GEOSPATIAL WORLD FORUM

15-19 January, 2018, Hyderabad, India

ONE GLOBAL PLATFORM — FOUR KEY EVENTS!

GEOBUIZ SUMMIT
15-16 January, 2018

AI & IOT SUMMIT
18-19 January, 2018

GEO4SDGs
Addressing Agenda 2030
18-19 January, 2018

LOCATION WORLD
18-19 January, 2018

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Geoinformatics Applications in Land Resources Management

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Geospatial Technologies

- Geospatial Technologies, which includes the technologies and principles of digital cartography, remote sensing, photogrammetry, surveying, Global Positioning Systems (GPS), Geographic Information System (GIS), and automated data capture systems.
Geospatial Technologies

- Geospatial Technologies provide the tools and techniques, which allows the processing and analysis of spatial data into information tied explicitly to make decisions, about portions of the earth and environmental problems.

- Geospatial Technologies, which include all stages of data collection, data processing, database management, data analysis and modeling and data presentation, to end use in the creation of value added maps and spatial information products.
Geospatial Technologies in Sustainable Land Management

1. Development of digital terrain database and landform mapping
2. Land resource inventory and mapping
3. Assessment of soil loss and erosion risk zone mapping
4. Harmonization of degraded and wastelands datasets of India
5. Soil fertility mapping and assessment
6. Land use systems analysis and monitoring in different AER’s
7. Spatial modeling for crop suitability and land use planning
8. Design and development of Geoportal
9. Capacity building
Why we need Geoportal?

Geoportal provides a mechanism to

- organize and catalogue legacy datasets and enrich with new datasets
- maintain uniform standards in development of geospatial databases
- organize, catalogue, view, edit, discover and display of geospatial datasets
- reduce redundancies and duplication of efforts in geospatial data generation
- enforce consistency, standards, data sharable protocols
- provide mechanism to build a cross-domain knowledge based applications
- provide a mechanism to assess the potentials and limitations of land resources
- data integration to generate land use plans at various levels
- suggest alternative land use plans and scenarios through modeling
- aid in dynamic decision making process of LUP through SDSS
- develop prescriptive land use modules for technology transfer
- generate outputs in the form of thematic maps, tables and reports
Identify new datasets
Identify legacy datasets
Identify public domain datasets
Identify data formats
Identify data models
Re-engineer the datasets
Standardize the datasets
Develop the protocols

Land Resource Information System (LRIS)
Design and develop of NBSS BHoomi Geoportal

Develop protocols to store and process geospatial database
Develop the modules for analyses, query and visualize the data

Develop data interoperable mechanisms
Develop applications and services in Geoportal

Develop data security mechanisms
Provide applications and services through Geoportal
Boomi GeoPortal Architecture

Data Sources for Geoportal

- Android devices
- Digitization
- Scanned images
- Excel files
- Satellite images
- Publications

Validation and Approval

Central Database Server

- Spatial database
- Attribute database
- Meta database

Application Server

Data and Information Dissemination Protocols

Formats, Schemas, Protocols, Standards and Workflows Development

Users
STATE WISE SOIL SERIES DATABASE
SOIL LOSS DATABASE
SOIL LOSS DATABASE

BHOOMI GEOPORTAL
A Gateway to Soil Geospatial Database
SOIL NUTRIENT DATABASE

BHOOMI GEOPORTAL
A Gateway to Soil Geospatial Database

Layers
- Base Layer
  - India
  - States
  - Districts
- Point Database
  - Benchmark Soil Database
  - Climatic Database
  - Soil Series Database-States
  - Soil Series Database-District
  - Soil Loss Database
  - NATP Observations
  - Nutrient Database
    - Nutrient Database
    - Kelapur Nutrient Database
    - Nagpur Nutrient Database
    - Soil Fertility Status in Rubber
    - Soil Fertility Status- Andhra
- Thematic Layer
- Land Use Planning

Map of India showing soil nutrient data.
SOIL FERTILITY DATABASE OF KERALA
BHOOMI GEOPORTAL
A Gateway to Soil Geospatial Database

- Home
- Thematic Raster
- Block Level Soil Database
- About NBSS
- About Bhoomi
- Bhoomi Services
- Metadata
- Spatial Data Query
- Publications
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Layers
- Base Layer
  - India
  - States
  - Districts
- Point Database
- Thematic Layer
- Land Use Planning
- Thematic Raster
  - Degraded and Wastelands
  - India SRTM DEM (90m)
    - High: 8570
    - Low: 17
  - India SRTM Hillshade

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics

SRTM DEM
CLOSER PERSPECTIVE OF SRTM DEM
AwiFs (56 m) Database
LANDSAT ETM DATABASE
Soil Loss database of India through Boomi Geoportal
BHOMI GEOPORTAL
A Gateway to Soil Geospatial Database

Search Legend Statistics

Thematic Layer: 1:250 K Soils
State: Chattisgarh
District: Raigam

1:250 K Soils (1 of 2)

srn_id: CG660
surf orm: H
sdepth: 2
mineral: k
calc: 0
sp: 5
sdain: 6
gwate r: 4
stex: 1
saxis: 4
sslope: e
salinity: 50
sodicity: 
stemp: H
stone: 2
flood: 0
pam: D
prsize: K
taxa: EoUT

Zoom to
Soil Loss Database

- Grid_No: KR287
- Latitude: 9.46
- Longitude: 76.51
- K_Fact: 0.18
- P_Fact: 1
- Is_fact: 4.84
- r_fact: 1300
- c_fact: 0.0005
- a_fact: 0.57
BHOMI GEOPORTAL
A Gateway to Soil Geospatial Database

Search
Legend
Statistics

Thematic Layer: Soil Series
State: Assam
District: Dhubri

Site Characteristics

- Unique Id: 0000000000000941
- Profile Id: INASDBBXXX 00018
- Village: 
- Tehsil: 
- District: Dhubri
- Classification: Coarse loamy, mixed, hyperthermic family of Typic Fluvaquents.
- Physiography: Undulating lowlands
- Elevation: 20-40 m above MSL
- GWD: 5-10 m
- Rainfall: 2025 mm
- Slope: Very gentle(sloping 0-1%)
- Erosion: Slight
- Drainage: Poor in rainy season
- Permeability: 
- Geology: Alluvium
- Associated: 
- Zoom to

Map showing soil series in Assam with detailed site characteristics.
Soil Series: Ghaggar Series
Village: Taran-Taran
District: Amritsar
State: Punjab
Rainfall: 475 mm
Slope: Nil
Drainage: Permeability: Alluvium
Geology: Erosion:
Associated: Landform:
Vegetation: Wheat, maize, mustard and vegetables. Tree species mostly found are babool and shisham.

Zoom to
• BHoomi Geoportal provides a platform to collate, organize and standardize the geospatial databases on land resources across the scales.

• It provides a robust platform for effective storage, process, analyze, query and visualize the geospatial data and information through interactive data analysis tools.

• BHoomi Geoportal enables to develop applications and services in effective utilization of land and allied resources databases in development of site-specific geosmart agriculture land use plans in the country.
Conclusions

➢ Use of modern geospatial technologies such as high resolution satellite data, GPS and GIS should be mandatory in land resources inventory, mapping, monitoring and management at watershed level.

➢ Geospatial technologies must be effectively used in generation of digital terrain database, inventory and mapping of soils, land use systems at parcel level, soil suitability evaluation, prioritization of watershed, assessment of carrying capacity and monitoring the impacts at watershed level.

➢ Synergy must be achieved in integration of precise database in through Geoportals on land resources, socio-economic and contemporary technologies to provide a sophisticated mechanism to generate alternative action plans at different scales for sustainable land resource management and land use planning.

➢ The stake holders should be the centre of action plans to integrate their priorities and aspirations with a convergence approach in decision making to improve the productivity levels to meet ever increasing food, fodder and fuel demand to ensure food security.
THANK YOU