

Up Close & Personal with GIS Mapping

Tech enables conservation science, economic development & planning



One-stop Data Shop

GIS puts all info on one surface with satellite imagery and detailed geographical information

How does it work



GIS layers various data on a single map image. Companies collect info on income distribution, age groups and occupation patterns in an area. This is integrated with satellite images to create a visual database, which can be used for consumer profiling and the products to sell

Privacy concerns



Observers can track your movements at all times. Not just govt, private cos like insurance firms can use GIS to study people's health status or behaviour

Examples of implementation



India Biodiversity portal provides map-based information on all aspects of biodiversity in India



Insurance cos use GIS to locate areas of high car theft



National Centre for Biological Research using GIS in bio-informatics and wildlife sciences

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A system of digitising spatial data, where numerical information can be layered on satellite imagery, is gaining popularity with government agencies and private companies for various studies. The technology, called Geographical Information System (GIS), is revolutionizing the way we study and analyse areas of habitation, experts say.

Last year, the Karnataka government tied up with SECON, a Bangalore-based engineering company, to develop a digitized, real-time property database of all the residents in Mysore city. The map deploying GIS techniques will provide information not only on the number of households and their occupation levels, but whether the families have paid their water bills or not.

"The company will identify the number of houses, income distribution of people, collect information on the nature of habitation and vegetation around the area and layer it on a GIS map," says Dhyani Appachu, Director of International Operations at SECON.

Where traditionally numerical data and maps were used as two different components, GIS puts all information on one surface with the help of satellite images and detailed geographical information. Interested parties can add, delete and compare data.

"GIS is primarily about layering different kinds of data on a single map image," says MC Kiran, co-ordinator at the Eco-Informatics lab at Ashoka Trust for Research in Ecology and the Environment (ATREE) in Bangalore. For instance, companies collect information on income distribution, age groups and occupa-

tion patterns of people in a particular locality when they set up factories or large stores. The information collected from government records and survey results is then integrated with satellite images that create a visual database. This makes it easy to figure out the consumer profile around a store and what products would sell. "Many companies from the wind energy sector have started using GIS to identify the right areas. In fact, telecom companies like Reliance Communications use this technology to map customers," he said.

While most of the GIS related work in India happens within the academic community, in recent years an increasing number of government agencies and private firms have identified it as a key tool.

For instance, India Biodiversity portal provides map-based information on all aspects of biodiversity in India and acts as a discussion forum. Recently, the rural development ministry in Kerala used GIS to layer information on public roads and soil patterns, when deciding how much funds to allocate for the MNREGS. SECON's Appachu says insurance companies use GIS to locate areas of high car theft. At research institutions like the National Centre for Biological Research, GIS is used as a tool for studies in bio-informatics and wildlife sciences, that includes tracking tiger movements with the help of satellite imagery.

Two years ago, when American geographer Paul Robbins and his team from Arizona University visited the School of Desert Sciences in Jodhpur, they wanted to study about the land cover change, human uses, and governance issues at the Kumbhalgarh Wildlife Sanctuary in South Pali district. But within days, Robbins and his team discovered something

that changed the course of their research: contrary to the general view, many areas showed significant regrowth although human use of the forest had destroyed some habitat.

"So what had caused the forest recovery? And what role did human settlements play in this?" Robbins recalled them discussing. The team realised that they had to do something more than merely collecting information on forest land. In a matter of days, they layered all possible information they had collected on a GIS-enabled electronic satellite image. "The surprise here was that, with the help of GIS we found out areas with loss of forest cover were indeed near human settlements, but so were areas of forest recovery — meaning, local settlements were not uniformly destructive of forests and people were fully capable of allowing areas to regrow."

With so much information about people now explicitly spatialised, does GIS trigger privacy concerns?

"There is certainly a concern. It is possible for observers to know where you are at all times, where you are going, and what you are doing," says Robbins. But it isn't just the government, private companies like insurance firms or other interested parties can use GIS to integrate spatial data about people's health status or behaviour in ways that are dangerous and undemocratic.

While the biggest challenge lies in collecting accurate information, experts say entering this information into GIS software and then presenting it in real-time is the biggest task.

"Earlier GIS was viewed as an expensive technology, but things are slowly changing," says ATREE's Kiran. "In sum, GIS is much more than making maps, a tool for conservation science, economic development, and community planning."