



National eGovernance division

Workshop Report

on Use of GIS in Informed Planning & Decision Making



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1. Introduction

Digital India programme is a flagship programme of Government of India with a vision to transform India into a digitally empowered society and knowledge economy. Its vision areas are centred on 'Digital Infrastructure as a Utility to Every Citizen', 'Governance & Services on Demand' and 'Digital Empowerment of Citizens'. GIS is a technology to geo-enable e-Governance (Pillar 4), to undertake efficient planning & decision making as part of 'e-Kranti – Electronic delivery of services' and 'Information for All' (Pillar 5) and to facilitate location based 'Information for All' (Pillar 6).

Geo-informatics is integral to Planning, Decision Making & Electronic Delivery of Services. It geo-enables e-Governance to facilitate location based information for all. Thus, implementation of GIS based Decision Support Systems (DSS) is essential for ushering 'Good Governance' as it facilitates transparency, responsiveness, efficiency & effectiveness, accountability and participation across Government.

In the earlier workshop held on 20th February 2015, a need to create a common GIS platform with a defined governance structure, clear cut responsibilities of different agencies in terms of data sharing & access, data standardization etc. was envisaged.

Accordingly, the National Centre of Geo-informatics (NCoG) was constituted and launched by Hon'ble MoCIT during the Good Governance Week celebrations in December, 2015. The vision behind NCoG is to be one of its kind 'GIS platform' for Sharing & Collaborating GIS data source, location based analytics and 'Decision Support System' serving to Central / State government departments, businesses as well as provide hosts of citizen services.

Thus, NCoG along with its knowledge partner Bhaskaracharya Institute for Space Applications and Geo-Informatics (BiSAG) and Capacity Building team of NeGD initiated this thematic consultation workshop regarding use of & Space Technologies in e-Governance. The workshop aimed to bring the States and Departments together for implementing GIS based system for easy, effective and good governance. The workshop was organized by Centre for Innovations in Public Systems (CIPS), Hyderabad.

Shri D. Chakrapani, IAS (Retd.), Director of Center for Innovations in Public Systems, Director General to APHRDI and Ex-Officio Secretary to Government of Andhra Pradesh, Department of General Administration, extended a warm welcome to all the participants and the speakers for the workshop. To set the background, he brought into light the work CIPS is doing with NeGD and DeitY in terms of projects.



One of them is a study of Common Service Centers in seven States which has already been completed. As a part of this project, CIPS has successfully completed 30 Intensive Training/Sensitization Workshops in 22 States and Union Territories across the country. CIPS is in fore front in conducting number of programmes and implementing many initiatives. One of the major

programmes that has been taken forward is 'Establishment & Institutionalization of Vision Centers in Common Service Centres' which are now being taken up by the States like Telangana, Jharkhand, Andhra Pradesh. 15 vision centers have already been established in Common Service Centers (CSCs) in the State of Jharkhand in association with Aravind Eye Care of Madurai, Tamil Nadu. Shri. Chakrapani expressed his gratitude for identifying CIPS as its training partner by Department of Electronics & Telecommunications for awarding with the Mission Mode Project. He stressed upon the importance of GIS technology in order to bring uniformity, compatibility and to smoothen the functioning of various departments like agriculture and revenue etc. in all the States of the country. To conclude, he wished that the workshop would be interactive and would be able to plan out the institutionalization of GIS in different parts of the country.

2. Details of workshop

The consultation Workshop on "Use of GIS in Informed Planning & Decision Making" was held on the 29 -30th of March, 2016 at India Habitat Centre, New Delhi.

3. Objectives

The objective of the workshop was to share the details of GIS platform developed by NCoG and understand the requirements of the participants on GIS based DSS:

- i. National GIS platform- capabilities and usage
- ii. Multi-purpose 2D/3D/4D, standardized, authenticated, common field level (ownership level) Geo-spatial databases
- iii. NSDI and GIS Data Standards & Policies
- iv. Integration, Analysis, Management of Spatial Data. Applications of GIS in Projects.
- v. Syntactic and semantic approach for Geo Information Management
- vi. Use of Remote Sensing and Geo Spatial Technology for Planning and Development
- vii. Showcase various innovative/best practices on use of GIS technologies in various Sectors/States and assess the replicability in different States to enhance the service delivery system

The workshop aimed to on-board Central Ministries / Departments, State Departments, State NIC officials, Agencies and NeGD representatives, for chalking out the way forward to implement the National GIS portal. The workshop also aimed to assess the role of NCoG in assisting the State Governments.

4. Participant's details

The workshop brought together over 176 officials from the Centre and 34 States / UTs, academicians, NIC officials and State e-Mission Team together.

Smt. Caralyn K Deshmukh, IAS, COO, NeGD, welcomed the participants to this 2 day thematic workshop. Smt. S Radha Chauhan, IAS, P&CEO, NeGD delivered the inaugural address and set the background of workshop. Dr Ajay Kumar, IAS, Additional Secretary,

DeitY, GOI delivered the key note address and highlighted the requirements & vision of GIS based DSS.

Senior level Officers from the following Govt. Departments both at the Central level and State level attended the workshop:

- Revenue
- Urban Development
- Rural Development
- Panchayati Raj
- Mines & Minerals
- Human Resource Development / Education
- Disaster Management
- Agriculture
- Research and Planning
- Space Application Centres
- Remote Sensing
- Earth Resources & Image Processing
- Fisheries
- Forest & Wildlife
- Horticulture
- Health
- Department of Regional Planning
- Environmental Affairs
- Natural Resources & Forestry
- Police
- Water Resources

Also, representatives from Office Surveyor General of India, Indian Institute of Space Science and Technology (IISST), Dept. of Space, National Informatics Centre (NIC), IIT Bombay, IIT Trivandrum, National Institute of Technology Hamirpur (HP), SCERT Nagaland, Smart Pro Facilities Delhi, and over 27 State eMission Team members from 24 States participated in the workshop.

The detailed list of participants shall be provided by CIPS later. The same may be attached as [Annexure A](#).

5. Workshop Agenda

The workshop agenda is attached as [Annexure B](#).

6. Session wise summary for Day 1 & Day 2

Day 1, Session 1: Digital India- GIS based Governance by Shri T. P. Singh - Director, BiSAG and Advisor – DeitY

The first session focused on the following topics:

- Realization of Digital India through GIS based governance



- Institutionalization of GIS Applications to enhance acceptability, adoptability, affordability, and availability
- Recommended characteristics of geo-spatial databases

- Methodology of village map geo-referencing using satellite images, and database creation
- GIS application areas - land use planning and development, soil card preparation, archaeology sector, agriculture, river linking, water harvesting, education, selection of industrial site, water supply network, flood visualization, mapping of toxic threat zones etc.

Day 1, Session 2: National Spatial Data Infrastructure (NSDI) and GIS Data Standards & Policies by Dr P S Acharya, CEO NSDI, Department of Science & Technology, Govt. of India

Dr. PS Acharya communicated the aim of NSDI i.e. to provide standardized means of sharing geographic data among all users. This leads to significant efforts and cost savings during data collection and use. He told about the policies and important decisions which helped in the sharing of data and among institutions and databases. He also informed about the meta data standards for geo-spatial information and standard services. The session ended with the review of NSDI technical architecture with National Data Repository (NDR) which interfaces with data.gov.in.

Day 1, Session 3: Using technology to increase Government capacity and capability in Planning, Evaluation, Monitoring and Implementation by Shri Vishnu Chandra, DDG - National Informatics Center (NIC), DeitY, Govt. of India

Shri Vishnu Chandra gave details of major eGovernance initiatives undertaken by NIC. He elaborated on Multi-Layer GIS systems and applications, like NICMAPs and Bharatmaps. Further, he provided details on the use of GIS as an important lever to accelerate growth and increase focus in the domains like eGovernance, education, environment, natural resources, utilities and business. The NIC Bharat maps is the seamless integration of data from Survey of India, imagery from Department of Science and data provided by user departments which has led to the creation of over 23 layers of NICMAPs accessible to the user Departments over cloud.



Further, he talked about BHARATMAPS which is a Multi Layered GIS platform/ web service comprising of seamless country wide base maps, satellite images and hybrid Maps aligned as per the global geo-spatial standards and is an essential component of Digital India for electronics delivery of services for planning and good Governance. He later discussed about the applications of Bharatmaps for Agriculture via AGMARKNET, National Agriculture Market Atlas (NAMA), Mapping of rural Post Offices, GIS based emergency planning & response system for major hazardous industries, Panchayat profiler, Banking infrastructure mapping, analytics through gap analysis, telecom

infrastructure mapping, GIS Dashboards, utility map services and various land use applications developed for MoUD and State Governments.

Day 1, Session 4: Syntactic and semantic approach for Geo Information Management by Dr. Surya S. Durbha, Asst. Professor, Centre of Studies in Resources Engineering, Indian Institute of Technology, Bombay



Dr. Durbha elaborated standards based geospatial approach. He also described the semantic approaches required for integrating the geo-information. He emphasised that GIS helps in answering: What is at a given location? Where does it occur?, What is the best way?, What has changed?, What is the pattern? and Modelling - What happens if ?. He discussed the requirements of interoperability in geo-spatial data. He communicated about the Open Geospatial Consortium (OGC), which has developed standards for geospatial web-services in order to

integrate Geospatial data from heterogeneous data sources. He further touched upon the working of web services, SOA, XML, Representational State Transfer (REST), GET/POST operations and OGC web-services.

Dr. Durbha elaborated on Web-Vision for sensors. Sensors are playing an increasingly prominent role in monitoring forest fires, floods, predictions, water quality monitoring etc. Semantics for GIS data, ontologies for enhanced GI discovery, intelligent geospatial query, semantic heterogeneities, semantic conflicts and related classification mechanisms were also discussed.

Day 1, Session 5: Remote Sensing and Geo Spatial Technology for Planning and Development by Dr. Nagaraja Ravoori, Proj. Director (SIS-DP), Chief General Manager (RCs), National Remote Sensing Centre (NRSC), ISRO, Department of Space, GOI



Dr. Nagaraja Ravoori briefed about the functions of the National Remote Sensing Center (NRSC), operational and future EO missions which provide satellite images, history of data reception at NRSC, IRS stations at the national and international level, Space Based Information Support for Decentralized Planning (SIS-DP) for panchayats and other planning needs, data archival, collection of data through crowd sourcing and modalities for gaining access to over 1025 TB of data with NRSC.

Day 1, Session 6: Demo of National Platform on GIS, Govt. Land Information System, GIS Based DSS for REC, GIS Based DSS for Mining by NCoG GIS Team (Shri Sachin Agarwal, Shri Tushar Rai, Smt. Reshma Agarwal, GIS Consultants, DeitY, Govt. of India)



Demo of the applications namely- Application for Mining Department, Government Land Information System and Rural Electrification Corporation of India, were given by the NCoG GIS team. The live demo of the applications was given. The mapping of forest, allotments, linkages with RoR, mapping methodology, and resulting decision support system were discussed in detail.

Day 1, Session 7: Consultation and Discussion Session attended by Dr. Nagaraja Ravoori, Proj. Director (SIS-DP), Chief General Manager (RCs), National Remote Sensing Centre (NRSC), ISRO, Department of Space, GOI, Shri Vinay Thakur, Director (Projects), NeGD, DeitY, Dr. Surya S. Durbha, Asst. Professor, IIT-B



The consultation and discussion session was an interactive among the participants and the panellists. The participants enquired about the roadmap for implementing GIS platforms for usage by the State / Departments.

Day 2, Session 1: Vision of NCoG, and coordination with States by Shri T. P. Singh ,Director-BiSAG, Advisor – DeitY & Shri Vinay Thakur, Director, NeGD, DeitY, Govt. of India

NeGD made presentation about the institutionalization of NCoG, its vision and responsibilities. The participants enquired about the GIS platforms which can be used for building the applications. During the workshop a lot of good work done in GIS by various Departments, States / UTs, was showcased. Although a lot of work has been done in GIS, the GIS data is available in isolated islands. Thus, the same needs to be integrated into the National GIS portal which is being developed by NCoG.

Day 2, Session 2: The Institutional Strengthening of Gram Panchayat (ISGP) Project, West Bengal by Shri Koustav Basu, IT-Consultant, ISGP Project, Panchayats & Rural Development Dept., WB

Shri Koustav Basu, demonstrated the GIS Based Integrated Planning and Monitoring System for the PRIs in West Bengal. He showcased the used of the application in maintaining the application profile, the corresponding mobile application, planning of works at the village, asset mapping, spatial planning and monitoring of physical progress of works at Gram Panchayats along with photographs, which can operate on limited bandwidths. He also displayed the dashboard which can be viewed by the citizens.He detailed future plans of implementing the ISGP project across the state. Participants from other states expressed their desire to use the application in their states as well. Shri Basu, assured that he can forward the written request for the same to competent authority for their consideration and approval.

Day 2, Session 3: Mobile based application for cadastral mapping by Shri Sunish Kumar, Sr System Analyst, NIC

Shri Sunish Kumar introduced the audience to Bhunaksha cadastral mapping software, developed by NIC,using Open source applications and libraries to facilitate management of digitized cadastral maps. He described the various features of the software like its availability as Web, Desktop and Mobile application, facility of dividing and merging plot maps, ability to take input from multiple sources like Shape file, ArcInfo files, Survey Data, FMB Ladder Data and support of Geo-Referencing legacy maps. Shri Sunish Kumar also described the architecture of Bhunaksha and its linkage to the record of rights (RoR).

Day 2, Session 4: GIS based System for Rural Road Development in Madhya Pradesh by Shri Vivek Chitale, Senior Technical Director, NIC, MP



Shri Vivek Chitale gave a presentation and demo on eMarg, the GIS based system for rural road development using which the planning,

construction of roads, monitoring of construction works, grievance resolution and payment to vendors is done in Madhya Pradesh under Pradhan Mantri Gram Sadak Yojna.

Day 2, Session 5: 5 minute presentation by SeMT resources regarding the current state of GIS implementation in their State/UT

The SeMT GIS representatives of States/UTs delivered presentation on various GIS based Decision Support Systems (DSS) implemented in their States/ UTs:

- Andhra Pradesh-various GIS based DSS have been implemented to map vacant plots and infrastructure for use by prospective entrepreneurs while enhancing the ease of doing business, mapping of houses allotted under NTR scheme, GIS mapping of all existing resources & assets (roads, schools, hospitals, sanitation, drainage etc.) at village / panchayat level, effective management of natural resources in planning, implementation and monitoring of developmental activities using Bhuvan, soil resources mapping, mapping of Primary Health Centres, Anganwadi's and Hospitals and mapping of the Government Lands and allotments for effective monitoring and decision making etc.
Further the Govt. of Andhra Pradesh plans to use GIS for mapping all public /private properties, planning Government Schemes, tracking of works (PDS Rice Tracking) and enable effective governance by using GIS based DSS in all Govt. Departments.
- Arunachal Pradesh- various GIS based DSS have been implemented to map Urban area under National Urban Information System (NUIS), for predicting natural disaster with respect to earthquake, flood & landslides, mapping of snow cover, glacial mapping, spatial assessment of soil carbon pool, ground water prospect mapping for drinking, sericulture development, geo-morphological and lineament mapping, plantation of agro-horticulture and medicinal plants, mapping & monitoring of shifting cultivation areas for sustainable development and land desertification mapping.
State Remote Sensing Application Centre, Itanagar (SRSAC) is the nodal department for all GIS related works in the State. The State plans to take up further development of GIS applications for delivery of services through web and mobile.
- Assam-has developed various GIS based applications for Seismic micro-zonation of Guwahati region, Election Department, bamboo coverage mapping, geospatial infrastructure development and creation of rural geospatial database for Dimoria CD Block, Kamrup District wherein schools, PHCs, houses under Indira Awas Yojna and other MNREGS works have been mapped. AMTRON is leading in GIS consultancy in Assam, which is working in coordination with various Govt. Departments.
Further the Govt. of Assam endeavours to map complete natural resources of the state, create DEM(Digital Elevation Model) of sub-meter accuracy for the state, create DTM(Digital Terrain Model) for the state, develop location based solutions for state line departments and construct a 3D map of urban areas.
- Dadar & Nagar Haveli-has developed a common Geo-database for all Department of U.T and prepared various thematic maps for departments in the fields of

administration, education, health, electricity, roads, water supply, municipal sewerage network, wells, religious buildings, public buildings, police stations, industry locations, parks, open spaces and water bodies.

The Govt. plans to conduct training on GIS including Remote Sensing and Database Management System to the selected officers of various Departments for the usage, edit and update of GIS Data.

- Gujarat- communicated regarding the various GIS applications developed in the areas of agriculture, horticulture, animal husbandry primary, higher and technical education power & petroleum civil supplies, environment & ecology, statistics, economics, electoral reforms, crime investigation, forensic sciences, rural healthcare, industrial development, rural industries, tourism geology and mining, ports, roads and transports, rural development, watershed management, water storage & distribution, water sanitation and management, land records, disaster management, science & technology infrastructure, sports and cultural events and activities.
In Gujarat, most of the Departments have developed GIS based applications with the help of BiSAG covering high-priority areas. Still there is a good scope for use of GIS in many more application areas for better Decision Support and Future Planning.
- Jharkhand-GIS based DSS have been developed in the fields of forests, land & revenue, agriculture, health facilities, rural development and electoral booth mapping by NIC. The upcoming GIS projects in Jharkhand are flash flood monitoring system in urban area, web-enabled GIS for irrigation projects, mapping of power transmission line in seven cities – Bokaro, Deoghar, Dhanbad, Dumka, Hazaribag, Jamshedpur & Ranchi, mapping of area under horticulture crop, identification of sites suitable for plantation and mapping of sewerage/drainage network at seven cities of Jharkhand.
Shri Sarvesh Singhal, IFS, Director, Jharkhand Space Applications Centre(JSAC) also gave a presentation describing the works done by JSAC in the field of GIS.
- Kerala-The GIS SPoC from SeMT Kerala communicated that GIS based applications in the fields of forests, agriculture, health, mining, planning and development, public works, soil, transportation and water resources have been made by Kerala State Spatial Data Infrastructure (KSDI), which is coordinating with 24 Departments to prepare the geo-processing framework with over 100 layers. The State is now building a common geo spatial data information system for all its Departments.
- Madhya Pradesh-has implemented various GIS based DSS in the field of rural road management, land acquisition planning, land bank visualization, infrastructure planning, health infrastructure mapping, CSC mapping, forest extent mapping and fire management, Aanganwadi mapping etc.
GIS applications for education, watershed management / planning, Dial 100 – homeland security, property registration, accident response system, pilot on electoral mapping & ward delimitation are being implemented by Department of Science and Technology (DoS&T) in the State.

A Nodal Agency, MPSSDI under SSDI is being institutionalized for integrating GIS data of all Departments. Departments have nominated Nodal Officers for GIS related works.

- Meghalaya- has implemented GIS based DSS for mapping infrastructure, drainage, watershed, forest, villages, health indicators, health centers, soil mapping and rice mission etc.
Meghalaya Information Technology Society (MITs) is the nodal agency for all GIS related initiatives across Departments. Meghalaya plans to set a centralized Web based GIS system with metadata search functionality on cloud.
- Nagaland- The GIS cell is functioning directly under the State Department of Planning & Coordination. Various GIS applications in the fields of health, roads, vehicle tracking, geomorphology and lineament mapping, Unmanned Aerial Vehicles (UAV), 3D Terrain Model Milling Laboratory, Digital Elevation Model (DEM) have been taken up by the Department.
- Punjab- has made use of GIS based applications in the field of urban planning, pollution control, municipality, mandi, agro-ecosystems, crop modelling, geology, water resources, soil resource mapping, forestry, land use, CSC mapping etc. PRSC is the nodal agency for GIS works in Punjab. NIC has proposed consolidation of all the available applications within 16 modules planned under the state GIS application for which the data collection is in progress and would be hosted very soon.
- Rajasthan-has implemented GIS based applications in the fields of education, health, land bank management, citizen application, infrastructure mapping under tribal area development, ground water mapping etc. An enterprise platform has been developed to enable line departments to update thematic maps and data in a centralized manner on a regular basis.
The Rajasthan Govt. plans to integrate spatial data with legacy applications through web services, design tools and templates for undertaking advanced analytics in the fields of change detection, what-if analysis, proximity analysis, buffer analysis, clip, point distance and implement GPS based vehicle tracking system in near future.
- Tamil Nadu-has developed GIS based DSS for health, transport, water resources, watersheds, forest, physical resources road networks, municipalities, land use planning, education, utilities and property tax collection. Open source software has been used for website preparation and dissemination activities.
The Tamil Nadu Geo-Informatics System (TNGIS) has taken up consolidation of about 80 layers from various Departments at appropriate scales, segregation of layers for public domain and closed domain including authentication mechanism, and their appropriate integration. TNGIS is based on GeoFOSS based SDI Software Architecture based on open source and OGC compliant geospatial web services. The State Govt. plans to scale up TNGIS further while developing capacity to support the same.
- Telangana- has prepared GIS based applications for Panchayati Raj, Planning Department, Irrigation Department, CCLA, TSIC, Disaster Management, Agriculture

and Ground Water Management Departments. These applications are yet to be integrated suitably. The State govt. hastaken up development of smart city monitoring system for city planning, building approvals using satellite maps, on-field tracking of works, implementation of schemes and GIS based planning for government schemes, eg. water grid, fibre grid etc. and asset mapping for effective decentralized planning.

- Tripura- As per guidelines from ISRO, the Govt. of Tripura established Tripura Space Application Centre (TSAC) for all Remote Sensing (RS), GIS and Geo-Spatial Information Technology (GIT) related activities in the state in 2006. The executive Committee of Tripura State Council for Science & Technology under the chairmanship of Hon'ble CM coordinates for GIS related work among its Departments.
TSAC has been instrumental for resource mapping, land suitability study for pineapple cultivation, dam site (Merucharra) suitability study, environment & forestry area mapping, planning for set up of water bodies, Natural Resources Information System (NRIS), Urban Resources Information System (URIS), land use identification, land cover mapping, land degradation mapping, study of conservation and protection of lakes, disaster management, utility, training and publications. TSAC has developed the Technology Capacity at various levels of administration for enabling the adoption of GIS for integrated development and planning.
- Uttar Pradesh-Individual Departments like PWD, Social Welfare, and Electoral Reforms have put efforts on different layer generation time to time. In 2009 web based, multi layered GIS framework called 'SRISHTI' was launched by NIC-UP to integrate all spatial and non-spatial data from its departments using open source softwares. SRISHTI is envisaged to include cadastral mapping, roads, amenities, water index, railways, canals, drainage etc.
- West Bengal-Some of the important GIS based DSS are Natural Resources Data Management System (NRDMS) for land and water management, groundwater management, West Bengal State Spatial Data Infrastructure (WBSSDI) which is a web based Geo-spatial Data Directory for the State to allow Departments to share and explore information for GIS based planning and decision making. The State Spatial Data Infrastructure (SSDI) project intends to develop an operational scale Geo-portal, which will also integrate other GIS apps and infrastructure such as NRDMS Data Centers as well as District and Block nodes of SSDI. The State is planning to integrate of GIS data from various sources like NSDI, Bhuvan, Google and other private sources, explore mobile device compatibility, integrate analytics feature for both spatial and non-spatial data and allow online editing and access of GIS data by authorized users/ Departments

Day 2, Session 6: Living with Modelling, Simulation and GIS by Dr. K C Gouda, CSIR Centre for Mathematical and Computer Simulation (C-MMACS), Bangalore

Dr. Gouda, presented the applications for modelling and simulation in GIS. He demonstrated case studies like comparison of rainfall maps between forecast and observation, monsoon

grid, monitoring global lightning, pollution cloud over India, shoreline change prediction model for coastal zone management off Mangalore coast, pollution monitoring over Bangalore using satellite data through analysis using spatial interpolation technique of ground data collected using sensors, climate change and agricultural sustainability study using remote sensing and GIS and drawing of frequency maps of chikungunya, malaria and dengue.

Day 2, Session 7: Web Map Services, Data and Metadata by Shri. Rajendra, Space Applications Centre (SAC),ISRO

Shri Rajendra presented the future of web-apps based on open source web technologies, interoperability, web personalization, web mining, semantic web and intelligent agents. He demonstrated the National Natural Resource Management System (NNRMS) which supports spatial query, OGC compliant web services and meta-data as per NSDI.

7. Expectations/ Support Requirements from NCoG, NeGD, DeitY

The workshop led to discussion among participants about the expectations from DeitY, for successful and nation-wide usage of GIS. Some of the key expectations are:

- Provide opportunities to work on projects based on latest equipment, satellite data, technologies and techniques in the Geospatial domain.
- Explore cases wherein the capabilities of Geo-informatics, GPS and sensors can be integrated to develop next generation applications.
- Request the State Govts. to form a State Level GIS committee
- Request the State GIS Nodal agency to obtain contact detail of GIS Nodal Officer in each State department who shall be responsible for GIS implementation.
- Conduct State Level Workshops to increase involvement of State Departments and capacity building.
- Provide access to GIS based DSS as per authorization
- Circulate GIS related standards among all State and Departments.
- Conduct proof of concept studies to explore applications of GIS in decision support systems.
- Provide support in order to develop or enhance GIS based application
- Provide financial support for effective implementation of GIS and allied activities.
- Consolidate and distribute best practices to be adopted for set up and enhancement of integrated, standardised GIS frameworks using open source technologies and web services
- Explore the usage of mobile in GIS applications
- Provide manpower support and infrastructure (software, hardware, connectivity) upgrade to support GIS application development
- Provide guidelines for usage and development of open source GIS tools
- Facilitate sharing of already available datalike LULC, Forest Cover etc. to all the States / UTs.
- Facilitate coordination between National & State level agencies to minimize effort duplication in application development, geographic database development and thus achieving direct cost benefits

- Involve States / UTs in projects of national importance.
- Support replication, adoption and customization of national level GIS applications and convergence with State initiatives like SSDI

Institutes like CSIR expressed interest in working collaboratively on projects in order to strengthen the research capabilities.

8. Way forward in panel discussion

The workshop was concluded by a panel discussion with NCoG team members. NeGD acknowledged the GIS work done by various Departments, States / UTs. It was requested that the States/UTs to upload their data into the National GIS portal which is being developed by NCoG. The following actions may be proposed:



- SeMT Nodal Officer for GIS along with Secretary, IT level may take stock of GIS applications and database created in the States. Small team can also be formed by Secretary, IT for carrying out this work in time bound manner.

- States / UTs may send GIS requirements to NCoG, who shall assist in on-boarding on the national platform. After customization of the required application the same shall be handed over to the respective State / UT Govt. for maintenance.

The salient points are as below:

- Separate link can be provided for User Depts/State. with their logo
- Data ownership to remain with User Depts/States.
- Application may be hosted to GI Cloud with necessary security mechanism
- Access – Authenticated & Role based
- Customization of parameters/ features as per User Dept. needs
- Usage of open source technology
- Communication with National GIS portal through web-services
- State / UTs may upload their GIS data on the National GIS portal and use the consolidated NCoG database for building required applications.
- Assistance shall be provided to set up the methodologies for data porting and data update on cloud.
- Workshops at the State / Regional level shall be held on a first come first serve basis, wherein it is proposed that either geo-referencing and mosaicking of 10 adjoining villages may be taken up during the hand-on workshop or any other case as proposed by the State / UT
- Requests by State Govt. for server space may be met using the NIC Meghraj Cloud.
- Proof of Concept (POC) studies specific to requirements of State Departments can be conducted by NCoG.
- Assistance for design and development of framework for Integration of existing application / GIS databases/ SSDI with national GIS platform shall be provided.

9. Feedback of participants

Annexure – C

Annexure A

List of Participants on Day 1

Sl. No.	Name	Designation/ Department	State	Mobile	eMail
1	Shri Mohammed Tahir	Assistant Director of Fisheries	Andaman & Nicobar	9476067280	
2	Shri S C Dey	Assistant Director of Fisheries	Andaman & Nicobar	9434285198	
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5	Mr. Abul Hasim	Senior Consultant Technology Management, SeMT	Arunachal Pradesh	9707096264	abul.hasim@semt.gov.in
6	Mr. Sazidur Rahman	Engineering Consultant (Flood Mitigation), Assam State Disaster Management Authority	Assam	9401953780	1985sazid@gmail.com
7	Mr. Debasish Baruah	Technical Assistant (GIS), Assam State Disaster Management Authority	Assam	9854374124	debz.baruah2@gmail.com
8	Mr. Dheeraj Gaur	SeMT	Assam	7086015255	dheeraj.gaur@semt.gov.in
9	Mr. A.M. Goswami, AFS	Working Plan Officer, LAC	Assam		
10	Ms. Davinder Suman, IFS	Deputy Conservator of Forests (Dev.)	Assam		
11	Mr. P.K. Hazarika, IFS	Conservator of Forests (Dev.)	Assam		
12	Mr. Abhishek Arun	SeMT	Bihar	7070999388	abhishek.arun@bihar.gov.in
13	Mr. Inderpal Singh	SeMT	Chandigarh	7508783259	inderpal.singh@semt.gov.in

Sl. No.	Name	Designation/ Department	State	Mobile	eMail
	gh				
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Annexure B



Consultation Workshop on
"Use of GIS in Informed Planning & Decision Making"
 29-30 March, India Habitat Centre, New Delhi

29th March, 2016

Day – 1

Tuesday

Time (Hours)	Topics	Speakers
9.30 – 10.15	Registration	
10.15 - 10.20	Background of the workshop	Shri D. Chakrapani, IAS (Retd.), Director, CIPS and DG, HRD Institute AP
10.20 - 11.15	Digital India- GIS based Governance	Shri T. P. Singh - Director, BiSAG and Advisor – Deity
11.15 - 11.45	Inaugural Session	<ul style="list-style-type: none"> • Welcome Address - Smt. Caralyn K Deshmukh, IAS, COO, NeGD, • Inaugural address and Setting the context of workshop - Smt. S. Radha Chauhan, IAS, P&CEO, NeGD • Key note address - Dr Ajay Kumar, IAS, Additional Secretary, Deity, GOI
11.45 – 12.00	Break for Tea	
12.00 – 12.30	NSDI and GIS Data Standards & Policies	Dr P S Acharya, CEO NSDI, Department of Science & Technology, Govt. of India
12.30 – 13.45	Integration, Analysis, Management of Spatial Data. Applications of GIS in Projects.	Shri Vishnu Chandra, DDG -National Informatics Center (NIC), Deity, Govt. of India
13.45 – 14.30	Break for Lunch	
14.30 – 15.15	Syntactic and semantic approach for Geo Information Management	Dr. Surya S. Durbha, Ass Professor Centre of Studies in Resources Engineering, Indian Institute of Technology, Bombay
15.15 – 16.00	Remote Sensing and Geo Spatial Technology for Planning and Development	Dr. Nagaraja Ravoori, Proj. Director (SIS-DP), Chief General Manager (RCs), National Remote Sensing Centre (NRSC), ISRO, Department of Space, GOI
16.00 - 16.15	Break for Tea	
16.15 – 17.00	Demo - National Platform on GIS, Govt. Land Information System, GIS Based DSS for REC, GIS Based DSS for Mining	Shri Sachin Agarwal, Shri Tushar Rai, Smt. Reshma Agarwal, GIS Consultants, Deity, Govt. of India
17.00 – 17.30	Consultation and Discussion Session	To be chaired by Smt. S. Radha Chauhan, IAS, P&CEO, NeGD



Centre for Innovations in Public Systems (CIPS), Hyderabad

Consultation Workshop on
"Use of GIS in Informed Planning & Decision Making"
29-30 March, Indian Habitat Centre, New Delhi

30th March, 2016

Day – 2

Wednesday

Time (Hours)	Topics	Speakers
9.30 – 10.15	Vision of NCoG, and coordination with States	Shri Vinay Thakur Director, NeGD, Deity, Govt. of India Shri T. P. Singh Director- BiSAG, Advisor – Deity,
10:15 – 10:45	The Institutional Strengthening of Gram Panchayat (ISGP) Project, West Bengal	Shri Koustav Basu, IT-Consultant, ISGP Project, Panchayats & Rural Development Dept., WB
10:45 - 11:00	Break for Tea	
11:00 - 11:30	Mobile based application for cadastral mapping	Shri Sunish Kumar, Sr System Analyst, NIC
11:30 – 12:15	GIS based System for Rural Road Development in Madhya Pradesh	Sri Vivek Chitale, Senior Technical Director, NIC, MP
12:15 – 13:30	Interactive Session – 5 minute presentation by SeMT resources regarding the current state of GIS implementation in their State/UT	SeMT and State GIS team
13.30 – 14.15	Break for Lunch	
14:15 – 15:45	Interactive Session – 5 minute presentation by SeMT resources regarding the current state of GIS implementation in their State/UT	SeMT and State GIS team
15:45 – 16:15	Living with Modelling, Simulation and GIS	Dr. K C Gouda CSIR Centre for Mathematical and Computer Simulation (C-MMACS) , Bangalore
16:15 – 16:45	Web Map Services, Data and Metadata	Shri. Rajendra, ISRO
16:45 – 17:15	Way forward and Action Points Concluding remarks and Vote of Thanks	Shri Vinay Thakur Director, NeGD, Deity, Govt. of India Shri Sachin Agarwal, Shri Tushar Rai, Smt. Reshma Agarwal, GIS Consultants, Deity
Tea		

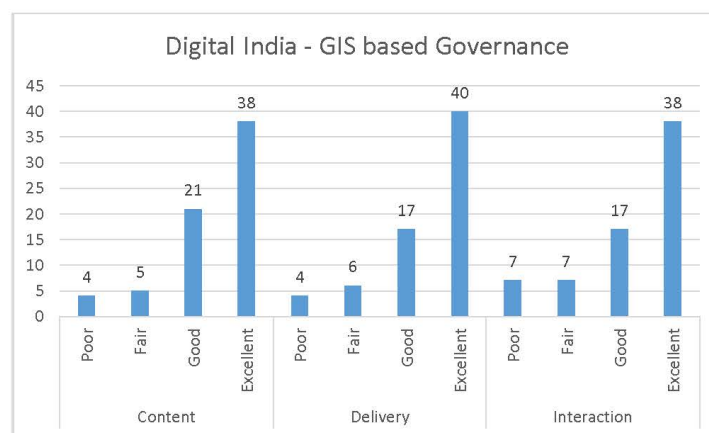


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Annexure C : Feedback Form

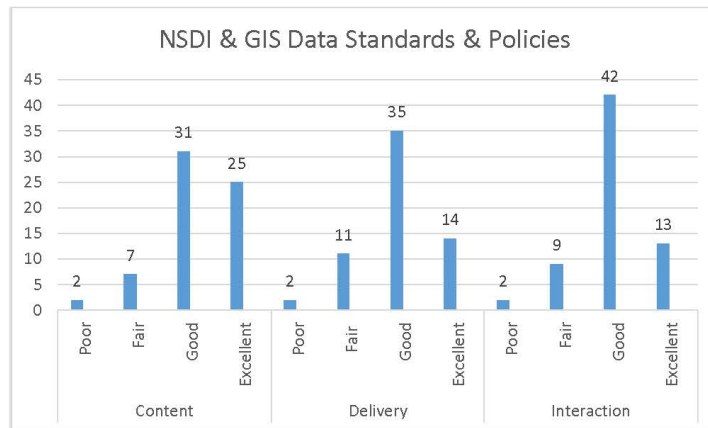
1. Shri T P Singh

Content				Delivery				Interaction			
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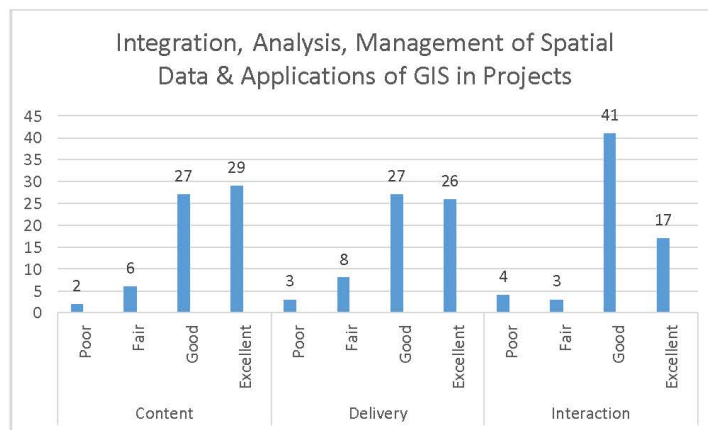
2. Dr. P S Acharya

Content				Delivery				Interaction			
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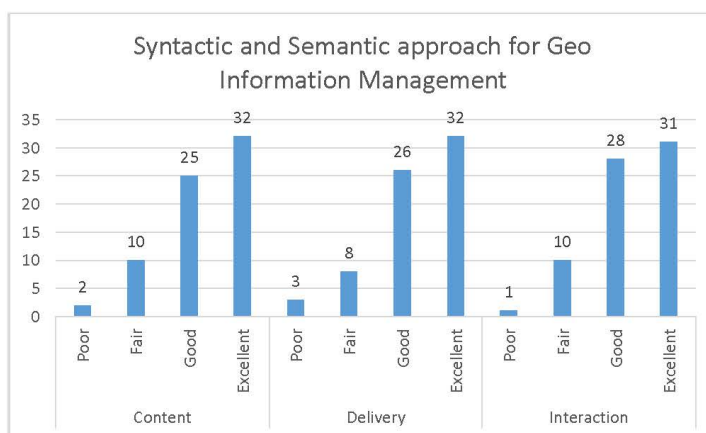
3. Shri Vishnu Chandra

Content				Delivery				Interaction			
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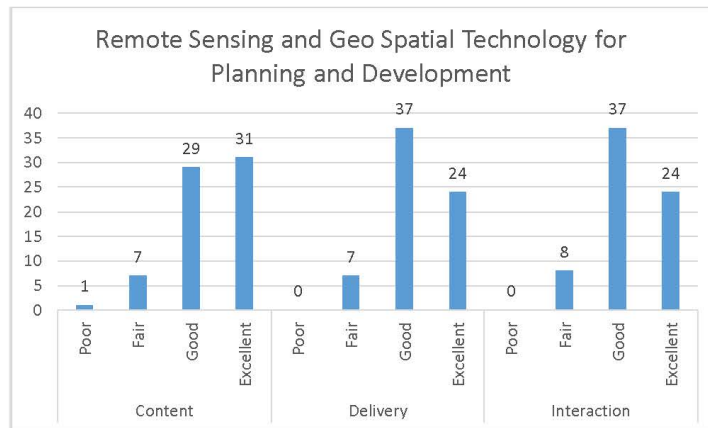
4. Dr. Surya S. Durbha

Content				Delivery				Interaction			
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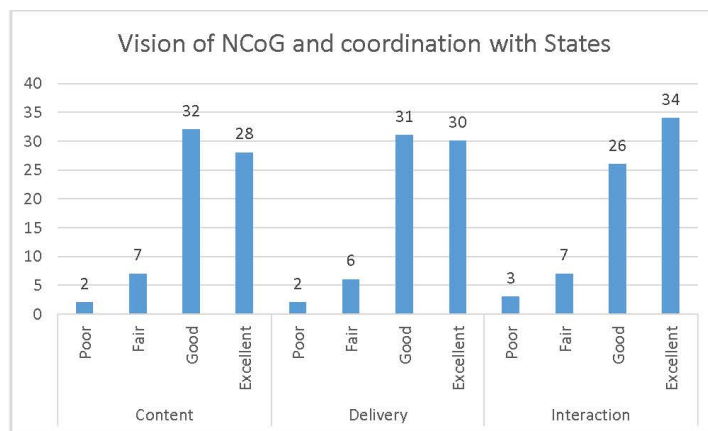
5. Dr. Nagaraja Ravoori

Content				Delivery				Interaction			
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1	7	29	31	0	7	37	24	0	8	37	24



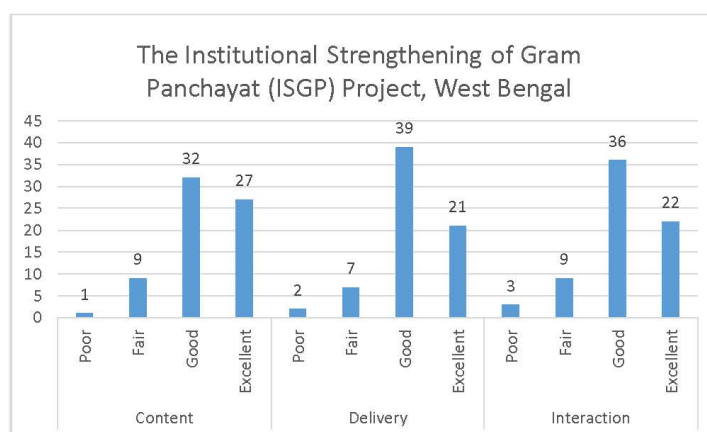
6. Shri Vinay Thakur & Shri T P Singh

Content				Delivery				Interaction			
Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent
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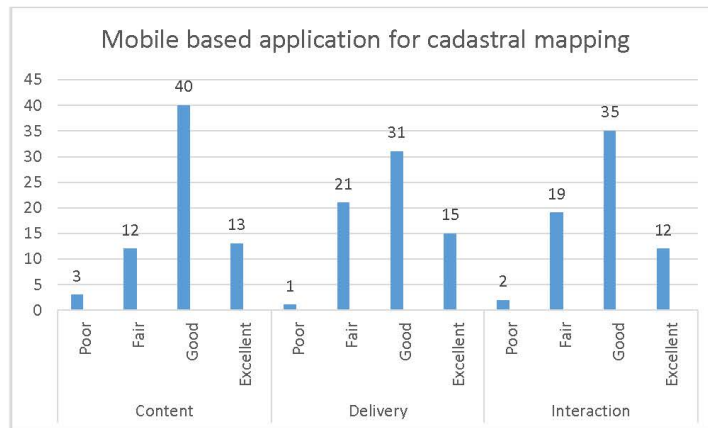
7. Shri Koustav Basu

Content				Delivery				Interaction			
Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent
1	9	32	27	2	7	39	21	3	9	36	22



8. Shri Sunish Kumar

Content				Delivery				Interaction			
Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent
3	12	40	13	1	21	31	15	2	19	35	12



9. Shri Vivek Chitale

Content				Delivery				Interaction			
Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent	Poor	Fair	Good	Excellent
3	6	21	39	3	9	26	31	3	10	28	29

