MLSC

Global Urban Data - Measuring Living Standards within Cities

Department for International Development

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

WORLD BANK GROUP

Pillar 1: Understanding intra-city variation in living conditions

Major data collection effort that contributes towards the twin goals and addresses existing information gaps

Pilot cities selected based on strong Bank's engagement and to represent cities at different development and income levels

National living standards

Surveys typically do not accurately measure costs of living in cities (samples are not representative at the city level in some cases and almost never for smaller areas within the city)

Living standards within cities

Housing, transport and utilities account for an increasing share of household spending but not well captured in many cases.

This project innovates through

Spatially-detailed sampling strategies that allow within city analysis

Specific questions about urban cost of living and housing quality

Dar es Salaam

Durban

10 THINGS

to know about the MLSC Survey Instrument and Report

1 — NEW! LIVING STANDARDS IN CITIES

This is a new survey instrument designed to measure living standards in cities. The survey instrument was designed in response to the growing need to understand urban living standards in Africa and across the world. Specifically, it responds to the need for improved data to support evidence-based policy in urban areas, such detailed understanding of housing and environmental quality.

2 — PILOTS: DAR ES SALAAM & DURBAN

The surveys were piloted in Dar es Salaam, Tanzania and Durban, South Africa. The survey instrument was designed and implemented in these two cities over the course of 2014 and 2015.

3 — GEO-REFERENCED SURVEYS

One of the key innovations of the MLSC survey is that it captures spatial dimensions that are central to understanding the dynamics of urban areas. Through geo-referencing survey data, key variables such as spatial variation in the distances, direction, and costs of travel across the cities were possible to obtain. Geo-referencing survey points also allowed to combine this information with satellite imagery to estimate dwelling size. This type of information is vital for policy makers to be able to design appropriate policies for land use and transport network design.

4 — SPATIALLY REPRESENTATIVE

The surveys are spatially representative of different areas within the city. The sampling strategy was designed to ensure that the surveys were representative for different stratum within the city. The data collected in Dar es Salaam and Durban is therefore of a much higher level of granularity than is possible in other surveys, allowing us to draw conclusions about variation in living standards within these cities in a way that has not been possible from previous living standards surveys which have only been representative for the entire city.

5 — SATELLITE DATA IN SURVEY DESIGN

The survey design made innovative use of satellite data. Cities in developing countries are often characterized by irregular and spontaneous settlements that do not conform with planning norms. In order to explore how living standards vary between regular and irregular settlements, the sampling strategy for the surveys differentiated between two different settlement types. In the Dar es Salaam survey, this classification took place using satellite data.

6 — NEW INSIGHTS ON HOUSING AND SERVICES WITHIN CITIES

They provide new insights on housing and basic services within cities. The detailed examination of housing attributes and basic services in the surveys go beyond the scope of most living standards surveys. As the initial findings presented in this report show, this data provides a new level of insight on the fabric of urban life in the pilot cities.

7 — PRACTICAL GUIDE FOR SURVEY DESIGN

The report provides a guide to practicalities of designing and implementing a survey in urban areas, including a stylized timeline based on the two pilot surveys, and links to useful documents.

8 — LESSONS LEARNED FOR SURVEYING URBAN AREAS

There are a number of challenges that are unique to surveying urban areas. This report aims to contribute to improved understanding of these challenges by providing clear information on the 'the good, the bad, and the ugly' of our experience. We hope others can benefit from transparent information not only on the successes of our approach but its weaknesses.

9 — IMPROVE UNDERSTANDING OF URBANIZATION IN AFRICA

The surveys are part of a larger World Bank initiative to improve understanding of urbanization in Africa. The instrument was developed under the World Bank's Spatial Development of African Cities and Global Urban Data Programs, which aims to build knowledge on urbanization and support evidence-driven policy making, with a emphasis on Africa.

10 — BROADER RESEARCH AGENDA

The MLSC is the tip of the iceberg: there is an important research agenda in improving understanding of living standards in urban areas. The surveys have already provided a launching point for further work and analysis (see Box 1). There is a wide research agenda can be taken further to help support improved understanding of urban living standards.
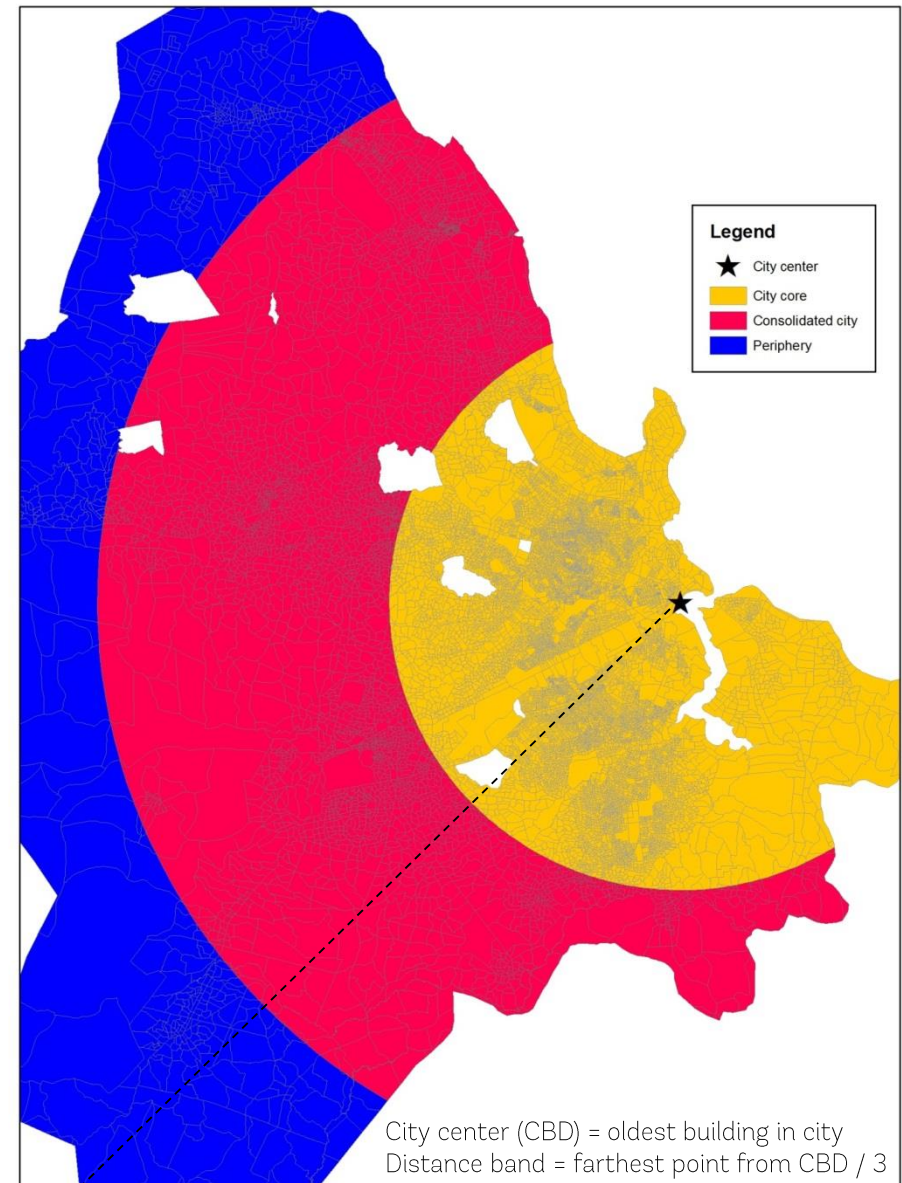
Using high-resolution satellite imagery to design sample stratification

Class
Id

- Commercial
- Industrial
- Residential non-shanty
- Residential shanty
- Road
- Vegetation
- Barren
- Water

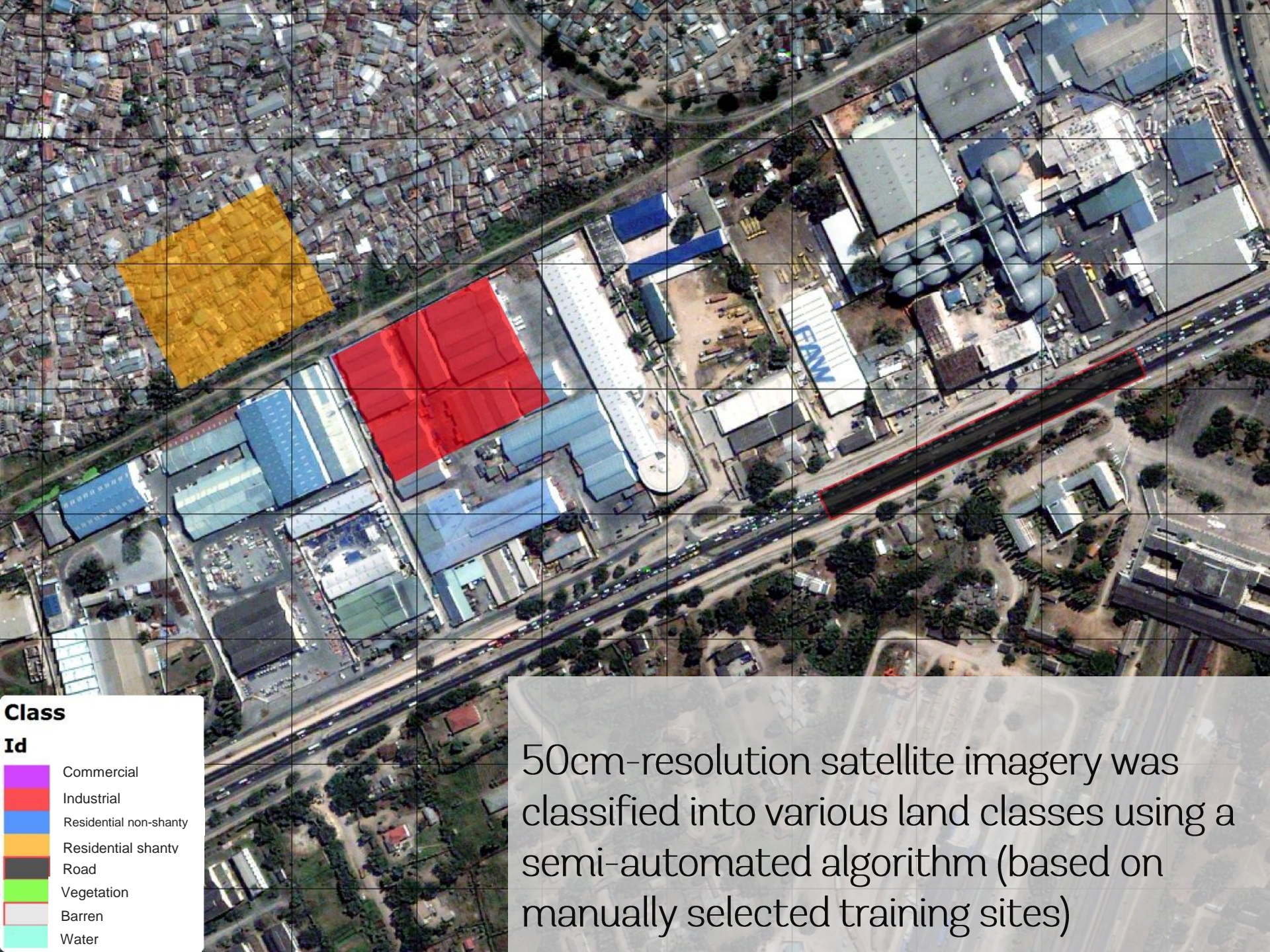# Stratification by distance to city center

In the absence of existing spatial strata, a first stage considered stratification by distance to city center:
- City core
- Consolidated city
- Urban periphery

This arbitrary definition would allow for comparability across cities, when no other spatial data is available.

Legend
- ★ City center
- City core
- Consolidated city
- Periphery

City center (CBD) = oldest building in city
Distance band = farthest point from CBD / 3

Class

Id

- Commercial
- Industrial
- Residential non-shanty
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50cm-resolution satellite imagery was classified into various land classes using a semi-automated algorithm (based on manually selected training sites)

Using satellite imagery to design sample stratification

Shanty residential areas are concentrated in the city center

Non-shanty residential areas spread out to the periphery of the city

Legend
- ★ City center
- No data
- Commercial
- Industrial
- Residential non-shanty
- Residential non-shanty
- Residential shanty
- Road
- Vegetation
- Barren
- Water
- Clouds
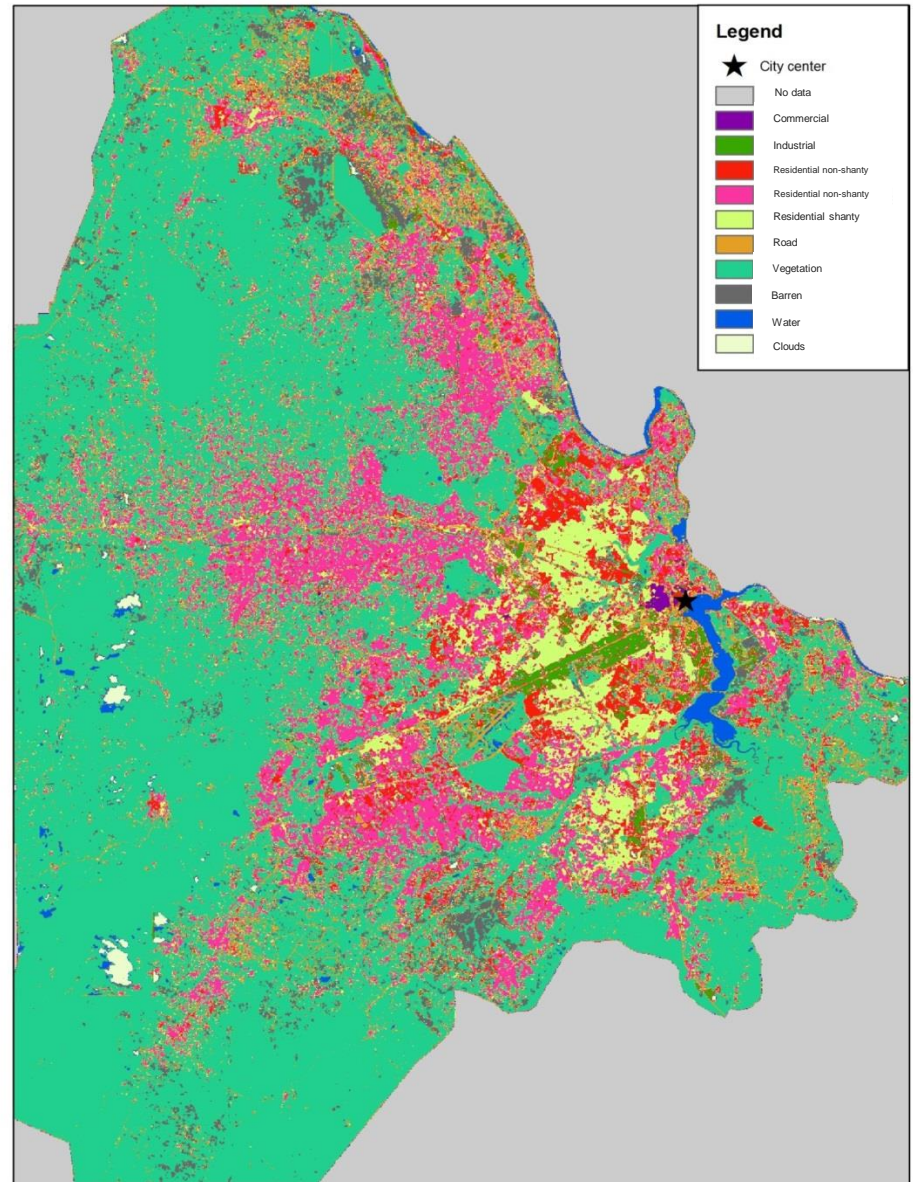
Classifying EAs by shanty vs. non-shanty

EAs were classified based on an indicator of "shanty-ness".

$$I = \frac{area\ of\ "shanty"\ pixels}{area\ (shanty + non - shanty\ pixels)}$$

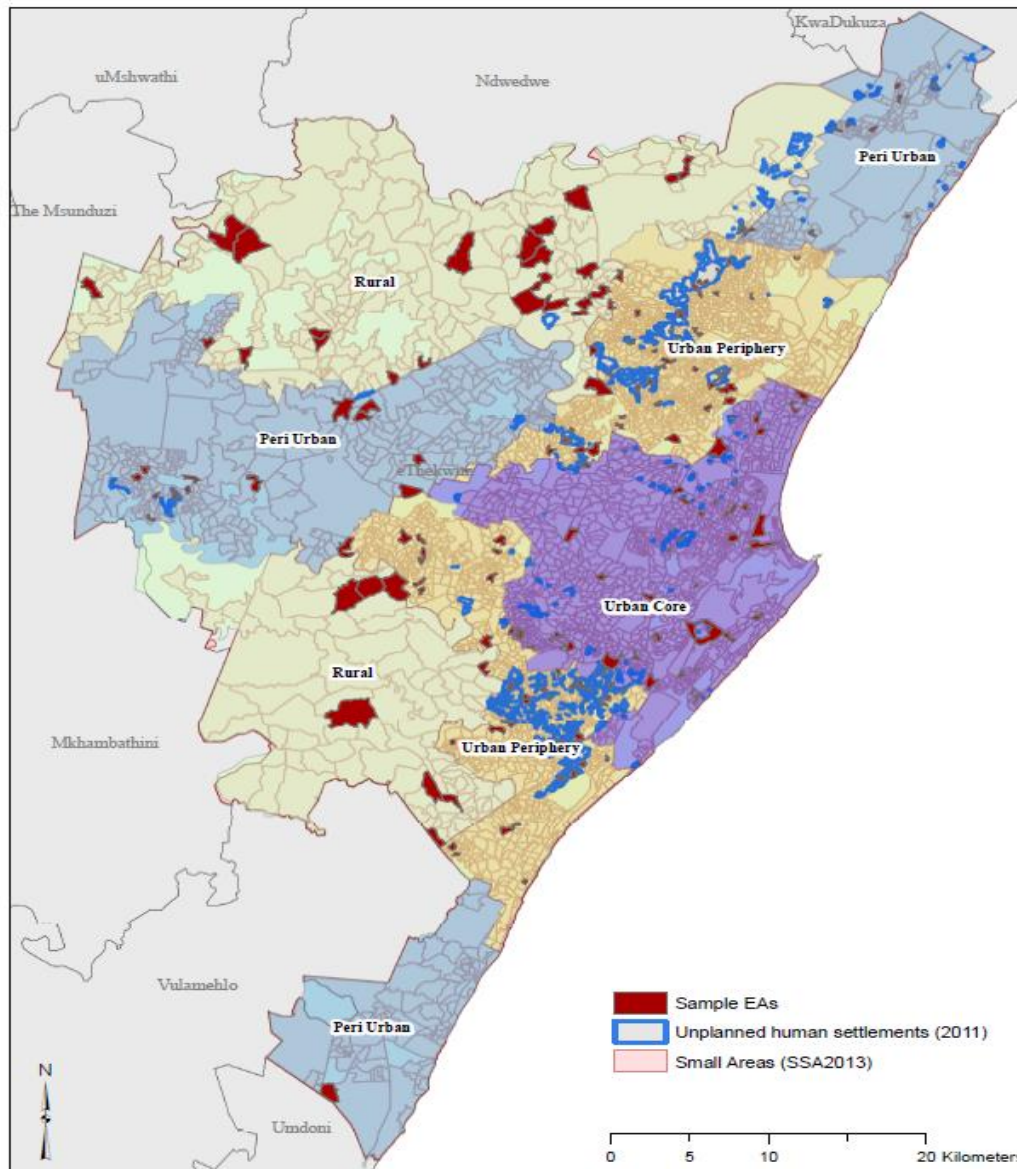Picked a threshold of *I=0.5* based on the distribution of this ratio across EAs.

Share of shanty pixels out of total shanty + non-shanty pixels
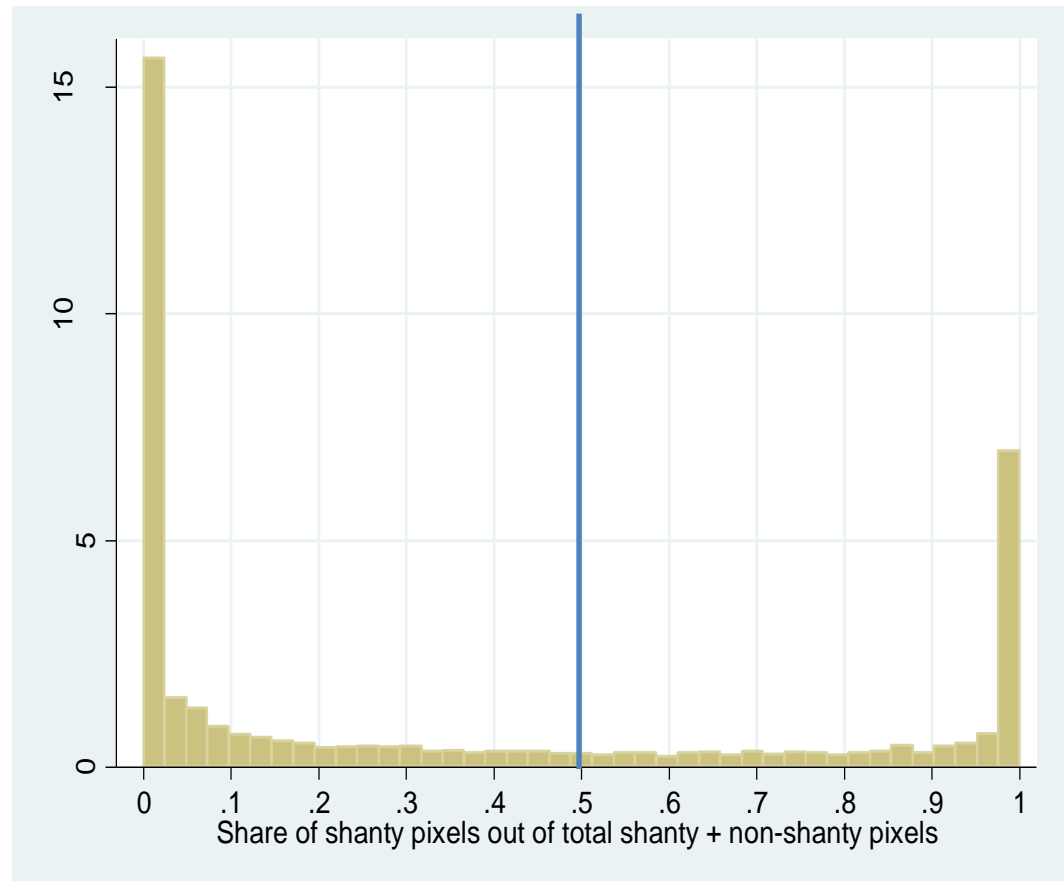
Sampling design

4 strata

200 EAs (selection pps)

2,397 sample households

Stratum	2012 Census			DESLSS 2015		
	No. of EAs	No. of HHs	Population	No. of Eas	Sample Size (HHs)	Margin of Error
1 Central core, non-shanty	4,943	329,477	1,317,095	56	672	5.3%
2 Central core, Shanty	6,073	422,123	1,586,762	64	768	5.0%
3 Middle Ring	3,692	275,620	1,146,747	51	612	5.6%
4 Periphery	554	41,388	166,360	29	348	7.4%
Total	**15,262**	**1,068,608**	**4,216,964**	**200**	**2,400**	**2.8%**

Legend
★ City center
No data
Commercial
Industrial
Residential non-shanty
Residential non-shanty
Residential shanty
Road
Vegetation
Barren
Water
Clouds
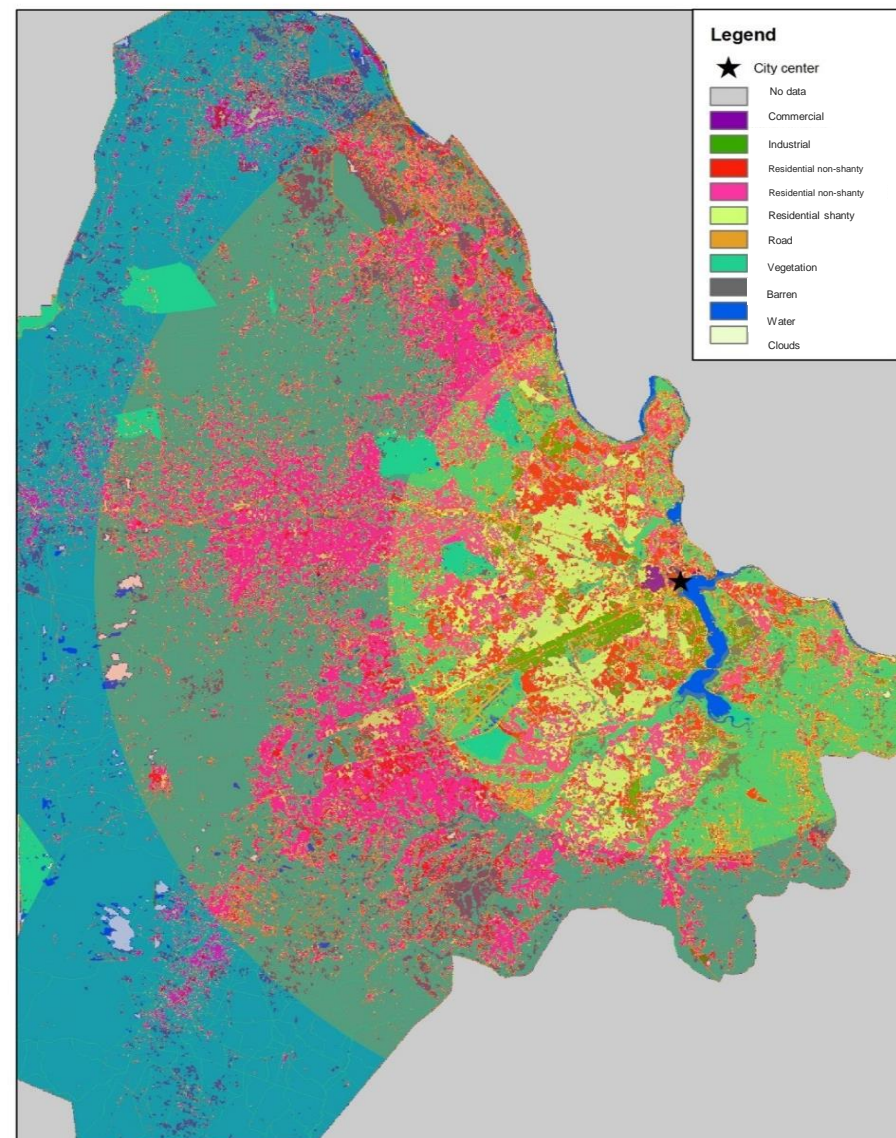
Source: South Africa National Statistical Agency, Durban municipality, World Bank.

Segmentation of large PSU

- Data-rich environment: spatial strata were provided by official authorities. (from Census and municipal services survey).

- Spatial distribution of unplanned settlements was known based on **ground information** and satellite imagery.

- **66 PSU were too large** (>250 dwelling).

- **Segmentation** was done using satellite imagery.

	Stratum					
	Peri Urban	Rural	Urban Core	Urban Periphery, No Slum	Urban Periphery, Slum	**Total**
0-200	15	20	21	30	4	**90**
201-250	4	6	12	15	7	**44**
251-400	5	5	9	10	12	**41**
401-500	1	0	2	0	8	**11**
501-1000	0	0	5	6	2	**13**
over 1000	0	0	1	0	0	**1**
Total	**25**	**31**	**50**	**61**	**33**	**200**

1. Large PSUs were split into segments of approx. equal dwelling count using roof count based on recent satellite imagery from Google Earth.

2. Selection of segment with equal probability within each segmented EA.

SN:188
D: 534

In high-density areas, segments accounted for high-rise buildings and large residential complexes.

SN: 197
D: 882

SN: 196
D: 567

EA 182 (c)
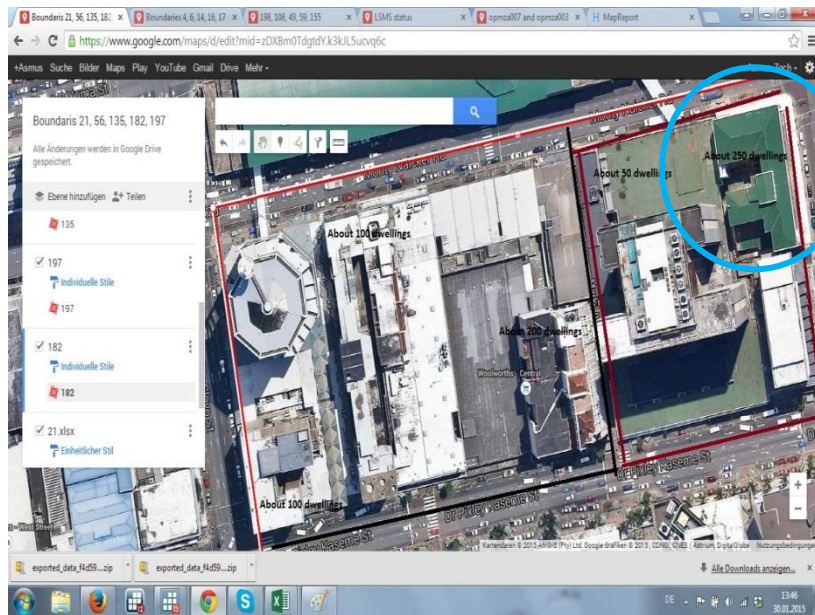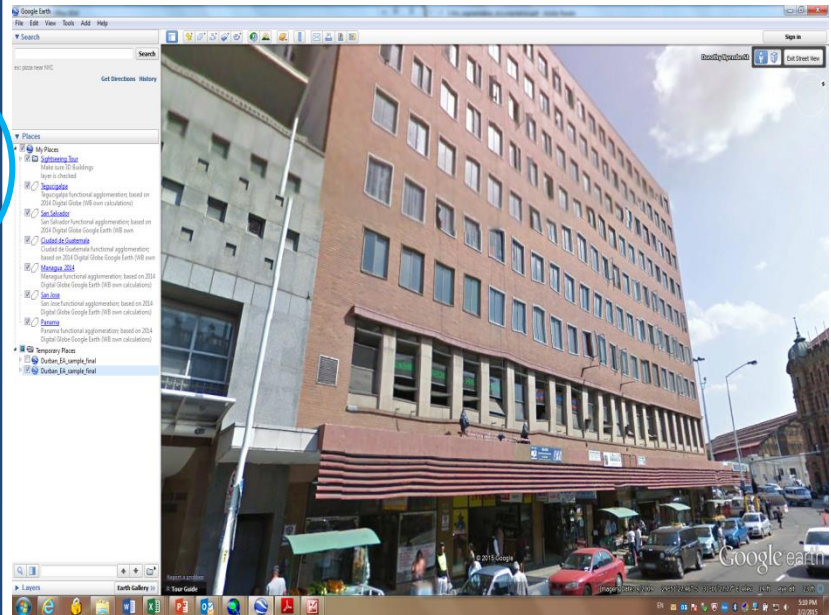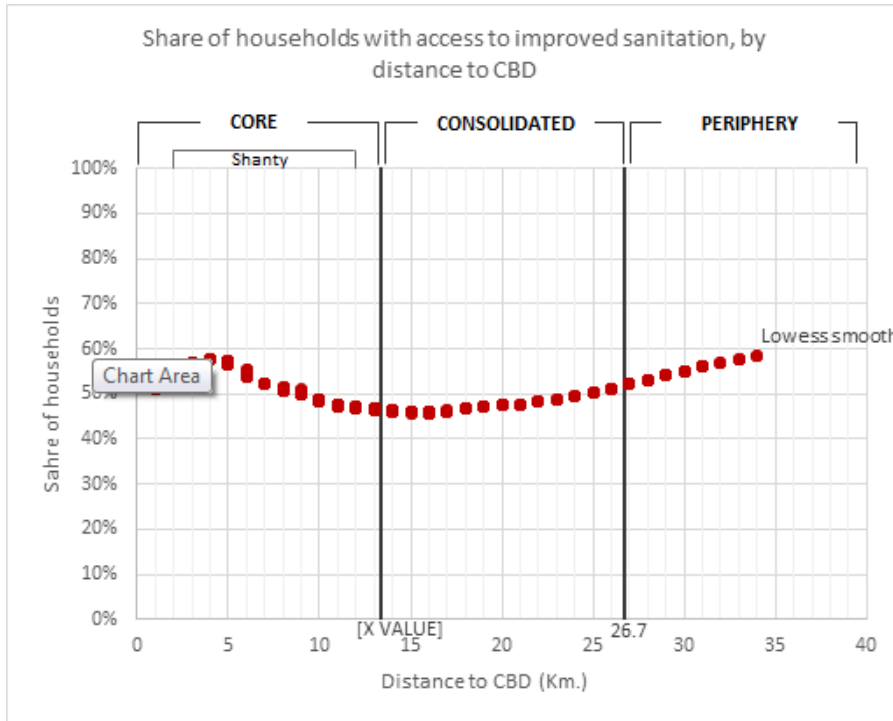## sub-segment: > 250 dwellings

Field observation (firm)

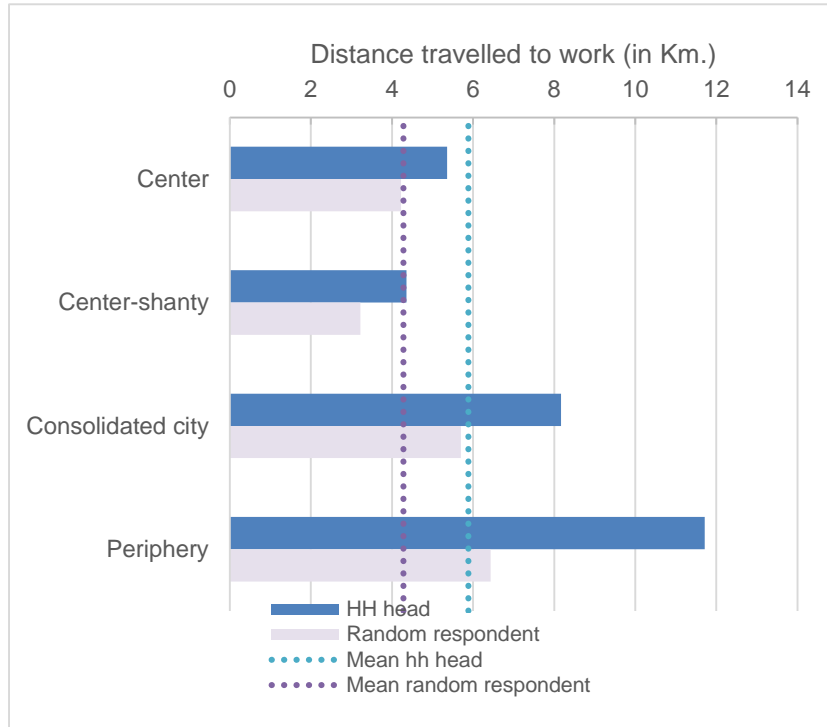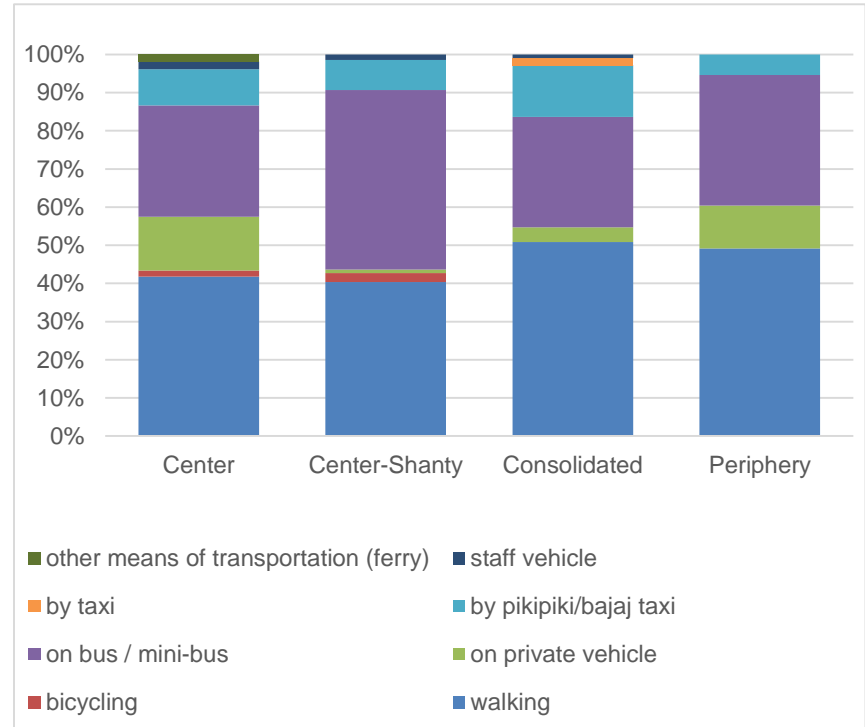**Google Street View**

PRELIMINARY RESULTS

Dar es Salaam

Durban
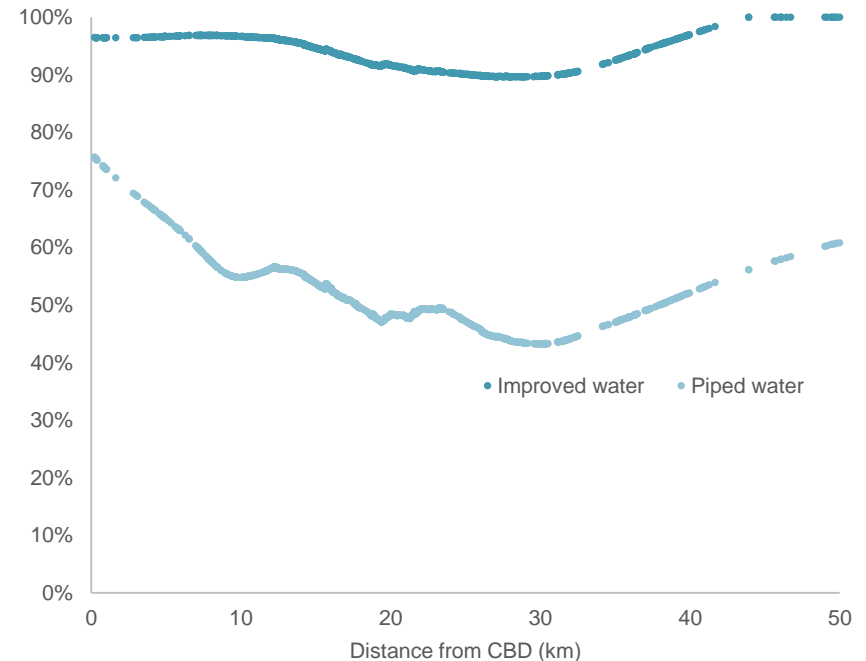
Using geo referenced household survey to measure intra-urban variations in service delivery

Dar es Salaam

Distance Travelled to Work

Transport Mode

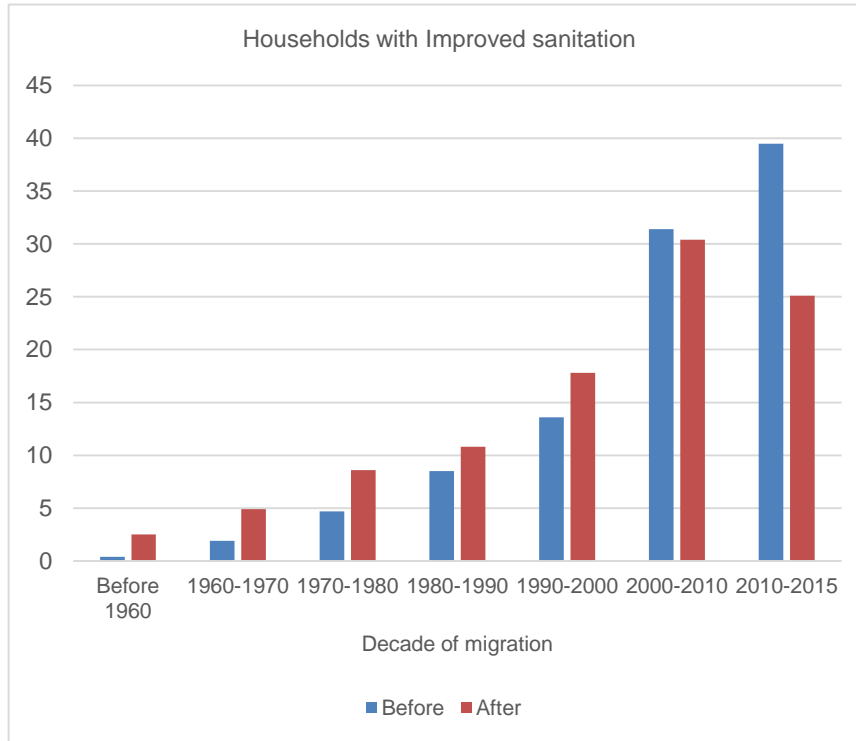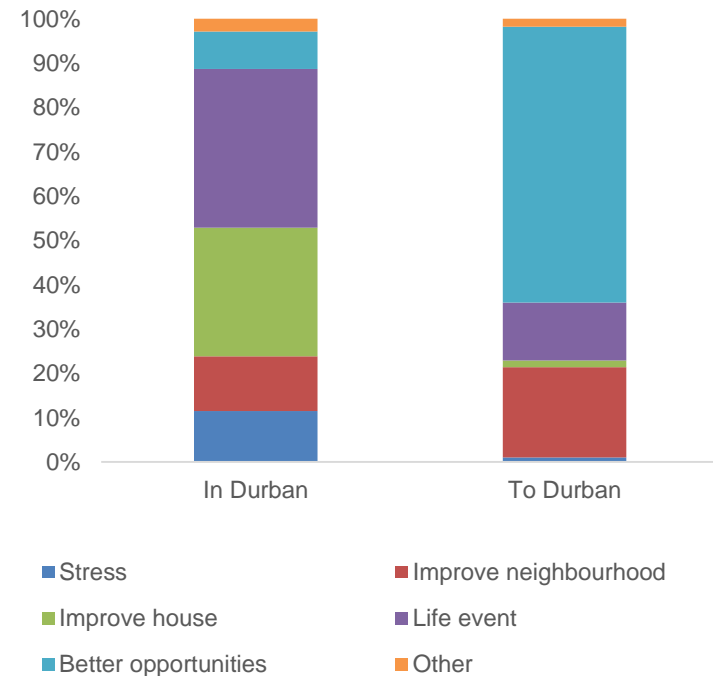Using geo referenced household survey to measure intra-urban variations in mobility

Durban

Access to Services and Migration

Households with Improved sanitation

Reason for Moving

Using geo referenced household survey to understand households' decision to move

The way ahead: new surveys, research, and policy

New surveys

Pilot Sensors Mobility Survey in Dar es Salaam

MSLSC surveys to be launched in Tana and Maputo

Research

Location decisions of households within the city-land use

Informality and within city moves

Policy

Sites and services and household outcomes

Dar es Salaam BRT project

Thank you
Questions?

Nancy Lozano-Gracia, GSURR (TTL)

nlozano@worldbank.org

Somik V. Lall, GSURR

Ana I. Aguilera, GSURR

Sarah E. Antos, ITSQS

Social, Urban, Rural, and Resilience GP

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