



## URBAN OBSERVATORIES FOR ENHANCING QUALITY OF URBAN LIFE

**Bharath H. A**

*Energy & Wetlands Research Group, Center for Ecological Sciences [CES]*

*Indian Institute of Science, Bangalore, Karnataka, 560 012, India*

*RCGSIDM, IIT Kharagpur, Kharagpur, 721302, India*

\*email: [bhaithal@iitkgp.ac.in](mailto:bhaithal@iitkgp.ac.in)

Urban India has been evolving out of complex, interrelated rural urban neighborhood with unique challenges and impacting the growth and health of cities in every country. More than half the world's population lives in cities due to the opportunities and increased standard of living. It is expected that by 2050, the urban population will reach to ~ 70%. This essentially necessitates understanding of urban growth phenomenon, making an impact on individuals and communities. This creates a need to collect and archive urban data for effective visualization of the process. This information is collected by most of global cities but not on a matching scale and context. Due to these limitations, despite data availability, there is limited knowledge and understanding required for planned urban path. Also, there are still lack of consistent, shareable plans illustrating various urban data starting from housing maps, street network maps, electric grids, water supply maps, and other essential infrastructure. There is no sense of comparative scale or complexity. In this context, the urban observatory addresses the need for a systematic method of data archival, access, visualization etc., and creates common platform for researchers, students, administrators enabling simultaneous data retrieval. Thus, urban observatory empowers global citizens to examine, compare, and comparative assessment of the urbanization process across cities.

Currently data that has been acquired for various stages by various users have certain drawbacks such as

- Academic / Private participants cannot use near real time data- Spatial data policy – Restrictions;
- Lack of appropriate information-Infrastructure, etc.;
- Inadequate information of the regional remote sensing centers, State centers, ISRO, Academic institutions, etc.;
- Absence of data interoperability and integrity (absence of data validation);
- Inaccessible digital repositories;
- Absence of access to spatial information of highly volatile and dynamic synergy of information, technology, etc.;

- Lack of real time data applications in the community based governance.
- Base or structure of practices and relationships among data producers and users that facilitates data sharing and use is not clearly known
- lack of actions and new ways for accessing, sharing and using geographic data enabling mechanism;
- absence of crowd sourced data validation and updating in near real time; and
- missing meta data in most repositories.

This essentially highlights the need for:

- Clean data: filling of missing values, identification or removal of outliers, resolving inconsistencies
- Data integration and normalization or Aggregation
- Data discretization: for numerical data
- Data aggregation, dimensionality, compression, generalization
- Near real time capabilities: Missing, No dedicated setting
- Data sharing policy – Not in place (map policy 2005, RS data policy 2016, Aerial photography policy 2011)
- Need to maintain ISO data standards and BIS standards

The concept behind the urban observatory is to create a Spatial data infrastructure (Figure 1) to access, regulate and maintain accurate data. The goal is to open up data and provide people with access to the dynamic content from cities. Using digital maps, they will be able to compare and contrast information for greater understanding of life in the 21<sup>st</sup> century.

Users can simultaneously visualize the most important questions that impact today's cities, by taking advantage of cloud computing, advanced display technology, and rich repository of data. In addition, they can interact and provide their own user-generated content. Ultimately, users will be

able to have the key understanding of unified authoritative data in comparative format.

Finally, a proposed Urban observatory would look like as shown in Figure 2. This paper is intended to provide a knowledge of an improved structural repository to store urban data and to make it accessible to users and making it interoperable to any platform or user request.

Keyword: Urban Observatory, Spatial data infrastructure, urban India

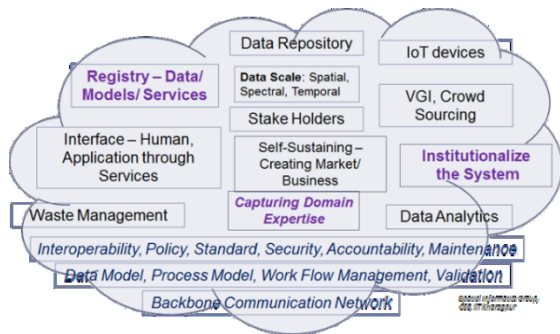


Figure 1: An example of SDI developed at IIT Kharagpur

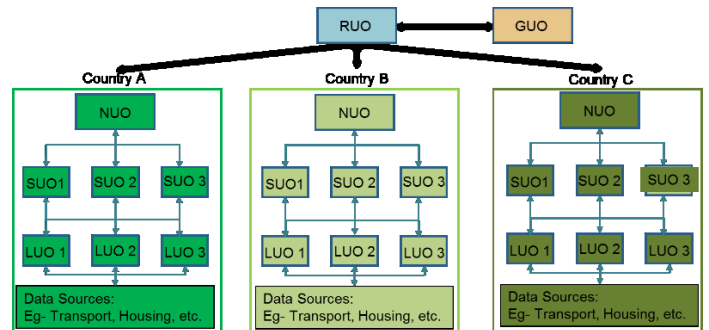


Figure 2: Example of Proposed urban observatory