

MAPPING SANITATION

Hexagon Geospatial's technology is helping an Indian city resolve its poor sanitation and provide a better life to the less affluent communities.

Lack of adequate sanitation is a major cause of deaths and diseases in a developing country like India. Poor sanitation not only adversely affects the quality of water and environment, but also has economic consequences and harmful effects on physical and mental well-being of the citizens. While there are many active developments focused on improving the infrastructure of more affluent areas, many of the informal settlements remain some of the most neglected vicinities. In the Indian state of Maharashtra alone, more than 11 million people are affected by open defecation.

However, a civil society organization — Shelter Associates (SA) — aims to convert urban informal settlements into housing societies, to provide safer and cleaner environment, thereby giving access to basic services like water, sanitation, etc. Working in the informal settlements of Pune, Pimpri-Chinchwad, Navi Mumbai, Kolhapur, and Sangli cities of Maharashtra, over the period of last two decades, SA has facilitated successful community and household sanitation projects. The launch of Swachh Bharat Mission by the Government of India, gave a further thrust to SA's work. Thus, SA focused its attention to household sanitation in informal settlements by launching 'One Home One Toilet' (OHOT) model

to overcome inadequate sanitation facilities in Pimpri-Chinchwad. Although along with inadequate sanitation, inadequate data was also a looming problem.

Limitations of conventional system

The success of any mission or program depends upon the credible data and an institutionalized tracking mechanism to measure the impacts or the adversities. Currently, in most of the Indian cities' plan there is dearth of precise data and if at all it is present, it is typically secondary data. It does not contain a detailed understanding of the existing



Pre intervention: Identifying the current places for defecation in Balajinagar settlement, Pimpri-Chinchwad



“ We believe that real time spatial data serves as a powerful planning tool in the delivery of essential services that are lacking in the urban informal settlements like housing, sanitation, water supply, electricity, waste management etc. This helps to plug the gap thereby ensuring equitable distribution of resources to the urban poor. ”

Pratima Joshi
Founder & Executive Director,
Shelter Associates

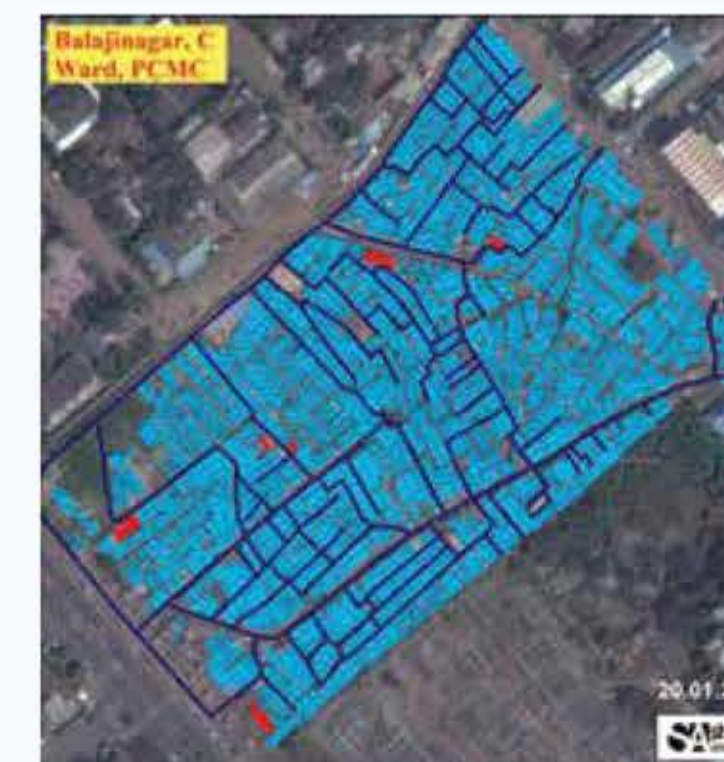
infrastructure or topography. This absence of spatially accurate and up-to-date data, which would allow cities to explore solutions, was one of the biggest challenges faced by the Shelter Associates team.

Enter Hexagon Geospatial

To overcome this challenge, SA opted to link the collected data with a GIS-based platform,

which could be accessed and analyzed in detail — it would facilitate data representation and identify the gaps in delivery of sanitation. Shelter Associates turned to Hexagon Geospatial's GeoMedia as an apt solution. GeoMedia is a comprehensive and dynamic GIS, which extracts powerful intelligence from geospatial data and integrates it to present actionable information. It links the queries together and view dynamically updated results as data changes.

The Shelter Associates' GIS team digitized all the houses and drainage lines on GeoMedia. The map with combined



Mapping new drainage lines and community toilet blocks using GeoMedia in Balajinagar settlement, Pimpri-Chinchwad



Post Intervention impact-Balaji Nagar, PCMC

geographic data from different sources is integrated onto a GIS platform. Several layers viz. sewer access locations, gutter lines, garbage bins, roads, water stand posts, taps, and community toilet blocks are then added. The household-level data obtained from Rapid Household Surveys (RHS) is attached to the digitized data. Following which the SA GIS team builds complex queries of the data, checking whether all houses on map are numbered, measuring proximity to water supply and drainage, identifying the occupancy of the structures, identifying the location of waste collection. This spatial data on analysis, gives rise to a comprehensive real time dataset which helps in targeting urban informal settlements strategically for carrying out interventions.

Efficiencies achieved

Hexagon Geospatial's GeoMedia efficient utilization of spatial data has helped Shelter

“ Hexagon Geospatial's GeoMedia has been the best planning, monitoring and tracking tool for us throughout the implementation of our projects everywhere. ”

GIS Team
Shelter Associates

Associates in mapping informal settlements lacking household sanitation and studies the existing drainage networks.

It has also facilitated in creating data on an open platform, allowing it to be analysed and studied by both Shelter Associates and the Urban Local Bodies (ULBs) for the first time. After the analysis, it is published on Google Earth enabling open viewership for everyone.

This data provides a useful planning tool to devise strategies for delivering sanitation solutions over a period of time and make budgetary provisions accordingly. The detailed data of each city where SA has been carrying out its interventions such as: Pune, Pimpri-Chinchwad, Sangli, Kolhapur, Navi Mumbai and Thane have been helping the respective city administration to plan their budgets for identifying, planning and adding/repairing/augmenting drainage lines.

Benefits galore

- Provides precision, accuracy and cross querying tools which enables the integration of data effectively
- Efficiently coordinates community mobilization activities, monitors and tracks the toilet construction processes
- Provides a portable dataset, speeds up the entire processes and results in on time delivery of the project
- Flexible and open architecture adds transparency for the funders