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MAKING SPACE ACCESSIBLE AND AFFORDABLE TO ALL COUNTRIES

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HUMAN SETTLEMENTS AND HOUSING ISSUES

USING SPACE TECHNOLOGY TO TACKLE DIGITAL DIVIDE

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ABSTRACT

Informal settlements accommodate more than fifty percent of the population of many cities which means that most of the housing programs are long term and are subjected to change over the decades. These projects are highly contextual and are concept oriented. There is a need for a system which makes the process of solving housing crisis painless. Making use of the advancement in Space technology, one can enlist all the data obtained by satellite mapping over the years which would be crucial for the development of these long-term projects. Remote Sensing can be used to classify and map land cover and land use changes with different techniques and data sets.

Space technology should be introduced in the construction industry. A reliable database with sound space technological application can provide sustainable design and construction process, which would be a step towards creating positive living environment for everybody.

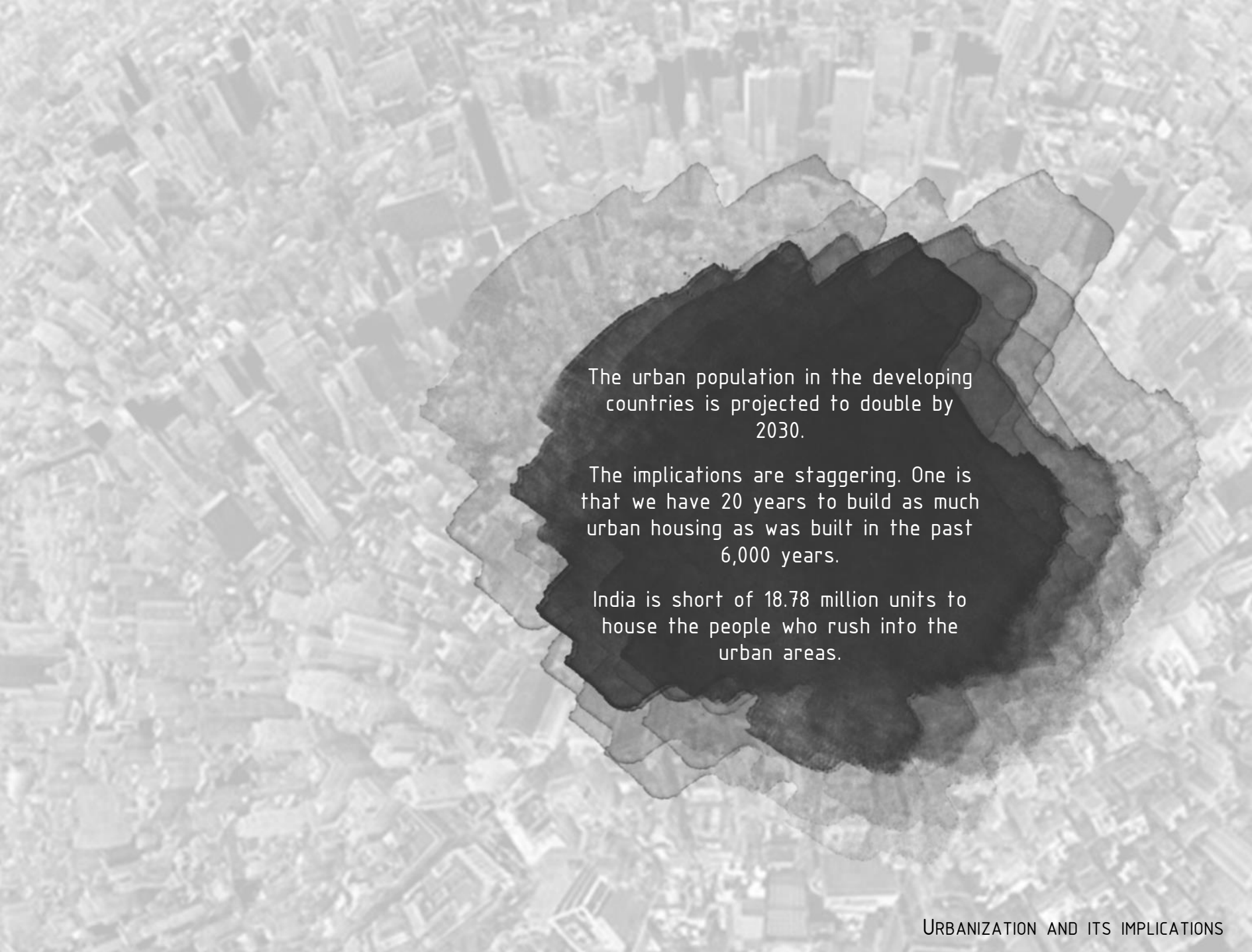
Trends of our age

Housing issues

Housing as a long term project

MODERNIZATION INDUSTRIALIZATION GLOBALIZATION INTERNATIONALIZATION

URBANIZATION ⟺ DIGITAL INFORMATION AND COMMUNICATIONS TECHNOLOGY



The urban population in the developing countries is projected to double by 2030.

The implications are staggering. One is that we have 20 years to build as much urban housing as was built in the past 6,000 years.

India is short of 18.78 million units to house the people who rush into the urban areas.

Informal settlements accommodate more than 50% of the population of many cities.

Characterized by,

- FLEXIBILITY
- RESPONSIVENESS
- AFFORDABILITY
- INCREMENTALTY

Constrained by,

- LACK OF OFFICIAL OR RECOGNIZED SUPPORTS
- INSECURE LEGAL STATUS
- UNDER-SERVICED BY URBAN INFRASTRUCTURE
- UNHEALTHY LIVING ENVIRONMENTS
- PHYSICALLY UNSAFE

Virtually all permanent and serviced housing is procured as an **incremental process** that takes place over relatively long periods of time. Only a minute segment of any society—that is, the very wealthy— has the resources to purchase outright or construct their dwellings as a one-off event.

Upper and middle income households with regular incomes and collateral have access to long-term credit—housing loans and mortgages—that may take between 15 and 30 years to redeem.

Households **with low or irregular incomes** and no access to formally recognized collateral construct minimal basic dwellings, which they extend and improve as resources become available and as the need for bigger or better structures becomes a priority. This process of extension and modification can take decades—or may be never ending.

Housing projects are highly **CONTEXTUAL** and are concept oriented. Long term projects are subjected to changes which affects the process. While the strength of the project is dependent on how well it can sustain in the location, it becomes necessary to observes the changes it is susceptible to.

CHANGES IN **PHYSICAL ENVIRONMENT**

- Land use
- Land cover
- Vegetation cover
- Growth
- Development
- Availability of Resources

TECHNOLOGICAL CHANGES

Advancements in technology

POPULATION CHANGES

Increased migration

CHANGE IN **ECONOMY**

CHANGE IN **SOCIAL STRUCTURE**

MONITORING THE CHANGE OVER THE YEARS GIVES US A STRONG STAND IN THE PROCESS OF DECISION MAKING.

MAKING USE OF THE **ADVANCEMENT IN SPACE TECHNOLOGY**, ONE CAN ENLIST ALL THE DATA OBTAINED BY SATELLITE MAPPING OVER THE YEARS AND CREATE A DATABASE WHICH WOULD BE CRUCIAL FOR THE DEVELOPMENT OF THESE LONG-TERM PROJECTS.

Housing programs in india

City of Mysore

creating database for affordable housing

National Rural housing programme

Indira awaas yojana (IAY)

INDIA

The UNDP – MoRD partnership with technical support from HUDCO aims to provide Indira Awaas Yojana households the choices in terms of green building designs, materials and construction technologies adapted to local conditions.

1. **Demarcate** the state into distinct 'housing zones' on the basis of climatic conditions, exposure to specific natural hazards, **resource mapping** of locally available skills and construction materials, existing traditional construction practices and design elements related to prevailing socio-cultural practices.
2. Prepare a **compendium** of technologies (building designs, materials, construction techniques and life cycle costs) including existing traditional practices where relevant and with potential for improvement in each housing zone.
3. To **suggest** a set of suitable foundation, walling, roofing options and other building elements specific to each housing zone.
4. **Develop indicative designs** for each housing zone including costing details and suggestions for incremental expansion of the house

National urban housing programme

Rajiv awas yojana (RAY)

India

ABSTRACT:

The paper presented the use of **GLOBAL POSITIONING SYSTEM (GPS) DEVICES** to map informal settlements in Cuttack, India in ways that enhance and supports residents' participation in the data collection and planning process.

Rather than relying on remote sensing to identify informal settlement locations, each settlement is visited individually by a **MAPPING TEAM** comprised of community leaders and NGO staff.

The mapping team meets with settlement boundary using a GPS device. This process is helped to open and sustain a dialogue between the residents of informal settlements and city government around 'slum' upgrading, and has influences the use of central government fund to support local upgrading plans.

The alliance:

SPARC (NGO), NSFD and Mahila milan (community based organisations), and the UDRC (local partner in Orissa)

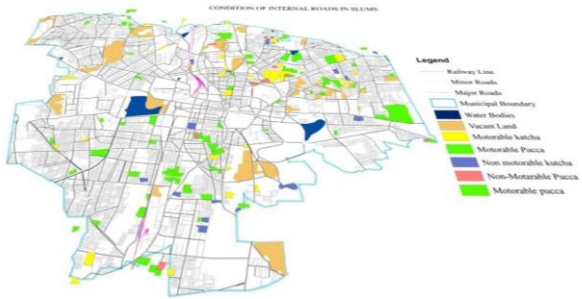

17
88
JLB Road
Devayanahundi Main Rd
Link Main Rd
Ring Rd
Mananthavadi Rd

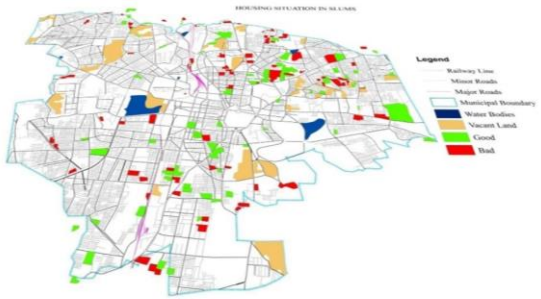
Mysore Urban Planning & Development Authority (MUDA) is an important state level urban authority in Karnataka, India to "Create and improve an economically vibrant, efficient and sustainable basic infrastructure and other facilities in the urban areas of Mysore to enhance the quality of life".

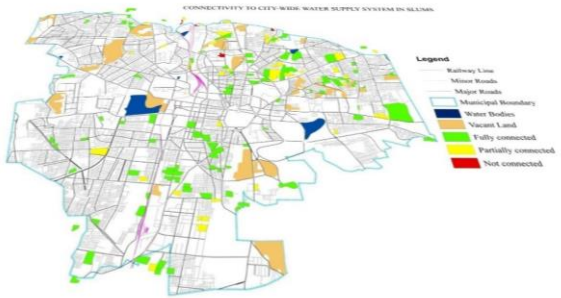
MUDA utilised the services of the **Karnataka State Remote Sensing Applications Centre (KSRSAC)** – the nodal agency for all RS and GIS activities in the state of Karnataka.

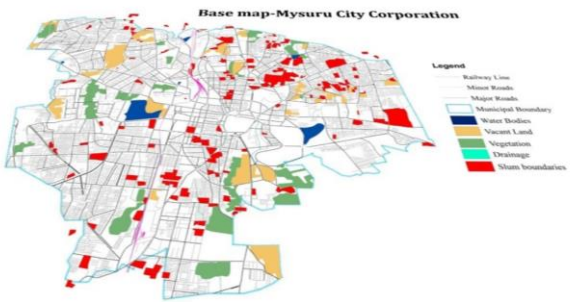
The overall MUDA-GIS addresses the following:

- IRS and high-resolution satellite image based **mapping and monitoring** of city urban spread and urban land use – generating a temporal image-based urban growth and change analysis.
- Organising, Updating and Maintaining a **systematic and detailed GIS database** for MUDA region – including satellite images, generation of about ~31 maps, cadastral and land ownership/parcel data integration, geo-tagging of property/taxation/schemes/financial/industrial/demographic/MIS data etc. This has ensured that MUDA always has an updated image and GIS database available and accessible.
- Development, operations and maintenance of a GIS Decision Support System applications software in support of different MUDA activities like property taxation, planning, urban monitoring, urban management, Master Plan generation, Development Plan generation etc. Specific citizen-services GIS applications for e-services for citizens have also been developed. Citizens have been engaged to interact with MUDA on the discussion on 2031 City Plan and also participation in city development process.
- Establish, Maintain and operational experience of MUDA-GIS facility – which host a set of advanced servers, software, applications and the MUDA-GIS database and MUDA GIS DSS application.









Rajiv Awas Yojana: Slum Free City Plan of Action (SFCPoA)

Mysuru City Corporation

Methodology for gathering information using **GIS**:

- Procurement of Satellite Image (NRSA-, ULB)-Cost Effective)
- Preparation of City Basemap (Geo-Referencing, Features)
- Slum Pocket Identification (Notified, Un notified)
- Slum Boundary Identification (GPS Survey)
- Building Foot Prints, Infrastructure/Utility Mapping
- Unique ID Creation
- Integration of GIS and MIS

SPACE TECHNOLOGY CAN BE INTRODUCED IN THE **CONSTRUCTION INDUSTRY** MAKING IT MORE EFFICIENT TOWARDS BUILDING BETTER SOCIETIES. THIS COULD BE AN INITIATIVE TOWARDS BRIDGING THE GAP BETWEEN THE APPLICATIONS OF SPACE TECHNOLOGY AND THE ASPIRATIONS OF A LAY MAN.

HIGH DEFINITION AND HIGH SPECTRAL REMOTE SENSING DATA CAN BE USED TO MONITOR AND RECORD THE CONSTRUCTIONS AND DEVELOPMENTS IN URBAN AREAS.

CREATING DATABASE FOR DEVELOPING EFFICIENT AFFORDABLE HOUSES

BIGGER PICTURE	DOCUMENTING	OBSERVATIONS	CATEGORIZED
LAND	• LAND USE • LAND COVER	• CLASSIFICATIONS OF DIFFERENT LANDSCAPES • IDENTIFICATION AND ALLOCATION OF LAND FOR HOUSING PROGRAMMES • MAPPING INFORMAL SETTLEMENTS	ZONE-WISE
VEGETATION	• GREEN COVER • GREEN BELTS	• ASSESS QUALITY • UNDERSTAND ITS IMPORTANCE AND NEED FOR POSITIVE LIVING ENVIRONMENTS	
ECOSYSTEMS	• LAKES, PONDS AND OTHER WATER BODIES • PARKS, LANDSCAPES		

SUPPORT	DOCUMENTING	OBSERVATIONS	CATEGORIZED
GROWTH AND DEVELOPMENT	• AREAS OF RAPID URBANISATION	• IDENTIFY PROMISING NEIGHBOURHOODS TO ESTABLISH LIVELIHOODS • PREDICT PATTERS THAT INFLUENCS HOUSING PROGRAMMES	ZONE-WISE
INFRASTRUCTURE	• WATER,ELECTRICITY AND TELEPHONE LINES • STORM WATER DRAIN AND GARBAGE COLLECTION • EDUCATION, HEALTHCARE AND SOCICAL WELFARE	• CONNECTIVITY AND DURATION OF SUPPLY • AVAILABLITY OF SERVICES	ZONE -WISE FEASIBILTY-WISE MATERIAL-WISE
RESOURCES	• MATERIALS FOR CONSTRUCTION	• AVAILABILITY • MOBILITY • FEASIBILITY	
SUPPORT SYSTEMS	• GOVERNMENTAL AND NON-GOVERNMENTAL ORGANISATIONS • PRIVATE DEVELOPERS • FINANCIAL ASSITANCES • DESIGN CONSULTANTS	• IDENTIFY THE APPROPRIATE ASSITANCE REQUIRED FOR THE EXECUTION OF THE PROJECT	

HOUSES	DOCUMENTING	OBSERVATIONS	CATEGORIZED
PROFILE	• SHAPE • HEIGHT • AREA • DENSITY • BUILT AND UNBUILT • ROOF TYPE • FORM	• MONITOR FLOOR AREA RATIOS AND DENSITIES • IDENTIFYING DOMINANT MATERIALS • ESTIMATE COST OF CONSTRUCTION AND MAINTENANCE • CREATE AN INVENTORY OF PREVAILING AND EVOVLING HOUSING TYPOLOGIES	ZONE-WISE FEASIBILITY-WISE
MATERIALS	ROOFING AND WALLING MATERIALS		

PEOPLE	DOCUMENTING	OBSERVATIONS	CATEGORIZED
MOVEMENT	• MOST VISITED PLACES • FREQUENCY	• AREAS OF INTEREST • CULTURALLY SIGNIFICANT AREAS	TIME-WISE ZONE-WISE
DENSITY AND CROWDING	ASSEMBLY OF PEOPLE IN PUBLIC OR SEMI-PUBLIC SPACES	• PUBLIC ACTIVITIES • CULTURAL SIGNIFICANT EVENTS • RIOTS AND FIGHTS	TIME-WISE ZONE-WISE
	SETTLEMENTS	• OPTIMUM DENSITY/CROWDING FOR BETTER LIVING ENVIRONMENT • SIGNIFICANCE OF COMMUNAL SPACES	TIME-WISE

Inference

The best innovation at our disposal should make an impact on every single person regardless of the digital wall that divides us.

Space technology should be focussed towards assisting people to acquire basic requirements such as housing.

A database should be created to support the process of providing affordable houses, towards
Creating better livelihoods

Our approach should deliberate on:

- Decentralised planning systems
- Community/ user level innovations
- Public participation

Sincere thanks to **Christian Feichtinger**, the Executive Director International Astronautical Federation;

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My family.

Thank you