Geospatial Technologies for Decentralised Planning and Governance

Empowering Institutions and Stakeholders for Spatial Planning

Nagaraja Ravoori,
Project Director, SIS-DP
Chief General Manager, RC, NRSC
National Remote Sensing Centre (NRSC)

New Shadnagar Facility
Multi-mission Data Reception, Archival, Processing and Dissemination

Main campus at Hyderabad

Regional Remote Sensing Centres

South
Bangalore

West
Jodhpur

East
Kharagpur

center
Nagpur
Currently operational EO missions

2003 RESOURCESAT-1
LISS 3; LISS 4; AWiFS

2009 RESOURCESAT-2
LISS 3; LISS 4; AWiFS

2009 RISAT-2
X-SAR

2012 RISAT-1
C-SAR

2015 LANDSAT-7

2007/08/10 CARTOSAT-2/2A/2B PAN

2011 RESOURCESAT-2
LISS 3; LISS 4; AWiFS

2005 CARTOSAT-1
STERO PAN, F/A

2009 OCEANSAT-2
OCM, SCAT ROSA

2013 INSAT-3D
Imager, Sounder

2011 Megha Tropiques
MADRAS, SAPHIR
SCaRaB

2013 SARAL
Aros, Altica
Future Missions:

Cartosat-2C/2D/2E

Cartosat-3, 3A & 3B - Sub meter PAN, Mx & IR

RISATs: RISAT-1A & 1B, 2A

NISAR

GISats: HR Missions from Geo orbit
Payloads:
- PAN camera with a resolution of 0.64m
- 4 Band MX camera with a resolution of 2.0m
- Experimental Event Monitoring Camera

Data handling:
- DWT based data compression, High Bit rate data formatter with encoder, NUC, AES Encryption
- Compression Ratio: Nominal MX 1:4.5 and Pan 1:4.5 (selectable)
- PAN payload data rate 2342 Mbps
- MX payload data rate 1464 Mbps
- Onboard storage capacity 300GbX2nos
- Data transmission rate: X-Band 320Mbps
**Cartosat-3**

**Planned for Launch in 2018**

- 0.25 meters GSD in Pan
- 1 meter GSD in Mx with four bands
- Swath: ~ 16 km

- Advanced HR Payload with focusing mechanism
- High rate data Acq., compression, storage and transmission (Ka band)
- Fiber-optic gyro
- High accuracy Star trackers (~3arc-sec)
- The Lithium-ion batteries
- Control Moment Gyro technology
- 10.30 am local time at ~450 km altitude
IRS INTERNATIONAL GROUND STATIONS

- P6 Ground Stations
- P5 Ground Stations
- O2 Ground Stations
- C2 Ground Stations
INDIAN POLAR GROUND STATION AT ANTARCTICA

GEO satellite

LEO satellite

Image Data
Service Data

NCAOR, Goa
NRSC, Shadnagar
Bharati

S Band Transmit
S/X Downlink

Data Reception Station

Larsemann Hills, ANTARCTICA

INDIA

F.O
Societal Applications
Application Projects in Diversified areas

Agriculture & Soils
- Crop Production Forecast
- Saline/ Sodic Soils mapping
- Agro-Met Services & Disaster Surveillance (pest, floods, drought)
- Horticulture development

Bio Resources & Environment
- Forest Cover & Type mapping
- Wetland Inventory & Conservation plans
- Biodiversity Characterization
- Desertification Status mapping
- Coastal, Mangroves, Coral related
- Snow & Glacier studies

Cartography
- GCP Library for IRS Data correction
- Large Scale Mapping
- Topo-map updation - Satellite-based
- Digital Elevation Model (Carto-DEM)
- Cadastral Level mapping

Geology & Mineral Resources
- Landslide Hazard Zonation
- Mineral/ Oil Exploration, Mining Areas,
- Seismo-tectonic Studies
- Engineering & Geo-Environmental studies

Ocean and Meteorology
- Ocean Primary Productivity
- Ocean State Forecast (OSF)
- Storm Surge Modeling
- Regional Weather prediction
- Tropical Cyclones & Mesoscale studies
- Extended Range Monsoon Prediction

Rural Development
- National Drinking Water Mission
- Wastelands Mapping/ Updation
- Watershed Development & Monitoring
- Land Records Modernization Plan

Ocean and Meteorology
- Ground Water Prospects Map

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Rural Development
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Application Projects in Diversified areas

**Urban Development**
- Urban Sprawl Mapping of Major Cities
- Master/ Structure Plans
- Comprehensive Dev. Plans (CDP) of selected Cities/ Towns
- Base Map generation for Towns
- National Urban Information System

**Water Resources**
- Irrigation Infrastructure assessment
- Water Resources Information System
- Command Area/ Irrigation Performance Evaluation
- Snow-melt Run-off Estimation
- Reservoir Capacity Evaluation
- Site Selection for Hydro-Power

**NR Census**
- Periodic Inventory of Natural Resources under NR Census Programme:
  - Land use/ Land Cover, Soil, Geomorphology, Wetland, Land degradation, Snow & Glaciers, Vegetation

**Disaster Management Support**
- Operationally addressing various natural disasters like Flood, Cyclone, Drought, Landslide, Earthquake and Forest Fire
- R&D Studies on Early warning Systems, Decision Support Tools

**Climate Change Studies**
- Mapping the indicators, Monitoring the agents and Modelling the Impact
- Characterisation of climate variables (Land, Atmosphere & Oceans)
- Methane Emission, Timberline study, LU LC Change dynamics, etc.
SMARAC Applications
GeoSpatial Decision Support System for Ease of Doing Business

Inventory & Site Mng. Plans for Heritage Sites and Monuments of National Importance

Total Monuments Nos: 3658
Inventory: 3227 (88%)
Site Mng. Plans: 1900 (52%)
Validation of Mng. Plans: 2.5%
G2G Application – Smart SMARAC App. For Site Management Plan

Satellite Data

Site Management Plan

- Protected Area
- Regulated Area
- Prohibited Area

Site Management Zones

3D Model

G2C Application – Smart Citizen App.

Online Citizen request processing

NMA/NIC Portal

- User Services
  - Application No:
  - Name:
  - Mobile No:
  - Email Id:
  - Download App
  - Submit form

Any RDBMS with Spatial extension/BLOB

- Mobile No
- Appl.No
- Date Time
- Lat
- Long
- Buf.
- Status approved

Postres

Verify Lat/Long

Internet

php routine

Bhuvan Server

GIS analysis

Geo processing

Intersect with 300 m Buffer

Intersect with 300 m Buffer Image clip- png/jpeg

RDBMS Log

Date Time

Lat

Long

Buf.

Status

Sample Outputs

Proximity Analysis

Map Display
State wise Breakup of Work accomplished

Status of All India Inventory of Sites & Monuments of National Importance

Legend

Inventory (%) -
- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100

All India Status of Site Mng. Plan Preparation for Monuments of National Importance

Legend

Site Mng. Plan (%) -
- 0 - 25
- 26 - 50
- 51 - 75
- 76 - 100
• Geo-spatial Inventory of Post offices
• Monitoring Postal delivery services & Postal Van Track and beat map refinement
• Total number of Post-offices mapped: 1,33,628 (08-01-16)
Mobile Application to collect the data
Inventory of Post Office Locations and Attributes

Rajasthan – 11,429  (08-01-16)  
Karnataka – 10,006  (08-01-16)
Refinement of beat-map sketches using HRSI/Infrastructure details

Beat Boundaries sketch → Refinement using HRSI/Maps → Final GIS Map of Beat areas
Way Forward

• Completion of Post Office Inventory
• Development/Testing of mobile app for post man/van delivery services

• Beat map Refinement – Rural
  • Integration of village boundaries
  • Procurement of details
  • Finalization of beat boundaries
  • Validation and Updation

• Beat map Refinement – Urban
  • Refinement of beat boundaries using HRSI/Road layers
  • Pilot study completed in Jodhpur town
  • Capacity Building of Postal department officials
## Horticultural Plantations (CHAMAN)

**User Agency:** MNCFC, Ministry of agriculture  
**Satellite data** Resourcesat LISS-IV and Cartosat-1  
**Plantations Type** Mango, Banana and citrus  
**Study Area:** The Project at national level covers 3 fruit crops (mango, banana, citrus), 3 vegetable crops (potato, onion and tomato) and 1 spice crop (chillies) in about 100+ districts of 12 states  
**Future Scope** Based on the results study will be extended to National level.  
**Deliverables** Horticultural crop map  
District-wise crop acreage estimation.

## Commercial Plantations

**User Agency** Ministry of Commerce  
**Satellite data** Resourcesat LISS-IV and Cartosat-1  
**Plantations Type** Rubber, Coffee and Tea  
**Study Area:** Coffee: (Karnataka, Kerala & Tamilnadu).  
Tea (Phase-1 in Assam & West Bengal completed. Phase-2 initiated for Karnataka Tamilnadu and Kerala)  
Rubber (Tripura completed)  
**Future Scope** Based on the results study will be extended to National level.  
**Deliverables** Taluq-wise crop acreage estimates  
MIS package for visualization and querying
**Space Based Information Support for Decentralized Planning (SIS-DP)**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 1</strong></td>
<td>To generate and provide ‘Satellite Image Maps’ for the entire country as base for decentralized planning. <em>(High resolution, true color, Ortho-rectified, merged satellite data products)</em></td>
</tr>
<tr>
<td><strong>Objective 2</strong></td>
<td>To prepare thematic &amp; base layers on 1:10000 scale using ‘Satellite Image Maps’, slope classes maps and Cadastral maps vectorization &amp; geo-referencing</td>
</tr>
<tr>
<td><strong>Objective 3</strong></td>
<td>To create databank: comprising of ‘Satellite Image Maps’, thematic and base maps, slope class maps; and organize census data, climate data, cadastral maps, stakeholder’s data and available legacy thematic &amp; base data on GIS platform.</td>
</tr>
<tr>
<td><strong>Objective 4</strong></td>
<td>To develop comprehensive web portal as per PRIs &amp; stakeholders needs for decentralized planning, governance, outreach to the citizens and data dissemination.</td>
</tr>
<tr>
<td><strong>Objective 5</strong></td>
<td>To build Capacity of PRIs &amp; stakeholders for the use of Space Based Information in Decentralized planning and governance.</td>
</tr>
</tbody>
</table>
THE CURRENT REQUIREMENTS: DATA & ENABLING ENVIRONMENT

Spatial, Participatory, Integrated Decentralized Planning

1. Panchayats and Urban local bodies boundaries
2. Satellite Image Maps & Thematic maps: The base for planning
3. Census & Climate datasets
4. Stakeholders data

Need for single window of all datasets in spatial format to PRIs & stakeholders

Capacity building of PRIs & stakeholders

Need for web based interface for planning, implementation & monitoring

1. Web based portal for PRIs, stakeholders & Citizens
2. Enabling environment for asset mapping
3. Enabling environment for activity planning
4. Enabling environment for area profile at three PRI levels
Satellite Data
(Cartosat – 1, 2 / LISS MX IV)

Land Cover, Road, Settlement, Drainage & WB, Linking of Legacy Data, Slope (DEM)

Cadastral (Digital Maps)
Digital village cadastral maps, attribute linking
(Existing digital maps if available will be used)
4/5 states, NLRMP

ISRO
NR Census layers
- Land Use / Land Cover
- Land Degradation
- Forest & Vegetation
- Wetlands
- Snow & Glacier
- Geomorphology
- Soil
Periodicity
- Every 5 years
- Every 20 years

User Projects
- Ground Water Prospect (RGNDWM)
- Wastelands
- Irrigation Infrastructure (AIBP)
- Watershed
- National Urban Information System
- Biodiversity
- Watershed Prioritisation
- Tribal Development

Resourcesat-2, Cartosat-3 …… ISRO EO Missions

Periodic Space based Monitoring

Existing Comm. Highway

Customized Dissemination

Based upon Policy: G2G, G2C

New
(1:10K)

Existing/ongoing
(1:50K)

Assured Continuity

New

Role

National
MIS Monitoring

State
State Data Repository Creation & Updating

District
District database Usage and updating

Panchayat
Usage through customized interface

New
(1:10K)

Existing/ongoing
(1:50K)

Assured Continuity

New
1. Database Generation and Organization
   - Spatial & non-spatial data
   - NRSC & States Centres / partners

2. Enabling Environment for PRI’s
   - Web Based System for PRIs – Four modules
     - NRSC / ISRO

3. Outreach
   - PRIs & Citizens
     - NRSC & States Centres / partners

- Asset Mapping & Activity Planning
  - PRIs, State Centres, NGOs, Citizens

- Capacity Building
  - State Centres & NRSC / ISRO

- Implementation & Monitoring
  - PRIs, State Departments

- Geo-Visualization
  - Search, Access, Understand

Identification of sector wise issues at all levels of PRIs

Bhuvan Panchayats
**STATE-WISE DEM / ORTHO-IMAGE GENERATION – METHODOLOGY & STATUS**

**Methodology**

1. Creation of State-wise Photogrammetric block
2. GCP Identification
3. Multi ray Image points
4. Triangulation
5. L1 DEM Generation
6. DEM Editing (break-lines/Mass pt editing)
7. Mosaic of Cartosat-1 Orthoimage
8. LISS IV Ortho-rectification
9. Fused product generation

**SATellite Data Products**

- Cartosat Ortho (2.5m)
- LISS-IV Ortho (5.8m)
- Merged Product (2.5m) (Cartosat + LISS-IV)

**Photogrammetric block Maharashtra**

**DEM of Maharashtra**

**CartoSAT-1 stereo pairs > 11,000**

**ResourceSAT-1 scenes > 12,000**

**ResourceSAT-2 scenes > 500**

**STATUS OF DATA PROCESSING**

<table>
<thead>
<tr>
<th>No of states / UT</th>
<th>% completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>States (29) / UT's (7)</td>
<td>100</td>
</tr>
<tr>
<td>S.No.</td>
<td>State</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------</td>
</tr>
<tr>
<td>1</td>
<td>Andhra Pradesh</td>
</tr>
<tr>
<td>2</td>
<td>Arunachal Pradesh</td>
</tr>
<tr>
<td>3</td>
<td>Assam</td>
</tr>
<tr>
<td>4</td>
<td>Bihar</td>
</tr>
<tr>
<td>5</td>
<td>Chattisgarh</td>
</tr>
<tr>
<td>6</td>
<td>Gujarat</td>
</tr>
<tr>
<td>7</td>
<td>Goa</td>
</tr>
<tr>
<td>8</td>
<td>Haryana</td>
</tr>
<tr>
<td>9</td>
<td>Himachal Pradesh</td>
</tr>
<tr>
<td>10</td>
<td>Jharkhand</td>
</tr>
<tr>
<td>11</td>
<td>Jammu and Kashmir</td>
</tr>
<tr>
<td>12</td>
<td>Karnataka</td>
</tr>
<tr>
<td>13</td>
<td>Kerala</td>
</tr>
<tr>
<td>14</td>
<td>Maharashtra</td>
</tr>
<tr>
<td>15</td>
<td>Madhya Pradesh</td>
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<tr>
<td>16</td>
<td>Meghalaya</td>
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<tr>
<td>17</td>
<td>Mizoram</td>
</tr>
<tr>
<td>18</td>
<td>Manipur</td>
</tr>
<tr>
<td>19</td>
<td>Odisha</td>
</tr>
<tr>
<td>20</td>
<td>Punjab</td>
</tr>
<tr>
<td>21</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>22</td>
<td>Sikkim</td>
</tr>
<tr>
<td>23</td>
<td>Tripura</td>
</tr>
<tr>
<td>24</td>
<td>Nagaland</td>
</tr>
<tr>
<td>25</td>
<td>Tamilnadu</td>
</tr>
<tr>
<td>26</td>
<td>Telangana</td>
</tr>
<tr>
<td>27</td>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>28</td>
<td>Uttarakhand</td>
</tr>
<tr>
<td>29</td>
<td>West Bengal</td>
</tr>
<tr>
<td>30</td>
<td>Chandigarh</td>
</tr>
<tr>
<td>31</td>
<td>Delhi</td>
</tr>
<tr>
<td>32</td>
<td>Dadar &amp; Nagar Haveli</td>
</tr>
<tr>
<td>33</td>
<td>Daman &amp; Diu</td>
</tr>
<tr>
<td>34</td>
<td>Puducherry</td>
</tr>
<tr>
<td>35</td>
<td>Lakshdweep</td>
</tr>
<tr>
<td>36</td>
<td>Andaman Nicobar</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>
## CADAstral Overlay Status

<table>
<thead>
<tr>
<th>STATE</th>
<th>Number of Villages – Total</th>
<th>Number of Villages – Overlaid</th>
<th>Percentage of Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andhra Pradesh</td>
<td>17385</td>
<td>12580</td>
<td>72.36</td>
</tr>
<tr>
<td>Assam</td>
<td>21225</td>
<td>18409</td>
<td>86.73</td>
</tr>
<tr>
<td>Haryana</td>
<td>7094</td>
<td>7030</td>
<td>99.09</td>
</tr>
<tr>
<td>Kerala</td>
<td>1593</td>
<td>1092</td>
<td>68.55</td>
</tr>
<tr>
<td>Telangana</td>
<td>10932</td>
<td>9350</td>
<td>85.53</td>
</tr>
<tr>
<td>West Bengal</td>
<td>4028 / 40203</td>
<td>2500</td>
<td>62.06</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>62229</strong></td>
<td><strong>50961</strong></td>
<td><strong>81.89</strong></td>
</tr>
</tbody>
</table>
CADASTRAL OVERLAY – Andhra Pradesh

Cadastral Overlay - Andhra Pradesh Krishna District

Cadastral Overlay - Andhra Pradesh East Godavari District
CADAstral Overlay – Telangana

Cadastral Overlay - Telangana Warangal District

Cadastral Overlay - Telangana Adilabad District
CADAstral Overlay – Haryana

Cadastral Overlay - Haryana: Fathehabad District

Cadastral Overlay - Haryana: Gurgaon District
CADA STRAL OVERLAY – Kerala

Cadastral Overlay - Kerala: Alappuzha District

Cadastral Overlay - Kerala: Idukki District
CADAstral Overlay – Assam and West Bengal

Cadastral Overlay - Assam: Sonitpur District

Cadastral Overlay - West Bengal: Birbhum District
Panchayat Portal

Space Based Information Support for Decentralized Planning (SIS-DP)

http://bhuvan-panchayat.nrsc.gov.in/
Enabling Environment – Bhuvan Panchayat Portal

**Cadastral Map of Jayapur Panchayat Overlaid on High Resolution Satellite Image (2.5m)**

**MODULES**
- Area selection
- Area Profile Report
- Asset Mapping
- Activity Planning
- Implementation & Monitoring
- Download Reports

**FEATURES**
- Planning window for citizens & PRI
- Inventory of Assets across the Nation
- Planning option from 17 CSS and other Schemes
- Dissemination of spatial & non-spatial information

Integration of schemes:
- Saansad Aadarsh Gram Yojana (SAANJHI)
- Backward Regions Grant Fund

Bhuvan Panchayat Portal Release:
- Ver 1.0 released on March 2014
- Ver 2.0 released on November 2014

Assets Mapped through Mobile app for Jayapur Panchayat, Varanasi

Mobile App for Asset Mapping

adopted by Prime Minister Shri Narendra Modi under SAANJHI

**Enabling Environment – Bhuvan Panchayat Portal**

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Mobile App for Asset Mapping

adopted by Prime Minister Shri Narendra Modi under SAANJHI
Classification of SIS-DP Assets

Asset Summary
Groups: 5
Subgroups: 25
Asset-Groups: 73
Assets: 281

Asset Classes
Civic Amenities/Infrastructure Assets: 46 Asset Groups
Governance Assets: 7 Asset Groups
Productive Assets: 9 Asset Groups
Human Resources and Livestock Assets: 2 Asset Groups
Natural Resources Assets: 8 Asset Groups
The Area Profile and Resource Inventory provides a snapshot of the area; it highlights key information on natural resources, various types of assets, socio-economic details, disaster prone areas, other major priorities and constraints in an area. These are represented in the form of Tables, Maps and Charts.

<table>
<thead>
<tr>
<th>Class of Agriculture</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area under crop</td>
<td>64</td>
</tr>
<tr>
<td>Plantations</td>
<td>56</td>
</tr>
<tr>
<td>Agro horticulture</td>
<td>23</td>
</tr>
<tr>
<td>Agro Forestry</td>
<td>2</td>
</tr>
</tbody>
</table>
1. Land and Water Development Activities
2. Productive Activities
3. Civic Amenities and Infrastructure Development Activities
4. Social Welfare Activities
5. Governance Activities

17 Flagship Schemes of Government of India: 2013-14

1. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA 2.0)
2. Integrated Watershed Management Programme (IWMP)
3. Indira Awas Yojana (IAY)
4. Pradhan Mantri Gramin Sadhak Yojana (PMGSY)
5. National Rural Health Mission (NRHM)
6. Integrated Child Development Services (ICDS)
7. Nirmal Bharat Abhiyan (TSS)
8. Mid-Day Meal Scheme (MDM)
9. Sarva Siksha Abhiyan (SSA)
10. Jawaharlal Nehru National Urban Renewal Mission (JNNURM)
11. Accelerated Irrigation Benefit Programme (AIBP)
12. National Social Assistance Programme (NSAP)
13. Backward regions grant fund (BRGF)
14. National Rural Livelihoods Mission (NRLM)-Aajeevika
15. Rashtriya Krishi Vikas Yojana (RKVY)
16. National Rural Drinking Water Mission (NRDWP)
17. Rajiv Gandhi Panchayat Sashaktikaran Abhiyan (RGPSA)
Capacity Building

### General Curriculum for all levels of Panchayats

- About Bhuvan Geo-Panchayats
- Geo-visualization and available data for decentralized planning
- Spatial data: Satellite imagery, Resource layers, Assets, Attributes
- Non-spatial data: General Village/Block/District Characteristics, Meteorological data, Census 2011 amenities and village & town directory, Major issues of the village
- Asset mapping: asset mapping using point, line & polygon, attribute editing, uploading photographs of assets.
- Activity Planning & monitoring: 29 activities, Planning using spatial & non-spatial data, finding an existing scheme, monitoring the progress of an activity
- Availability of different Schemes
- Profile of the area
- Panchayat & citizen login
- Share views

### Gram Panchayat Curriculum

- How to take data from portal
- How to map assets in a village
- How to plan activities at gram Panchayat level
- Area Profiler - Snapshot of the panchayats which includes size of the population, structure of the population, animal wealth etc. in the area
- Finding the gap or the priority areas
- How to incorporate suggestions in planning
- How to share views

### Panchayat Samiti (Block) Curriculum

- How to take data from portal
- Visualization of the desired area in terms of availability of assets, climatic conditions, natural resources
- Considering the different village level development plans
- Consolidation of village development plans
- Feasibility analysis of consolidated plans
- Spatial Distribution of assets and considering availability of assets for more than one village using proximity, buffer analysis.
- How to check the availability of assets in vicinity
- How to plan activities at Block Panchayat level
- Synergy between all activities, funds and schemes
- Implementation and Monitoring of activities
- How to incorporate suggestions in planning

### Zilla Parishad (District) Curriculum

- How to take data from portal
- Consolidation of block level plans
- Feasibility analysis of gram Panchayat plans passed by block
- Sector wise analysis of proposed plans and analyzing the funds available within same sector
- How to check the availability of assets in vicinity
- How to plan activities at Block Panchayat level
- How to incorporate suggestions in planning
- Implementation and Monitoring of activities – Scheme/Sector wise
## Scale of Operation

Number of Elected Representatives in the three tiers Panchayats in the Country + PIA, NGOs

<table>
<thead>
<tr>
<th>Category</th>
<th>PRI No.</th>
<th>General</th>
<th>SC</th>
<th>ST</th>
<th>Total</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Village Panchayats</td>
<td>232913</td>
<td>1851166</td>
<td>490986</td>
<td>314324</td>
<td>2656476</td>
<td>975116</td>
</tr>
<tr>
<td>Intermediate Block level Panchayats</td>
<td>6094</td>
<td>112371</td>
<td>32898</td>
<td>11340</td>
<td>156609</td>
<td>58094</td>
</tr>
<tr>
<td>District Panchayat</td>
<td>537</td>
<td>11311</td>
<td>2734</td>
<td>1649</td>
<td>15694</td>
<td>5779</td>
</tr>
<tr>
<td><strong>Grant Total</strong></td>
<td><strong>2,39,544</strong></td>
<td><strong>19,74,848</strong></td>
<td><strong>5,26,618</strong></td>
<td><strong>3,27,313</strong></td>
<td><strong>28,28,779</strong></td>
<td><strong>10,38,989</strong></td>
</tr>
</tbody>
</table>

Estimated no. of functionaries requiring training & data

<table>
<thead>
<tr>
<th>Level</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centre/State Level</td>
<td>3,600</td>
</tr>
<tr>
<td>District Level</td>
<td>27,500</td>
</tr>
<tr>
<td>Block Level</td>
<td>2,70,000</td>
</tr>
<tr>
<td>GP Level</td>
<td>15,98,900</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1900000</strong></td>
</tr>
</tbody>
</table>
1. MGNREGA - Water harvesting - Check Dam construction

A.P – Anantpur – Dharmavaram - Pothkunta

LULC – Agriculture/cropland area with high drainage density
MGNREGA - Water harvesting - Check Dam construction

SLOPE: Very Gentle to Moderate
Check Dams could be constructed at these locations as these have:
1. High Drainage density
2. Agriculture cropland in vicinity
3. Gentle to moderate slope
2. Sarva Siksha Abhiyan – Construction of School buildings

U.P - Varanasi – Arajiline - Jayapur

Asset data to identify existing school and their types: No higher School present
Sarva Siksha Abhiyan – Construction of School buildings

Settlement with demography data

Road network for connectivity
School can be constructed at this location due to:
1. No school other than primary school exist in panchayat
2. Good connectivity by road
3. Near to settlements
5. National Rural Drinking Water Mission – Public Facilities for Drinking Water

Rajasthan - Jodhpur - Luni - Subdand

Settlement locations & demography

Legacy data – Ground water potential

Legend:
- Very good to good
- Good to moderate
- Good
- Good but Saline
- Moderate
- Moderate to Poor
- Poor
Public facility for drinking water can be proposed here due to
1. Very good to good ground water prospects
2. Near to settlements
6. Pradhan Mantri Gram Sadak Yojana – Upgradation of Roads

Rajasthan - Jodhpur - Luni- Subdand

Road Network – For identification of roads that are frequently used and are to be upgraded

1. Cart track to be metalled/ made as pucca road
2. Not many metalled roads in the vicinity
Bhuvan

The Gateway to Geospatial World

Developed with Open source Solutions

National Remote Sensing Centre
Indian Space Research Organization
Department of Space, Hyderabad

www.bhuvan.nrsc.gov.in
## Bhuvan – At a glance

<table>
<thead>
<tr>
<th><strong>Satellite Data</strong></th>
<th>1m (269 Cities) , 2.5 m (32 States)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Map</strong></td>
<td>Scale based (1:50,000 to 1:10,000)</td>
</tr>
<tr>
<td></td>
<td>1:10,000 : - 95% of India from SIS-DP</td>
</tr>
<tr>
<td></td>
<td>and 152 towns from NUIS Projects</td>
</tr>
<tr>
<td><strong>Thematic Maps</strong></td>
<td>15 Themes with Web Map Services</td>
</tr>
<tr>
<td><strong>Data Download</strong></td>
<td>Total downloads : 4.7 Lakhs</td>
</tr>
<tr>
<td></td>
<td>Nices Products : 30,000+</td>
</tr>
<tr>
<td><strong>Disaster Support</strong></td>
<td>6 Disasters, NRT Support for Cyclone, Flood, Landslides, Forest fire</td>
</tr>
<tr>
<td></td>
<td>• Live Map Upload from DSC,</td>
</tr>
<tr>
<td></td>
<td>• Automated Forest Fire Alert</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>75</td>
</tr>
<tr>
<td><strong>State Portals</strong></td>
<td>30</td>
</tr>
<tr>
<td><strong>Ministry Portals</strong></td>
<td>22</td>
</tr>
</tbody>
</table>

**Data**
- 18 TB of 6 sensors
- Web Apps 75+
- Maps From Data 32
- Services WMS 6204
- Crowd Sourcing 4 Million

"Open Source Geospatial Approach & OGC compliance Services"
1 m Meter Resolution
212 cities
Bhuvan
Crowd Sourcing

Field Survey
Disaster Damage
Watershed Monitoring
Incident Reporting
Disaster Management Support Services

- Drought
- Flood
- Forest Fire - Daily
- Cyclone
- Landslides
- Earthquake - (Feed USGS)

IMD – Fog, Thunderstorm

Flood Layer
Flood hazards zones
Forest Fire Regime
Satellite based AIBP Project Monitoring

About AIBP
AIBP Phase - I
AIBP Phase - II
AIBP Phase - III (Online)

State: Andhra Pradesh
River Basin: East Flowing
Irrigation Project: Gundlakamma

Physical-Financial Progress

Physical and Financial Progress

Physical Programme of AIBP Components

<table>
<thead>
<tr>
<th>S.No</th>
<th>Item of AIBP</th>
<th>Estimated Quantity</th>
<th>Quantity Executed</th>
<th>Balance</th>
<th>Programme</th>
<th>Year</th>
<th>Q1 Program</th>
<th>Q2 Program</th>
<th>Q3 Program</th>
<th>Q4 Program</th>
<th>Split/Over</th>
</tr>
</thead>
</table>

No records to view

Export CSV file

Close
Monitoring and Evaluation of Watersheds

Department of Land Resources, Ministry of Rural Development

Summary of the Microwatersheds can be obtained State-wise, Year-wise, District-wise.

Select Microwatersheds by navigating through selection of State->Year->District to get the Details and Layers available.

Microwatershed Legend
- PREPARATORY
- WORK
- CONSOLIDATION

Monitoring and Evaluation
A Web based GIS application (Geoportal) enabling the monitoring and evaluation of IWMP watersheds, using satellite remote sensing and sample field data using mobile smart phone applications has been realised. This Geoportal facilitates M&E of all IWMP watersheds for 10 states and 50 special watersheds in 15 states.

Salient Features
- The geoportal enables image and map display, monitoring tools, summary statistics of all the IWMP watersheds.
- The application enables National, State, District and watershed level access for information and report generation.

Login as:
- Administrator Module
  - DOLR
  - SLNA
  - WCDC
- Data Provider Module

Download
Field Data Collection App for Android
Smart phone App for online Field data collection.
NRSC Open EO Data Archive (NOEDA)

A new initiative to download IRS satellite data products.

- Cartosat-1: DEM: 1 arc Sec
- Resourcesat-1: AWiFS Ortho (2008, 2009): 56m
- Resourcesat-1: LISS III Ortho (2008-09): 24m
- Metadata NSDI 2.0
- Select Area based on ‘Bounding box, Mapsheet (SOI), Tiles, Interactive Drawing’

-BHUVAN
Space Inputs, Spatial Enablement and G - Governance

Thank you