

Annual Report

2016 - 17



Odisha Space Applications Centre

Department of Science & Technology

Government of Odisha

www.orsac.gov.in

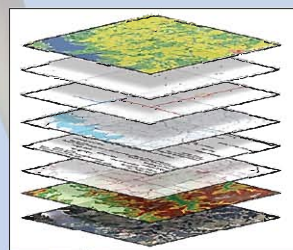
■
Nodal agency of the state in providing Remote Sensing, GIS and GPS applications solutions to all the departments / offices and agencies of the state.

■
Nodal agency of the State Government for the purpose of DGPS and ETS survey to facilitate digitization and Geo-referencing of mining maps.

■
Nodal agency of the state for submission of Geo-referenced digital data (using Geo-referenced image, ETS/DGPS survey outputs) for proposal submission to Central and State Govt. for diversion of Forest land for non-forest use under Forest Conservation Act. 1980

■
State centre for implementing projects of ISRO, Dept. of Space, Govt. of India in Odisha state.

■
Nodal agency for implementation of Odisha Spatial Data Infrastructure (OSDI) under Odisha State Data Policy-2015.





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IMPORTANT APPLICATION PROJECTS UNDERTAKEN DURING 2016-17



NATIONAL LEVEL PROJECTS

- Natural Resources Census (NRC) Landuse Project
- FASAL (Forecasting Agricultural output using Space, Agro-meteorology and Land based observations)
- Coordinated Horticulture Assessment and Management using Geoinformatics (CHAMAN)

CENTRAL & STATE JOINT PROGRAMMES

- NLRMP- (National Land Records Modernisation Programme) - Cadastral Resurvey & Updation
- Dissemination of Educational Services through EDUSAT
- Interactive training through GRAMSAT network
- Remote Sensing Application for Sericulture Development in Odisha

STATE SPONSORED PROGRAMMES

- Geo-spatial Technology for Rural & Urban development programme on web-GIS platform
- Cadastral level Geo-spatial Database generation (1:4K) for Odisha
- RS & GIS inputs for Comprehensive Development Plan (CDP) preparation of towns
- Odisha Land Bank Development
- Web GIS 'Odisha Sampad'
- Optical Fiber Cable (OFC) route plan for BBNL in Odisha
- GIS based Stage Carriage Permit Management System
- Survey and GIS referencing of Roads
- Odisha Police Information System
- Mining Lease Boundary survey through High-Tech method
- DGPS survey for Forest Diversion Proposals
- DGPS survey, Infrastructure and Land use mapping of OTELP/Power-GIS project
- GOiPLUS- Govt. of Odisha's Portal for industrial Land Use Services
- Plantation monitoring of Odisha State
- LIS-Land Information System for GA Dept. Govt of Odisha
- Property Tax Assessment of Bhubaneswar and Puri Municipal area
- Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), District Irrigation Plans
- GIS database of Irrigation Infrastructure of Odisha
- Climate Change-Assessment of erosion prone areas of Odisha State and Study of effects of erosion on coastal roads and settlement

IMPORTANT INITIATIVES 2017-18

- Web services for Land Bank data dissemination
- Geo-coordinate Library of Landmarks/important Locations of the State
- Updated Odisha Sampad on Internet
- Odisha Spatial Datasets Availability through 'BHUBAN'
- Utilization of 'RISAT all weather data & ISRO 'GAGAN' Network
- LIS for GA Dept. Odisha
- Extension of Edusat Network
- Establishment of Odisha State Spatial Data Infrastructure (OSDI)
- Industrial infrastructure data supply services through GOiPLUS
- Database for implementing Crop Technology Mission
- Survey and Mapping using Unmanned Aerial System (UAV)



**Chief Secretary, Govt. of Odisha
and Chairman, ORSAC**

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MESSAGE

It gives me immense pleasure to present the Annual Report of Odisha Space Applications Centre (ORSAC) for the year 2016-17, which incorporates its activities and achievements during the year.

ORSAC is the nodal centre for space technology applications in Odisha state. The Centre is engaged in harnessing space technology and geo-informatics for providing inputs to number of Government departments for various development planning activities and societal benefits. The major activities at present include projects related to mining joint survey, land bank development for industrial development planning and compensatory afforestation, mapping for connecting the remote habitations, survey and mapping of urban land utilization, sanitization of irrigated areas data and development of irrigated area GIS database of the state, survey for forest diversion proposals, input generation for forest Working Plan preparation, plantation monitoring, spatial database generation of police infrastructure, rice crop acreage and yield estimation and stage carriage database for transport etc.

It is important to mention here that the centre proved its excellence in bagging two prestigious international awards this year, The "Geospatial World Excellence Award" from The World Geospatial Forum and "Special Achievement in GIS (SAG)" Award from Environmental System Research Institute (ESRI), USA the e-governance applications developed under GOiPLUS for Industries Department.

The centre is now identified as an implementing agency for operationalization of "Odisha State Data Policy" approved by Govt. of Odisha. It is also establishing "Odisha Spatial Data Infrastructure" to attain ease of sharing of geo-spatial data and enhanced application of such geospatial data in development planning of the state.

I take this opportunity to record my appreciation for the dedicated work rendered by all the personnel of ORSAC.


(A.P. Padhi)



**Commissioner-cum-Secretary
Govt. of Odisha
Dept. of Science and Technology
Phone : +94-674-2536772**

MESSAGE

It is my privilege to present the Annual Report 2016-17 of Odisha Space Application Centre, an agency under Department of Science and Technology, Govt. of Odisha. In recent times, use of Remote Sensing and Geographical Information System for supporting public and program administration is gaining importance. Generation and analysis of Geographical information is vital to plan and implement the developmental programmes of the State. The report depicts summary of activities undertaken and significant achievements of the Centre in assisting the State administration. The center has done a commendable job in collection, analysis and dissemination of geographical information for the benefit of the Line Departments and people of Odisha.

ORSAC is the nodal agency of the state in the matters of providing Remote Sensing, GIS and GPS application solutions to all the departments/offices and agencies of the State. The center acts as nodal center of state for the purpose of DGPS and ETS survey to facilitate digitization and Geo-referencing of mining maps and for submission of Geo-referenced digital data for proposal submission to Central and State Govt. for diversion of Forest land for non-forest use. It also acts as focal point for ISRO, Dept. of Space, Govt. of India, towards implementing the ISRO/DoS projects in Odisha state with survey and mapping specifications and standard as per the guidelines / instructions of NRSC/SAC/ISRO, Dept. of Space, Govt. of India. The center is now identified as the implementing agency for operationalization of "Odisha State Data Policy" approved by the State Cabinet and for maintenance of "Odisha Spatial Data Infrastructure" under Dept. of Science and Technology.

I also take this opportunity to record my appreciation for the centre, for receiving two awards, viz. "Geospatial World Excellence award" from the Geospatial World Forum and "Special Achievement in GIS (SAG)" from The Environment System Research Institute (ESRI), USA during the year for commendable work done for development planning of the State using geospatial technology.

(V.V. Yadav)



From the desk of Chief Executive



It is my privilege to present the Annual Report of 2016-17 which reflects upon the significant achievements and contribution of the Centre in assisting the state administration in providing required geospatial data inputs for resources management and development planning. The year 2016-17 will go down in the annals of the history of the centre as a remarkable year for receiving two important world awards. The first one "The Geospatial World Excellence Award" to Odisha State by Geospatial World Forum (GWF), is meant for the organizations providing innovative application and development of Geospatial technologies for societal benefits. The forum conferred Geospatial World Excellence Awards, 2016 to GOiPLUS, project developed by ORSAC & Industries Department, Govt. of Odisha. The second award, "Special Achievement in GIS" (SAG) Award by Environmental Systems Research Institute (ESRI) is to highlight extraordinary achievements and efforts to improve our world. This is awarded to ORSAC for development of GOiPLUS (Government of Odisha's industrial Portal for Land Use and Services) project which is a web enabled platform to display real time information with regards to land bank, utilities and infrastructure around land banks besides information about existing industries.

As a multidisciplinary organization and in line with its mandate, the center is continuously engaged in providing support solutions for effective governance using remote sensing, satellite communication, geo-informatics, geo-ICT, satellite navigation and computer technologies. During 2016-17, the center provided datasets to state departments like Revenue and Disaster Management, Industries, Steel and Mines, Water Resources, Energy, Tourism and Culture, General Administration, SC/ST Development, Rural Development, Forest and Environment, Agriculture, Commerce and Transport, Housing and Urban development and Panchayatiraj Department etc. It is pertinent to mention here that this year the centre supported the state administration in providing spatial and geo-analytics inputs for remote areas connectivity status evaluation and planning. Further, the centre is identified as the agency for sanitizing the irrigated and agricultural area data of Odisha and development of Web-GIS portal on irrigation.

I take this opportunity to record my gratefulness to Shri A.P.Padhi, IAS, Chief Secretary who in his capacity as Chairman of the Centre has provided much needed direction and guidance for the growth of the center. I also thank the staff of the center for their contribution to the success of the organization in 2016-17.

(Dr. Sandeep Tripathi)



Administration

ODISHA SPACE APPLICATIONS CENTRE is acting as the apex body of the State for space technology applications and comprises of a pool of multidisciplinary application scientists to undertake remote sensing, GIS, GPS and communication technology applications. ORSAC has been appointed by the State Government vide resolution No.3765/ST dated 30th July, 2009 of the Science & Technology Department as the sole Nodal Agency for providing remote sensing, GIS, GPS and SATCOM application solution to all Govt. departments, public sector undertakings and other research organisations as per their requirements.

Mandate / Objectives

- Establishment of up-to-date library of satellite data, topo-maps, cadastral and Geo-coordinates for the State.
- Demonstration and operationalisation of space technology applications in State for several development planning activities.
- Supply of up-to-date accurate and geo-referenced database to all users of the state.
- Operationalisation of district / block / village level GIS database through internet / Web services.
- Participation in Remote sensing and SATCOM programmes of Indian Space Research Organization (ISRO), Department of Space, Govt. of India.
- Reaching quality teaching to school students uniformly across the state through EDUSAT network.
- Popularization of space technology through Space Information Centre and Vigyan Prasar program.
- Capacity building of Government employees in the use of Remote Sensing, GIS & DGPS.
- Implementing agency for "Odisha State Data Policy" and maintenance of Odisha Spatial Data Infrastructure.
- Demonstration of multi-disciplinary application projects for mapping, monitoring and management of natural resources and environment.

Resources & Infrastructure

Human Resources

24 Scientists and 46 Engineering/ Technical staff having specialization in optical and microwave Remote Sensing, Image Processing, GIS, ICT, Digital Photogrammetry, GPS & Computer Applications etc. having subject background of applied geography, geology, physics, botany, oceanography, marine science, mathematics and civil/mining/electrical engineering etc. are working now at the centre.

For completion of multiple sponsored projects, the centre have engaged 84 contractual staff (project scientists, project assistants, engineering assistants, MIS/CAD and GIS operators during, 2016-17.



Hardware / Instruments

Printer / Plotter	Nos.
Blade servers (2 x Intel Xeon Ten Core ES -2660 V3 @ 2 .6 GHz)	3
Blade servers (2 x Intel Xeon Eight Core ES -2650 V2@ 2.6 Ghz) / Super Micro Blade Server (Intel)	4/8
Rack Server (2 x Intel Xeon Processor ES -4620 v2@2 .6GHz)	6
Xeon based Tower Servers / Dell Rack Server	6/5
High -end Workstation for Digital Photogrammetry	4
High -end Desktop (Intel core -i5) with Graphics and 24" LCD Monitor	50
Desktop – Intel core -i5 / i3	22/18
Desktop – Pentium Quad core / Pentium IV	50 / 55
Storage	
On –Line Storage (36 TB) with Tape Backup System	1
Mini – Storage attached with Blade servers (9TB) / SAN Storage (Blade Server-16 TB)	1/1
Scanner / Printer / Plotter	
(VIDAR) AO Size (Titan H36) (colour / B&W)	2
Inkjet / Deskjet / Laserjet - A4 and A3	16
Multi Function Printer (Print, Scan & Copy)	3
Design Jet 4000 -AO (36 inch) / T 7100 – EAO (42 inch)	2
GPS/DGPS	
Hand held GPS (Garmin- 12)	21
DGPS (Base) + ROVER	4/10
ETS (Total Station)	2

Software

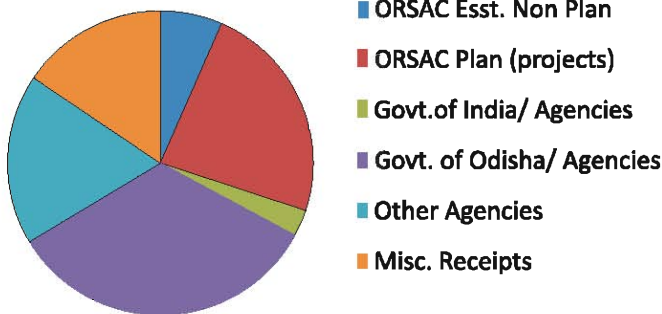
GIS	Nos.
Arc GIS (Workstation + Desktop) Version 10.3	24
Auto CAD + Auto CAD Map	1/1
Geomedia Desktop	2
Terrago Geo PDF (2D & 3D)	1
Image Processing	
ERDAS WITH LPS (Leica Photogrammetry Suite)	2/4
ENVI / TNT MIPS / ERDAS Apollo (Enterprize GIS)	1/1/1
Intergraph Geospatial Server 2015	3
Arc GIS Server	2
Others	
ORACLE lg R2/12c	1
Office Std SNGL OLP NL 2013 / 2016	3/2
VMware Virtualization Kit	1
SYMC ENDPOINT PROTECTION 12.1	11
EMS Tool (CA UIM)	1
RDBMS (+) MS SQL 2008 (2) ORACLE	1
Client Supporting / CITRIX	70



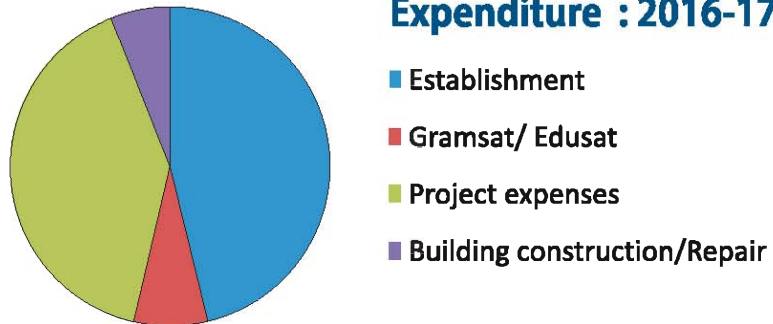
Accounts

Year (Rs. In Lakhs)	2012-13	2013-14	2014-15	2015-16	2016-17
RECEIPTS	2971.28	3112.57	3246.00	6211.46	4688.55
EXPENDITURE	2912.83	1761.25	2645.29	1588.67	2030.42

Receipts : 2016-17



Expenditure : 2016-17



Receipt

(Rupees in Lakh)

Schemes	Nature of funding	2012-13	2013-14	2014-15	2015-16	2016-17
ORSAC Esst. Non Plan	Grant-in-aid	309.00	309.00	309.00	309.00	309.00
ORSAC Plan (projects)	Projects	580.42	900.00	1146.12	1063.53	1100.00
Govt. of India / Agencies	Projects	117.10	195.28	318.86	595.70	131.33
Govt. of Odisha/Agencies	Projects	163.52	492.48	679.95	2339.71	1572.91
Other Agencies	Projects	1149.39	560.45	120.09	1157.19	845.61
Misc. Receipts		651.85	655.36	671.98	746.33	729.70
Total		2971.28	3112.57	3246.00	6211.46	4688.55

Expenditure

(Rupees in Lakh)

Head of expenditure	2012-13	2013-14	2014-15	2015-16	2016-17
Establishment	724.54	660.53	658.33	831.64	937.71
Gramsat/ Edusat	299.98	135.31	835.30	205.61	151.75
Project expenses	1888.31	869.18	1092.00	503.59	819.19
Building construction/Repair	000	96.23	5966	47.83	121.77
Total:	2912.83	1761.25	2645.29	1588.67	2030.42

Odisha Spatial Data Infrastructure (OSDI)

Odisha State Data Policy (OSDP) is approved by Govt. of Odisha vide Gazette of Govt. of Odisha Notification No.1270, 29th August 2015. ORSAC is the Nodal Agency of the Govt. of Odisha for implementing the policy in the state. Department of Science & Technology, Govt. of India has sponsored the Project to create Odisha Spatial Data Infrastructure(OSDI) in the line of National Spatial Data Infrastructure (NSDI) in the year 2015. The project duration is for three years and its budget is shared between GOI and State Govt. in 60:40 % ratio respectively.



In order to implement the Project i.e. "Development of Geoportal and Clearing house for Provision of Geospatial Information Services under Odisha Spatial Data Infrastructure (OSDI)"; thirty-five (35) Departments of Govt. of Odisha have identified their Nodal Officers to putforth the spatial data requirements and its use by the respective departments for their decision making process. The Centre conducted the first OSDI workshop during 4th -5th September, 2015 which was an appraisal about OSDI to the Govt. Departments before taking up the project. The second one was about the Awareness-cum-Requirement Workshop for the Govt. Departments, conducted on 4th November, 2016 and the third one, a one-day event organized on 7th April, 2017 involving the nodal officers of 35 Govt. Departments of Govt. of Odisha to finalise the data layers.

Milestones accomplished during 2016-17
 Selection of S.I through Tender Process
 Project Inception/ Planning / Requirement Analysis
 Preparation of real world object catalogue
 Conceptual Data Model development.

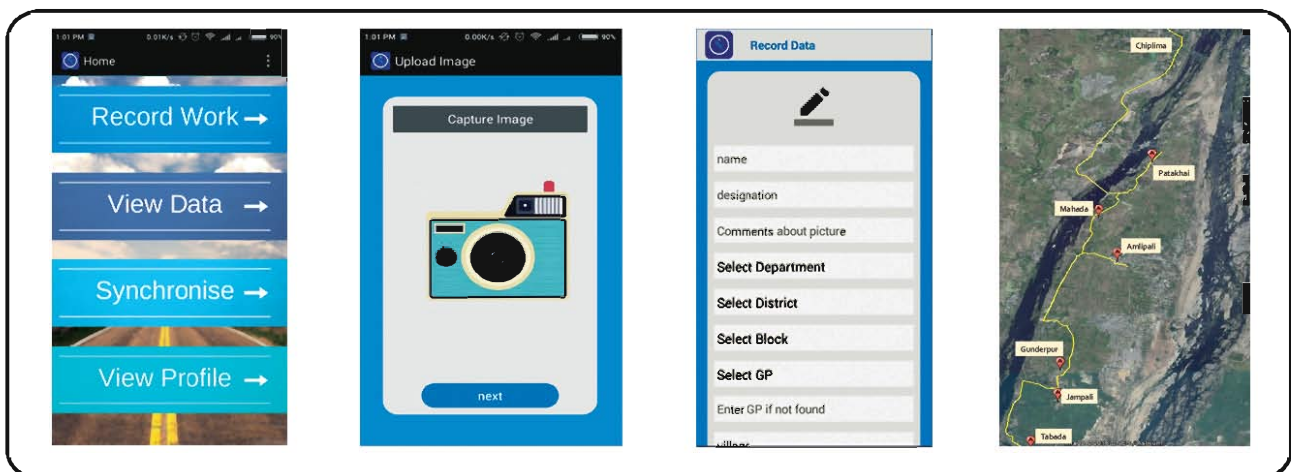
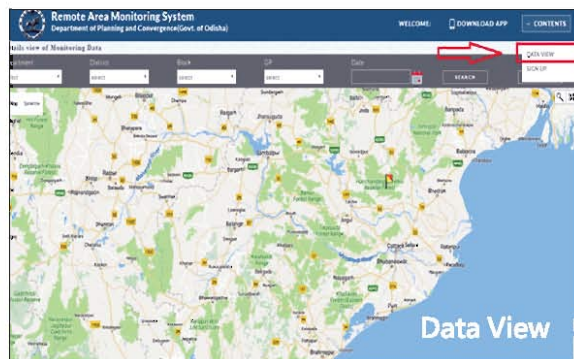
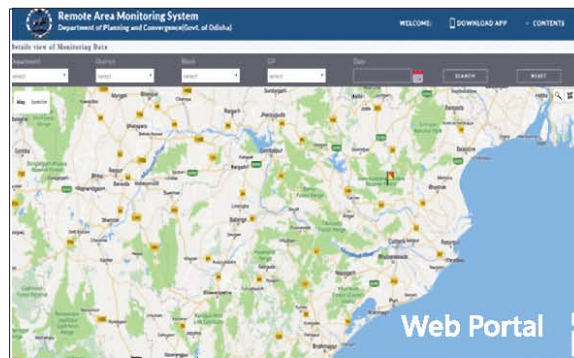
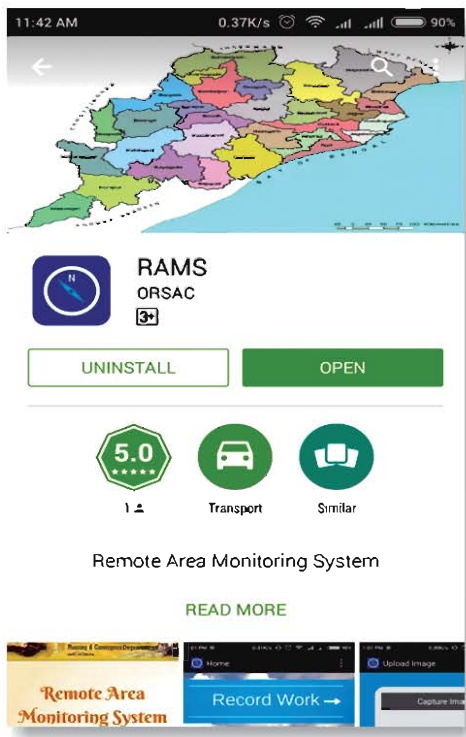




Remote Area Connectivity Planning program

The major scope of the work was to identify the all weather road to the villages/ habitation (provided by P&C Dept) using the high resolution satellite image. The objective was, to find connectivity to the unconnected habitation through the nearest motorable road using geospatial data. The habitations were identified by using the administrative database and toposheets. Once the habitations are identified, the next objective was to find out the road connectivity for the given habitation. The roads are identified using the centres available database, high resolution satellite images and open source Google Earth images. One RAMS (Remote Area Monitoring System) mobile app was developed at the centre to meet the objective. It can be downloaded from the Google Play Store by searching "rams orsac" in the search bar. Web-Application is also developed and hoisted in ORSAC server for visualization of the unconnected/ under developed sites of the state under this programme.

RAMS Mobile Application



Odisha Land Bank Web services

Availability of land and its associated attributes is one of the most important factors for policy makers to devise smart growth strategies and development framework. Odisha Industrial Policy Resolution 2015 focusses on providing quality industrial infrastructure and creation of a large land bank. In this resolution it was decided to develop a GIS based web-services for use by decision makers, planners and investors. Considering the requirement of the Government, a GIS based web-portal was developed by the centre for providing land bank and associated utility and developed infrastructure information to potential investors and entrepreneurs. Geo-ICT, space technology inputs and geospatial data modeling was used to create the Web-GIS based Land Bank portal.

ODISHA
NEW OPPORTUNITIES

GIS referenced 100,000 acres of land bank is now available for industrial use in Odisha

GO PLUS is a GIS based portal which provides information on land bank, utilities & existing industries

<p>Land Bank</p> <ul style="list-style-type: none"> Provides information with regards to availability of industrial plots and attributes in terms of connectivity, utilities and social infrastructure in the vicinity. Provides information on zoning of the industrial land in terms of environmental categories to enable a prospective investor decide on a suitable location based on the proposed business activities. 	<p>Industry Database</p> <ul style="list-style-type: none"> Enables a user to get detailed information about the key attributes of existing industries such as sector of operation, products, capacity, employment, raw material, linkage, etc. Existing industries are encouraged to update information regarding their units by visiting the portal.
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GO PLUS is the winner of Geospatial World Excellence Award 2017 awarded by Geospatial World Forum

OPEN YOUR EYES TO A WORLD OF NEW OPPORTUNITIES. INVEST IN ODISHA.

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ISO 9001 & 14001 Corporation

Call toll free 1800 345 7111 | e-mail: info@investodisha.org

RECOGNISED AS A LEADER
In the State of India for creating a customer's highest demand with best about internet

Visit the portal on <http://gis.investodisha.org>
Now some login details can be used to access all applications including GOPLUS, Central Inspection Framework and Automated Post Allotment Application (APAA - for IDCO land allottees)

For any queries or information regarding the portal, please contact: rajibdhai@investodisha.org

Watch this space for more industry-friendly reforms implemented in the State

Download our mobile app InvestOdisha from Find us on

The system provides detailed information with regards to availability of land and utility / services around it. A prospective investor can define preferred parameters such as the district, size of land required, facilities available in the vicinity and environmental categorisation etc. based on which the portal identifies and returns information regarding the suitable and available land parcels in the State. Through the System, a prospective investor can get information not only about land availability but also the key attributes of existing developed and operational infrastructure required for industrial activities. It also provides information on zoning of the industrial land in terms of environmental categories i.e. Green, Orange and Red to enable an investor decide on suitable location for investment based on the proposed business activities.

The portal provides land bank details covering 1,00,000 acres of land in 23 districts of the State and also Industrial plots available at KNIMZ, Kalinga Nagar; PCPIR, Paradip; SEZ, Gopalpur and plots available at focus sectors zone like metal, chemicals, plastic & petro-chemicals, electronics manufacturing , food processing, tourism, textile and apparels.

Land bank is also being developed for Forest and Environment, Housing and Urban Development, Tourism, Labour & Employment and General Administration Departments.



Web-Portal services for Industrial and Infrastructure Development under GOiPLUS

Government of Odisha's industrial Portal for Land Use and Services

- Land Bank map, data and land schedule for 1,00,000 Acres are made available in public domain. GIS database of 106 Industrial Estates, industry location maps and database of sector specific cluster development are generated.
- Cadastral maps of the entire state are digitised, coded, standardise and geo-referenced with ortho-images of the entire Odisha.
- Multisource data are used to generate data on landuse, network infrastructure and social infrastructure of the state.
- Multi-source and multi-scale data in GIS environment are integrated starting from 1:50000, 25000, 12500, 4000 and 2000 scale.
- The system provides detailed information pertaining to land with regards to availability of industries, plots under land bank cluster and location specific attributes in terms of connectivity, linkages and availability of other utilities, amenities and services.
- Significantly under this project, query based spatial and attribute search and information extraction is provided in web-portal in public domain for benefits of all types of stakeholders.

GOiPLUS

Toll Free Helpline - 1800 345 7111
(Timing 10.00 AM to 06.00PM on working days)

HOME ABOUT US ABOUT GOiPLUS WALK-THROUGH VIDEO USER MANUAL CONTACT

To make optimum use of the website, kindly spare few minutes to read the User Manual and view the Walk-through Video.

Govt. of Odisha's
Industrial Portal
for Land Use and Services

LAND BANK INDUSTRY INFO

INFO SUBMISSION BY INDUSTRY

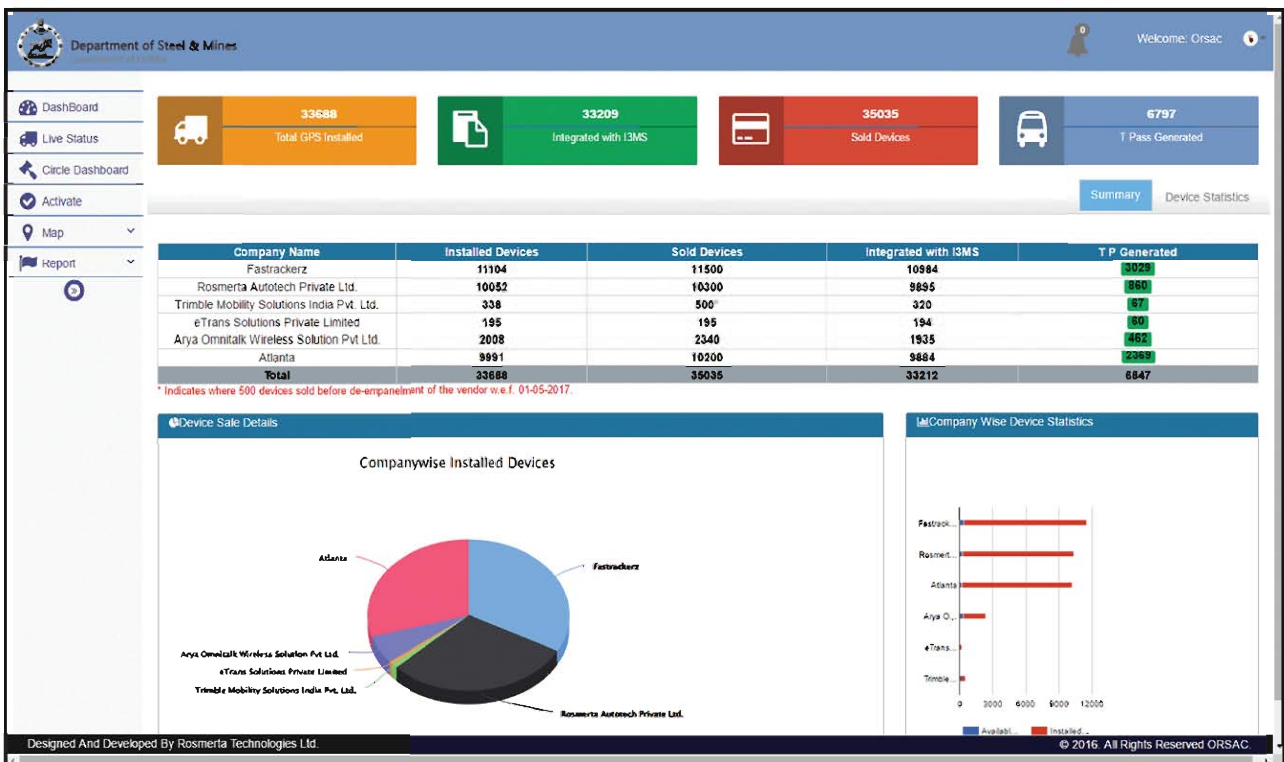
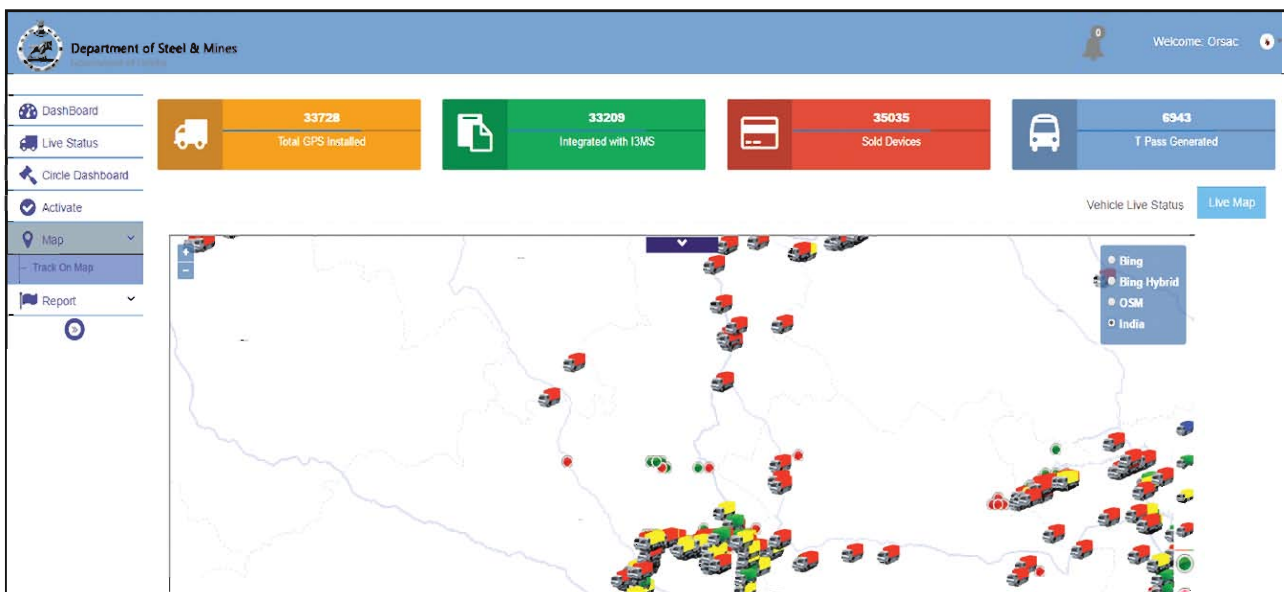
Policy Framework Focus Sectors & Investment Opportunities Setting up Private Industrial Estates Info Wizard

The portal is utilized in creating inventory and prioritise industrial land utilization to provide strategic direction for industrial and economic development. The database provides critical information in the decision making process and planning for future industrial developments in the state. The portal is accessible through www.gis.investodisha.org.



GPS Based Tracking of Mineral Carrying Vehicles

The centre has generated GIS database of all mines and related infrastructures for all the 14 circles of Directorate of Mines, Govt. of Odisha. Vehicle Tracking Devices are being installed in nearly 38,000 trucks of the state. Control centres are installed at each circle and mining Headquarters with appropriate hardware and software. One web-application is under operation to report the movement of the Mineral Carrying Trucks and its deviation from the destined routes. This application is integrated with i3 MS software of Steel & Mines Department of Govt. of Odisha.





Generation of GIS enabled Web Based Power Atlas for Odisha State

Odisha Power Transmissions Corporation Limited (OPTCL) assigned the centre to develop GIS enabled Web Based Power Atlas for the Cuttack circle on pilot mode, which was completed in a record time within 8 months. On successful implementation of the utility of the pilot project immensely, OPTCL entrusted the centre to roll over the Project in the rest of Circles of OPTCL. The scopes under the project are as follows.

- Geocoordinate collection through DGPS/ ETS survey and Geodatabase creation.
- Survey of 95 EHT (400 KV, 220 KV & 132 KV) Sub Stations, EHT Lines having 24,289 Towers (approx.) covering 6952.975 route km.
- Each Tower survey (survey of three of its stubs) and software based derivation of fourth stub's coordinates as well as GIS Coordinates of Power Line projections on the Land.
- Substations survey (coordinates of boundary of all vertices) including location of transformers, Switchyard, Main Gate, Gantry Tower, Control room and Colony etc.
- Survey of angle towers and the co-ordinate list collection.
- Ground photographs collection (3 each) for each tower which includes Tower Base, close up view showing all insulators & jumpers and approach view of entire Tower in the direction of pre-traversed path alongwith naming convention procedure.

The web atlas is under operational use by OPTCL.

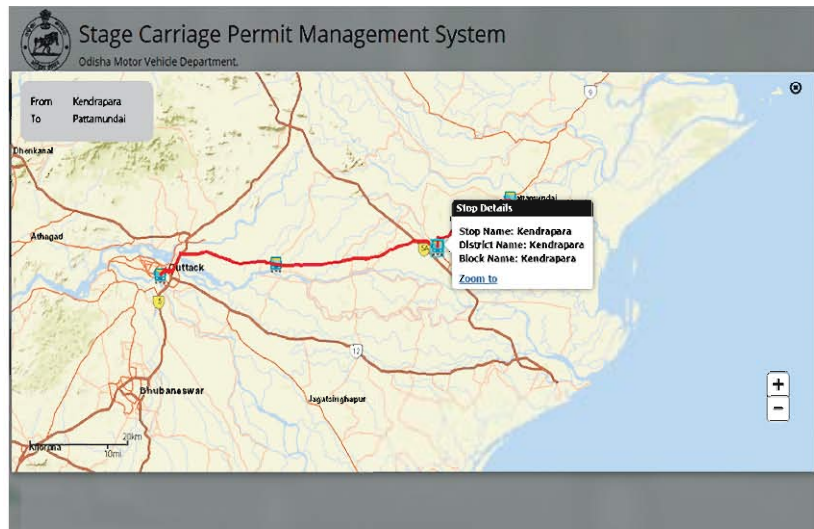




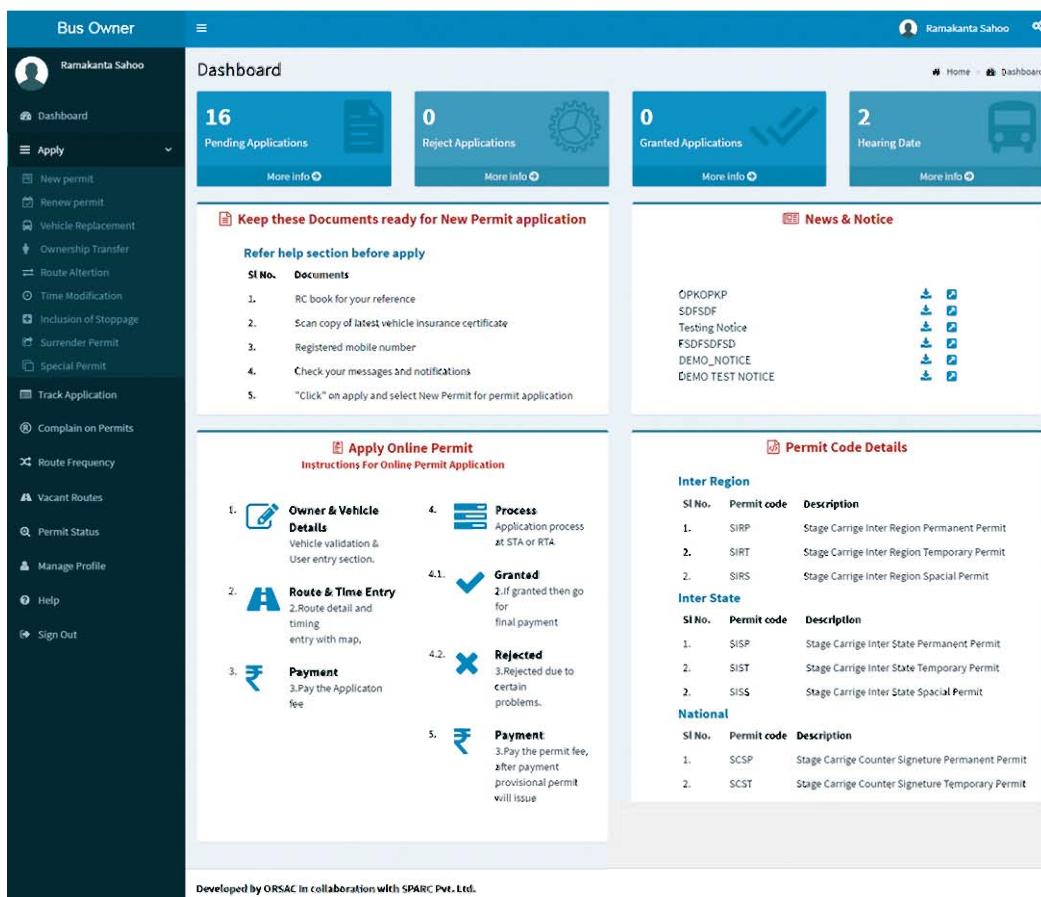
GIS based Stage Carriage Permit Management System

This project is undertaken by the centre for State Transport Authority and focused on:

- GIS mapping of all existing Stage Carriage Permit routes (STA & RTA)
- Status analysis of Public Transport service and preparation of District wise Transport Master Plan
- Implementation of a Web GIS based Permit Management System with mobile utilities
- Issuance of Stage Carriage Permits and Management of associated Services



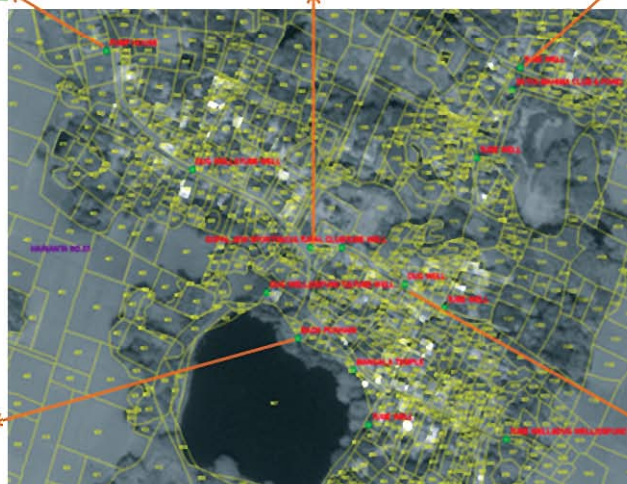
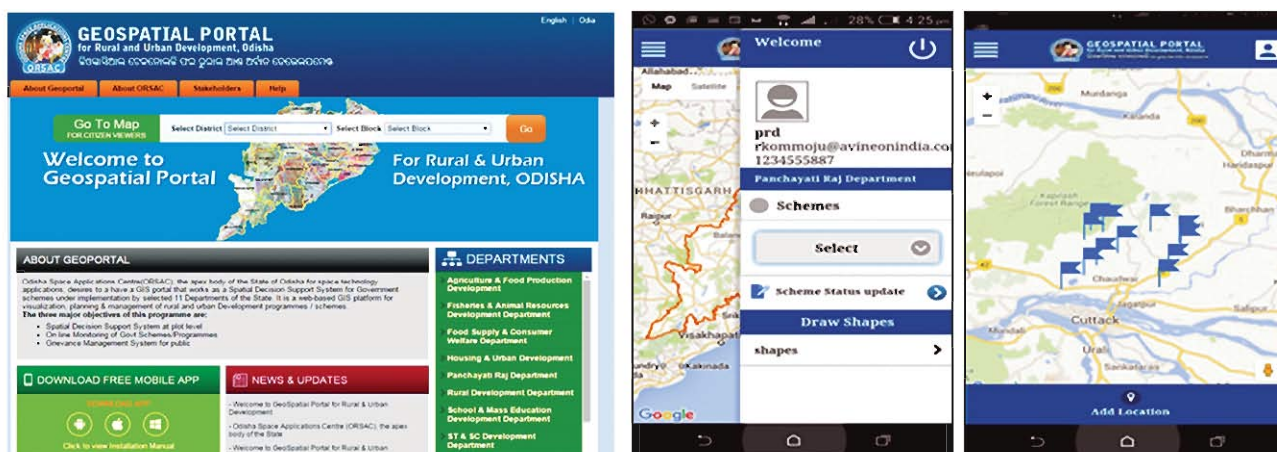
- Web enabled Trip Planner for Travel planning with information on Bus routes and Timings
- Mobile based utility for locating nearby stops and Bus Timings at specified location/ stop





Geospatial Technology for Rural and Urban Development

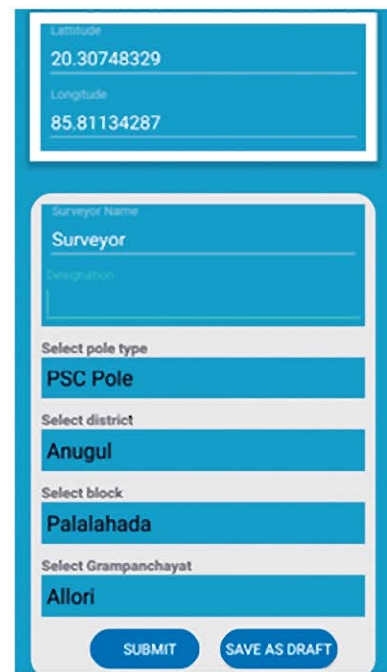
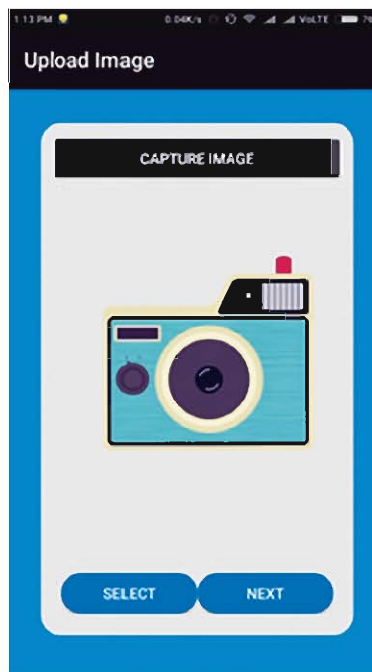
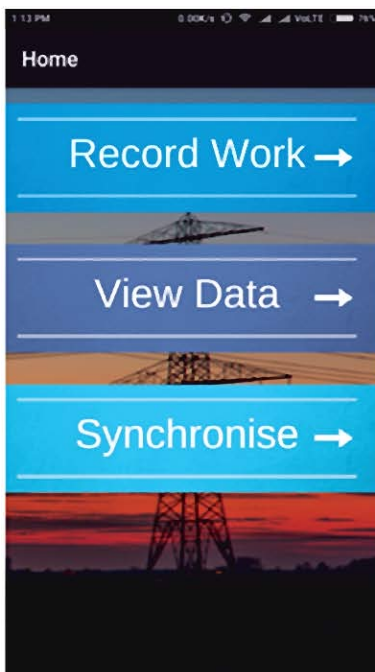
Geospatial technology for Rural and Urban Development project is a web based solution on GIS platform for visualization, planning and management of rural and urban development programmes/ schemes in Odisha state by integrating geospatial technologies. The objective is to develop a dynamic application with MIS support having capabilities for generating queries, both generic and specific and working as a Decision Support System. This can be used as a Programme Scheme Monitoring System for Odisha State at 1:4000 scale. All the infrastructures/ utilities / amenities created under Government schemes are being mapped from high resolution satellite images (World View -I with 50 cm resolution) and ground truth collection using Mobile App. The Centre is also creating the land use database of entire state at 1:4000 scale under the project. This is a sponsored project of Science & Technology Department of Govt of Odisha.



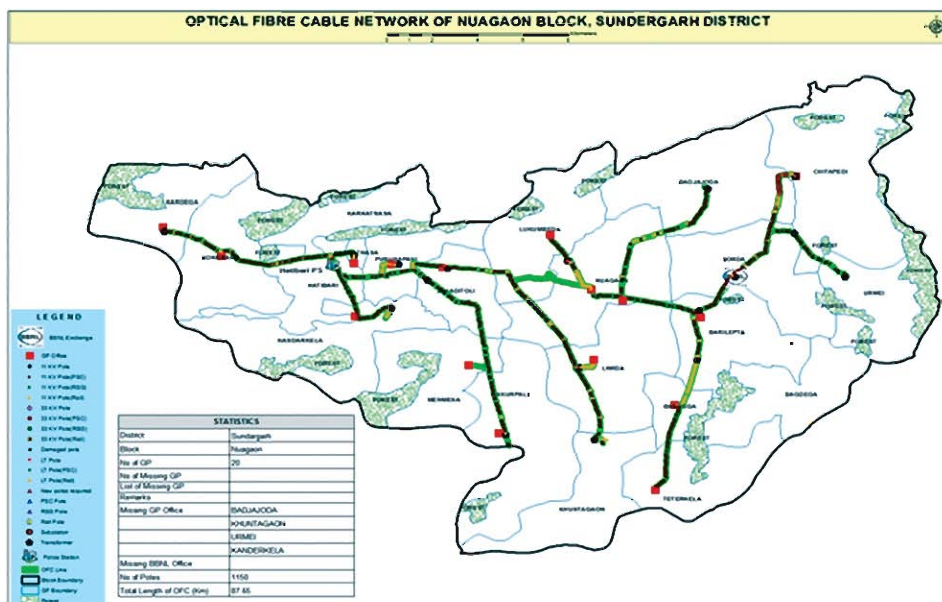


Optical Fibre Routing under Bharat NET Phase –II

For optimal overhead routing of Optical Fibre under Bharat NET Phase -II project in 133 blocks of 15 Districts, the centre has developed a Mobile App for geo-tagging (for 14 type of electricity poles like 11KV Poles, 33KV pole, LT pole etc. with field photographs) and prepared GIS data based plans for BBNL. The Geo-tagged electric poles are loaded to the web-portal generated for the project. 1,31,309 poles have been plotted and subsequently block wise /district wise routing plan for OFC have been developed. The deliverables in GIS formats are delivered to OPTCL & OCAC.



Mobile Application



ESRI “Special Achievement in GIS (SAG)” award

Odisha Space Applications Centre has been selected for “Special Achievement in GIS (SAG)” award by Environmental Systems Research Institute (ESRI). ESRI is an international developer of geographic information system (GIS) software, web GIS and geodatabase management applications. The organisation is headquartered in Redlands, California.

“Each year, the SAG Awards highlight extraordinary achievements and efforts to improve our world,” says ESRI president Jack Dangermond. “At ESRI, we are always deeply impressed with the work of our users. This recognition is well deserved for how they have applied geospatial technology to address the needs of their industries and communities. They are defining GIS best practices. Organizations from around the world were also honoured at the ESRI User Conference including agriculture, cartography, climate change, defense and intelligence, economic development, education, government, health and human services, telecommunications and utilities sectors etc.”

SAG awards recognize users who have applied geospatial technology innovatively to address the needs of their industries and communities, defining GIS best practices. This is the result of exemplary work done by ORSAC in GOiPLUS (Government of Odisha’s industrial Portal for Land Use and Services) project which is a web enabled platform to display real time information with regards to land bank, utilities and infrastructure around land banks besides information about existing industries. GOiPLUS project is developed by the centre for Industries department. The project team comprises Dr. S. Tripathi, CE, ORSAC, Dr. Debajit Mishra, Project Coordinator, Dr. Srikant Das, Dr. S. D. Sahu and Sri M. K. Sanabada, Scientists of ORSAC. Dr. Sandeep Tripathi, Chief Executive, ORSAC received the award on 19th January, 2017 at Leela Ambience Convention Hotel, Delhi.





Glimpses of Activities



ORSAC pavilion at WGF-2016, Hyderabad



Director, NRSC at ORSAC pavilion, WGF, Hyderabad



Pr. Secy., Agril., Odisha at WGF-2016, Hyderabad



Pr. Secy., Industries, Odisha at WGF-2016, Hyderabad



CE, ORSAC at SAMA Conference, New Delhi



OSDI stakeholders' meet on 04.11.2016 at BBSR



OSDI Nodal Officers' meet at Bhubaneswar



Address of Pr. Secy. DoWR- Commencement of Irrigation Data Sanitization Project



Glimpses of Activities



Republic Day Celebration



Biswakarma Puja Celebration



EDUSAT Tele-Teachers' Orientation Training



Blood Donation Camp at the centre



Hi-Tech Survey awareness meeting



Visit of students of North Odisha University



Participants of OSDI meeting with Pr. Secy, D.S&T



Visit of students of XIMB



Geospatial World Forum Excellence Award for 2016 to GOiPLUS



ORSAC and Dept. of Industries receiving the award at World Geospatial Conference, Hyderabad



ଓଡ଼ିଶା ଲାଣ ବ୍ୟବହାର କୁ ଚମତ୍କାର-ଆଇ-ପୁରସ୍କାର
ସେଣ୍ଟାଲ ଆପ୍ଲିକେସନ୍ ଉତ୍କଳ ପୁରସ୍କାର



ଓଡ଼ିଶା ଲାଣ ବ୍ୟବହାର କୁ ଚମତ୍କାର-ଆଇ-ପୁରସ୍କାର
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ORSAC GOiPLUS Project team
Dr.Sandeep Tripathi, Chief Executive, Dr.Debajit Mishra, Project Coordinator,
Dr.Srikanta Das, Sri M.K.Sanabada and Dr.S.D.Sahu, Scientist





Remote Sensing based Property Tax Assessment

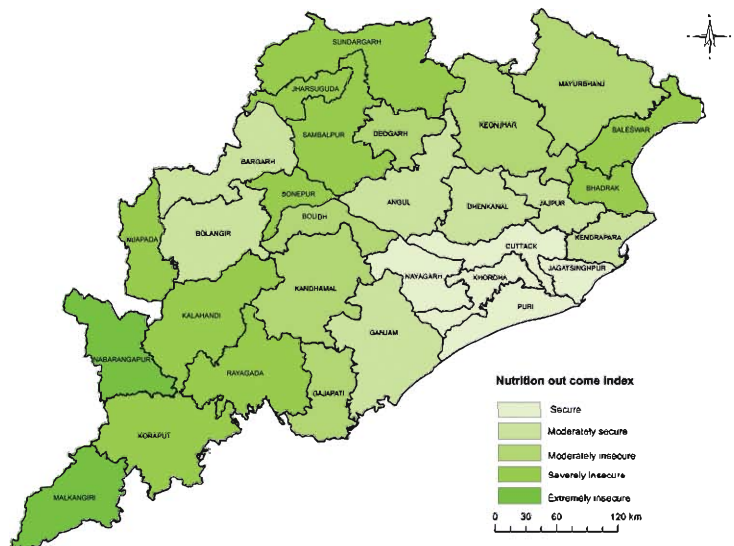
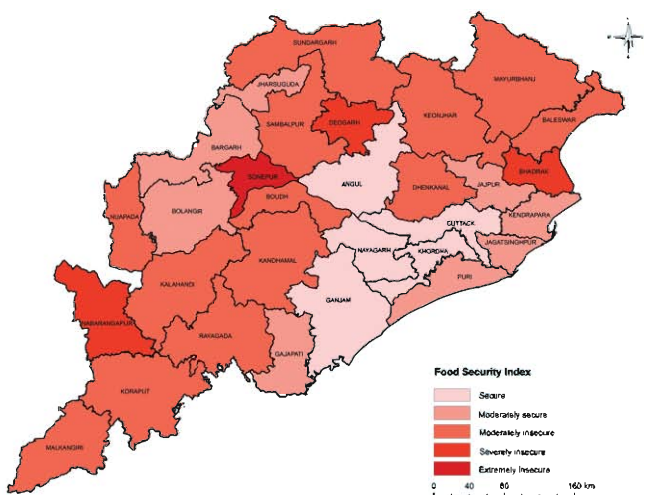
Assessment of Property Tax of Bhubaneswar and Puri Municipal Areas using high resolution World View 2 satellite images, field based observations and GIS data base creation is undertaken with the financial assistance from Housing and Urban Development Department of State Government during the year 2016-17. Individual households have been delineated from the satellite image. Each street, house hold and block have been coded with unique numbers. Base data sets are now available for field level enumeration.

PROPERTY TAX MAP OF WARD 55
 MAP SHOWING BLOCK BOUNDARY, ROAD NUMBER, PROPERTY NUMBER, FOOTPRINT



GIS database Generation for PHDMA

In this project, GIS data base of major indices like food, hunger, nutrition, population etc. have been prepared based on the data provided by the Poverty and Human Development Monitoring Agency (PHDMA), Planning & Convergence Department, Govt of Odisha, for the entire 30 districts of Odisha.

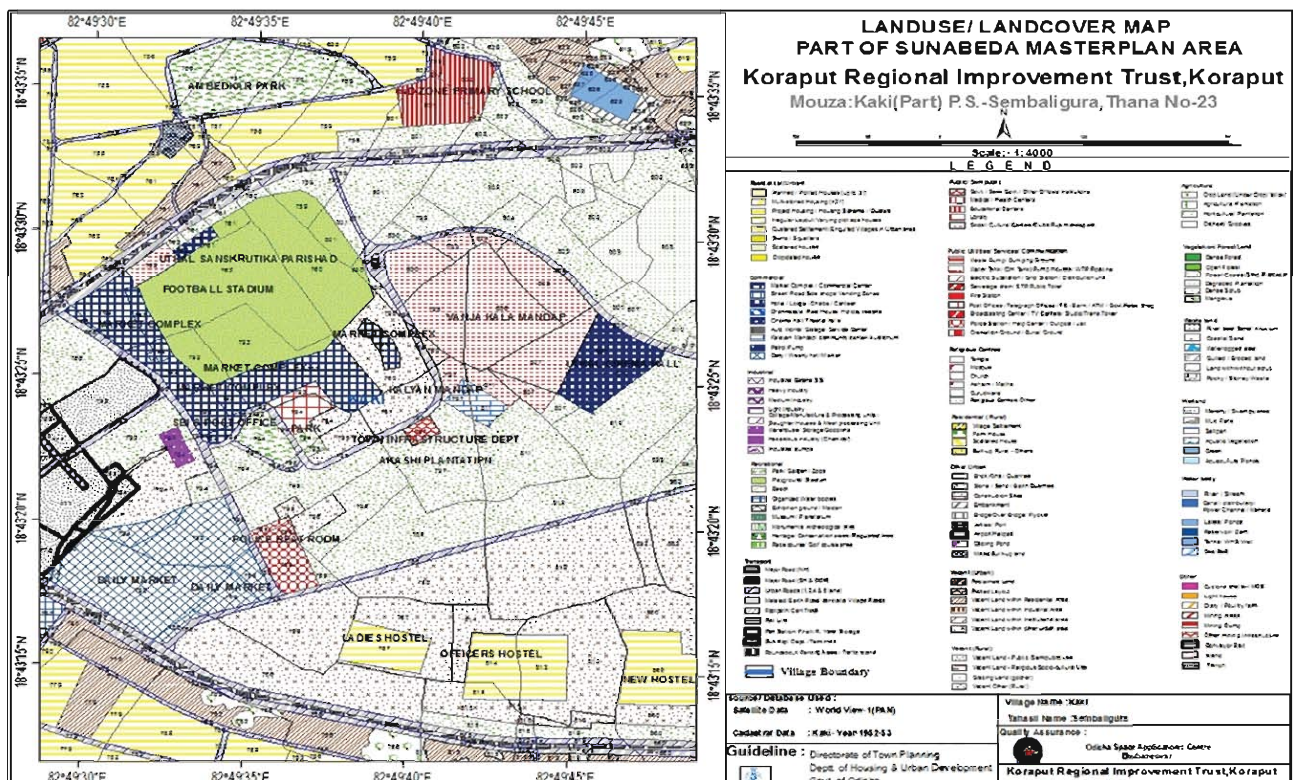




Remote Sensing and GIS Input for CDP Preparation of Towns

Housing and Urban Development Department, Govt. of Odisha has assigned the task to the Centre to prepare Remote Sensing and GIS database as input for CDP preparation of 59 Towns of Odisha State in the year 2016-17. The maps have been prepared on 1:2000/4000 scale. The main objectives of the project is to use cadastral maps in digital format as base maps, high resolution satellite data for land use mapping (in conjunction with ground truth data) and GIS for data base generation. Plot level Digital Urban Land use Database on cadastral base is used as input for CDP preparation of towns.

During 2016-17, input for 12 towns namely Padmapur, Atabira, Barpali, Nilagiri, Udala, Tarava, Patnagarh, Nimapada, Daspalla, Kuchinda, Pipili and Sunabeda on 1:2000/4000 scale have been completed.





WEB GIS Database Preparation of GA Lands in Bhubaneswar

General Administration (GA) Department has assigned the centre to develop a web-enabled GIS database of Lands under its jurisdiction in Bhubaneswar municipal area. It was decided to generate database of Bapuji Nagar area as a pilot study in phase-I as a state plan activity. Under the pilot study, geo-referenced/ geo-tagged map and attribute database of GA dept. lands are prepared using Revenue maps, GA maps/ land allotment statistics, high resolution satellite data, administrative maps and other spatial data. The center demonstrated the pilot study of Bapuji Nagar area using RoR data of Revenue & DM and General Administration Department.

Department of General Administration
 Government of Odisha
 Land Data Portal

LAND DATA PORTAL OF GA DEPARTMENT, GOVT. OF ODISHA WELCOME'S YOU...!

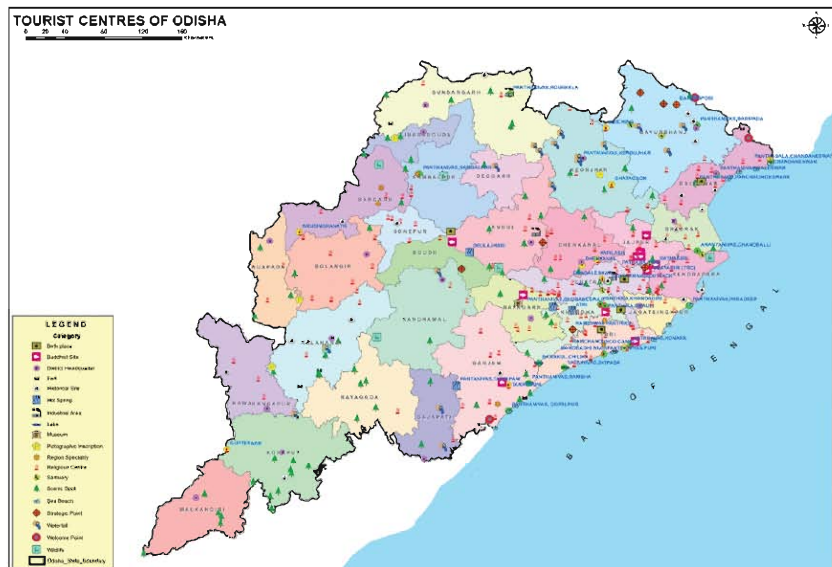
GA PLOTS MAP
 GA PLOTS: BAPUJINAGAR_GA

MEASUREMENT
 Is For Mouza
 Is For GA Plots

BAPUJINAGAR_GA
 RO/ORSAC Data
 FID: 78
 PLOT_NO: 259
 VILLAGE_NAME: BAPUJINAGAR-51
 ORSAC LU CODE: 1121
 LOC_NAME: CAPITAL MARKET
 PAR_TYPE: PA
 ORSAC LU: Market Complex / Commercial Center
 DESCRIPTION: 259
 NEW_PLOTNO: 259
 District: ଗୋରା
 Tehsil: ଭୁବନେଶ୍ୱର
 RIC: ବ୍ୟାପାର-1
 Village: ଭୁବନେଶ୍ୱର ଉତ୍ତର ଛୁଟି ଟ-1
 Khata_No: 357
 Tenants: ଉପାଧିକାରୀ
 Plot_No: 259
 Area_AC: 1.7
 Ltype: ଉପକରଣ
 Plot_No_NE: 259

Tourism Information System

The Centre in collaboration with Tourism & Culture Department has generated Tourism Information System incorporating Geo-location of 367 tourist spots and allied infrastructure for the entire state.

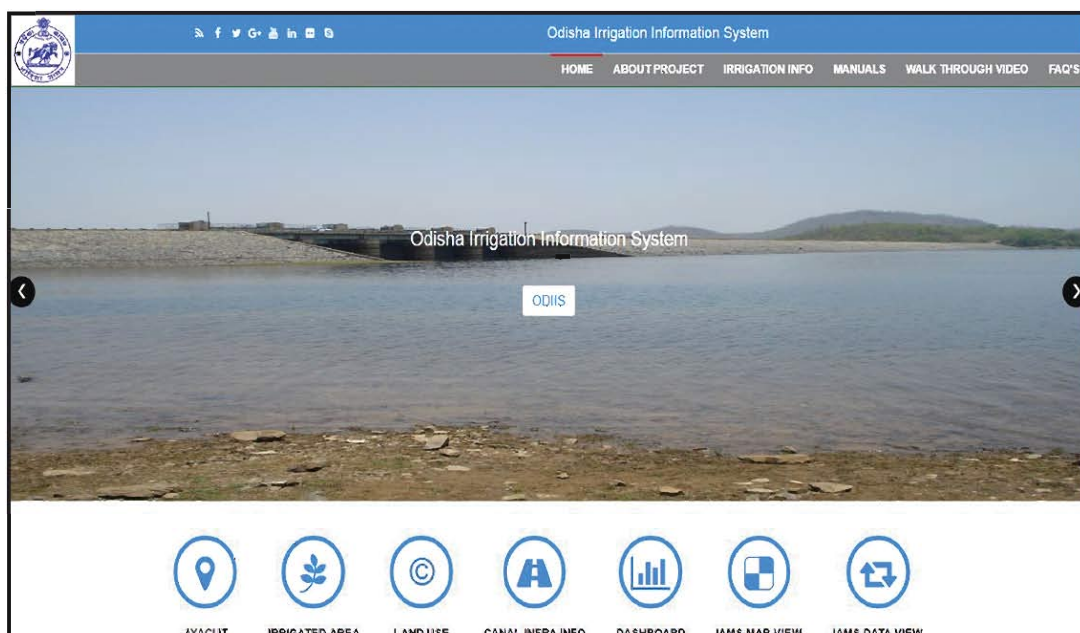




Odisha Irrigation Web-GIS portal development under “Strategy for Sanitizing the Data on Cultivated area and Irrigated area of the State” Programme

Geographical database of the irrigation network, its asset and functioning status in digital format are not available for the state. In addition to this accurate data relating to cultivated area and irrigated area are also not available in standardized manner. Interdepartmental co-ordination issues and absence of proper system for data collection, collation, storage and dissemination are major factors for varying statistics by various departments. In view of the above, the Principal Secretary, Dept. of Water Resources, Govt. of Odisha observed that data on cultivated area and irrigated area needs to be properly sanitized and efforts may be put to work out strategy for the same. In this regard, a high level meeting on "Strategy for sanitizing the data on cultivated area and irrigated area of the State" was held on 17.05.2016 at state secretariat. A detailed presentation was made on the matter to generate a common standard database of cultivated and irrigated area using Remote Sensing and GIS technologies. As a response, Dept. of Water Resources assigned to this centre to undertake the work for generating data on cultivated and irrigated area of the state in the first phase and asset database generation in second phase.

At present, data from Dept. of Water Resources, (Irrigation Dept.-Major, Medium, Minor, Creek; Watershed Mission, OLIC and Mega Lift); Dept. of Agriculture (Jalanidhi - I, OAIC- Jalanidhi-II, Horticulture); Dept. of SC/ST (ITDA) and Dept. of Panchayatiraj (DRDA /BLOCK) are collected and GIS database generation is continuing. Sanitizing the data will start after GIS database generation. Initiatives are also taken for development of Geo-ICT based Technology for regular, automated and authentic data collection of further irrigation related activities/new project execution of the state. The web-portal development is under progress and will be completed in 2017. The outputs of the Pilot District (Anugul District) are presented to the officials of Department of Water Resources, Government of Odisha.

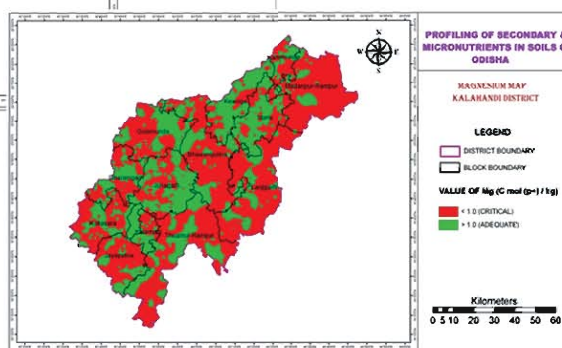
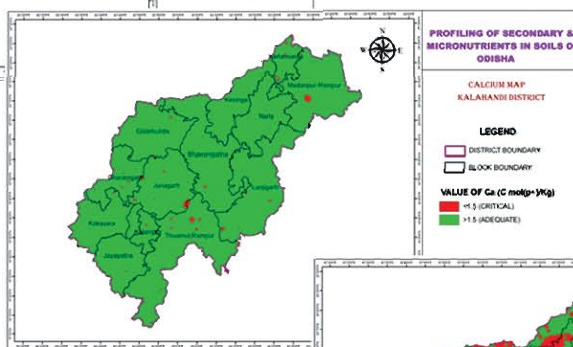
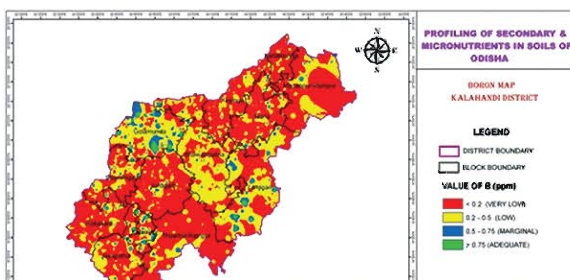




Technology Mission for Geo-Spatial Aided Agricultural Information System Development of Odisha State

Technology Mission for Geo-Spatial Aided Agricultural Information System Development of Odisha State project is focussed on Village/Cadastral based crop monitoring, Irrigation infrastructure mapping, Advisory for Fertilizer Distribution and Land Suitability analysis for different crops. Spatio-temporal satellite images, geo-referenced cadastral database, input on soil characteristics/ nutrients as available at the centre and Agriculture Department and ground based observations are being utilized in this endeavour. Optical and Microwave high resolution satellite images are being utilized for each cropping season. This project is of two years duration and sponsored under Rastriya Krishi Vikas Yojana of Govt of India.

Cadastral based Crop Monitoring



Mapping of Micro Nutrients





Forecasting Agricultural output using Space, Agro-meteorology and Land based observations (FASAL)

District wise Kharif rice acreage estimation and production forecast in Odisha has been made in collaboration with Mahanobis National Crop Forecast Centre (MNCFC), Ministry of Agriculture & Farmers Welfare, Govt. of India, New Delhi. Three dates of RISAT-1 SAR (Synthetic Aperture Radar) Medium Resolution Scan SAR mode data were used for acreage estimation. Last date of remote sensing data used for acreage estimation is 10th Sept.2016. Rice yield has been estimated by using a combination of district level correlation weighted Agro-met model by IMD and remote sensing based Vegetation index. The Kharif rice acreage and production has been estimated at 3.63 million ha. and 6.38 million tonnes respectively for the year 2016-17. Village list has been supplied to Directorate of Agriculture & Food Production, Govt. of Odisha, Bhubaneswar for Crop Cutting Experiment for Kharif rice from all 30 districts of Odisha.



Rabi rice acreage estimation has been undertaken using Sentinel-1 SAR data (20m. resolution) and Landsat-8 OLI data (30m. resolution). Last date of remote sensing data used for the state is 20th March,2017. District level yield forecast have been made integrating the estimates of IMD developed correlation weighted Agromet model and MNCFC developed remote sensing weather data upto March, 2017 first fortnight. The rabi rice acreage and yield at state level has been estimated at 2.74 lakh ha. and 10.32 lakh tones respectively.

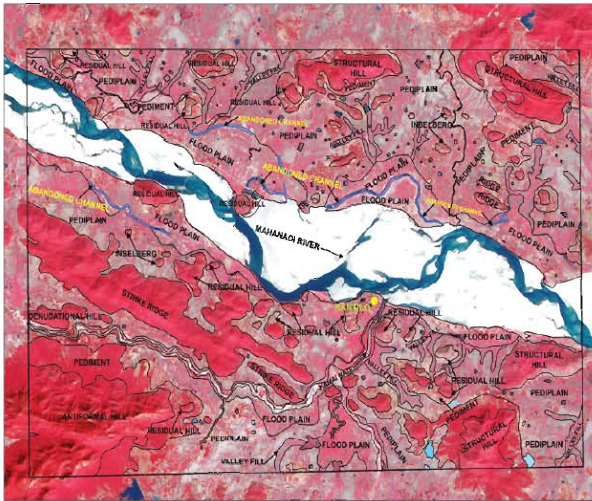
Coordinated Horticulture Assessment and Management using Geoinformatics (CHAMAN)

This project aims at horticulture crop inventory and management using Remote Sensing, GIS and collateral data. It has been approved by Ministry of Agriculture and Farmers Welfare, Govt. of India, under the Mission for Integrated Development of Horticulture (MIDH). This project is being coordinated by Mahanobis National Crop Forecast Centre (MNCFC), Ministry of Agriculture and Farmers Welfare, Govt. of India, New Delhi. The technique development for horticulture crop inventory for tomato and chilli crop is attempted with the technical collaboration of Space Applications Centre (SAC), ISRO, Ahmedabad. Inventory for tomato crop for five selected districts namely, Keonjhar, Khurda, Kalahandi, Mayurbhanj and Ganjam and chilli crop for six districts namely, Ganjam, Sambalpur, Balasore, Cuttack, Koraput and Kalahandi is being undertaken by using RS data, GIS and multiple ground truth.



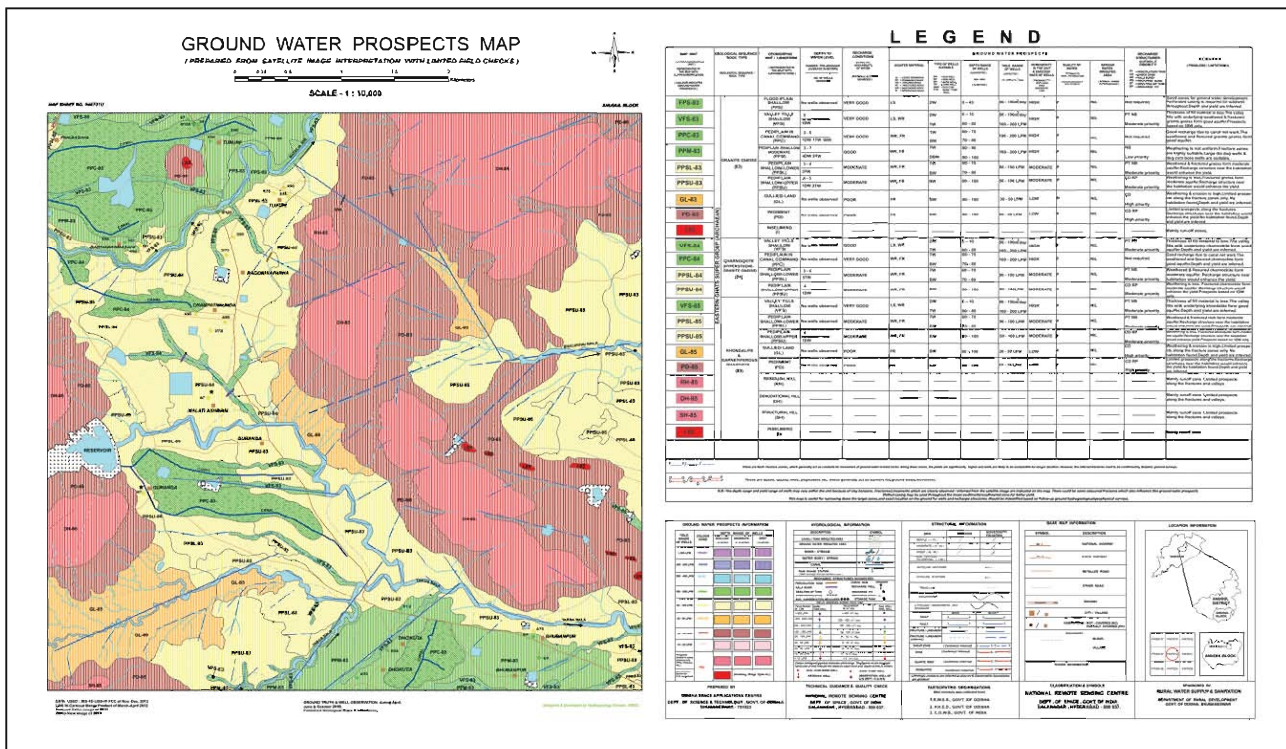


Groundwater Prospects Mapping For Anugul Block



Groundwater prospects maps prepared earlier for the entire state of Odisha in 1:50,000 scale, which were provided to user agencies depict groundwater prospect zones and indicative groundwater water yield. These maps are used to select suitable sites for borewells, dugwells etc. for drinking water supply to the villages. Though these maps provide indicative information about groundwater occurrence, it is difficult to get plot level information from these maps because of the scale limitation. Therefore, Anugul block was taken up on a pilot basis for groundwater prospects map preparation at 1:10,000 scale. This project is sponsored by the Directorate of Rural Water Supply and Sanitation of Govt.of Odisha.

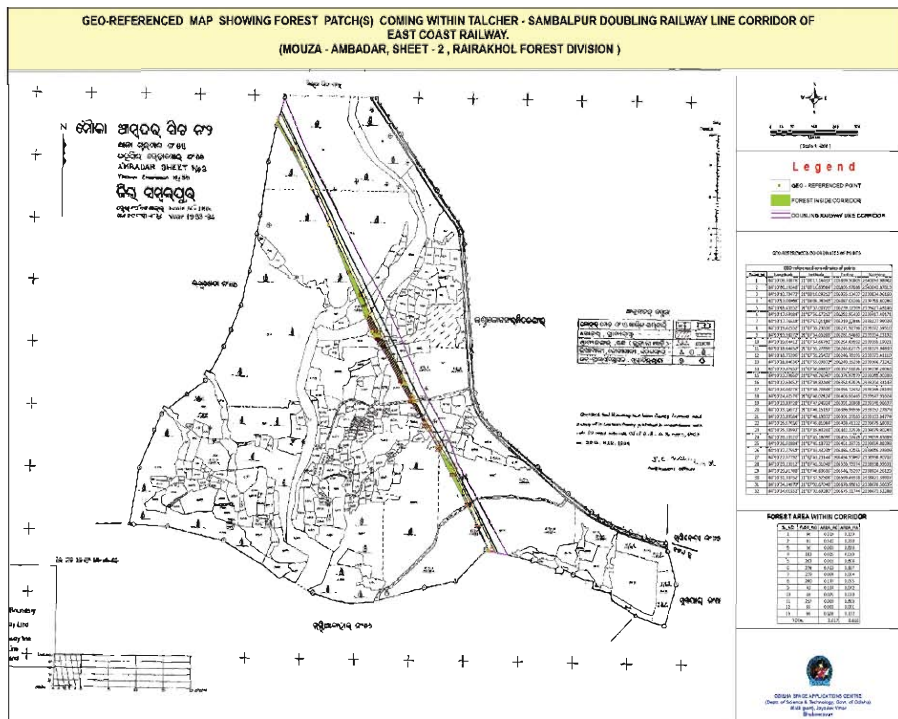
The objective of the project is to prepare maps at a larger scale (1:10,000) using High Resolution Satellite data which gives clarity for interpretation, there by identifying smaller geomorphic features and fractures. Ortho images of High Resolution Cartosat/ World View data along with LISS IV data have been used for mapping purpose. In addition to this, other ancillary groundwater data such as depth of the wells, depth to water table and yield of the existing wells are also used to authenticate the maps. Base maps are prepared from ortho-images of Cartosat data depicting road, river, stream, rail and major waterbodies. Thematic maps on lithology, geomorphology, lineaments and other features are prepared for the project. Finally, all the information is integrated in GIS to prepare groundwater prospects maps on 1:10,000 scale for Anugul Block.





RS-GIS-GPS based Mapping & Survey of Forest area proposed to be diverted for development planning activities

As per the circular of Ministry of Environment and Forests, Govt. of India (No.F.No.-11-9/98-FC, dated 08-07-2011) and State Govt.in Forest & Environment Department notification on forest areas proposed to be diverted for non forest use (vide letter no.18393/F&E, dt.13-10-2011) ORSAC (as the nodal agency) is undertaking DGPS/ETS survey and technically authenticate survey undertaken by empanelled DGPS/ETS survey agencies.



Survey completed in 2016-17 for Forest Diversion/ Compensatory Afforestation

Sl.No.	Name of the project category	No.of projects A.	No. of projects B.
1	Irrigation projects	-	06
2	Power Plant & Transmission Line	04	06
3	Railway network	01	05
4	Roads / Infrastructure	05	13
5	Water Supply/ Gas Pipe Line/ Drainage	02	-
6	Industry & Allied Services	01	07
7	Mines / Canal	04	40
8	Compensatory Afforestation	08	25
9	Miscellaneous	-	07
Total number of projects		27	115

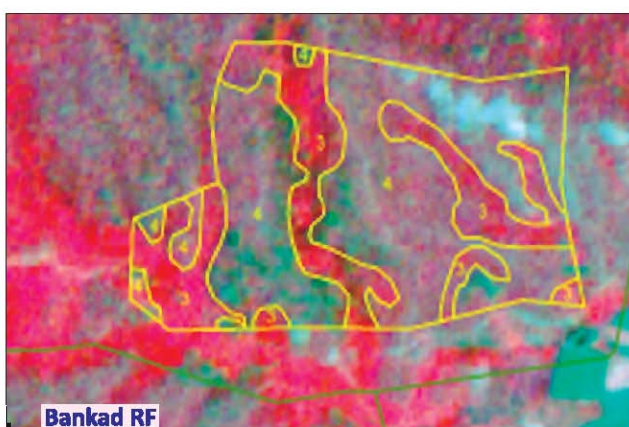
A. Work done at ORSAC B. Vetting of survey undertaken by empanelled vendors.



Monitoring of Afforestation / Plantation areas inside the Forests of Odisha

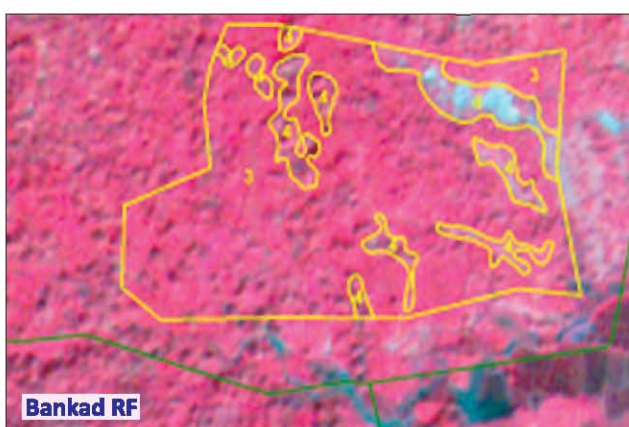
Afforestation and plantation activities inside the forest areas of Odisha are being undertaken by Forest Department, Govt. of Odisha. Different plantation programmes namely block plantations, gap plantations and avenue plantations are taken up under different schemes like CAMPA / OFSDP. To prepare a consolidated map showing the status of afforestation/ plantations undertaken by Forest Department, the centre is assigned to undertake satellite remote sensing based mapping of afforestation / plantations activities in all 50 Forest Divisions of Odisha (plantations made during 2008 to 2014). Forest Department is providing the KML files of plantation boundaries of each Forest Division drawn on Google images based on the GPS data collected from boundary pillars of each plantation sites. Two dates satellite data e.g (Resourcesat 2 LISS IV 2012 & 2014) have been used in the study. Maps depicting plantation density classes are prepared based on crown cover viz. 1. Dense plantation (> 70% crown cover), 2. Moderately Dense Plantation (40-70% crown cover) 3. Open plantation (10-40% crown cover) and 4. Degraded plantation (< 10% crown cover). The mapping is carried out on 1:10,000 scale. The change detection study is carried out to monitor the status of all the plantation patches covering 50 Forest Divisions in Odisha.

MONITORING OF PLANTATION, KHURDA FOREST DIVISION



RESOURCESAT 2 LISS IV, 2012

LOCATION	BANKED RF
RANGE	BALUGAON
SCHEME	NAP
YEAR OF PLANTATION	2008-09
Recorded Area (Ha.)	25



RESOURCESAT 2 LISS IV, 2014

Code	Class	2012 (Area Ha.)	2014 (Area Ha.)
3	Open Plantation (10-40% Crown Cover)	08.24	21.10
4	Degraded Plantation (<10% Crown Cover)	16.89	04.03
TOTAL		25.13	25.13

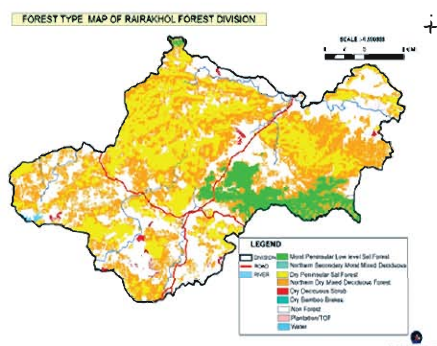
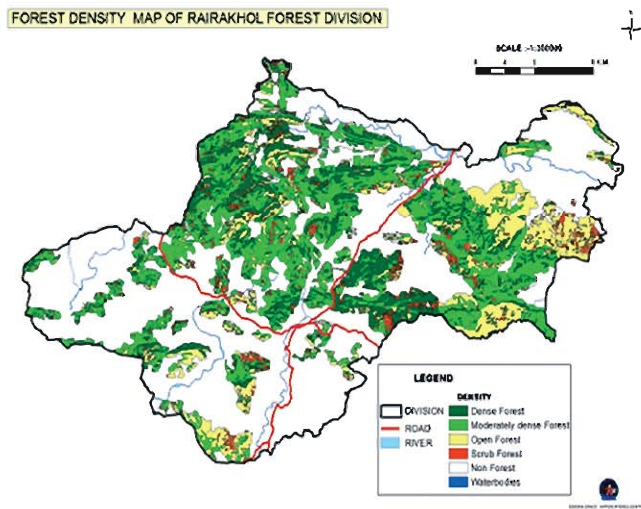




Preparation of RS/GIS inputs for Forest Working Plan preparation

Conventionally, Working Plan input generation normally takes 3 to 4 years for a division and expensive. The centre in collaboration with NRSC, Hyderabad introduced remote sensing and GIS based input generation in the preparation of Working Plans during the year 2006-08. Working Plans for 12 divisions were completed in record time during 2006-08. The study demonstrated that significant reductions in cost and time can be achieved by relying on stratified sampling methods based on mapping of forest canopy density and forest type using satellite remote sensing. At present, Working Plan inputs are under preparation for 34 Forest Divisions whose Working Plan expires during 2016-2017 and 2017-2018.

The centre is involved in preparation of different thematic layers such as preparation of forest density, forest administrative, forest management boundaries of the forest divisions where as NRSC is involved for preparation of forest type mapping, generation of sample points for forest inventory and development of software for stock and yield calculation. Forest Department is involved in carrying out forest inventory work on the field.



The final outputs namely forest administrative, forest management, forest density, forest type and compartment wise stock maps showing stand table, stock table and yield of the economic important species are generated on scales 1:50,000 for each Forest Divisions separately.

KHOLAGARH RF Compt. KG-9		GIRISCHANDRAPUR RANGE		SNC	
<i>For Office Use Only</i>					
AREA STATISTICS					
Compartments	Coupe	Area	TYPE	>40%	25-40%
KG-9	KG-G-V	621.73	MISC	0.51	35.55
Total		621.73	NONFORE	0.50	2.00
			SAL	230.31	108.19
			SCRUB	0.50	2.00
			TOTAL	230.91	104.75
					31.52
					154.54
					0.00
					0.00
					621.73
STAND TABLE (number of trees)					
MAJOR SPS	30-40	60-90	90-120	120-135	135-150
Do mal	7.975	5.118	2.389	427	288
Mac	42.158	17.701	7.048	1.073	1.226
Sho rob	20.354	15.229	9.545	1.772	7.02
Ter tom	9.751	3.857	3.031	374	46
Total	89.269	41.906	21.983	3.646	1.928
					1.410
					1.57.141
STOCK TABLE (volume in Cu. m)					
MAJOR SPS	30-40	60-90	90-120	120-135	135-150
Do mal	450	1.290	1.461	404	457
Mac	2.390	3.017	3.032	590	1.507
Sho rob	1.648	4.065	5.713	1.808	901
Ter tom	500	862	1.072	315	127
Total	4.996	10.164	12.778	3.604	2.498
					3.001
					34.339
YIELD TABLE					
		Strydom's	Available	Per Ha.	
Coupe	SAL	MISC	SAL	MISC	
KG-G-V	91	173	65	87	0.67
					0.14





Empowering Panchayati Raj Institutions Spatially (EPRIS)

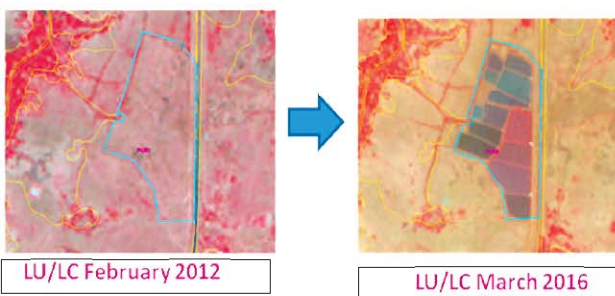
It is a collaborative Project between Odisha Space Applications Centre and National Remote Sensing Centre, ISRO, DOS, Govt. of India. The project goal is to empower Panchayati Raj Institutions for resource-based and integrated spatial developmental planning inputs in a user-friendly enabling environment. The scope of the work includes (i) Capacity building of EPRs, support functionaries and facilitators, (ii) Asset mapping and (iii) Activity planning. Project scientists engaged in the project have been trained by NRSC at national/regional level. After the training of trainers, a cascading series of trainings are planned in the selected districts. There will be training workshops organized by ORSAC in State, district and block headquarters. All community assets lying in the Panchayat area are to be mapped by the facilitators chosen by the Panchayats. The latest version of Bhuvan Panchayat Asset Mapping Mobile App, freely downloadable from the Bhuvan Panchayat Portal is to be used for the purpose of mapping assets.



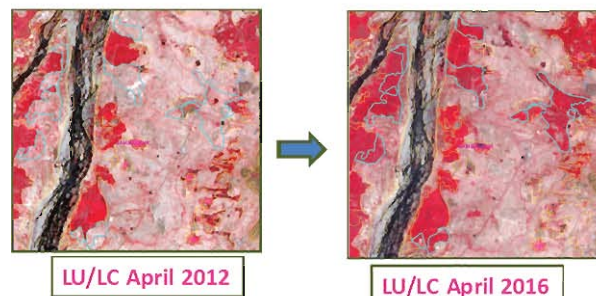
Natural Resources Census (Land use Mapping, Wasteland Monitoring & Land Degradation Mapping)

The main objective of Natural Resource Census project is to update the existing land use and land cover spatial database (2011-12), wasteland spatial database (2011-12) and land degradation spatial database (2011-12) of the entire state from recent satellite image (Year 2015-16) and field based observations. During the year 2016-17 updated spatial database for fifteen districts have been generated.

Landuse/Land Cover Change in parts of Puri District, Odisha



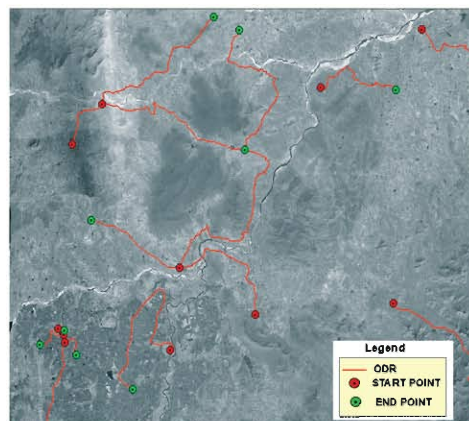
Landuse/Land Cover Change in parts of Sambalpur District, Odisha





Survey and GIS Referencing of Other District Roads (ODR)

Survey and GIS referencing of the newly declared Other District Roads (ODRs since 2011) are assigned to the centre by Works Department, Government of Odisha. The centre is assisting Works Department for their GIS network referencing of newly declared ODRs for updating the road network under Odisha Road Asset Management System (O-RAMS). The objective is to carry out GPS observation of newly declared Other District Roads and their cross-checking from High Resolution satellite data. World-View Satellite data of the period 2012-16 and Ortho-rectified Cartosat Satellite data of the period 2008-12 are used for the study.

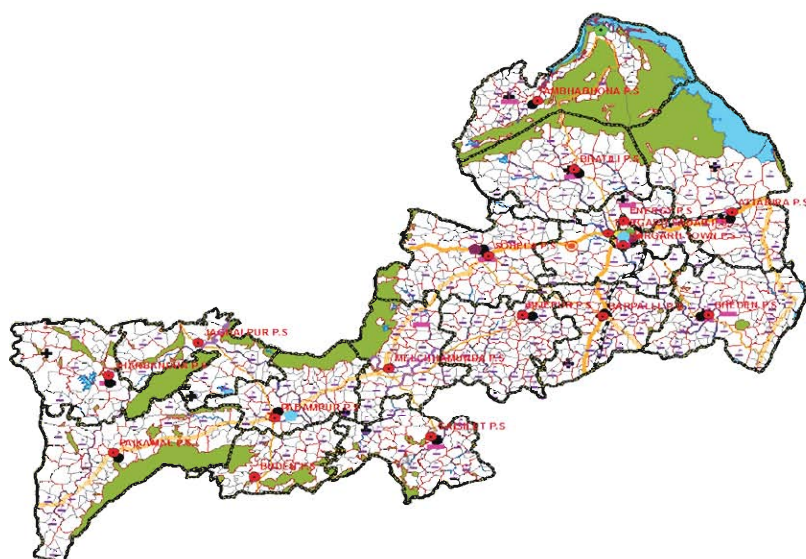


GPS survey was undertaken for location referencing of selected ODR network of various R&B Divisions of Odisha. The device records start point, end point, significant intersections, village/towns etc. of each road at the central line. The recording is automatic and the recording interval is less than 1 metre in order to get closely placed points to gain accuracy. The collected GPS data is imported to Arc-GIS environment and overlaid on Geo-rectified World View satellite data. Three thousand kilometers of ODRs were surveyed during 2016-17.

GPS Survey of Other District Roads of Kalahandi R&B Division of Works Dept.

Police Information System

Existing infrastructure of police administration has been mapped and GIS database has been developed. The police administrative boundaries have been reorganized. The Police Infrastructure GIS has been submitted to all police district administration.



- PS_LOCATION
- lat
- BH
- COLLECTORATE OFFICE
- COURT
- DRDA
- FIRE STATION
- FOREST OFFICE
- OP
- POST OFFICE
- PS
- PWD
- RESERVE OFFICE
- SDPO OFFICE
- SP OFFICE
- SUB-COLLECTORATE OFFI
- DIST_HQ
- BLOCK_HQ
- BLOCK_HQ
- EDU_INST_BARGARH
- insti_type
- GCOLL
- HIGH
- LPUP
- TRIBAL
- UGME
- HEALTH_CENTRE
- <all other values>
- CATEGORY
- COMMUNITY HEALTH CENT
- DISTRICT HQ. HOSPITAL
- PRIMARY HEALTH CENTRE
- SUB CENTRE
- SUB-DIVISION HOSPITAL
- INDUSTRY_BAR
- BARGARH_TAHSIL
- BARGARH_TAHSIL
- PS_BOUND_FINAL
- BLOCK_BND
- BARAGARH_ROAD_FINAL
- ROAD_DES
- State Highway
- National Highway
- District Road





Mining Lease Area Survey

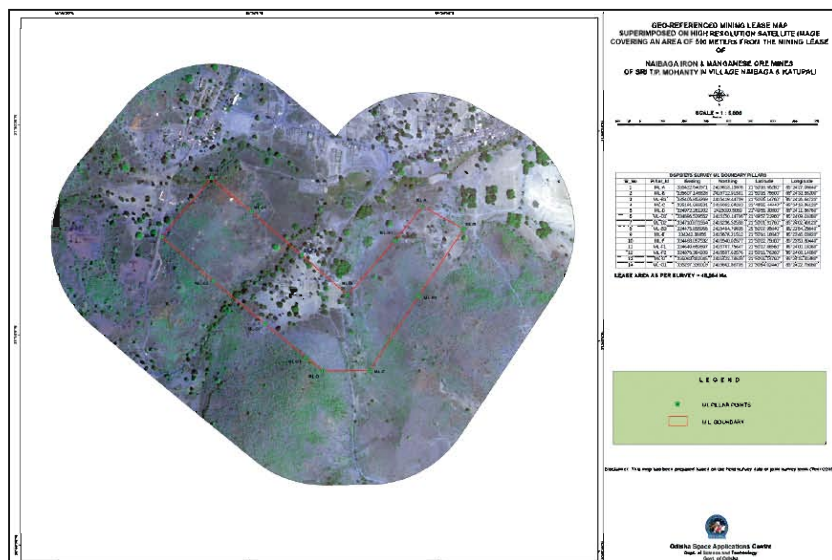


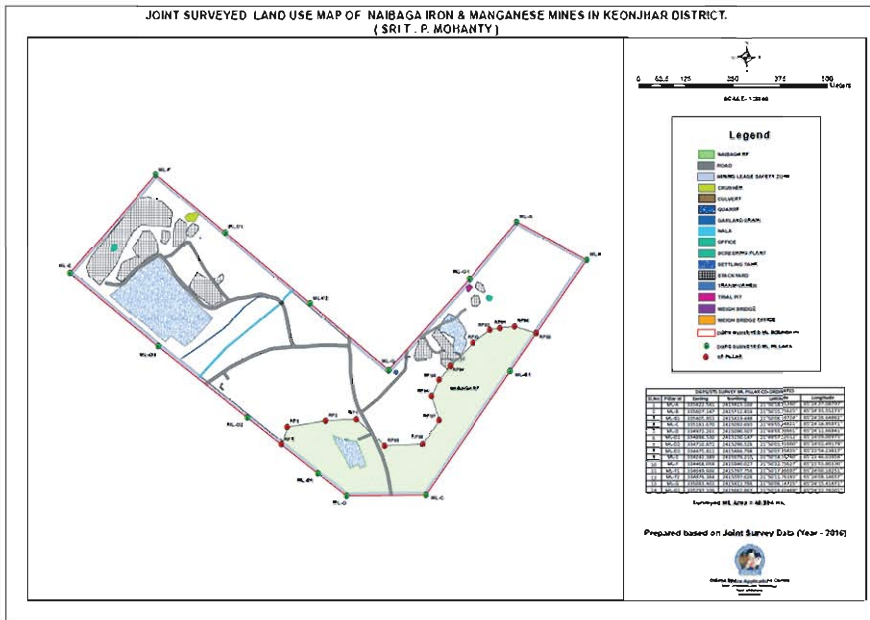
Govt. of Odisha has recognized ORSAC as the Nodal agency for the purpose of DGPS survey to facilitate digitization and geo-referencing of mining lease map (Letter No: 4276/IV(A)SM-92/09 dt-17.7.2010) to comply with the IBM (Ministry of Mines, Govt. of India) circular on geo-referencing and DGPS survey of Mining lease boundary. Accordingly, each Lessee of the individual mining lease

has to apply to ORSAC for DGPS survey of their lease. Further, Steel & Mines Department, Govt. of Odisha issued an order vide letter No: IV (B) SM-39/2014/ 0058, dt: 18.12.2014 for joint survey of all Iron & Manganese mines of the state. The Joint survey is under progress in Joda and Koida mining circle by 5 nos. of Joint Survey team constituted by Steel & Mines Department comprising of representatives from ORSAC, Revenue, Forest and Mining Department. The formation of another 10 joint survey team by Steel & Mines Department is under process for DGPS survey of the mining leases of remaining mining circles of the state.

The steps of database generation are: Field DGPS and ETS survey along with the joint survey team, Ortho-image preparation from high resolution stereo pair satellite image using network adjusted DGPS control points, Digitization and geo-processing of cadastral revenue map/ original mining lease map/ plan map and their integration in a GIS environment to prepare a final geo-referenced map of the mining lease superimposed on high resolution satellite image.

DGPS survey for lease boundary of 236 mining leases of the state has been completed as per the request of concerned Lessees. The Joint survey exercise for 91 Iron & Manganese leases has been completed including 40 leases in the year 2016-17. The joint survey for remaining mines is under progress.

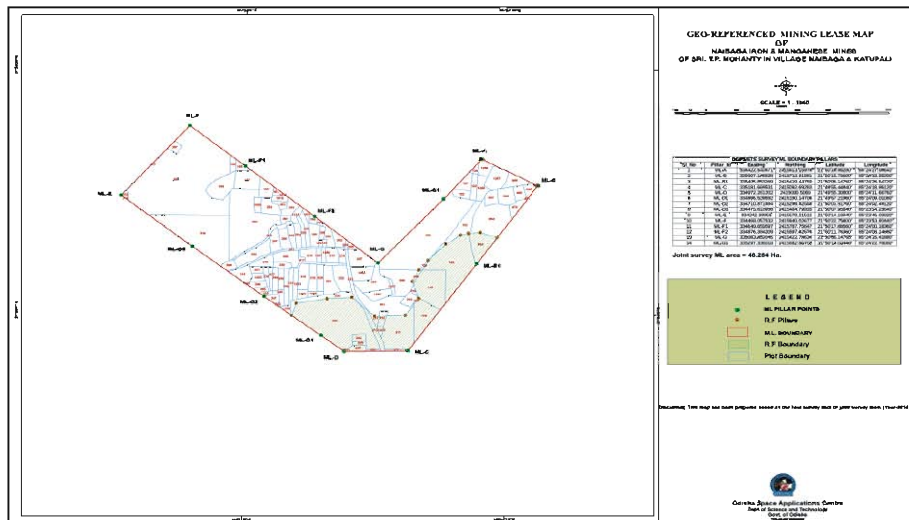




The exercise for satellite based temporal monitoring (Six months interval) of the mining area for detection of illegal mining outside the lease hold is undertaken by the Centre.

As per the requirement of Revenue & Disaster Management Dept. and Steel & Mining Department, Govt. of Odisha, the DGPS survey exercise for all the minor minerals and Sairat sources (sand, stone, morrum quarry etc.) of the state is initiated.

Fifty-eight Sairat leases (16 sand and 42 stone quarry) have been completed as a pilot survey after demarcation in the field by the Revenue Department in the year 2016-17. The field demarcation of remaining Sairats is under progress by the field officers of Revenue Department for DGPS survey.



Year wise Progress in mining area survey project:

YEAR	DGPS/ETS SURVEY OF MINING LEASE BOUNDARY	DGPS/ETS SURVEY FOR GEOREFERENCING OF COAL BLOCK	JOINT SURVEY OF MINING LEASES USING DGPS/ETS	JOINT SURVEY OF MINERALISED BLOCKS FOR AUCTION PURPOSE USING DGPS/ETS	DGPS/ETS SURVEY OF MINOR MINERALS(SAIRAT SOURCES)
2010-2011	29	-	-	-	-
2011-2012	139	-	-	-	-
2012-2013	24	-	-	-	-
2013-2014	25	11	39	-	-
2014-2015	11	3	-	-	-
2015-16	4	2	12	-	-
2016-17	-	1	40	9	58
TOTAL	232	17	91	9	58



National Land Records Modernization Programme (NLRMP)

Major components of National Land Records Modernization Programme (NLRMP) programme are: Computerization of all land records, Survey/re-survey of lands and Updation of all survey and settlement records including creation of original cadastral records. In Odisha state, Revenue and Disaster Management Dept. is implementing the program. The centre is associated in two major project components, i.e. Quality Checking of digitized cadastral maps and Cadastral Resurvey.

A. Quality Checking of digitized cadastral maps

Cadastral maps of 51,612 number of villages, out of 51675 villages are digitised by Revenue Dept. and Quality Checked (QC) at Survey and Map Publication Office(S&MP), Cuttack and also at the centre (QC of digitized maps). The newly published digitized cadastral maps of 1945 villages generated by Revenue Dept. are also quality checked first at S&MP office, Cuttack and later at ORSAC. The centre is preparing GIS ready CAD files of digitized maps after quality check. Datasets are also prepared for linking of Bhulekh RoR data with cadastral map plots.

B. Cadastral Resurvey by High Resolution Satellite Image (HRSI) method

High Resolution Satellite Images depict field bunds distinctly. The plot parcels are delineated from cloud free orthoimages and obscured/difficult areas are surveyed using DGPS and ETS. The vector datasets derived through RS/DGPS/ETS survey are integrated in GIS environment to generate the base cadastral vector datasets for further settlement/ title confirmation activities by Revenue Department. The project is implemented in Khurda, Keonjhar, Cuttack and Ganjam Districts by Revenue & DM Dept. in technical consultation with the centre. 334 maps have been quality checked. Maps authenticated by the centre were submitted to Revenue and DM Dept. for resurvey work for Khurda and Cuttack districts.

C. Cadastral Resurvey by Aerial survey/photography method

The centre is also assisting the vendor engaged by the Revenue & DM Dept. for preparing cadastral maps of 5 districts (Sundergarh, Deogarh, Samabalpur, Bolangir and Sonepur) using Aerial Photography method. 130 maps of part of Sundergarh district prepared by the vendor have been quality checked and verification completed.





Digital Elevation Model & 5m Contour Database Creation of State

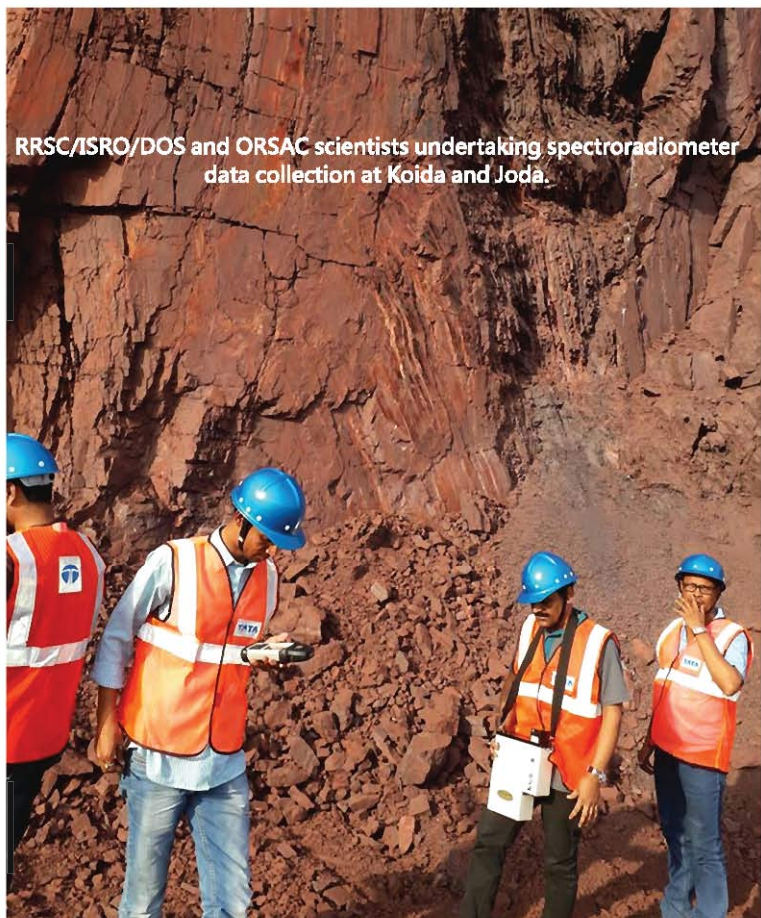
Generation of Photogrammetric Block using CARTOSAT-1 stereo pairs (spatial resolution of 2.5m) for the Odisha State is undertaken to generate Digital Elevation Model and Contour of 5m interval by using Network Adjusted Ground Control Points (GCPs) surveyed through DGPS. As per thumb rule, the DEM of 10m resolution and Contour of 10m interval could be generated i.e. 4 times spatial resolution of the sensor. A research initiative has been undertaken by taking up a Project sponsored by PCCF, Odisha, where a close network of Ground Control Points (GCPs) of the entire state surveyed through DGPS having sub-meter RMS error. GCP's would be used for orienting the Photogrammetric Block to provide 5m accuracy (two pixel accuracy) while generating DEM and Contour. Under the programme, GCP collection is under progress.

Hyper-Spectral Remote Sensing Application in Geological/ Mineral Study

A hyper-spectral sensor collects data in contiguous narrow bands (up to several hundred bands) in the electromagnetic spectrum (0.4 micrometers - 2.5 micrometers wavelength range) using reflected solar radiation and captures the spectral signature of an object, which can be used to trace the presence of mineral at surface outcrop. Hyper-spectral data can map many specific alteration on mineral. The objective of this R&D study is to assess the potentiality of the hyper-spectral imaging technique as a tool for wide-area mineral exploration and identification with reference to Iron. A collaborative study is initiated during 2016-17 consisting RRSC-East, Kolkata, NRSC/ISRO/DOS, Directorate of Geology, and Odisha Mining Corporation of Govt. of Odisha.

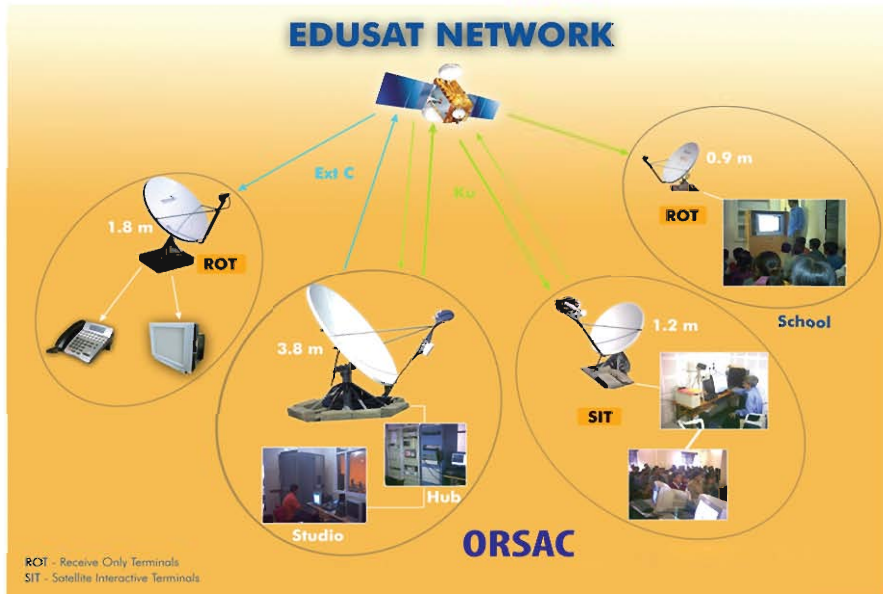
In situ data collection for the two mining areas i.e. Koida and Joda using Spectro-Radiometer of RRSC-East, Kolkata is undertaken jointly by the Scientist of the centre and RRSC-East. The pure laboratory spectra of the samples are being generated at RRSC-East, Kolkata.

Chemical analysis of the rock samples will be carried out in the Laboratory of Directorate of Mining at Joda. The spectral library of Iron, Manganese and Iron & Manganese mixed ore would be generated combining the in-situ and pure spectra towards the end of this year.



RRSC/ISRO/DOS and ORSAC scientists undertaking spectroradiometer data collection at Koida and Joda.

Satellite Communication Project



GRAMSAT NETWORK IN ODISHA :

During the year 2016-17, GRAMSAT has produced three public awareness video spots for Health & Family Welfare Dept. on "Mother & Child care immunity," three spots for Energy Dept. on "Energy Conservation," and one documentary on "Solar water pump" for OREDA and six audio spots on "Witch Hunting" for Science & Technology Dept.

EDUSAT NETWORK IN ODISHA :

During 2016-17, EDUSAT has transmitted 175 educational programmes utilizing 65 transmission days. The transmission has covered hard spots from IX & X syllabus on the subjects like English, Mathematics, Life Science, Physical Science and Geography. In total 216 State Govt. High Schools are connected through Edusat Network having 2 way audio and video facilities.

Production of Edusat programmes

- Target audience of Edusat transmission : Secondary school students (Class-IX & X) .
- Subjects covered : Mathematics, English, Physical Science, Life Science & Physical Geography.
- Live classroom programmes : 57 nos of trained resource teachers empanelled through an audition test are now operating from ORSAC studio as Resource Persons. The hard spots on Mathematics, English, Science and Geography are being taught to the students with required visual support.
- Transmission timing : Monday to Friday : 12.30 PM to 01.30 PM, 03.00 PM to 04.00 PM, 07.00 PM to 08.00 PM

Saturday & Sunday : 11.00 AM to 01.00 PM

Evening transmission on Saturdays and Sundays are meant for Residential Schools of ST & SC Dev. Dept. The transmission schedule in form of wall calendar is provided to all Edusat schools for information of students and teachers about the specific subject to be covered in each transmission slots.

- Training of new Tele-teachers : The Tele-teachers selected through an audition test recently were trained through an orientation course.
- Edusat transmission -175 (109 for class -IX and 66 for Class-X) classes for students of class- IX & X. Out of this 30 sample classes were uploaded in the Odisha Knowledge Corporation Ltd. (OKCL) server for viewing of the students of 4000 e-schools under School and Mass Education Department, Government of Odisha.



Training / Capacity building programme

ORSAC provides its services in disseminating knowledge on Remote Sensing & GIS and on hi-tech surveys to the students of different universities and technical institutions through summer training. Students from different universities are also allowed to carry out their project work/ dissertation work for partial fulfillment of M.Phil./M.Sc/B.Tech/PG Dip. Degree for a period upto six months.

Students of Marine Sciences Dept., Berhampur University, CET and KIIT, Bhubaneswar, completed their project work for fulfillment of their Degrees/Diploma.

Students from IGNOU, Bhubaneswar, Govt. Polytechnic, Bhubaneswar, XIMB, Bhubaneswar and North Odisha University visited ORSAC. They were given exposure on application of RS & GIS, Information Technology. Officer trainees from Gopabandhu Academy of Administration also visited ORSAC in two occasions for exposure on RS & GIS.

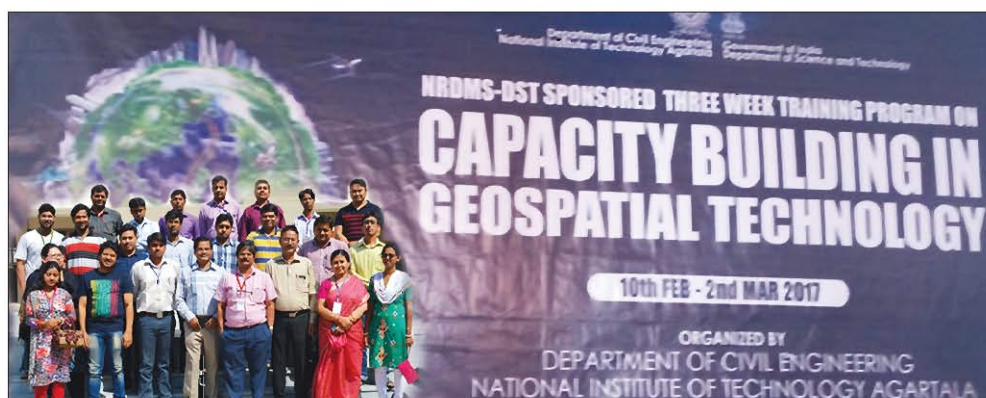
Orientation Training is also provided to the officials of Government departments to enable them to use RS & GIS datasets and to handle the data in GIS environment. Centre is providing project based data, SW and portal handling software training to users and project sponsoring departments and agencies.



The scientists of the centre paid visit to different Universities of Odisha. They have delivered lectures at Gopabandhu Academy of Administration, Revenue Officers' Training Institute (ROTI) and IMAGE Administration, regularly on topics related to technology use for development planning and decision support system development.

Scientists, engineers and technical support staffs of the centre are being trained regularly on advance application areas relating to CAD, GIS, DGPS operation, spatial data management, image processing, web service applications and Geo-ICT developments.

Scientists of the centre conducted user training at Bhubaneswar, Cuttack, Berhampur, Rayagada, Sambalapur and Balasore on use of GOiPLUS web-portal.



The centre facilitated NIT, Agartala in conducting 3 weeks NRDMS, DST Govt. of India sponsored capacity building programme on Geoinformatics.



Certificate

For

Application of Geospatial Technology
in Land Services

to

**IPICOL and IDCO, Department of
Industries, Government of Odisha &
Odisha Space Applications
Centre, India**

for **GOiPLUS (Government of Odisha's
Industrial Portal for Land Use and Services)** –
a GIS-based web enabled platform to display real
time information with regards to all the industrial
land available in the State.

DR. M P NARAYANAN
Chairman
Geospatial Media and
Communications Pvt. Ltd.

25th January, 2017
Hyderabad, India

SANJAY KUMAR
CEO
Geospatial Media and
Communications Pvt. Ltd.



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