Agriculture (pocket) -> transformed into a brown pocket and then constructed upon

Vacant (Brown) Pockets

GTZ PUMP Project Cairo

Participatory Development Programme in Urban Areas

Sharing Available Information through GIS

Manual

gtz kfw

2 How to obtain a map for the area ?

The following section will explain:

- How to create a recent map of the area?
- How to find satellite images on the internet?
- How to obtain a high resolution satellite image of your area?
- How to derive a map of the area from the satellite image!

How to create a recent map of the area?

Nowadays, the easiest way of creating a map of a certain area is to use a satellite image as a master copy. Satellite images from almost any place in the world can be found on the Internet. These satellite images can be downloaded and saved in an easy-to-use format.
Satellite images provide you with very exact information on the layout of an area. They show the real physical situation at a given moment. They are usually quite up-to-date, often not more than a few years old.

Head of the information center in one of the districts: "The most recent satellite images can be found on the Internet. Google Earth, for example, offers the option to download satellite images on their homepage free of charge for everybody."

How to find satellite images on the internet?

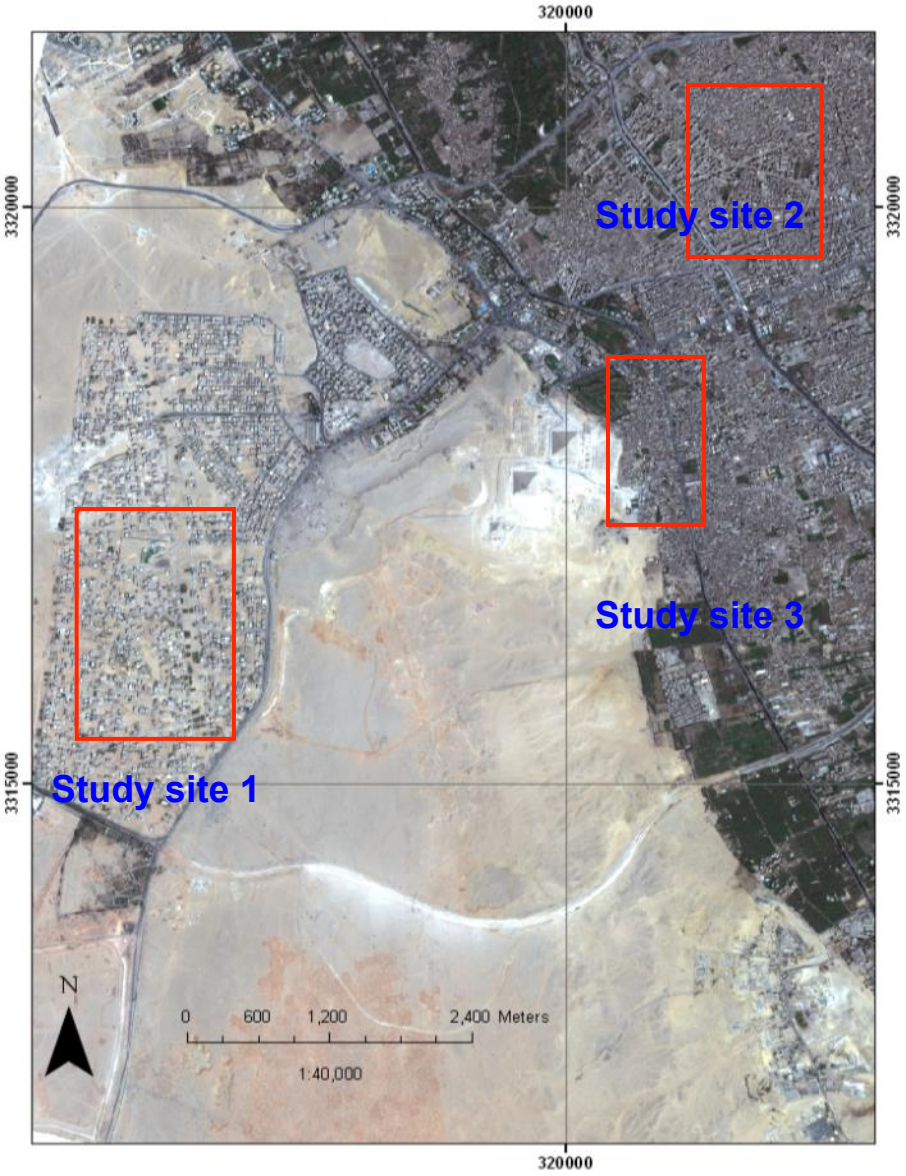
All you need is a computer with an operating system that meets certain specifications (see website for a reference), and an Internet connection. Go onto the Internet and visit the site: http://earth.google.com
The Internet site is in English and Arabic. At this Internet address you can download a program called Google Earth. The installation process is quite simple and straightforward. Just follow the instructions on the screen and you will easily manage to install the program on your computer.
Once this is done, you can open the program and navigate to any place on the planet you would like to see from a bird's eye view

What is a base map?
A base map is a map showing built-up areas (i.e., buildings and roads) as basic information for the physical situation of an area.

ITC UNIVERSITY OF TWENTE.

3D approaches with stereo images (Source: Joshi)

Study Area: Cairo, Egypt

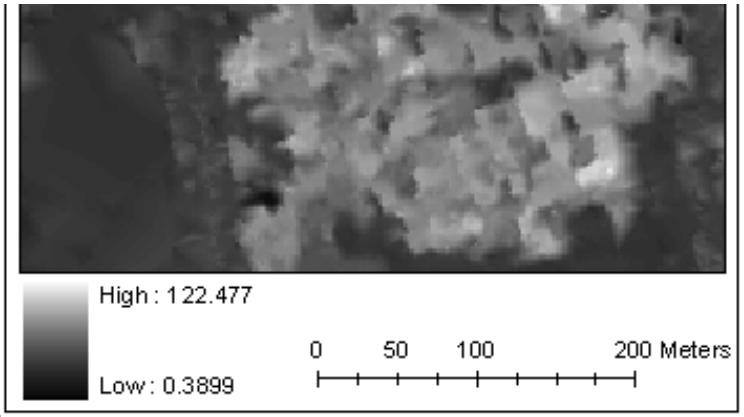


GeoEye-1, Stereo pair, 2009-07-02 08:47 GMT

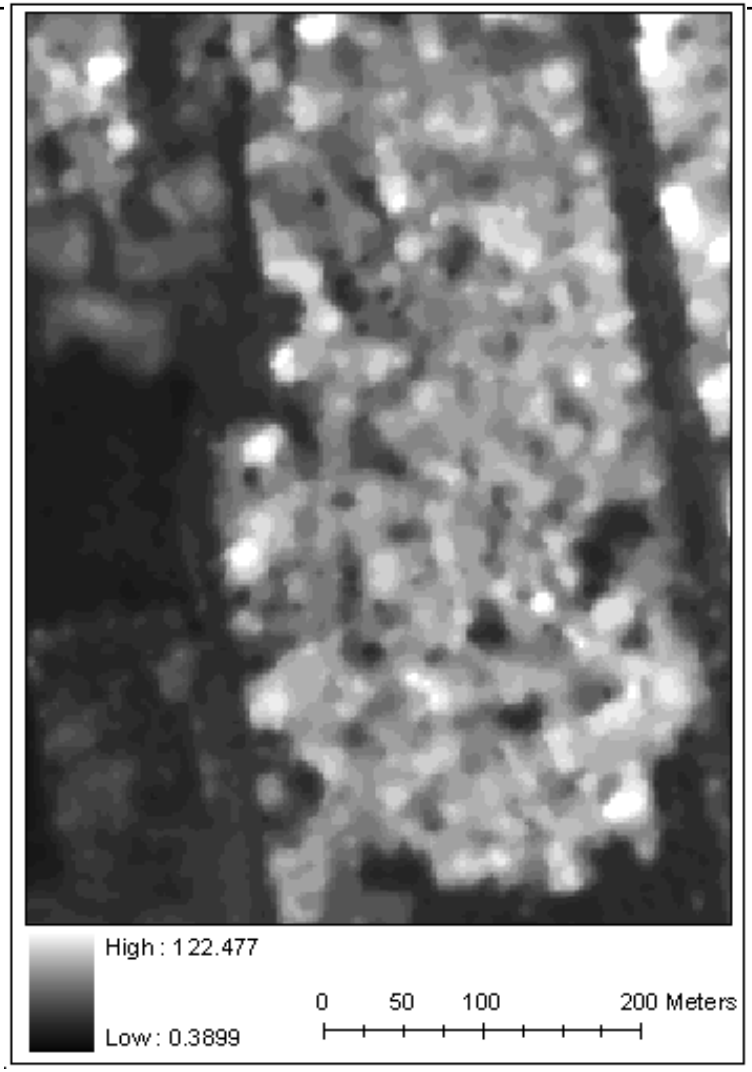
MSc thesis Joshi

DSM generation

- Edges of buildings are not well preserved in DSM
- Buildings “grow” together in the DSM
- Details are not represented, at least in a dense environment



DSM from LPS, study site 3



DSM from SAT-PP, study site 3

MSc thesis Joshi
Building extraction by OOA:

Image segmentation

Scale 50
Shape 0.6
Compactness 0.8

NDVI
Ratio Blue
SSI
Height (nDSM)
Brightness
Rectangular fit
Asymmetry
Area
Height
Rel border to shadow
Rel border to buildins
Rel border to vegetation

Features used

Class hierarchy

Classification

Final buildings

MSc thesis Joshi

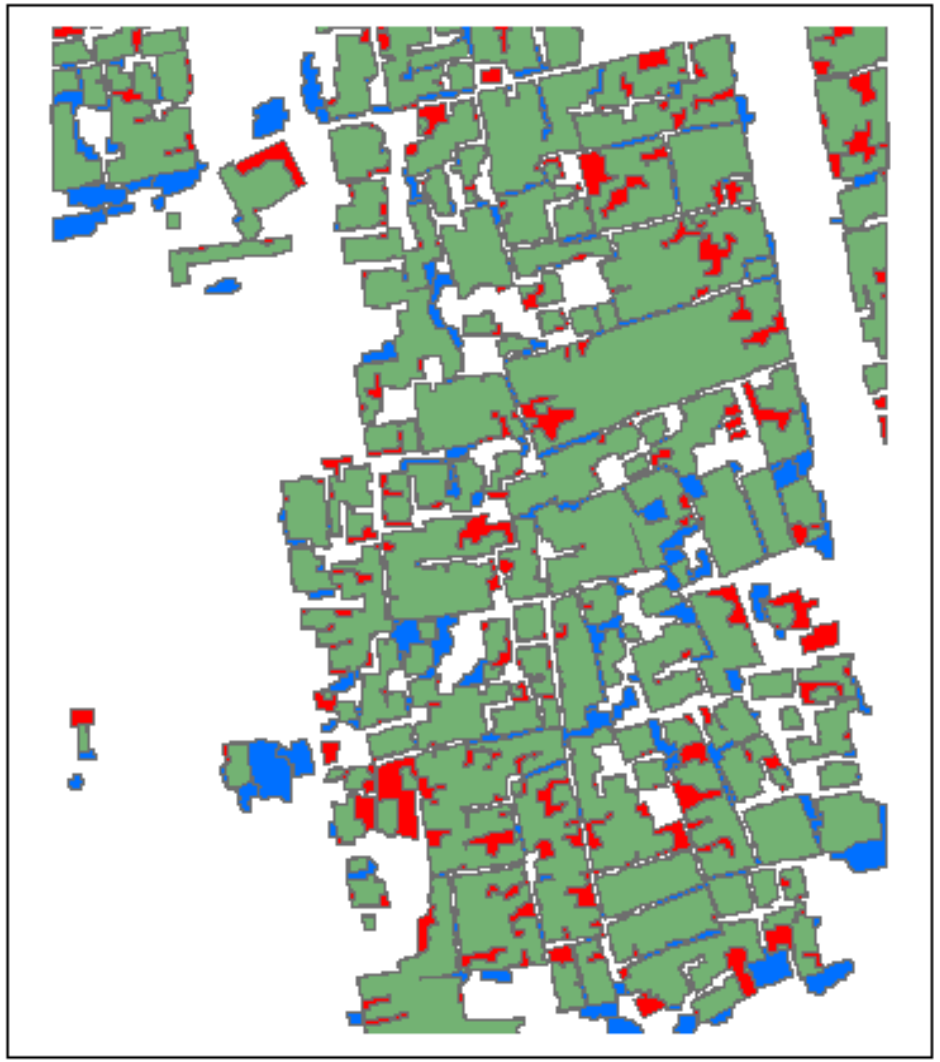
Building extraction by OOA

Building detected, site 3

Building detected, Site 2

MSc thesis Joshi

Building extraction by OOA: assessment



Site 3

Site 1

Correctness	92 %
Completeness	91 %
Error of omission	8 %
Error of commission	9 %

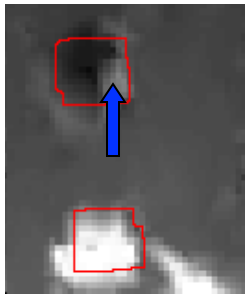
Site 2

Correctness	89 %
Completeness	92 %
Error of omission	11 %
Error of commission	8 %

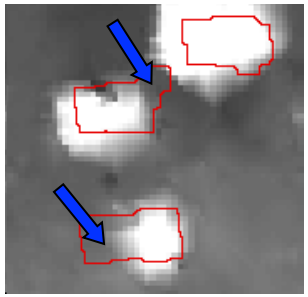
Site 3

Correctness	86 %
Completeness	85 %
Error of omission	14 %
Error of commission	15 %

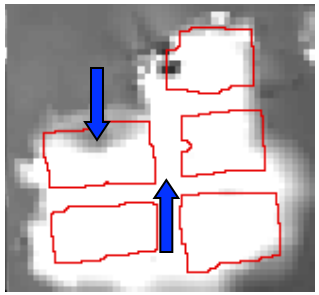
Improving the quality of DSM: Problems



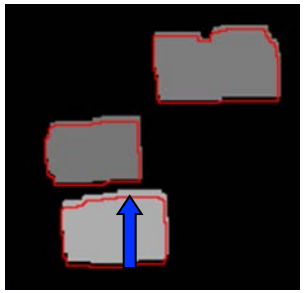
Absence of gray values



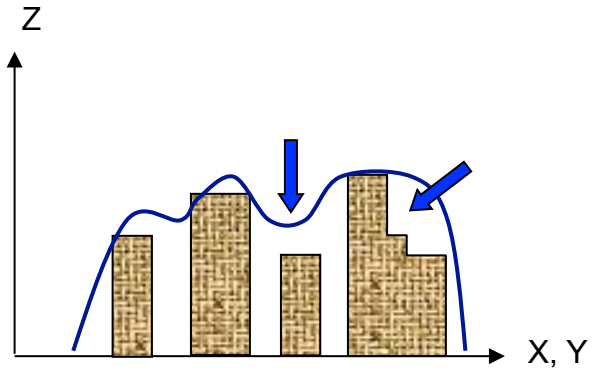
Partial matching over a building



Uneven gray values within a building and gap between the building



Relief displacement in building outline



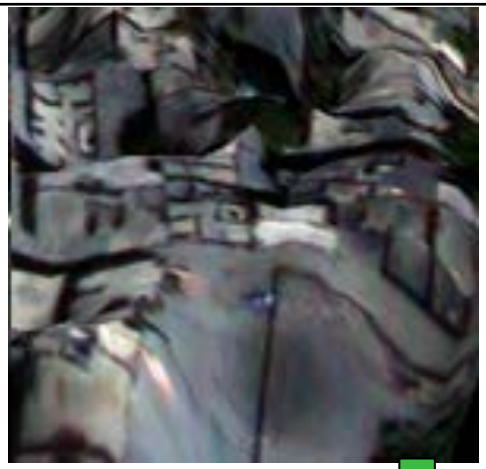
Bell shaped, smooth DSM over the buildings, short and stepped building DSM

MSc thesis Joshi

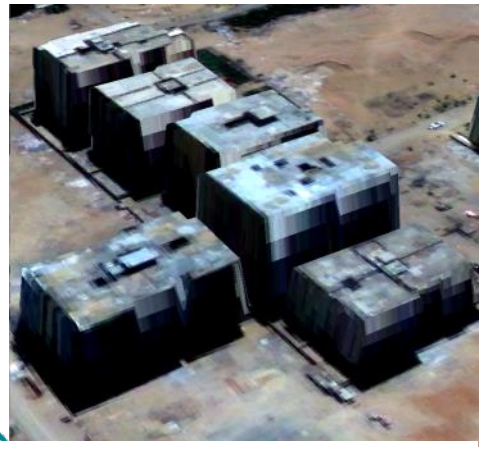
Improving the quality of DSM: Results

Before

Before



Before



After improvement, site 1

After improvement, site 2

After improvement, site 3

OUTLINE

- What is a slum
  - UN-HABITAT's definition
  - Global Slum Ontology
- Slum mapping
  - Purpose
  - Methods – data sources and data acquisition
    - Aerospace (spatial data)
    - Field-based methods
- **Current research directions**
  - Geo-Object Based Image Analysis (GEOBIA)
  - Data integration – exploiting existing data sets (spatial) to enhance identification and classification accuracy

Object Oriented Approach to image data extraction with spatial metrics: Divyani Kohli

Pune, India

ANALYSIS AT THREE LEVELS OF ONTOLOGY

- Environs
  - Close to rivers, major roads, on hill slopes, marshy land
- Settlement
  - Irregular , linear shape
  - Highly dense – texture, area, association with built-up and vegetation
- Object
  - Clumped buildings with very small footprints – area, mean layer DN value
  - Irregular access roads with variable widths

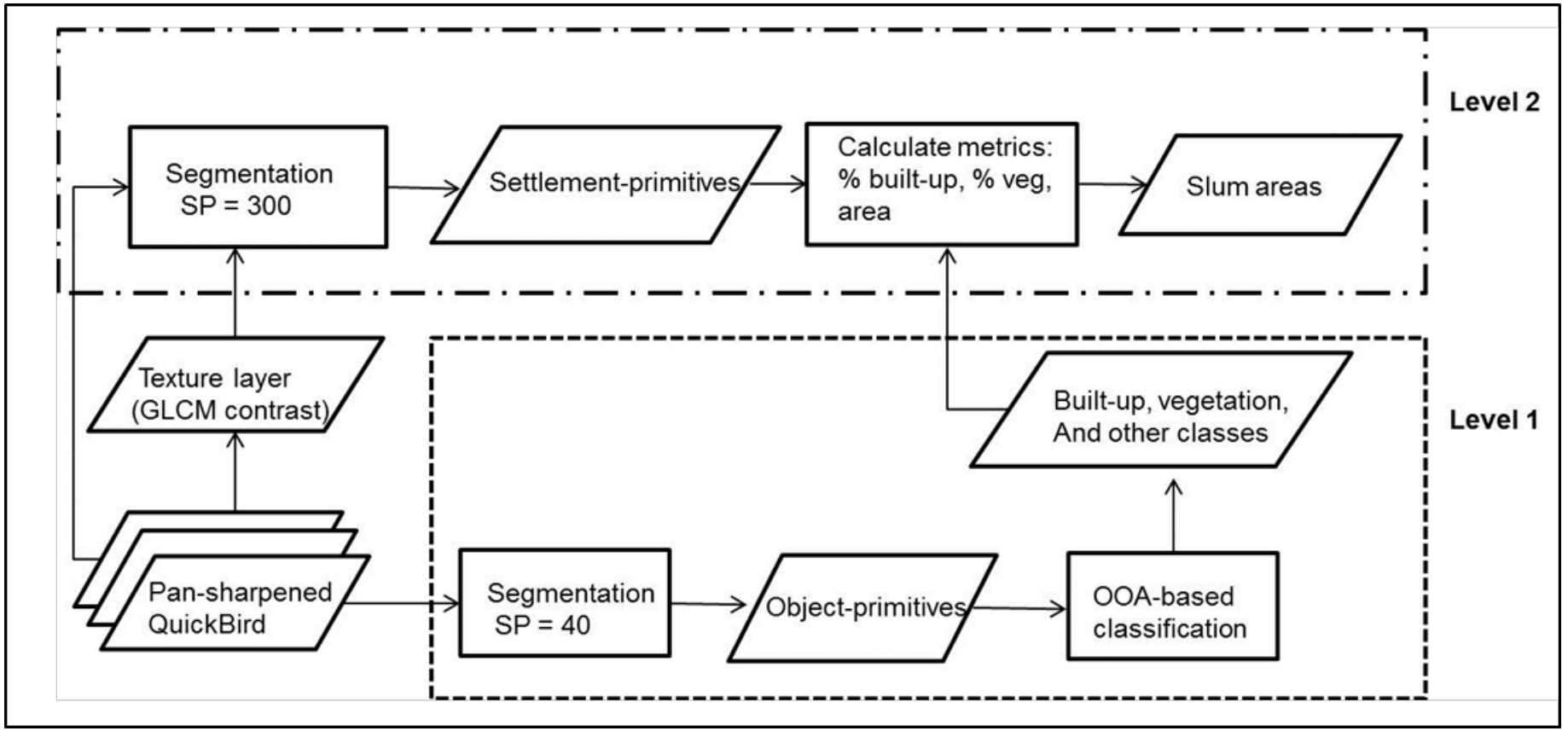
GEOGRAPHIC OBJECT BASED IMAGE ANALYSIS - GEOBIA

Image

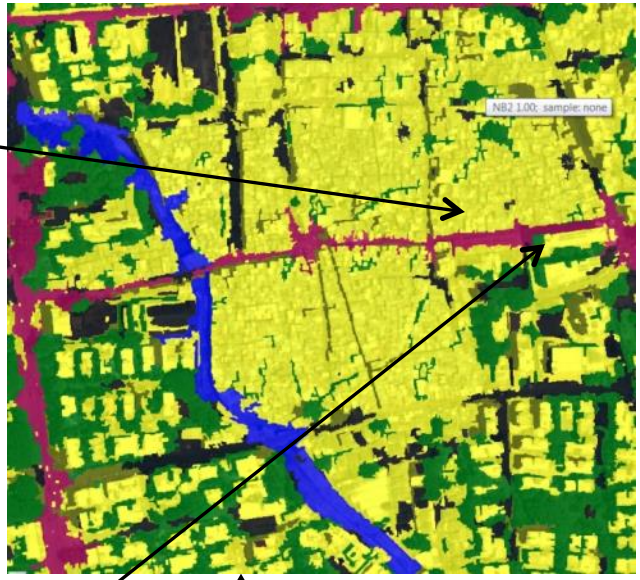
Segmentation: spectral, spatial properties, scale

Classification , cleaning

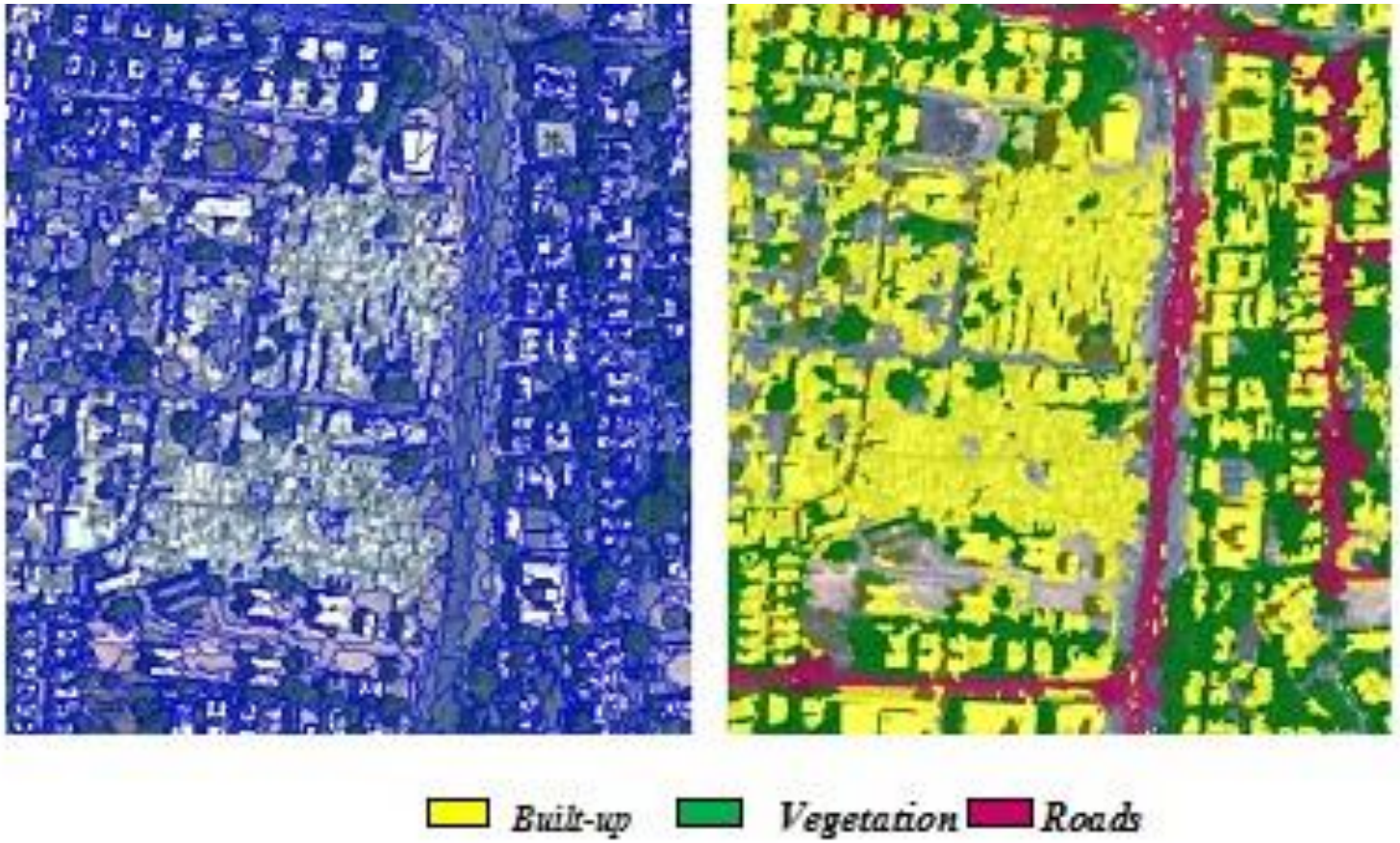
Method


Level 2
Segmentation
SP = 300
Settlement-primitives
Calculate metrics:
% built-up, % veg,
area
Slum areas
Texture layer
(GLCM contrast)
Built-up, vegetation,
And other classes
Level 1
Pan-sharpened
QuickBird
Segmentation
SP = 40
Object-primitives
OOA-based
classification

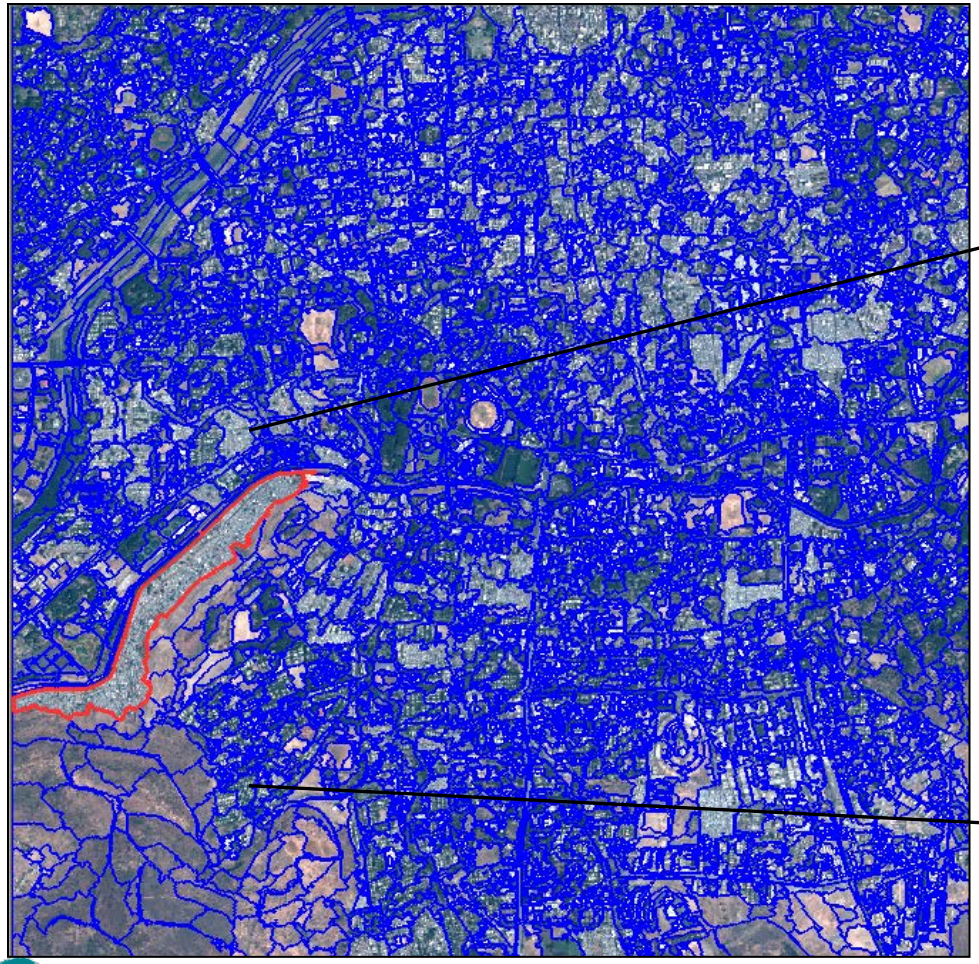

05/02/2012

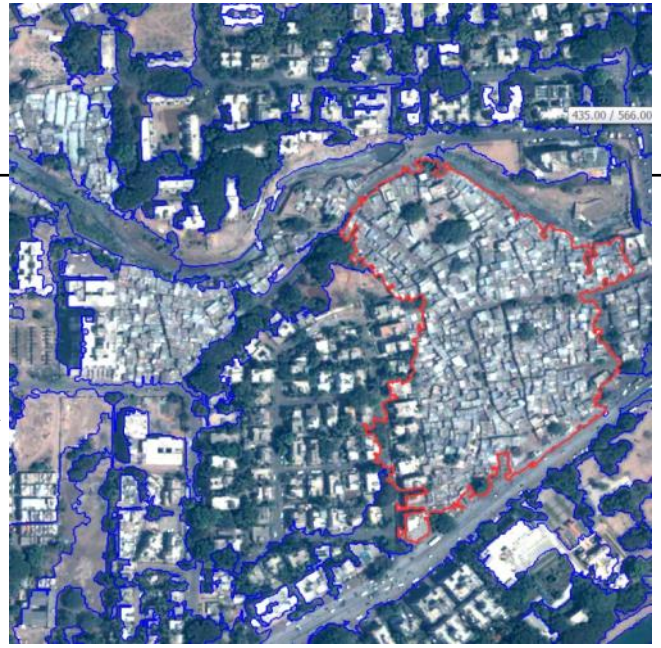

NB2 1.00; sample: none

Level 1- segmentation and classification



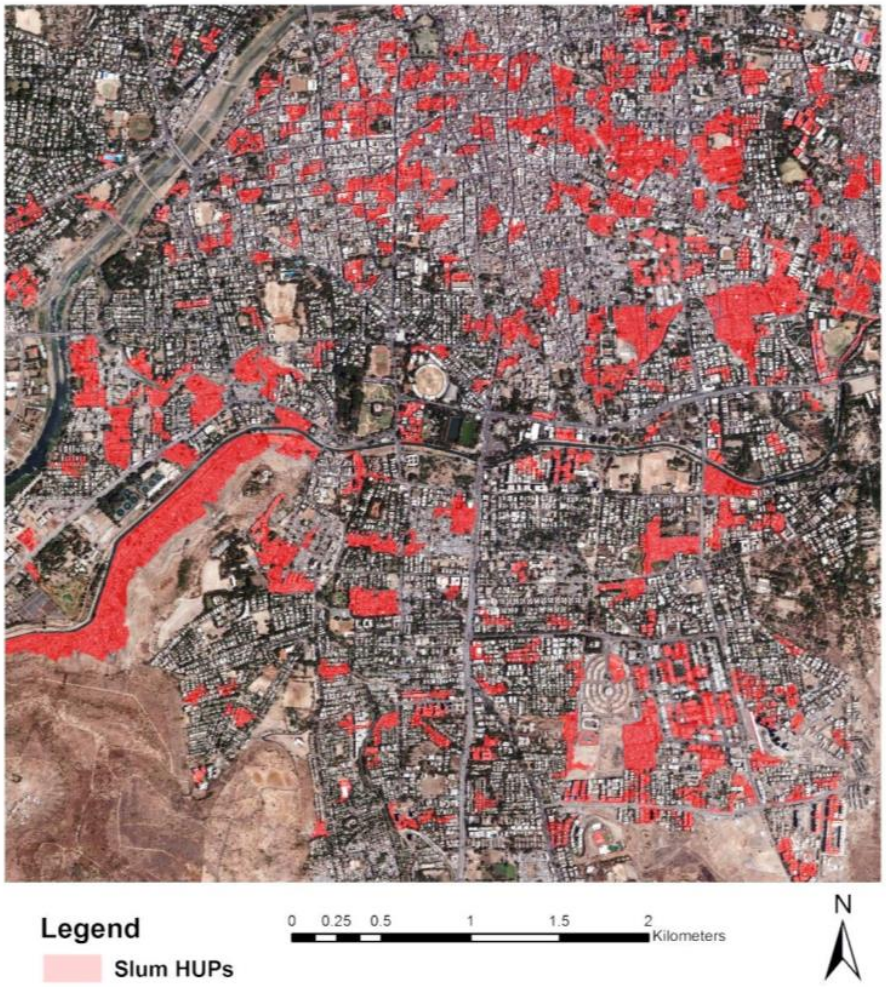
Segments with homogeneous texture at Level 2



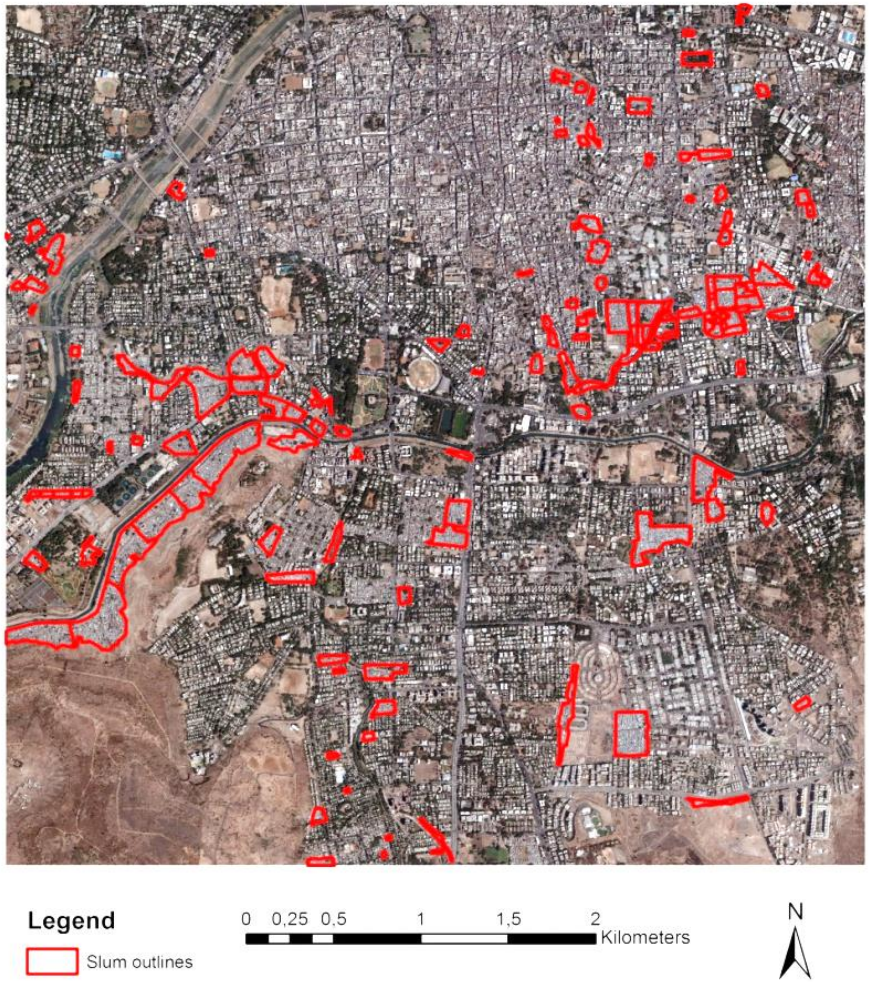


Classified slum areas

Proportion per segment:
>70 % Buiilt-up < 20 % Veg



2008 Visual Interpretation
by MASHAD



ITC UNIVERSITY OF TWENTE.

Accuracy: 68%

Challenge - slum like formal or historic areas


येथे
पंक्चर
काढून मिळेल
बाबा टायर्स
३४ कसबा पेठ,पुणे -११.
श्री आई काळुबाई मंदिर
धावडे वाडा
३४, कसबा पेठ, पुणे
बाबा टायर्स
05/02/2012

REFLECTIONS

- Best approaches visual (expert or participatory) or semi-automatic.
- Community participation critical for detailed slum area mapping and enumeration (engagement, empowerment) and will be more important
- Scope for use of open source spatial data base & GIS e.g. Social Tenure Domain Model , Micro Aerial Vehicles for smaller areas.
- Partnerships between traditional and community based mapping.
- Geo-Object based approaches promising but considerable tweaking to give good results; expertise is scarce, software expensive and quite steep learning curve.
- Data fusion: multiple data sources can improve performance of image based data extraction (LIDAR, hyper-spectral etc.)
- What about the hazards component?

CONCLUDING REMARKS

- Remote sensing **CANNOT** provide
  - Identification of slum households based on the all five slum indicators
- Remote sensing **CAN** help to provide
  - City-wide, objective and robust information
  - Indirect 'slum' descriptors:
    - Hazardous locations
    - Building size and orientation
    - Narrow roads with haphazard orientation
    - Little open spaces and vegetation
- Size, density and quality of housing may be such that even 40-60cm resolution is insufficient for mapping
- Need to identify different development stages (process of slum formation not just the end state)

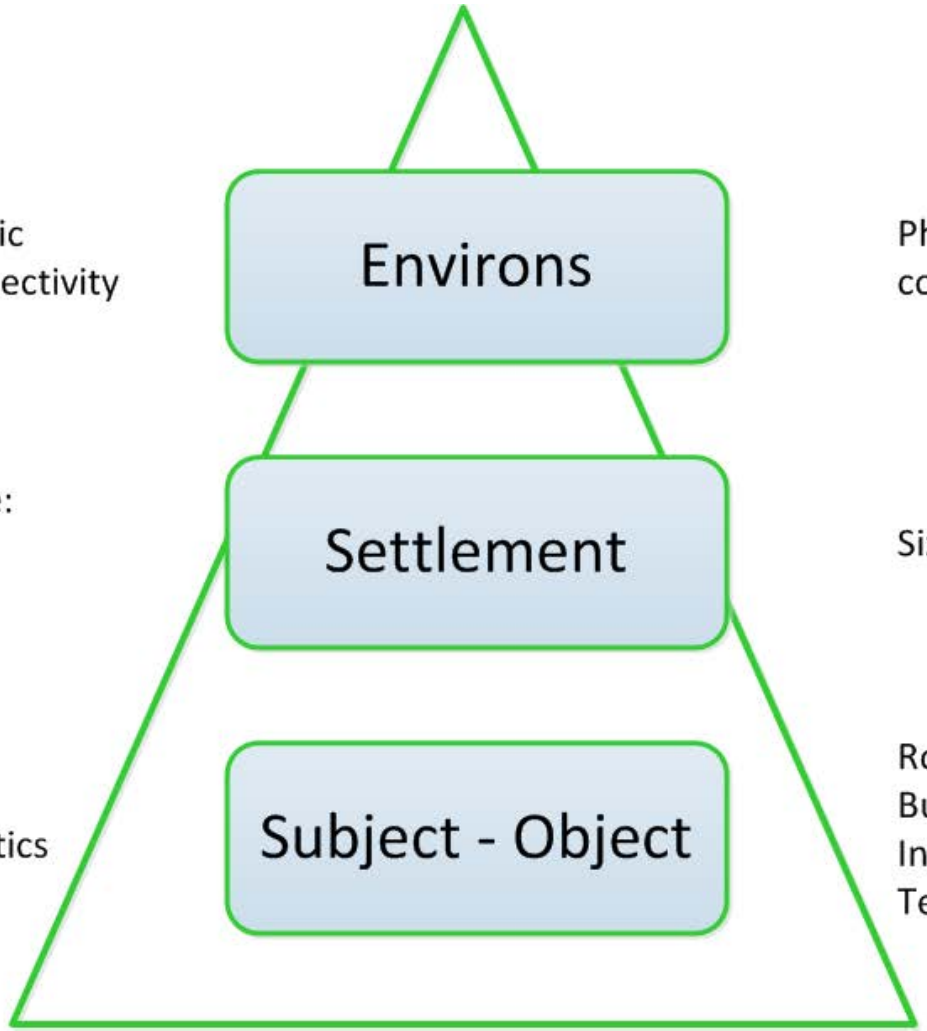
UNIVERSITY OF TWENTE.

THANK YOU

ACKNOWLEDGEMENT

SOME OF THE MATERIALS PRESENTED HERE WERE PRODUCED BY: DIVYANI KOHLI, MONIKA KUFFER, MARKUS GERKE, S. KYESSI.

PHYSICAL AND SOCIO-ECONOMIC COMPONENTS



Relative socio-economic performance and connectivity

Socio-economic profile: Population density, employment rate etc.

Household characteristics

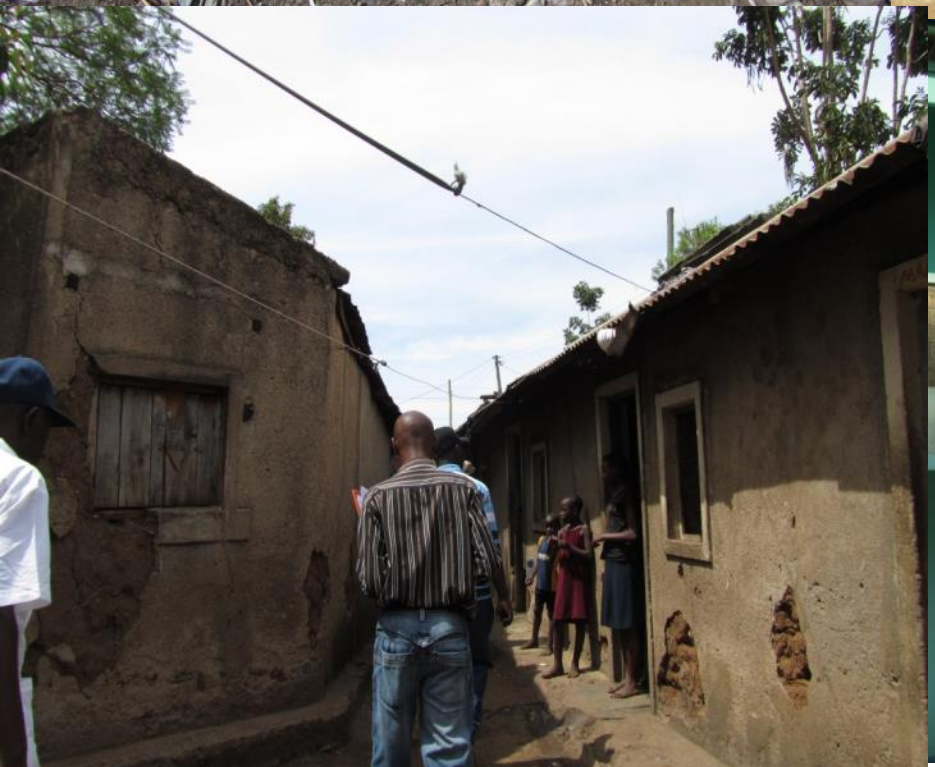
Physical characteristics Spatial connectivity, hazards

Size, housing density, etc.

Road characteristics
Building characteristics
Infrastructure
Tenure

Local adaptation for Kisumu, Kenya

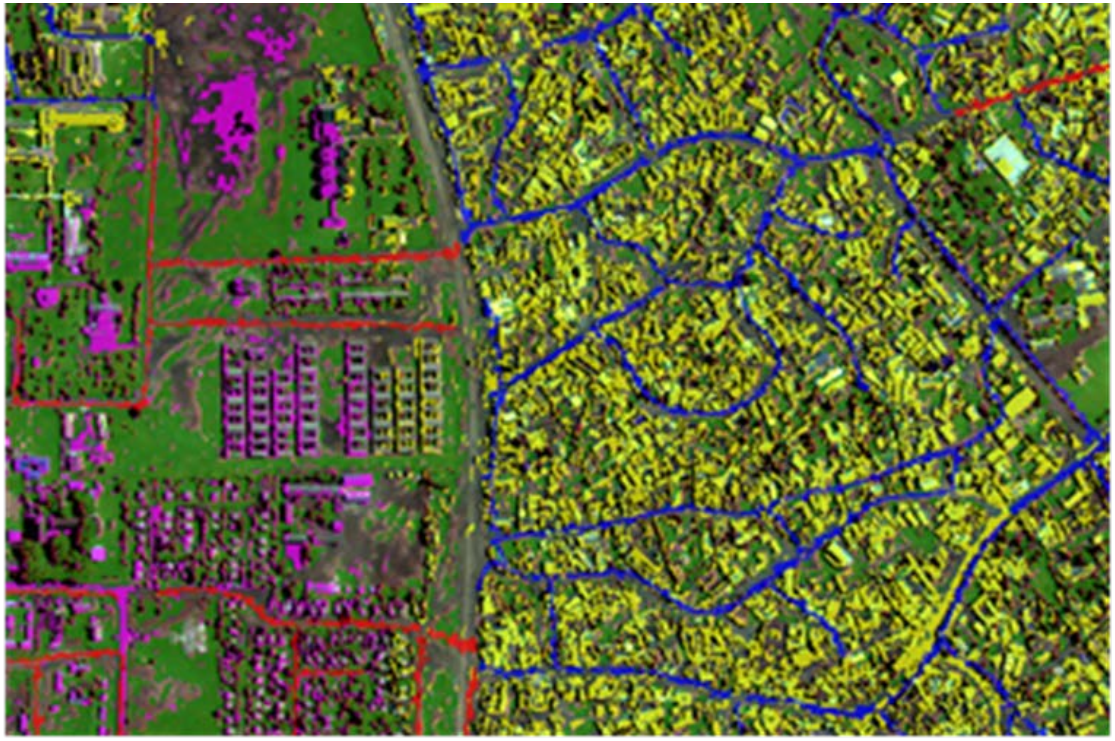
ITC

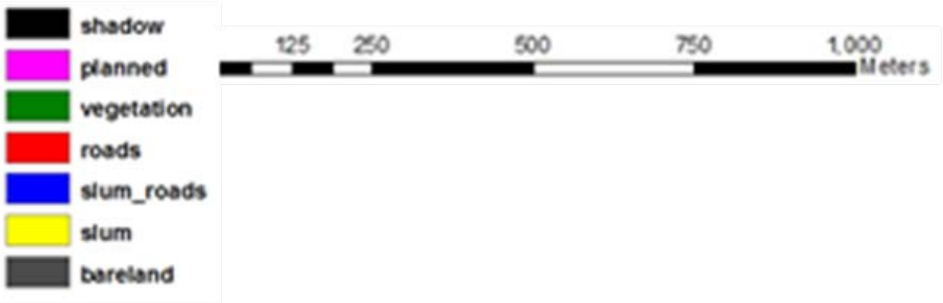


Adapt OOA parameters to local context

- Environs
  - On flood zones, marshy areas, close to farmlands, and along highways , clear contrast to the planned areas - distance to features
- Settlement
  - Encircling the major ring road – buffer analysis
  - Denser compared to planned – texture, area of vegetation/open space, association with shadow
- Object
  - Haphazard orientation, varying colors and size – rectangular fit, area, layer mean value, main direction
  - Irregular access roads with variable widths – number of nodes, length/width ratio

Slums classified in the subset





Based on orientation, density and irregular access lanes.