

HARNESSING DATA FOR URBAN TRANSFORMATION

Empowering Cities through Informed Decision-Making

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Outline

- ❖ Introduction
- ❖ Data collection methods & analysis techniques
- ❖ Case studies
- ❖ Data challenges
- ❖ Recommendations

Introduction

- ❖ Urban transformation in India requires a multi-dimensional and collaborative approach involving government, private sector, local communities, and other stakeholders.
- ❖ The areas requiring transformation being:
 - Infrastructure Development (mobility solutions, drainage, water supply, sewerage, etc.)
 - Housing and Slum Redevelopment:
 - Waste management, plastic waste reduction and Recycling
 - Water and Sanitation
 - Climate Resilience (energy efficient buildings) and Disaster Preparedness
 - Culture, Heritage & Architectural preservation
- ❖ Different types of data, that provide insights leading to informed decision-making, improve city services, and enhance overall urban development are crucial to such Urban Transformation.

Data Collection Methods and Analysis Techniques

Effective urban planning involves a **combination of data collection methods and analysis techniques**, depending upon the specific needs and context of the city.

Deployment of **advanced analytical tools such as GIS contribute to a more holistic understanding of urban dynamics**, facilitating informed and sustainable planning decisions.

Data Collection Methods

- Census Data
- Govt. records on permits, licenses, consumers, etc.
- HH/ Stakeholder surveys
- Mobile Apps, Social Media and Crowdsourcing
- Remote Sensing
- Aerial Photography & LiDAR surveys
- Topographic Surveys
- Sensors and IoT Devices

Data Analysis Techniques:

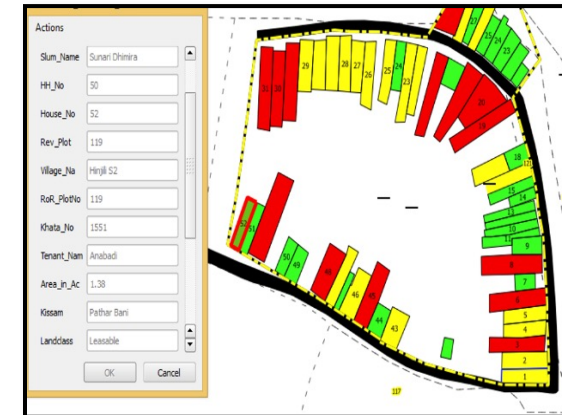
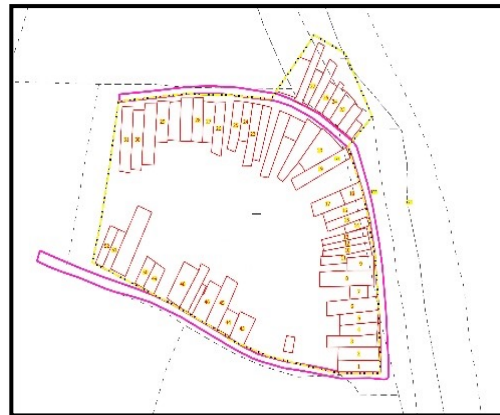
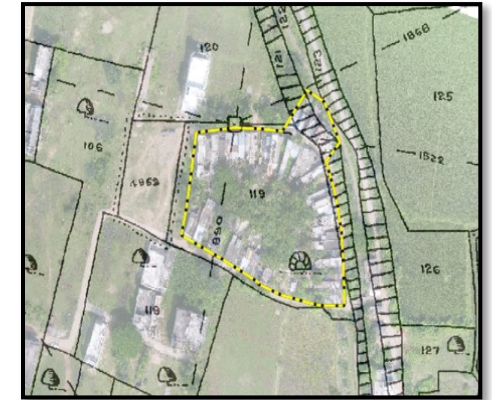
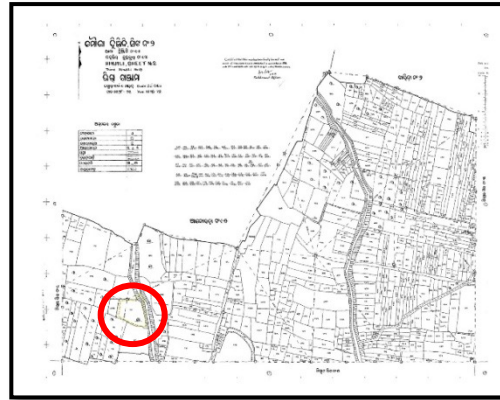
- Statistical Analysis
- Time-Series/ Trend Analysis
- Social Impact Assessment
- Spatial Analysis (GIS)
- Network Analysis
- Visualization (charts, graphs, maps)
- Predictive Modelling (ML)

CASE STUDIES

Data driven initiatives to address urban/ environmental challenges

Odisha Jaga Mission: Slum to Livable Habitat

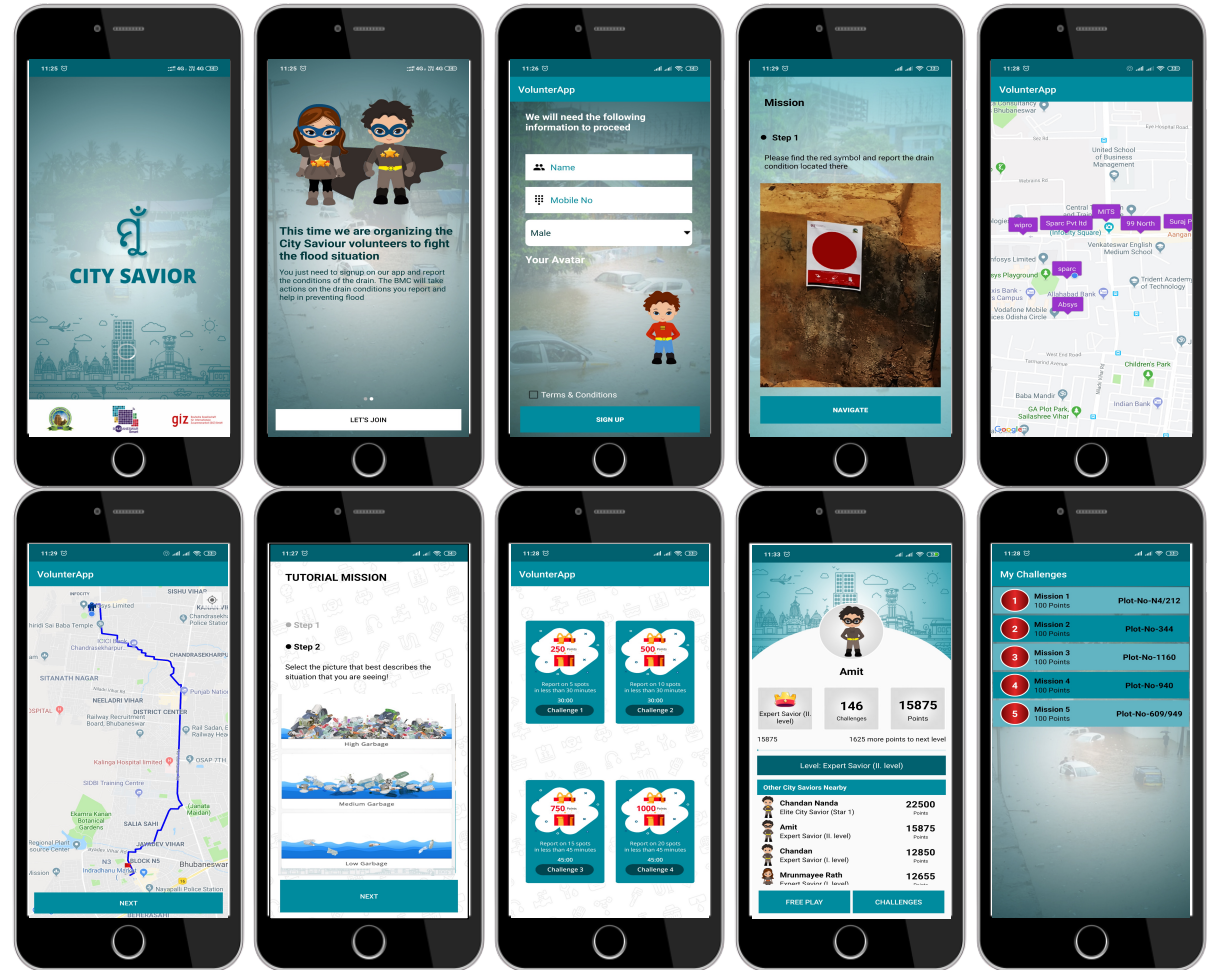
- ❖ Land rights assessment completed in 114 ULBs covering about 2 million slum dwellers (~400,000 households) in a span of less than 2 years using GeoICT Technology (GIS, UAV, Mobile, Cloud).
- ❖ The objective and transparent technology process led to a dispute-free implementation.



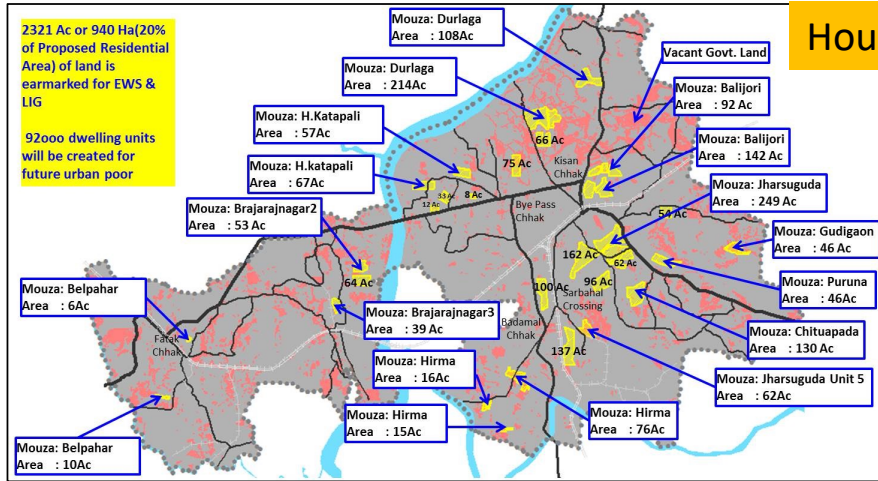
- Legend
-  Slum Boundary
 -  Revenue Plot Boundary
 -  Road
 -  In Situ Plot
 -  Shift Plot
 -  Area <=30 Sqm
 -  Area >30 & <45 Sqm
 -  Area >45 Sqm

Crowd sourcing data for alleviation of Urban Flooding

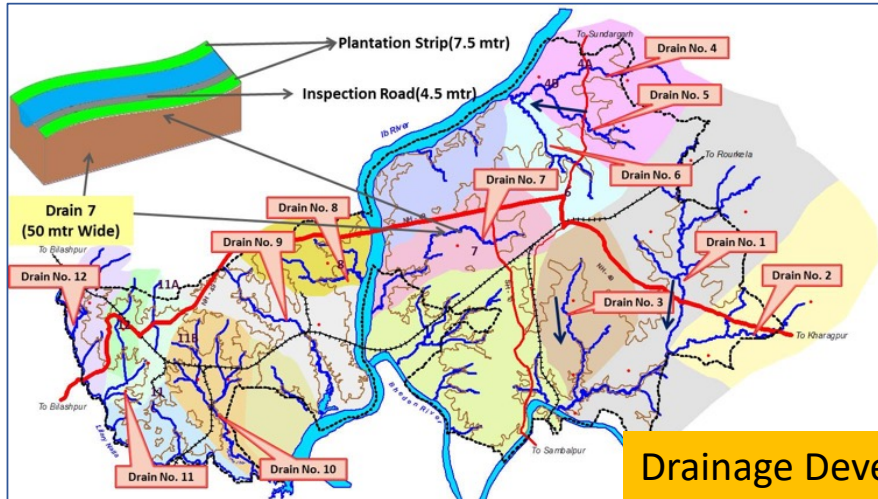
Mu City Savior Mobile App, an ICT-based digital solution, developed by SPARC and supported by GIZ, engages the citizen of Bhubaneswar with a mobile game to crowd-source real-time location-based information about the status of urban drainage infrastructure for timely preventive actions by municipal authorities and keep drainage-congestion areas safe from flooding and waterlogging.



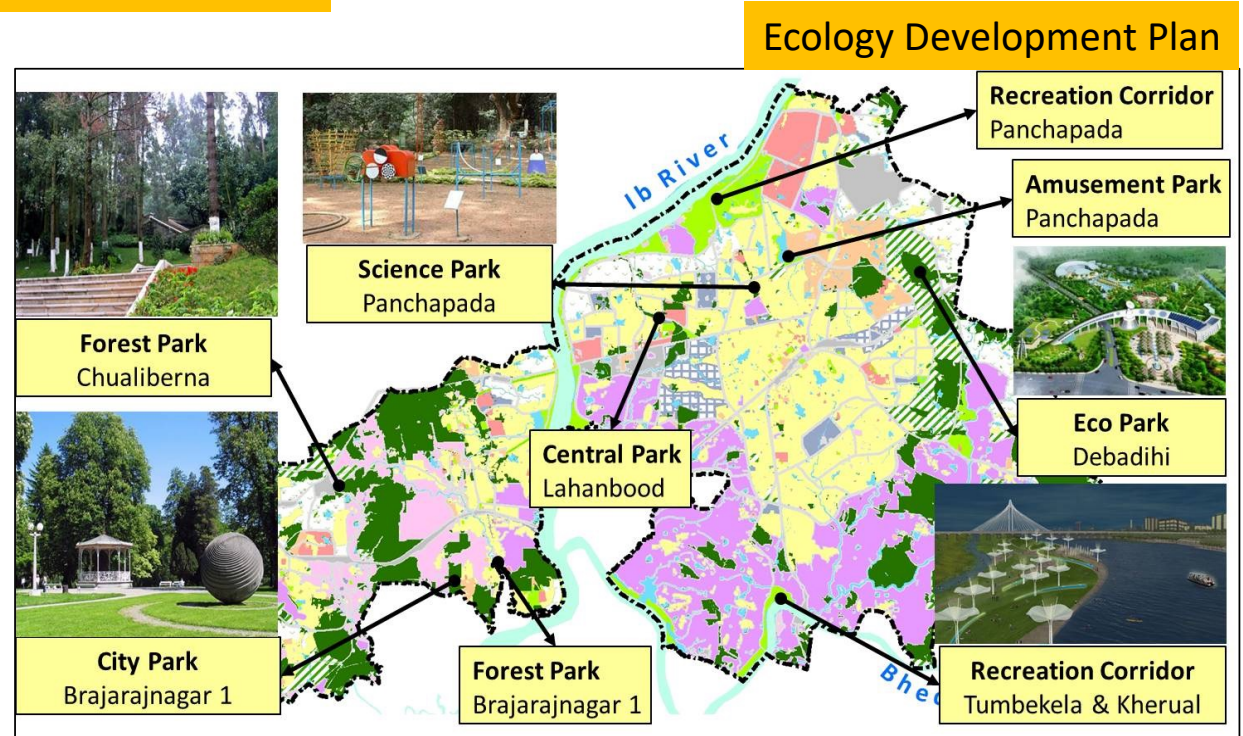
Digital Master Plan for Jharsuguda



Housing for Urban Poor



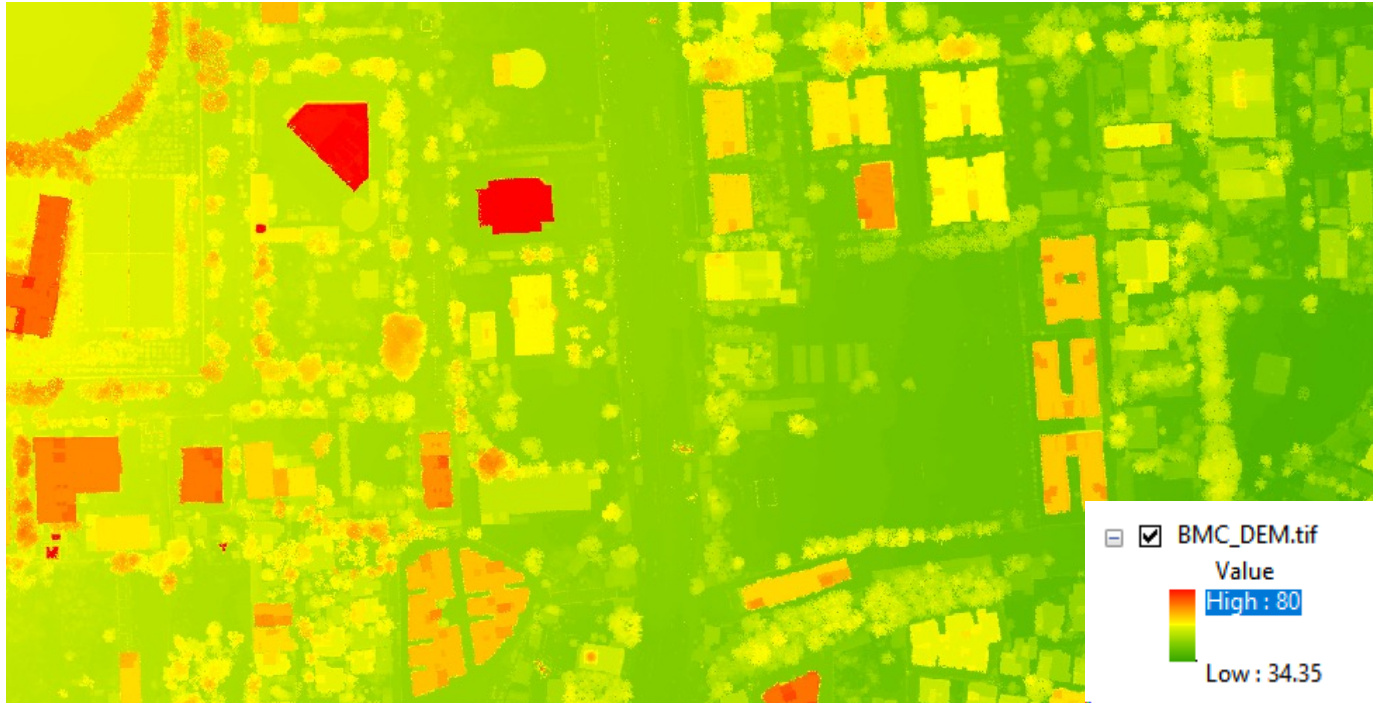
Drainage Development Plan



Bhubaneswar Spatial Data Infrastructure

- ❖ Spatial data is crucial for urban planning, management and decision-making.
- ❖ SDI provides the framework to generate, organize, share, and use the spatial data across various sectors and stakeholders of the urban area adhering to data standards.
- ❖ SPARC, under the aegis of ORSAC supported by NSDI, implemented the SDI Pilot project for BMC area deploying **Aerial LiDAR Survey (10cm GSD)** to generate high quality spatial data for effective decision making.
- ❖ **60+ data layers (DEM, orthoimage, land use, contour, drainage, transport network, etc.)** were generated with highest precision in **1:2000 scale**. Cadastral & CDP data were integrated holistic planning.
- ❖ The Spatial Data Infrastructure (geospatial database with metadata) is being **utilised by customised urban application for infrastructure, land use planning and management.**

Bhubaneswar SDI

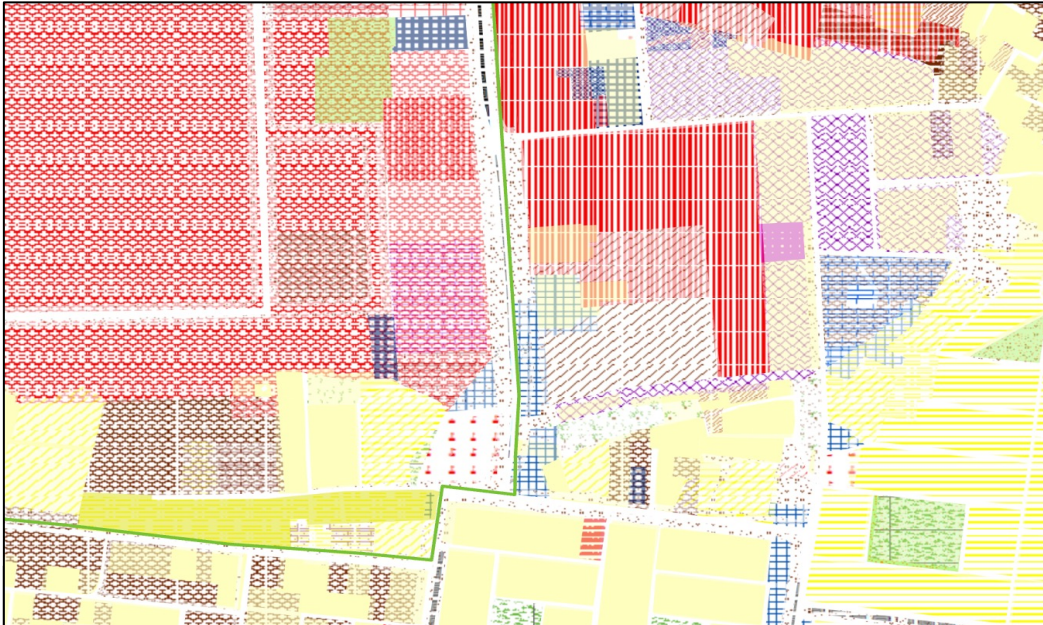














Digital Elevation Model

3D vizualisation



Bhubaneswar SDI



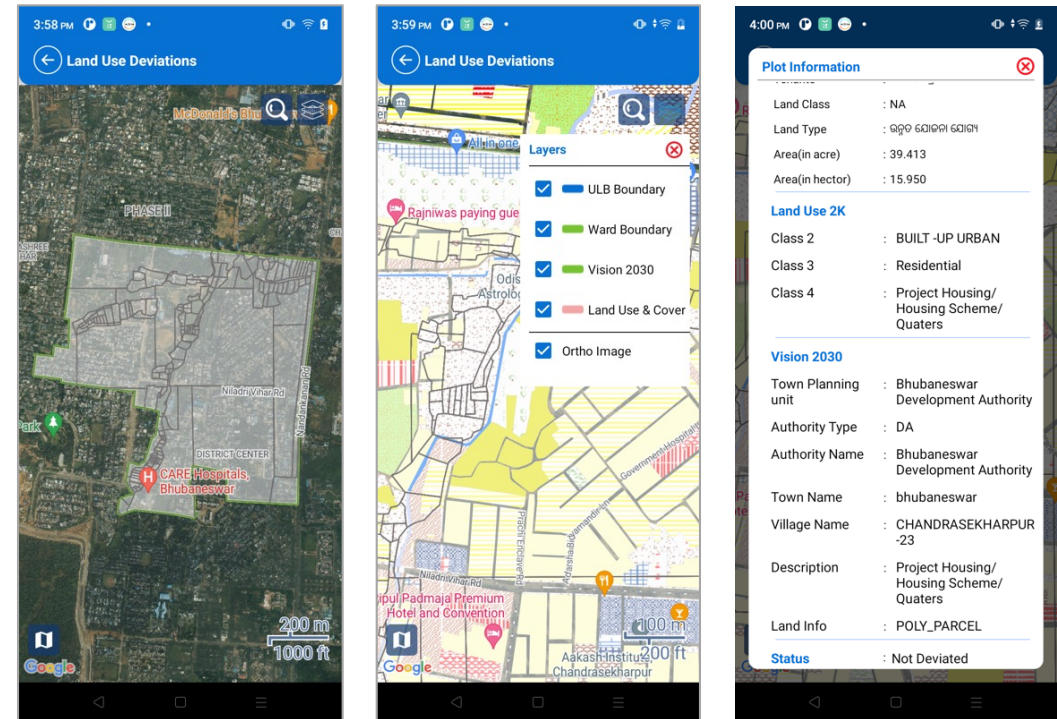
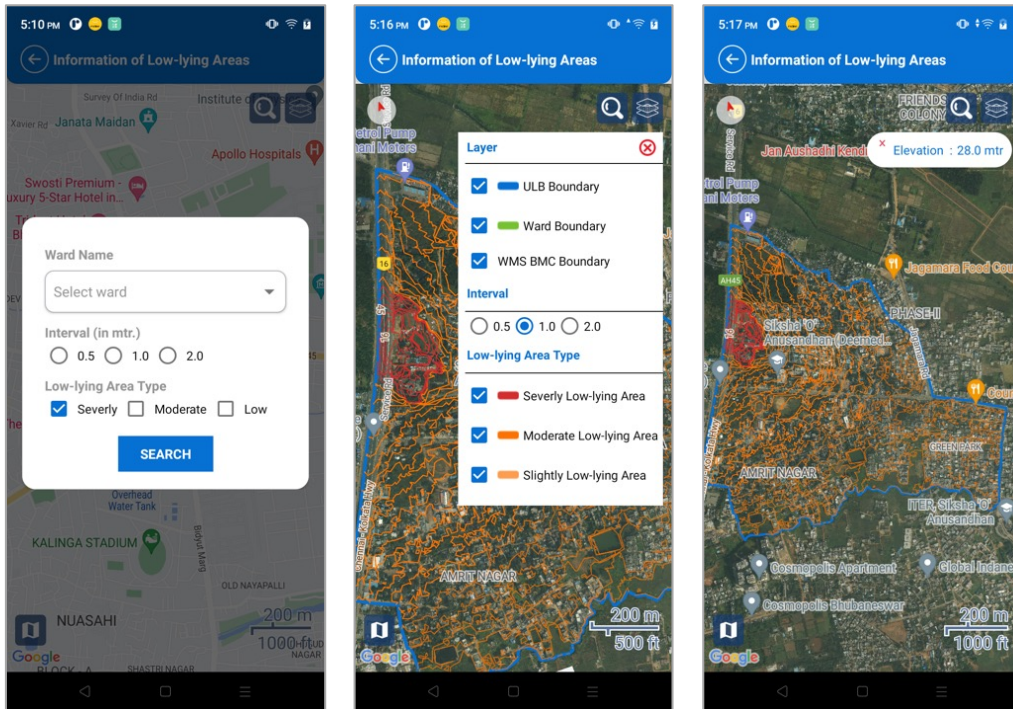
-  Dairy / Poultry Farm
-  Educational Centers
-  Electric Substation / Grid Station / Distribution Unit
-  Embankment
-  Exhibition ground / Maiden
-  Farm Houses
-  Fire Station
-  Forest / Coastal / Strip Plantation
-  Govt. / Semi Govt. / Other Offices / Institutions
-  Gurudwarn
-  Hazardous Industry (Chemical)
-  Heavy Industry

Land Use (2022)

Orthoimage and Contour



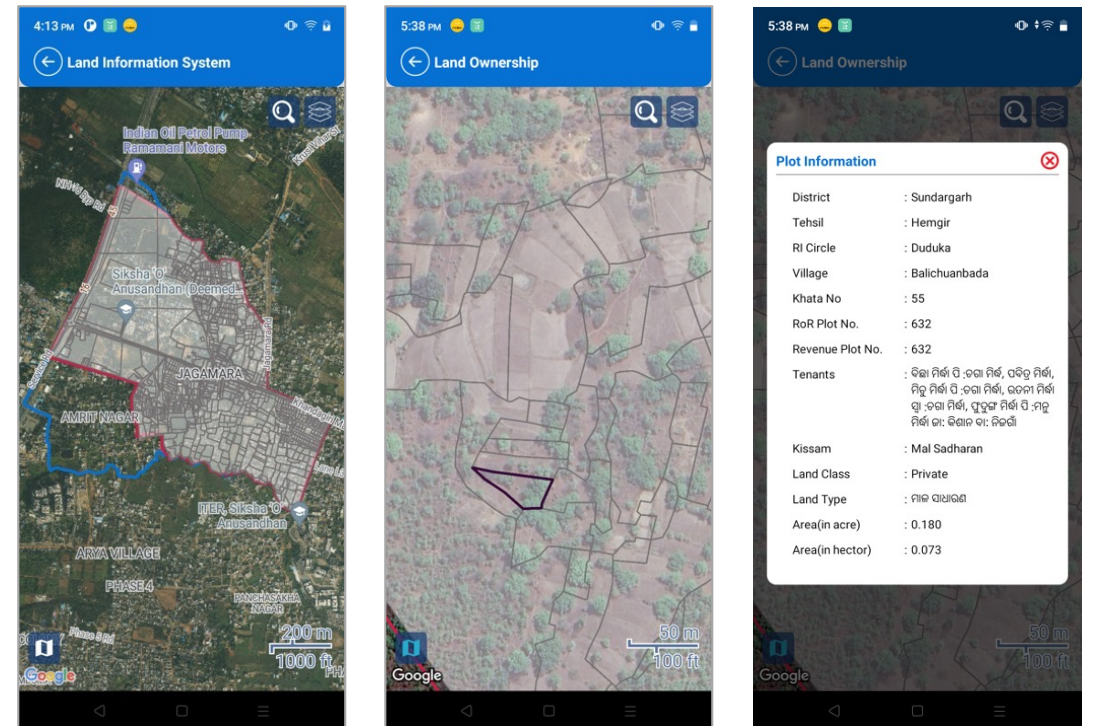
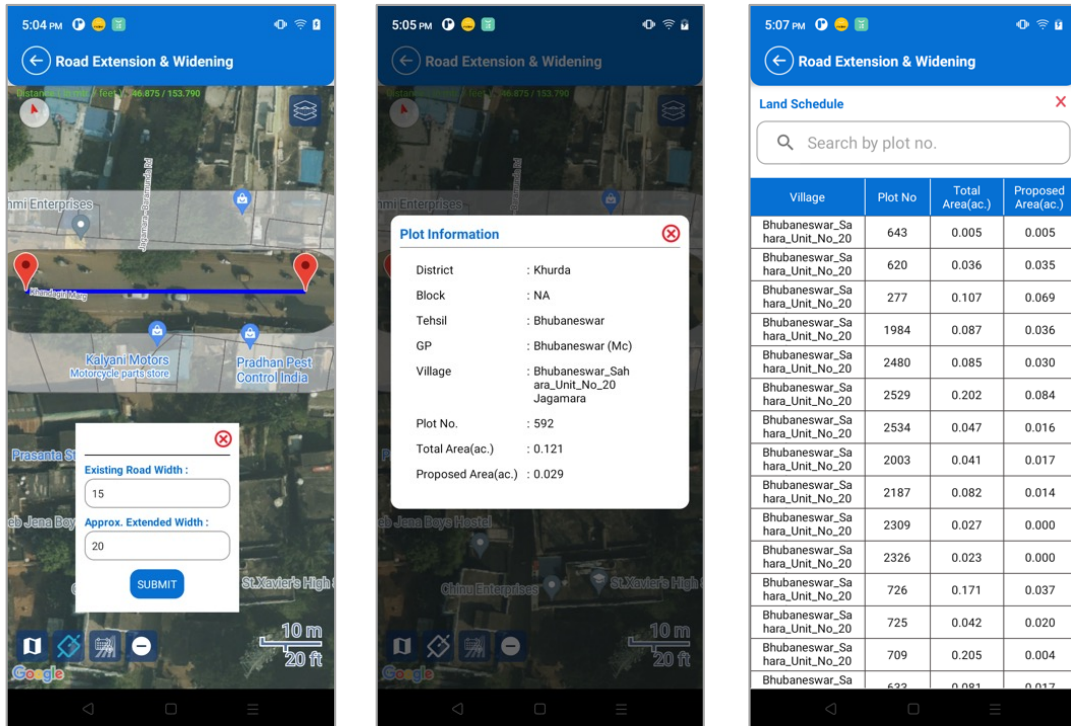
Elevation information



Land use change detection

Bhubaneswar SDI

Road extension/ widening



Land Ownership Information

- ❖ Harnessing data for Urban transformation would entail overcoming certain challenges, few of which are listed below.
 - Technological **infrastructure** (software, hardware, people, etc.)
 - **Data quality & standardization**: heterogeneity in formats, standards, and quality
 - Data **accuracy and currency** (timeliness)
 - Data updation/ **maintenance and data security**
 - **Policy framework for data ownership, sharing, and usage.**
 - **Integration of fragmented data systems**: different agencies often work in silos.
 - **Capacity (skill)** to effectively manage and interpret the data.

Recommendations

- Urban authorities should aim at maintaining a repository of high quality, up-to-date data of different types avoiding duplicity and make such data available for various urban applications
- Implementing a robust Spatial Data Infrastructure in the urban context contributes to more informed decision-making, efficient urban planning, and improved service delivery.
- It enables stakeholders to collaborate, share data seamlessly, and harness the power of data for sustainable urban development.

Key components of Urban Data Infrastructure:

- Data Standards and Interoperability
- Metadata Catalogs
- Data Repositories (spatial and non-spatial data)
- Web Services and APIs
- Data Sharing Policies:
- User Interfaces and Visualization Tools
- Capacity Building and Training:
- Regular updates and improvements with user feedback

Thank You !

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