INDIA GEOSPATIAL FORUM

7 – 9 February, 2012

Theme: Geo-Budget - Enabling Sustainable Growth

And

GEO INFRA 2012 GEO GOVERNANCE 2012

Report

Inaugural Session

'G-tech the tool to build India of the future'

The inaugural session of the three-day India Geospatial Forum, being held at the Apparel House in Gurgaon during February 7-9, 2012, brought forth the significance of geospatial technology in shaping up the future of the nation. The Forum turned out to be extremely successful with total number of 1162 delegates in attendance. In addition, land administration department from 14 Indian states and surveying organisations from 15 Indian states participated in the Forum. Sighting numerous examples of how the technology can be used in various fields to speed up the country's growth, the speakers at the session set the tone for the rest of the day, which saw geospatial experts and users converge at the venue to learn about the latest happenings in the field of geospatial technology.

Addressing the gathering in his welcome address, Dr. M P Narayanan, Chairman, Geospatial Media & Communications said that although the country has witnessed a lot of development in the field of geospatial technologies during the recent past, there was still plenty of scope for development. "We have come a long way with regards to the application of geospatial technologies. But, we must acknowledge that we are presently just touching fringes of its potential."

Anil Kumar Sinha, Vice Chair, Bihar State Disaster Management Authority, Government of Bihar said that any major disaster that strikes a country lends a significant blow to the GDP and thus it affects the process of sustainable development. "The most important aspect is how can geospatial technology help mitigate the effect of disasters," he said.

Alok Perthi, Secretary, Ministry of Coal, Government of India gave a comprehensive overview of the mining sector in the country and explained how geospatial technology can be effectively used to evolve new ways of exploration and thus increase production. He said that although the country has increased its drilling capacity significantly over the past few years, it was not enough and there is need to use modern techniques to ensure mining in a sustainable manner. "Geospatial technology has a very important role to play in this area as it can be used to locate minerals below the earth." Citing the example of cities like Jharia in the Indian state of Jharkhand where uncontrolled mining has led to underground fires during the last few decades, he said that geospatial technology is a tool that can be used to identify the areas affected and thus help douse the fires.

Further, he said that when talking of mining and sustainable growth, the most important issue is that of reclaiming land that has been affected by mining. "One of the most significant areas where geospatial technology can be used is to monitor reclamation and to make sure that it is actually proceeding as per the plan." He concluded his presentation by saying that geospatial technology can play a major role in all the three aspects of the industry, which include exploration, mining and closure.

Subsequently, KK Singh, Chairman & Managing Director of Rolta India Ltd shared his experience of being associated with the technology for so long and how it had transformed into a technology that can shape the future of the country.

"Over the last decade, the application of geospatial technology has increased exponentially. It has become the fundamental tool for achieving sustainable growth and it is for this reason that every progressive nation has a forward looking GIS policy," he said. Sharing his experience of being associated with the

technology since the past so many years, he said "In my personal association with this technology for the past 30 years, I feel very excited about the prospect and utility of geospatial industry in building India of the future. I would like to reiterate my belief that geospatial information will be the next frontier of information revolution in our country." Commending the government for implementing forward looking policies, he said, "It makes me feel good that in recent past, government policies and programmes have encouraged implementation of geospatial technology in various programmes, providing an opportunity for the industry to serve our nation."

Talking of the rapid pace at which development is happening in the country, Dr. Shailesh Nayak, Secretary, Ministry of Earth Sciences, Government of India said that the country's rapid progress demanded robust information and decision support systems to aid the planning and implementation of various developmental programmes. "GIS will be the mainstay around which such information and decision support systems can be built," he said. He further informed that an expert group was formed to formulate a plan to have a national GIS. "We have submitted a detailed report on this and it is under the process of implementation" he said. Besides, he also pointed out at the challenge of making all the data gathered by various agencies GIS ready and thus ensure its use in many more verticals.

Saumitra Chaudhuri, Member, Planning Commission, Government of India presenting the inaugural address, called for increased use of geospatial technology. "GIS can help us in achieving better and productive living for our people. There is a lot of opportunity to use these technologies in different fields and make sure that better results are achieved." He also explained how satellite imagery can become an effective tool for better land management and successful demarcation of boundaries.

The session concluded with a moving forward from Prashant Joshi, Director – Sales, Geospatial Media and Communications who thanked the esteemed gathering for enlightening the audience. He gave an overview of the changed structure and focus of the conference.

Guest Address:

The session stated with a guest address by Katherine Sandford, General Manager, Geospatial Division, Trimble. She presented an industry perspective on geospatial technology in her guest address. Talking about evolution of geospatial data, Katherine observed that geospatial data has evolved from paper maps, to GIS and now toward 3D virtual models of our world. Never before has geospatial information been accessed by so many people, through platforms like social media. Smart phone has made its users surveyors, in the sense of creating geospatial information that can be accessed by others. Integrated technologies that can collect 216 billion data points per hour will begin to commoditise positioning. All these factors are necessitating change in approach towards geospatial data.

Plenary Panels

Reinvent to stay relevant

Geospatial technology can play a significant role in managing national development programmes. The plenary panel session, Managing National Development Programmes through Geo-ICT, on the inaugural day of India Geospatial Forum, being organised here by Geospatial Media and Communications, highlighted instances of this role and also deliberated.

Dr. RC Sethi, Additional Registrar General, Office of the Registrar General & Census Commissioner, India informed the audience about the use of GIS in its activities to fulfill the objective of 'no omission, no duplication.' The Office is incorporating digitised boundary of more than 6 lakh villages, maps of 8000 towns upto ward level, notional maps upto street and house level and satellite based digital maps of 33 capital cities upto street and building level.

Kaushik Chakraborty, Country Head, India and SAARC, Intergraph SG&I India Pvt Ltd, elaborated on the benefits of Geo-ICT in national development. According to him, governments, be it local, regional, or central level, are under increased pressure to provide safe infrastructure, increase transparency in decision making, improve public services and offer services at lower costs due to budget constraints. It is geospatially integrated solutions that can help them address these issues. Geospatial information has a role to play in ensuring safety of cities too. Kaushik stressed that reliable, integrated geospatial applications are needed to transform vast

amounts of data into intelligent information and promote interoperability.

Manish Choudhary, MD, Pitney Bowes Software India expressed that while GIS holds tremendous potential for governance programmes, its use is still in fringes. The main reason for this according to him is that its implementation is very traditional that needs to be reinvented to maintain its relevance. The road ahead for GeoICT according to him includes convergence (the integration of GIS with other aspects like workflow management, BI tools, logistics and market analysis), neogeography (user-generated geographic content), crowdsourcing and cloud.

The Indian geospatial ecosystem can do with certain reforms in order to fully realise the benefits of geospatial technology towards governance. Prof Arup Dasgupta, Managing Editor, Geospatial World, analysed India's geospatial trajectory and observed that the key challenges facing the Indian geospatial industry are unwillingness to share data, inadequate human resources, and the need to align data policies to technological advances. He also made certain recommendations with regard to the data policies. Some recommendations for the Map Policy included making the Open Series Maps completely unrestricted; providing slope and aspect maps derived from height information; charging royalty on map reuse through value addition but not demanding IP rights and base map series having lower positional accuracy for thematic mapping. Prof. Dasgupta also asserted that where public private partnership is concerned, that the government lays great emphasis on, efforts should be there towards promoting volunteered geographic information as a source of data and firming up the participation of private industry by taking their role beyond services and contracts. He concluded that Indian problems are unique and require unique Indian solutions and that the induction of geospatial technology is an urgent necessity.

Stalwarts envisage industry's dimensions, directions

In the financial year 2010-11, National Remote Sensing Centre (NRSC), India, surpassed its sales target. In the near future, the Centre is set to launch two polar satellites RISAT-1 and SARAL and two geostationary satellites INSAT-3D, GISAT. Amongst these four satellites, GISAT will be launched in 2013. However, the remaining three satellites will be launched in 2012, according to Dr. V K Dadhwal, Director, NRSC, India. Dr. Dadhwal was addressing the Plenary Panel, Dimensions & Directions of Geospatial Technology. About Resourcesat-2, which was launched in 2011, he said that it improved radiometric quality, enhanced ortho-rectification using CartoDEM, improved geo-location accuracy and automated LISS-4 MX registration.

Offering industry perspective, Rajesh Mathur, Vice Chairman, Esri India, highlighted a market report by Gartner which rated cloud as the technology highly appreciated by the industry. Elaborating on the untapped potential of cloud, he stressed that the market for cloud will touch USD 118 billion by 2014 and by 2020 it will reach USD 241 billion, according to Forrester. Mathur elaborated on PaaS (platform as a service, example GMail), SaaS (software as a service, example Windows Azure) and IaaS (infrastructure as a service, example Amazon). Addressing security concerns, he explained the differences between private and public cloud. He also explained how Esri's technology can aid geospatial industry to maximise ROI using cloud.

Another industry representation was by Jean-Baptiste Monnier, Senior Vice President, Bentley Asia Operations. He stated that there is only thing common between India and China and that is the 12th Five Year Plan which both the countries are set to introduce. From the industry point of view and especially for a company like Bentley, the USP of the plan is the approximately trillion dollar investment in infrastructure. Citing the example of Crossrail project, Monnier explained how Bentley technology can help develop futuristic infrastructure.

Prof Josef Strobl, Director, University of Salzburg, Austria, touched upon various futuristic technology trends and observed that if sensor on one hand is data source, cloud is facilitator for real time geography. Showcasing an example of real-time geography, he stated that at a Census Department conducts census after an interval of 10 years but using sensors it takes only about 15 minutes. He showcased a picture of a university campus during college hour (derived from sensor data), which showed students' density on the campus. He used the term 'in-volunteer geographic information' for the information gathered by sensors. He stressed that sensors can be anything including people.

Big data holds tremendous opportunities

Enterprise Resource Planning for Infrastructure and Utilities was the theme for the last plenary panel of the day. While inaugurating the panel, Lt Gen AKS Chandele (retd) talked about how the infrastructure is going to play an important role in the development of the country.

The first speaker of the panel was Dr BVR Mohan Reddy, Chairman and Managing Director, Infotech Enterprises, India, who spoke about the importance of geospatial dimension in utilities. "The only way to locate utilities is by finding out about the geo-positioning of its assets." He then talked about the need to integrate GIS with ERP (enterprise resource planning). "Spatial dimension becomes extremely important in ERP in utility companies. There are various benefits of ERP-GIS integration like it helps in reducing duplication of data, or improve ability to consistently achieve service levels." Speaking about the future technology trends, he said, "Companies will face 'big data' problems in future but there are tremendous opportunities. We can get business intelligence from that data," adding, "Smart grid and social networking will play a major role in future, while

cloud will help reduce investment in infrastructure."

Ramamurthy Kolluri, Vice-President Networks, Bharti Airtel, India, spoke about how the company successfully incorporated geospatial technology in its day-to-day activities. Explaining the reasons that led to the incorporation of GIS in the company, Kolluri said, "We had to be quicker than the competition." He then spoke about the challenges involved in the process. "Traditionally, world over, companies have maintained separate systems for wireless and wireline services. We have been able to successfully incorporate both into a common system," he said.

Gagan Kakkar, General Manager – Digital Energy, GE Energy, India, talked about how IT has revolutionised telecom sector in the country. Speaking about geospatial technology, he said, "The technology forms the crux of the smart business." He spoke in length about the need to integrate network infrastructure and information infrastructure.

The last speaker of the evening was Sanjeev Gupta, CEO, Rural Electrification Corporation Subsidiary Ltd., India. Talking about the need to set up big infrastructure structure, he said, "Twenty first century demands cannot be met with traditional means." He then talked about the importance in today's power sector. "Technology in this area will be a game changer," he said.

The panel ended with an interactive question-answer session. One of the interesting points raised by Dr Reddy during the session was the need for defence sector to strike a balance between cost and technology. "The cost of doing business with defence is very high. I call this T1L1 factor, that is, they want the best technology at lowest cost," he said.

Symposium: Effective Land Administration

Experts advocate use of modern tech in land administration

Land titling in India is a challenge of enormous proportions owing to the mammoth area that needs to be covered and the size of population, indicated John Whitehead, APAC Manager, Emerging Markets and Funded Projects, Trimble, Singapore as he brought to light the most serious challenge facing effective land administration in India. The session titled 'Role of Geospatial Technology in Effective Land Administration: Benefits, Road Map and Challenges' brought to light the current state of land administration in India, the urgent need to modernise and computerise land records and how geospatial technology can be used to ensure more effective land tenure systems.

Several speakers from government and private organisations participated in the day-long session and deliberated on various issues such as capacity building, digitisation of old spatial records and correlating those with the resurvey records, carrying out ground surveys using latest technologies and the need for proper demarcation of land parcels to promote effective land administration. The day was divided into separate tracks on Computerisation of Land Records/Creation of LIS Issues Related to Delineation/Demarcation of Boundaries, Applications of Geomatics/Digital Mapping Technology and Establishment of LIS/Databases for Land Administration/Capacity Building.

The National Land Records Management Programme (NLRMP) remained a major point of deliberation during the day with several speakers citing it as an example of notable work done in the field of land management in India.

The inaugural session started on a positive note with Dr. M K Munshi, Advisor, Geospatial Media and Communications giving an extensive presentation on land administration in India. The presentation highlighted various initiatives of Department of Land Records in this direction and emphasised how proper support at the central and state levels can help the successful implementation of geospatial technology in the field.

Subsequently, Prabhu Dayal Meena, Additional Secretary, Department of

Land Resources informed the gathering about some of the ongoing programmes at DoLR. Naming the Computerisation of Land Records and Modernisation of Land Records programmes, he informed that there was rapid progress in the direction with some states having stopped the use of manual recording altogether while others putting their records online. He also talked about the National Land Records Management Programme (NLRMP), which aims to modernise and build up an integrated land records management system with the help of modern technologies. He concluded by saying that the ministry plans to setup a National Institute for Land Management (NILM) that will work to build capacity in the area and educate states on evolving policy level guidelines.

John Whitehead gave an interesting presentation on how strategies implemented by various countries can be applied in India. Citing the example of China, he informed that although the country lacks a parcel-based land cadastre, it is ready to roll out land titles as a result of its massive geodetic infrastructure investment.

U N Mishra, Director, Geodetic & Research Branch, Survey of India explained the significance of a datum and coordinate system to perform surveying and mapping and also informed about the completion of the first phase of the ground control point library.

P V Rajasekhar, Director, Survey of India explained the significance of capacity building in his presentation titled Legal Cadastre: Training. According to him, some of the aspects that need to be considered in surveying are reference system, support in surveying, instruments and resources.

Representatives from the industry also shared their perspective on how geospatial technology can become an effective tool for land management in the country and also shared several examples of how other countries around the world have successfully employed latest technologies in this area.

Symposium: Integrated Coastal Zone Management

The symposium on Integrated Coastal Zone Management saw experts discuss various issues such as the latest advances and innovative ideas in the field of hazard management, which help in the process of proper management of the country's coastal resources. Some of the major technological developments that were discussed during the day-long symposium included airborne & LiDAR mapping, inundation modelling, high-resolution stereo satellite photogrammetry data processing and stereo data acquisition by digital aerial photography.

The symposium witnessed the presentations by B. Bernard, Imaging Scientist, ITT, USA Brad Skelton, CTO, Intergraph, USA, Inder Claire, Director, GeoEye, India, Wolfgang Aleithe, Sr. Technical Head, Tridex Solution Germany in the session Photogrammetry & Data Processing

The session on LiDAR and Mobile Mapping was discussed by David Collison, Regional Sales Manager, Optech, Australia, Pankaj Gupta, Head Utilities (APAC Region), Trimble, India, Hannu Korpela, Sales Manager, Terrasolid, Finland, R. M. Vashisth, Co-founder & CEO, Tridex Solutions, USA

Session on Modelling &Enterprise Solution saw presentsations on various aspects by Seema Joshi, Head – PTG, Esri India, India, Dr. Ravi Kumar, DVS, IIC Technologies, India, Sathya Prasad, Practice Head - GeoSpatial Technologies, Tata Consultancy Services, India and Sundar Ram, Vice President, Technology Sales Consulting, Asia Pacific, Oracle Corporation, India

Sessions

India Geospatial Forum hosted Sessions on varied themes. These sessions wer aimed to give members of the geospatial community an opportunity to showcase thei work through paper and poster presentations. The proposed focus areas for technica sessions were:

- NRDMS
- Remote Sensing and Image Processing
- Cloud Computing
- 3D Modelling
- Web Services and Open Source
- Planning & Development
- Utility
- Surveying, Mapping and LiDAR
- LBS & Emerging Trends
- Capacity Building Round Table

Vertical Conferences

Geo-Infra 2012: focuses on intelligent infrastructure

The focus of Geo-Infra 2012 was on building sustainable and green infrastructure. The session saw a mix of people from industry, government and user communities.

Inaugural Session: Speaking about the negligence of urban transport over the years, B I Singal, Director General, Institute of Urban Transport, said, "It was only in the 11th Five Year Plan that urbanisation was accepted as a natural outcome of development," adding, "While Kolkata Metro took off after 11th plan, it was only after Delhi Metro's success that more and more cities opted for metro." He also suggested improving bus services and encouraging public-private partnership for major infrastructural projects.

Geoff Zeiss, Industry Programme Director, Utilities AEC – Autodesk, Canada, spoke about the 'Digital infrastructure for smart cities.' Speaking about the future of urbanisation, he said, "People want urbanisation to happen as it is directly related to GDP," adding, "There are plans to build five new cities in Saudi Arabia; and seven new cities between Delhi and Mumbai." He also talked about the growing importance of green building and clean energy. He suggested incorporating gaming technology with engineering to develop models of infrastructure projects for better understanding of the complexities involved in the task."

Rajan Aiyer, Managing Director, Trimble, India, introduced audience to the importance and challenges of infrastructure in today's environment. "The growing demands of infrastructure have to be met in a sustainable way without destroying environment, economy and society," he said. He talked about how geospatial data has evolved from paper maps to 3D virtual maps.

Session: Building sustainable infrastructure: Talking about urban explosion in terms of population growth rate, Dr Anjana Vyas, Dean, CEPT, India, said, "By 2040, it is estimated that there will be equal distribution of urban and rural population." She also listed out challenges that are involved in building sustainable infrastructure like transportation, encroachments and so on; and talked about the importance of green infrastructure.

Dr Y. Pari, Head (GeoInformatics), L&T, India, talked about the importance of public transit system. Defining sustainable construction, he said, "It is an attitude, a special way of thinking that runs along with specific technology." He also spoke about the concept of green buildings and their benefits.

Meanwhile, Milin D'Silva and Vinod Oommen Ninan from Rolta India, introduced audience to the concept of geospatial fusion, "Geospatial fusion involves integration and collaboration," said D'Silva. They then talked about GIS' relevance in asset management, benefits of integrated asset management system with geospatial technology.

Session: Role of geospatial technologies in roads and highways: S K Popli, Team Leader, Road Safety, RITES, India, introduced audience to the implementation of an effective safety management system. Speaking about GIS based referencing and analysis system, he said, "It enhances the capability of engineers to conduct problem identification and countermeasure evaluation studies."

Atul Kumar, Chief General Manager (P&IS), NHAI, India, talked about national highways in India and the importance of imagery in carrying out road-related projects. "High resolution satellite imagery can be used for exactly determining the current status of projects, evaluating the progress of work, etc. GIS and satellite technology can be used for building design of highways, road asset management, planning of projects etc.," he said.

Samitran Sen, Executive Director, Consulting Engineering Services, India, spoke about RIS (Road Information System) and explained the importance of GIS-based RIS. "GIS based RIS is a way forward. It helps in real-time data collection, and automatic data updation."

Anuradha Shukla, Transport Planning and Environment, CRRI, India, spoke about road transport in economic growth, and presented several case studies to explain the importance geospatial technology in road planning like noise mapping, pollution profile mapping of Delhi, etc.

Dr P K Sikdar, President, ICT Online, India, spoke about the benefits of geotech

in highways. "GIS can be used throughout the lifecycle of a project. It can be used for transportation planning, construction management, transportation safety analysis, environment management and so on," he said.

Jugal Makwana, Global Product Manager, Road & Rail, Bentley India, spoke about huge investment in roads and bridges and explained the concept of asset management. "In order to ensure that our assets are always in a better condition, we require better asset management practices," he said. He then introduced audience to Bentley's Integrated Asset Information Solution.

Session: Role of geospatial technologies in railways, ports and aviation

S S Mathur, General Manager-corporate strategy, CRIS, India, spoke in detail about the need to have integrated GIS system in Northern Railways; and how railways is proceeding in this direction. Speaking about the challenges, he said, "Building base map of our assets is one of the biggest challenges."

Satish S. V., General Manager (Gagan), Airport Authority of India (AAI), spoke about the evolution of geospatial technology in aviation and talked about AAI. He presented a documentary of GAGAN to highlight how the system will enhance safety in aviation

P P Sinha, Deputy Director General, Directorate General of Lighthouses and Lightships, India, spoke about e-navigation and how it is enhancing safety in maritime operations. He however, had a word of caution, "e-navigation may help in reducing fatigue but should not be used to reduce crew sizes."

Mahesh Reddy, Technical Manager, Intergraph, India, talked about rail infrastructure management and spoke about the company's solutions in the sector. He also presented the case study Infrastructure management for London Railway.'

Session Geospatial technology in urban transport

Developing countries pose several challenges for the transport sector. Speaking about these challenges, Dr R S Moorthy, Head (Projects), Urban Mass Transit Company, India, said, "In developing countries, availability of data is a major bottleneck," adding, "We require a properly developed user-friendly information system." He then presented a case-study of Thane transport system to illustrate how geospatial technology can help in the development of an efficient transportation model.

P K Choudhary, General Manager (MRTS), RITES, India, spoke about the integration and convergence of geospatial technologies and explained how integration of geotech with mainstream IT has increased the scope of technology and made it more popular. He also talked about the importance of sensor fusion and how data sharing plays an important role in information fusion.

Sustainable urban transport and how geotech can be used to determine viability of solutions was the focus of presentation by Dr Anvita Arora, CEO, Innovative Transport Solutions, India. She presented several case studies to illustrate the use of tech in effective planning like 'City mobility plan for Patna', 'Detailed project report for Naya Raipur', and so on.

Meanwhile, G V Sreeramam, Chief Operations Officer, Geoinfosys Technologies, informed audience about the work they are doing along with authorities to build better roads in many areas of Uttar Pradesh, India. He also spoke about the need to improve road network in a holistic way.

Session: Geospatial technology in ITS

Ashish Verma, Assistant Professor, IISC Bangalore, India, introduced audience to the public transport system in Bangalore city. He spoke about the advantages of Passenger Information System (PIS) and complexities involved in transit network. Talking about the future, he said, "We are now trying to develop a web-based transit PIS. In future, we will try to use GPS to provide real-time transportation information to public."

"Why are we not having a single platform for locating and tracking vehicles?" asked Ashutosh Pande, Managing Director, CSR India, who spoke about the technologies in AVL and PIS. He introduced audience to various types of technologies like positioning, communication, mapping, data processing.

Speaking about Google maps and the importance of location in today's world, Pankaj Khushani, Enterprise Head, Google Geospatial Business – Asia, India, said, "At Google, we try to find out what consumers want and then accordingly roll out our products. That is one of the major reasons behind the success of Google."

While Anand Kumar S.V., Deputy General Manager, Corporate IT GIS, Reliance Energy, India, explained how Reliance has successfully incorporated geospatial technology for carrying out its metro project, Alex Chew, Regional Sales Manager – Asia Pacific, Trimble Geospatial Division, Singapore, introduced audience to the company's land mobile mapping systems.

Later, a panel discussion was also held on the topic, 'Emerging trends and the way forward for geospatial technology in the infrastructure sector.'

Geo-Gov 2012: Enhance governance with g-tech: Forum

Geospatial technology is fast becoming an engine of growth for businesses and is poised to become a formidable driving force in the global as well as Indian economy. Today, the Indian government is trying to bring e-governance and geo-Governance together. To showcase the role of geospatial in governance and deliberate upon various issues related to it, Geospatial Media and Communications introduced the vertical conference Geo-Gov as part of India Geospatial Forum.

In its inaugural session on the second day of India Geospatial Forum, various luminaries shared their views on different aspects of geo-governance. B B Bhattacharya, Member, National Disaster Management Authority, highlighted the organisation's initiatives towards equalisation of geospatial data in disaster management. He observed that India is one of the most disaster prone countries in the world, owing to various hydrometeorological and geopolitical factors. While natural hazards cannot be averted, its effects can be mitigated and this is where disaster risk management programmes have a very significant role to play. Pruning down the level of risk requires science and technology.

Sanjiv Mittal, CEO, National Institute of Smart Government, highlighted how the organisation is involved with the government in enhancing the use of geospatial technology in the government sector. He highlighted the instance of a project with the Ministry of Water Resources involving minor irrigation surveys. While the surveys with traditional methods would take 3-4 years, solutions provided by NISG incorporated GPS coordinates, digital photographs and other information at source, and could be mapped on GIS, giving considerable efficiency to the entire process. Another significant area in which NISG solutions have found implementation is curbing malpractices in civil construction projects where progress can be monitored on a weekly basis using GIS and GPS.

Kaushik Chakraborty, Country Head – India & SAARC, Intergraph SG&I India remarked that Smart Governance is about people, processes and technology. One big challenge according to him in the pervasiveness of GeoICT is the collaboration between various agencies. To enhance the pervasiveness of GeoICT, he suggested having integrated and consistent data sets rather than discrete datasets, empowering NSDI and state SDI, and use of more open standards. Another concept he proposed was master data management where the base data of the entire nation is established once and updated regularly through efficient data collection.

Rakesh Raina, Vice President – Sales, Esri India shared his views on geo-enabling of governance. He observed that while the convergence of geospatial with e-governance is there in India, it does not have a strong presence in practice. He suggested strengthening the use of GIS in conjunction with traditional e-governance infrastructure. He laid particular emphasis on State GIS for cohesive operation, decision making and communication that focusses on application rather than data.

One of the most progressive states in India in the deployment of geospatial technology in India is Gujarat. Ravi S. Saxena, Additional Chief Secretary, Department of Science and Technology, Government of Gujarat, elaborated on the use of geospatial technology in the state. He informed the audience that every inch of Gujarat has been mapped with survey numbers. Village maps of the state (at 1:5000 scale) have been superimposed on seamless mosaic satellite data. This layer has been used as base map for various activities. He said that it is almost mandatory for all departments in the state to map their assets on GIS. Some of the successful applications in the state are in the sectors of urban development, revenue, forest department, environment department, investor support system for the industry, rural development, irrigation, tribal department.

Don't reinvent the wheel, urges panel

"GIS is not for the sake of technology, hardware, software or even applications. GIS is meant for common man on street. The benefits of the technology should reach the last mile otherwise it is not of much use." This was the assertion of Anoop Singh, Special Secretary to Government, Information Technology & Communications Department, Government of Andhra Pradesh, during the Panel Discussion on the status of Geo-governance in India, on the second day of India Geospatial Forum. Anoop, who is also Project Manager GIS Development for the state, traced the evolution of geospatial databases by various department of the state and

expressed that it is high time we stopped working in silos and stopped reinventing the wheel. He was of the opinion that 'anything which has anything to do with space and spatial location, is GIS based.' Where the use of geospatial technology in governance is concerned, he noted that there are sparks of brilliance but 'that is about it.' One key aspect in promoting g-governance is convincing the political honchos about the benefits of the technology. Another is to have like-minded people come together and form a forum at national level.

An instance of use of geospatial technology in governance was highlighted by Dr. AP Singh, Deputy Registrar General, Office of the Registrar General of India, Ministry of Home Affairs, Government of India. He informed that properly updated geo-database on each administrative unit are required before census is undertaken. Therefore the organisation generates geospatial database at all levels. He also informed that all the maps are compiled into an administrative atlas of India. Manoj Jain, Sales Director, Pitney Bowes Software discussed how GIS can be useful in governance. He was of the view that a lot of information resides in non-spatial sources but they have geo-coordinates.

Ravi Gupta, Editor-in-Chief, eGov, observed that the industry issues that were prevalent more than a decade ago are still prevalent, which is not a good sign. However, there are signs of hope, he expressed. These include mobile, social media, and GPS which is easier to deploy than GIS.

Session: Geo-ICT in agriculture

The vertical conference on Geo-Gov during India Geospatial Forum also focussed on specific sectors. One such sector was agriculture which saw several eminent personalities from the sector discuss various aspects related to the use of the technology.

Agriculture today has remote sensing data, statistics, maps, different survey reports, Web, internet, various agencies producing data related to agriculture, state reports, district reports, mobile phones – all of which were not there or hardly there at the time of Green Revolution, observed Dr. Prithvish Nag, Vice Chancellor, MG Kashi Vidyapeeth, India. Such an evolution requires higher skills in agricultural management, and this is where GeoICT has a role to play. He further added that this role is at two levels – production level (providing information on what and how much to produce) and at policy level.

Dr. Vinod Bothale, Director, Maharashtra Remote Sensing Application Centre, remarked that there is very less land available for agriculture in India, while the demand for yield is increasing with growing population. Also, agriculture, which is the largest source of employment in India, is also the slowest growing sector. He

said that farmers who understand market trends and market opportunities have a better chance of succeeding than those who don't.

M. Moni, Deputy Director General, Agricultural Informatics Division, NIC, asked the audience about 'how well do we know farmers,' and added that we should have information about the farmers and develop user friendly systems accordingly while ensuring that the systems speak the language of farmers. He opined that there is a need for agriculture governance system and that is where GIS has a role to play. The session then witnessed several applications of the technology in agriculture. Dr. Tauqueer Ahmad, Senior Scientist, Indian Agricultural Statistics Research Institute demonstrated the estimation of area under agroforestry using remote sensing and GIS, since agroforestry according to him is the need of the hour for farmers for economic development. Kaushik Banerjee, Zonal Manager, Stesalit Ltd informed the audience about a solution developed by the company in agriculture, on integrated pest monitoring. Darsh Worah, Deputy Manager, National Dairy Development Board, shared how the organisation is working towards optimising milk procurement route using GIS. According to him, the Board is estimating annual savings of 6 percent through this optimisation.

Session: G-tech for healthier cities and people

The concluding day of India Geospatial Forum, organised here by Geospatial Media & Communications, witnessed several sessions as part of the vertical conference GeoGov. In the session role of Geo-ICT in Municipality, PS Uttarwar, Director (Planning), Dwarka Project, Delhi Development Authority, elaborated on the benefits of municipal GIS in managing municipal tasks such as property tax, birth and death registration, socio economic data management and holding registration, adding that it links the corresponding database with the geospatial view of the current municipal area. He also highlighted the institutional support required to have a full-fledged municipal GIS at various administrative levels. This includes incorporating geospatial operations to manage, update and maintain database and system (at municipality level); need for a dedicated team of geospatial personnel to utilise funds (at taluka level); dedicated funds for geospatial development (at district level), and need for geospatial budget (at state level). Vijay Kumar, Practice Director (Geospatial Technology), TCS, stressed on the need to automate the complete process from bottom level rather than just focus on GIS. Pritish Bisoyi, Senior Consultant, Pitney Bowes Software India stressed that the solutions for municipalities should have the following three components: location intelligence, data enrichment and citizen data. He also informed the audience about the solutions offered by the company for municipalities, including the data product

Street Pro India for select cities in India that do not have base maps. Shrinivas Khandure of Maharashtra Remote Sensing Application Centre informed the audience about the pilot municipal GIS project undertaken in Nagpur City. Ishan Das, Assistant General Manager, detailed about the Urban Property Ownership Records project undertaken by the company for the government of Karnakata through a public private partnership model.

G-tech can enhance health services significantly. Geo ICT can efficiently be used for disease surveillance, identification of high risk areas for prompt treatment; analysing spatio temporal disease trends and predicting future scenario for prompt control; prioritising areas for intense/ prompt control activity; improving hospital management; monitoring toxic spills to protect the health hazard of nearby residents; facilitating demographic analysis to estimate the demand for various types of services; marketing pharmaceuticals; conducting market studies and document health care needs of a community; maintaining locational inventories of health care facilities, providers, and vendors and locating the nearest health care facility or health care provider on the Web, observed Aruna Srivastava and B.N. Nagpal of National Institute of Malaria research. Sharing her vision on the future of GIS in health services, Dr. Madhulekha Bhattacharya, Professor & Head, Deptt of Community Health, Acting Director, National Institute of Health & Family Welfare said the need of the hour is to have a GIS hub at the district level with multi sectoral data sets, for analysing and presenting the data to the district and health administrators for use and support functions.

The day also witnessed a session on the role of geo-ICT in forestry. AK Wahal, Director General, Forest Survey of India, Ministry of Environment and Forests, Government of India informed the audience about the initiative of the establishment of National Forestry Information System in the country that aims to be a decision support system for the planning processes in environment and forestry. The system envisages creation of a node at FSI that would have all layers of information related to forests in the country. Some nodes would also be at state forestry headquarters, and all the nodes will be linked. The system is set to become operational from the next financial year. Also in the session, ML Srivastava, Joint Director, NFDMC, Forest Survey of India detailed the latest technology interventions and initiatives by the organisation using g-tech. Some such initiatives include national level mapping for forest type and forest cover, near real time monitoring of forest fires, coastal zone mapping, natural disaster assessment and impact of land use land cover change.

India Geospatial Excellence Award

The geospatial industry has been evolving and maturing as one of the mainstream businesses having its own identity in the world economy. Undoubtedly, this has been possible only by innovations and excellence brought forward by geospatial technology developers, professionals, end users and policy makers. In order to recognise and encourage such efforts, Geospatial Media and Communications has instituted awards and recognitions for exemplary innovations and practices in geospatial industry. The awards were in two categories – the India Geospatial Excellence Awards and India Geospatial Leadership Awards.

Excellence Awards:

Category	Recipient	Project
▪ Agriculture	Directorate of Rice Research, Hyderabad, Andhra Pradesh	Spatial Rice Decision Support System
▪ Disaster Management	(C-DAC) and	Near Real Time Flood

	Department of Information & Technology; Government of India	Monitoring System for Brahmaputra Basin using Microwave Remote Sensing
Land Administration	Excise and Prohibition Department, Govt of Bihar	Creation of Visual MVR (Minimum Value Register) using GIS maps
Telecommunication	BSNL	Geospatial analysis for the deployment of rural wireless broadband telecom services using geo-information technology
Urban Planning	MRSAC, Nagpur, Maharashtra;	Civic Information System
e-Governance	NIC, Tamil Nadu State	Mainstreaming GIS in e-governance through Web services in TN
Natural Resource Management	Watershed Organisation Trust, India	Use of NRM planning, implementation and monitoring
Construction	RITES Ltd.	construction of Yamuna expressway
Infrastructure & engineering	Reliance Infrastructure Ltd	enterprise-wide GIS implementation for metro
Rachapudi Kamakshi Memorial Gold Medal	Dr. MB Rajani, Assistant Professor, NIIT University, India; Mr Uttam Kumar, PhD student, IISC	Young Geospatial Scientist

India Geospatial Leadership awards

The Premier Geospatial State	State of Madhya Pradesh
Most popular geospatial data portal	maps.mapmyindia.com
Young geospatial entrepreneur	Mr Sudhakar Reddy Arumalla
Capacity buildingand professional development	Dr PS Roy for capacity and professional development in geospatial sciences
Corporate leadership	Dr BVR Mohan Reddy
Lifetime achievement	Sri Rajesh C Mathur

Valedictory Panel

The India Geospatial Forum, held here at the Epicentre, Apparel House concluded in grand style with a panel of experts deliberating on various outcomes of the three-day conference. Addressing the gathering, Arun Goel, Joint Secretary, Ministry of Urban Development, urged the planning commission to make GIS compulsory for every city development plan (CDP). He informed that the ministry was looking at geo-data on a very big level in the 12th Five Year Plan and that communication gap is the biggest challenge facing master planning in the country. He also informed that a large part of the funds in each project had been allocated for capacity development.

Commenting on Goel's demand for GIS as the basis for reimbursement of fund for every CDP, Dr. Manoj Singh, Advisor (transport), Planning Commission, India, said that it is a good idea and the idea will be put forth in planning commission's meeting. In his concluding notes, he said that there was a lack of good decision support systems in the planning commission and that technology can help the decision makers take more informed decisions.

In his closing remarks, Sanjay Kumar, CEO, Geospatial Media and Communications, revealed that 'Data Sharing Policy of India' is in final stage. About the India Geospatial Forum, he observed that it had aptly showcased how technology can act as a catalyst to solve various issues facing our nation.

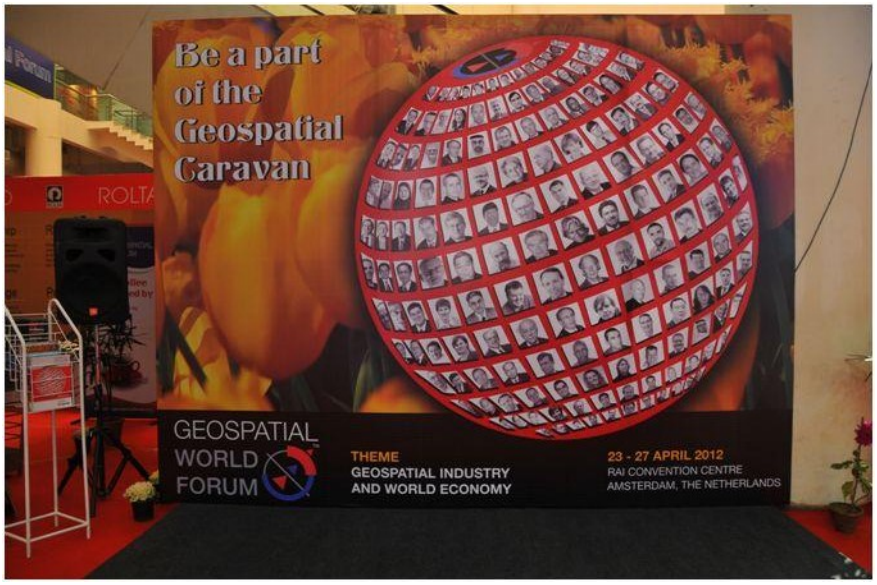
Dr. Siva Kumar, CEO, NSDI, India painted a positive picture of the geospatial industry in India saying that there is conducive environment for the growth of the industry in terms of government policies and the need of the hour is to build capacity in the field. He also informed that the government was looking at developing state SDIs in the 12th Five Year Plan.

Geoff Zeiss, Industry Programme Director, Autodesk, Canada revealed certain startling figures on how the country would require a staggering amount of resources during the coming few years and that technology can help fill the existing void between demand and supply upto a great extent. Ashutosh Pandey, Managing Director, CSR India, hinted that the biggest problem facing the world today is of outdated technology and the need is to introduce technology in a way that the youngsters are able to better associate with it and thus use it for the growth of the nation.

Earlier in the day, the symposium on Integrated Coastal Zone Management saw experts discuss various issues such as the latest advances and innovative ideas in the field of hazard management, which help in the process of proper management of the country's coastal resources. Some of the major technological developments that were discussed during the day-long symposium included airborne & LiDAR mapping, inundation modelling, high-resolution stereo satellite photogrammetry data processing and stereo data acquisition by digital aerial photography.

Organised by Geospatial Media and Communications Pvt Ltd, the India Geospatial Forum 2012 was held during February 7-9, 2012.

Exhibition



958 square meter exhibition area was declared open to the delegates by Dr. Shailesh Nayak, Secretary, Ministry of Earth Sciences, Government of India and Saumitra Chaudhuri, Member, Planning Commission, Government of India. 36 companies took part in the exhibition. During the three days the delegates took the opportunity to visit the various booths and consulted with the business partners. The exhibition was a learning experience for those who attended it and was highly successful. The exhibitors at India Geospatial Forum were:

- Rolta
- GE India
- IL&FS Environmental Infrastructure and Services Ltd.
- ESRI
- Infotech
- Intergraph
- Autodesk India
- Ministry of Earth Sciences
- Trimble
- PCI India
- Pitney Bowes Software
- IIRS
- HP
- BAE Systems
- ASB Systems
- Bentley
- NIIT University
- Hi-Target
- RapidEye
- China Huace
- JIYA INFOTECH
- Omnistar
- Terrasolid
- Groupe SCE
- NATMO
- Elates
- Reprographics India
- Geoeye
- IIC Technology
- RSI Softech
- Trimble
- Stesalit
- GMC
- FSI
- Janak Positioning
- Tridex Solutions

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