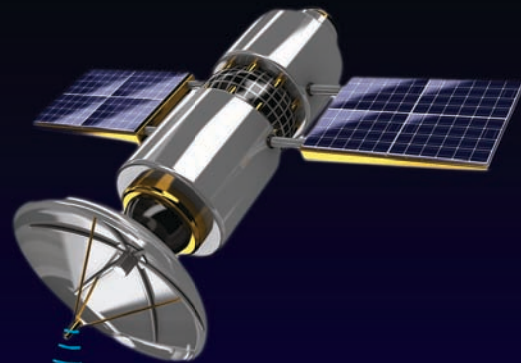
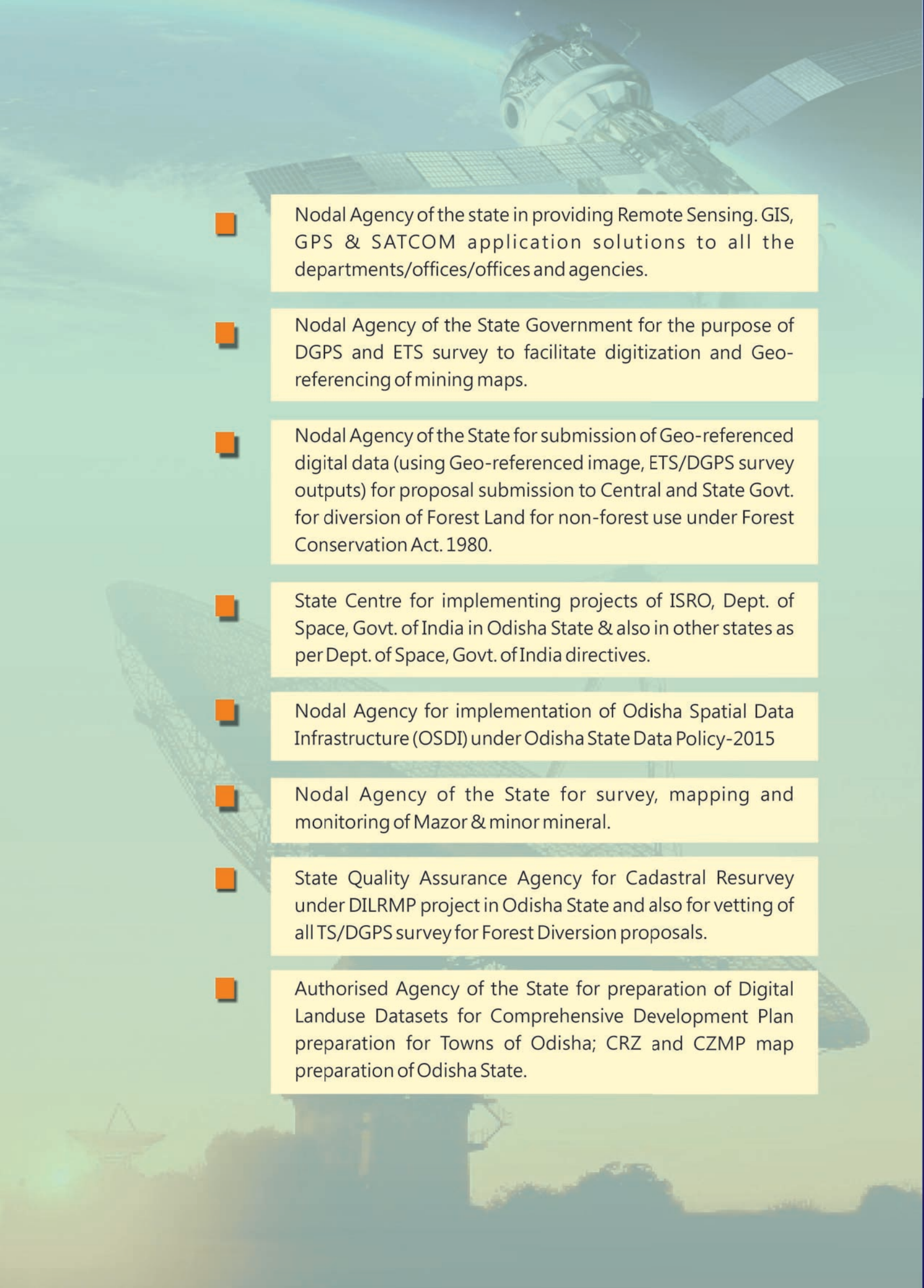


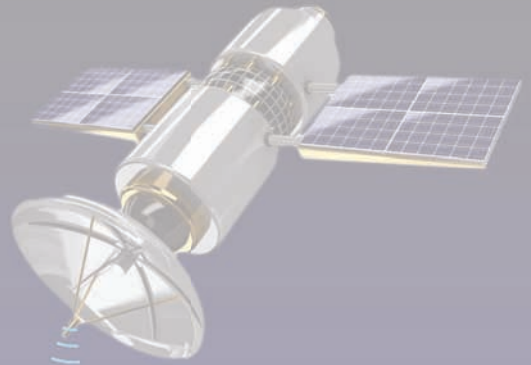
Annual Report

2019-20



Odisha Space Applications Centre
Department of Science & Technology
Govt. of Odisha
www.orsac.gov.in

- 
- Nodal Agency of the state in providing Remote Sensing, GIS, GPS & SATCOM application solutions to all the departments/offices/offices and agencies.
 - 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 & also in other states as per Dept. of Space, Govt. of India directives.
 - Nodal Agency for implementation of Odisha Spatial Data Infrastructure (OSDI) under Odisha State Data Policy-2015
 - Nodal Agency of the State for survey, mapping and monitoring of Mazar & minor mineral.
 - State Quality Assurance Agency for Cadastral Resurvey under DILRMP project in Odisha State and also for vetting of all TS/DGPS survey for Forest Diversion proposals.
 - Authorised Agency of the State for preparation of Digital Landuse Datasets for Comprehensive Development Plan preparation for Towns of Odisha; CRZ and CZMP map preparation of Odisha State.



Annual Report

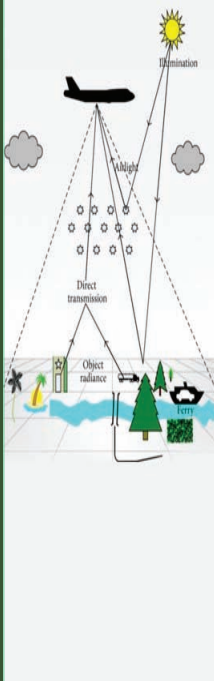
2019 - 20



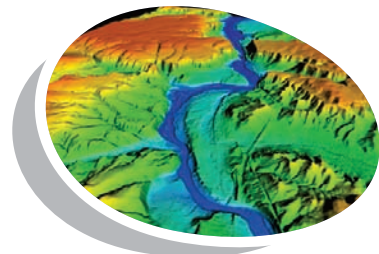
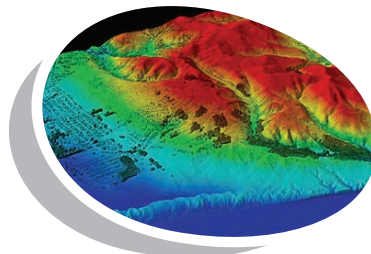
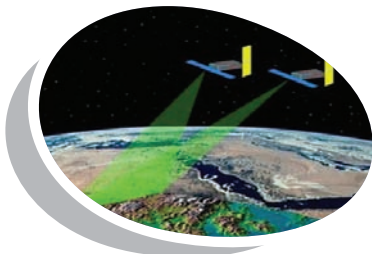
Odisha Space Applications Centre
Department of Science & Technology
Govt. of Odisha
www.orsac.gov.in

ORSAC Domain Activities

Remote Sensing & SATCOM Applications



- Repository of RS Data of Odisha & adjoining areas
- Remote Sensing Data Analysis
- Thematic Resource and Infrastructure mapping using HR image
- Natural Resources, Infrastructure & Environment status survey & monitoring
- Temporal change, Growth and Trend analysis
- Radar/ Microwave Data Analysis & All-Weather Data Acquisition
- Hyperspectral Remote Sensing
- AI/ Deep learning-based image processing for dynamic change study
- Digital cadastral and RS data integration
- 1:4k Development plan input generation using HR image
- GRAMSAT/EDUSAT Programme implementation in Odisha
- AV Programme/Spot production
- Tele Education for Secondary & Higher Secondary Students of Odisha





Hon'ble Minister
Science & Technology, Public Enterprises,
Social Security & Empowerment of Persons with Disability
Government of Odisha



I am happy to present the Annual Report 2019-20 of ORSA which reflects significant achievements and contribution of the centre in assisting the state administration in its mandated objective by providing geospatial DSS based solutions for Resource Management, infrastructure development, environmental monitoring and sustainable development.

During 2019-20, the Centre provided Geospatial Datasets as inputs for state's development planning process. Various types of decision support solutions are also provided to State Government for effective governance using remote sensing, satellite communication, geo-informatics, Geo-ICT, satellite navigation and computer technologies.

Significant contribution of the Centre in last year is to establish a platform in the state to facilitate collation of standard spatial data in an inter-operable and open protocol for development planning and e-governance purposes. The centre played an important role in providing database solution to state departments for land bank development, establishing vehicle tracking system for mineral carrying vehicles, sanitization of cultivable and irrigated area data of the state, forest working plan preparation, urban area database development for CDP preparations of towns of the state, wasteland mapping of the state and DGPS based survey of mining areas, minor minerals and for the purpose of forest diversion. Further, under the Hon'ble Chief Minister's 5T programme the centre is developing web-based portals for providing accurate, timely and scientific inputs for decision making.

I take this opportunity to record my appreciation for the efforts and activities conducted by the staff of the centre and wish all success to the organisation.

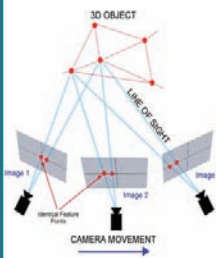


(Ashok Chandra Panda)

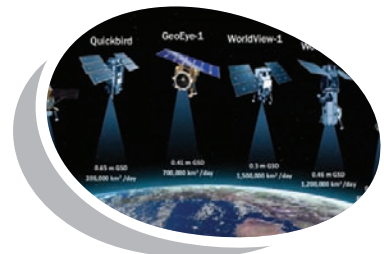
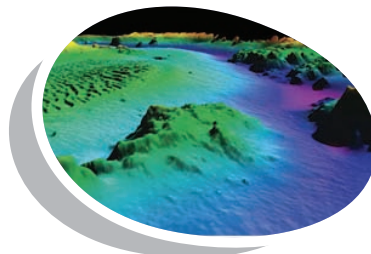
M E S S A G E

ORSAC Domain Activities

Photogrammetry/ 3D Analytics



- Georeferencing of HR image
- Stereo data Analysis
- DSM/DEM (Digital Elevation Model) generation
- Photogrammetry services for revenue land record preparation
- 3D image analytics for urban and mining areas
- Photogrammetric services for UAV/Drone/ Lidar Data Analysis
- Network alignment, Viewshed creation and Runoff modelling
- Land & Water Resources Action Plan preparation
- Geo-engineering Applications
- Terrain Analysis





Chief Secretary, Govt. of Odisha &
Chairman, ORSAC



M E S S A G E

In the present age of 'knowledge society', credible data is the sine-qua-non for informed planning, monitoring and evaluation of the developmental projects. Odisha Space Applications Centre (ORSAC), as a mandated body for creating the data repository through space technology and geo-informatics has been catering to this need in a number of ways since last three decades. This year too, ORSAC is bringing out its Annual Report for the year 2019-20 to chronicle its activities for cumulative growth in coming years, which is heartening.

With its sophisticated laboratories, softwares and a team of well-experienced scientists, ORSAC has generated multi layered database such as Odisha Sampad, Odisha 4K Geo and Odisha Spatial Data Infrastructure. Presently, it has extended its frontiers of action to mapping of urban land utilisation, identification of land for industrial land bank, development of irrigation database, data analysis, UAV applications, assessment of crop condition, mapping of wet and moisture level of soil etc. In the current year, the Centre has initiated use of Space Technology and Artificial Intelligence based application for detecting the 'changing landuse pattern' in Government owned lands of the capital city. ORSAC is now ready with a 'single window platform' for providing Geospatial Data Services to all departments through web based portals and mobile Apps.

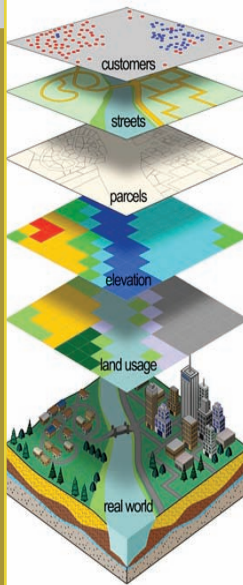
Because of its qualitative excellence, ORSAC has bagged prestigious international awards like Geospatial World Excellence Award from the World Geospatial Forum and Special Achievement in GIS (SAG) from Environmental System Research Institute (ESRI), USA. I hope, the ORSAC team will keep up its innovative ventures to scale newer heights in the years to come.

I compliment the sincere efforts of ORSAC Team and wish the publication of the Annual Report all success.

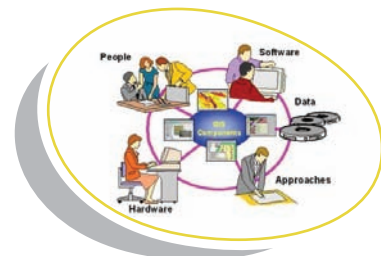
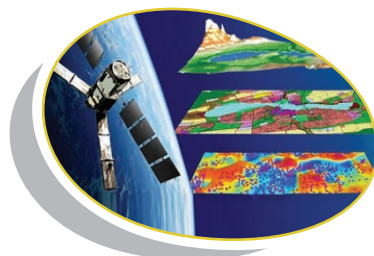
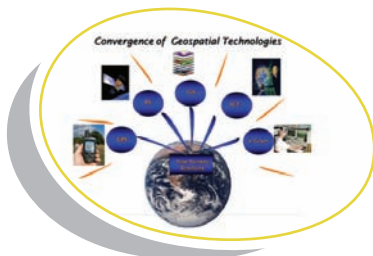

(Asit Tripathy)

ORSAC Domain Activities

Geoinformatics



- R2V (Raster to Vector) conversion
- GIS database from satellite image
- Geo-database creation in open source
- Geodata integration
- Data analytics
- Data migration
- Data mining
- Thematic map generation
- Landuse Planning
- Land Management
- Urban & Municipal Application
- Network Planning
- Geotagging





**Development Commissioner-cum-
Addl. Chief Secretary**
Government of Odisha

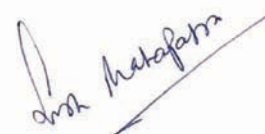


M E S S A G E

I am glad to present the Annual Report of Odisha Space Applications Centre (ORSAC) for the year 2019-20 documented for dissemination of information about its activities.

ORSAC is the Nodal Agency of the state for application of Remote Sensing, GIS, GPS, Geo-ICT and SATCOM technologies for development purposes. As a multidisciplinary organisation and in line with its mandate, the centre is continuously engaged in providing support services and solutions for effective governance using scientific methods and advanced technologies. The centre has created a repository of GIS database of all major natural resources, infrastructures and environmental parameters of the entire state. Geospatial Datasets for the state are created from District to Village level having plot level datasets for local, GP, Block and District level planning. The centre is providing geospatial DSS portals as planning inputs to all departments of the state for development planning, scheme formulation, enforcement, and site plan preparation. Some of the significant achievements of the centre during 2019-20 are development of Odisha 4k GEO, Odisha KYL (Know Your Location) and Odisha Agri-DSS and Odisha Road-DSS portals for use by State Departments. Odisha 4k GEO is a unique portal which provides geospatial datasets in Revenue/Cadastral scale and Odisha KYL provides all locational & Administrative division information of any location of the state.

I record my appreciation for the services rendered by ORSAC team for the significant achievements during the year 2019-20.



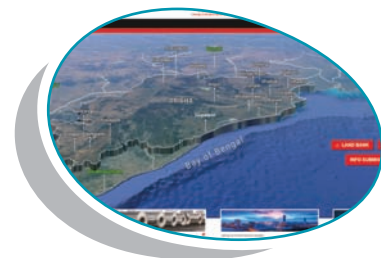
(Suresh Chandra Mohapatra)

ORSAC Domain Activities

Web-GIS/Mobile GIS/Geo-ICT Applications



- Web-GIS Portal Development
- Geospatial Mobile Application Development
- Decision Support System Development
- WMS & WFS services for Govt. Departments
- Spatial Data Infrastructure
- Cadastral Geo Services
- Vehicle Tracking through IOT Device
- Geospatially aided Citizen Services
- Geospatial MIS Services for Development Planning





Principal Secretary to Govt. of Odisha
Science & Technology Dept.



M E S S A G E

Since 1984, ORSAC as the State Nodal Agency for geospatial datasets has been catering to the needs of State Departments and other Central Government institutions. During 2019-20 the centre undertook several important assignments like landbank development for industrial activities; sanitisation of irrigated and cultivated areas data of the state; completion of DGPS survey of projects relating to several forest diversion proposals of mining areas, road expansion, canal network extension and provision of power networks etc.; digital map creation for CDP preparation of towns; survey of minor mineral of the state; Forest Working Plan preparation; PMGSY road network planning and Crop Acreage & Yield Estimation for Kharif and Rabi season etc.

The activities of the ORSAC is aimed at developing State Spatial Data Infrastructure through OSDI and Odisha 4K Geo to support users to use and share cross platform support and device development web-responsive maps and Apps for geospatial DSS services. Besides, the above the centre is assisting PCCF Wildlife & Kendu-leaves, Water Resources Dept., Energy Dept., GA & PG Dept., Handicrafts Dept., RD Dept. and Finance Dept. under the 5T initiative objective of Hon'ble Chief Minister, Odisha in generating Web-portals and Mobile Apps. The centre is now assigned the task of generating Government Assets database by Finance Department under the project Odisha Public Assets Monitoring System (OPAMS). It is pertinent to mention here that all departments of Government of Odisha are advised to use "Odisha 4K Geo", "Odisha KYL", "Odisha Asset Mapper" under the guidance of Finance Department as per the decision taken in the meeting of All Secretaries/ Special Secretaries in November 2019.

I extend my best wishes for the endeavour of ORSAC and hope that its activities will serve the interest of people of Odisha.



(Santosh Kumar Sarangi)

ORSAC Domain Activities

Data Analytics

- AI/ Deep learning-based Geoinformatics
- Matlab based Digital Image Processing
- Login Analytics
- Dashboard Development
- Geospatial IOT Application
- Bigdata Analytics
- IOT based Vehicle Tracking, Soil Moisture Studies, Runoff Estimation, Mining area Monitoring & Vegetation cover Analytics





From the desk of Chief Executive

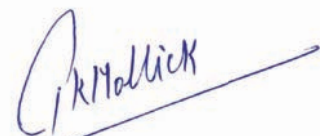
I am happy to present the Annual Report 2019-20 of ORSAC which reflects significant achievements and contribution of ORSAC in Geospatial based solutions for Development planning ,Resource management, Infrastructure development, environmental monitoring and sustainable development.

During 2019-20 the Centre provided geospatial datasets as inputs for our state development planning process. Various types of Decision Support solutions are also provided to State Government for effective governance using Remote Sensing and Geoinformatics.

Significant contribution of the centre in last year is to establish a platform in the state to facilitate collation of standard spatial data in an inter-operable and open format for development planning and e-governance purposes. The centre played an important role in providing Geo-ICT solution to state departments for land bank development, mineral vehicle tracking , sanitization of cultivable and irrigated area data for whole state, forest working plan preparation, Rurban Geo-Database development and mapping, Agricultural GIS and DGPS survey of mines and forestlands for diversion.

Under the Hon'ble Chief Minister's 5T programme, the centre is developing state of the Art Geoinformatics products and services for providing accurate, timely and scientific inputs for decision making. BLUIS (Bhubaneswar Land Use Intelligence System) and Odisha 4k Geo Mapping (in 1:4000 Cadastral Scale) are two significant projects in this regard during 2019-20.

I take this opportunity to express my deep appreciation and well wishes towards my fellow colleagues in ORSAC for their innovation and dedicated hard work.



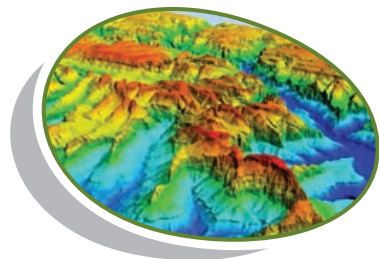
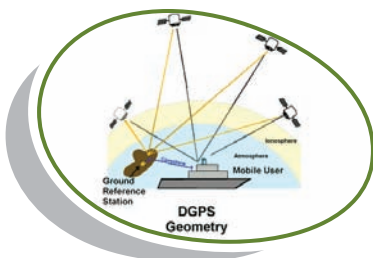
(Prafulla Kumar Mallick)

ORSAC Domain Activities

Geospatial DGPS/ ETS Services



- Survey for Forest Diversion
- Mining Lease Boundary Survey
- Compensatory Afforestation Survey
- Cadastral Survey
- Land Record Modernization
- Property Survey
- Land Acquisition Survey
- Digital cadastral and RS data integration
- Forest Land Georeferencing service supports
- State Geo-coordinate Database Creation
- Location -based Services



Important Application Projects 2019-20

1. Bhubaneswar Landuse Intelligence System (BLUIS)
2. Vehicle Tracking Solution (VTS) for Mineral Transporting Vehicles of Odisha.
3. Technology Mission for Geospatial Aided Agricultural Information System
4. ODIIIS – Odisha Irrigation Information System under Sanitization of Cultivated and Irrigated area data of Odisha
5. Odisha Sampad
6. COAST-Coastal Aquaculture Information System
7. GOPLUS – Govt. of Odisha's Portal for Land Use Services
8. Odisha Land Bank Development for Industrial and Tourism purposes
9. Monitoring of Nuapada NAFCC (National Adoptive Fund for Climate Change) project sites
10. OSDI – Odisha Spatial Data Infrastructure
11. RS & GIS inputs for Comprehensive Development Plan (CDP) preparation of towns
12. DST Climate Change project – DEM creation and Assessment of erosion prone areas of Odisha State
13. World Bank Assisted Rural Roads Project (PMGSY) for RD Department
14. Mining Lease Boundary survey through High-Tech method
15. TS/DGPS survey of Minor Minerals (SAIRAT) of the State
16. DGPS survey for Forest Diversion proposals
17. FASAL (Forecasting Agricultural output using Space, Agro-meteorology and Land based observations)
18. Coordinated Horticulture Assessment and Management using Geoinformatics (CHAMAN)
19. SIS-DP (Space based Information Support for Decentralized Planning)
20. National Wetland Inventory and Assessment
21. Desertification and Land degradation Monitoring
22. Monitoring of IWMP Watersheds
23. DILRMP- Cadastral Resurvey
24. KRUTI – Web-Portal and Mobile App development for Handicraft Artisans
25. Odisha Road Geospatial DSS
26. Coast Zone Management Plan Preparation
27. Odisha Police Station Geodatabase creation
28. Know Your Location (KYL) portal & Mobile App development
29. Odisha Asset Data portal
30. OPMS - Odisha Permit Management System
31. Geoinformatics Citizen Services
32. Supports for Forest Land Georeferencing Services
33. Anukampa-PCCF-WL Portal for Compassionate payments
34. SATCOM Programs ---GRAMSAT/ EDUSAT
35. Map Data Dissemination & Citizen Services
36. Implementation of State's 5T initiatives

Odisha Space Applications Centre (ORSAC)

ODISHA SPACE APPLICATIONS CENTRE (ORSAC) established during 1984 is the apex body of the State for Space Technology Applications and comprises of a pool of multidisciplinary Application Scientists and Engineers to undertake Remote Sensing, GIS, GPS, Geospatial Data management, Geo-ICT and Satellite Communication Technology Applications. State Government vide resolution No.3765/ST dated 30th July 2009 of the Science & Technology Department declared the centre 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 Organizations 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 operationalization 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.
- Operationalization 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.

Human Resources

20 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 has engaged 68 contractual staff (Project Scientists, Project Assistants, SW Developers, Database Managers, Engineering Assistants, MIS/CAD and GIS Analysts) ETS/DGPS Surveyors, System Managers and Satcom Engineers during, 2019-20.



Accounts

Receipts

(Rupees in lakhs)

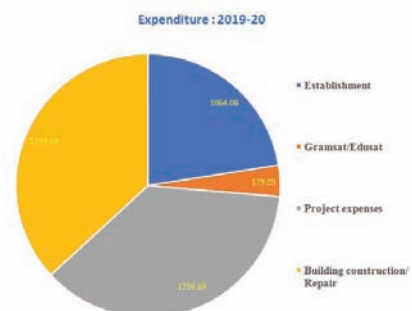
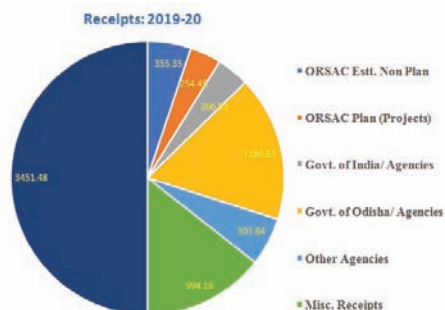
Schemes	Nature of funding	2015-16	2016-17	2017-18	2018-19	2019-20
ORSAC Estt. Non Plan	Grant-in-aid	309.00	309.00	355.35	355.35	355.35
ORSAC Plan (Projects)	Projects	1063.53	1100.00	867.25	1145.32	254.45
Govt. of India/ Agencies	Projects	595.70	131.33	72.39	346.86	266.83
Govt. of Odisha/ Agencies	Projects	1839.71	1572.91	1524.95	1078.87	1186.83
Other Agencies	Projects	786.66	845.61	305.12	224.02	393.84
Misc. Receipts		746.33	729.70	891.82	1009.78	994.18
Total		5340.93	4688.55	4016.88	4160.20	3451.48

Expenditure

(Rupees in lakhs)

Head of expenditure	2015-16	2016-17	2017-18	2018-19	2019-20
Establishment	831.64	937.71	816.81	1362.72	1064.08
Gramsat/Edusat	205.61	151.75	315.87	186.90	179.05
Project expenses	503.59	819.19	1478.64	1659.15	1739.69
Building construction/ Repair	47.83	121.77	153.64	50.00	120.00
Total	1588.67	2030.42	2764.96	3258.77	3102.82

Year	2015-16	2016-17	2017-18	2018-19	2019-20
RECEIPTS	5340.93	4688.55	4016.88	4160.20	3451.48
EXPENDITURE	1588.67	2030.42	2764.96	3258.77	3102.82



Infrastructure

Hardware

System	Nos
Blade servers	29
Rack Servers	13
High-end Workstation for Digital Photogrammetry	8
High-end Desktop (Intel core-i5)	50
High-end Desktop (Intel core-i7)	69
Desktop - Intel core-i5	35
Desktop - Intel core-i3	2
Workstation - Intel core-i7	18
Desktop - Pentium Quad core	10
Storage	
On -Line Storage (36 TB) with Tape Backup System	1
Mini - Storage attached with Blade servers (14TB)	1
SAN Storage attached with Blade servers (16TB)	1
SAN Storage attached with Blade servers (20TB)	1
Scanner	
(VIDAR) A0 Size (Titan H36)	2
HP - A4 size	10
Printer/MFP	
Inkjet / Deskjet / LaserJet - A4 / Multi-Function Printer	21
A3 Laser color Printer	1
Plotter	
HP Design Jet 4000 —A0 (36 inch)	1
HP Page wide XL5000	1
GPS/DGPS	
Hand GPS (Garmin — 12)	21
DGPS (Base) + ROVER (Trimble/Leica)	14
ETS (Total Station)	6
GPS Based Hand Held Device	3

Infrastructure

Software

GIS	Nos
Arc GIS Desktop Version 10.7/Arc GIS Pro	24
Auto CAD + Auto CAD Map	2
GeomediaWeb map/Desktop	4
TeraGo Geo PDF (2D & 3D)	1
Image Processing	
ERDAS WITH LPS (Leica Photogrammetry Suite)	6
ENVI / TNT MIPS / ERDAS APOLLO (Enterprise GIS)	5
Intergraph Geospatial Server 2018	4
Arc GIS Server	3
Others	
ORACLE 11g R2/12c	1
Postgress EDB (Enterprise + Developer)	3
VMware Virtualization Kit	1
RDBMS (+) MS SQL 2008 (2) ORACLE	1
Exchange Server 2013	1
Operating System (Window Vista/7/8/10, Windows Server 2000/2003/2008/2012/2012 R2/2016/2019)	
Office Std 2013/2016/2019/365	
End Point Security	200



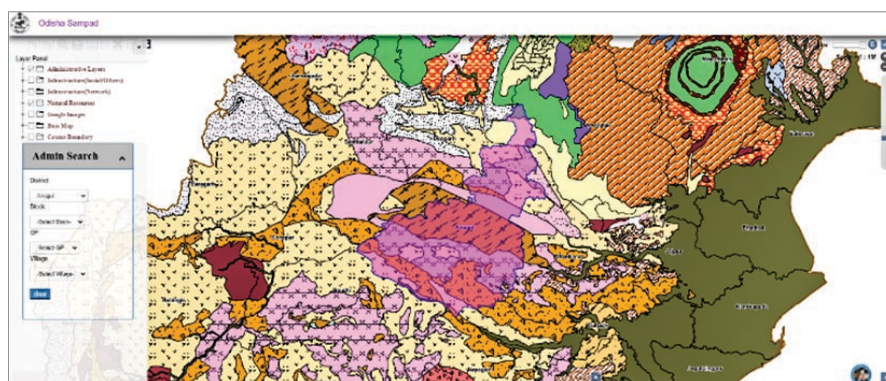
Odisha Sampad ver 3.1

“Odisha Sampad” portal is the repository of State's Geospatial Datasets consisting of administrative information, natural resources data layers, georeferenced infrastructure details and other socio-economic data in spatial format. The portal aims to cater to the need of Geo-spatial data need of State Administrators, Decision Makers, Resource Managers and Planners.

The portal can be used for planning, especially for community development at Block level by using scientific database containing geo-spatial natural resources & infrastructure profile of the Block and can use Geospatial demographic, socio-economic, agro-economic and utilities/ amenities/ infrastructure data (generated by GIS based analysis and visualization). During 2007-08, this Digital Web-Atlas was developed as ODISHA SAMPAD (Ver 1.0). The portal was updated again in 2012 as Ver 2.0 by updating the information in various layers.

Growth of IT technology particularly web-based services in e-governance, adoption of advanced Geo-ICT technology at ORSAC and approval of Odisha State Data Policy (OSDP) led the foundation for creation of ODISHA SAMPAD Ver 3.0 in 2018 and Ver 3.1 in 2020.

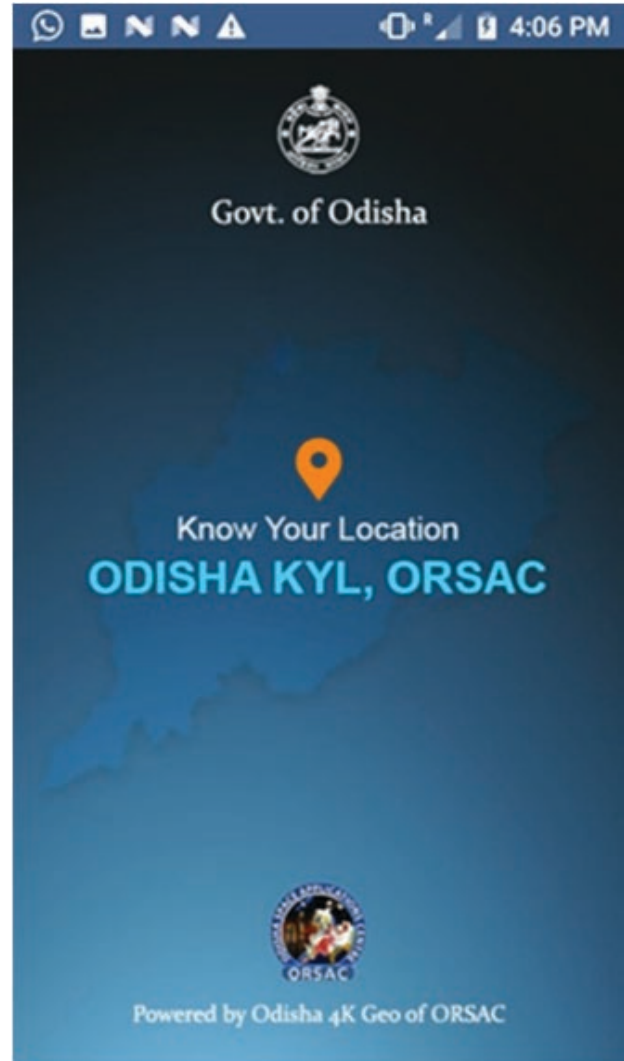
ODISHA SAMPAD (Ver 3.1) facilitates easy access and sharing of Government owned Geospatial data in open format for supporting sustainable and inclusive governance, and effective planning. Odisha Sampad Web-portal is supported by an online platform that provides authoritative spatial data at Block and District scales having an authentication data integrity framework and a set of on-line tools to visualize, analyse and access Geospatial Data.



Odisha KYL (Know Your Location)

ODISHA KYL (Know Your Location) is a locational Intelligence App developed by ORSAC utilising the “Odisha 4K Geo” geospatial services. The App is developed by utilising georeferenced and geotagged administrative boundary and location data of “Odisha 4K Geo” .The App is very user-friendly and on opening the App (the person holding the Mobile on any location inside the State of Odisha), it gives the following locational information.

- District Name
- Block Name
- GP Name
- Village Name & Code
- Thana Name & Code
- Legislative Assembly Constituency Name
- Parliamentary Constituency Name
- If inside forest – Forest Name
- Khatian Number
- Plot Number
- Latitude
- Longitude and
- Option to take ground images



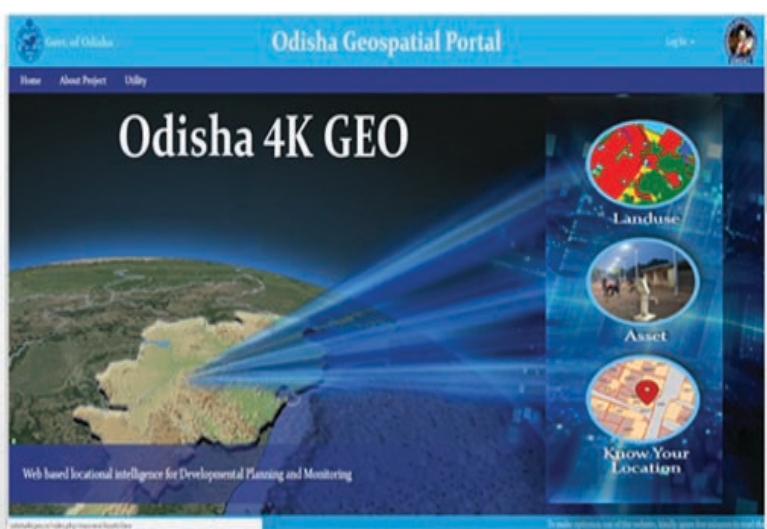
The App is extensively used by the centre during field validation and geotagged data collection for projects sponsored by various State Departments. The App is also embedded into various Mobile App based applications for Department of Water Resources, Department of Farmers Empowerment & Agriculture and Department of Forest & Environment etc.

Georeferenced cadastral maps merged with High Resolution Satellite Image (Orthoimages) and time to time modified administrative boundary layers are used to generate the digital geospatial database of the state along with linking of Revenue cadastral level info.

The App is developed under 5T initiatives of Government of Odisha.

Odisha 4K GEO Services

The Centre created the Cadastral map database and Land Use Database of entire state at 1:4000 scale after georeferencing all the Revenue Cadastral maps of the State using Orthoimages under 'Geospatial Technology for Rural and Urban Development project', funded by Dept. of Science and Technology during 2015-2018. During 2019-20, the centre decided to put all these Datasets under a Web-GIS based Web-Portal as 'Odisha 4K GEO services' for data visualization, Data dissemination, Data access and for providing inputs for development planning activities by State Departments using ORSAC's own resources. Odisha 4K GEO services are designed to be used as State Asset Data Portal & for Programme Scheme Monitoring System for Odisha State at 1:4000 scale. All the infrastructures / utilities / amenities created under Government schemes are to be incorporated to the portal via dedicated server and Mobile-App based architecture.



WEB PORTAL FOR DATA SERVICE IN 1:4000 CADASTRAL LEVEL ALONG WITH DEPARTMENTAL ASSETS:

Information on Georeferenced revenue maps, Cadastral scale Landuse & Location Info



Mobile App with background Geospatial Framework for Asset Data collection

Odisha 4k Geo portal provides availability of data sharing framework; Standardized, Structured & Updated Geospatial Data infrastructure for seamless integration of data of multiple-sources; Standard mechanism for ensuring Data integrity. Technology for dynamically updating of real-time data and live feeds and finally Geo-coordinated location-based data and GIS-based Maps for effective Decision Support.

The portal module "Landuse & Landcover" provides opportunity to users to access plot level cadastral scale land use map and data as per Administrative hierarchy i.e., District, Block, GP and Village. The maps can also be viewed with satellite data and cadastral (Revenue) maps in the background.

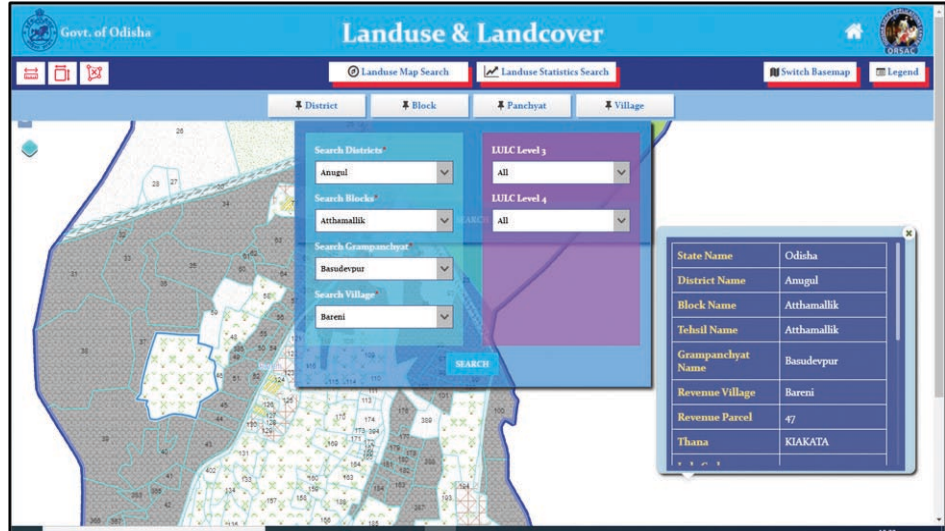
The portal module "Asset" provides facilities to view the departmental assets (to be collected through the Mobile App – OdishaAsset Mapper) as per Administrative hierarchy basis and department wise Data viewing as per the decision of Department of Finance, Govt. of Odisha.

The portal module "Odisha KYL" provides facilities to view the locational Intelligence Data as per click on map or mobile screen such as Administrative locational data like District, Block, GP, Village name, Forest name, PS/Thana Name, Khata number, Plot number, Latitude and Longitude etc. The data and map collected to Odisha KYL App are viewed in this module.

Odisha 4k GEO services provides

- Structured storage
- Multi-source Data Integration
- Web-enabling of Data
- Mobile App for Data capturing
- Data analytics
- Query module creation
- Dashboard based information visualization
- Net based data dissemination, WMS/WFS services and
- On-demand Decision Support provisions
- Integration with other Geospatial Services

Odisha 4k Geo Landuse Module

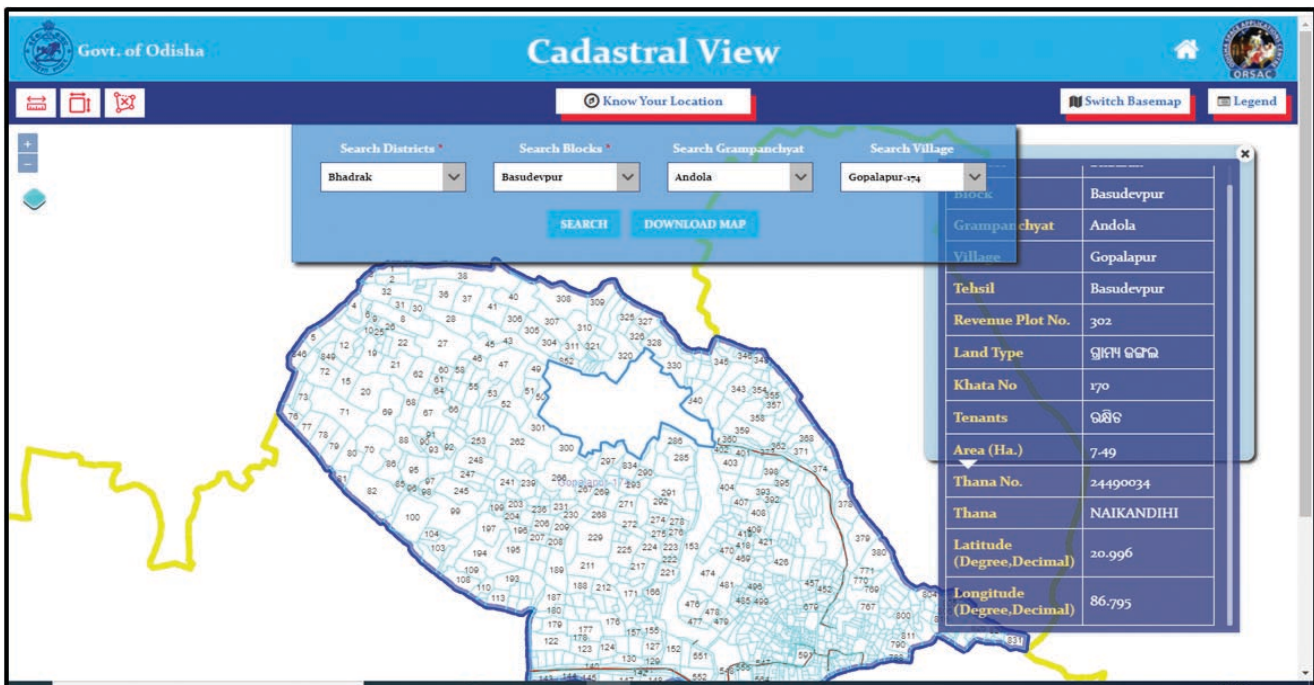


State Name	Odisha
District Name	Amugul
Block Name	Arthamallik
Tehsil Name	Arthamallik
Grampanchayat Name	Basudevpur
Revenue Village	Bareni
Revenue Parcel	47
Thana	KIAKATA

Mobile Apps using Odisha 4k GEO infrastructure

Under Odisha 4k GEO, it is decided now to generate a module ASSET to capture Departmental Asset Data as per the requirement of State Finance Dept. Asset module will be a Data analytics based web-based services through integration of ORSAC's OSDI and Odisha 4k GEO Validated GIS Data layers with Departmental Asset data. Odisha Asset Mapper Mobile App is created in this regard which provides framework for frequent modification as per different department needs.

Odisha 4k Geo KYL Module



Block	Basudevpur
Grampanchayat	Andola
Village	Gopalapur
Tehsil	Basudevpur
Revenue Plot No.	302
Land Type	ଘାଟମ ଗଢ଼ା
Khata No	170
Tenants	ଘରଟ
Area (Ha.)	7.49
Thana No.	24490034
Thana	NAIKANDIHI
Latitude (Degree,Decimal)	20.996
Longitude (Degree,Decimal)	86.795

The Odisha 4k GEO infrastructure is now used in Agri-GeoDSS project of FE & Agri Dept., ODIIS project of Dept. of Water Resources, GOPLUS project of Industries Dept., Odisha Police Station Geodatabase of Home Dept. and services are used on operational basis by Forest & Environment Department for Forest, Kenduleaves & Wildlife Management.

BLUIS

(Bhubaneswar Land Use Intelligence System)

BLUIS (Bhubaneswar Land Use Intelligence System) is developed for Safeguarding Government Lands in Bhubaneswar city by leveraging Space Application and Geo informatics by GA & PG Dept. Govt. of Odisha under state 5T initiative.

The Bhubaneswar Land Use Intelligence System (BLUIS) is developed under the authority of the General Administration Department of Odisha, to prevent Govt. land encroachments in Bhubaneswar city. The application uses frequently updated Geo-referenced cadastral map with geocoded Govt plots and monitored through AI/Deep learning-based change detection modules using monthly acquired high definition satellite images. The Alerts created are disseminated through mobile application for use by the field officials to validate the alerts that were identified by executing the machine learning modules.

The developed BLUIS Mobile APP helps enforcement authority and Common Citizens to report encroachment on Govt lands in Bhubaneswar city. The BLUIS App enables Municipal ward officers and Citizens to report any unauthorised construction happening in government lands in Bhubaneswar.

BLUIS Portal and App is developed by Odisha Space Application centre using Space Technology, AI/Deep Learning based Image Processing, Geo-ICT and Web-Technology as per the requirement of GA Dept., BDA and BMC. Citizen can download the 'BLUIS' app from Play store and App store.

BLUIS Portal is web hosted as www.bluis.odisha.gov.in

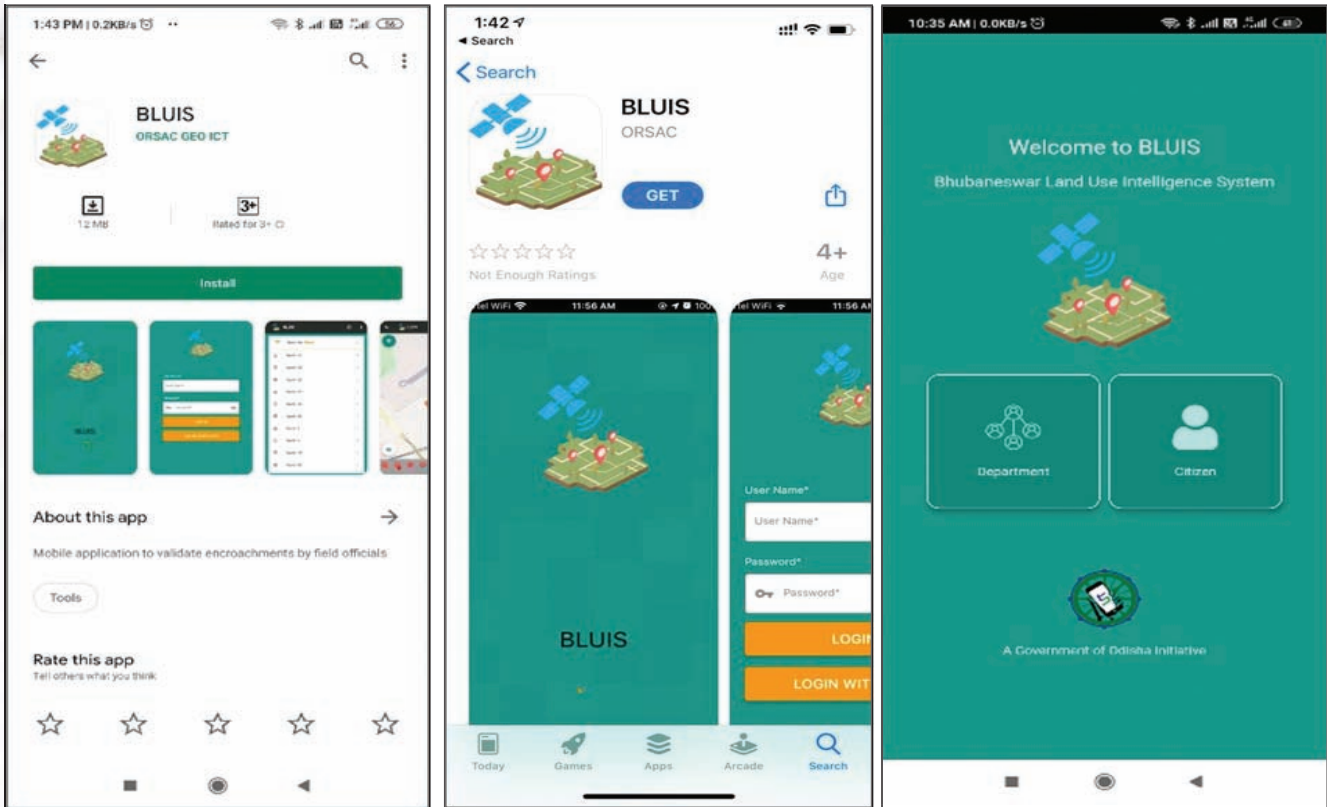
Under this program Digitization & Georeferencing of Revenue maps and Geotagging of all GA lands in Bhubaneswar was undertaken using Georeferenced Cadastral data and Orthoimages of the city. AI based satellite data processing of HR images is made to detect changes every month by acquiring HR satellite data from Planet Lab, USA through NRSC/ISRO, Dept. of Space. For monitoring purposes, alert creation for each ward officer through SMS and uploading of ground realities by ward officers is made through a Mobile App. Monitoring of actions are initiated after alert generation till removal of unauthorized constructions.



www.bluis.odisha.gov.in

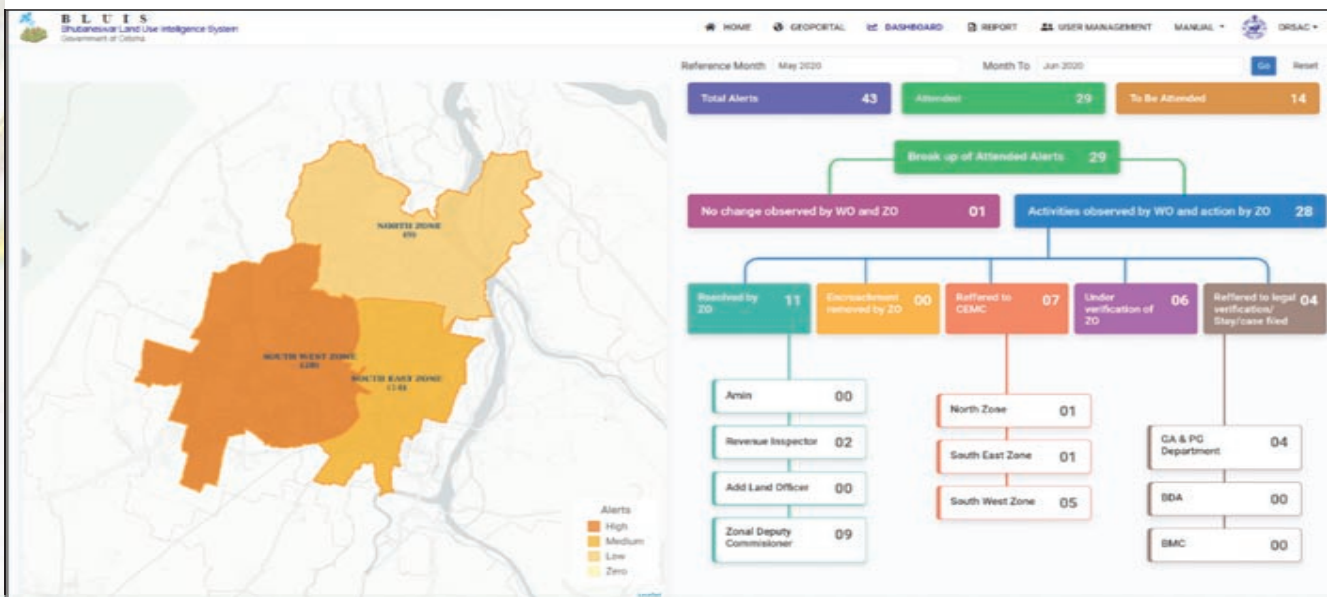


BLUIS MOBILE APP



For proper monitoring and effective implementation of the project, SOP has been formulated indicating the role of different officials of GA & PG Dept., BDA and BMC. Timeline has been given to the concerned officials at different stages starting from receipt of SMS alert upto removal of encroachment of Government lands. A cell has been constituted in BDA comprising officials of GA, BDA, BMC & ORSAC for monitoring & implementation of the project. Training of all Ward officers are made for use of Mobile App and officials allotted to BLUIS cell of BDA are Trained on Portal Management. Escalation mechanism to track any delay at the stage of evidence upload or follow up is embedded in the system.

BLUIS DASHBOARD



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



This program has been sponsored under Rastriya Krushi Vikash Yojana (RKVY), Department of Agriculture and Farmers' Empowerment, Govt. of Odisha, Bhubaneswar. This program aims at village / GP level crop monitoring, fertiliser distribution advisory, land suitability study for various crops and irrigation infrastructure mapping.

Satellite based crop area estimation at GP level for Odisha state during Kharif season has been undertaken using Sentinel-1 ASAR data. Four time series data have been analyzed and the total cropped area during Kharif season has been estimated at 59.44 lakh ha. as on 19th September, 2019. Report on satellite-based crop area estimation for Odisha state has been prepared and submitted to Agriculture & Farmers Empowerment Department, Govt. of Odisha. GP wise total crop area estimation during the current Rabi season has also been completed.

The Agri Geo-DSS Web Portal along with two Mobile Applications namely Odisha Agro Mapper for Ground Truth Data Collection and Farmers Grievance Redressal System has been developed and made operational from March, 2020.

AGRI-DSS ODISHA MODULES

Agriculture decision support system provides insight about the agriculture land, cultivated areas, crop health, crop diversity and cropping system. Agri-DSS portal is integrated with Odisha AIC (GIS), OISDI (Odisha Spatial Data Infrastructure) services and ODIS (Odisha Irrigation Information System).

Crop Statistics

Land Suitability

Soil Nutrients

Irrigation Information

CROP STATISTICS MODULE

- Season-wise satellite image
- Data Analytics based Crop Dashboard to show the overall statistics of crop sowing
- GP level statistics using Spatial Query
- Crop Coverage Map Data
- Kharif, Rabi and Zaid Crop Visualization
- Season-wise Crop Health Map

LAND SUITABILITY MODULE

- Crop Suitability for various crops
- Analytics based on spatial variables for crop suitability

SOIL NUTRIENTS MODULE

- Soil Nutrients Information
- Crop advisory suggestions for Alternative Crop Adoption
- Fertiliser Recommendations
- Variability of Soil Erosion

IRRIGATION INFORMATION MODULE

- Department wise Irrigation Acreage
- Satellite derived cropping area extent in cropping season
- Irrigation Information Integration with ODIS web-portal of DSOIS, Government of Odisha

Geospatial Road DSS

Development of Web-GIS Based Odisha Road Information System

The Odisha Road Information System is a web-GIS portal of all roads of all Govt. Departments of Odisha. Besides depicting All road types of the state with its ownership and connectivity, Geospatial Road DSS is under preparation to expand the practice of Asset Management (state-wide) to enhance the productivity of investment in inroads and bridges. Part of the portal aim is to gather physical inventory and condition data for all roads and bridges in Odisha. There is also GIS-based mobile applications that allow department officers to report asset information. Mobile App (Odisha Road Explorer) based data collection mechanism is developed to report on the current condition of the roads and bridges and other social & infrastructural info in the road catchment. The Geo-database of all roads is also designed for all applications, storing, editing or accessing data for management purposes. One central portal for all road data allows several agencies to work cooperatively rather than competitively. Information can be produced for distribution to the public from one central location. There is also a dashboard feature that shows extent of roads as per administrative divisions, Department and scheme-wise road network distribution and all infrastructure in its buffer zone, bridge and attribute data relating to road condition.



The portal contains functions powered by GIS analysis tools that utilize geospatial data to correlate Asset Data with geographic data and other datasets (e.g., socio-economic, asset & infrastructure data). Automated GIS analysis tools will allow departments to develop better designs and more efficient operating and maintenance plans, assess asset performance against safety measures, undertake disaster planning, and database programs for automatic analyzing asset data against other datasets.

Road Explorer Mobile App

Mobile Apps – Dashboard & Survey Form

ROAD-DSS Database

Transport Networks mapped	Social/Asset layers
NH	Bank
PWD(SH/MDR/ODR)	Health Centre
Forest Road	Police Station
Urban Road	Fire Station
PMGSY	Tourist Centre
MMSY	Technical Institutions
NABARD	Hotels
RD Road	Colleges
Irrigation Road	Schools
PR/PS Road	Hospitals
Railway Line	Market Centers
Railway Station	
Level Crossing	
	Theme layers
	River/Water body
	Forest Boundary
	Habitation
	Mines/Minerals
	Landuse/Land Cover(4k)

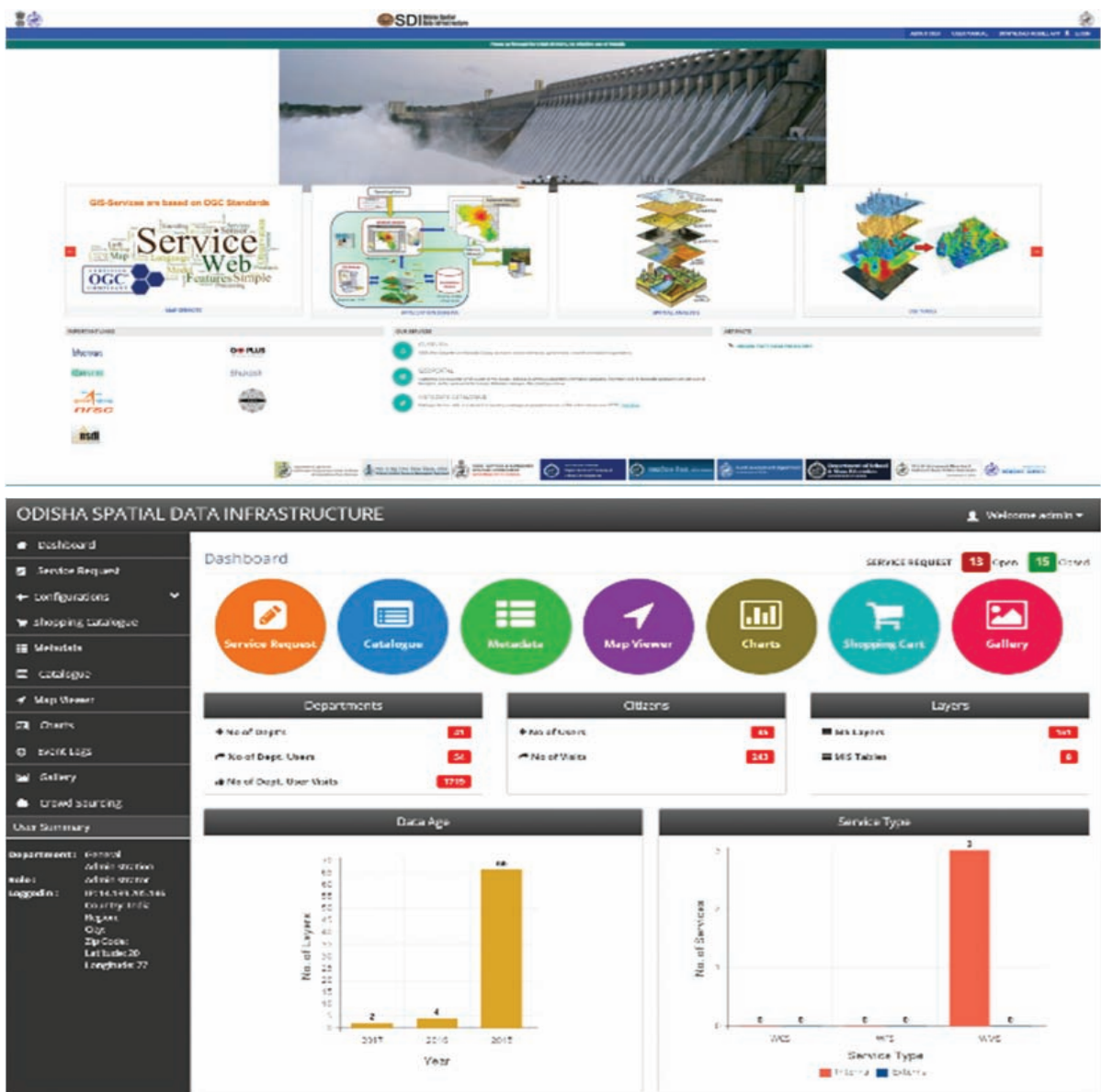
Odisha Spatial Data Infrastructure (OSDI)

Odisha Spatial Data Infrastructure (OSDI), a single window based Geospatial Clearing house, was established in the line of National Spatial Data Infrastructure (NSDI) of Govt. of India to access, share and disseminate GIS Datasets available with various Government agencies in Odisha through OGC compatible web-services. It is one of the nodes of the National Spatial Data Infrastructure (NSDI) like other State data Infrastructures of the Country. Odisha Space Applications Centre (ORSAC) is identified by the Govt. of Odisha as the nodal agency to design, develop and update the OSDI and it is hosted at State Data Centre. Odisha Spatial Data Infrastructure (OSDI) aims to position itself as an essential instrument to support decision-making through the use of Geographic Information system.

The departments using/consuming OSDI services till date are:

Forest and Environment Department, Panchayati Raj Department, Odisha Power Transmission Corporation, Rural Development Department, Agriculture and Farmers Empowerment Department, Town Planning Department and EIC, Water Resources, Department of Water Resources.

The other application using OSDI services are Odisha 4K Geo, Agri-GEO DSS, Odisha Road-DSS and Odisha Sampad etc.

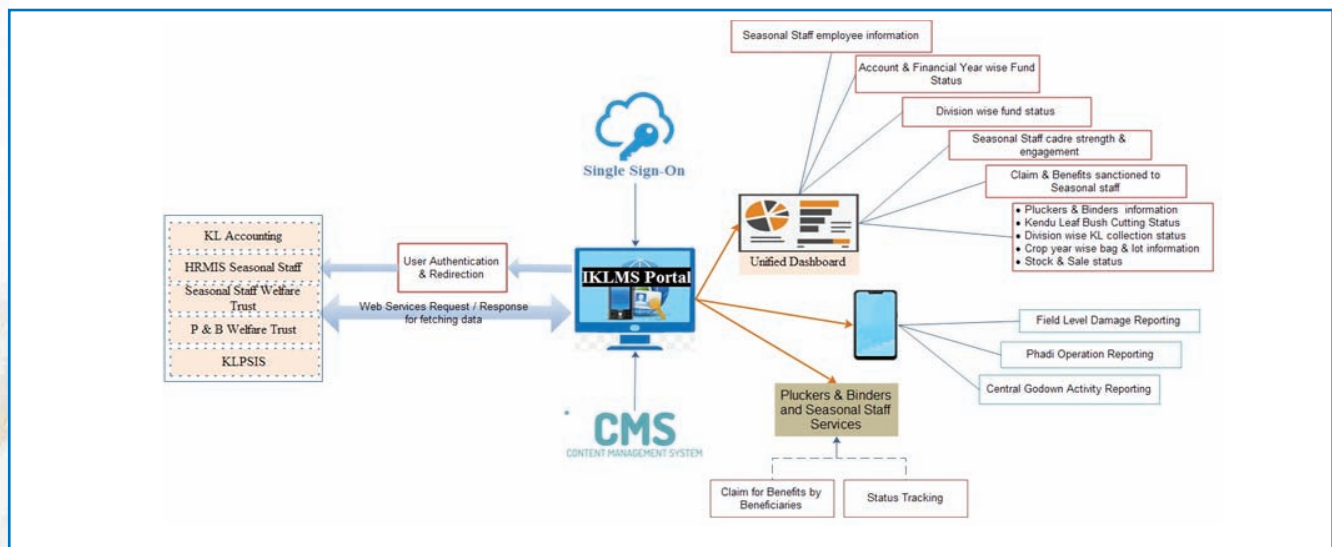


<http://osdi.orsac.gov.in>

Integrated Kendu Leaf Management System (iKLMS)

Integrated kendu Leaf Management System (iKLMS) with Mobile App is under development for following solutions at different level of users/ stakeholders.

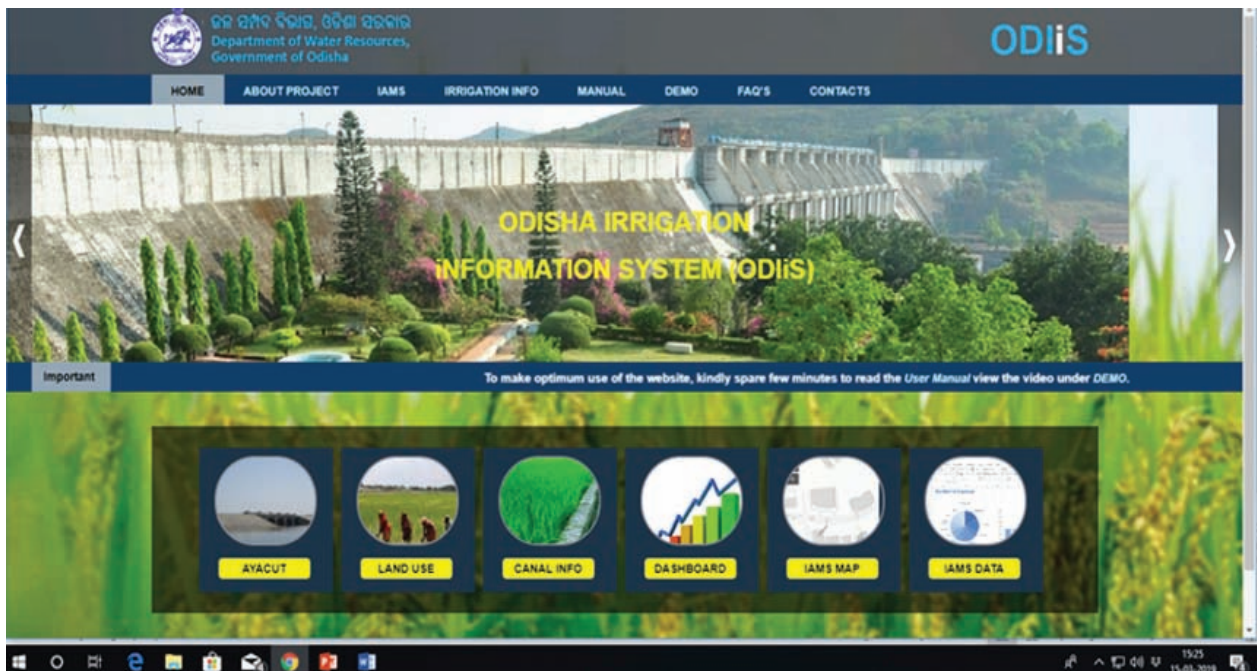
- Integration of all KL applications viz. KLPSIS (KL Procurement & Storage Information System), KL Accounting, KL Seasonal Staff HRMS, Welfare Trust Applications for seasonal staff and Pluckers & Binders.
- Single Portal for all operative of KL activities in integrated management and Single Sign-On for all the KL Applications
- Content Management System for Web Portal Content moderation with Analytics, Multilevel Dashboards and reports on various information.
- Field data collection and visualization through Mobile App
- Integration with notifications services like mail service and SMS gateway
- Integration with Bank CMP and Insurance for payment
- To introduce transparency & accountability in all KL Operations at all levels of operational activities.



Odisha Irrigation Information System (ODiS)

ODiS 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 standardised and structured manner. 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, Dept. of Water Resources, Govt. of Odisha as per the High-Level meeting on "Strategy for sanitizing the data on cultivated area and irrigated area of the State" on 17.05.2016 assigned the work 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.




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 completed. Sanitization of the data is completed and submitted to DoWR after departmental vetting. High Resolution 0.5 m World-View data of all blocks of the state are

<http://odishairrigation.gov.in>


ODiS

Irrigation Data Sanitisation-Background



- 

Accurate updated geographical data of Cultivated area/irrigated area and irrigation network/assets data of the state are not available
- 

Interdepartmental coordination and lack of proper data collection, collation, standardisation, storage & dissemination process leads to reporting of varying statistics by different depts.
- 

Sanitisation of cultivated and irrigated area data is based on application of Space (SRS), Geo-informatics and Geo-ICT technology by using 2.3 lakh maps and excel data (Plot details of ayacut/schemes) provided by 11 organisations of 5 departments.
- 

Data provided by departments are scanned, coded and converted to digital format and finally integrated to Ortho-rectified image based georeferenced revenue cadastral maps.
- 

Sanitisation program consists of two phases.
Phase-I-Data Sanitisation and Web-portal development
Phase-II-Asset Database of Major/Medium/Minor projects.(Canal networks & assets database)

Under Phase-I, ODiS-Odisha Irrigation Information System is created

georeferenced using orthorectified cadastral data of Revenue Dept. for interpreting agricultural area to generate agricultural area extent of each village/Block. The irrigated area and cultivated area data are later on used to generate Odisha Irrigation information System web-portal developed as ODIiS, which is under operational use by DoWR Dept. only for official purposes.

ODIiS constitutes several modules. **Ayacut Info Service** provides user to query information about ayacuts of any Department or Organisation by District / Blockwise, River basin wise and as per Department ownership basis. All ayacut and scheme implemented info of 11 agencies of 4 departments are web hosted in the portal in query based modules.

Landuse Info Service provides land utilisation in Ayacut and extension of cultivable lands. The portal also provides information on extent of cultivable land for all 314 blocks as interpreted from high resolution satellite data.

Canal Info Service (under development) provides Georeferenced canal network map as interpreted from high resolution image along with all its attribute info. The portal is designed to provide information on extent of canal upto tail end and coverage of revenue plots.

Odisha Agri-GEO Database (Web-portal of Agriculture & FE Dept.) and ODIiS is integrated to provide information on

ODIiS DASHBOARD (Irrigation Information display on click over a district or block)-

IRRIGATED AYACUT
ANGUL DISTRICT

Legend

- Horticulture
- DAIC_CLIP
- JALANDIHI_Agriculture
- Panchayatra (Dept/DRDA)
- Watershed_Mission
- OLIC_BOREWELL
- OLIC_MicroRL
- OLIC_CLIP
- Megaffit
- Minor_Checkdam
- Minor Irrig.
- Medium Irrig.
- Major Irrig.
- ANGUL DISTRICT

ODIiS AYACUT INFO SERVICE

Query based data search & retrieval system

DERJANG

Project	DERJANG
Department	OWRI
Organisation	OWRI/MLM
Category	WATERLOG Intregation Project

Odisha Land Bank web services through GOPLUS

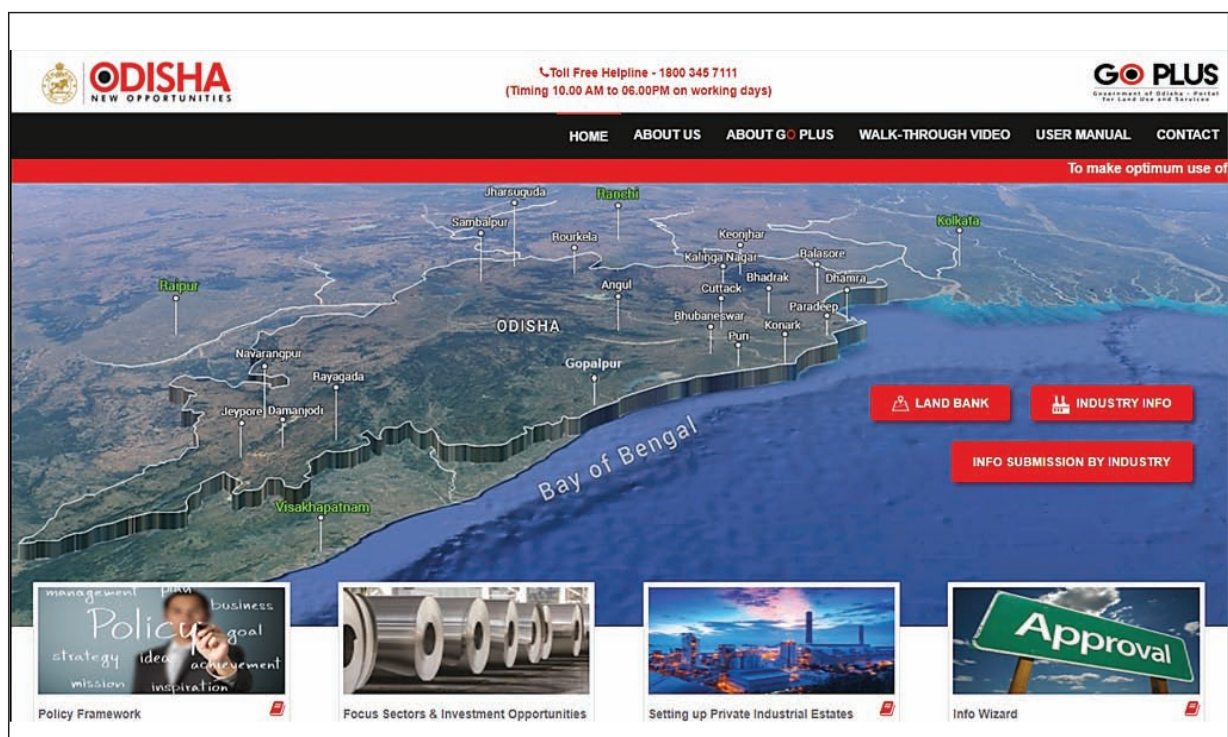
Availability of land and its associated attributes is one of the most important factors for policy makers to devise smart growth strategies and development framework. Odisha Industrial Policy Resolution 2015 focusses on providing quality industrial infrastructure and creation of a large Land Bank. In 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 in 2016 for providing Land Bank and associated utility and developed infrastructure information to potential investors and entrepreneurs. Geo-ICT, Space Technology inputs and Geospatial Data modelling was used to create the Web-GIS based Land Bank portal.

GOPLUS- Government of Odisha's Industrial Portal for Land Use and Services <http://gis.investodisha.gov.in>

GOPLUS (Ver 3.0) portal contains:

- Land Bank map, data and Land schedule for 1.30 Lakh Acres are made available in public domain. GIS database of 113 Industrial Estates, industry location maps and database of sector specific cluster development are generated.
- Digital Database of 715 Industries outside IDCO Estates and 15 Industrial Parks / Investment Region are also generated and web-hosted.
- 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.
- 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.

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.



<http://gis.investodisha.gov.in>

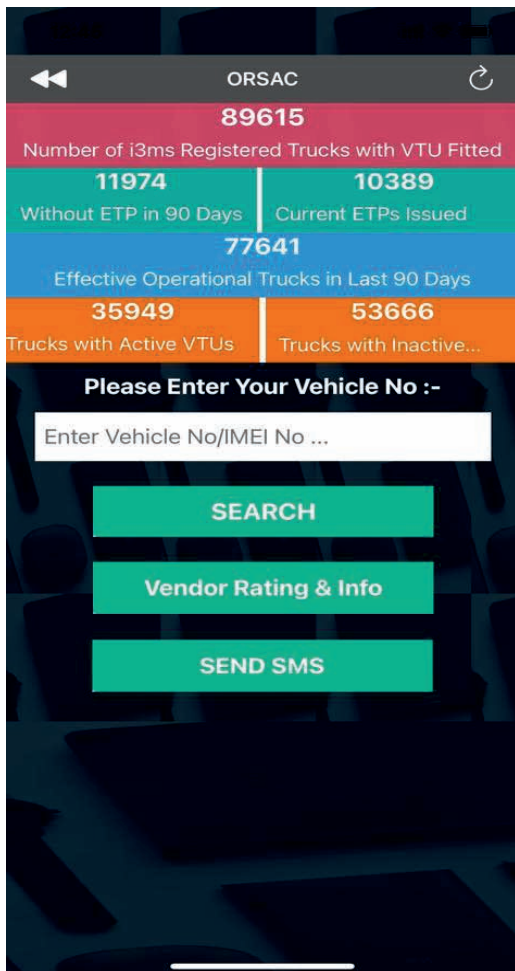
The system provides detailed information with regards to availability of Land and utility / services around it. A prospective investor can define preferred parameters such as the District, size of land required, facilities available in the vicinity and environmental categorisation etc. based on which 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 on Land availability, but also 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 to decide on suitable location for investment based on the proposed business activities. The unit cost of the Land as per IPR 2015 has also been provided for easy assessment by the user.

GOPLUS Mobile Version 2020

Odisha Mineral Vehicle Tracking System (OMVTS)

Government of Odisha has implemented the IT Based mineral administration through a software application named Integrated Mines and Mineral Management System or “i3MS” , it was also decided by Govt. of Odisha to monitor and manage the mineral carrying Trucks through a Global Position System (GPS) based IoT device installed in the Trucks from source to destination to bring transparency in the mineral delivery process. ORSAC is assigned to design, operate and manage the Vehicle Tracking System to facilitate Steel & Mines Department, Government of Odisha in monitoring the mineral transport. The Project is launched in 2016 with the name “Odisha Mineral Vehicle Tracking System (OMVTS)” and it has completed successfully 3 years fulfilling its objectives.

The OMVTS has a web portal with an URL www.vts.orissaminerals.gov.in and an android & iOS based Mobile App, available in Google Play store and Apple Store as



OMVTS_ORSAC. The Mobile App is freely accessed by all the stake holders to know about the current location of the vehicles, working conditions of Vehicle Tracking Units (VTUs), SIM validity and Electronic Transit Pass issued against the vehicle. The web-portal is also accessed by the stake holders with proper login authentications.

Some of the use aspects of the OMVTS Project are depicted through the screen shots of the OMVTS Web-Portal and OMVTS_ORSAC Mobile App pictures. Almost 90% of the VTUs are migrated to Govt. Of India approved Cloud Server facilitated by ORSAC to ensure 24x7 OMVTS service to all the Stake Holders in case of failures of the OMVTS Servers at Odisha State Data Centre due to any technical reasons. The downloading of Mobile Apps has crossed more than 50,000 as evident from the System. Till date more than 85,000 trucks are fitted with tracking devices.

Generation of GIS enabled Web Based Power Atlas for Odisha State

Under the OPTCL sponsored project, survey of EHT Towers; mapping of Land Use and Land Cover of the portion of the land under the power corridor and area covering the Grids and Substations; integration of existing MIS/ERP data with the spatial data; updating of the infrastructures through Crowd Sourcing; integration of cadastral parcel level information and other infrastructures crossing through the Power Corridor and Live Crossings of other Power lines under the Transmission Network etc. are undertaken. The main components of the projects are the following

- Survey covering 95 EHT (400kV, 220kV & 132kV) Sub Stations, EHT Lines having 24,289 Towers covering 6952.975 route km having 3-5-meter accuracy.
- Generation of GIS Data base and integration of Survey data.
- MIS Data integration.
- World View High Resolution satellite image-based Land use / Land Cover mapping.
- Power Atlas composition by Integration of all survey and Land Use/ Land Cover data of the patch of the land under the EHT line along with all physical connectivity of the lines etc. to depict in the GIS User Views.
- Web Based customization was done using Geospatial Server. Oracle 11g R2 and ASPNET Technology. A user-friendly GUI was developed for easy access of Web Based Power Atlas and for Crowd Sourcing facility.



The Web Based GIS System is able to respond to user-based queries. These queries are based on spatial and non-spatial data. The queries are generated on any of layers of the system. Standard Spatial queries cover all spatial operators, including Proximity / Neighborhood analysis, thematic Analysis, shortest and Optimal Routing, Multi-criteria and Multi-Objective Analysis etc.

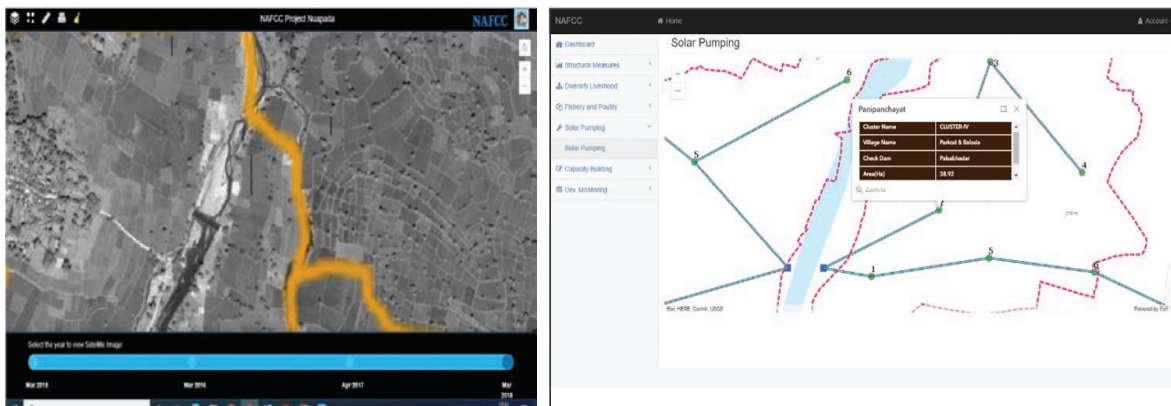


NAFCC Nuapda Project

The project envisages development of a Web Based dashboard for depicting the land based & socio-economic interventions made under NAFCC Nuapda Project. The Nuapada Adoption Project is a Programme under National Adaptation Fund for Climate Change (NAFCC) and the objective is to construct water harvesting structures i.e., check-dams to conserve water through the management of run-off in the river basin to reduce vulnerability and enhance resilience for traditional livelihood. Under NAFCC Nuapada Project, three Check Dams are constructed at Budhipali, Parsabhadar and Parkod. The project area is covering six villages along Kharkharanala (Amlidadar, Baloda, Burhipali, Parkor, Prasabhadar, Bhainsatal, Jangula) nala in Nuapada district.

The goal of the project is to develop a GIS-based system for visualisation and analysis of Geotagged activities of NAFCC Nuapada. Under the project, the DEM/DSM of the area is generated using HR images. The activities undertaken are :-

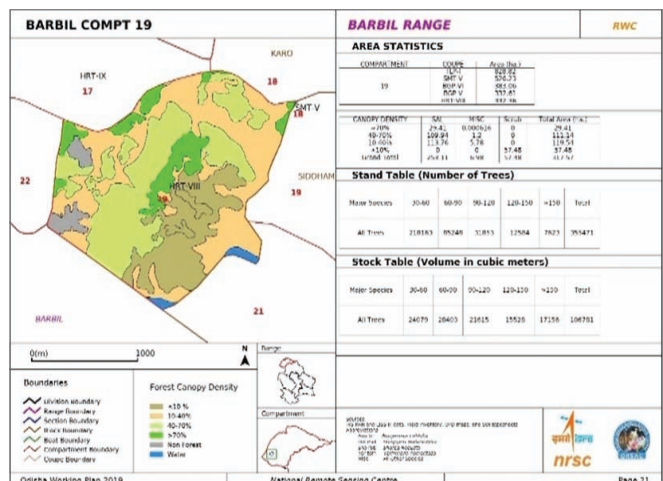
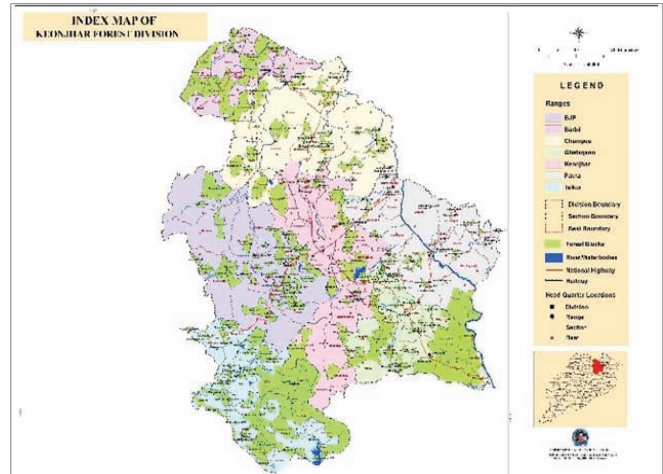
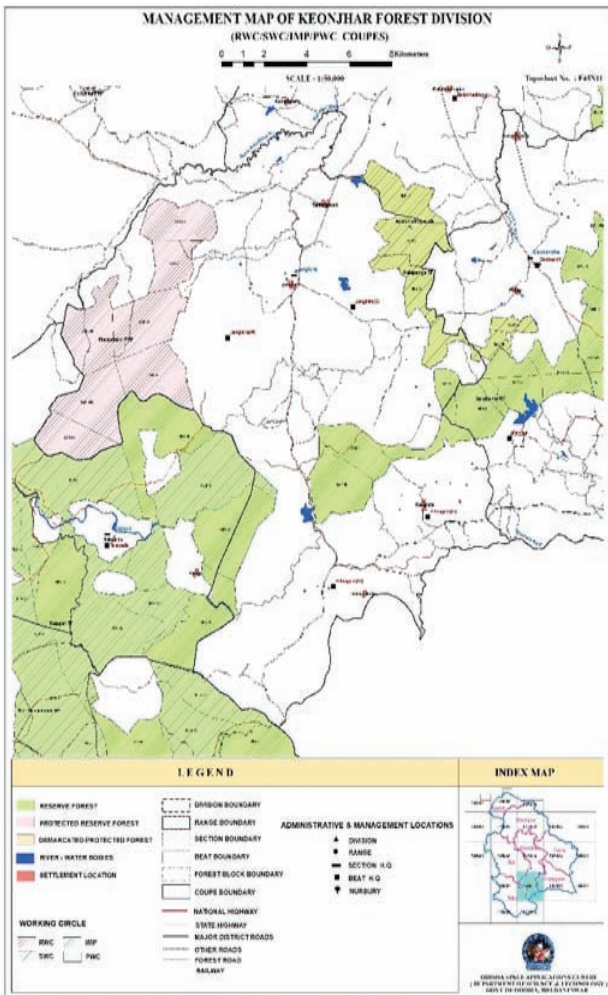
- ✧ Geotagging of all plot level interventions and DEM creation using stereo satellite data
- ✧ Integrating Data & Information from all sources seamlessly
- ✧ Supporting, simplifying and connecting all stakeholders
- ✧ Improving delivery of temporal changes
- ✧ Making integrated information and change statistics available to policy makers
- ✧ Preparation of Dashboard based info services
- ✧ Monitoring of activities using temporal satellite data



Preparation of Working Plan Inputs for Territorial & Wildlife Divisions

ORSA in collaboration with NRSC, Hyderabad & Odisha Forest Dept., Govt. of Odisha completed preparation of Working Plan inputs using Remote Sensing & GIS for 34 Territorial and Wildlife Divisions (28 Territorial and 6 Wildlife) completing the Working Plan for the year 2019.

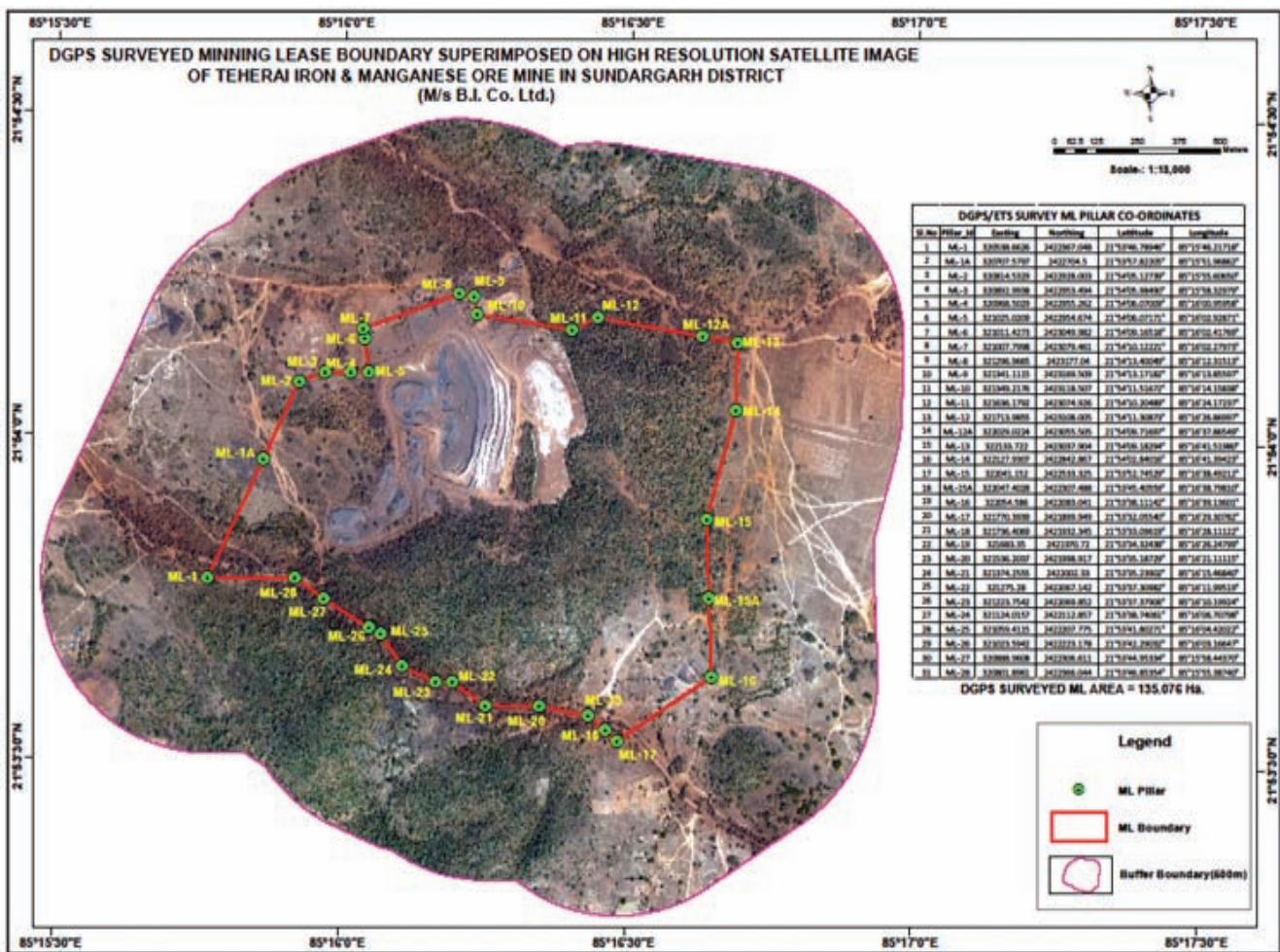
National Working Plan Code 2014 was followed for preparation of Working Plan inputs. ORSA prepared different thematic maps namely Forest Density maps on scale 1:25,000 using Wold view II MX data, Forest Administrative maps showing Division, Range, Section and Beat & Forest Management maps showing Forest blocks, compartment, coupe and different Working Circles are prepared on scale 1:50,000. NRSC, Hyderabad prepared forest type map on (scale 1:50,000) and generated 16620 sample points using Stratified Random Sampling technique for forest inventory. OFD collected the forest inventory data of the sample points using GPS-PDA device and the data was uploaded in OFD webserver. NRSC carried out stock analysis using the customised software developed in the project. Compartment wise stock analysis report & stock maps were prepared. Other thematic maps namely Carbon map, Biodiversity map, Fire regime map were also prepared and submitted to respective Forest Divisions for preparation of Working Plan report.



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 in 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 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 by constituting 5 nos. of Joint Survey team comprising of representatives from ORSAC, Revenue, Forest and Mining Department. Subsequently, Steel & Mines Department has constituted another 10 joint survey team vide Govt. order no.2229/SM dt.15.3.2017 for DGPS survey of other mineral leases of the state.

The steps involved in this process 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



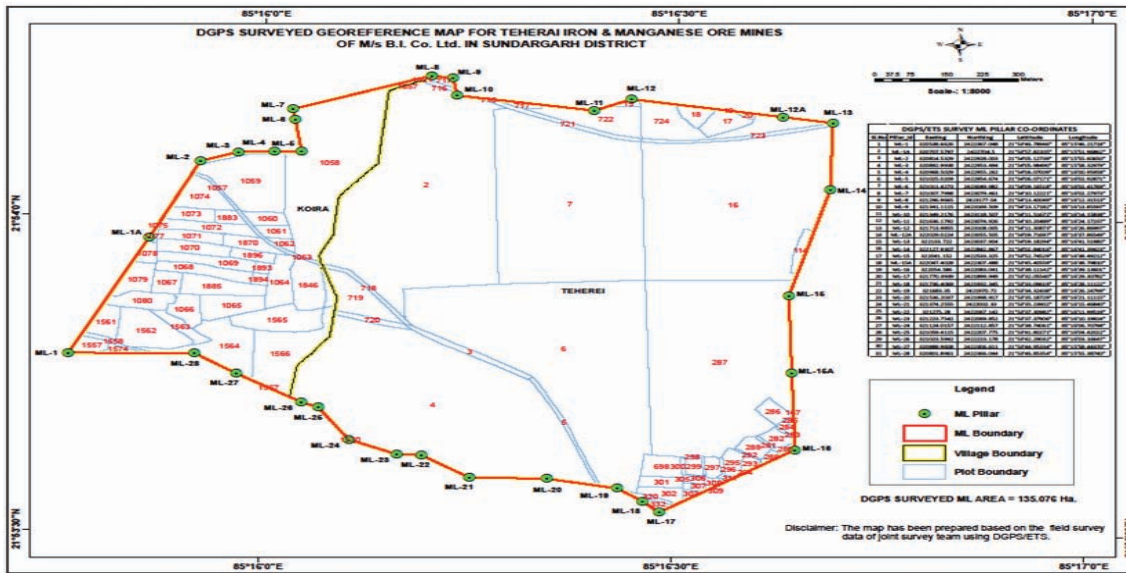
and geo-processing of cadastral revenue map/ original mining lease map/plan map and their integration in a GIS environment to prepare a final Geo-referenced map of the mining lease superimposed on High Resolution Satellite Image.

The field DGPS survey for all 153 working mining leases including 8 leases in the year 2019-20 have been completed during the joint survey exercise. The DGPS survey map for 38 mineral blocks to be put up for auction and 18 Decorative stone (Granite) leases have also been completed as per the requirement of Steel & Mines Department. The DGPS survey exercise for 202 Mining lease areas of which possession have been taken over by the concerned mining circles is initiated and the field survey will be undertaken in the year 2020-21.

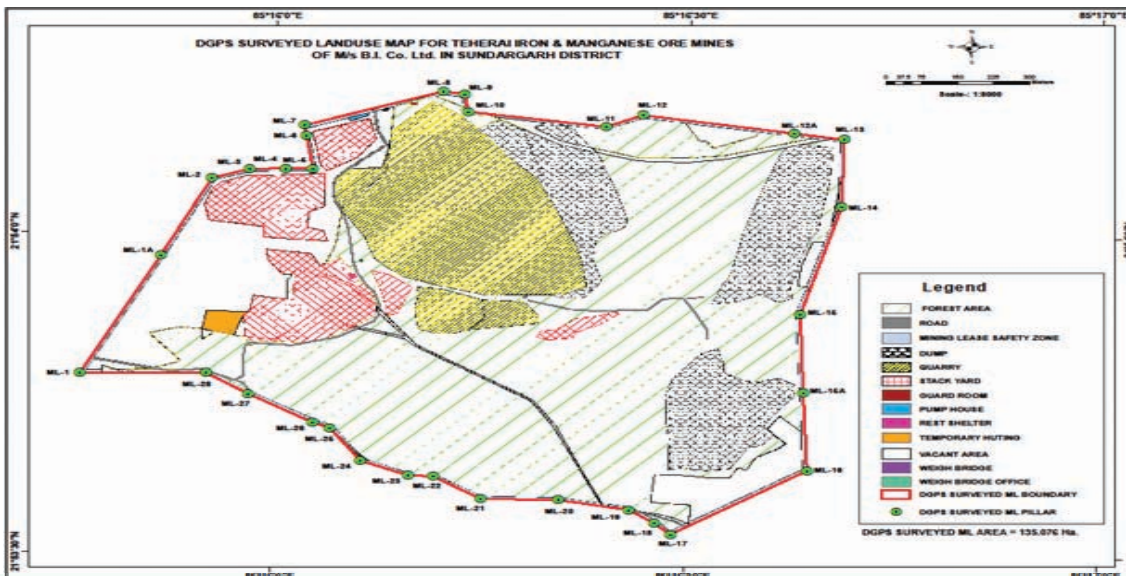
The Progress and target under the mining area survey exercise for 2020-21 is summarized in table below:

Progress in Mining area Survey project

Progress/ Program	Joint Survey Of Mining Leases Using DGPS/ETS	Joint Survey Of Mineral Blocks For Auction Purpose Using DGPS/ETS	DGPS/ETS Survey For Geo-Referencing Of Coal Block	DGPS/ETS Survey Of Possession Leases	DGPS/ETS Survey Of Granite Leases
Completed up to the year 2019-20	153	38	22	04	18
Works allotted & Target in 2020-21	00	00	02	198	11



The DGPS survey exercise for all the minor minerals and Sairat sources (sand, stone, morrum quarry etc.) of the state is initiated. The survey of 438 sairat leases have been completed so far in the field. The field demarcation of survey of remaining sairats are under progress.



Assessment of Erosion Prone Areas of Odisha State & Digital Elevation Model Creation

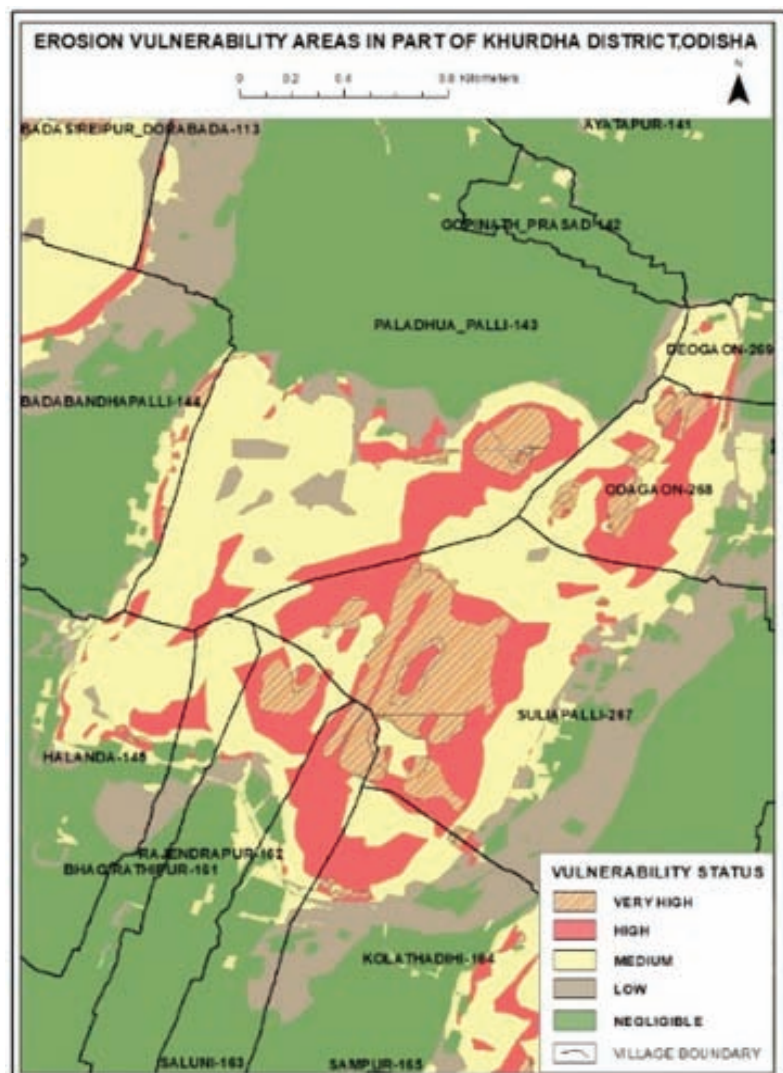
(A Research & Development Project under the Climate Change Action Plan of Odisha)

Detailed scientific study of erosion prone areas of the state is being undertaken to prepare concrete adaptive action. Base level data of Slope, Land use/Landcover, Geomorphology, Drainage, and Soil have been generated for the entire Odisha at 1:10k. These geospatial datasets are integrated on a GIS based model for vulnerability in context of erosion for all the districts of Odisha. A sample map of vulnerability areas in parts of Khordha district is shown in the Figure.

Generation of DEM/DSM and orthophoto of Coastal Study Area (7555 sq km) is under preparation. Baseline data of Land use/landcover and Geomorphology of this study area have been generated at 1:4k. Simulation, analysis and modeling are being undertaken. A shoreline change study is also undertaken for the entire coast of Odisha.

The following are the usefulness of the study:

- Plan Preparation of Coastal Zone Management
- Water Resources Management
- Site suitability for afforestation, reforestation and coastal belt plantation
- Modeling of risks to croplands by saline and rain water
- Suitable planning measures for croplands on slopes
- Planning for roads, houses and water bodies Providing 3-D approach in various rural development activities
- Identifying vulnerable settlements to rain water
- Providing actionable information to BDOs and PRIs
- Submergence of storm/cyclone water
- Planning for flood relief operation
- Site suitability planning of flood & cyclone shelters



RS & GIS Applications – Agriculture

Forecasting Agricultural Output Using Space, Agro-Meteorology and Land Based Observations (FASAL)

District wise Kharif Rice Acreage estimation and production forecast has been undertaken in collaboration with Mahanalobis National Crop Forecast Centre (MNCFC), Govt. of India, New Delhi. Three dates of Sentinel-I SAR data have been used for district wise acreage estimation for Kharif Rice in Odisha. Rice yield has been estimated by using meteorological subdivision level yield models. Remote Sensing based yield models and selected Crop Cutting Experiment (CCE) carried out using Remote Sensing based CCE plans. The Kharif Rice area of the state is estimated at 40.22 lakh ha. with rice production of 86.46 lakh tonnes. Rabi rice acreage estimation for selected districts of Odisha has also been undertaken using Sentinel-II optical data.



Co-ordinated Horticulture Assessment and Management using Geoinformatics (CHAMAN)

After successful implementation of CHAMAN Phase-I, Ministry of Agriculture and Farmers' Welfare, Govt. of India, New Delhi has approved Phase-II Programme for the period 2018-19 & 2019-20. This project is being coordinated by Mahanalobis National Crop Forecast Centre (MNCFC), Govt. of India, New Delhi. The major objectives of the programme is operationalization of the technologies developed during the Phase-I, inclusion of new crops and research & development studies, especially the crop yield modelling.

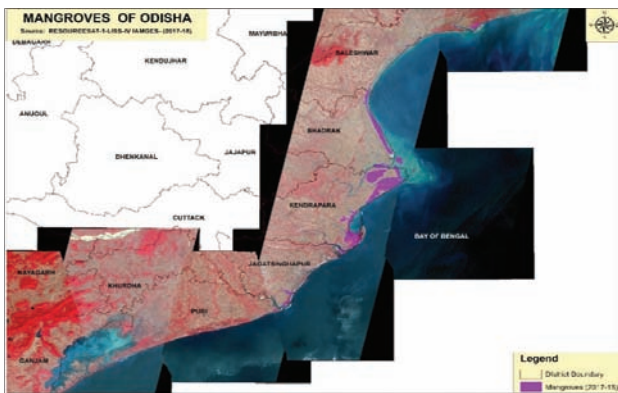


Under this Programme, acreage estimation for Tomato and Chilli crops for selected districts of Odisha have been undertaken in association with MNCFC, New Delhi. Ground Truth has been collected for complete horticulture crop mapping for Anugul & Khordha districts. Geospatial studies for Dhenkanal and Ganjam districts have been completed in collaboration with State Horticulture Department with special reference to MIDH schemes of the State.

Mangrove Community Zonation and Biophysical Characterization for Coast of Odisha

The coast of Odisha is endowed with rich mangrove vegetation. It survives in substrate salinities ranging from fresh water along riverside to hyper saline waterbodies and mudflats. The vegetation communities are sensitive towards environmental variations in a region. Remote sensing is proved to be an efficient tool to map and study the species zonation and their biophysical characterization due to the signature variation which are discernible in the satellite images.

Mangrove cover mapping is a part of country-wide National Mangrove Mapping, a joint collaborative project of Space Applications Centre (SAC), ISRO, Govt. Of India. Odisha Space Applications Centre (ORSAC) is one of the participating organization in this programme. Important objectives of the project is updation of dominant community zonation at 1:25,000 scale for the coast of Odisha & testing and extrapolation of existing models for bio-physical characterization & the density mapping for the time frame of 2005-06/2011-12 and 2017-19 and change detection study have been completed.



Mobile and Web Applications for Handicrafts Artisans (KRUTI)

A Web and Mobile Applications have been developed for Handlooms, Textiles and Handicrafts (HT & H) Department, Govt. of Odisha for collection of various data on Handicrafts Artisans. Collection of Artisans data has been completed for Bhadrak and Kendrapada districts. Application module for moderating district and state level online survey has been developed for KRUTI Web Portal as well as Mobile Applications. The Application Support, Customizations and Management for Kruti Odisha Web Portal has been extended upto December 2020.

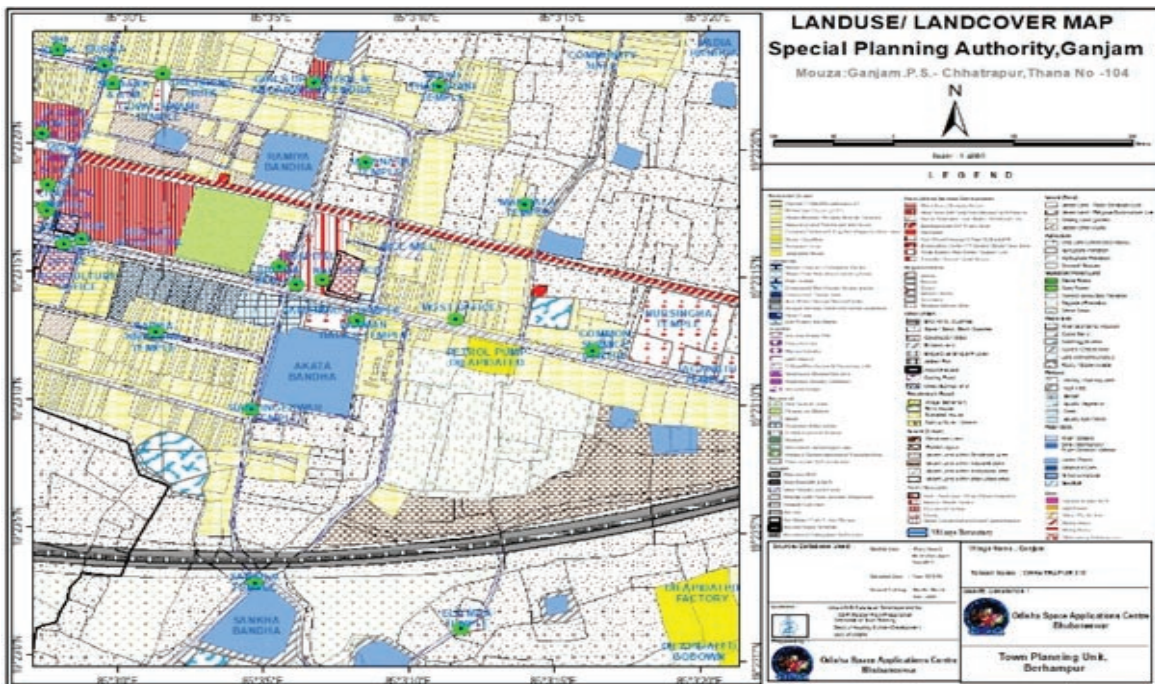
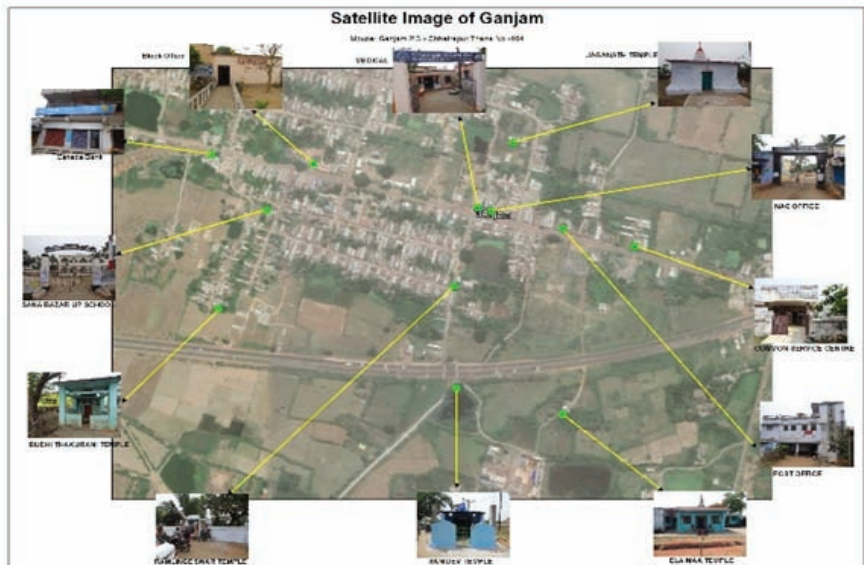


Geo-Spatial Inputs for CDP Preparation of Towns

Housing and Urban Development Department of Govt. of Odisha has assigned the task to ORSAC to prepare RS and GIS based Database for CDP preparation of 59 Towns of Odisha State. The maps have been prepared on 1:2000/4000 scale. The main objectives for preparation of GIS Database of towns are:

- To capture cadastral maps in digital format and to use this as base for CDP map preparation.
- Generation of RS & GIS inputs for CDP on cadastral base of Town Planning area / Development Authority Area, Special Planning Authority Area / Regional improvement Trust Area.
- Plot level Digital Urban Land use Database Generation on cadastral base.
- During 2019-20, Remote Sensing & GIS data inputs of 04 towns namely Rambha, Kabisuryanagar, Sorada and Polsara on 1:2000/4000 scale have been completed using Worldview - 2 satellite image.

The GIS Database in complete format are supplied to planning section of respective Town Planning Units for Comprehensive Development Plan (CDP) preparation. The Database has been generated to establish an Urban Database Information System in the urban local bodies for planning, monitoring and management purposes.

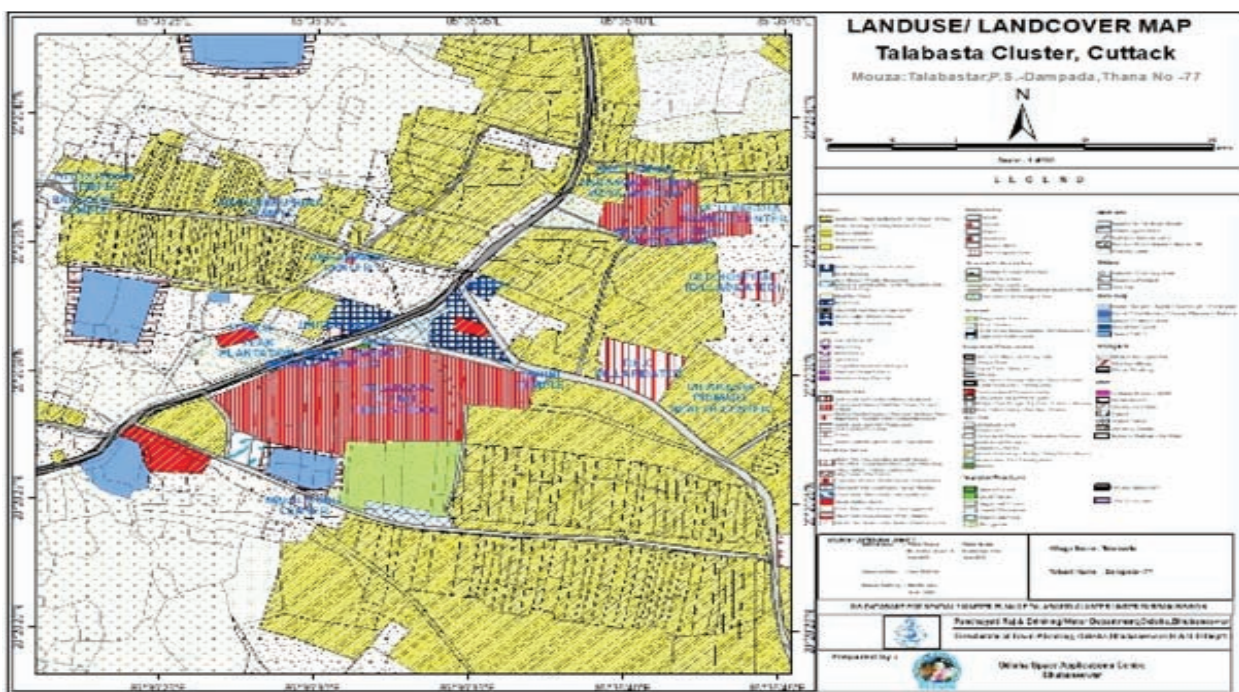
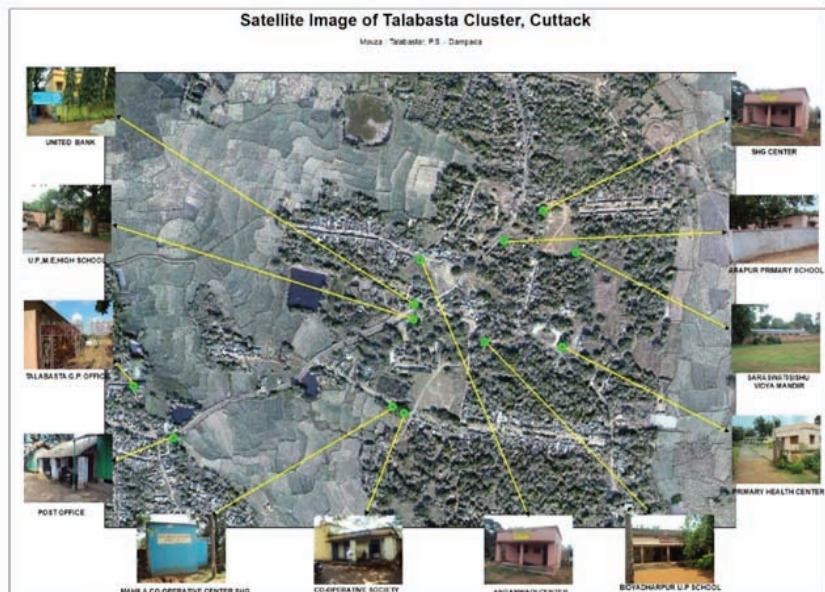


Land Use Mapping for Rurban Clusters

Panchayati Raj and Drinking Water Department has assigned the task to ORSAC in consultation with Housing and Urban Development Department to prepare land use/land cover maps using Worldview-II satellite data on 1:1000/2000/4000 scale of 14 Rurban Clusters of Odisha State in the year 2019-20. The main objective is

- Generation of cluster-wise image derived digital cadastral/ revenue map generation for 14 clusters of Odisha.
- Landuse/ landcover maps preparation in 1:2000/4000 scale from High Resolution Satellite Image (World View-II)
- Creation of database cluster-wise with all administrative boundaries for preparation of Master Plan in Urban vicinity.

During 2019-20 land use / land cover maps of 07 Clusters (Ranipada, Samsingha, Thakurmunda, Utkela, Dahita, Kotagarh, Murtama) have been assigned out of which four clusters have been completed and rest 03 clusters (Dahita, Kotagarh and Murtama) are in progress. The georeferenced digital cadastral datasets have been used as base for generating other datasets required for Master plan preparation of Rurban Cluster. Other datasets linked to the plot level cadastral datasets are existing land use, ownership, network connectivity etc. along with information on natural resources like vegetation cover, drainage and surface water bodies.

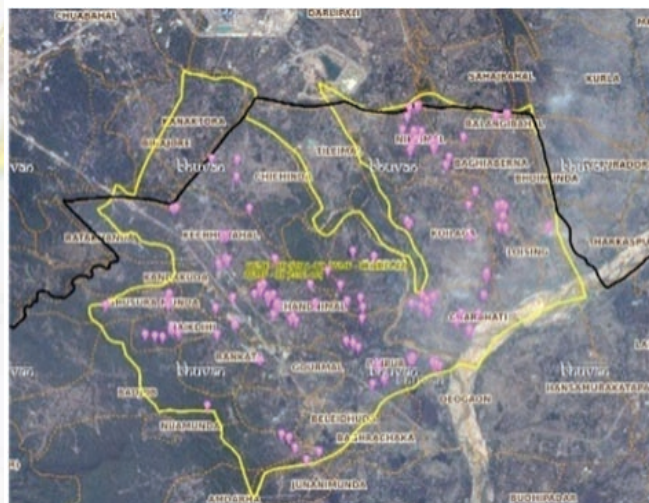
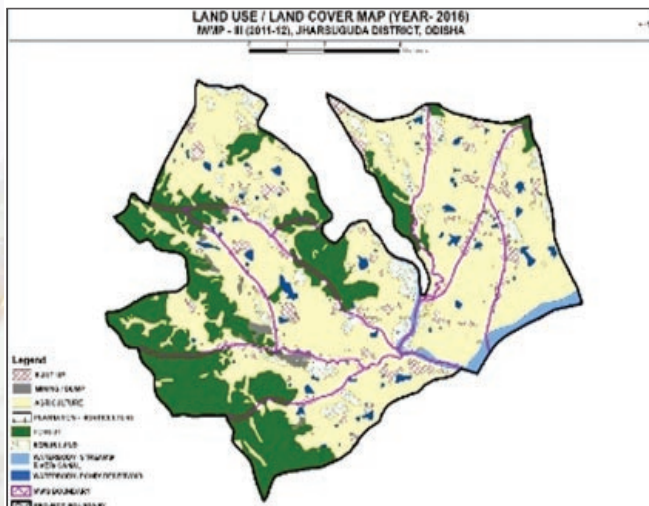
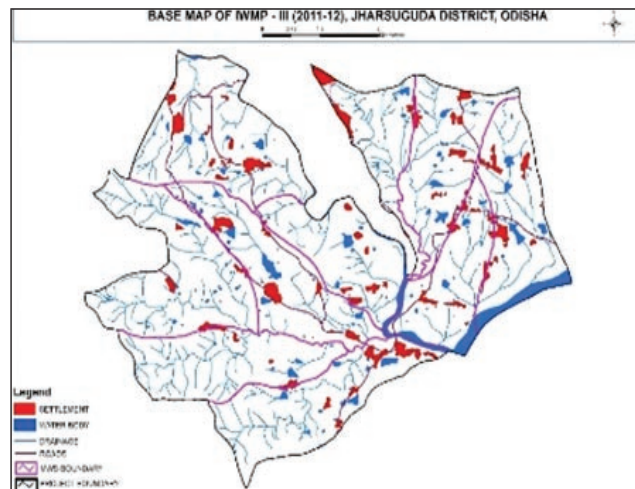
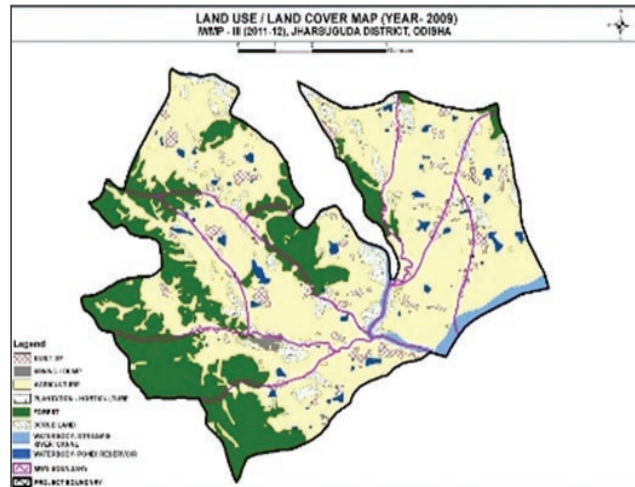


Monitoring of IWMP Watersheds

Integrated Watershed Management Programme (IWMP) deals with the integrated use of land, vegetation and water in geographically discrete drainage area for the benefit of the people and addresses key issues related to land and water resources by incorporation of environmentally benign or clean technologies. Space technology currently with the high spatial and temporal resolution satellite data are envisaged for effectively planning, monitoring and evaluation of IWMP activities.

Odisha Space Applications Centre (ORSAC) has been assigned 310 number of projects through National Remote Sensing Centre (NRSC), ISRO for monitoring and evaluation of IWMP watersheds using the Bhuvan Geo-ICT Web portal tools namely- Srishti and Drishti.

Srishti facilities Decision makers at National and State Level to monitor program implementation at different levels,



including at the local level on the geoportal, while state Level Nodal Agencies (SLNA) and Watershed Cell cum Data Centres (WCDC) are facilitated with necessary tools on the package to provide specific inputs on implementation of the program at micro-watershed level. Drishti, a smartphone based application is suitably designed and developed towards realizing the objective of modernizing the field data collection process for monitoring watershed activities, wherein it can be used at field level to capture actual field realities of project implementation and sending the same to the Bhuvan Server.

Monitoring of NABARD sponsored Watersheds using Geospatial Technologies - The project envisages monitoring and evaluation of NABARD sponsored projects using Bhuvan web services and Mobile app. Each project is monitored three times using multitemporal data. ORSAC has been sanctioned 65 number of projects through NRSC.



RS-GIS-GPS based Mapping & Survey of Forest Diversion Proposals

As per the circular of MoEF Govt. of India & State Govt.in F & E 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.

Status Report on Forest Diversion Proposal Authenticated by ORSAC (April 2019 to March 2020)

Category	No. of Projects
Road	29
Railway	03
Irrigation	03
Power	07
Coal Block	03
Industry	10
Mines	04
Others Development Project	08
Compensatory Afforestation	10
Total	77

Status Report by ORSAC Survey For Forest Diversion Proposal (April 2019 to March 2020)

Project type	Forest Diversion
Irrigation	02
Coal (MCL)	01
Energy/Power	01
Road	03
Other	
Development Project	03
Oil Pipeline Project	01 (in 03 districts)
Gas Pipeline Project	01 (in 06 districts)
Compensatory Afforestation	04
Total	16

Digital India Land Records Modernization Programme (DILRMP)

Major components of DILRMP program 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. ORSAC 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 51,660 number of villages, out of 51,703 villages are quality checked by Revenue Dept. and Quality Checked (QC) at Survey and Map Publication Office (S & MP), Cuttack on glass table for one to one check and also at ORSAC (QC of digitization). The newly published digitized cadastral maps of 2499 villages generated by Revenue Dept. are also quality checked. The Centre is preparing GIS ready CAD files of digitized maps after quality check for linking of BhulekhRoR data with cadastral map plots by NIC in form of shape files.

B. Cadastral Resurvey by Aerial survey/photography method

The centre is also assisting the Revenue Dept. engaged vendor for preparing cadastral maps of 5 districts (Sundergarh, Deogarh, Samabalpur, Bolangir and Sonepur) using Aerial Photography method. 4000 draft village maps of parts of Sundargarh, Deogarh, Samabalpur, Bolangir and Sonepur districts prepared by the vendor have been quality checked at ORSAC and verification completed. Technical support is being provided for preparation of maps along with quality checking of maps. Draft village map preparation work in 250 villages has been completed and ready for publication. Resurvey work in Deogarh and Sonepur is continuing during 2018-20, for which draft maps of Deogarh district has been completed by the vendor and quality checking work has been completed at ORSAC.



National Wetland Inventory & Assessment (NWIA) Phase-II

As per the decision of Ministry of Environment, Forests and Climate Change and SAC, ISRO Govt. of India a digital wetland atlases based on Resourcesat-1 LISS-III data of 2006-07 timeframe was prepared by the Centre as one of the participating Organisation in the above National Mapping programme.

There is need to develop an integrated technique towards National level water watch system to address quantity and quality of water resources. Under the Satellite based RIVER basin hydrological Technique and Applications (SARITA) programme formulated at SAC aims for following objectives;



- Updation of Wetland Inventory of Odisha at 1:50,000 scale using Resourcesat LISS-III data of timeframe 2017-18, using the existing Wetland Inventory of timeframe 2006-07 as base layer. Change analysis between Wetland Inventory of timeframe 2017-18 and 2006-07 and report preparation.
- Preparation of Wetland Inventory of Odisha at 1:25,000 scale using Resourcesat LISS-IV data of timeframe 2017-18. Preparation of state level project report and Atlas.

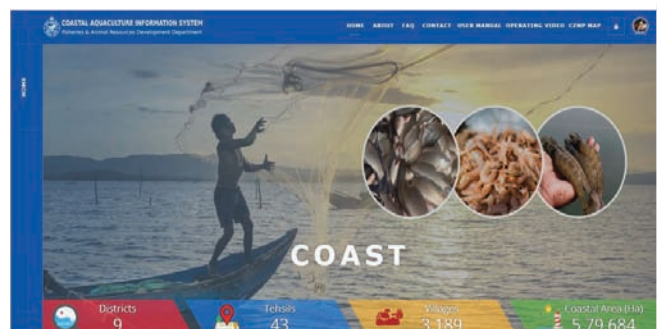
Wetland maps of 2017 time frame have been prepared from LISS-III data and submitted to Space Applications Centre, ISRO, Ahmedabad.

Coastal Aquaculture Information System (COAST)

Odisha occupies fourth place in brackish water shrimp farming (area wise) and third place (production wise) amongst the coastal states of the country. Nine districts namely Ganjam, Khurda, Puri, Jagatsinghpur, Kendrapada, Bhadrak, Baleswar, Jajpur and Cuttack are considered as coastal districts in Odisha.

One Web Geoportal on coastal aquaculture named Coastal Aquaculture Information System (COAST) is developed by ORSAC to facilitate the management of aquaculture information in the state of Odisha. The application portal provides an interface where users can log in and upload their requests by searching the location or browsing over the map about the aquaculture activities. Further the portal facilitates all location and attribute-based queries (based on the input spatial and attribute data). The web portal enables the decision makers for consideration of aquaculture activities to be developed in particular coastal patch of land. Cadastral Plot level locational occurrence of Aquaculture activities (Farm ponds/registered farms) inside/outside Coastal Regulation Zone (CRZ), Ecologically Sensitive Areas (ESA), High Tide Line(HTL) and Government lands are depicted in a user friendly visual mode for use by the administrative staff of the Directorate of Fisheries. It facilitates verification of field level inputs collected by the officials at grass root level. While selecting a specific Block name or Village name, the dashboard displays available information on aquaculture and other assets/infrastructure in it and also shows the information dynamically through graphical representation. The project was sponsored by the Fisheries Dept. Govt. of Odisha.

<http://odishaaquaculture.in>



Preparation of (CZMP) Maps of Odisha

Government of India in the Ministry of Environment, Forest and Climate Change (MoEF&CC) has issued a Notification No. G.S.R. 37(E), dated the 18th January, 2019 declaring certain coastal stretches of the country as Coastal Regulation Zone (CRZ) superseding the Notification No. S.O.19 (E), dated the 6th January, 2011. The preparation of CZMP based on these guidelines was entrusted to Odisha Space Applications Centre (ORSAC).

ORSAC has prepared the draft maps using the Base data: High Tide Line (HTL), Low Tide Line (LTL), Ecologically Sensitive Areas (ESAs), and Critically Vulnerable Coastal Areas (CVCAs) demarcated by the National Centre for Sustainable Coastal Management (NCSCM), Chennai, and the 'Hazard line' as demarcated by the Survey of India.

CRZ classifications into CRZ-I, CRZ-II, CRZ-III A, CRZ-III B and CRZ-IV was done as per the guidelines given Annexure-IV of the CRZ notification, 2019. The draft updated CZMP were submitted to Forest and Environment Department, Govt. of Odisha and subsequently uploaded in the websites of the OCZMA and F&E Dept.. Collectors of all coastal districts were provided with copies of the draft CZMP maps with a request to place it before the District Level Coastal Zone Monitoring Committee, for Public Hearing with a detailed discussion with the stakeholders, NGOs and individuals and to furnish their suggestions and comments, if any.

Anukampa

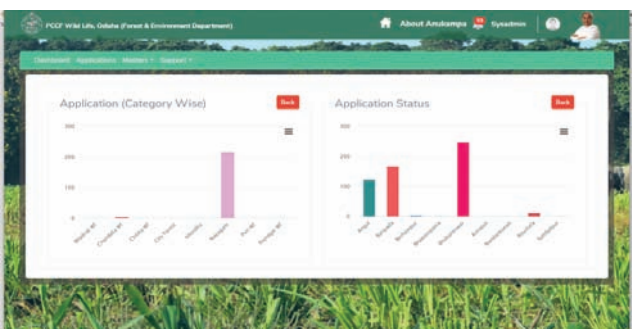
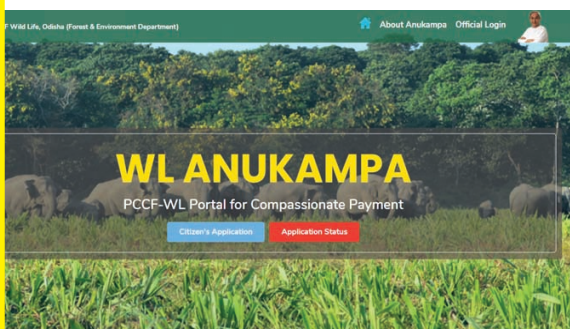
(PCCF-WL Compassionate Payment Portal)

"Anukampa" is a user-friendly software developed and launched for PCCF-WL & Chief Wildlife Warden, State Wildlife Organisation, Dept. of Forest & Environment, Govt. of Odisha by Odisha Space Applications Centre (ORSAC), Bhubaneswar. The portal is used for Compassionate payment on account of Human Kills, Human injury, Cattle Kills, Crop damage or House damage by Wild Animals as per Chapter-VAA, Wildlife (Protection) (Orissa) Rules, 1974. Portal has provisions for Crop Damage, House Damage, Cattle Kill, Human Death and Human Injury purposes.

The objective of this program is to facilitate citizens victimized due to wildlife depredation for compassionate payment in time. The victims can apply online or through mobile app for sanction of compassionate payment. In case of any difficulty, the applicant may contact "Mo Sarkar Cell" in the concerned Range Officer for necessary assistance.

The portal can be accessed by <http://odwlanukampa.in>. The Mobile App can be downloaded from Google Play store & APP store. Using the Anukampa portal and Mobile APP, Citizens/Applicant can fill-up application form on both android app and web. Applicant can view application in web portal search by auto generated token id and can edit data. Against the applicant form, Department Surveyor can survey with in their jurisdiction. Surveyor can survey after 24 hours of submission application form. Message and mail are sent to applicant after submitting application. Pay modules for the purposes are also embedded to the system.

<http://odwlanukampa.in>



Satellite Communication Project

Gramsat Network in Odisha:

During the year 2019-20, GRAMSAT has produced public awareness spots for various departments of Government of Odisha. Two spots for Health & Family Welfare Dept., seven video spots for ORERA, four video spots for Energy Dept., two video documentaries for Food Supply & Consumer Welfare Dept. and one video documentary on ORSAC & its commitment are prepared. There are several video spots of Health & Family Welfare Dept. and Revenue & Disaster Management Dept. at different stages of production. One video programme for ODIIIS project is also prepared.



Edusat Network in Odisha:

Renovation of Edusat studio set is completed and now ready for Edusat transmission. That apart for Edusat transmission, through an Academic Workshop programme briefs on the subjects Math, English, Physical Science, Life Science and Physical Geography for class IX and X were prepared. Details of supporting visuals of each topic are also prepared and the regular Edusat transmission through Doordarshan is continuing.

Map Sales by Map and Data Dissemination Section (MDDS)

The map sale to the users by the Centre through MDDS section during 2018-2019 has earned Rs. 54,81,640.00. The users comprise Government Departments / PSUs of both Govt. and private entrepreneurs, researchers, NGOs and individuals. Soft copy and GIS ready datasets are provided to Government departments and agencies as per Map and Date Policy of Govt. of India and ORSAC Governing Body approved norms/rates. The details of cost is as follows:

ORSAC Map prices (Hard Copy)

Map Specification	Rate
1 Hard copy (Map of standard size A2 and above both Colour & B/W)	Rs.1250/-
2 Hard copy (Map of standard size A3 and above both Colour & B/W)	Rs. 550/-
3 Hard copy (Map of standard size A4 and above both Colour & B/W)	Rs.300/-

Cost of digital vector data per 1:50,000 toposheet (Archive Data)

Sl. Theme(s)	Rate
1 Land Use/land cover	Rs.1430/-
2 Hydrogeomorphology	Rs.1210/-
3 Soil	Rs.1100/-
4 Drainage/River/Canal	Rs.1430/-
5 Drainage/Watershed/Watershed Priority	Rs.1100/-
6 District/Block/Village	Rs.1100/-
7 RF/PF/Forest Management boundary	Rs.1100/-

Glimpses of Activities

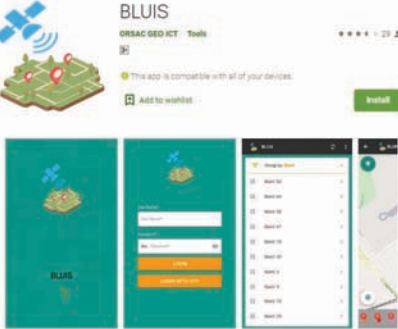


ORSAC Participation at Industrial Meet on Digital transformation by Govt. of India at SCOPE, New Delhi and Discussion with GAIL India Ltd., New Delhi on technology Applications in pipeline survey.



ORSAC Participation at GEO-SMART INDIA 2019 at HICC, Hyderabad and discussion at IT Research Labs at Cybercity, Hyderabad relating to use of AI/Deep Learning in Geospatial DSS generation.

ORSAC's GEO-ICT Activities

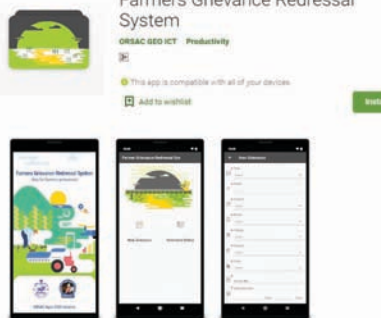


BLUIS
ORSAC GEO ICT Tools

This app is compatible with all of your devices.

Add to wishlist Install

The Mobile Application would be used to validate alerts. Land-use change generated from satellite imageries will be automatically available in the BLUIS Mobile Apps for department officials as per their jurisdictions. The user will be able to Geotag the changes as per jurisdiction and roles and data will be stored in the web portal for further analysis.




Farmers Grievance Redressal System
ORSAC GEO ICT Productivity

This app is compatible with all of your devices.

Add to wishlist Install

The mobile app enables farmers to submit their grievances and check the status of the application. Farmers may enter the details of risk, photograph and details such as Village Name, crop name etc. Once they submit the data, it would be verified by block & District Officers and respective insurance Companies.




Kruti Odisha
ORSAC GEO ICT Tools

This app is compatible with all of your devices.

Add to wishlist Install

A Mobile GIS application to Empower Artisan of Odisha by Dept of handlooms, Textiles & Handicrafts Odisha.
Powered by ORSAC




Odisha Mines VTS
ORSAC GEO ICT Auto & Vehicles

This app is compatible with all of your devices.

Add to wishlist Install

Mobile application for vehicle tracking system for Odisha state department of steel and mines.



Mo Jungle: My Odisha Forest
ORSAC GEO ICT Tools

This app is compatible with all of your devices.

Add to wishlist Install

Odisha State Forest Dashboard



WL Anukampa
ORSAC GEO ICT Productivity

This app is compatible with all of your devices.

Add to wishlist Install

WL Anukampa Mobile application is developed and launched by State Wildlife Organisation, Odisha in association with Technical Partner Odisha Space Application Centre (ORSAC), Bhubaneswar. The objective of this program is to facilitate citizens victimized due to wildlife degradation for compassionate payment in time. The victims can apply online or through the mobile app for the sanction of compassionate payment. In case of any difficulty, the applicant may contact 'Mo Sarani' Cell in the concerned Range Office for necessary assistance.




Odisha Agro-Mapper
ORSAC GEO ICT Productivity

This app is compatible with all of your devices.

Add to wishlist Install

Odisha agro mapper is an omnibus mobile app developed to help farmers/policy makers by providing relevant information on various crops to them quickly. This mobile application is designed for collecting crop data and field photos with latitude and longitude details and others information of crop.



ORSAC-Know Your Location
ORSAC GEO ICT Maps & Navigation

This app is compatible with all of your devices.

Add to wishlist Install

Odisha know Your Location (KYL) is an Android Application part of AIGeo is a suite developed and powered by ORSAC.

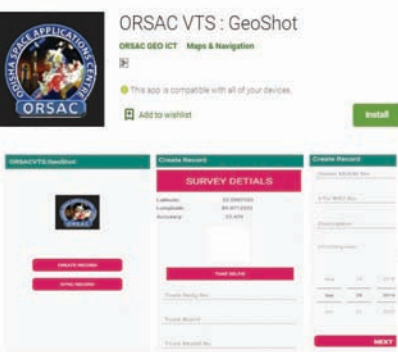


Wildlife Odisha
ORSAC GEO ICT Tools

This app is compatible with all of your devices.

Add to wishlist Install

Wildlife Odisha is an Application by the State Wildlife Organisation Odisha with the objectives to reverse the trend of habitat fragmentation and loss, and to generate stakeholding and participation of the local populace and various sections of society in the programs of wildlife conservation.



ORSAC VTS: GeoShot
ORSAC GEO ICT Maps & Navigation

This app is compatible with all of your devices.

Add to wishlist Install


This Mobile App use to do survey for a vehicle on a certain location. Using this app user can take different snap of a vehicle from a certain location. This application generally built to track the vehicle trailer installed in different vehicle running in Odisha state.



FITGC-OFMS
ORSAC GEO ICT Tools

Add to Wishlist Install

Odisha Forest Management System is an application developed and maintained by FITGC, Odisha used for management and monitoring of forest activities throughout the state of Odisha.



OSDI Mobile
Anthem India Pvt. Ltd. Maps & Navigation

Add to Wishlist Install

A) The system should allow citizens to enrich the published dataset via photograph and layer specific predefined forms will be available to them to update the info.
B) The System administrator at ORSAC may need to review and validate the attributes before they are finally uploaded in the System.
C) The Portal should manage all these feedback and maintain a dashboard of the same and roll forward.



Odisha Space Applications Centre (ORSAC)

Department of Science & Technology, Govt. of Odisha

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