ANNUAL
ACTIVITY REPORT
2020-21

Science & Technology Department
Government of Odisha

Annual
ACTIVITY REPORT
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Content

1. Introduction

Science & Technology Department is the nodal Department for promotion and Development of Science & Technology in the State. The Department implements various schemes, activities and programme through organizations, such as Odisha State Council on Science & Technology (OSCOST), Odisha Space Application Centre (OSAC), Odisha Bigyan Academy (OBA), Pathani Samanta Planetarium (PSP), Institute of Mathematics & Applications (IM&A) and Bio Technology Cell (BT).

2. Objectives

- ❖ To popularize Science and Technology among the people in general and the student community in particular of our State to inculcate a scientific temper and rational attitude.

- ❖ To provide support for Bio-Technology teaching, research and investment in the State.

- ❖ To promote and popularize integrated use of space and information technologies by various departments for better planning and implementation and monitoring of various development programme effectively.

- ❖ To provide financial support to Scientists / academicians of the State to participate and interact in the higher forums of International Conferences by presentation of their research / technical / scientific papers.

❖ To provide financial support for the promotion of science communication, cross learning holding Seminars / Workshops / Science competitions / Science Exhibitions etc.

❖ To provide financial support to pursue masters and Ph.D. programmes in basic and applied science; to promote research in Basic and Applied science; to organize seminars / workshops of international, national and State levels, to encourage participation in the international and national conferences.

❖ To create awareness among the people in Astronomy, Astrophysics and Space Sciences.

❖ To pursue teaching programme in higher mathematics, research and its application and to search and nurture talents in mathematics.

3. Activities of all agencies

3.1 Odisha Space Applications Centre (ORSAC)

ODISHA SPACE APPLICATIONS CENTRE (ORSAC) 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 in 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.

● **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.

OSDI aims towards facilitating and co-coordinating the exchange and sharing of spatial data among the stakeholders in Odisha, thus creating an information highway and facilitating smooth transaction and integration of sophisticated Geospatial Datasets. OSDI operates on GIS Database layers containing important information such as Administrative Boundaries, Roads, Railway Lines, Land Use / Land Cover, Hydrology, Soil, Geomorphology, Geology, Structures, Ground Water Potential, Forestry, Cadastral and others.

During 2020-21, OSDI Geo portal is now being used by many departments like Forest & Environment, Rural Development, Panchayati Raj & Drinking Water, Water Resources, Housing & Urban, Home Dept. etc. for the OGC services to consume the layers like Administrative, thematic, infrastructure etc. at their end to integrate the layers at their end.

- **BLUIS (Bhubaneswar Landuse Intelligence System)**

BLUIS (Bhubaneswar Landuse 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 understate ST 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 Al/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, Al/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.

For proper monitoring and effective implementation of the project, SOP has been formulated indicating the role of different officials of GA & PG Dept., BOA and BMC. Timeline has been given to the concerned officials at different stages starting from receipt of SMS alert up to removal of encroachment of Government lands. A cell has been constituted in BOA comprising officials of GA, BOA, 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 BOA are Trained on Portal Management. Escalation mechanism to track any delay at the stage of evidence upload or follow up is embeded in the system.

During 2020-21, (March 2020 to March 2021) 508 alerts on land encroachment/ landuse changes were reported out of which 412 are attended by BMC, BDA and GA officials. Out of 508, only 29 cases no changes are observed, enforcement action was taken on 190 cases and 69 cases were forwarded to CEMC excluding 50 stay/ legal cases.

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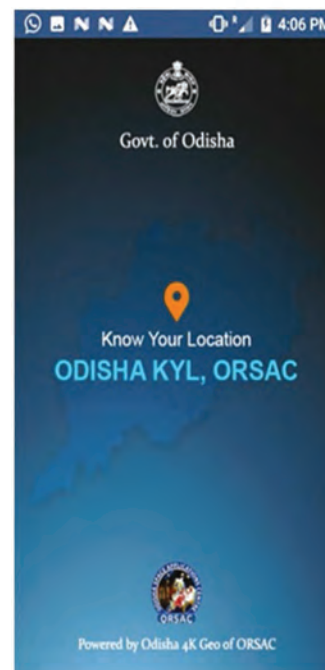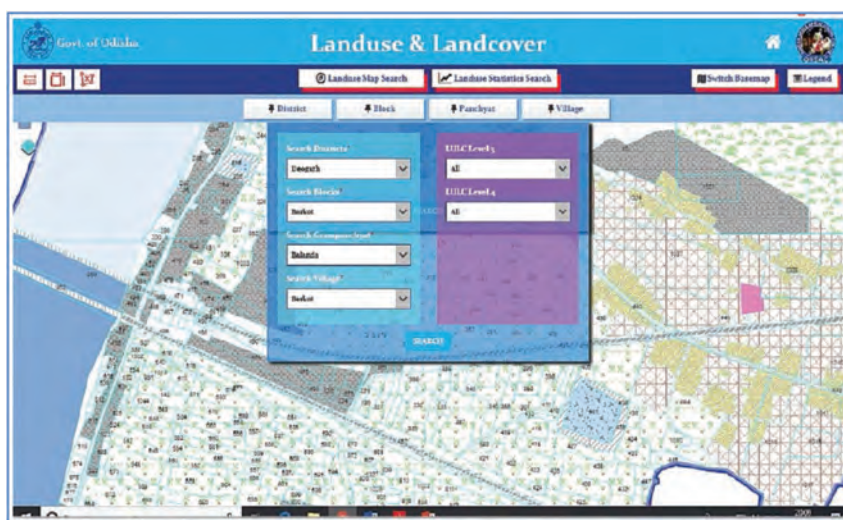
Georeferenced cadastral maps merged with High Resolution Satellite Image (Orthoimages) and time to time modified administrative boundary layers are used to generate the digital geospatial database of the state along with linking of Revenue cadastral level info.

The App is developed under ST initiatives of Government of Odisha.

- ### Odisha 4k GEO Web-Portal

Under Odisha 4K Geo Land Use Database of entire state was created at 1:4000 scale using georeferenced Revenue Cadastral maps of the State. All created under "Geospatial Technology for Rural & Urban project were web-enabled Datasets under a Web-GIS based Web-Portal for visualization, Data dissemination, Data access and for providing inputs for development planning activities by State Departments. The

objective is to develop a dynamic application with MIS support having capabilities for generating queries, both generic and specific and working as a Decision Support System. At present it is now planned to put all infrastructures, Govt. Assets, utilities, amenities created under Government schemes are to be incorporated to the portal via dedicated server and Mobile- App based architecture. Odisha 4k Geo services is designed to provide availability of data sharing framework; Standardized, Structured & Updated Geo-spatial 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.

During 2020-21, the Odisha 4k Geo Services were extended to following projects of State Department:

❖ GOPLUS/ Odisha Land Bank Development – Plot level land info for landbank to IDCO and Industry info of IPICOL (Dept. of Industry)

❖ Odisha Agri GIS – Plot level info for visualizing crop acreage (DA&FE)

❖ ODIIS – Plot level Cadastral info for all ayacuts of DoWR.

❖ Forest Diversion Proposal – Plot level Cadastral info of Forest Diversion/ Compensatory Afforestation project area (S&M Dept)

❖ COAST – Plot level info to prepare aquaculture database of the state (FARD)

❖ OFMS – Plot level administrative info to OFMS portal of Forest & Environment Dept.

❖ Mo Jungle and Odisha KYFL – Revenue and Administrative info services for Mobile based info access.

● **Odisha Sampad**

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

ODISHA SAMPAD

State and District Level Geospatial Web Portal For Planning and Development

"Odisha Sampad" portal is the repository of State's Geospatial Datasets consisting of administrative information, natural resources data layers, geocoordinate / georeferenced infrastructure details and other socio-economic parameters. The portal aims to cater to the need of geo-spatial data need of State Administrators, Decision Makers, Resource Managers and Planners.
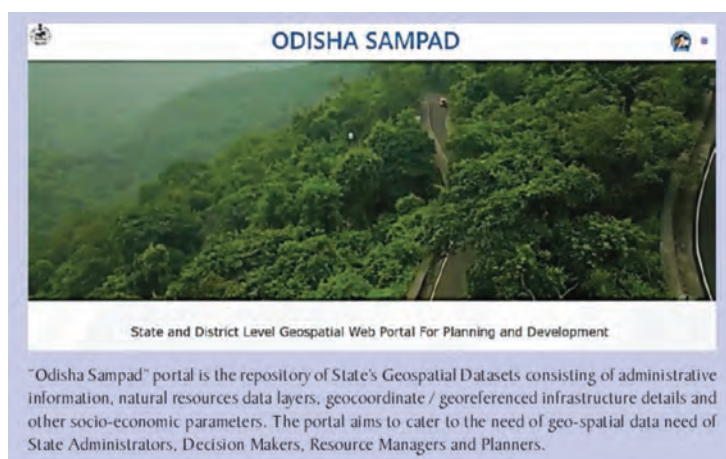
The portal is used for planning, especially for community development at block level by using scientific database containing geo-spatial natural resources & infrastructure profile of the Block and spatial representation of demographic, socio-economic, agro-economic and utilities/ amenities/ infrastructure data (generated by GIS based analysis and visualization).

During 2007-08, the Centre undertook 'Block Level Resource Atlas & GIS Database Generation' project using satellite remote sensing data for all the B locks of the State. The Center has aptly demonstrated the application of Space and IT technology for generating inputs for development planning through preparation of this Digital Web-Atlas 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.

ODISHA SAMPAD (Ver 3.0) 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, analyze and access Geospatial Data. Odisha Sampad Ver 3.0 is expanded to provide spatial data through administrative search query mode.

During 2020-21, updated spatial data layers were incorporated to the portal. 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, **Ver 3.1** in 2020 and version 4.0 is under development now.

- **Odisha Irrigation Information System**

ODIIS 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 Panchayati Raj (DRDA /Block) are collected and GIS database generation has been completed. Sanitization of the data has been completed and submitted to DoWR for vetting.

Initiatives are also taken for development of Geo-ICT based Apps for regular, automated and authentic data collection of further irrigation related activities / new project execution of the state.

The web -portal developed as ODIIS is under operational use by DoWR Dept.

During 2020-21, all Ayacut & Scheme implemented info of 11 Agencies of 4 Departments web hosted in the portal in query-based modules. Odisha Agri-GIS (Web-portal of Agriculture & FE Dept.) and ODIiS is integrated to provide information on crop acreage inside ayacuts for Kharif, Rabi & Zaid season. One new module on canal infrastructure is now under preparation. ODIiS portal bagged the AGI India water awards for 2020-21 as best web-portal of the country as per voting by Geospatial Industries of the country.

● **NAFCC Nuapada 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 have been constructed at Budhipali, Parsabhadar and Parkod. The project area is covering six villages along Kharkhara nala (Amlidadar, Baloda, Burhipali, Parkor, Prasabhadar, Bhainsatal, Jangula) nala in Nuapada district.
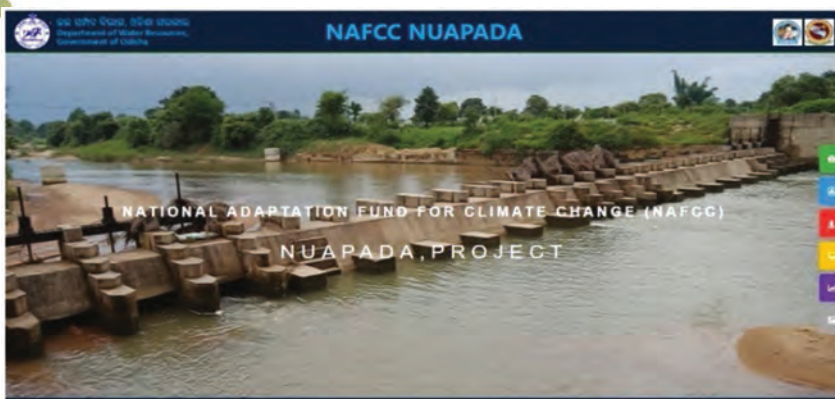
The goal of the project is to develop a GIS-based system for visualization and analysis of Geotagged activities of NAFCC Nuapada. Under the project, the DEM/DSM of the area has been generated using HR images. Key Expectations of NAFCC is to provide a Common Operational Platform for Geotagging of all plot level interventions, 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 and Preparation of Dashboard based into services.

During 2020-21, Under NAFCC Nuapada Project, all ground level intervention by NAFCC Nuapada MI Division are uploaded to the web-portal www.odishairrigation.gov.in/nafcc . The project area is covering six villages along Kharkhara nala (Amlidadar, Baloda, Burhipali, Parkor, Prasabhadar, Bhainsatal, Jangula) nala in Nuapada district. DGPS survey and orthoimage generation of the project area was undertaken.

- **Odisha Land Bank Web services through GOPLUS**

Availability of land and its associated attributes i s one of the most important factors for policy makers to devise smart growth strategies and development framework. Odisha Industrial Policy Resolution 2015 focusses on providing quality industrial infrastructure and creation of a large Land Bank. In this resolution, it was decided to develop a GIS based web-services for use by Decision Makers, Planners and Investors. Considering the requirement of the Government, a GIS based web-portal was developed by the centre for providing Land Bank and associated utility and developed infrastructure information to potential investors and entrepreneurs. Geo-ICT, Space Technology inputs and Geospatial Data 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 1,31,852 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.

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 categorization 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 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.

During 2020-21, 1692 Ac. of landbank for industrial purposes are provided to IDCO and integrated in GOPLUS web portal for public and entrepreneurs. Time to time industrial plot allotment by IDCO & IPICOL in 106 Industrial Estates, SEZ, Industrial Park, Kalinganagar KNINZ and PCPIR Paradip areas are updated. The GOPLUS new version for Mobile view is also released by Hon'ble Chief Minister of Odisha under 5T initiative of Govt. of Odisha.

- **Odisha Mineral Vehicle Tracking System (OMVTS)**

Odisha is endowed with about one third of the estimated national mineral resources. International and domestic demand for minerals has grown steeply in the past decade. This was preceded by a slump in the global mineral industry lasting well over a decade. Streamlining the mining operations including tracking of end to end mineral transaction has been an issue of deep concern for the Government since long. On the above backdrop, implementation of a comprehensive Information Technology based e-Governance initiative by the Department of Steel & Mines has been underway in multiple stages and phases since early 2010. 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 based Mobile App, available in Google Play store as **OMVTS_ORSAC**. The Mobile App
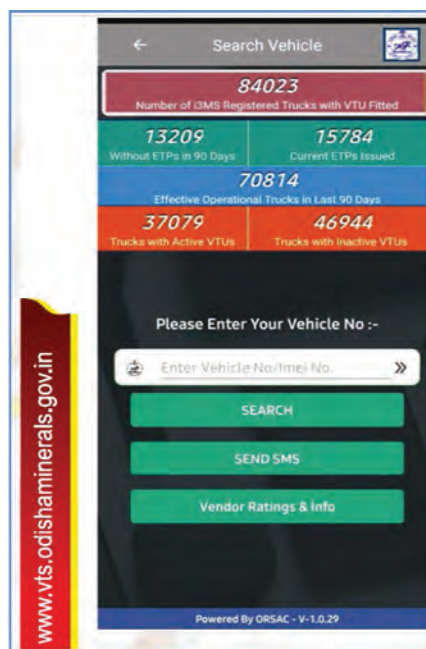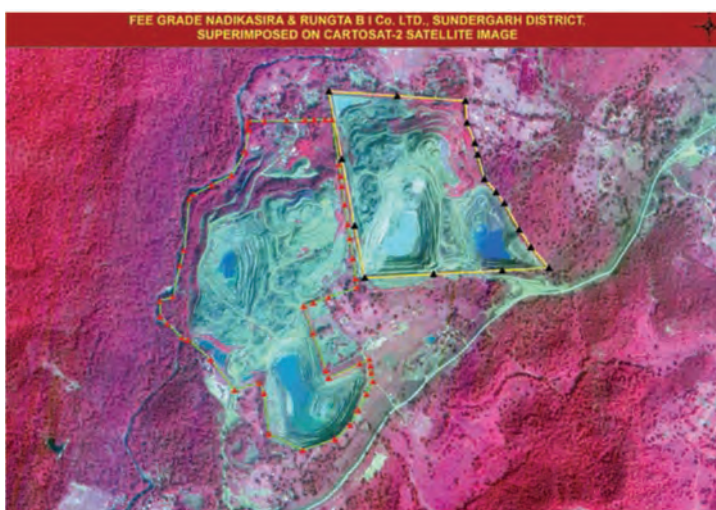
is freely accessed by all the stake holders to know about the current location of the vehicles, working conditions of Vehicle Tracking Units (VTUs), SIM validity and Electronic Transit Pass issued against the vehicle. The web -portal is also accessed by the stake holders with proper login authentications.

During 2020-21, Mobile application in IOS was developed and facilitated. Upgradation of Android based mobile application was also carried out to accommodate new features like VTU, Vendor, Ranking & online monitoring. The system of State Data Centre has been upgraded to enhance the system capability to accommodate the future requirements. Georeferencing facilities around mines, visualisation of route covered and 24X7 monitoring options are added in OMVTS system.

- **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 for their lease. Further, Steel & Mines Department, Govt of Odisha issued an order in 2014 for joint survey of all Iron & Manganese mines of the state by constituting representatives from ORSAC, Revenue, Forest and Mining Department.

For Mining Lease survey & mapping, the steps involved in this process are field DGPS and ETS survey by 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 DGPS survey exercise for all the Minor Minerals and Sairat sources (sand, stone, morrum quarry etc.) of the State is initiated. The survey of 240 Sairat Leases have been completed so far in the field.

The field DGPS survey for 157 working mining leases ae completed so far including four mines during 2020-21. The DGPS survey map for 30 mineral blocks to be put for auction relating two mineral blocks during 2020-21 are also completed as per the requirement of Steel & Mines Dept. 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 are completed in 2020-21.

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

As per the circular of MoEF Govt. of India & Department notification on Forest areas proposed to letter no.18393/F&E, dt.13-10-2011); ORSAC (as the ETS survey and technically authenticate survey undert agencies. The centre is authenticating all FD/CA Propo requirement.

During 2020-21, DGPS survey for total 102 Forest Di has been completed.

- **FASAL Project**

During 2020-21, three dates of Sentinel-1 Microwave data (Spatial Resolution 20m, Temporal Resolution 12 days, VV polarization) have been used for district wise acreage estimation for Kharif Rice in Odisha. District level crop yield has been estimated by optimum combination of the estimates from weather-based regression models, crop simulation model and remote sensing indices (NDVI & NDWI) based models. The Kharif Rice area of the state is estimated at 40.36 lakh ha. with rice production of 87.60 lakh tonnes. Rabi rice acreage estimation area for selected districts of Odisha is being undertaken using Sentinel-II optical data.

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

Under this project the Centre developed Odisha Agri-GIS web-portal to provide online total crop acreage data of all Grampanchayats of Odisha in three cropping seasons like, Kharif, Rabi & Zaid. During 2020-21, Satellite based crop area estimation at GP level for

Odisha state during Kharif season has been undertaken using Sentinel-1A SAR data. Four time series data have been analyzed and the total cropped area during Kharif season has been estimated at 60.69 lakh ha. as on 26th September, 2020. 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 is in progress.

- **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 all Class-I and Class-II 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 georeferenced 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.
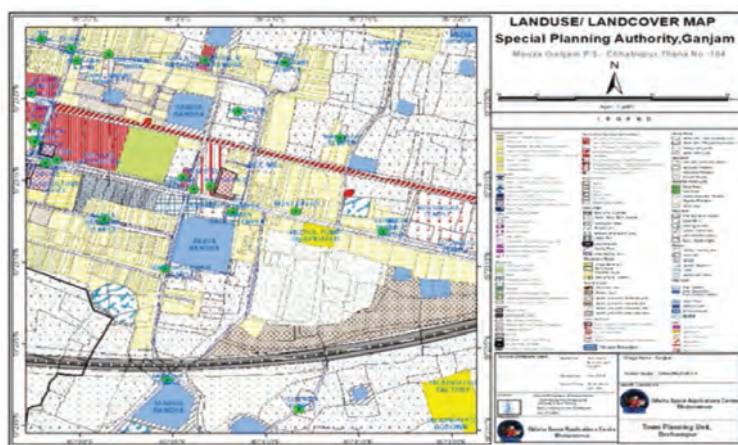
❖ Plot level Digital Urban Land Use Database Generation on cadastral base.

The GIS Database in complete format has been supplied to planning section of respective Town Planning Units for Comprehensive DevelopmentPlan (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.

During 2020-21, Remote Sensing & GIS data inputs of 10 towns namely Damanjodi, Khandapada, Polsara, Soro, Rambha, Kabisuryanagar, Sorada, Umarkote, Athamallik and Hinjilicut on 1:2000/4000 scale have been completed using Worldview -2 satellite image.

● **Assessment of Erosion Prone Areas of Odisha State**

(A R&D Project under the Climate Change Action Plan of Government of Odisha)

Odisha, which has a coastline of 480 Km and an abundance of rivers that flow into the sea, could be subject to the merciless onslaught by the monstrous seas. A modest sea-level rise will not only create havoc on the coastal ecosystem but also disrupt the very socio-economic foundation of the thickly populated coastal areas. The coastal tract of Odisha has an average height of 4 -5 m above mean sea level with some areas as low as 1 -2 m above mean sea level. The coastal tract is also subject to all kinds of fluvial, aeolian, tidal and other marine activities and supports a variety of landforms. In global warming scenario, the impact on these coastal features is expected to be traumatic. Therefore, a detailed scientific study is being undertaken using Geospatial Technologies. The progress in the project to generate the base level data are listed below.
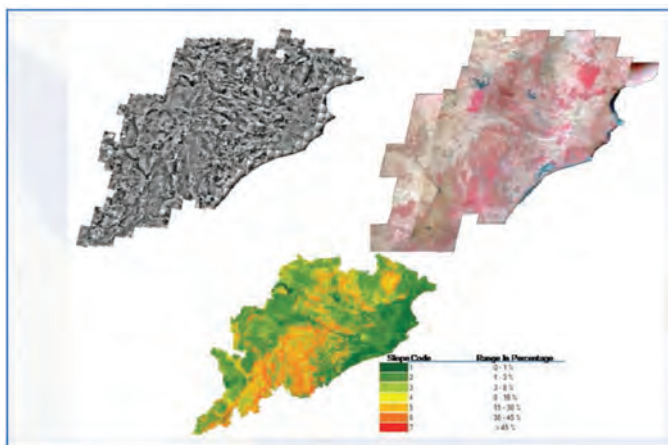
❖ DEM/DSM and Orthophoto generation of entire Odisha using Carto Sat Stereo data (5m contour interval). DEM data along-with slope, Land use / Land cover, Geomorphology, Soil and Drainage data; Spatial & Temporal data on precipitation. Detailed GIS based simulations, analysis and modelling will be undertaken for vulnerability studies and delineation of erosion prone area map of entire Odisha at 1:4K.

❖ DEM/DSM and Orthophoto of coastal Odisha are being prepared from High Resolution (30cm resolution) World View Stereo data. Integration of DEM data with slope, LU/LC,

Geomorphology, Soil, Drainage maps of coastal Odisha at cadastral scale (1:4k) are being undertaken to develop a GIS based 3D model of coastal Odisha

During 2020-21, shoreline change analysis has been carried out for the entire coast using USGS-DSAS system and vulnerable areas have been identified. District-wise vulnerability analysis for 07 districts are generated under this project.

- **Coastal Aquaculture Mapping**

During 2020-21, a Web Portal on the Coastal Aquaculture Information System named "COAST" has been developed comprising information related to leasable Govt. lands, infrastructure, administrative boundaries. Query based information are being easily retrieved using this web portal on the occurrence of aquaculture in Government land / information related to CRZ status and occurrence in specific administrative units etc.
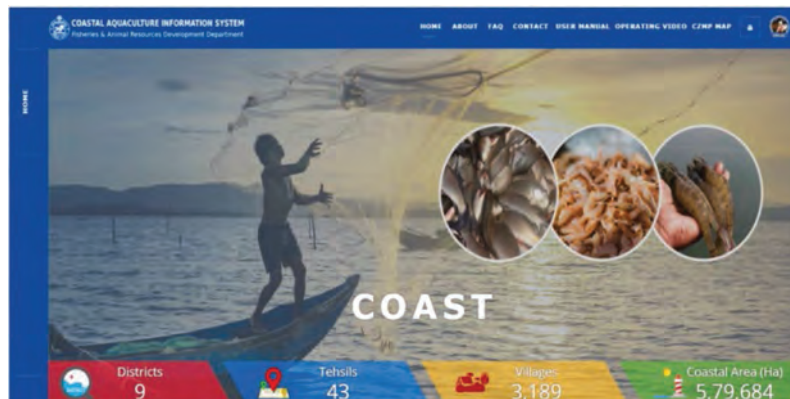
- **Coastal Zone Management Plan Preparation**

Coastal Regulation Zone Management Plans for the entire coast have been prepared jointly with the Forest and Environment Department, Govt. of Odisha in accordance with CRZ Notifications-2019. During 2020-21, 95 nos. of CZMP maps have been prepared and submitted to Forest & Environment Department, Govt. of Odisha. The maps have been approved by MoEF & CC, Govt. of India.

- **Working Plan Input Map Preparation of Odisha Using RS & GIS**

The Centre is preparing working plan inputs for 38 Forest Divisions of the state in collaboration with NRSC, Dept. of Space, Govt. of India and State Forest & Environment Dept. The reapproved inventory data of sample points of 33 forest divisions has been submitted to NRSC, Hyderabad. The final result, stock maps and other thematic maps of 31 forest divisions are submitted to respective forest divisions for preparation of working plan documents.

During 2020-21, online module has been created for the forest officials to upload the sample observations of the different forest vegetation species relating to preparation of forest biomass stock.

- **Mobile and Web Applications for Handicrafts Artisans (KRUTI)**

A Web and Mobile Application have been developed for Handlooms, Textiles and Handicrafts (HT & H) Department, Govt. of Odisha for collection of Handicrafts Artisans data. During 2020-21, Training has been imparted by the Master Trainers of ORSAC to the enumerators of all 30 districts of the State. Collection of Handicrafts Artisans data have been completed from Keonjhar, Sonepur, Baleswar Bhadrak and Kendrapara districts using Kruti web and mobile application. Collection of Handicrafts Artisans data from other districts is in progress.

- **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 Fisheries and Animal Resources Information System (OFARIS)**

Development of a Web Portal for Management of Assets and different Functionalities of Inland and Marine Fisheries and Animal Resources Development Department.

Development of mechanism for Collection of Assets data and Field Level Reporting, Monitoring and Management of Resources/Schemes through development of Mobile Apps. During 2020-21 the following work is undertaken.

- ❖ Class and categories of Assets and different Functionalities of Inland and Marine Fisheries and Animal Resources have been organized and dashboard for the portal have been designed.

- ❖ Development of Mobile Apps for Collection of Assets data and Field Level Reporting and Management of Resources has been also undertaken.

- **Mo Jungle and Odisha KYFL**

"Mo Jungle: My Odisha Forest" Mobile App is developed by PCCF Odisha in Technical Collaboration with Odisha Space Applications Centre (ORSAC) for monitoring all kinds of Afforestation programme of Forest Department Odisha and to provide public access to all Afforestation information and obtain feedback from public under a mobile enabled crowdsourcing mode.

This App is developed under 5T and "Mo Sarkar" initiatives of *Forest & Environment Department, Government of Odisha*. The App *"Mo Jungle: My Odisha Forest"* can be downloaded from Google Play Store and Apple App Store.

KYFL, Odisha (Know Your Forest Location) Mobile App and its associated Web-GIS Portal is developed by PCCF Odisha, in

Technical Collaboration with Odisha Space Applications Centre (ORSAC) by utilizing its Enterprise Class Geo-Informatics Services and Odisha Forest Management System (OFMS). The App is primarily designed to provide preliminary forest l and information on-fly on mobile, for developmental planning involving forest land.

Any user from anywhere, can avail all kinds of Forest Land and Forest Administrative information of any Point of Interest (POI) in the State of Odisha. The App also provides the additional Land Revenue Information of District, Tehesil, CD Block, GP, Village, Khata number, Revenue Plot number, Owner's Name, Land Type and Area, Police Station Details (Thana Name & Code and Distance of Thana) etc with respect to POI.

This App is developed under 5T and "Mo Sarkar" initiatives of *Forest & Environment Department, Government of Odisha*. The App *"KYFL @ Odisha"* can be downloaded from Google Play Store and Apple App Store.

- **ANUKAMPA**

"ANUKAMPA" is an IT initiative of Govt. of Odisha to facilitate compassionate payment in a transparent and time bound manner to citizens who are victims of wildlife depredation.

The portal can be accessed by www.odwlanukampa.in The Mobile App can be downloaded from Google Play store & Apple App store.

"Anukampa" is a user-friendly software developed and launched by PCCF (Wildlife) & Chief Wildlife Warden, Odisha, State Wildlife Organisation, Department of Forest & Environment, Government of Odisha in association with Technical Partner, Odisha Space Application Centre (ORSAC), Bhubaneswar. The portal is to be used for claiming Compassionate Payment towards Human Kills, Human Injuries, Cattle Kills, Crop Damages and House Damages by wild animals as per Chapter-VAA, Wildlife (Protection) (Odisha) Rules, 1974.

APPLICATION PROCESS • Citizens/Applicants can fill-up application form on both Android App and Web Portal. • Applicants can view application by "Search" in Web portal giving auto generated Unique Token ID. • After receiving such application, department surveyor will verify the claims within their jurisdiction within stipulated time. • Message and mail as a token of acknowledgement will be automatically sent to applicant at his registered mobile number/email.

- **Satellite Communication Project (GRAMSAT Network)**

During 2020-21, ORSAC has produced nine awareness spots for Health & Family Welfare Department, one video spot for Revenue & Disaster Management Dept., two documentaries for Food Supply & Consumer Welfare Dept.

- **EDUSAT Network in Odisha**

During 2020-21, when all classes in schools and colleges were closed due to COVID pandemic situation, ORSAC in close association with School & Mass Eductaion Department has produced 222 programmes for Class-IX and X students and 121 programmes for +2 students of the state. To increase the Edusat reach, these programmes are aired through Doordarshan Kendra, Bhubaneswar with intimation to students by S & ME Department. These programmes also available through Youtube and Dikhsha App for larger viewing of the students across the state.

3.2 State Council on Science & Technology

The State Council on Science & Technology functions for development of Science & Technology and oversees the implementation of the programs undertaken in the field of Science and Technology in the State. Various programmes implemented by State Council on S&T for 2020-21 are given below:

- **Financial Assistance providing for Science Education at University level.**

  ❖ **Scholarship at Post-Graduate Level on Basic Science:** To promote and encourage the meritorious students to pursue their Post-Graduate studies in Basic Science, Government of Odisha in Science and Technology Department is providing financial assistance @ Rs. 2000/- per month for two year.

- During 2020-21, Rs 48,00,000/- have been released to Institutes of Mathematics and Application (IMA), Bhubaneswar for 200 nos. of students of 2019-20 batch (2ⁿᵈ year) towards Post Graduation Scholarship. Entrance test for 2020-21 will be held on 25/04/2021 by IMA, Bhubaneswar.

- **Award of Biju Patnaik Research Fellowship in Science to pursue Ph.D:** In order to attract students for pursuing full time Ph.D. work, the Science and Technology Department is being provided Biiju Patnaik Research Fellowship (BPRF) in Basic & Applied Science for maximum three (03) years. The rate of fellowship is **@** Rs 12,000/- per month for 2 years and Rs 14,000/- per month for 3rd year along with Rs 25,000/- towards contingency per year. Besides, Rs 10,000/- is also paid to mentoring Institute for departmental assistance per year.

  During 2020-21, Government have been approved 10 (Ten) Biiju Patnaik Research Fellowship in Basic and Applied Sciences for pursuing their research in Basic Sciences leading to Ph.D Degree.

- **Research and Development projects in Basic and Applied Sciences:** Financial assistance is provided to Government Universities, Colleges, State Funded Research Institutes of Odisha and Research Institute of Government of India functioning in Odisha to encourage the scientists/academicians for Research and Development project in Basic & Applied Science. Rs 10,00,000/- maximum is paid during 3 years Project Period.

  During 2020-21, selection of R&D projects for the year 2020-21 is in process.

- **Travel Grants:** Financial support is being provided for Travel Grant to academicians/ scientists to give oral presentation in National/ International Conference/ Seminars/ Workshops/ Symposia etc. The ceiling of financial assistance by the S&T Department is Rs 30,000/- for National Level Conference/ Seminars/ Workshops/ Symposia etc & Rs 70,000/- for International Level Conference/ Seminars/ Workshops/ Symposia etc.

  During 2020-21: Nil

- **Financial support for holding seminars, workshops, conferences etc:** Financial support is provided to Government Colleges/Autonomous Colleges & State Universities of Odisha for organizing State, National & international level Seminars/ Symposia/ Conference/ Workshop. The ceiling of financial assistance by the S&T Department is Rs 80,000/- for State Level, Rs 1,00,000/- for National Level & **Rs 1,50,000/-** for International Level.

During 2020-21, financial support of Rs 25,000/- has been provided to Regional Science Centre, Bhubaneswar for organizing Digital Mega Science Festival and a sum of Rs 1,00,000/- has also been provided to IMA for organizing National Seminar.

❖ **Training & Capacity building of Science & Math teachers.**

The State Council on S&T, S&T Department have initiated a training programme for Science & Math teachers of High School/College/Universities of this State through the Talent Development Centre (TDC), Indian Institute of Science (IISc), Bangalore. Prof. M.S Hegde and Dr. Malti of Talent Development Centre (TDC), Indian Institute of Science (IISc), Bangalore have visited few high Schools, Higher Secondary School, OAV & Degree College of Odisha during 13-17, January 2020 and interacted with the Science & Math teachers. A Memorandum of Understanding (MoU) has already been signed between Science & Technology Department, Government of Odisha and Indian Institute of Science (IISc), Bengaluru in this regard.

❖ **Student Project Scheme for Diploma & Degree engineering students.**

`The Student Project Scheme for final year Engineering students (BE/B.Tech (250 nos.) and Diploma (250 nos.) in partnership with DST, GoI has been approved by the Finance Department and Planning & Convergence Department. The main objective of the scheme is to develop and utilize the talents and potential of engineering students of the State and to use them for solving specific scientific and technological problems relevant and useful to our society. With approval of the State Government, the Student Project Scheme proposal has been sent to the DST, GoI for consideration of releasing the GoI share to implement the scheme.

❖ **Establishment District Science Centres in the State:** A Sub-Regional Science Centre at Mouza-Tukurla under Bhatli Tahasil in Bargarh District in the State with support of GoI, has been inaugurated on 21/01/2020 by the Hon'ble Chief Minister, Odisha.

Government have decided to establish Science Centre/Park in all district headquarters of the State. With 100% funding from State Budget initially, it will be established in 10 districts. Sites have been identified in Ganjam (Gopalpur), Koraput (Jeypore), Keonjhar (Ghatagaon), Bolangir, Bhadrak, Jagatsinghpur, Sundargarh, Nayagarh, Mayurbhanj and Puri. State agency IDCO for Ganjam & Nayagarh, Central agency NBCC for Puri, Bolangir, Sundargarh and Jagatsinghpur

and NPCC for Mayurbhanj, Keonjhar, Koraput & Bhadrak have selected and engaged for execution of the projects.

A sum of Rs 2,16,80,187/-, 2,16,71,361/- and 2,14,49,498/- have been released to NPCC towards construction of the Science Centre-Cum-Planetarium at Keonjhar and Mayurbhanj and a Science Centre at Jeypore respectively.

The Collectors (Angul, Boudh, Balasore, Deogarh, Gajapati, Jharsuguda, Jajapur, Kalahandi, Kandamal, Kendrapada, Malkanagiri, Nabarangpur, Nuapada, Subarnapur) have been requested to submit land/sites to this Department for establishment of another 10 District Science Centre/Park in 2nd phase following Govt. orders

❖ **Establishment of Planetarium:** Government have decided to establish 6 Planetarium in the district of Keonjhar, Mayrbhanj, Rayagada, Ganjam, Bolangir and Sunndargarh.

❖ **Develop Innovation Hubs & Outdoor Science Parks:**

Development of Innovation Hubs and Outdoor Science Parks in Odisha has been initiated with collaboration with Homi Bhabha Centre for Science Education (HBCSE), Mumbai.

❖ **Patent Information Centre in the State:** Patent Information Centre (PIC) is functioning under the State Council on S&T with financial assistance from Government of India.

During 2020-21, PIC has attended 04 no's of invited talk for IPR in different Institutes. The Institutes are ICAR, NRRI, Cuttack, Govt. ITI, Cuttack, Odisha, S. B. Women (Auto.) College, Cuttack and Sri Sri University, Cuttack respectively. PIC has forwarded 10 nos. of Inventor's data to Government of India for filing of Patent. PIC has facilitated one Copy Right registration and 4 nos. of Trade Mark registration.

❖ **Award/Prize:**

UNESCO- Kalinga Prize: During 2020-21, Rs 12,27,150/- has been approved towards State Government share for the UNESCO Kalinga Prize for the year 2021.

3.3 Biotechnology Cell

Biotechnology is a frontier area of applied basic science with immense benefits to the society in diverse areas such as food security, nutritional supplementation, affordable health-

care products and potential industrial applications. Considering the diversified resources of the State, this cutting edge technology has a potential to make a significant contribution to the economy of the State.

Achievements

- **R&D Projects in Biotechnology**

  ❖ The presentation of the final findings of the projects by the respective PIs of R&D Projects Scheme 2016-17 batch has been completed.

  ❖ The review for release of 3rd year grant towards R&D Projects Scheme 2017-18 is over.

  ❖ Rs.6,30,000/- has been released towards 2nd year grant for R&D Projects Scheme 2018-19.

  ❖ The monthly remuneration of Project Fellows under Research & Development Project has been enhanced to Rs.17,000/- for first two years and Rs.19,000/- for 3rd year.

- **Biju Patnaik Research Fellowship to pursue Ph.D. in Biotechnology**

  ❖ 3rd year grant of Rs.3,81,000/- has been released towards BPRF 2017-18 batch.

  ❖ 2nd year grant of Rs.2,62,558/- has been released towards BPRF 2018-19 batch.

  ❖ The final selection of 10 Proposals for Biju Patnaik Research Fellowship for the year 2020-21 has been completed.

- **Implementation of Skill Vigyan Programme**

  ❖ To impart hands on training in various tools & techniques to Biotechnology students of the State and enable them to take up the jobs as well as exposure of entrepreneurship for self-employment, a MoU has been signed between DBT, GoI and Science & Technology Department, GoO. MoAs have also been signed between Science & Technology Department and 5 partnering institutes of the State for facilitation of the said skill development training. A sum of Rs. 273.80 lakh has been sanctioned by DBT in favour of the State Council on Science & Technology, Odisha For the above purpose.

  ❖ Four partnering institutes i.e. NRRI, Cuttack, ICMR-RMRC, Bhubaneswar, Institute of Life Sciences, Bhubaneswar, OUAT, Bhubaneswar except Sambalpur University have successfully completed faculty/technician/students training under Skill Vigyan Training Programmes .

- As per guidelines of DBT, GoI, one Dr. Prasanna Kumar Panda, Retired Scientist, IIMT, Bhubaneswar who had joined in this Department on 27.10.2020 (FN) as Consultant for the Skill Vigyan Programme vide this Department Order No. 3469/ ST, dated 15.09.2020, has expressed his inability to continue vide his email dated 28.10.2020 due to the ensuing COVID pandemic situation. A fresh advertisement dated 05.4.2021 has been floated for the same.

- Miss Padmini Rani Panda has already joined and working as DEO in Skill Vigyan Programme.

- **Biotechnology Incubation Centre**

  ❖ Out of Rs.2 crores, a sum of Rs.1 crore has been released in the year 2020-21 in favour of the Institute of Life Sciences(ILS), Bhubaneswar for the establishment of a Biotechnology Incubation Centre in their second campus

  ❖ Biotechnology Incubation Centre(BIC) at ILS has been inaugurated by Hon'ble Chief Minister on 15th March, 2021.

  ❖ 9 incubatees are working as Start-ups in ILS-BIC.

  ❖ Implementation Committee Meeting have been convened to review the status of BIC-ILS and for consideration of release of the rest Rs.1.00 Crore in their favour.

- **Biotech Finishing School (BFS)**

Three Biotech Finishing Schools (BFS) Proposals have been submitted to DBT, GoI under Skill Vigyan call for proposals 2020 for funding.

- Guidelines of various programmes under Development of Biotechnology Scheme

For implementation of Biotechnology Policy, 2018, Government Order have been obtained with respect to the five guidelines relating to the following scheme / fellowship i.e.

Biotech Finishing Schools (BFS)

Immersion Fellowship

Bio-Innovation Grant (BInG)

Establishment of Biotechnology Incubation Centre and

Centre of Excellence in Biotechnology (CoEB)

which had earlier been vetted by Finance Department. (Odisha Gazette Notification No.503 dt.22.3.2021/ Odisha Gazette Notification No.504 dt.25.3.2021

- Biotechnology Park

OBPPL has obtained necessary approvals regarding functioning of Biotech park at Andharua. BBIL will invest 330 Crore for functioning of 1ˢᵗ phase of the Biotech Park and the work is under progress.

- **Collaborative Research Project Grant scheme**

Two proposals received under the scheme Collaborative Research Project Grant in Advanced Areas of Applied Biotechnology for the year 2020-21 namely

Covid-19 persistence within rural and urban populations of Odisha : A comprehensive immunophenotypic, genomic and metagenomic mapping approach (Collaboration of AIIMS and OUAT) and

Studies on the bioactive properties of small peptides from protein hydrolysates of fish waste using biotechnological tools and suitable incorporation into bacterial/animal cell culture media for better growth (Collaboration of NOU, CIFA and IMGENEX)

are in the final stage of assessment. The funding under the scheme amounts up to 30 lakh per annum per approved project.

- **Global Bio - India 2021**

Odisha participated as a State Partner of Global Bio – India 2021 event organized virtually by DBT, Government of India and its Public Sector Undertaking BIRAC along with Confederation of Indian Industry (CII) from 01-03 March, 2021

3.4 Institute of Mathematics & Applications (IMA)

The Institute of Mathematics & Applications was established by the Government of Odisha in the year 1999 with the noble vision of creating a Centre of Excellence for mathematical education and research. During these years it has evolved into an all India Institute for production of committed and competent human resource specializing in Mathematics, Statistics and Computer Science. It is a favourite destination for local mathematicians to avail themselves the opportunity of updating with latest trends in mathematics and its applications. The fundamental aims and objectives of the

MASTER PLAN OF IMA

Institute of Mathematics & Applications are to pursue teaching programme on higher mathematics, research & its applications, to search and nurture talents in mathematics, to set up advanced computing centre and to offer specialized courses.

- **Teaching Programme:**

At present the following three courses are being imparted by IMA.

- ❖ B.Sc.(Hons.) in Mathematics and Computing.
- ❖ M.A./M.Sc. in Computational Finance.
- ❖ M.A/M.Sc. in Mathematics with Data Science.

- **Recruitment**

During the year, the recruitment for the following posts have been made and the posts have been filled up:

- ❖ Director, IMA
- ❖ Registrar, IMA
- ❖ One post of Finance Officer, IMA
- ❖ Two posts of Associate Professor, IMA

- **Research:**

The following papers have been published / accepted for publication in different Journals by Faculties and Post-Doctoral Fellows of IMA :

- ❖ S. Pal, S. Sahoo, B. K. Nayak, Construction of One Dimensional Non-Uniform Number Conserving Elementary Cellular Automata Rules, 05 October 2020, International Journal of Bifurcation and Chaos. (Accepted).
- ❖ P. Das, P. K. Dey, B. Maji, and S. S. Rout, Perfect powers in an alternating sum of consecutive cubes, Glas. Math. Ser. III 55(1) (2020), 37-53.
- ❖ S. S. Rout, The dynamical Mordell - Lang problem for intersection of two orbits, J. Number Theory 207 (2020), 122-137.
- ❖ P. Das, P. K. Dey, and S. S. Rout, Sums of fifth powers being a perfect power: A special case, J. Ramanujan Math. Soc. 35(1) (2020), 23-33.
- ❖ E. Mazumdar and S. S. Rout, Perfect powers in sums of terms of binary recurrence sequences, Monatsh Math. 189(4) (2019), 695-714.
- ❖ S. S. Rout, Lucas non-Weiferich primes in arithmetic progressions, Funct. Approx. Comment. Math. 60 (2019), 167-175.
- ❖ A. Berczes, L. Hajdu, I. Pink and S. S. Rout, Sums of S-units in recurrence sequences, J. Number Theory 196 (2019), 353-363.

- ❖ S. Nayak, Classification of finite dimensional nilpotent Lie superalgebras by their multipliers, to appear in J. Lie Theory (2021).

- ❖ R. N. Padhan and S. Nayak, On capability and the Schur multiplier of some nilpotent Lie superalgebras, to appear in Linear Multilinear Algebra (2020).

- ❖ S. Nayak, R. N. Padhan and K.C. Pati, Some properties of isoclinism in Lie superalgebras, Comm. Algebra, 48(2) (2020) 523-537.

- **Seminar /Workshop:**

Invited Lecture

One Invited Lecture programme has been conducted on 10th February 2021 from 3:00 PM to 5:00 PM on the topic Black hole.

Invited Lecture by Professor S.Pattanayak on 10th February 2021 from 3:00 PM to 5:00 PM

Student Seminar:

The following student seminar programme has been conducted by IMA.

Name of Students	Semester Batch	Day and Date	Time	Topic
Akash Choudhuri	3rd Semester, M.A./M.Sc. In Mathematics with Data Science	Friday, 26th Feb 2021	03:00 PM	Imbalanced Classification using User-Automated Artificial Neural Networks
Mr. Nishant Kumar and Mr. Suraj Kulkarni	5th Semester, B.Sc. (Hons.) in Mathematics and Computing	Friday, 19th March 2021	03:00 PM	On the Singular Value Decomposition (SVD) and pseudoinverse

● **Search & Nurture Programme:**

Indian National Mathematical Olympiad 2021(INMO-2021) examination organized by HBCSE (Homi Bhabha Centre for Science Education), TIFR, Mumbai have been conducted in IMA as centre of examination on 7th February 2021 from 12:00 Noon to 4:00 PM with Covid-19 precautionary measure guidelines.

Conduction of INMO Examination 2021 at the Institute of Mathematics and Applications on 7th February 2021

● **Post Graduate Merit Scholarships:**

For 2018-20 Academic Session

2nd Installment scholarships to the awardees fulfilled the requirements as per guideline have been disbursed to 167 out of 197 selected awardees during the year.

For 2019-21 Academic Session

1st Installment scholarships to the awardees fulfilled the requirements as per guideline have been disbursed to 55 out of 232 selected awardees during the year.

For 2020-22 Academic Session

Advertisement for inviting applications from Odisha State domicile students pursuing Post Graduate study in any of the following disciplines in Appendix-I to appear for the written test have been made by IMA.

❖ Physical Science

❖ Mathematical Science

❖ Chemical Science

❖ Biological Science

❖ Earth & Geological Science

❖ Computer Science

❖ Bio-informatics/Bio-technology

3.5 Pathani Samanta Planetarium (PSP), Bhubaneswar & Dr A P J Abdul Kalam Planetarium, Burla and Pathani Samanta Museum, Khandapada

● Pathani Samanta Planetarium is a premier institute of the state for popularization of science in general, Astronomy, Astro-Physics and Space Science in particular under the

administrative control of Science and Technology Department, Government of Odisha. It is named after the illustrious Astronomer of Odisha, "Mahamahopadhyaya Chandrasekhar Singha Harichandan Mahapatra Samanta", popularly known as Pathani Samanta (1835-1904). It was inaugurated to the public on 8th of January, 1990.

Since its inauguration, PSP has increased its activities manifold and it has established a scientific link throughout the state. Various programmes are being conducted throughout the year. About 1,60,000 (One Lac Sixty Thousand) visitors visit Planetarium every year since 2013 after digitization of the Planetarium during 2012. Due to Covid-19 pandemic Planetarium shows at Bhubaneswar and Burla were ceased from 13.03.2020 to 01.02.2021. Similarly, entry of visitors to Khandapara Museum was also ceased for above period. Shows at above two places and entry of visitors at Khandapada resumed with effect from 02.02.2021.

Pathani Samanta Planetarium (PSP), Bhubaneswar   *Dr APJ Abdul Kalam Planetarium, Burla*

❖ Visitor & Revenue Collection (Pathani Samanta Planetarium) from 02.02.2021 to 31.03.2021.

	PSP Show
Total no. of Shows	201
No. of Adult Visited	8173
No. of Child Visited	2842
Total no. of Visitors	11,015
Total Amount Collected (in Rs.)	**02,99,445.00**

❖ Visitor & Revenue Collection (Burla Planetarium) from 02.02.2021 to 31.03.21

	Burla Show
Total no. of Shows	96
No. of Adult Visited	1671
No. of Child Visited	1278
Total no. of Visitors Visited	2949
Total Amount Collected (in Rs.)	**75,690.00**

❖ No. of Visitors visited Pathani Samanta Museum, Khandapara during 02.02.21 to 31.03.21=2207

- **YATS Programme**.: Young Astronomer Talent Search (YATS) Programe is a very unique programme of the state under joint collaboration of P.S. Planetarium and TATA Steel Ltd. The programme has started from 2007. Students from 8th to 10th class from all over the state are selected through a three tier process. Students have to submit an essay pertaining to Astronomy, Astrophysics and Space Science (Topic is given every year) to the Planetarium authorities in first round. Selected students' essays are evaluated by panel of Experts district wise and from every district two students are selected for the final round. Around 60 selected participants from different districts meet in a State Level Exhibition on 12-13 December every year at Planetarium, Bhubaneswar. The best twenty budding Astronomers are felicitated by the Hon'ble Chief Minister of Odisha in a function on 13th December. The guide teachers are also felicitated. Subsequently, the students and guide teachers are taken to pioneer Space Organisation of the Country (Bengaluru or Ahamadabad) during 1st week of the succeeding year (month of May/June of every year) for an exposure visit free of cost. But, during 2020-21,due to Covid-19 pandemic, the observation of the Pathani Samanta Jayanti on 13th December-2020 was done on virtual mode only.

- **Lecture Series:** A lecture series on **'Virtual tour of Cosmos"** was conducted by PSP during 08.01.2021 to 17.01.2021 where eminent Directors, Engineers of different Planetaria, Science Centres and State Council participated on virtual mode in the eve of celebration of 31st annual day of PSP for awareness of student, teacher community and general public. Planetarium show was also conducted online during the said period.

## 3.6 Odisha Bigyan Academy (OBA), Bhubaneswar

The aims and objectives of Odisha Bigyan Academy (OBA) are to promote and popularize science amongst people of Odisha, based on informed knowledge emanating from various frontier fields of science & technology.

Achievements :

- **Publication of Magazines :** Odisha Bigyan Academy (OBA) is publishing monthly Odia Science magazine **'Bigyan Diganta'** and distributed to Govt. recognized High Schools of the State free of cost.


- ❖ Similarly an abridged version of **"Bigyan Diganta"** in Odia Braille script quarterly for visually disabled students and distributed to the visually disabled students through their institutions.

- ❖ Apart from this OBA is publishing a monthly science magazine **'Science Horizon'** in English and distributed to Navodaya Vidyalaya, Kendriya Vidyalaya of Odisha and +2 & +3 Colleges of the State free of cost every month.
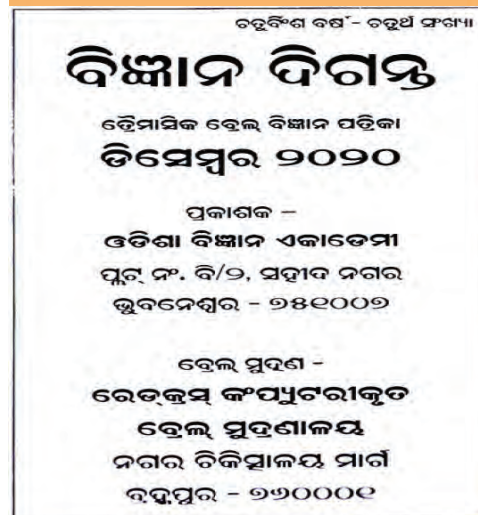
- This year OBA published five '**Manographs'** by reputed writers in various topic in Odia i.e. **Biswatapan O Jalabayu Paribartan, Black Hole, Nano Technology, Biotechnology & Artificial Intelligence** to develop scientific attitude in readers.
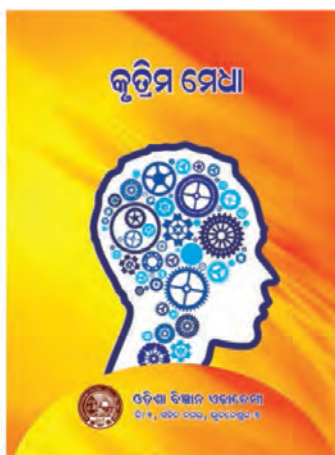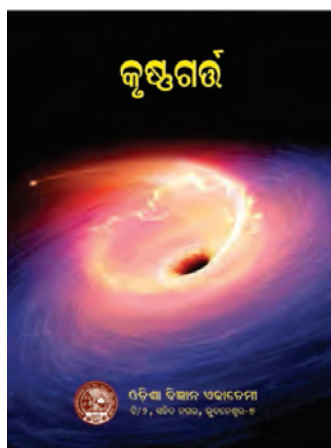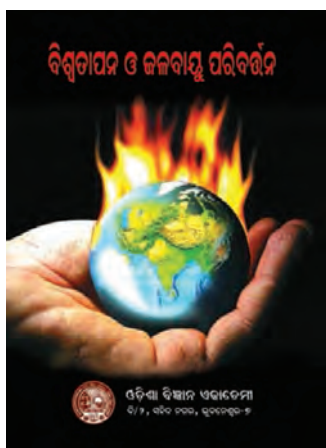
Felicitation and Presentation of Awards :

- OBA is presenting various awards i.e. **'Biju Patnaik Award for Scientific Excellence'**, **'Samanta Chandra Sekhar Award'**, **'Odisha Young Scientists Award'** and **'Pranakrushna Parija Popular Science Book Award'.**

- Apart from this '**Felicitation of Senior Scientists of Odisha'** is also being done by OBA.

- The Investiture Ceremony of different awards of Odisha Bigyan Academy for the year 2018 was organized at EDUSAT Studio, ORSAC Complex, Bhubaneswar on 20.10.2020 at 11.30 am through Video Conferencing. Hon'ble Minister, Science and Technology, Social Security & Empowerment of Persons with Disabilities, Public Enterprises, Sj. Ashok Chandra Panda graced the occasion as Chief Guest and felicitated the eminent Scientists of Odisha Prof. (Dr.) Shankar Prasad Pati and Prof. (Dr.) Sudarsan Nanda. He also presented the "Biju Patnaik Award for Scientific Excellence" to Prof. (Dr.) Subrat Kumar Acharya and also presented the "Samanta Chandra Sekhar Award" to Dr. Sanghamitra Pati, Prof. (Dr.) Pramila Kumari Misra, Prof. (Dr.) Sanjaya Kumar Dash and Dr. Swarup Kumar Parida. He also awarded Dr. Sandeep Kumar Panda, Dr. Sudhanwa Patra, Dr. Sankarsan Mohapatro and Dr.Kaushik Parida for "Odisha Young Scientists Award" and also presented the "Pranakrushna Parija Popular Science Book Award" to Dr. Rajballav Mohanty and Dr. Narendra Prasad Das in this occasion. Shri Santosh Kumar Sarangi, I.A.S., Principal Secretary to Govt, Science & Technology Department, Government of Odisha was the Guest of Honour. Prof. Pramod Chandra Mishra, President, Odisha Bigyan Academy presided over the function and Er. Bhagat Charan Mohanty, Secretary, Odisha Bigyan Academy offered the vote of thanks.

Award Investiture Ceremony 2018

Presentation of awards to the awardees – 2018

ପ୍ର. (ଡକ୍ଟର) ଶଙ୍କର ପ୍ରସାଦ ପତି

ପ୍ରଫେସର (ଡକ୍ଟର) ସୁଦର୍ଶନ ନନ୍ଦ

ପ୍ର.(ଡାକ୍ତର) ସୁବ୍ରତ କୁମାର ଆଚାର୍ଯ୍ୟ

ଡାକ୍ତର ସଂଗମିତ୍ରା ପତି

ପ୍ର. (ଡକ୍ଟର) ପ୍ରମିଳା କୁମାରୀ ମିଶ୍ର

ପ୍ର. (ଡକ୍ଟର) ସଂଜୟ କୁମାର ଦାଶ

ଡକ୍ଟର ସ୍ୱରୂପ କୁମାର ପରିଡ଼ା

ଡକ୍ଟର ସନ୍ଦୀପ କୁମାର ପଣ୍ଡା

ଡକ୍ଟର ସୁଧନ୍ୱା ପାତ୍ର

ଡକ୍ଟର ଶଙ୍କର୍ଷଣ ମହାପାତ୍ର

ଡକ୍ଟର କୌଶିକ ପରିଡ଼ାଙ୍କ
ତରଫରୁ ତାଙ୍କ ପିତାମାତା ପୁରସ୍କାର ଗ୍ରହଣ କରୁଛନ୍ତି

ଡକ୍ଟର ରାଜବଲ୍ଲଭ ମହାନ୍ତି

ଡକ୍ଟର ନରେନ୍ଦ୍ର ପ୍ରସାଦ ଦାସ

- The names of the Awardees for the year 2019 have been approved by the Government. The Award Investiture Ceremony for the said year will be held shortly.

Popular Science Programmes :

- OBA is also celebrating various science related important days like National Science Day, National Pollution Control Day etc., arranging Popular Science Talks etc. Due to extraordinary situation arising out of Pandemic COVID-19, this year Odisha Bigyan Academy organized 27 Nos. of **Online Lecture Programme** on different topics by the Scientists for the benefit of Science Teachers & Students of High Schools of the State.

Celebration of National Science Day-2021

Hon'ble Minister released March Issue of Bigyan Diganta on COVID-19

Hon'ble Minister released March Issue of Science Horizon on COVID-19

Principal Secretary, S&T, released Monographs 'Artificial Intelligence'

Hon'ble Minister felicitated to Dr. Ashit Kumar Swain, Superintendent Geologist, GSI, Bhubaneswar

Popular Science Lecture by Prof. Subrat Kumar Acharya, Pro-Chancellor, KIIT, Bhubaneswar

Popular Science Lecture by Dr. (Mrs.) Sanghamitra Pati, Director, ICMR-RMRC.