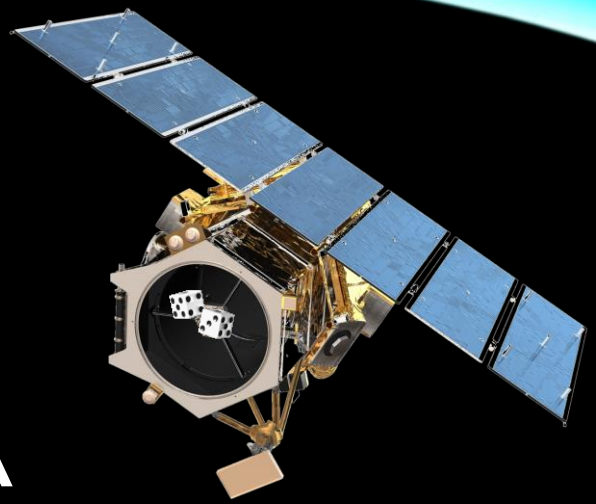


VILLAGE/GP LEVEL DATA CAPTURING USING HR RS DATA

Dr. Debajit Mishra

Odisha Space Applications Centre

NSDI PROGRAM – NFSD

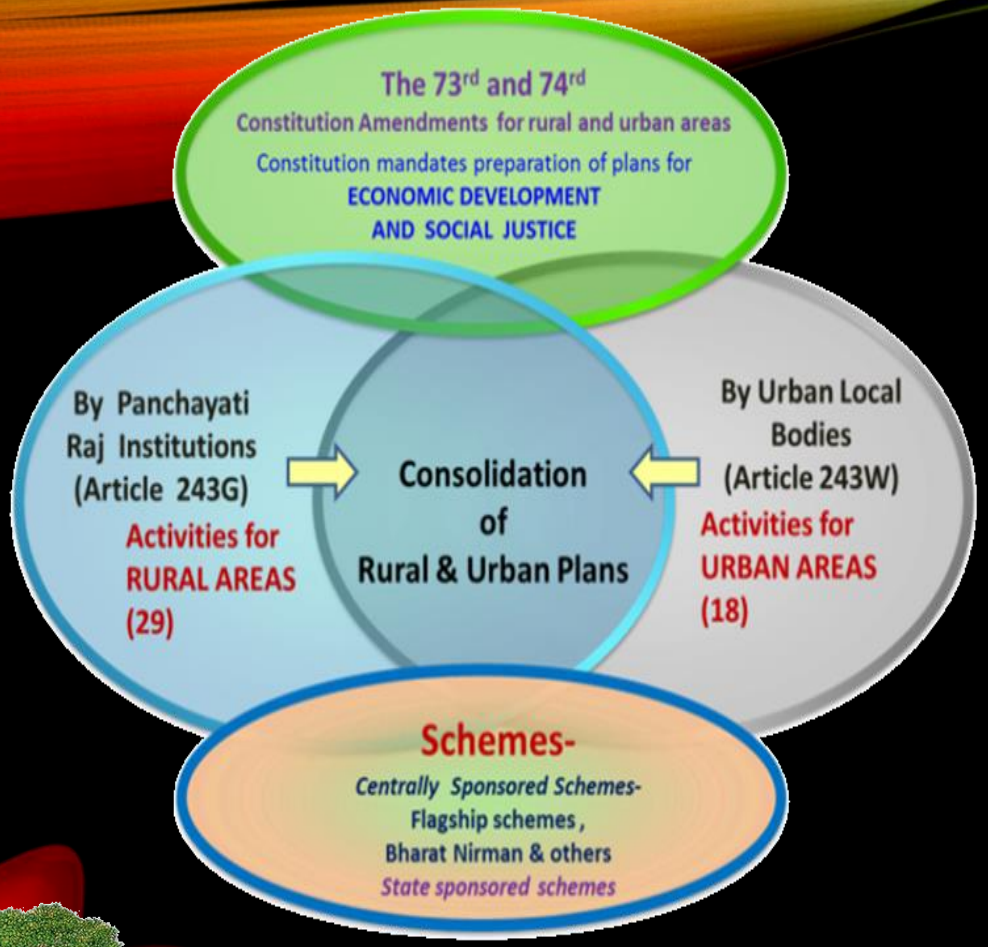
Generation High-resolution National Foundation Spatial Data (NFSD) --as a set of reference spatial datasets for the GP/Village/Ward level development planning and scheme implementation.

Cadastral scale data generation.

NSDI-SDI HAVE NOW ESTABLISHED DATA FRAMEWORK-
New Requirement NFSD

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

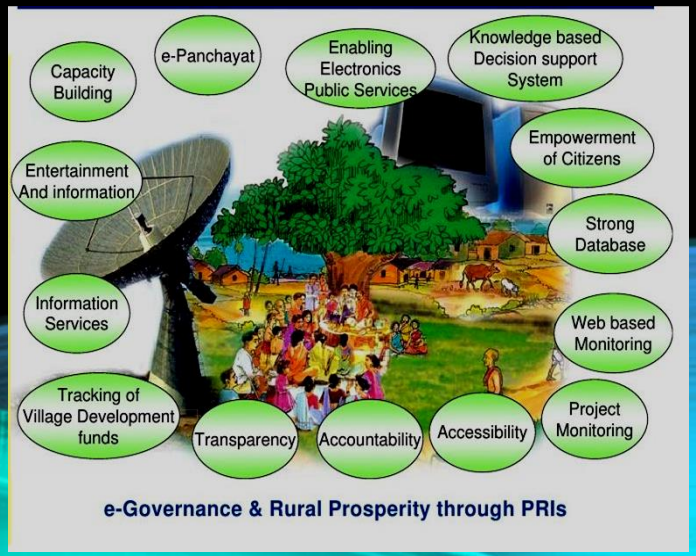
Why at GP/Village & Plot Level ?



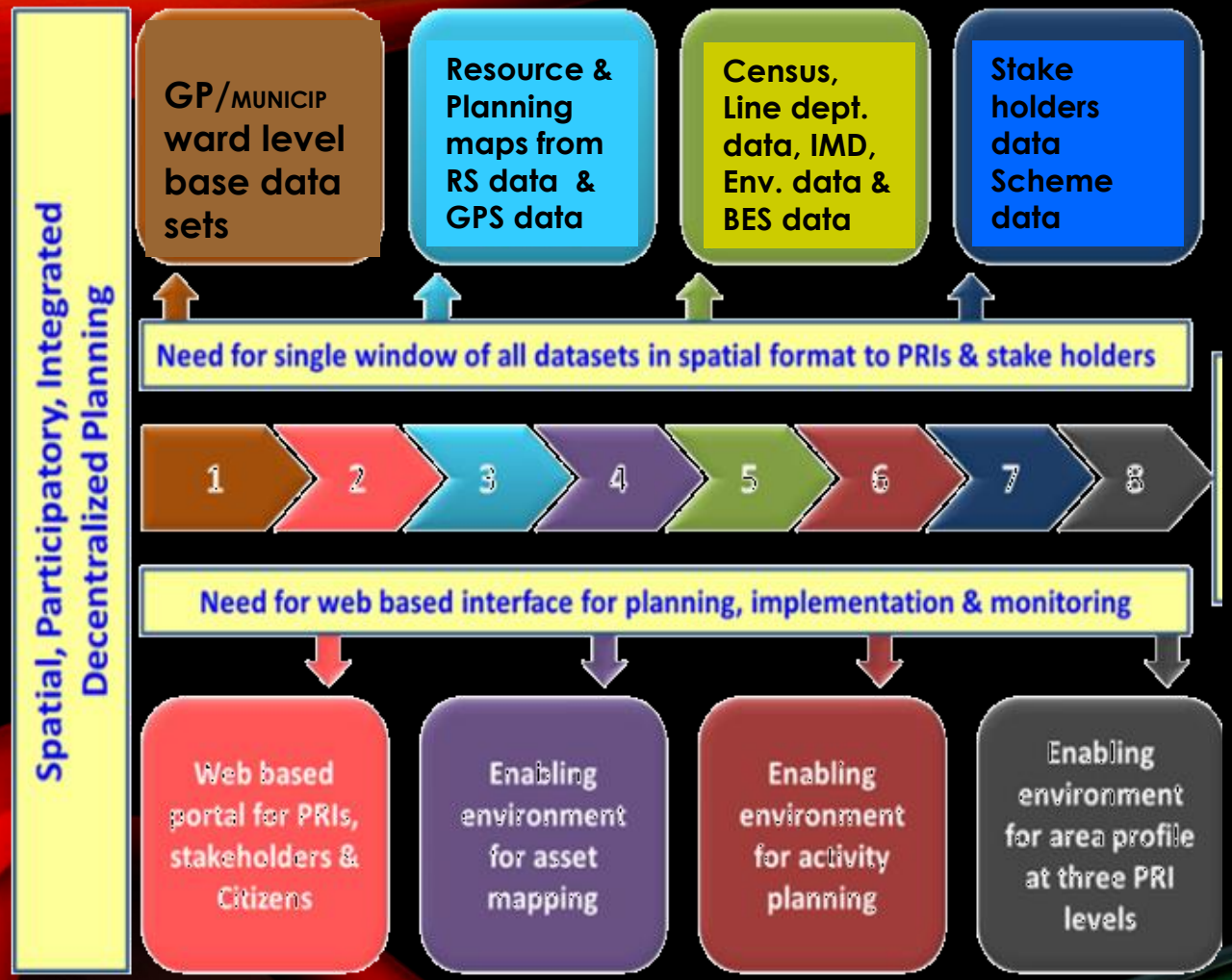
Decentralized Planning for rural and urban areas & consolidation

Dr Debabrata Mishra, Scientist/Project Coordinator, ORSAC

Constitutional mandate to generate data at local level for development planning and scheme implementation



NFSDI-EMPOWERING THE DECISION MAKERS & CITIZENS



Data sets
to be uploaded in the **State Spatial Data Infrastructure** and
will be shared to all the departments of government as web-services
(wms, wfs & wcs etc.)
depending on **application requirements.**

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

DATA REQUIREMENT AT GP/VILLAGE LEVEL

Land use data

- Extent of land under forest, Cultivation, water use and built-up structures etc.
- Extent of Govt. and Panchayat land
- Total irrigated area, Unirrigated area, Culturable waste and area not available for cultivation
- Area under green/heritage/ conservation zone

Natural resources Data

- Soil, Physiography, Surface & Groundwater , Biomass & Slope etc.

Topographic data

- DSM/ DTM/Slope etc. Contour, Spot heights, geo-coordinates

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

DATA REQUIREMENT AT GP/VILLAGE LEVEL

1.Census, Infrastructure, Scheme, Planning and Development data

- **House hold data** (Area, Number, size etc.)
- **Population** (Type, local enumeration)
- **Occupational data**
- **Education facilities** (Number, infrastructure, attendance, Midday meals, distance)
- **Medical facilities** (Type, Distance, Specialty, infrastructure, welfare schemes)
- **Drinking water facilities** (households covered, Tap, well, tank, TW, open source)
- **River water, Canals, Lakes & Spring**
- **Post, telegraph and telephone facilities**
- **Approach to villages** (Metal, CC, BT, Mud, earthen)
- **Communication facilities** (Bus, train, waterway--type & frequency)
- **MSME Data**

- **Banking facilities** (Number, range, type & schemes)
- **Co-operative & Credit societies**
- **Number of SHGs**
- **Recreational and cultural facilities** (Sports/Cinema/Stadia)
- **Television connections** (HH connected)
- **Distance to nearest town**
- **Power supply**
- **Number of business connections** (rice mills, flour mills, shops, etc)
- **Number of community establishments**
- **Income and expenditure of the village**

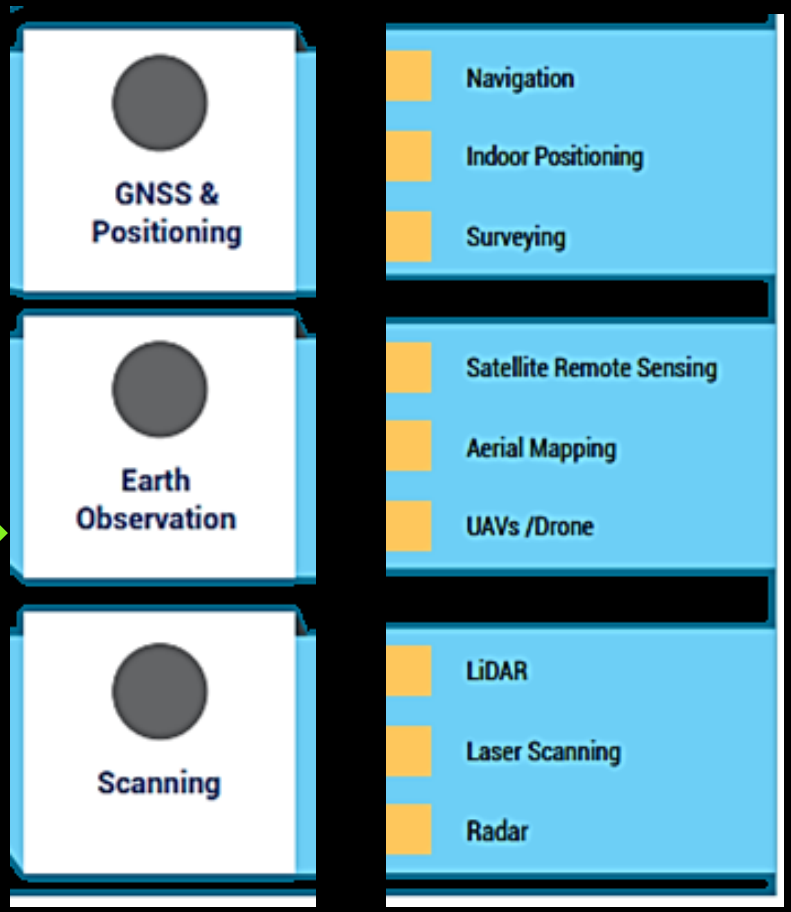
2.Central and State sponsored scheme data

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

LOCAL LEVEL DATA COLLECTION METHODS

- ❑ Village & House hold basis survey
- ❑ Participatory resource & CPR mapping
- ❑ Panchayat record/ Tehasil/ BES data
- ❑ Third party survey
- ❑ Data collection through RS data & field support services
- ❑ Mobile/LBS services



Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

TECHNOLOGIES FOR VILLAGE LEVEL DATABASE CREATION

EO technology-
REMOTE SENSING

for spatial data acquisition and information generation

Geospatial technology

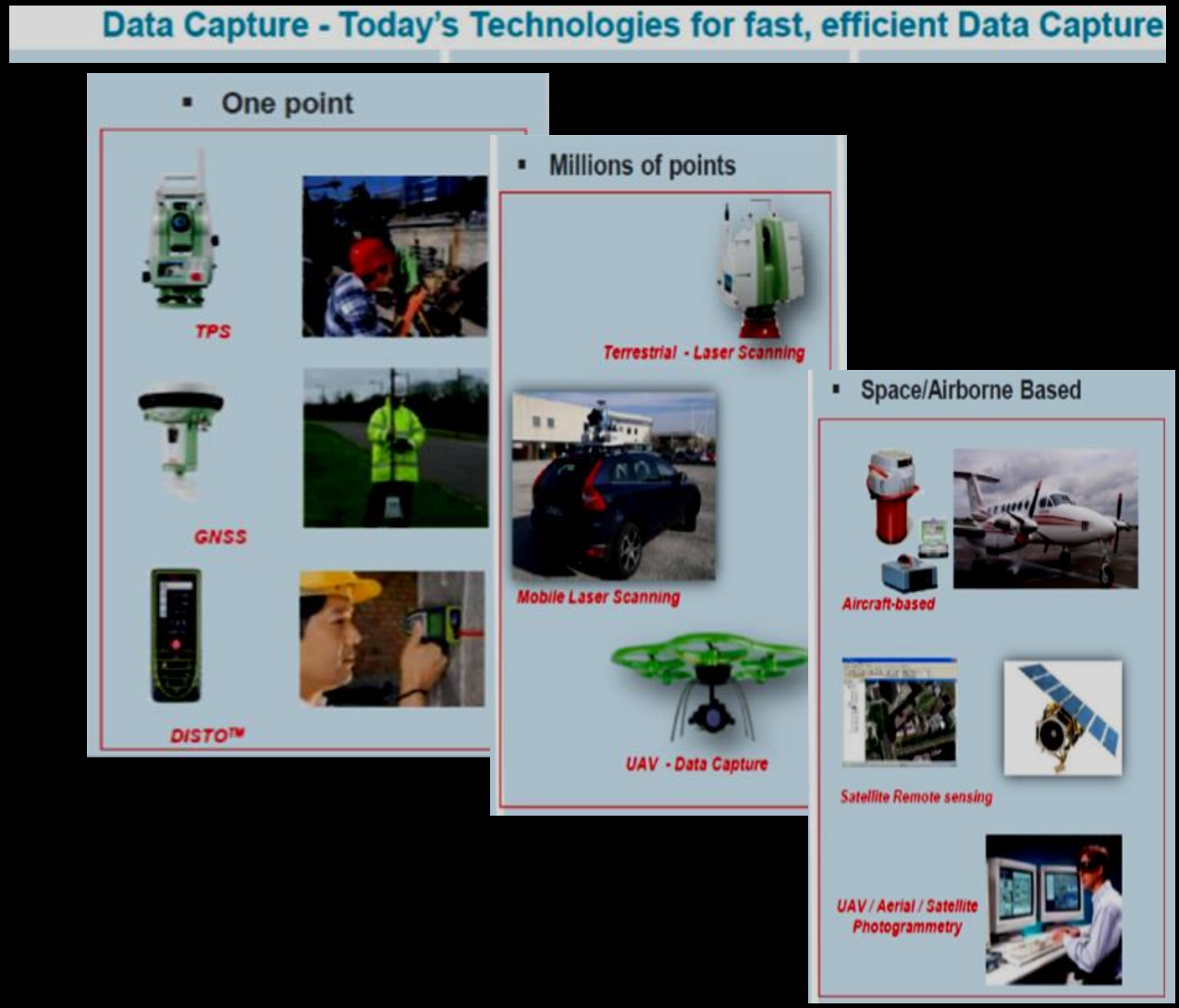
for spatial & statistical data integration, analysis, trend analysis and modeling.

GPS (Global Positioning System)

for topographic, spatial and attribute data acquisition.

ICT technology (Web services, Data analytics, Cloud, Bigdata, IoT)

for database development, data dissemination, data mining, interoperability and production.



Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

EMPOWERING THE CITIZENS: DATA & ENABLING ENVIRONMENT

Earth observation plays a key role in community driven management and acquires special importance in the context of decentralized planning.

Observations of the Earth system constitute critical input for advance understanding towards local planning by providing information, measurements and quantifications of natural or manmade phenomena.

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

EMPOWERING THE CITIZENS: DATA & ENABLING ENVIRONMENT

- **Earth Observation and Spatial Planning**
- The synoptic view provided by satellite imagery
  - for quick and reliable mapping
  - Monitoring --natural resources & Geo-environment both in space and time domain.

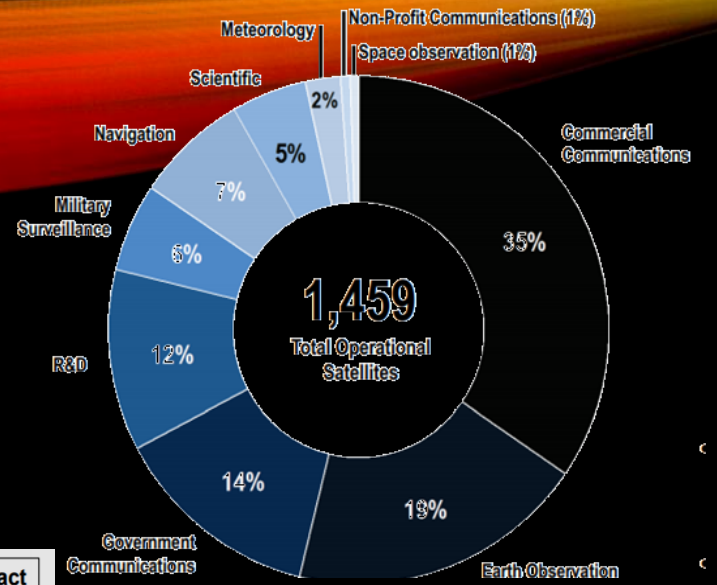
  ❑**RS & GIS technologies** -- creating various resource information layers along with regular updates.

- The illustration through GIS is an innovative approach for planning process and strategy for
  - economic development,
  - disaster management and
  - human welfare

  same datasets could be used for all tiers of integrated decentralized planning by data aggregation at different scales.

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

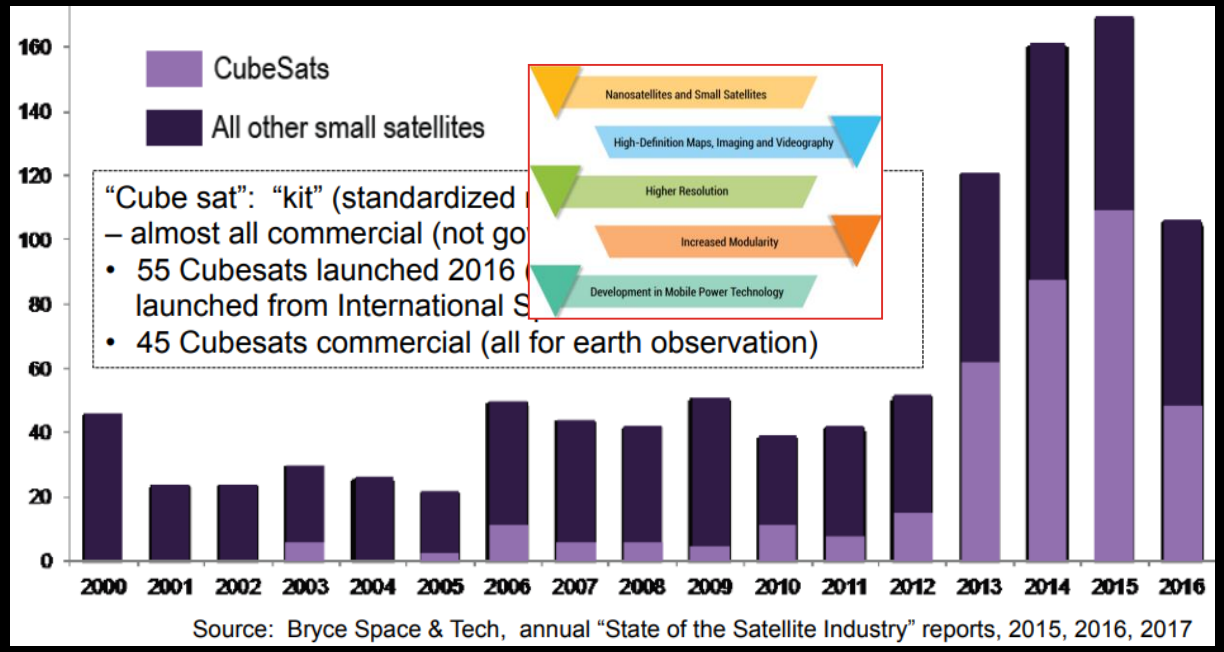
RS BASED DATA CAPTURING



Satellite services global growth ($ bn)

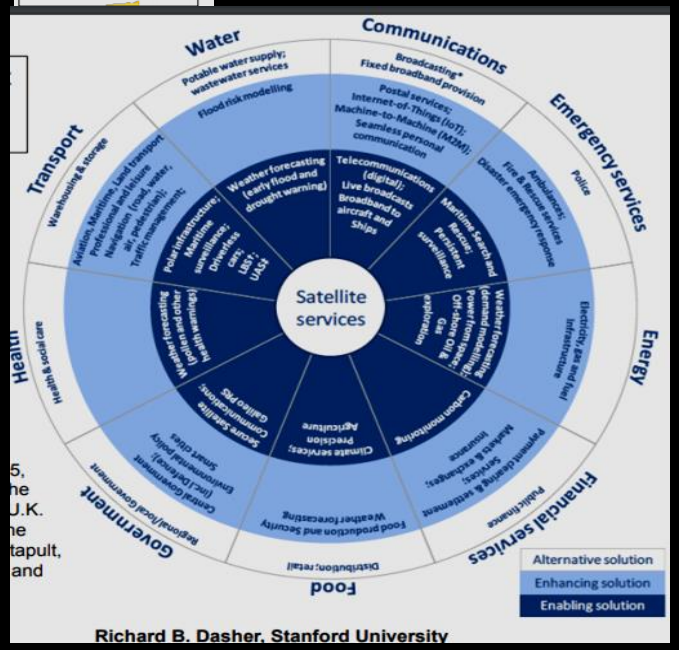
	2014	2015	2016	2017	2018
Mobile	2.4	2.6	3.3	3.4	3.6
Earth observation	1.3	1.5	1.6	1.8	2.0

Small Satellites launched 2000-2017)

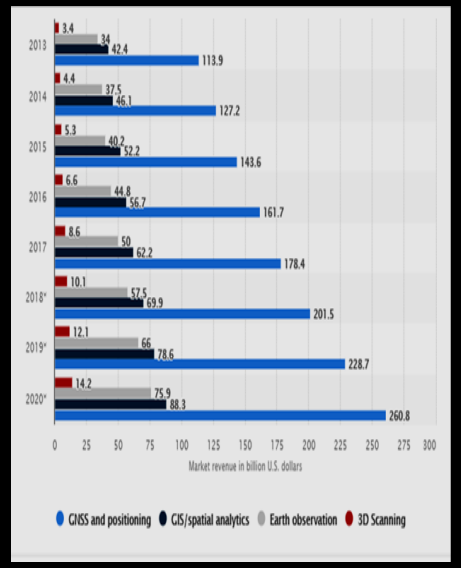


Source: Bryce Space & Tech, annual "State of the Satellite Industry" reports, 2015, 2016, 2017

Broader impact of satellite services



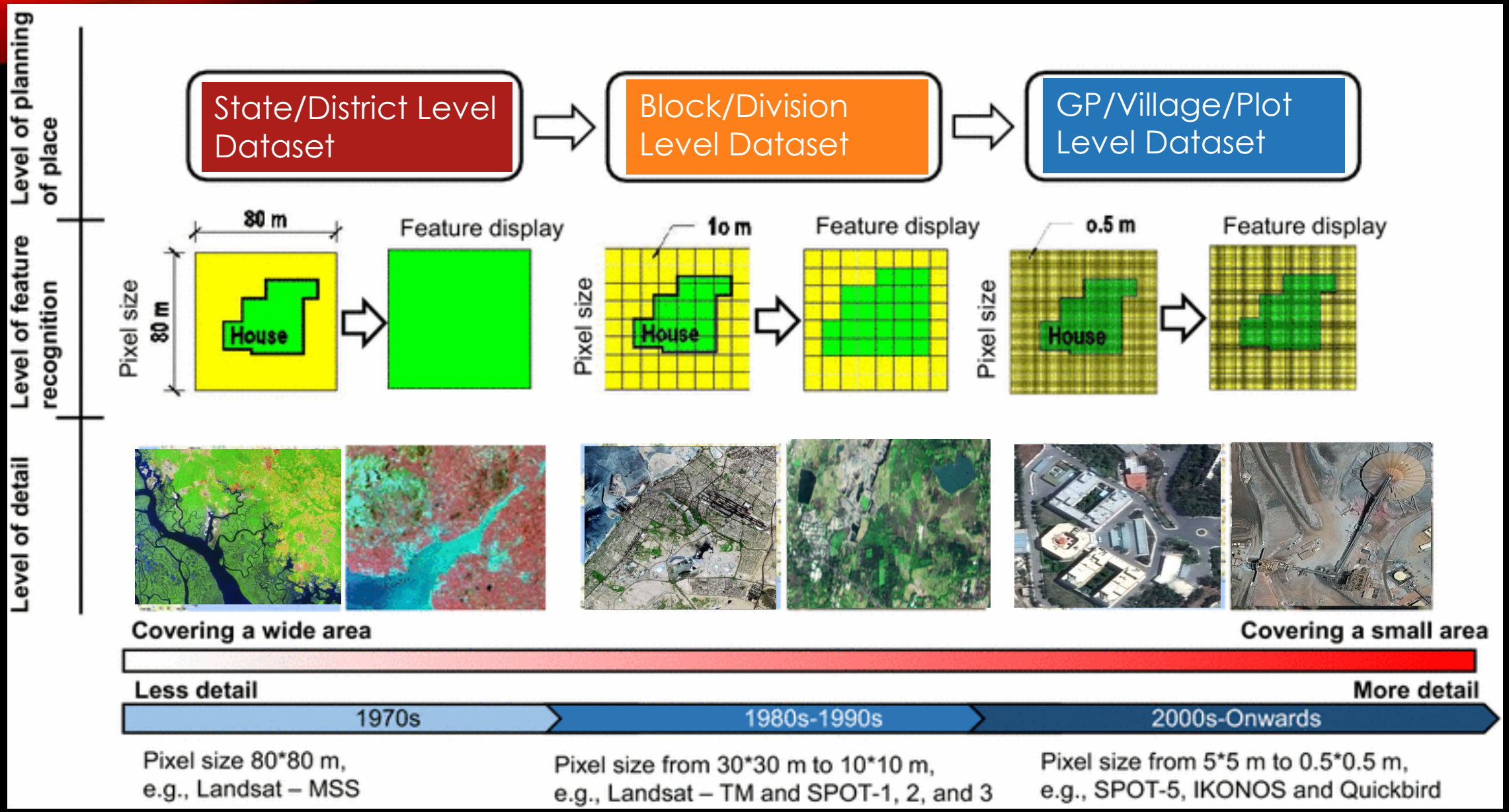
Richard B. Dasher, Stanford University



State of Space Agency Report 2017

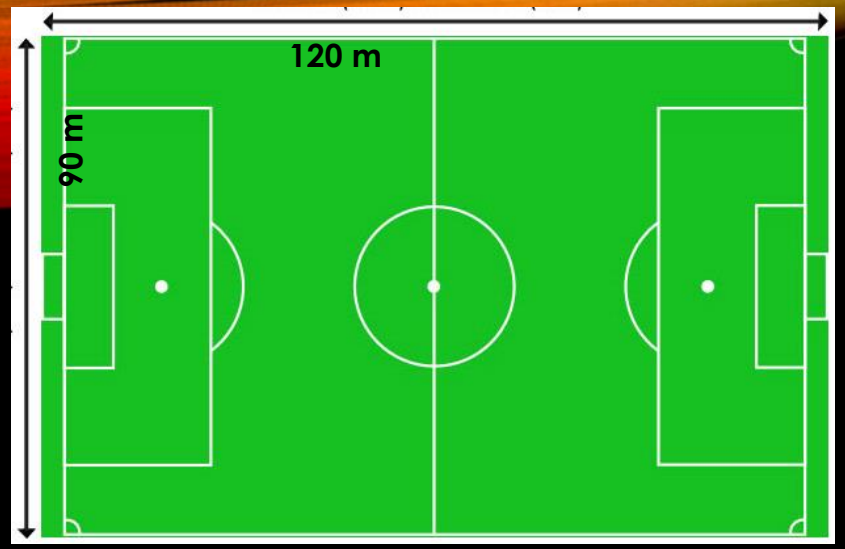
Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

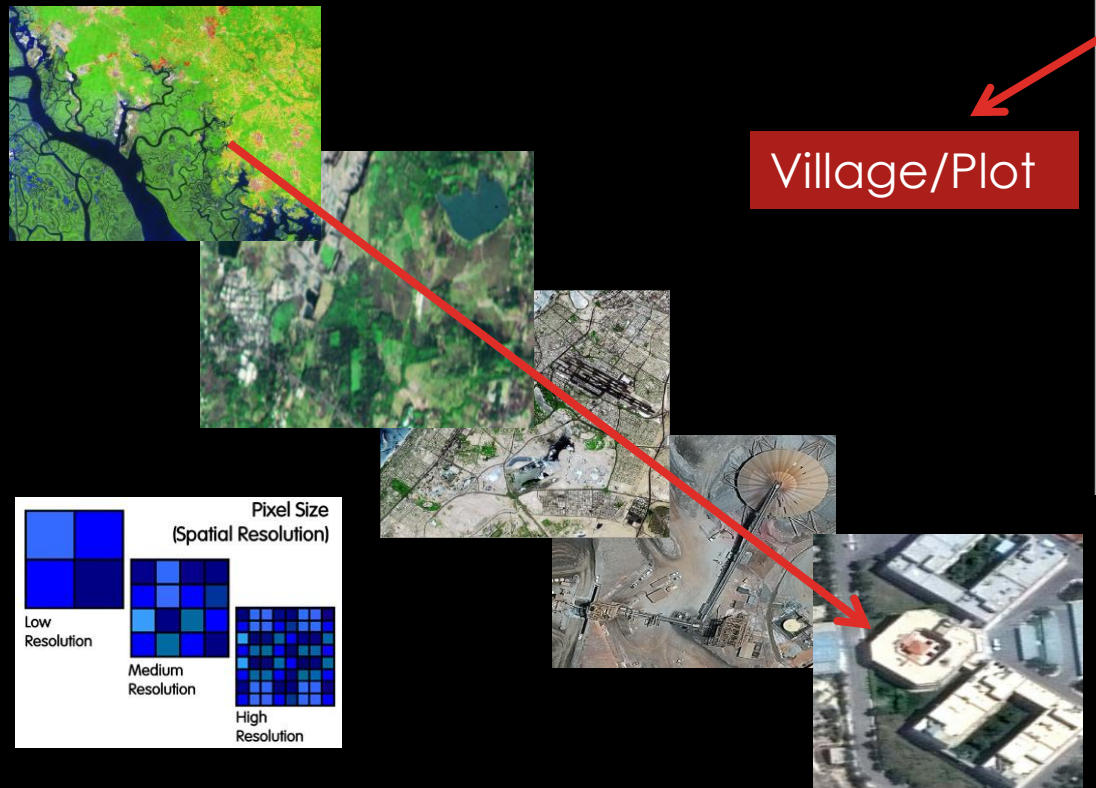
WHAT IS HR RS DATA

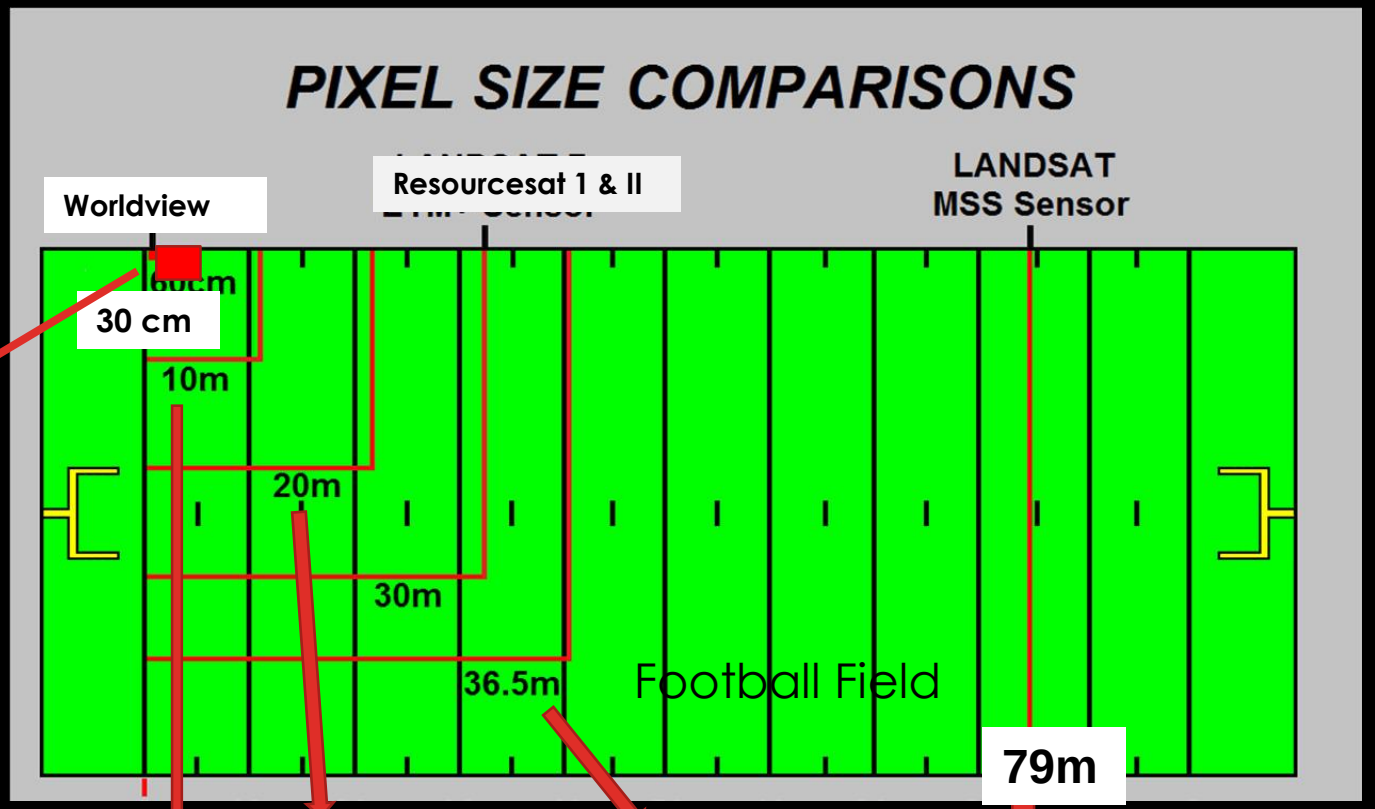


Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

WHAT IS HR RS DATA







Village/Plot

City/Town

District

State Dataset

Municipality

Block/Tehesil

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

HR RS DATA USE IN ODISHA

•EVERY 22 DAYS IMAGING

•1:50K SCALES

•DETAILED RESOURCES SURVEY

District-level applications

0.6 m

•EVERY 5 DAYS IMAGING

•1:12500 SCALES

•LARGE SCALE MAPPING

•STEREO CAPABILITY

Block-level applications

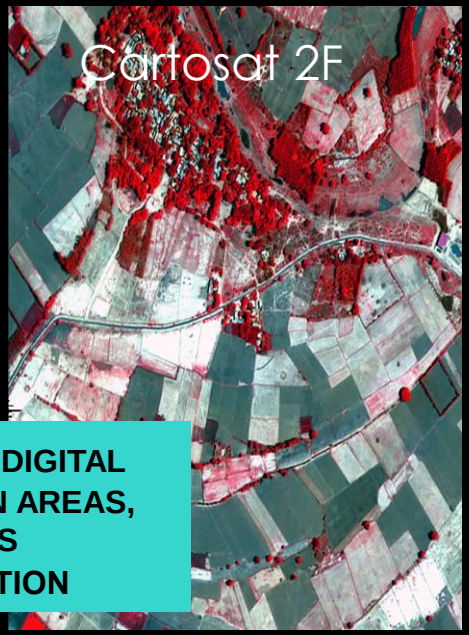
Indian satellites

for planning activities at Country, State, Block, Gram-Panchayat, Village, Micro watershed, Plot level information generation

•LOCAL AREA IMAGING

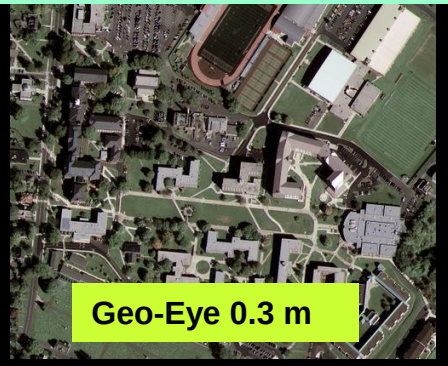
•STEREO CAPABILITY

Town-level applications



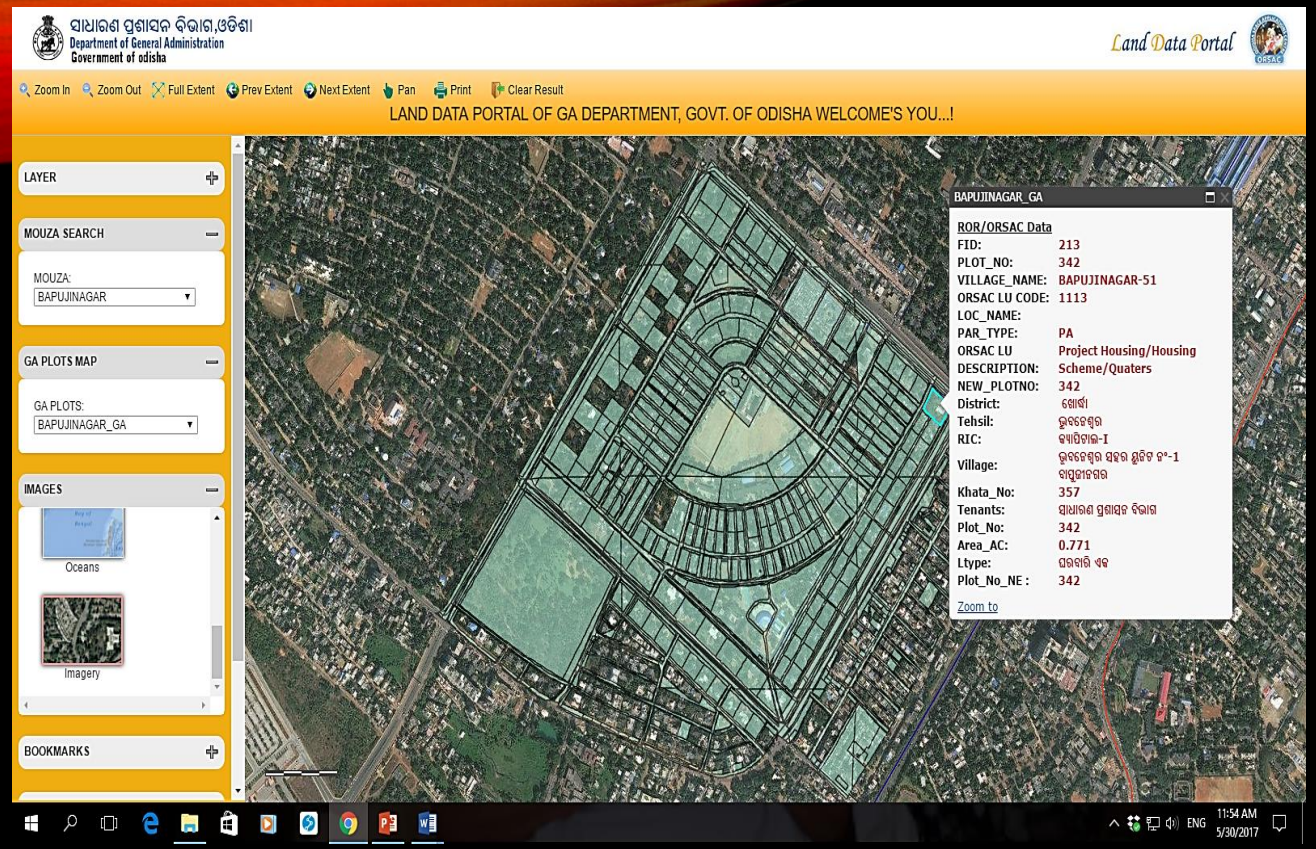
Cartosat Data UNDER USE FOR DIGITAL DATABASE GENERATION OF URBAN AREAS, WATERSHED, VILLAGE LEVEL MAPS USED FOR 'ODISHA SAMPAD' CREATION

USED FOR DIGITAL DATABASE GENERATION OF TOWNS, CADASTRAL & MINES SURVEY



Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

CADASTRAL SCALE BASE DATA CAPTURE FROM HR ORTHOIMAGE



GEOREFERENCED CADASTRAL MAP DATABASE OF ENTIRE STATE IS CREATED AND USED FOR PLANNING PURPOSES

DGPS BASED COORDINATE COLLECTION/ CONTROL NETWORK ESTABLISHMENT

↓

ORTHOIMAGE CREATION

↓

GEOREFERENCING OF CADASTRAL MAP/PLOT SUBDIVISION UPDATION

↓

CADASTRAL SCALE BASE FOR THEMATIC LAYER CREATION

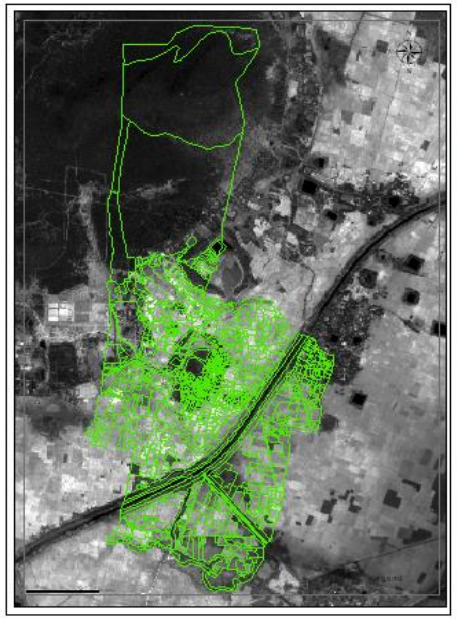
↓

GIS DATABASE CREATION

NLRMP CADASTRAL RESURVEY MAPS –REVENUE MEASUREMENT

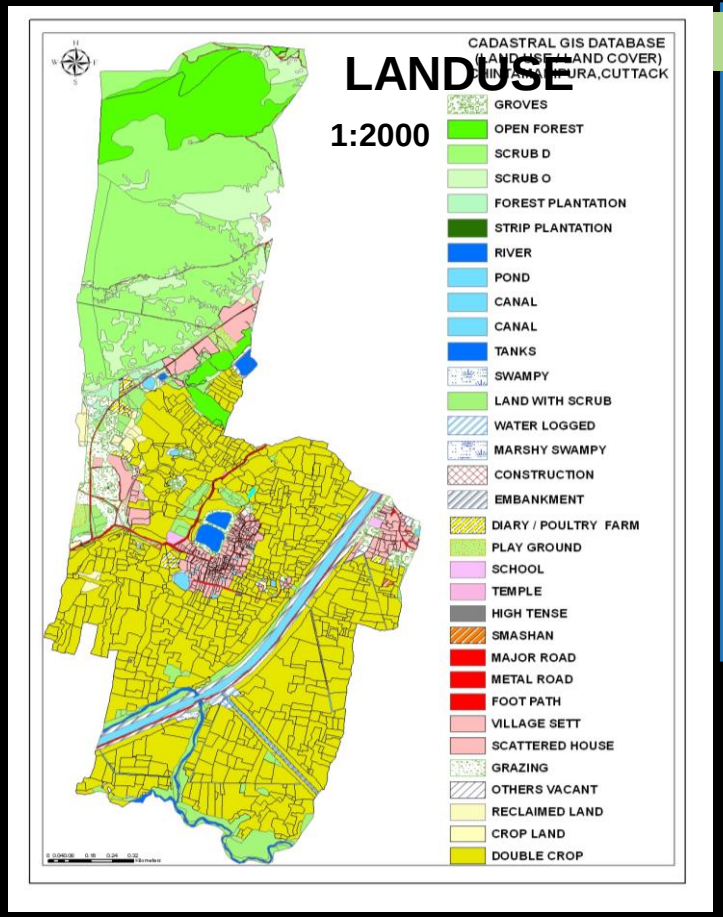
Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

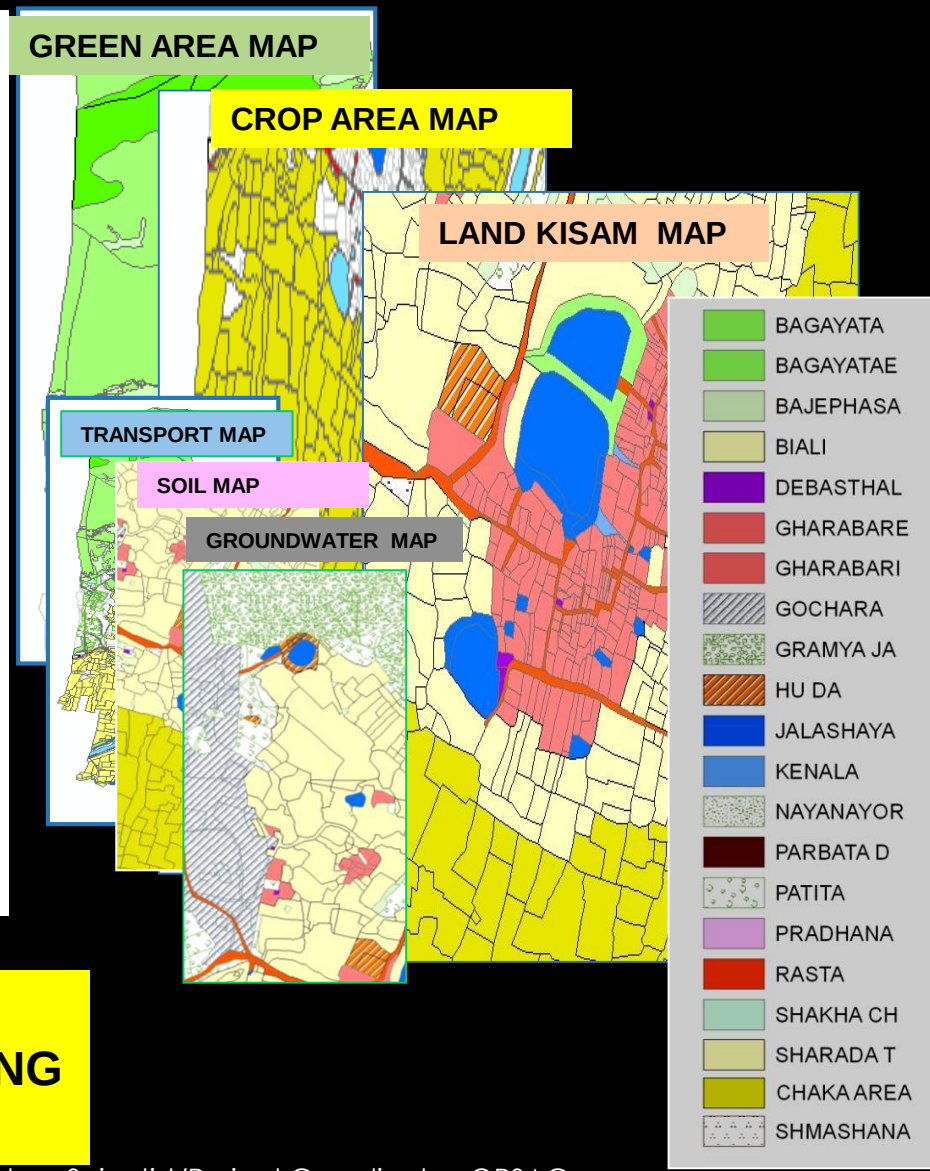
CADASTRAL SCALE THEME DATA CAPTURE FROM HR ORTHOIMAGE



Worldview 0.5 m-PAN

Worldview 2.5 m-MX

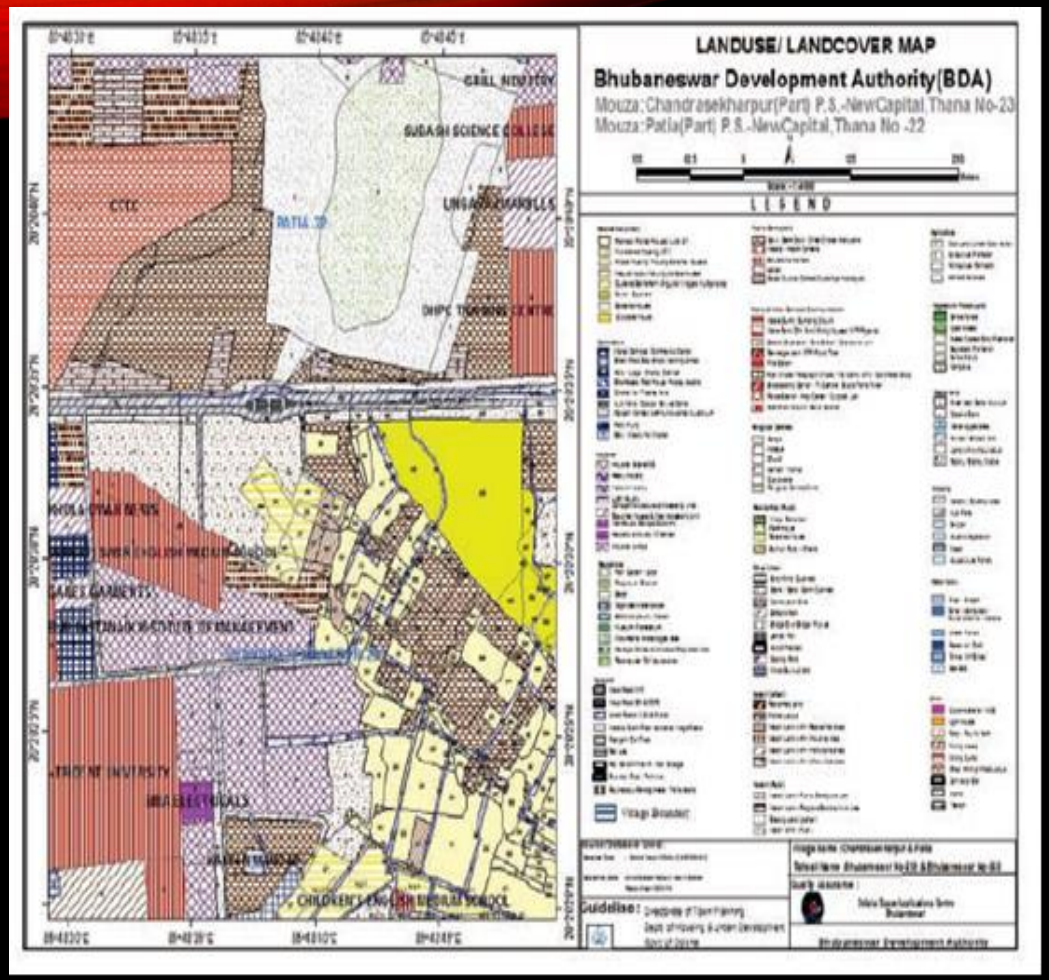




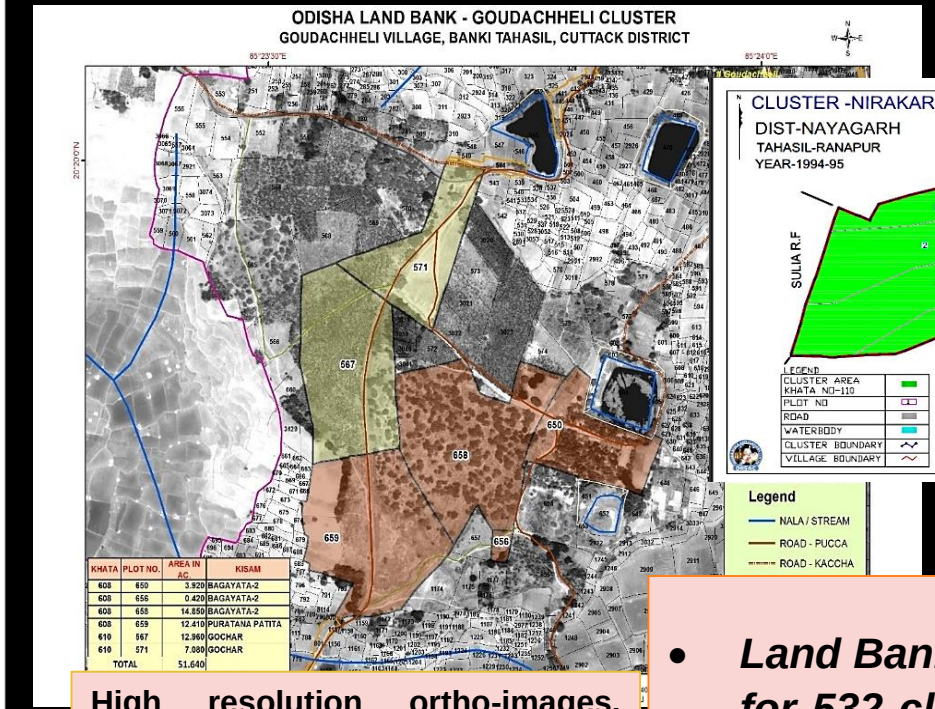
ENTIRE STATE GEOREFERENCED CADASTRAL SCALE LANDUSE MAP IS PREPARED ALONG WITH GEOCDDED POINT DATA LINKING ON PLOT BASIS

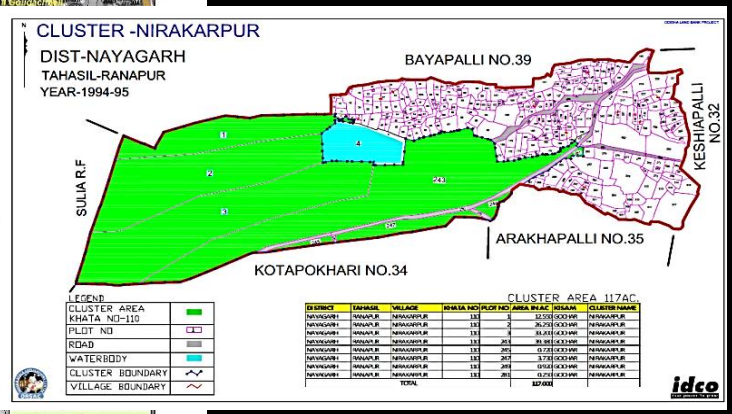
Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

CADASTRAL SCALE THEME DATA CAPTURE FROM HR ORTHOIMAGE



1: 4000 SCALE URBAN LANDUSE MAP PREPARATION OF 59 TOWNS



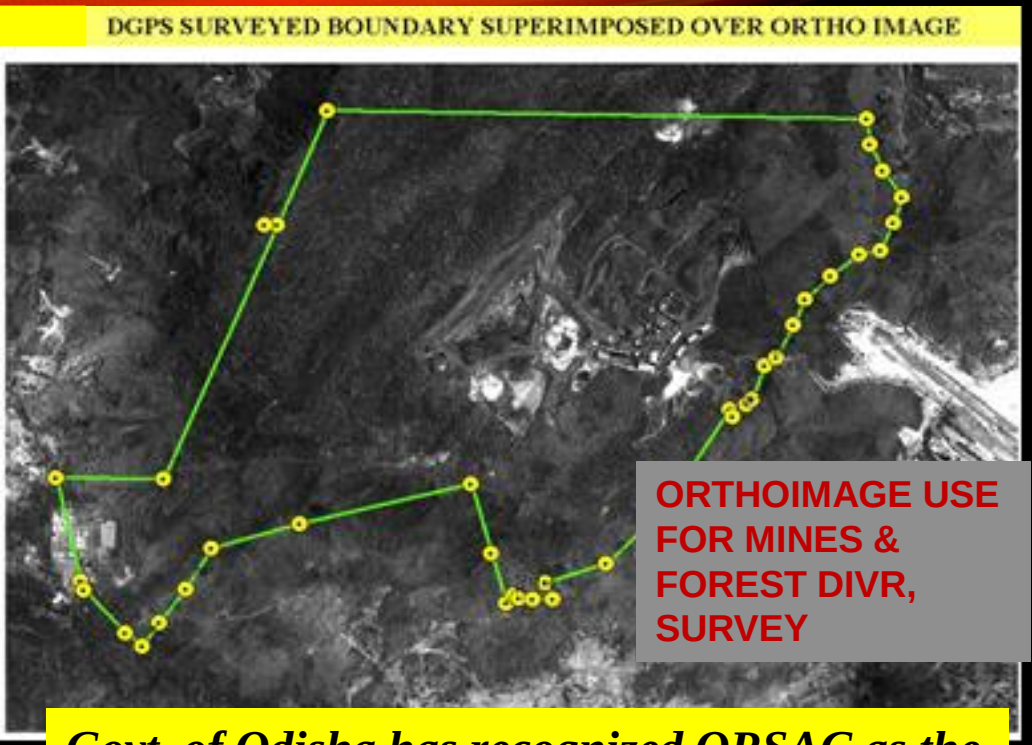


High resolution ortho-images, geo-referenced digital revenue cadastral datasets, Bhu-lekh RoR data, satellite derived spatial datasets and attribute datasets of industry department are used to create the Web base repository of state land bank.

- ***Land Bank maps and land schedule for 532 clusters comprising 124000 Acres has been web-hosted and the hard copies are provided to IDCO for submission for alienation purposes.***

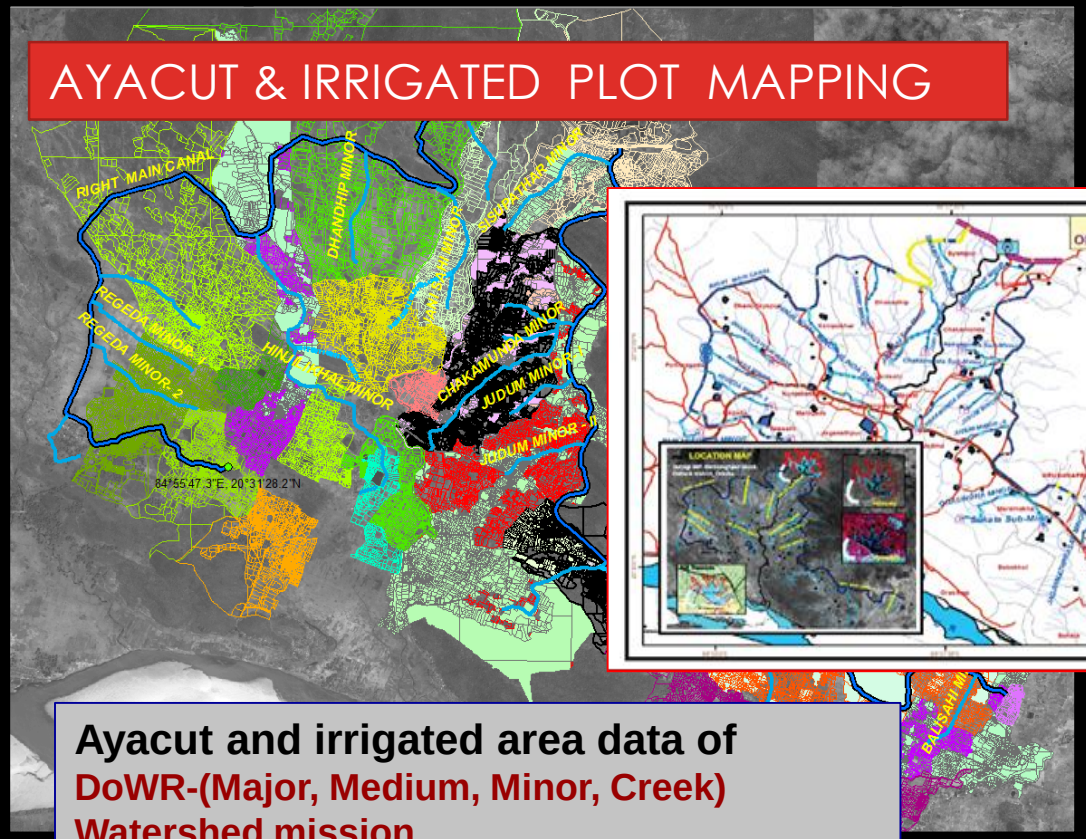
Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

CADASTRAL SCALE THEME DATA CAPTURE FROM HR ORTHOIMAGE



ORTHOIMAGE USE FOR MINES & FOREST DIVR, SURVEY

Govt. of Odisha has recognized ORSAC as the Nodal Agency for the purpose of DGPS Survey to facilitate digitization and geo-referencing of mining lease maps. Joint survey involving Revenue, Forest, Mining & ORSAC officials are being carried out using DGPS/ETS and the final survey data are being validated in the ortho image.



Ayacut and irrigated area data of
- DoWR-(Major, Medium, Minor, Creek)
- Watershed mission
- OLIC- CLIP, Jalanidhi 2
- Mega Lift
- OAIC (jalanidhi – II) & CLIP
- Dep't. Of Horticulture
- ST & SC Dept. (ITDA)
- Panchayatiraj Dept. (DRDA)

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

DATA CAPTURE AT 1: 10,000 & CUSTOMISATION FOR DP

Collect

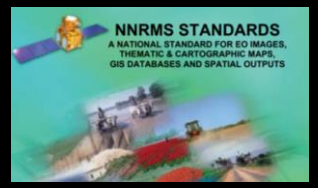
Transform

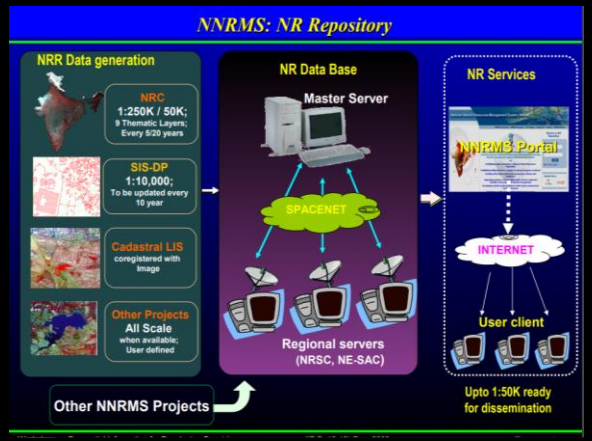
Visualize

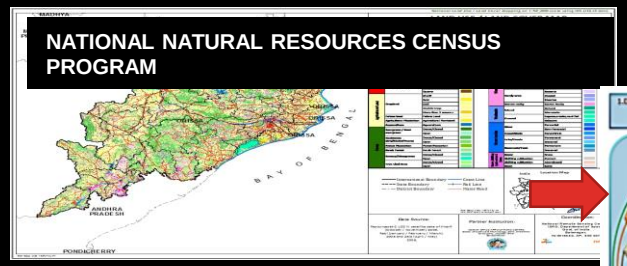
DATA DISSEMINATION & DSS CREATION FOR ODISHA STATE

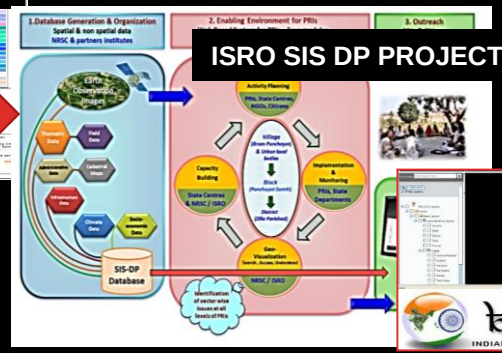
NRDMS

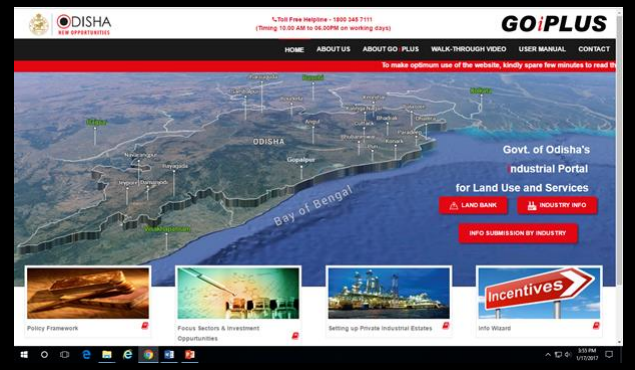
THE SPATIAL SUPPORT FOR LOCAL LEVEL PLANNING











Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

GEOSPATIAL TECHNOLOGY FOR RURAL AND URBAN DEVELOPMENT

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC

LINE DEPARTMENTS

PANCHAYATI RAJ DEPT.

- Indira Awas Yojana
- Cement concrete Road
- Backward Region Grant Fund
- Gopabandhu Grameen Yojana
- National Rural livelihood Mission
- Rajiv Gandhi Panchayat Sashaktikaran Abhiyan
- MNREGS

AGRICULTURE & FOOD PROD. DEPT

- FIAC Building
- Agro Service Centre
- Departmental Lab.
- Agricultural Farms
- Dealer Network for Fertilizers, Pesticides, Seeds
- Commercial Agri Enterprises

HOUSING & URBAN DEV. DEPT

- Water Supply
- City Bus Infrastructure
- Swerage Project
- JICA project

FOOD SUPPLY & CONSUMER WELFARE. DEPT

- Paddy Procurement
- Public Distribution

RURAL DEV. DEPT

- Rural Works
- Rural Water Supply

GEOSPATIAL PORTAL

SCHOOL AND MASS EDUCATION DEPT

- Mid Day Meals

WOMEN & CHILD DEV. DEPT

- Anganwadi

ST & SC DEV. DEPT

- Tribal School and Hostel Monitoring

WATER RESOURCES DEPT

- Deep Borewell Secha Karyakaram

FISHERIES & ANIMAL RESOURCES DEPT

- Brakish Water Shrimp Farm

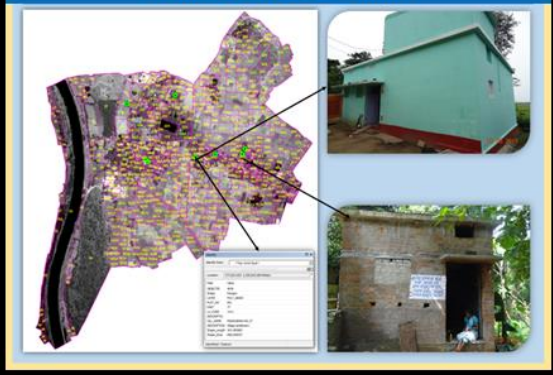
WORKS DEPT

- Works

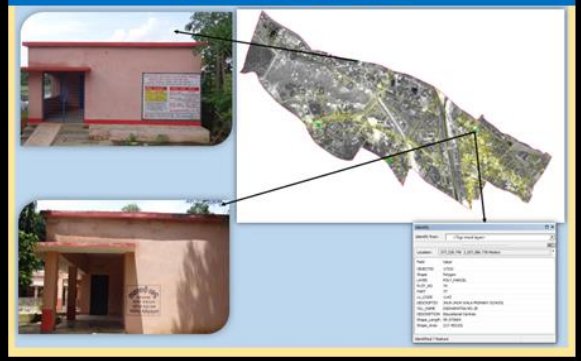
GEOSPATIAL DATABASE FOR DIFFERENT DEPARTMENTS

TUBEWELL INFORMATION SYSTEM

INDIRA AWAS LOCATION

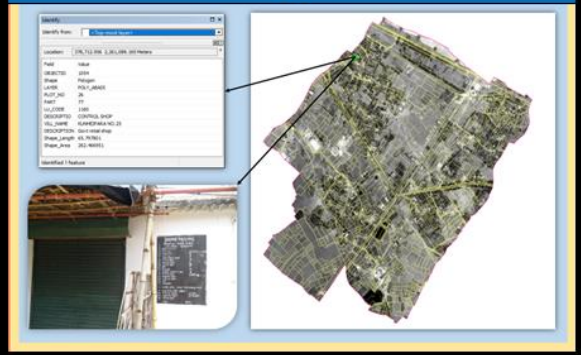


ANGANWADI CENTRE

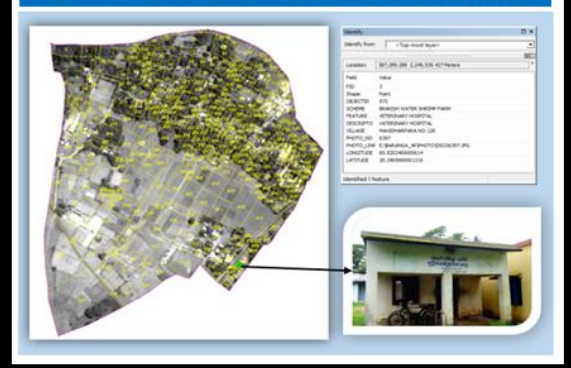


SCHOOL INFORMATION SYSTEM

PDS



ANIMAL HUSBANDRY & VETERINARY SERVICES



Thank you

djmishra@yahoo.com

Dr.Debajit Mishra, Scientist/Project Coordinator, ORSAC