Space Application, Governance & Mass Inclusion

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Recent advances in Information and Communication Technologies (ICT) have fundamentally changed the way we work, communicate and live. Internet is one of the biggest innovations of the last century. ICT has also fundamentally changed the governance delivery systems. Leveraging ICT is to provide a Simple, Moral, Responsive and Transparent (SMART) governance system also known as e-Governance. ICT is a great enabler in the area of Governance by way the government services are delivered.

E-Governance vision as enunciated in the e-Governance Roadmap of Jharkhand is to build a citizen-centric, inclusive and development-oriented information society and provide services to common man in a cost-effective, transparent and easily accessible manner. Significant amount of work has already been put in to lay down the service delivery infrastructure by the state Department of Information Technology. State-Wide Area Network called JharNet is established; Common Service Centres known as Pragya Kendras in every Panchayat of the State has being established. These Pragya Kendras are computer kiosks connected to the Internet and JharNet. Jharkhand Space Applications Center uses this infrastructure to deliver Government to Citizen (G2C) services.

Jharkhand Space Applications Center (JSAC) was established in the year 2003. Space Technology based applications and solutions being adopted systematically in Government Departments. JSAC is set up to provide value-added services in various sectors and focusing on the following issues like e-governance, resources management, rural and urban development and education and health management, etc., in the state.

Computerisation of land records

The main objective of the project is to introduce the e-governance in the Department of Revenue and Land Reforms by linking public services related to land records and deliver online to the citizen at their doorsteps. The direct beneficiaries are the villagers / land owners and the Dept. of Revenue and Land Reforms. It also serves almost all the departments directly or indirectly associated with land for their planning and development. This will facilitate easy maintenance and updating of changes that occurs in Land Record Database. To provide fool proof system that may reduce menace of litigation and social conflicts associated with land disputes. To facilitate accurate documents of recording details such as collection of land revenue, cess, etc. and facilitate integration with other natural resource maps.

Computerisation of land records is a major initiative of Department of Information Technology, Govt. of Jharkhand for e-governance in the Department of Revenue and Land Reforms. Under this initiative JSAC has taken up computerisation of land records and digitisation of cadastral maps for entire state. This project involved digitisation of cadastral maps and georeference it with satellite data for geographical location and linking with Khatian details including land ownership details, sale, or transfer of land, land tax, property tax, etc.

The pilot study for Lohardaga district was completed wherein computerisation of Record of Rights (RoR) data contains Khatian and Register II and Village Cadastral/Revenue Maps. Stakeholders have been consulted at every stage for their inputs to make the outputs of this venture beneficial to its maximum level. The outcomes of this project is generation of digital copy of Records of Right (RoR) documents i.e. Khatian, Register II and Village Revenue Maps and made them available in the public domain (Internet) for universal accessibility for information retrieval, viewing and printing from the website. The same be seen at http://210.212.20.94/land .

It is fully automated and the information can be accessed by the Internet café, district and block offices and the Common Service Centres (Pragya Kendras)

The printed copies of Maps, and RoR document have already been verified by the concerned department (Dept. of Revenue and Land Reforms) and the printed RoR document has been distributed to each Raiyat or landholder which had two purposes: i) the record of property is made available to each Raiyat and ii) it offers chance for verification by themselves (Raiyats) also.

In addition, the intranet based software was developed for search and update the land records by the authorised officials at Anchal level and certified by the district officials (Figure 1). It also includes the mutation software and tax collection software. Further, this facility will also be used by other departments to integrate with

land related information such as issue certificates such as Caste, Income and Residential and agricultural loans, etc. The Internet based land records information VASUDHA enables universal access for the land holders and common citizens on the Internet. It is fully automated and the information can be accessed by the Internet café, district and block offices and the Common Service Centres (Pragya Kendras). The certificate issued through the Internet is true replica of the certificate issued by land records and is recognized by the government departments.

Through this khasra maps are linked to the land records. It has not only cut down the distance, time and expenses but drastically removed the administrative harassment in getting the land records by the people, primarily the villagers.

Natural Resource Information System

This State is enriched with natural resources that need to be conserved and utilised in a sustainable manner for all-round development of the state. The state comprises of the Chhotanagpur Plateau which is a hilly, undulating and characterised by predominantly tropical forests and tribal settlements. State of Jharkhand consists of 24 districts, 33 sub-divisions, 211 blocks and 32,620 villages. The total geographical area of the State is 79,70,000 hectares. Out of which 23,22,000 hectares (29.33%) are under forests; 566,000 hectares (7.12%) are barren lands; 724,000 hectares (9.10%) are put to non-agricultural use; 90,000 hectares (1.15%) are under pastures and other grazing lands; 307,000 hectares (3.86%) are cultivable waste lands; 88,000 hectares (1.11%) are under miscellaneous trees and groves; 12,04,000 hectares (15.14%) are current fallows; 845,000 hectares (10.63%) are under other fallows; and 17,95,000 hectares (22.58%) are the net sown area. These figures indicate that an area of 24,40,000 hectares (30.61%) is under agricultural wastelands that have to be beneficially utilised for rural development.

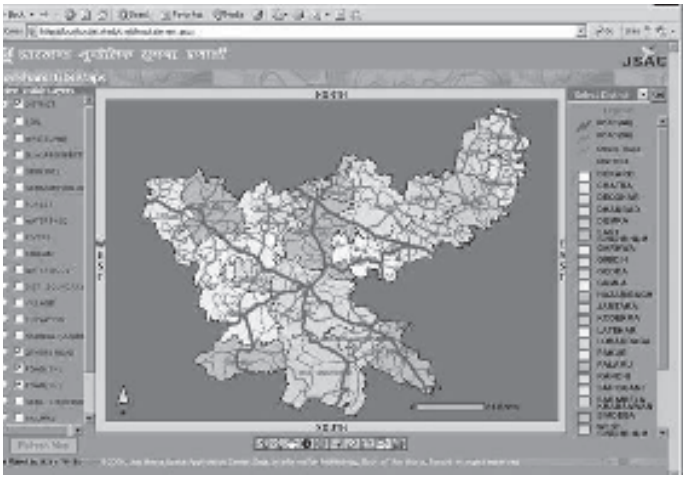
Land utilisation, rural and urban development plan needs to be evolved taking care off macro as well as micro-level development. The entire development plans need to be generated based on scientific and realistic information on natural resources such as agriculture, forestry, water resources and wastelands etc., infrastructure facilities and socio economic conditions. The resource maps such as Geology, Geomorphology, Forest, Soils, Ground Water Prospects, Transport Network, Water Resources, Administrative information, etc. in 1:250,000 scale are generated using remote sensing data and linked to GIS environment for its accuracy and consistency. The development of user friendly web enabled software on GeoJharkhand can be viewed at http://210.212.20.94/JSAC/state/jgis.

JSAC has developed web-based information system for GIS database created as consistent and standard databank for developmental activities of the state

The NRIS consists of a set of databases on natural resources generated for entire state. The purpose is to create all the thematic layers in a single standard format so that all the departments can use and access the same data and thereby bringing uniformity in database organisation and applications. The databases will be made available through Internet such that an integrated database in the framework of a spatial information system. NRIS is a customised application shells that allow the administrator to interact with the system and get information as and when needed. This calls for the development of generalised query shells as well as specific decision support shells running user defined models. These databases and shells can handle spatial data in the form of satellite imagery and maps derived from them and other sources.

JSAC has developed web-based information system for GIS database created as consistent and standard databank for developmental activities of the state. The information included at present are Geology, Geomorphology, Forest, Soils, Ground Water Prospects, Transport Network, Water Resources, Administrative information, etc. The link of NRIS data base is given in GeoJharkhand website at http://210.212.20.94/state/jgis.

Further plan under NRIS Initiatives: Under NRIS, JSAC is carrying out all the natural resources layers in 1:50000 scale using the latest Indian Remote Sensing Satellite's LISSIII or LISS IV data with 23m or 5.8m spatial resolution.



The unique feature of this project is based on geo spatial technology to provide quick decision support for overall development at different administrative levels from villages to anchal and district. The Internet based webGIS was developed for analysis of resource layers linked to house hold survey information

The land use land cover using LISS-IV data, the geomorphology, geology and other thematic maps related to Rajiv Gandhi Drinking Water Technology Mission, the soil and slope information using LISS IV data and the mapping of wasteland and degraded land at 1:50,000 scale using LISS III data is also being completed.

District Development Plan: Once the preparation of all the natural resources layers in 1:50,000 scale is completed, the decision support system for district development plan based on land and water resources development plan will be generated and hosted in the GIS server for its usage and updating at districts.

Village profile

The Census data from village to state level information related to demography, infrastructure, amenities, facilities, etc. are integrated with administrative maps in the GIS environment. The user friendly web enabled linkage of selected administrative boundaries with the corresponding census and query based information system on facilities was also developed and hosted in the Village profile website http://210.212.20.94/JSAC/cmcvp.

Rural Development Projects:

Drinking water information system: Maps such as geology, geomorphology, geological structures on lineaments and faults, ground water potentials, the land development plan and water resource development plan to improve ground water prepared under Rajiv Gandhi Drinking Water Technology Mission projects at 1:50,000 scale was re-digitised and integrated with administrative boundary up to villages and settlements and watershed wise up to micro watershed level was provided for Drinking Water and Sanitation Department, Govt. of Jharkhand for scientific and sustainable ground water exploration. Further, the well locations, surface water bodies, soils, slope and mines informations are digitized in GIS environment and made available in the website http://210.212.20.94/mines/.

Road Information System:

The webGIS was developed by digitising all the roads from national or state highway, district and other road with bridges along with village and settlements for road construction department. This website http://210.212.20.94/road/ is made available to the public through Internet.

eGram Swaraj: Egswaraj is a decision support system developed for Integrated Development of Rural Area with special reference to tribal population. Simdega district was taken up as a pilot project. Its main objectives are to create information related to natural and human resources, infrastructures and facilities. The unique feature of this project is based on geo spatial technology to provide quick decision support for overall development at different administrative levels from villages to anchal and district. The Internet based webGIS was developed for analysis of resource layers linked to house hold survey information. Refer http://210.212.20.94/egswaraj. Further, it is planned to develop both land resources and water resources development plan and other online public services to be hosted in the website.

EYGIPLAD (Empowering Youth through Geo-Informatics and Participation for Local Area Development):

Department of Science and Technology, Govt. of India, sponsored the project of Empowering Youth through Geo informatics and Participation for Local Area Development (EGIPLAD). JSAC has developed geo informatics based action plans for development of Hochar village in Ratu block and demonstrated the utility of the system to the villagers through training in association with Nehru Yuva Kendra Sangatan (NYKS). For details, please visit http://210.212.20.94/JSAC/egy.

Further plan in Watershed management: JSAC provides information on watershed to government and non government departments for watershed management planning in the state. On a pilot scale, need based strategic (watershed) planning using Remote Sensing and GIS project was taken up for Kokro-Rasa, Upper Subernarekha and Salda Watershed of Jharkhand state. The project is sponsored by Dept. of Science and Technology, Govt. of India. The objective of this project is to develop spatial and non-spatial database for watershed development and management. Customisation of web-enabled software for Spatial Decision Support System (SDSS) is being developed for watershed planning. For details, please visit http://210.212.20.94/angra/.

In the coming years JSAC aspires to act as a nodal centre in the development of GIS and Management information system (MIS) for state rural development department that will help characterising the watershed, watershed prioritisation, formulation of project proposal based on land and water resources development in the project and monitoring the progress of the projects sanctioned, etc.

Geo-database creation for Department of Mines & Geology

JSAC created the Geo-database of existing data and maps of Department of Mines and Geology including leased areas of important minerals.

Besides the data from the user department, all other available database, useful to user, has been converted into digital format in GIS environment. This web enabled will be useful in making the policy decision in sanctioning the leases of important minerals and their management.

Agriculture Information System

Jharkhand Space Applications Center, Department of Information Technology, Govt. of Jharkhand has initiated the Jharkhand Agricultural Information System (JAIS) Project in association with i) National Remote Sensing Center, Department of Space, Govt. of India which provides near real time transmission of satellite data through ftp without any additional cost. Further it also provided cloud cover satellite data at concessional rate. ii) Department of Agriculture, Government of Jharkhand and iii) Birsa Agricultural University, Ranchi provides ground support on crop and seasonal conditions information.

Though, the National level agricultural drought assessment and monitoring system established at Decision Support Center of National Remote Sensing Center provides district level monitoring for entire country and sub district level monitoring for few states, Jharkhand is the first state in India took initiative of State level monitoring crop condition with 56 m AWiFS data on its own to provide real time information to administrators, planners, managers and researchers related to agriculture and disaster management at village level.

JSAC acquires the satellite data in near real time from National Remote Sensing Centre (NRSC) through FTP (file transfer protocol) and analyse the satellite data in terms of crop and moisture conditions in each month from May to October. The crop progress in each month is provided by comparing the crop and moisture conditions of current month with previous month during the crop growth period of May to October. The month wise relative crop condition assessment is provided by comparing the month wise crop and moisture conditions of current year with the corresponding month of normal agricultural year. All these layers with the spatial resolution of 56m by 56m of Jharkhand is monitored and hosted regularly in the webGIS with other administrative layers up to villages.

In addition, the reports are also being hosted regularly in the web site www.jharkhand.gov.in and http://210.212.20.94/jais_gis. This Internet based Jharkhand agriculture information system provides information related to progress of sowings and their spatial extent during June, July and August. Expected crop production based on crop condition information observed during the season by September and October. This satellite based crop condition information will be improved by incorporating automatic weather station based weather data for providing early warning and farmer's advisory services in the coming years.

School Information System:

Digitisation of government schools in GIS platform is hosted in the intranet of JharNet http://172.16.20.251:8080/jharkhand_jepc with the development of web enabled query based software. This work was initiated for Jharkhand Education Production Council, Government of Jharkhand. This will be helpful to the managers and administrators in monitoring, managing and improving the status of schools. The main objective of the project was the conversion of tabular data of schools in to GIS maps and attachment of detail attribute data collected by District Information System of Education (DISE) under Sarva Siksha Abhiyan (SSA) and School Sanitation & Hygiene Education (SSHE) programme. The location of schools are identified in revenue village (source: map of census of India) and settlement layers (source: SOI toposheet) of GIS. The intranet GIS enabled software for map display and query. The query cells enable the user to know the details of any school on a mouse click. The present queries incorporated are schools having toilet, drinking water facility, pucca/kachcha building etc. It is planned to link the outline map and photographs of school building. On a mouse click, maps and photographs of the schools, and the details of the school will be available for the user which shows the actual scenario of the schools. The facility of updating and maintenance of the web site is also planned for improving the digital content.

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Conclusion

The state has vast natural resources and need effective resource management for the development of the state. The various initiatives of JSAC through Internet and intranet delivery of resource information and the digital content helps significantly for the overall development of resource management in the state. It further helps in assessing the resources, aid planning and implementation of development projects, monitoring the progress of the project and assessing the impact of the project using the geoinformatics.

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