REMOTE SENSING

India Struggles to Handle an Embarrassment of Riches

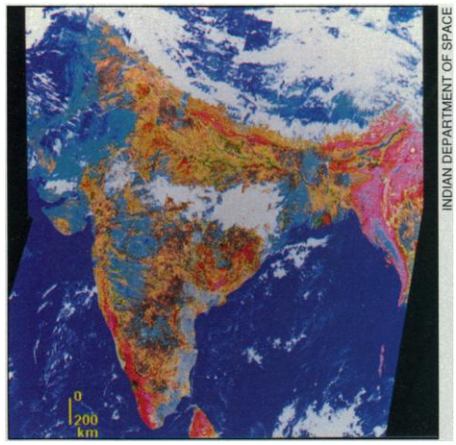
NEW DELHI—The successful launch last December of India's fourth Earth-orbiting satellite—one with the ability to take color images of objects as small as 5.8 meters across—was hailed by government officials as evidence of the country's global ranking in remote sensing technology. But with leadership comes closer scrutiny. A number of high-volume users have begun to complain quietly that India's system is too slow, expensive, and cumbersome to serve their needs. They say its full potential for helping public officials and private organizations keep tabs on everything from schools of fish to soil erosion cannot be realized unless the government eases obstacles—including military restrictions—to the data's availability and concentrates on making the system more user-friendly.

"The technology is still largely in the experimental stage," says agronomist Maiku Lall, deputy commissioner for crops in the Ministry of Agriculture. Voicing the frustration of users who have endured long waits for data that fell short of expectations, he says, "Government departments are more like guinea pigs for the remote sensing scientists to perfect their technology." As a result, he adds, "NRSA [the National Remote Sensing Agency] is not yet at the point where government officials can use the data to make policy."

Bulusu Lakshmana Deekshatulu, director of the NRSA in Hyderabad, acknowledges the emerging problems that have come with success. "India is using remote sensing more than any other country in the world," he says, but there is "more information flowing in from the IRS series [India Remote Sensing satellites] than we are using." The country is also selling non-Indian satellite data to the rest of the world through a cooperative marketing agreement with a U.S. company.

Remote sensing has long been a priority for the Indian government, which sees it as a way to speed development, particularly in the agrarian sector. Its $340 million investment, although much less than what the United States and Europe have spent, has produced satellites offering features on a par with the U.S. LANDSAT and the French SPOT satellites. The IRS-1C satellite launched in December, for example, employs a panchromatic camera, a four-band multispectral camera, and a two-band wide field camera.

At the same time that it has pursued the latest technology, India also has encouraged broad dissemination and use of the data. NRSA has an annual budget of $8.8 million—$4.6 million from the Department of Space and the rest from selling its services and products—to analyze, store, and disseminate data from those satellites. Nearly all of NRSA's customers are government agencies, among them the ministries of agriculture, water resources, ocean development, environment, and forests. Their planned use of the data includes estimating crop cover and total crop yields, producing drought alerts, assessing flood inundation patterns and designing irrigation systems, designing coastal zone maps and fishery resource patterns, and analyzing forest cover and land denudation.



Uneven growth? This vegetation index map was generated by India's newest satellite, part of its ambitious remote sensing system. Red indicates area of greatest vegetation.

For some users, timeliness is almost as important as the data themselves. Diwakar Sitaram Meshram, chief planner for the federal government's Town and Country Planning Organization, knows firsthand about waiting for data. Two years ago his agency signed a contract with NSRA for a pilot study to create line maps for 25 towns across India. Although he paid the $50,000 fee up front, Meshram says he's received data for only five towns.

Such delays make it hard to use NRSA data to track changes over time, for instance, to measure the loss of forest cover to development, says Ranjan Verma, director of information systems for The Action Research Unit (TARU), a nongovernmental organization based in New Delhi that does contract work for the government and industry. But Verma's complaints don't stop at timeliness. "NRSA often slips up on quality," he says, citing one case in which TARU spent an estimated $5000 or more to process and clean up NRSA data for a development plan for Palamau District in northern India. Verma would like to see NRSA put more effort into effective marketing of the data as well as developing better satellites. "The people at NRSA are very good scientists doing good research," he says, "but they are not professional enough in data marketing, which is a different ball game."

NRSA's Deekshatulu admits that there are too many high-density tapes at the agency's National Data Center and too little expertise on how to archive the data properly: "Evaluating, calibrating, standardizing, and rectifying the data and making it user-worthy is a tedious and lengthy process." Deekshatulu says that the situation should improve later this year when the agency switches from magnetic tapes to optical disks. The upgrade will also help the agency cope with the increased flow after satellites are fitted with microwave sensors in 1998–99 to see through cloud cover. But he notes that NRSA also faces the challenge of educating its users, because many agencies are not familiar with the technical details of obtaining the data.

Federal planner Meshram believes that the problems aren't limited to timeliness and quality, however. Too much of the data, he says, is plain unavailable: "Chunks of data are often missing from maps or digital data sets because the Ministry of Defense has the first say."

The role of national security in vetting remote sensing data is a sensitive topic for the government. Although many users say privately that military censorship is routine, few are willing to speak publicly. For his part, Deekshatulu maintains that "we do not mask any data and all data are available, both nationally and internationally, without restrictions." He adds, however, that "we do keep the defense office informed" about what data have been requested. A spokesperson for the Defense Ministry declined to comment, noting that "even to talk about remote sensing is classified."

Users hope that growing demand will make the government more responsive to its customers. "As more and more people outside the government use the remote sensing data, [the system] may be perfected to the point where there should be a very fertile domestic market," predicts Subash Marcus of Development Alternatives, a nongovernmental community organization based in New Delhi. Deekshatulu hopes that day is not too far off. "NRSA is now seriously getting into commercialization," he says. "Our goal is to become self-sufficient in 5 years."

–Pallava Bagla

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