

Geospatial Tools for Ecosystem Restoration

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India has initiated several schemes to promote ecosystem restoration. These include restoring 26 million hectares of degraded lands by 2030, conserving 157 wetlands, and restoring around 2,228 waterbodies. These conservation spaces have been identified using geospatial tools, which are emerging as the best bet for informed decision-making.

For instance, the Indian Space Research Organisation (ISRO) has developed portals such as Bhuvan, Meteorological and Oceanographic Satellite Data Archival Centre (MOSDAC), and Visualisation of Earth observation Data and Archival System (VEDAS), that provide access to a range of data sets and tools, which students and researchers can use for geospatial analytics.

Geospatial tools provide near real-time images for managing and monitoring blue infrastructures such as lakes, wetlands, and rivers and green infrastructures such as forests, wastelands, and farms. These tools can also be used in replantation programmes post the closure of opencast coal mines. A large number of mines would be retired in the coming years, and rehabilitation plans can reduce the threat to the population living around them.

How it works

Geospatial tools provide data that can be used to formulate policy. For instance, recent geospatial studies on urban sprawl, urban heat islands, and population growth warn us of the dire consequences of reducing green spaces within city limits. According to experts, satellite imageries have revealed that rapidly urbanising cities, such as Bengaluru, have witnessed a 525% growth in built-up areas in the last four decades at the cost of vegetation cover (-78%). A

satellite-based land-use change study of Nagpur pointed out temperature fluctuations in the city, underlining the negative impact of the urban heat effect. Realising the potential of geospatial tools, the Government liberalised regulations on geospatial data and modern mapping technologies in February 2021.

Geospatial tools and analyses help identify ideal locations for ecosystem restoration. A mix of the latest airborne technologies would aid in the real-time monitoring of forest fires, wasteland restoration, retired coal mine re-vegetation, and wetland conservation. Geospatial data would also be crucial in identifying air pollution caused by different sectors (industries, coal mining, waste burning, etc.). Information gathered using geospatial tools can aid in building a robust database that would add much-needed impetus to the National Clean Air Programme (NCAP), another vital cog in India's ecosystem restoration plans. More studies on the effect of urban sprawl in Indian cities and its relation with degrading air quality are essential for restoring clean air. Research institutions and organisations working in the field should conduct workshops, or skill-building training, to promote the use of geospatial tools in ecosystem restoration.

While several schemes are in place, only their effective execution would help restore the environment. The active integration of geospatial tools in ecosystem restoration efforts would help in the efficient monitoring of projects. Real-time updates and interventions would ensure that projects are completed on time without undue delay or expenses.

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