

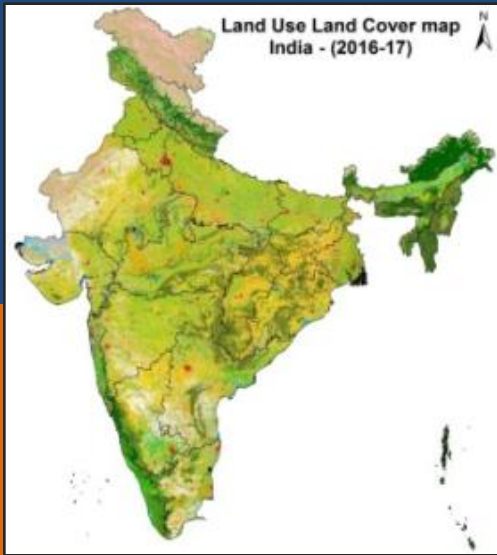


Geospatial Applications *for* Sustainable Development Goals

Dr. V. V. Rao
Deputy Director, Remote Sensing Applications Area

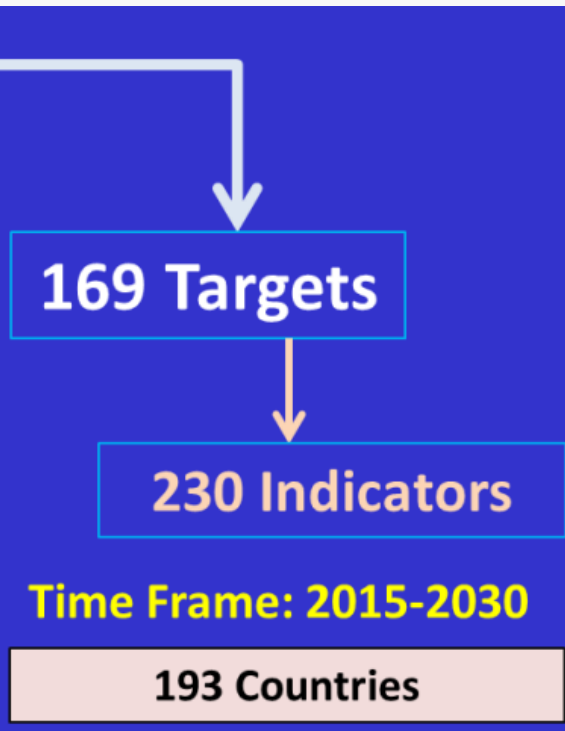
Presentation : NRSC User Interaction Meet (UIM), 29th March 2022

Geospatial Applications for Sustainable Development Goals



Multi Disciplinary Approach for Integration of Information & Dev. Of Decision Support Approaches / Tools / Methodologies

“Sustainable Development Goals(SDG) are the blueprint to achieve a better and more sustainable future for all”– United Nation



Sustainable Development: “Development that meet their needs of present without compromising the ability of future generation to meet their own needs”– World Commission on Environment & Development.

Earth Observation

Information & Knowledge

Utilisation for Governance

Geospatial Applications



“

- Agriculture
- Water Resources
- Rural Development
- Natural Resources
- Disaster Management Support
- Forestry & Ecology
- Geosciences
- Urban & Infrastructure .
- Information Services

”

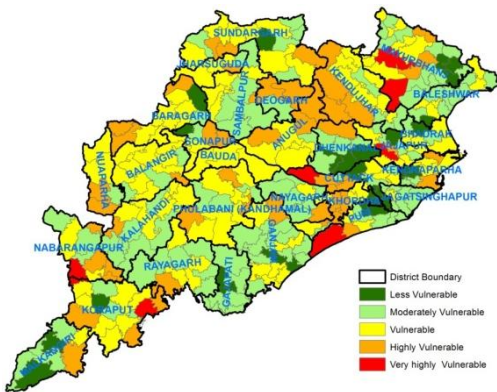


Agriculture

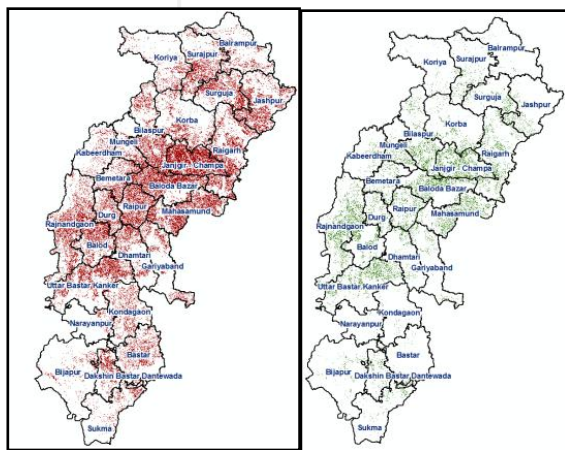
- Agricultural Drought
- Site suitability for various cropping cultures
- High value, Fiber Crops
- Crop Intensification
- Crop Insurance Value
- Bioenergy -Agricultural Crop residue
- Carbon, Moisture Fluxes

Supporting PMKSY,NFSM,PMFBY, RKVY,MNRE, etc.

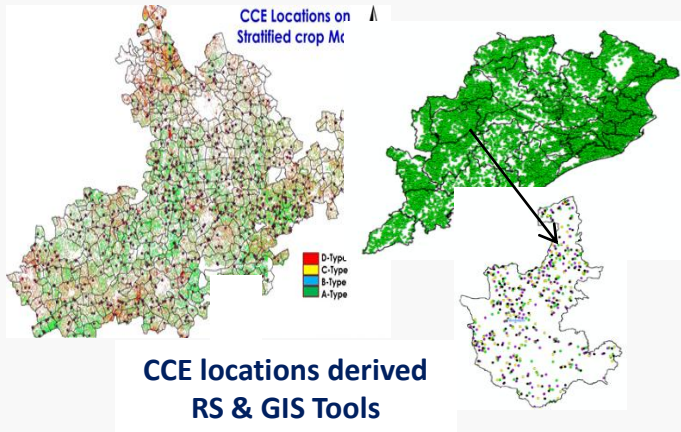
Agricultural Drought Vulnerability



Identifying Scope for Crop Intensification

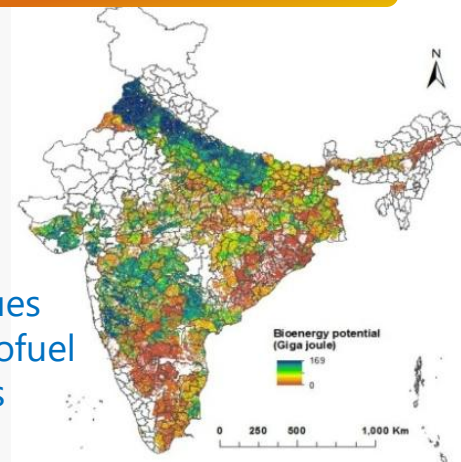


Crop Insurance - Value Chain – Inputs



Bio-Energy

- Crop residues for biofuel plants



Mobile Based Suvelliance



Improved Field Instrumentation



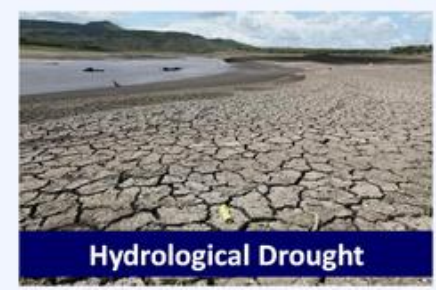
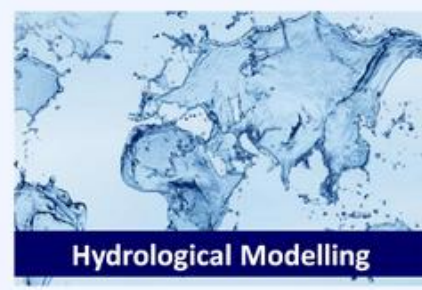
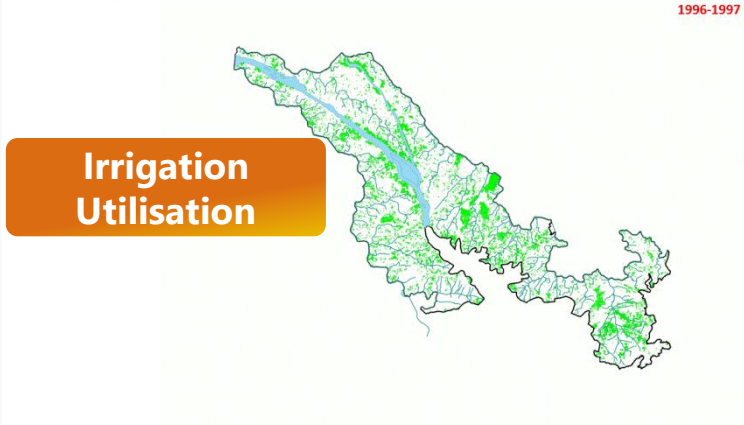
Water Resources

- Irrigation Potential, Expansion, Inter-Basin Water Transport, Water Use Efficiency
- Surface Water -Storage, Dynamics, Quality
- Snow cover , Snowmelt, Reservoir inflows
- Water availability & Demand, Reservoir inflow, Stream flow (Long-term, Future)
- Urban Lakes, Pollution, Water Sources, Spatial Demand

Supporting CWC, MoJS, Programmes – NHP,AIBP,ILR, etc.



Irrigation Expansion

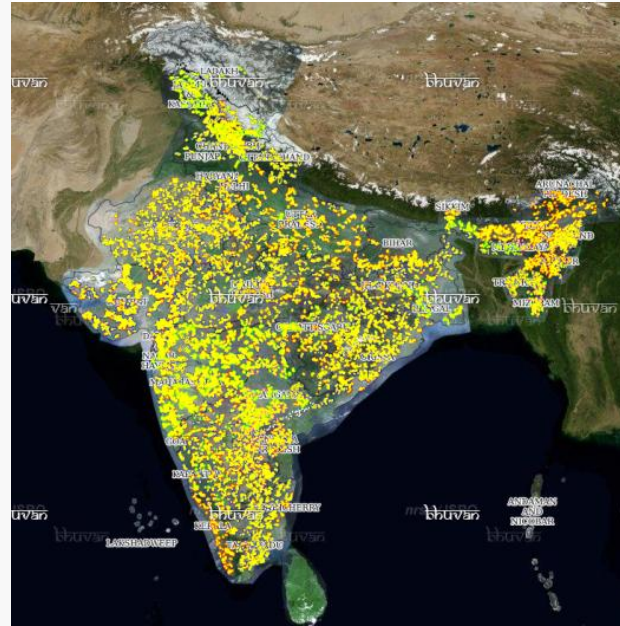


Rural Development

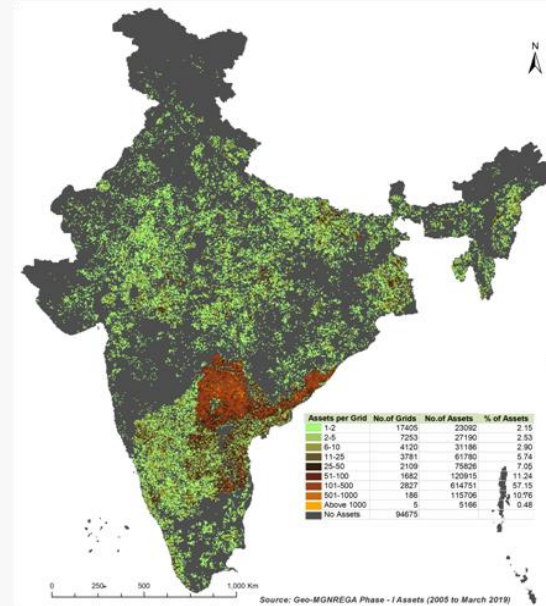
- GIS implementation of Mahatma Gandhi Rural Employment Guarantee Act (MGNREGA)
- Online GIS repository for watershed development assets
- Impact Monitoring of Watersheds
- Decentralized Planning at Panchayat Level
- Rural Road Connectivity

Supporting MoRD, NABARD Programmes – MGNREGA, IWMP, NABARD, etc.

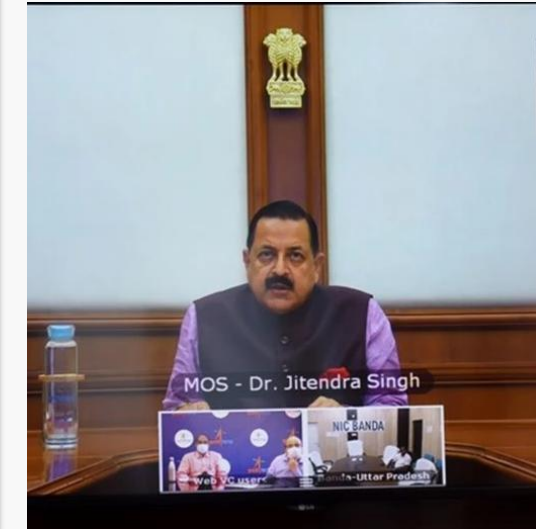
Watershed Monitoring



Afforestation Assets



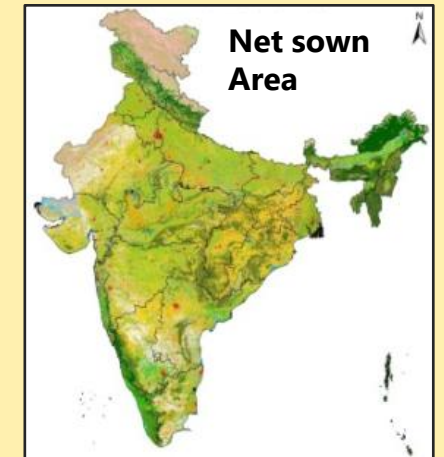
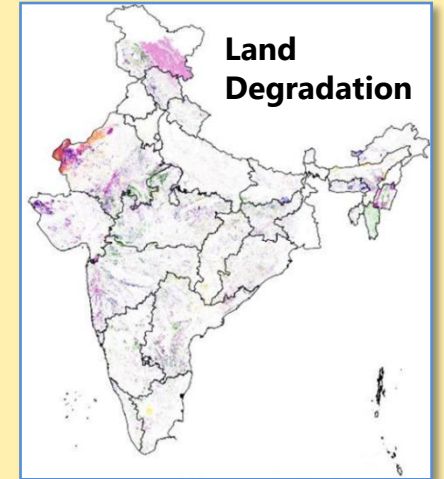
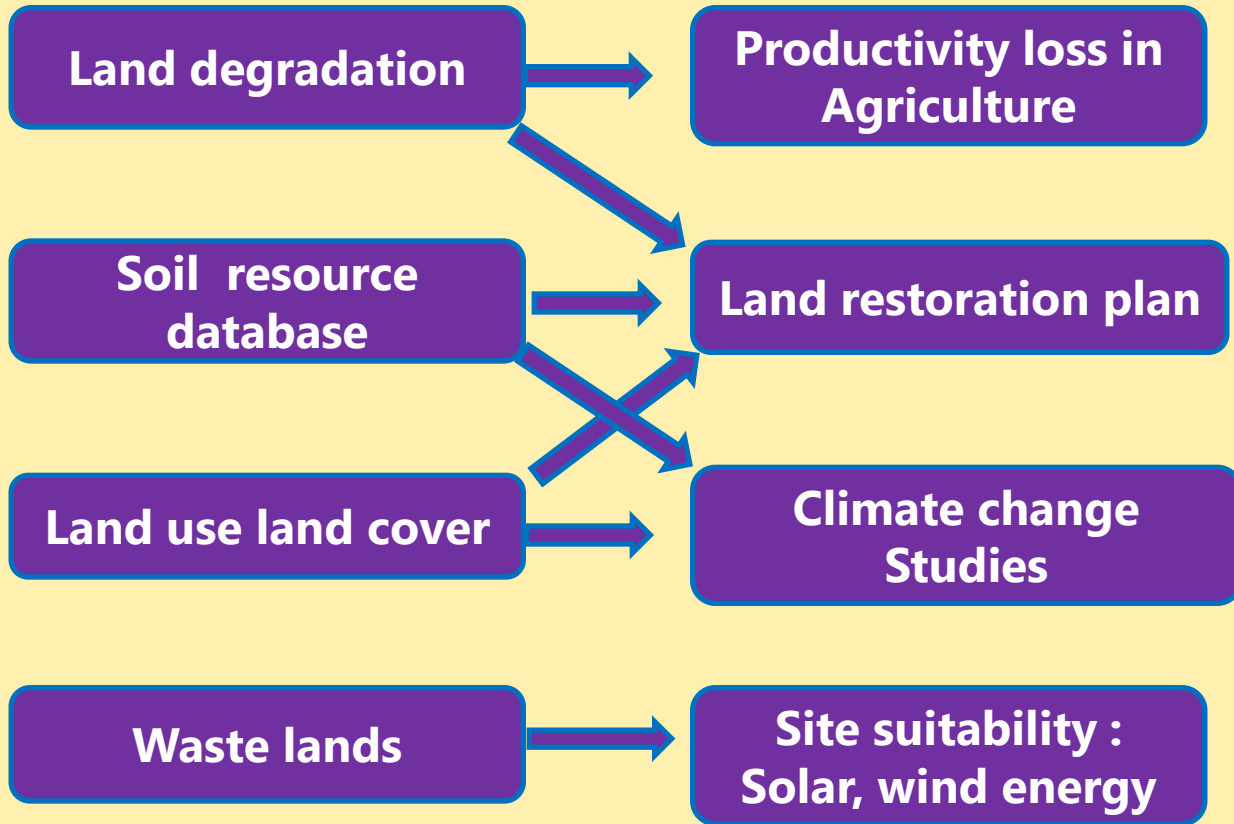
Geospatial Tools for Online Geospatial Tools



- Paradigm shift in MGNREGA implementation
- Management Planning using Yuktdhara
- Geotag linked budget release system (Before / during / after assessment)
- Total Assets geotagged : 4.85 Crore

Natural Resources Monitoring

- Land use/ Land cover at 1:250,000 & 1:50,000
- Land Degradation (1:50,000)
- Waste Land Mapping and Monitoring (1:50,000)
- Soil Resource Mapping



Supporting MoA, Programmes – Supporting PMKSY, NAPCC, NSM, NRCP, etc.

Disaster Management Support

Near real time monitoring and mapping (Flood, Cyclone, Earth Quake, Forest Fire)

Early Warning Systems

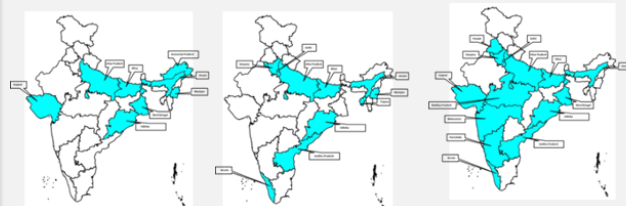
Disaster Mitigation Planning Inputs

National Database for Emergency Management

Intl. Cooperation

Supporting MHA, Disaster Management Authorities (State/Central)

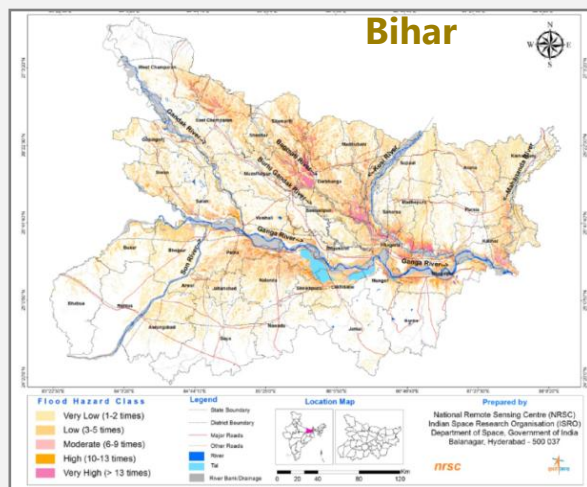
Near Real Time Flood Mapping



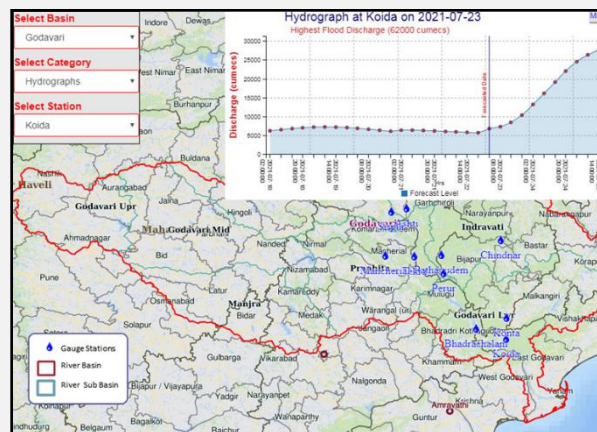
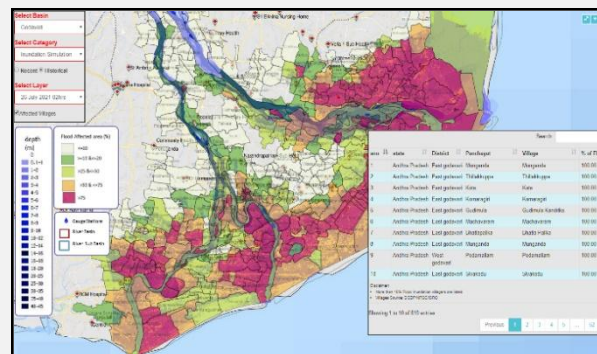
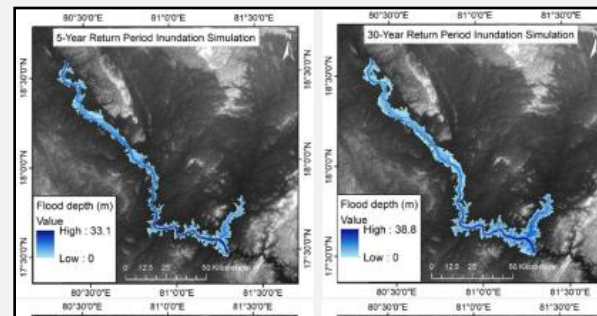
Flood Affected States

Year	2017	2018	2019
No. of States Flooded	8	10	14
Districts affected	108	112	186
Total flooded area (sq.km)	25,536	15,340	40,233
No. of flood products	101	92	256

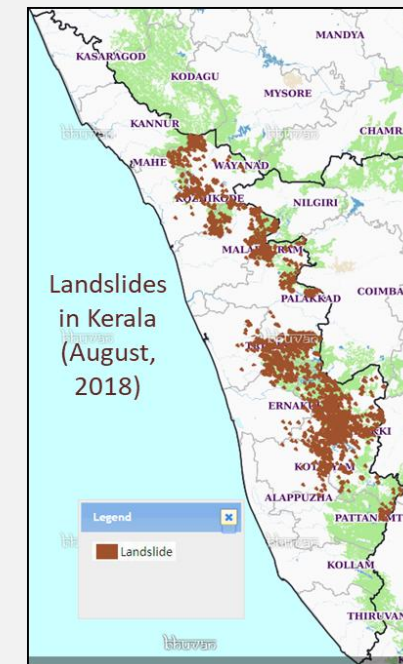
Flood Hazard Atlases- 5 States



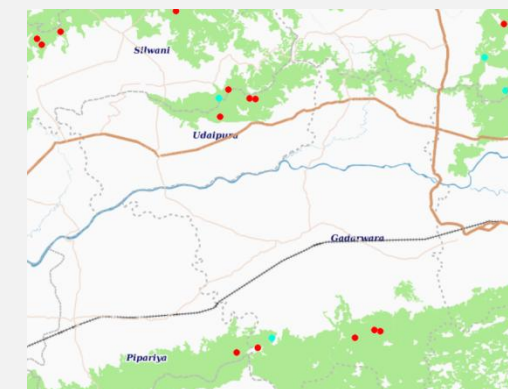
Flood Prone Area – Risk Assessment



Landslides



Forest Fire Alerts

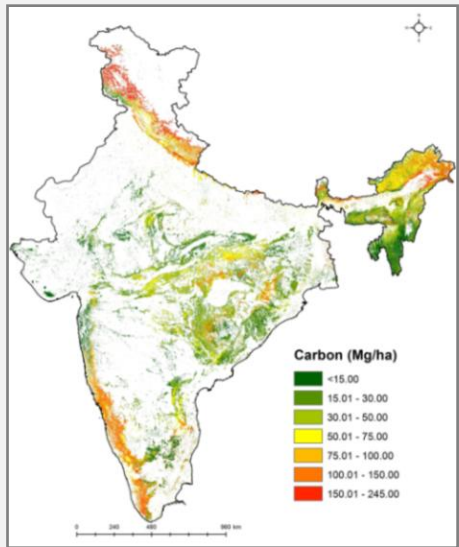


Forestry & Ecology

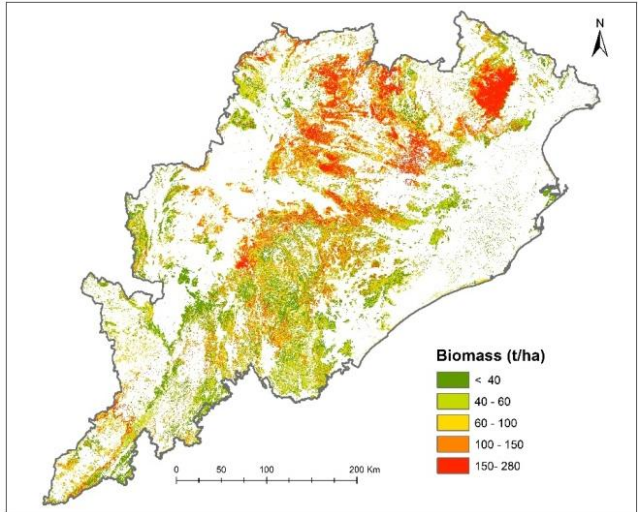
- Forest Mapping and Monitoring
- Forest Fire
- Forest Loss alerts
- Forest biomass
- Biodiversity
- Spatial Carbon Assessment

Supporting MoEnF, FSI, DST, DBT, ICFRE, State Forest Departments

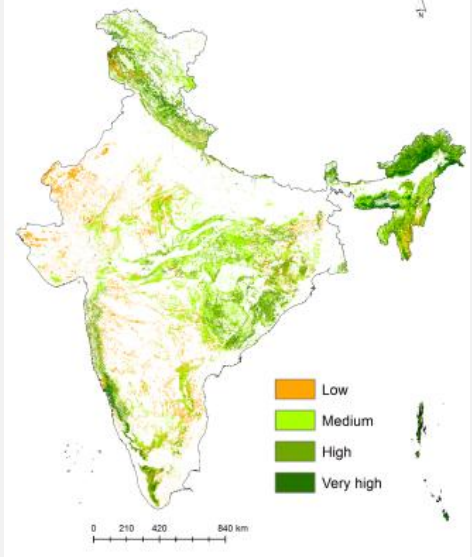
National Forest Biomass



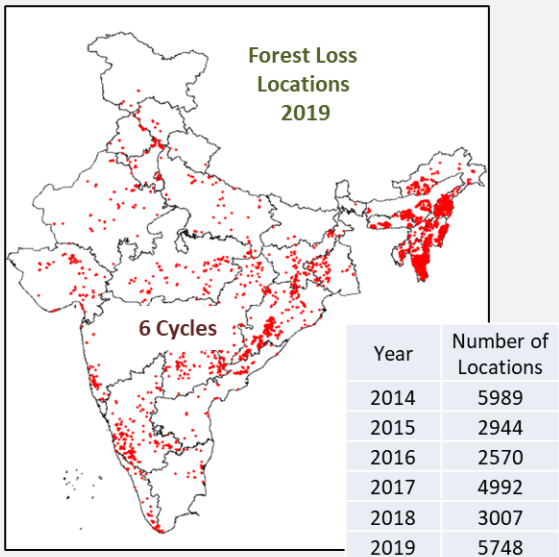
Above Ground Forest Biomass



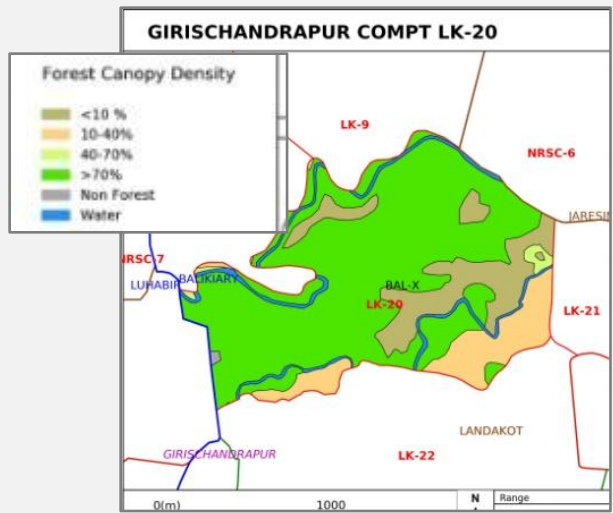
Biological Richness



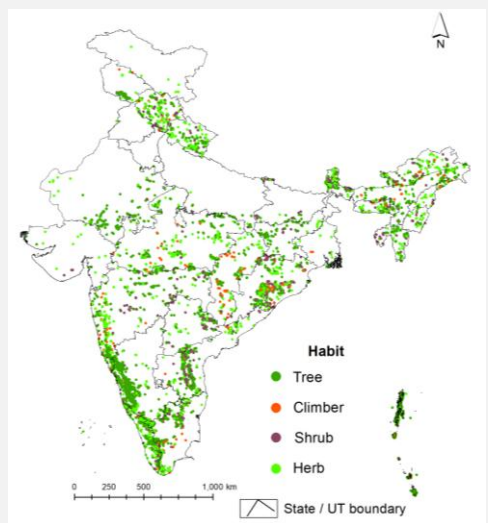
Forest Loss Locations



Forest Working Plans



Endemic Plant Species



Geosciences

Ground Water Prospects & Quality

Geomorphology

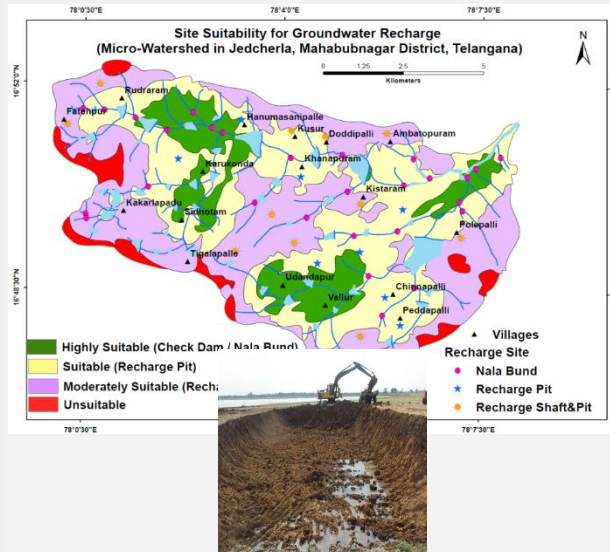
Mineral Prospects

Landslide & Earthquake

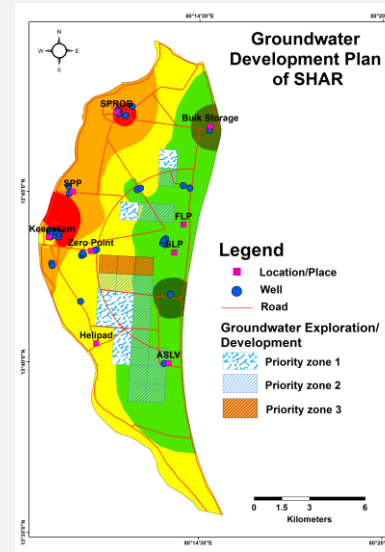
Coal Fire

Land Subsidence

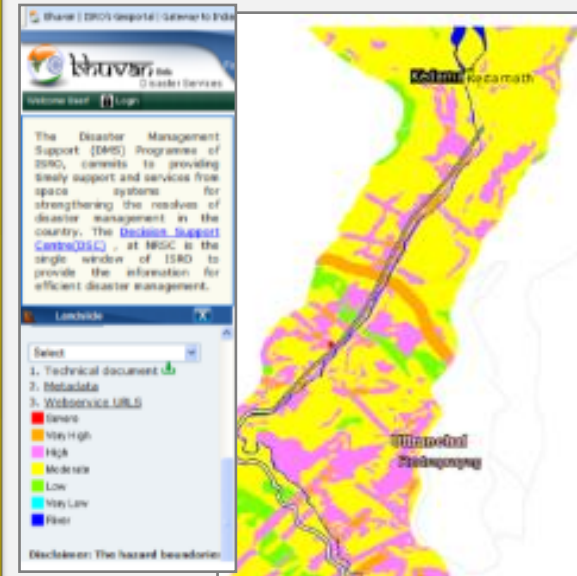
Sites- Groundwater Recharge



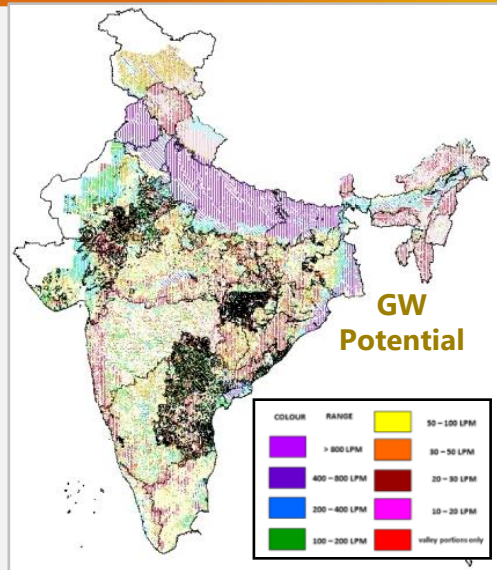
Groundwater Dev. Plan



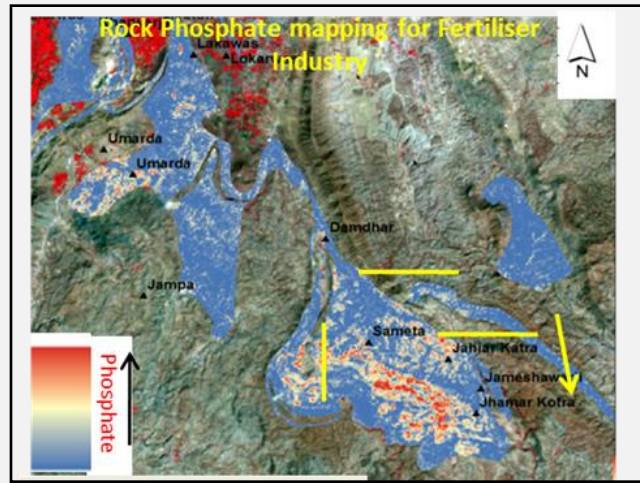
Landslides –Inventory, Hazard zonation



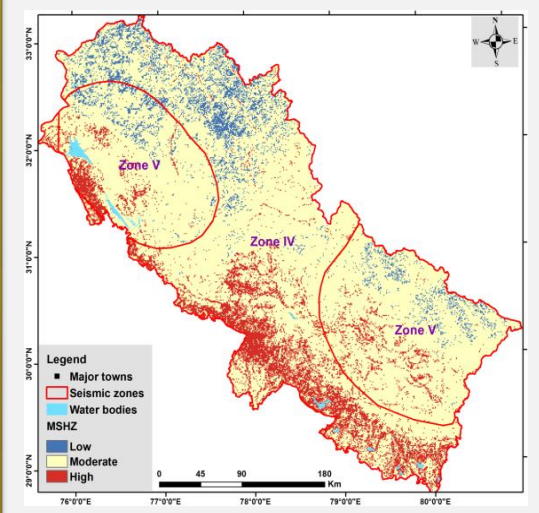
Ground water Potential



Mineral Prospect Mapping



Seismic Hazard Zonation



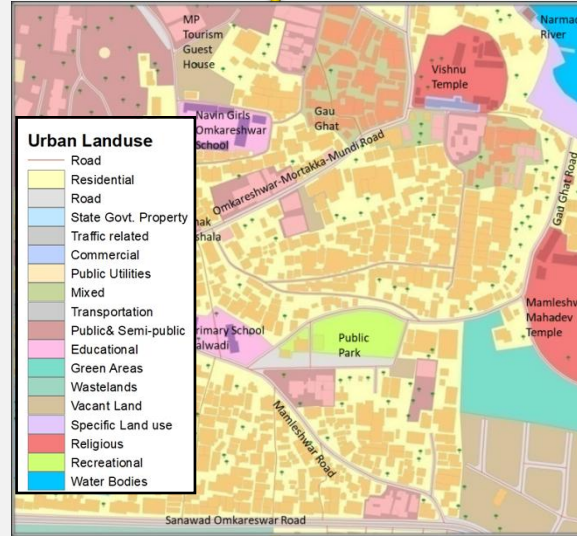
Supporting RGNDWM, NRDWP, JSA, JJM

Urban & Infrastructure

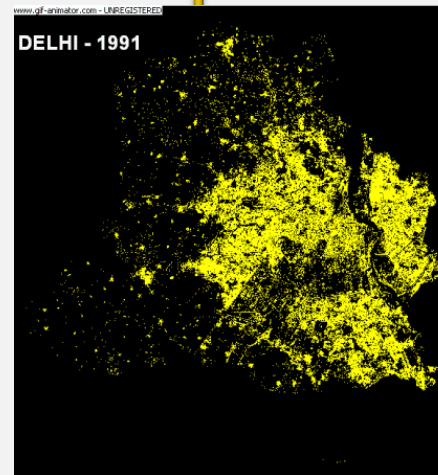
City Master Plans
Regional Plans
Infrastructure Monitoring
Urban Information System
Site Management and Inventory of Heritage Centres
Urban Growth Dynamics

Supporting AMRUT, Smart Cities, NUIS, NRCPB

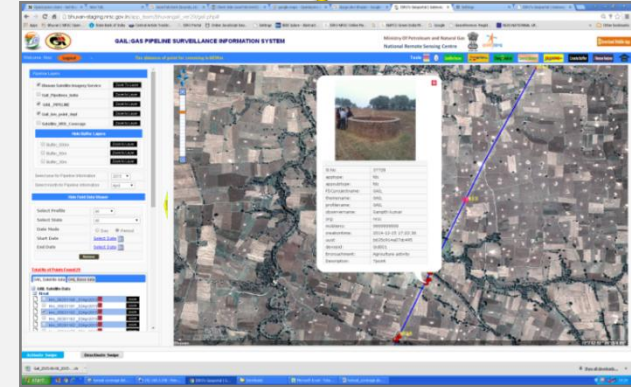
1: 4000 Database



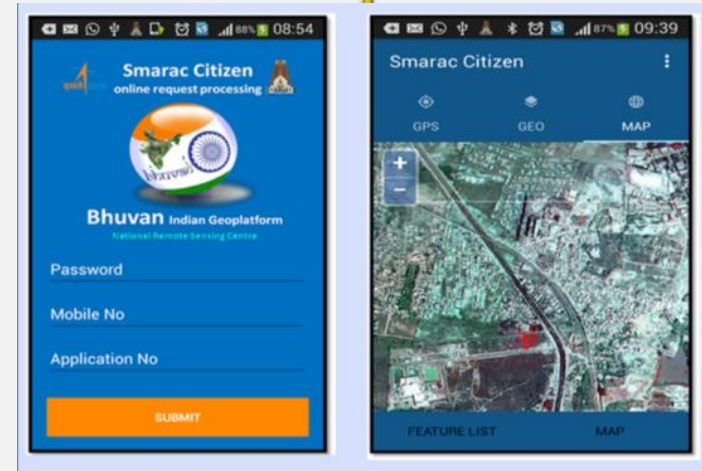
Urban Growth Monitoring



Pipe Line - Right of Use Monitoring



Infrastructure Monitoring

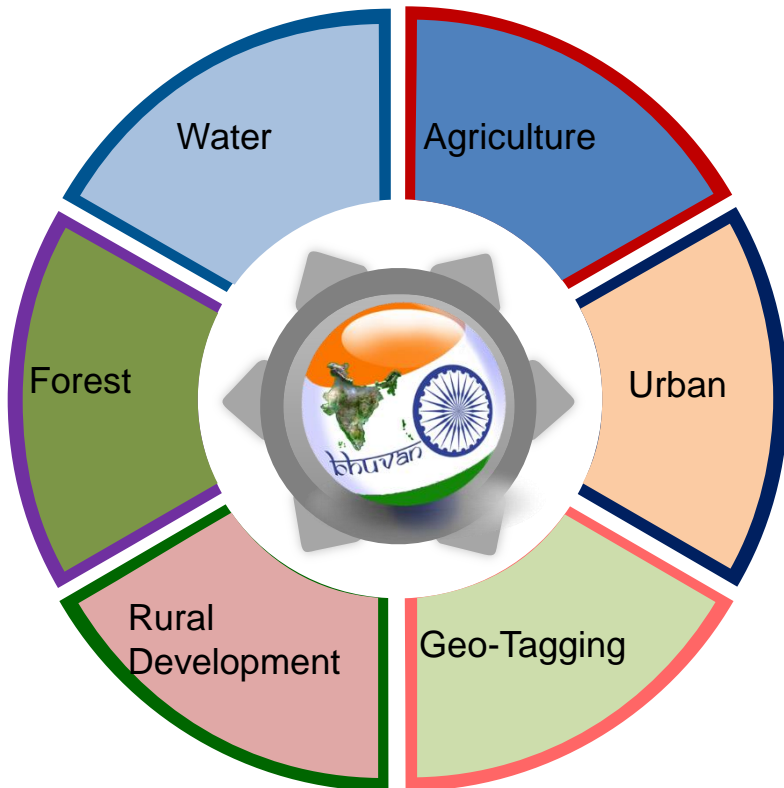


SDG-1: End poverty, 3: healthy lives , 6: Access to water & sanitation, 8: Economic growth and employment, SDG-11: Make cities safe & sustainable, SDG-12: Sustainable production and consumption patterns,

Bhuvan APPLICATIONS

- 100+ Apps
- 75+ Mobile Apps
- 1 m high resolution satellite data for entire India

Major Bhuvan Application Sectors



Asset Mapping and Inventory Creation

Planning & Development

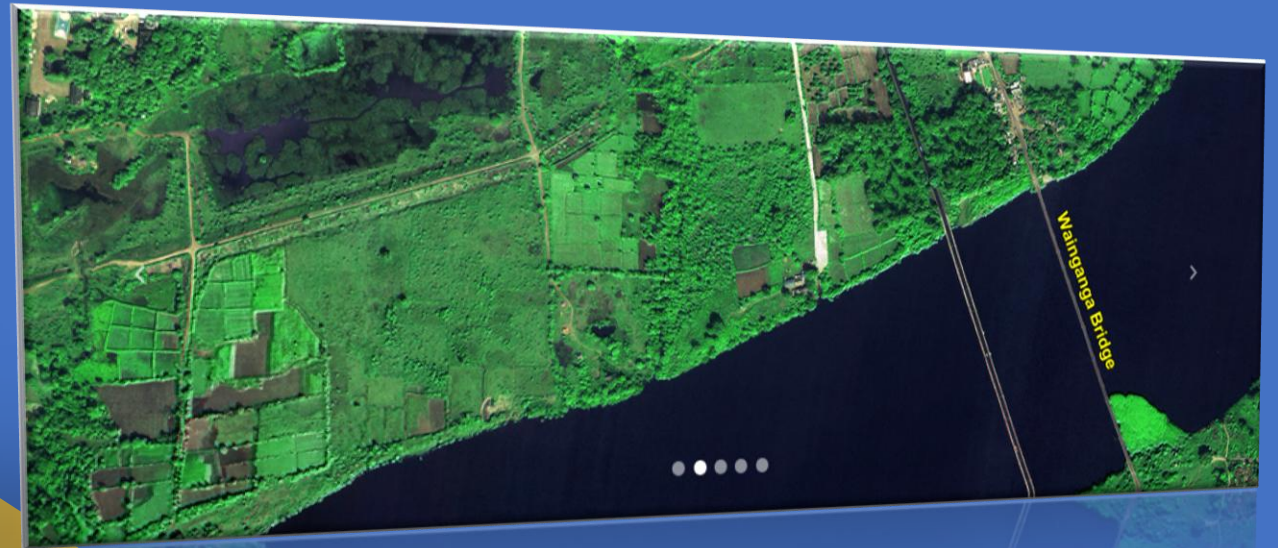
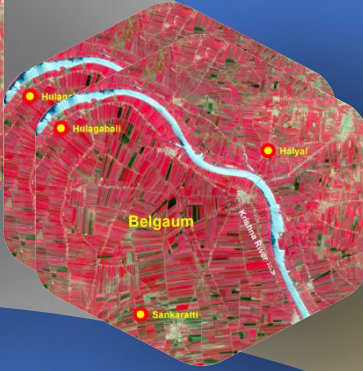
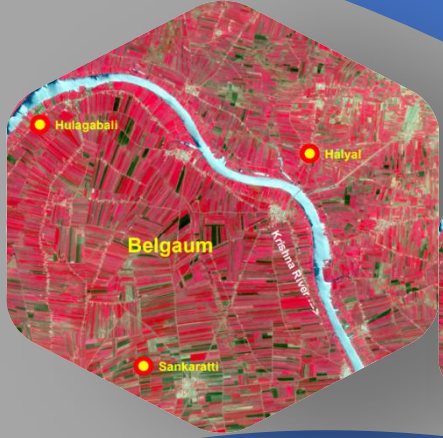
Evaluation of Program Activities

Sustainable Development of Land and Water Resources

Flagship Programs : Multi-Activity Support

Governance Functions

SI	NO	INDICATORS	SOURCE
1	2.4.1	Proportion of agricultural area under productive and sustainable agriculture	LULC
2	3.8.2	Number of people covered by health insurance or a public health system per 1,000 population	AB/NHRR
3	3.C.1	Health worker density and distribution	NHRR
4	6.3.2	Proportion of bodies of water with good ambient water quality	WBIS
5	6.5.2	Proportion of transboundary basin area with an operational arrangement for water cooperation	NHP
6	6.6.1	Change in the extent of water-related ecosystems over time	WBIS
7	7.1.1	Proportion of population with access to electricity	Suomi NPP
8	7.2.1	Renewable energy share in the total final energy consumption	AIML/S/W
9	9.1.1	Proportion of the rural population who live within 2 km of an all-season road	PMGSY
10	11.1.1	Proportion of urban population living in slums, informal settlements or inadequate housing	Mapping/AIML
11	11.3.1	Ratio of land consumption rate to population growth rate	Mapping/AIML
12	11.6.2	Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	NICES
13	11.7.1	Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	Mapping/AIML
14	11.a.1	Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city	NUIS
15	15.1.1	Forest area as a proportion of total land area	LULC
16	15.3.1	Proportion of land that is degraded over total land area	LDM



Thank You

vvrao@nrsc.gov.in



nrsc