

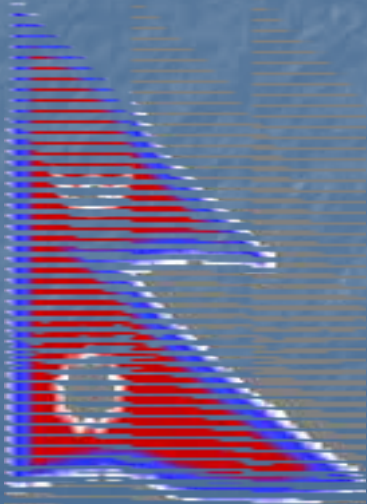


Present Status of NEPAL on Space Tools for Sustainable Development

(Symposium on Space Tools and Solutions for Monitoring
the Atmosphere and Land Cover

Graz, Austria

9-12 Sept 2008)



By : Rajendra Kr Manandhar
Ministry of Environment,
Science & Technology
NEPAL

e-mail : manandharrk@yahoo.com

Introduction to Nepal

(Federal Democratic Republic of Nepal)

- Kingdom Since [December 21, 1768](#)
- Republic Since [May 28, 2008](#)



■ Geographical Setting

■ Latitude: 26° 22' N to 30° 27' N, Longitude: 80° 4' E to 88° 12' E

■ **Border:** China in the North and India in the South, East and West.

■ **Size:** Area = 141,181m², Average length = 885 km (East to West)

■ Width = Non-uniform, mean width of 193km. North to South.

■ Socio-economic indicators:

■ It has a population of 29.5 millions. Per capita GDP is \$345.0

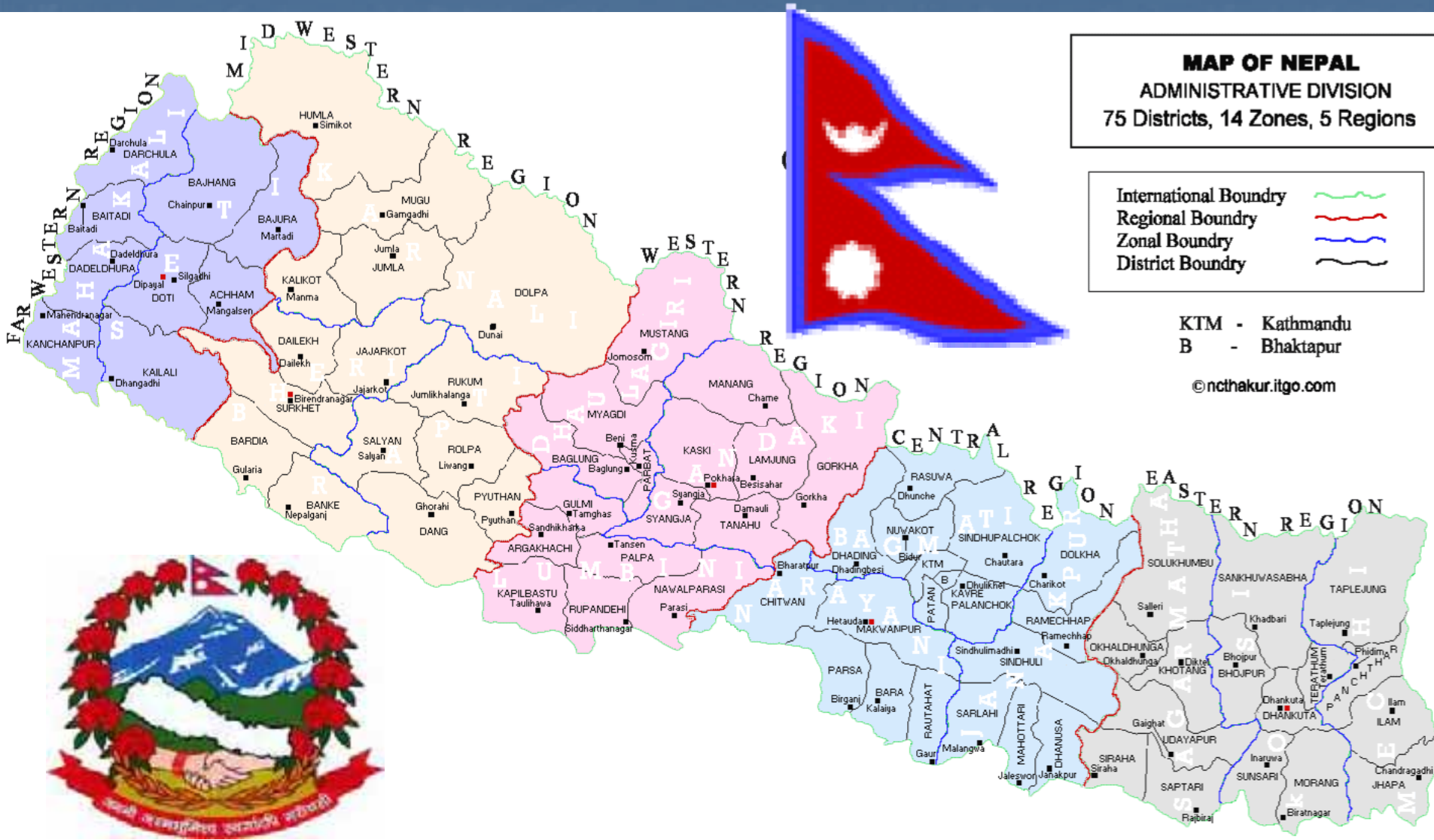
■ The country is basically agrarian and has some agro-based industries. It has flourishing tourist, and garment industries.

■ Major resources are: water, minerals and forests. With 2.27% of the world water resources, Nepal is the second richest country in hydropower resources.

■ **Ecological Division:** Ecologically the country is divided into three regions, running east to West. Mountain, the Hill and the Terai (Plains).

■ Administrative Divisions:

■ The country is divided into 5 Development Regions, 14 Zones, 75 Districts and 3,914 Village Development Committees (VDC) and 58 municipalities.



MAP OF NEPAL
ADMINISTRATIVE DIVISION
 75 Districts, 14 Zones, 5 Regions

International Boundry	
Regional Boundry	
Zonal Boundry	
District Boundry	

KTM - Kathmandu
 B - Bhaktapur

©ncthakur.itgo.com



National Activities On Space Technology

- National Remote Sensing Center was established in 1981
- In 1989 the Center was merged with the division of Forest Research Department and presently became a Remote Sensing Section -- National Focal Point for RESAP

(Regional Space application Programme for Asia Pacific)

- In 1993 Remote Sensing Section within the Department of Mines and Geology was established for updating Geo- Scientific information
- Five Members task force has been formed under the aegis of the then MoST to identify the outstanding issues on Space technology in 2000

Recommendations made by task force

- A National Space Technology Center (NASTECC)Should be Established
- A High level National Committee on Space Science Should be Constituted.
- A technical Committee with Different Organization Should be Formulated
- Measures should be taken to avoid unnecessary duplications of works
- HRD on the field of Space technology should be given due priority
- All relevant space data and information should be instituted with necessary archival facilities
- An appropriate Data dissemination Policy for national, regional and international level should be formulated by NASTECC
- All necessary measures should also be taken towards the utilization of the space slots, internationally allocated to the nation, for its full benefits
- self-reliant suitable Ground Receiving Stations for catering the needs of the various sectors should be established.
- NASTECC would necessarily consist of staff members from multi-disciplinary areas

Action Taken on Recommendation

- In 2003 to establish the NASTEC, a proposal was presented in MoEST but due to the policy of the government's down sizing of the Governmental organization and internal conflict it could not be approved.
- Presently the country's political situation is totally changed so to established NASTEC , the importance of space technology should be advocated.

Application of Space Technology In Nepal

- Satellite Communication
 - Telecommunications
 - Television broadcasting
- Remote Sensing , Geographical Information System & Global Positioning
 - Environmental Surveying
 - Resource Management
 - Disaster Monitoring
- Weather forecasting & Hydrological studies
- Earth Resource Observation

Important Data Producers & User in Nepal

- Department Of Hydrology & meteorology (MoEST)
- Department Of Forest Research & Survey (MoFLC)
- Department Of Survey (MoLR)
- Department Of Mines & Geology (MoSIC)
- Department Of Roads, - Housing & Urban Planning (MoPP)
- Department Of Water Induced Disaster Prevention (MoWR)
- Department Of Irrigation (MoWR)
- Central Bureau Of Statistics (NPC)
- Different NGO, INGO, University, & Research Organization

Status of Space Science and technology Education

- As such there is no such Academic courses offered by any university
- The Department of Geography at Tribhuvan University Conducts short courses in GIS
- ICIMOD promoting the GIS
- Recently Some institutions introduce Basic level course on Geometric Engineering

Some Major Project Completed (With the aid of RS, GIS, GPS & VSAT

(1992-2006)

- Forest resources and deforestation in Lowland forest of Nepal
- Preparation of Woody Vegetation maps of eastern and central development regions
- Updating Topographical Database (maps) of different area
 - Images - IKONOS, IRS 1C/1D, IRS P6, ALOS
 - Software- Erdas Imagine, ArcGIS, ArcView, Arcinfo
- Links for GSM/CDMA services to the remote location of the country using Ku-band links to Satellite Earth station

Different Space tool used in NEPAL

1. Communication satellites:-

- Responsibility - Nepal Telecommunication Company (NTC)
- Operating Agency for the International Satellite Organization (Intelsat) System
- In 1996 NTC introduce VSAT service
- In 1982 Sagermatha Satellite Earth Station was established- Equipped with Intelsat IDA/IBS equipments & Providing services via its Intelsat Standard
- Nepal Television has started its Broadcasting Via satellite from 4 July 2001
- At present NTV signal is up linked from Sagamatha Earth Station of NTC , with Chinese Government's grant 5Kw transmitter transmitting NTV2 (Metro channel)



2. Global Positioning System (GPS)

satellites:-

- Different organizations have used different types of GPS receiver in locating the ground coordinates.
- Leica 300 high precision GPS receiver is being used in the Department of Survey to find out the geodetic control points
- SR 200 GPS receivers for cadastral surveys , geodetic surveys and topographic mapping.
- Handy GPS receiver for locating the geographical position during their field data collections.

3. Meteorological satellites:-

- In 1975 An Asia-Pacific Telecommunity (APT) receiving station for meteorological satellites had been installed at the Tribhuvan International Airport
- Upgraded in 1990 to receive hourly images from GMS satellites. But now it's not functioning
- Set up an INSAT Ground receiving station for receiving Meteorological data and imageries.
- Since 1998 Satellite Distribution System (SADIS) with links to World Area Forecast Center (WAFC) has been functioning.
- Used satellite images through internet from Dundee University Website for weather forecasting for
 - Civil Aviation
 - Mountain Expeditions
 - General Public

4. Earth Resource Observation Satellites:-

- Department of Mines and Geology
 - Mandate to map the nation's geology and identify potential mineral resources
 - processing and interpretation of Landsat TM and IRS data
- Ministry of Agriculture
 - Requires information on the movement or spread of the particular crop disease or insect infestation or the likely yield of an important crop
- Department of Forest Research and Survey
 - Obtains satellite data from the Indian Remote Sensing Center at Hyderabad and Landsat TM data to prepare national forest inventory as well as to provide necessary information for forest management
- Other agencies of the Government and non government
 - Using satellite data for various purposes by acquiring the space data using different methods

Challenges

- lack of a national level organization on space science consisting of a multi-disciplinary team and with the responsibility of coordinating, networking and operating in this field & use of space data to support decision-making at various levels
- lack of a platform for overall development of space science in the country.
- lack of coordination and integration
- lack of awareness on the benefits of the technology among many potential users
- High precision Data (image) are expensive, Low precision – not very effective
- lack of data sharing policies
- lack of quality standards
- Reluctance to release and / or share information across multiple users and discipline
- Lack of trained man power & continued loss of expertise in the technology due to a lack of opportunity in Nepal
- lack of readily available user-oriented products & Expensive Software
- Difficulties amongst the users in obtaining funding for the acquisition of data

Conclusion

- The time has come to realise, at the higher executives and decision making levels of Nepalese Government , the need for a sound policy on space science and its application for Sustainable Development . It is necessary that efforts be made to formulate a strategy for the development and application of space science at national level in order to benefit maximally from the currently available opportunities.
- Assistance from the International donor agencies also sought for Sustainable Development of the developing countries to fight against the challenge presented.

Thank You

