya (HKH) region. MENRIS was established in 1990 with the basic concept of making a coordinated effort to take advantage from the potentials of GI technology. Its main objectives are to build capacities of national institutions, to assist in development and sharing of geographic information, and to act as a clearinghouse for the existing knowledge in mountain resources' management. The developments in GI systems and Internet technology have provided new opportunities in publishing, sharing and discovering geographic information and greatly facilitated the clearinghouse functions. As a result, MENRIS initiated the development of a Mountain GIS Portal focusing on the needs of the region. The portal provides a common platform for users and providers to share maps, metadata, data and applications through the Internet Mapping tools on all themes thus providing a horizontal integration.

Recently, MENRIS along with its partners also felt the need for addressing varieties of thematic issues of mountain development that are regional in nature and dealing with geographic information in many ways, for example bio-diversity management, water resources management and climate change. Initiatives are now undergoing to develop thematic portals dealing in depth with these specific issues and integrate them vertically under a common framework. These thematic portals will serve as knowledge centres or information infrastructures on the specific themes, as well as a forum to build partnerships and on-line communities among different institutions in the region. The framework will continue with the data centric approach to share, publish and discovery approach taken by the mountain GIS portal, but will additionally incorporate specific tools like modelling tools, spatial decision support applications, dynamic GIS capabilities, as well as documentation of best practices and applied case studies on the particular themes. Such a platform will help to develop networks and partnerships among stakeholders and promote regional cooperation in dealing with many issues which are transboundary in nature.

Introduction

Geo-Information Systems have emerged as indispensable tools for dealing with issues on natural resources and environmental management. They are powerful tools for integrating and analyzing complex sets of spatial information and presenting the results in an effective and efficient way. The International Centre for Integrated Mountain Development ICIMOD, through its Mountain Environment and Natural Resources Information Systems (MENRIS), has been working for the dissemination and application of GI technology in the Hindu Kush – Himalaya (HKH) region. The region extends from Afghanistan in the west to Myanmar in the east, with Pakistan, China, India, Nepal, Bhutan and Bangladesh in between. MENRIS was established in 1990 with the basic concept of making a coordinated effort to take advantage from the potentials of GI technology by the institutions in the region with the broad objectives - to improve environmental and natural resources management and promote sustainable economic growth by facilitating solutions to common problems and ensuring the communication of results on a compatible GIS platform; to assist in the promotion of information exchange; and to act as a clearinghouse for the existing knowledge in mountain resources management. The developments in GI systems and Internet technology in the late 1990s have provided options for the clearinghouse function which were not available before. The Internet has revolutionized the concept of networking and information sharing and provided a means for efficient and effective ways in obtaining, using and sharing information both spatial and non-spatial. Taking advantage of these new developments, MENRIS initiated to develop the Mountain GIS Portal.

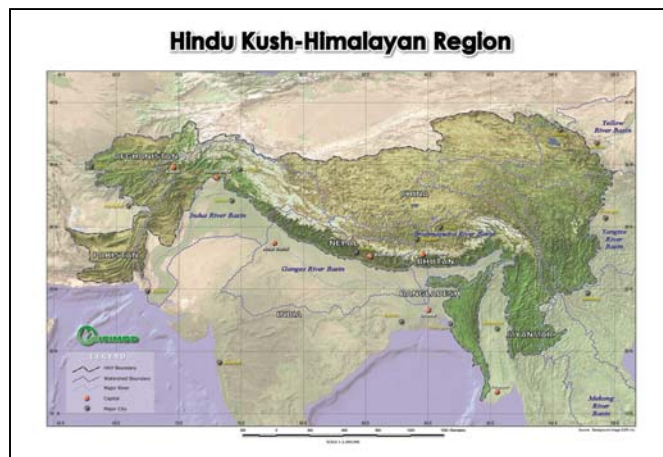


Figure 1. The HKH Region.

Mountain GIS Portal –sharing GI resources

MENRIS has been continuously working for capacity building and networking of the national institutions in the region to promote the development of relevant information on mountain environment, its sharing and effective use. The Mountain GIS Portal has been developed to serve the GIS resources and is envisaged as an important step in facilitating the sharing, integration and use of geographic information across a broad user-base, giving particular consideration to standardized datasets, using the potential of modern information and communication technologies, particularly the Internet. It is aimed at serving a common platform to access and share information and knowledge about the GIS technology and its applications in mountain development. The portal is developed using network-based architecture which is both multi-participant and collaborative, and allows sharing GI resources through distributed sources at the same time. It is designed as a network of country pages of regional member countries serving

national GIS resources in a common and consistent format. The country pages provide a means for national institutions to host their data, metadata and other resources specific to the countries. Such a system encourages sharing of geographic information among the potential users and brings together all the stakeholders in a common platform to share their experiences and knowledge as well as discuss about various issues related to application of geographic information in the mountain environments, thus creating a mountain geography network.

Initiative on Thematic Portals

The Mountain GIS Portal is aimed at serving the vast GIS resources that MENRIS had developed together with network of national partners in the region. The GIS resources include training and educational resources, database and meta-data resources, map resources, and application resources. With the growing use of GIS in wider areas of applications and continuous growth in the training materials that are to be served on the portal, there has been a need for systemic management of information as well as expanding the system with more detailed information in various thematic areas. Hence, initiatives are now undergoing to develop thematic portals dealing with specific issues in depth and integrate them vertically under a common framework. Separate thematic portals will be developed to address key issues of mountain development such as environment, bio-diversity conservation, poverty, water resources and floods based on the infrastructure of Mountain GIS Portal.

Conceptual Framework of Thematic Portals

The Mountain GIS Portal is the primary infrastructure as per basic GIS data is concerned. Upon this the thematic portals will be built. The Mountain GIS portal will continue offering a broad range of content on issues like metadata, data and their availability. Thematic portals are built upon the underlying core layer and represent a portal instance of applications, defined by a major topic or domain. These thematic portals will serve as knowledge centres or information infrastructure on the specific themes, as well as a forum to build partnerships and on-line communities among different institutions in the region. The thematic portals will be more application oriented and will incorporate specific tools like modelling tools, spatial decision support applications, dynamic GIS capabilities through extensive use of on-line data and maps, as well as document best practices and applied case studies on that particular theme. Such a platform will help to develop regional cooperation in dealing with many issues which are transboundary in nature.

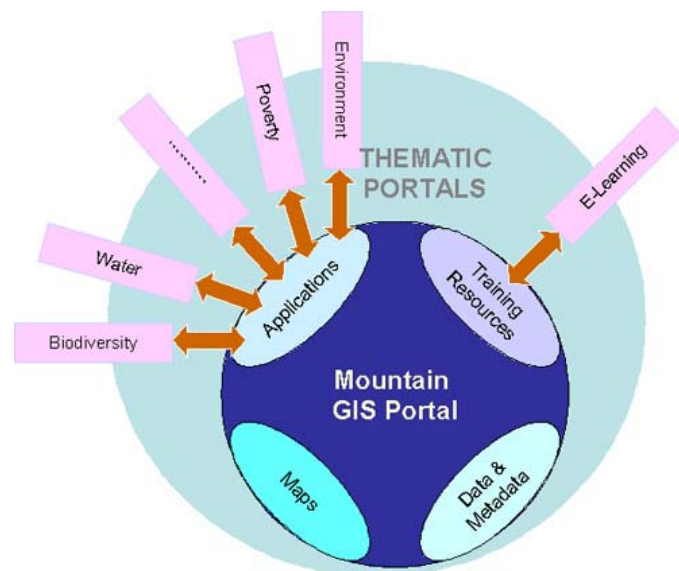


Figure 2. Conceptual Framework of Thematic Portals

makes the system lightweight and easily transferable to partner institutions. Initiatives on mapping indicators of development are undergoing for Bangladesh and Himachal Pradesh of India which will be incorporated into the portal.

Water Portal – Management of water resources is another critical transboundary issue on which ICIMOD has already initiated a number programs. Web sites such as South Asian Floods (www.southasianfloods.org), HKH-FRIEND (www.hkh-firend.net) and Regional Site on Water Quality (sawan.icimod.org.np) have already been implemented for sharing data and information on hydrology and meteorology. A number of studies on glaciers, glacial lakes and glacial lake outburst floods (GLOF) have been undertaken in different parts of the region. A thematic portal on Water will integrate these different developments and provide a platform for partnership among various water related organizations from the countries in the region.

E-Learning GIS Portal - Capacity building has been one of the major focuses of MENRIS program and training on Geo-Informatics is one of its strengths. It has already trained more than 1500 professional from about 120 institutions. A number of training materials have been developed for training courses on different themes. At present, the Mountain GIS Portal serves the on-line training CD developed by MENRIS and materials like “GIS for Beginners”. A thematic portal on GIS training, “E-Learning GIS” is being conceptualized to present the different training materials in a self paced learning environment. It will include on-line interactive examples of different analysis tools in GIS. There are already a number of on-line GIS courses, but this portal will focus on applications to mountain areas with particular focus to the HKH, and a number of universities in the region will be the partners in developing this portal.

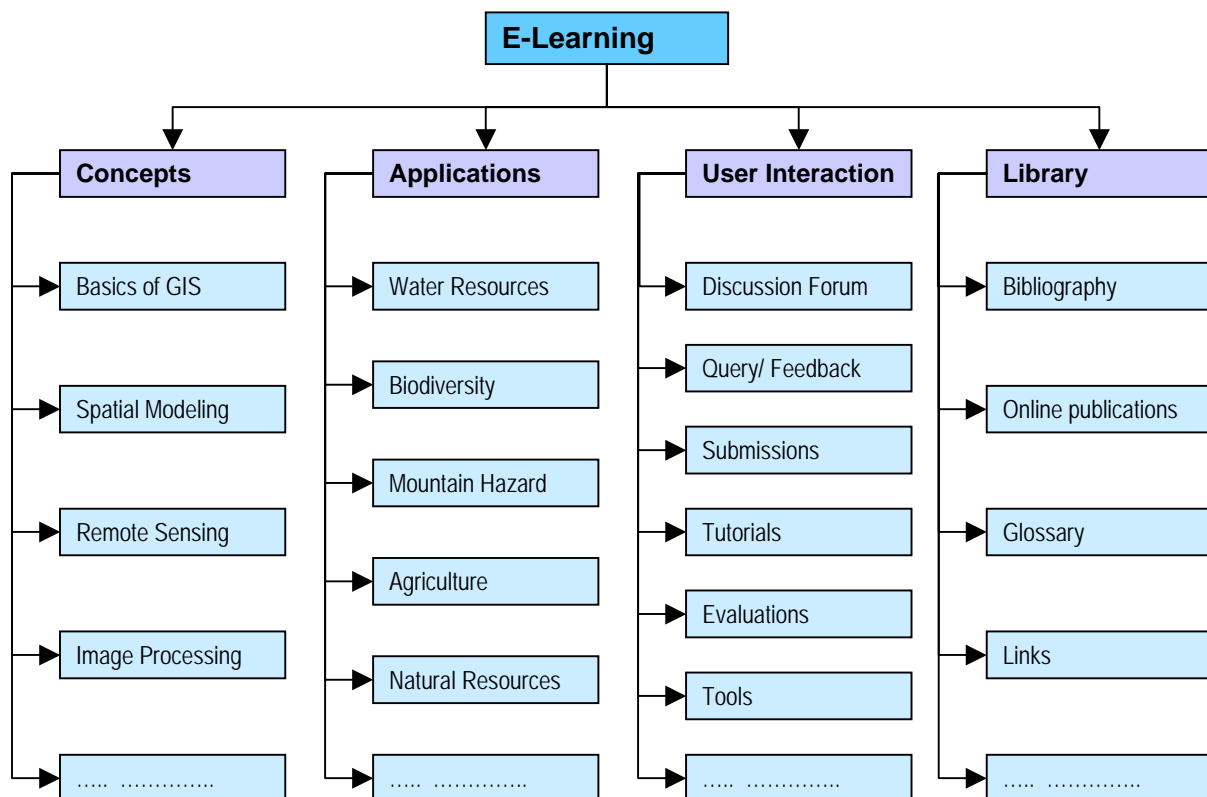


Figure 5. Conceptual framework of E-Learning GIS

Partnerships for Sustainable Development

The underlying philosophy of Mountain GIS Portal is partnership among the users and providers of geographic information. The extension of the portal into a number of thematic portals will increase more avenues for partnership. Institutions on specific themes (such as biodiversity, forestry, water) from ICIMOD member countries are already participating in a number of initiatives such as Transboundary Biodiversity Project, HKH-FRIEND network and South Asian Floods. The development of portals on these different themes will provide a mechanism for continuous participation and interaction between the related institutions. These portals will also allow to deal with issues related to particular themes in more detail, thus providing vertical integration of information and knowledge on those issues at different levels and scales. The sharing of information and knowledge among the stakeholders in the region will definitely contribute towards sustainable development efforts where information gap is seen as one of the major hurdles in all development interventions.

Conclusion

Poverty alleviation and sustainable development of the mountain people in the HKH have been the main agenda of ICIMOD. The various activities of its MENRIS program have been focussed towards dissemination of Geo-Information technology for applications to sustainable development issues. Major issues on operationalising GIS in the region are the lack of basic data layers and restrictive policies on sharing existing spatial information. The Mountain GIS Portal has been one of ICIMOD's initiatives towards facilitating data and information sharing among the stakeholders and building a GIS community in the HKH region. The participation by regional institutions in the portal and the increasing trend in number of users is an encouraging sign for the success of this initiative. Extending the portal to GIS oriented thematic portals dealing with specific issues in depth will further enhance partnerships among the institutions with more focussed contributions in their area of interest.

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