# Bangalore Metropolitan Region Development Authority

# PREPARATION OF BASE MAPS FOR MASTER PLANS

A case study of Bangalore Metropolitan Region

### Shantappa B. Honnur

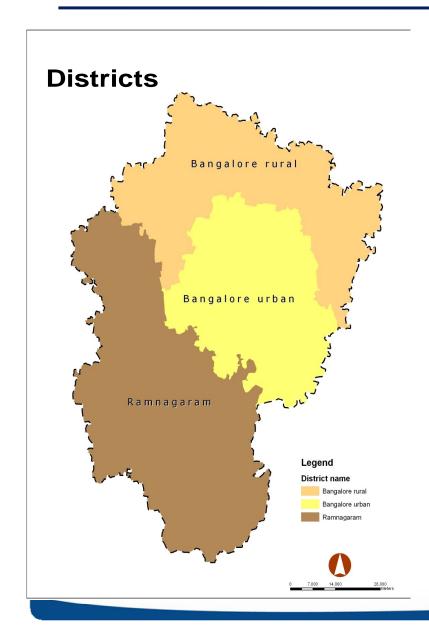
Additional Director of Town and Country Planning, BMRDA and

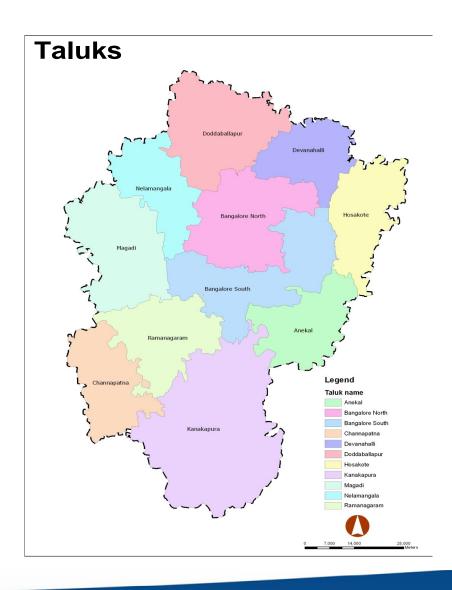
Director of Town and Country Planning, Bangalore

## **Agenda**

- Introduction to BMR
- Extension of KTCP Act,1961
- Preparation of Base map
- Scope of Work
- Approach and Methodology
- Stages of Map preparation
- Preparation of Master Plan and case studies
- Latest trends-Geospatial technologies for effective urban planning
- Condusions

## Introduction to BMR





### Introduction to BMR

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### ULB's, UDA's and PA's in BMR

□ NUMBER OF ULB's: 11

**One Corporation** 

3 CMC's:Ramnagar, Channapattana, D.Ballapur

7 TMC's: Magadi, Kanakapur, Vijayapur, Devanhalli,

Anekal,

Hoskote, Nelamanagal

- 284 Gram Panchayats covering 2551 villages
- NUMBER OF UDA's TWO
- □ NUMBEROFPA'S SIX

## Introduction to BMR

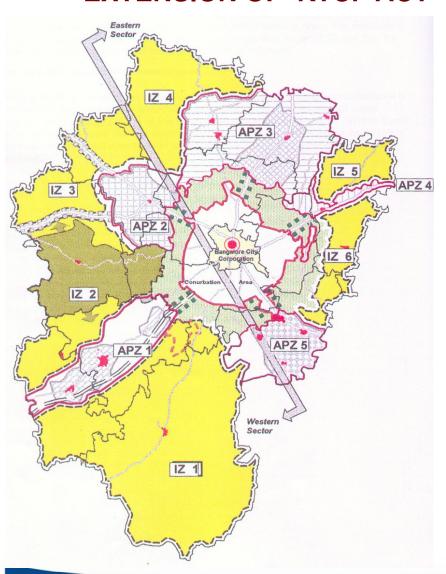
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#### PLANNING FOR BANGALORE METROPOLITAN REGION

Areas within BMR	Area in Sq. Kms.
1. BDA	1219.50
2. BMICAPA	426.24
3. RCUDA	63.06
4. Anekal LPA	402.30
5. Nelamangala LPA	735.00
6. Magadi LPA	501.52
7. Hoskote LPA	535.00
8. Kanakapura LPA	412.78
9. BIAAPA	792.00
10. APZ-I (excluding RCUDA & BMICAPA)	462.50
11. All IZ's in BMR	2455.00
TOTAL BMR	8005.00

## Extension of KTCP Act, 1961

**EXTENSION OF KTCP ACT TO AREA PLANNING ZONES** 



#### WHY INTERIM MASTER PLAN?

- There were no base maps for the Local Planning Areas.
- In view of the increased intensity of development in the LPA's,
   Master Plans are essential to plan, guide and regulate the growth.
- The BMRDA initiated the preparation of Interim Master Plans for five Local Planning Areas viz; Nelamangala, Magadi, Kanakapura, Anekal, and Hoskote in June 2006 to guide and regulate the developments.
- IMP-2021 was prepared through BMRDA using LISS IV with 5.8 resolution and the base map was prepared without incorporating the approved lay outs and some existing developments.

## **Preparation of Base Map**

Anekal Local Planning Area - Rolta

Magadi Local Planning Area - IN-RIMT

Kanakapur Local Planning Area - Pixel

Biappa Local Planning Area - Rolta

Nelamangala Local Planning Area - Pixel

Hoskote Local Planning Area - Pixel

## Scope of Work

Preparation of digital Base Maps for 5 (Anekal, Magadi, Kanakapur, Biappa & Nelamangala) Local Planning Areas (LPA) using high resolution Satellite Data (0.6 mts of Quick Bird) at scale 1: 2000.

Generation of Cadastral GIS database for each LPA by geo-referencing the revenue and Superimposing on base map.

Preparation of Existing Land use maps for each LPA in the satellite images by interpretation technique and validate by field survey.

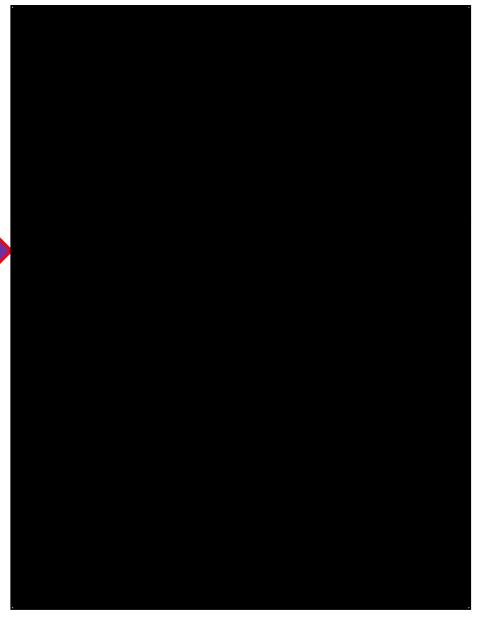
Generation of Base maps and Land Use map by incorporating approved layouts plans and change of land use for the 5 LPAs.

## Approach and Methodology

- Feature extraction: all natural and man-made features visible in the satellite image shall be captured (digitised) as per the list of layer
- Each feature shall be laid on its respective layers
- Annotation of features: Local areas, extensions, all roads, All public offices, All educational institutions, All large hospitals, All parks and play grounds, Major places of worship, Community facilities, Major industries, prominent commercial establishments should be annotated.
- Ground validation by field surveys: Validation to confirm the exiting land use and also the names of the roads and buildings

## Methodology – BASE MAP

Quick Bird Satellite Imagery from NRSA, Hyderabad.



# Input Data

- High Resolution (0.6m) Quick Bird Satellite Imagery.
- Total station survey for Anekal, BIAPPA and Neelamangla(19.47 Sq.km)
- Cadastral Maps
- Layout Plans
- Interim Master Plans
- SOI Toposheets(Option)
- Historical Monument Details

# **Stages of Map Preparation**

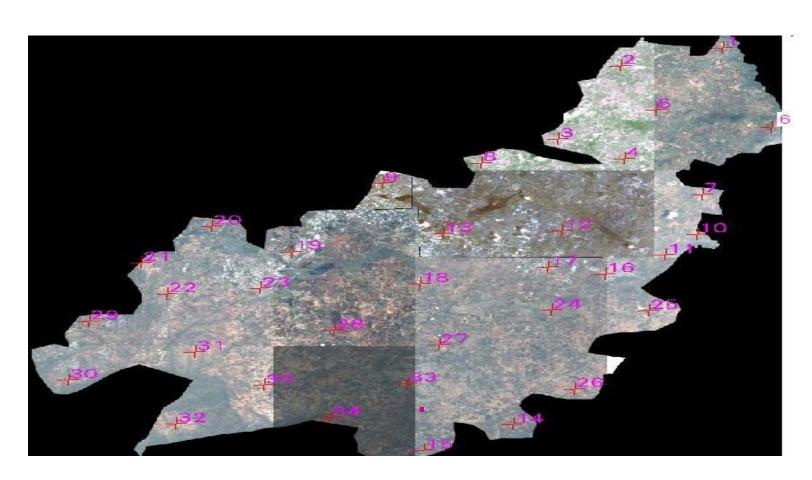
Identification OF GCP points on satellite for field survey



# Identification of location of GCPs and DGPS observation in field



# Registration and Ortho Rectification of Satellite Image using DGPS surved points.



Accuracy to be maintained within 3pixel.

# Feature extraction for generation of digital base maps on Satellite Image



### **Cadastral Map Registration on Orthorectified Satellite Image.**



# Capture Cadastral Features on Geo-referenced Satellite Image.

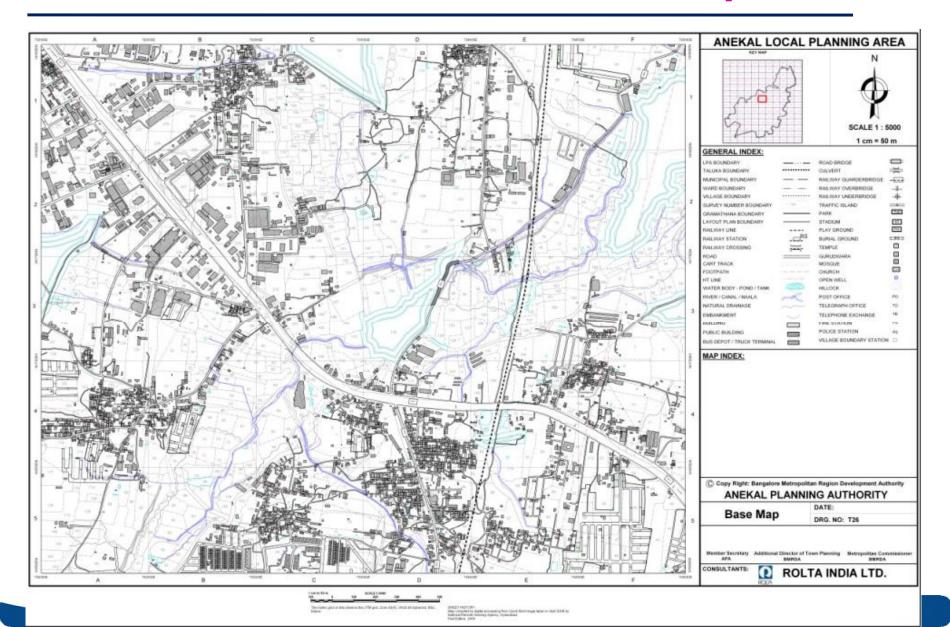


# Geo-reference Layout Plan using Ortho-rectified satellite image

Capture Circulation Pattern, Parks and CA from registered Layout Plan



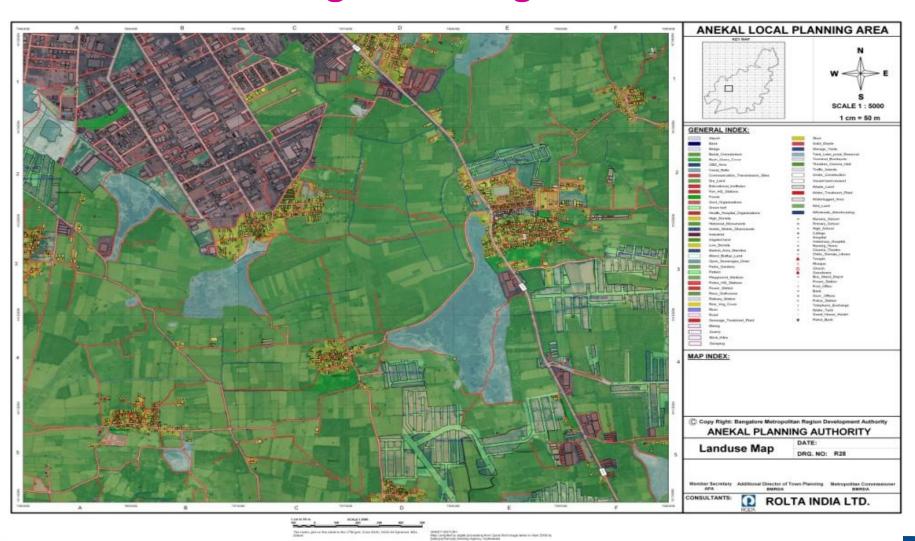
### **Generated Draft Base Map**



### Capture Land use Features on Satellite Image



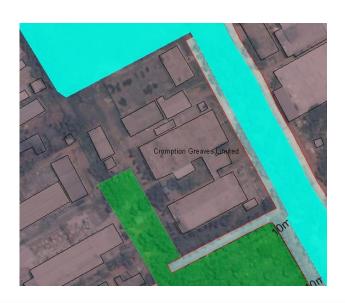
# Generate Land use Survey Plots with Satellite Image at Background



### Survey mark the Building name and Land use

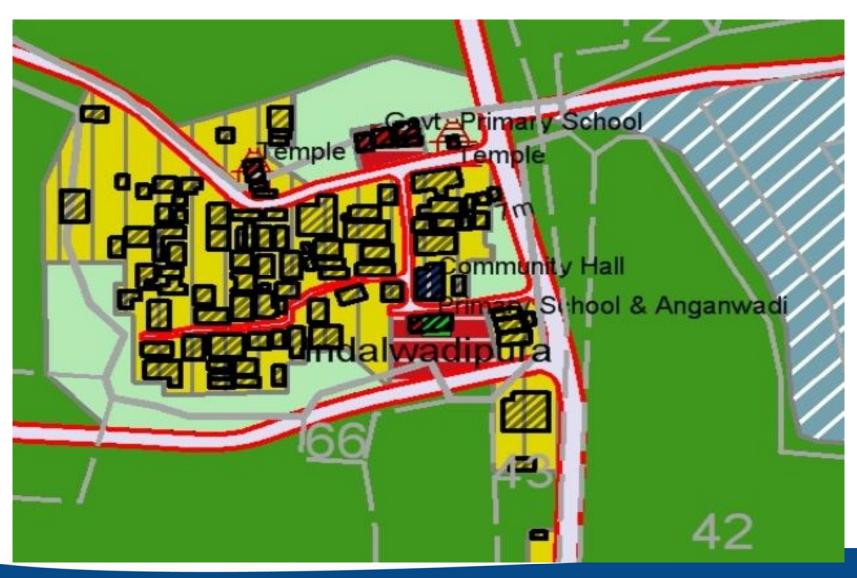




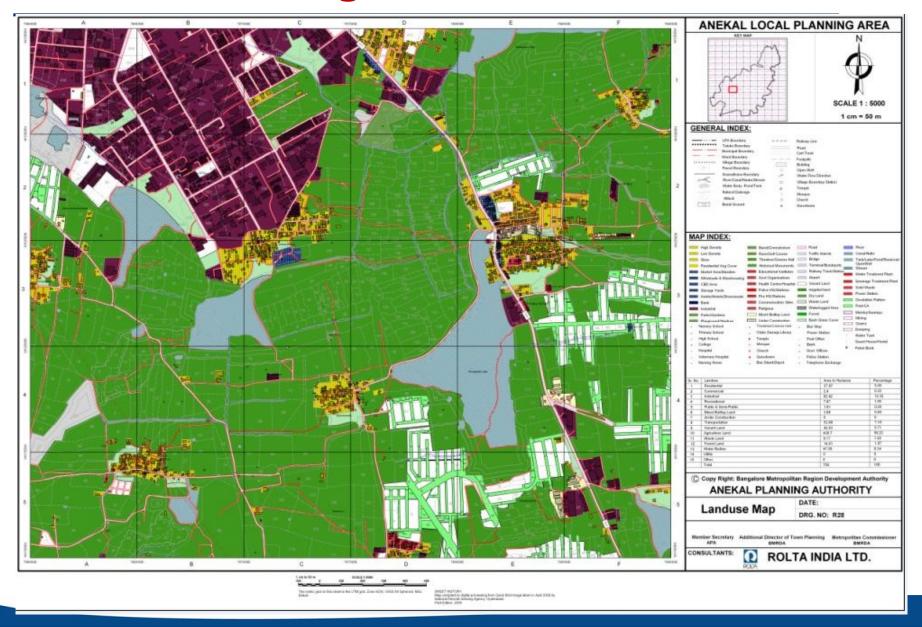




# Incorporate survey marked Building name and Landuse.



### **Generating Final Land use Plots**

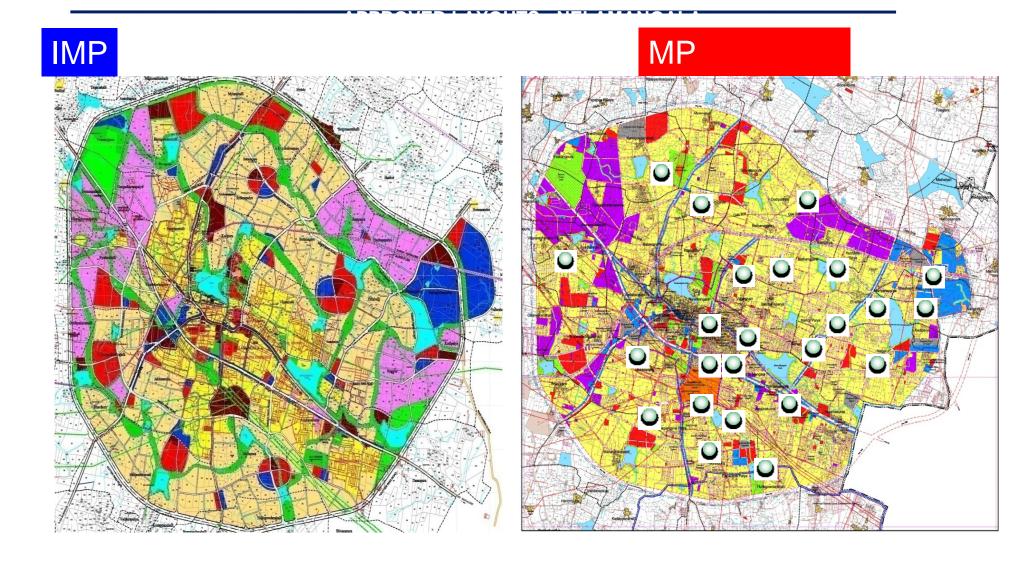


### **Preparation of Master Plan 2031**

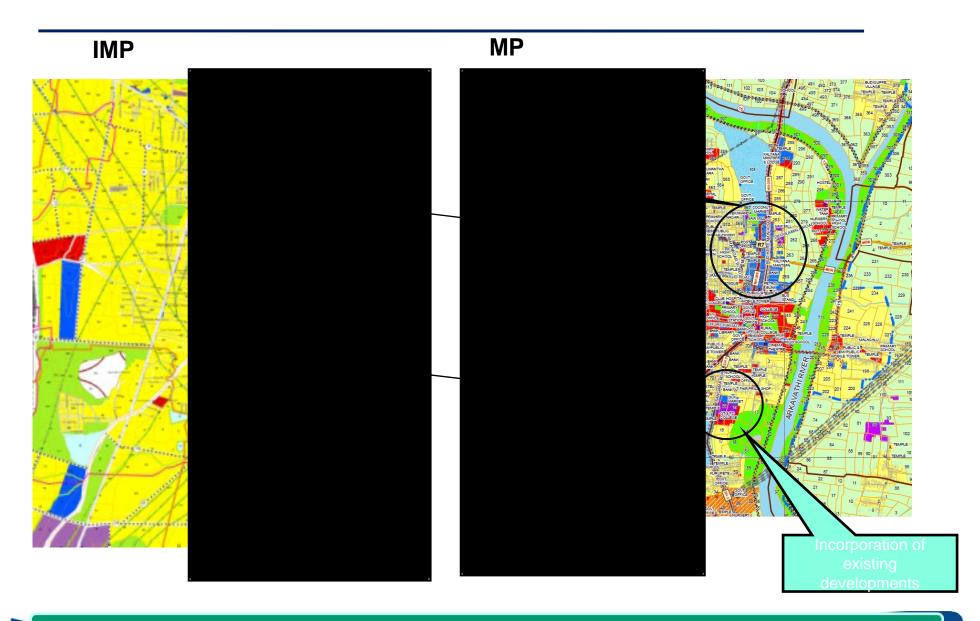
### The Process:

- Preparation of scientific base maps was taken up by BMRDA during 2009.
- ►Used Q.B. satellite image (.60 m. Resolution) as the source data for extracting existing developments
- revenue data was incorporated
- ➢All the approved layouts, change of land uses, major roads were incorporated as per notification etc.,
- ≽finalized the maps with the technical support of Karnataka Remote sensing agency (KSRSAC) during April 2012
- existing land use finalized during July 2012.

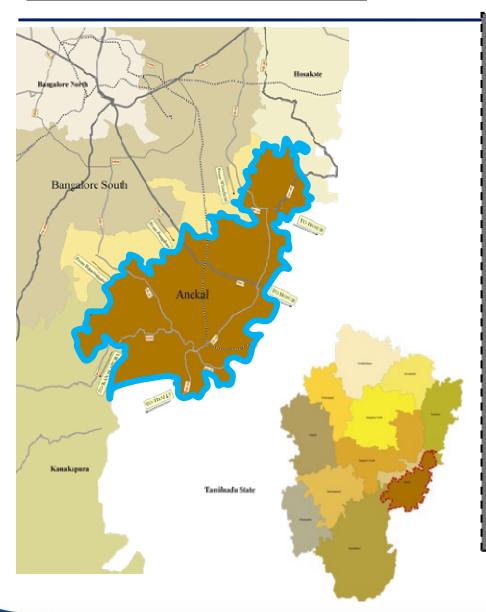
## **Case studies**



### **Kanakapura Master Plan 2031**

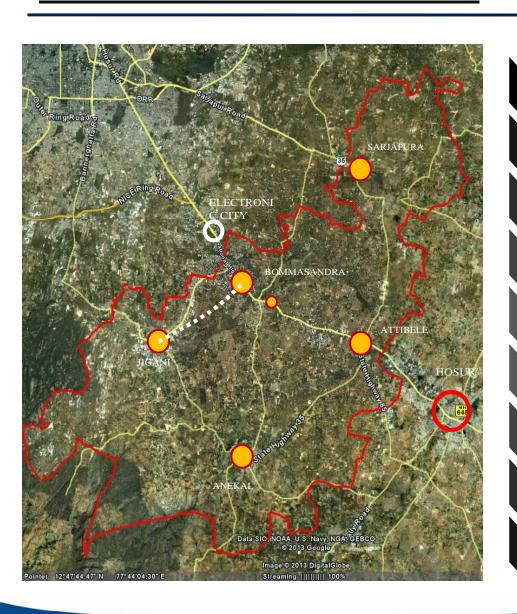


### **GEOGRAPHICAL PROFILE**



- Located at a distance of 35 km from Bangalore
- Situated at 77 42' 8.181" E and 12 45' 49.193" N
- Total geographical area 402.30
   Sq km
- District Bangalore Urban
- Taluk Anekal
- No of Hoblis 4
- Total no of settlements in the LPA - 170

### **GROWTH POTENTIAL IN THE LPA**



•Continuity of conurbation with BDA

•Huge housing projects by KHB

•Existing Bommasandra KIADB industrial area

•IT SEZ in Sarjapura (Infosys 400 Acres, Wipro 250 Acres)

•World class granite industries in Jigani and KIADB industrial areas

•Healthcare hub in Chandapura

•Educational facilities in the region

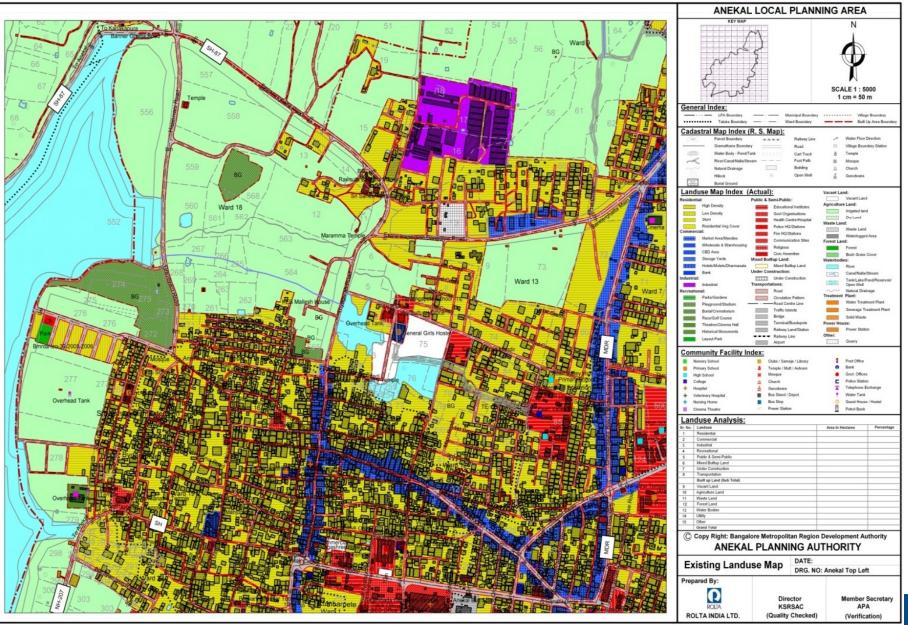
•Industrial influence of the neighboring industries in Hosur (Tamil Nadu)

•Bangalore Chennai Industrial Corridor

### **BASEMAP OF ANEKAL**



### PREPARATION OF EXISTING LAND USE MAP

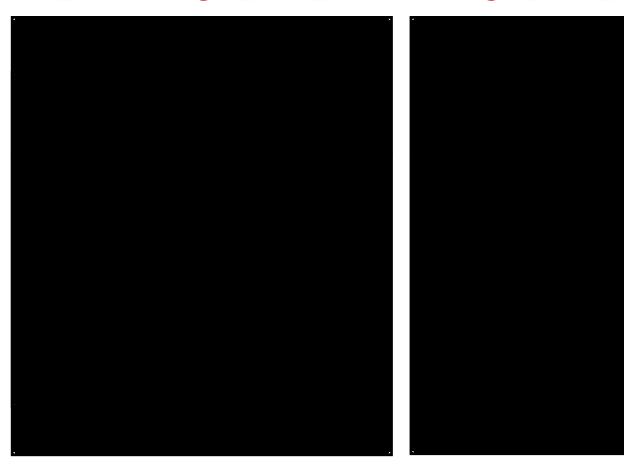


#### **JIGANI PLANNING DISTRICT**

### **Approved Layout**

#### INTERIM MASTER PLAN

#### **MASTER PLAN PROPOSAL**



**Approved Layout is not incorporated** 

Layouts, CA, Parks & Roads are incorporated

#### **JIGANI PLANNING DISTRICT**

#### **INTERIM MASTER PLAN**

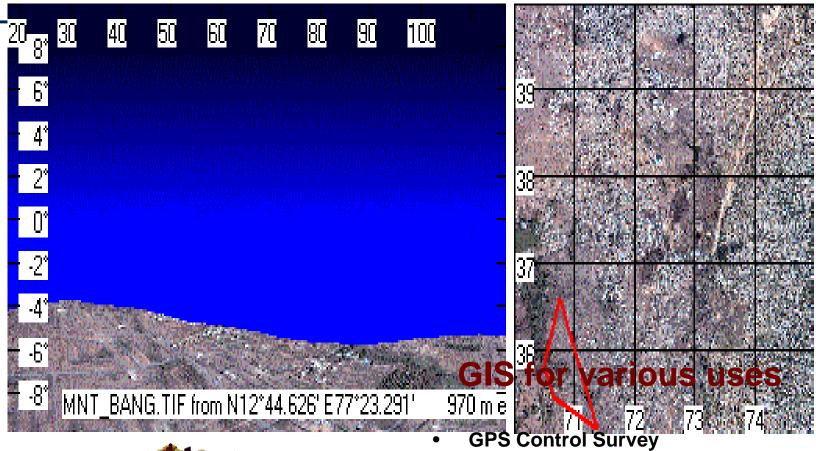


#### **MASTER PLAN PROPOSAL**



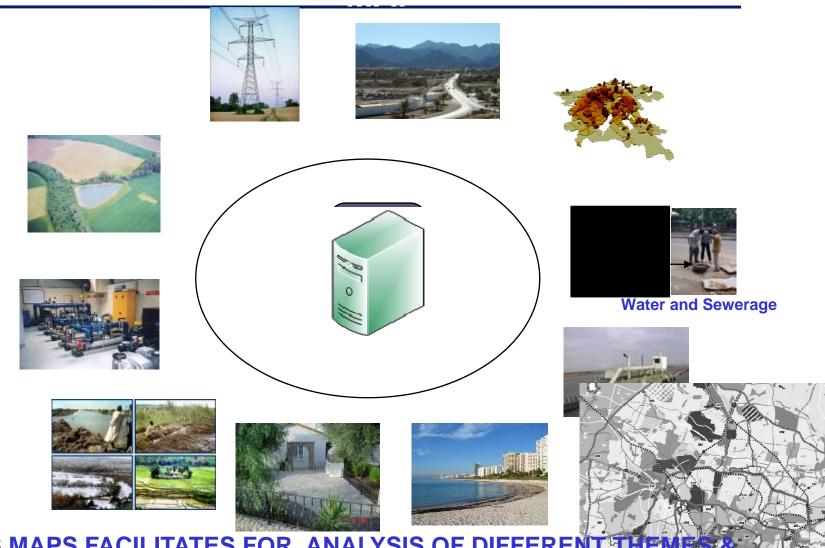
K.H.B. Approved Layout has been considered

### **Latest Trends**



- Digitization
- **Thematic Mapping from Satellite Imagery**
- **Digital Terrain Models**
- **Web GIS**
- **GIS Application tools**

### **Conclusions**



GIS MAPS FACILITATES FOR ANALYSIS OF DIFFERENT THEMES & USED FOR PLANNING OF VARIOUS ACTIVITIES.



# Thank You