INTRODUCTION REMOTE SENSING AND GIS INTO DISASTER PROTECTION ACTIVITIES

Colonel D.Ariundalai

Head of Communication, Information and Technology Division of NEMA

1. Whether GIS is used for disaster risk management (DRM) in the Country?

In Mongolia, there are occurred major and small disasters regularly as a result of Drought, Dzud, Severe Snow and Dust Storm, Flood, Forest and Steppe Fires, Earthquake, Desertification, Object Fires, Epidemic, Epizootic, Hazardous Vegetative Disease or spreading of Detrimental Rodents, Bird Flu, Traffic accidents as well as Explosives, and increased the number and frequency of disasters. These disasters cause huge number of damages to human life, their properties and environment and influence to the state social and economic sustainable development negatively.

Progressing of remote sensing (RS) and geographic information system (GIS) data's are most efficient in Mongolia in monitoring the coverage and state of national forests and spread and condition of forest and steppe fires. These technologies are also useful in timely and quick assessment of the risks of natural disasters and in determining timely preventive measures.

"State Policy on Disaster Protection", ratified by the Parliament of Mongolia in 2011, stipulates that technologies to probe and assess hazards and possible disasters would be introduced, ways and channels to promptly deliver information to the end users would be devised, and the early warning systems would be improved.

2. What are the status, experiences and lessons-learnt in this front?

By using information from satellites, it is possible to analyze the state of ongoing disasters, evaluate the pre-disaster and post-disaster situations, and constantly monitor and depict pictorially possible and ongoing hazards and disasters. Therefore, with the help of remote sensing, geographic information system and GPS (3S) technologies, it is possible to collect and register accurate information on the damages and losses from forest and steppe fires, floods, earthquakes and other natural disasters. Moreover, it is possible to disseminate information, forecast possible disasters and hazards, and analyze the causes and real-time situation of disasters.

3. How your country can get access to satellite data/products in the event of major disasters?

Remote sensing is a technology that detects and monitors the movement of natural hazards and their parameters and disaster situations by measuring the electromagnetic waves reflected or emitted from the related natural object. Space information derived through remote sensing methods is divided into two types: active-radar and inactive-optic.

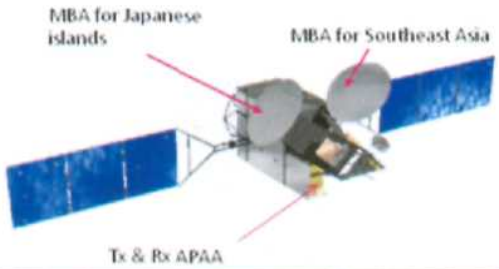
Remote sensing is now widely used in all sectors of Mongolia. NEMA cooperates with many foreign and domestic organizations, which are engaged in geo information.

Currently, NEMA receives information from NOAA AVHRR and TERRA MODIS satellites whose precision is 250-1000 meters to monitor forest and steppe fires, droughts, dzuds and strong snow and dust storms, and evaluate disaster situations.

4. What are the key policy and institutional issues that require the interventions for enhancing the capacity of the government to get benefited from geo-referenced disaster risk management (Geo-DRM) information?

Within the framework of the "Sentinel Asia" project, a memorandum of understanding has been signed with the Atmosphere and Space Research Agency of Japan, and NEMA has installed a land antenna of a communication satellite, which would be used to retrieve information from ALOS satellites during possible disastrous situations in Mongolia.

Outline of WINDS satellite



Outline of WINDS System

- Ka-band Satellite with High Speed Transmission Capability Gbps order
- Bent pipe and Onboard ATM Switching
- Multi-Beam Antenna (MBA) and Active Phased Array Antenna (APAA) with high speed scanning capability

Launch Schedule	February 23rd, 2008 by H2A Launcher
Mission Life	5 years
Location	143 degree E
Dimension	3 x 2 x 8m Span of Solar Paddles: 21.5m
MASS	4,850 kg (lift off)
Electric Power	5,200W / EOL, Summer Solstice
Attitude Control	Zero-momentum 3-Axis Control
Frequency	U/L : 27.5 – 28.6 GHz D/L : 17.7 – 18.8 GHz
Satellite G/T	> 18 dB/K (MBA) > 7 dB/K (APAA)
Satellite EIRP	> 68 dBW (MBA) > 55 dBW (APAA)
Onboard Processing	ATM Baseband SW

5. Does your country has Geo-DRM information sharing portal? If so, please provide its current status, and benefits received.

THE APPLICATION OF RS AND GIS DATABASE FOR DISASTER

Remote Sensing Application:

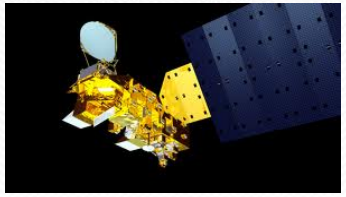
✓*MODIS – (Moderate Resolution Imaging Spectro-radiometer)*
✓*NOAA – (National Oceanic and Atmospheric Administration)*
✓*LANDSAT TM and ETM – (Land + Satellite)*
✓*ASTER DEM - Advanced Spaceborne Thermal Emission and Reflection Radiometer , Digital elevation model*
✓*SRTM DEM - Shuttle Radar Topography Mission , Digital elevation model*
✓WORLD VIEW 2 - 2010
✓ALOS - *Advanced Land Observing Satellite*
✓PALSAR DATA

Geographic Information System:

✓Cadastral database of Ulaanbaatar city, scale is 1:5000,
✓ All Mongolia shape files /Boundary, River, Lake, Main road, road, bag, ., etc../
✓Maps by digital, scale is 1:100000, 1:500000, 1:1000000

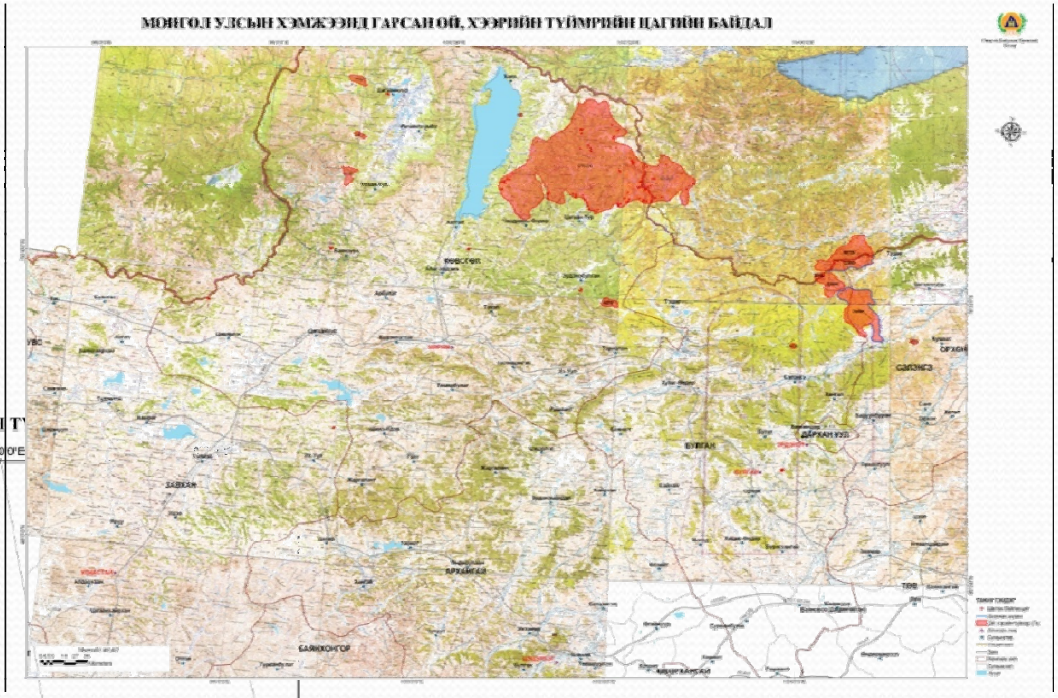
Software utilization:

✓ArcGIS 9.3.1 With license /supported from America/
✓Erdas, ENVI, MapInfo, ErMapper etc,..



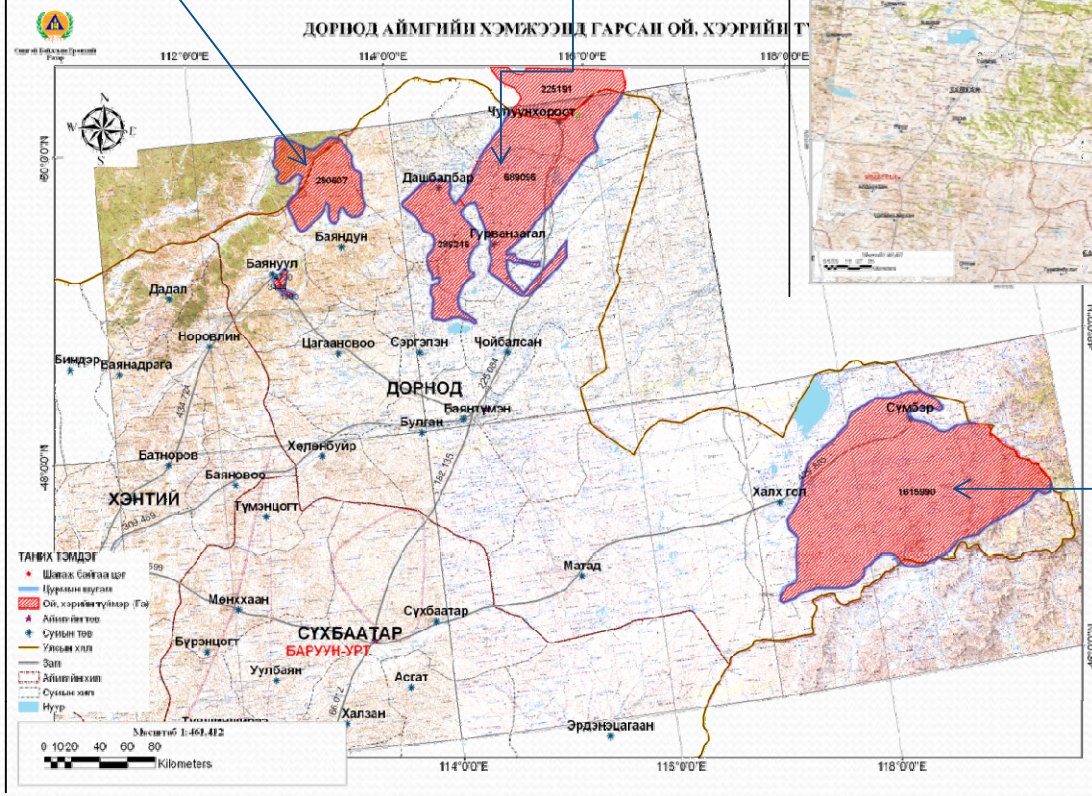
6. What are challenges in sustaining geo-DRM information sharing portal/system? The primary challenge is that we don't provided with the access to getting new geo DRM information.

FOREST FIRE 2012



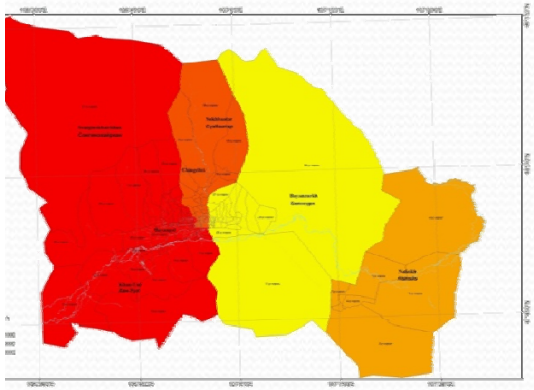
290 807 hec

689 096 hec

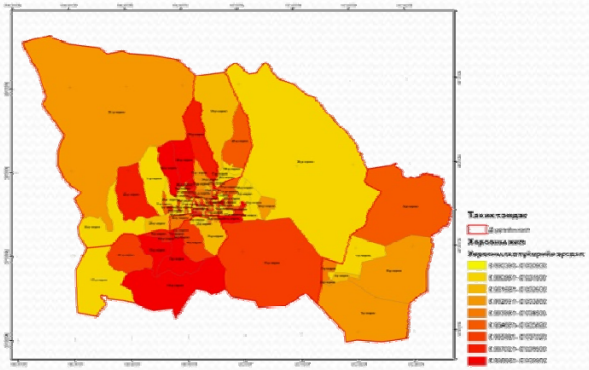


1 615 990 hec

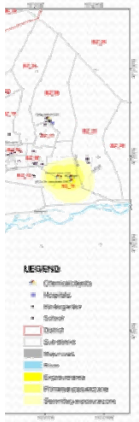
EMICAL HAZARDS RATE BY DESTRICT



FIRE RISK BY SUB DESTRICT



CHEMICAL PROBALE RISK ASSESSMENT BY DESTRICT



CHEMICAL PROBALE RISK BY DESTRICT