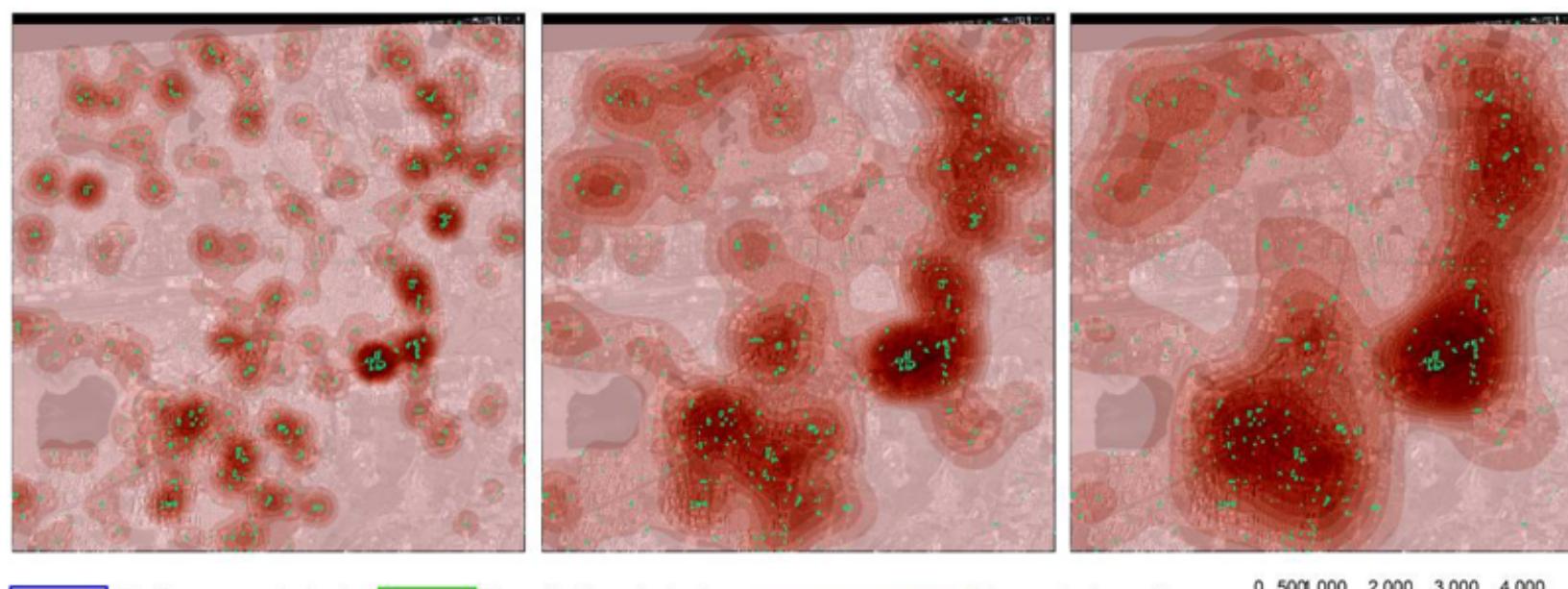
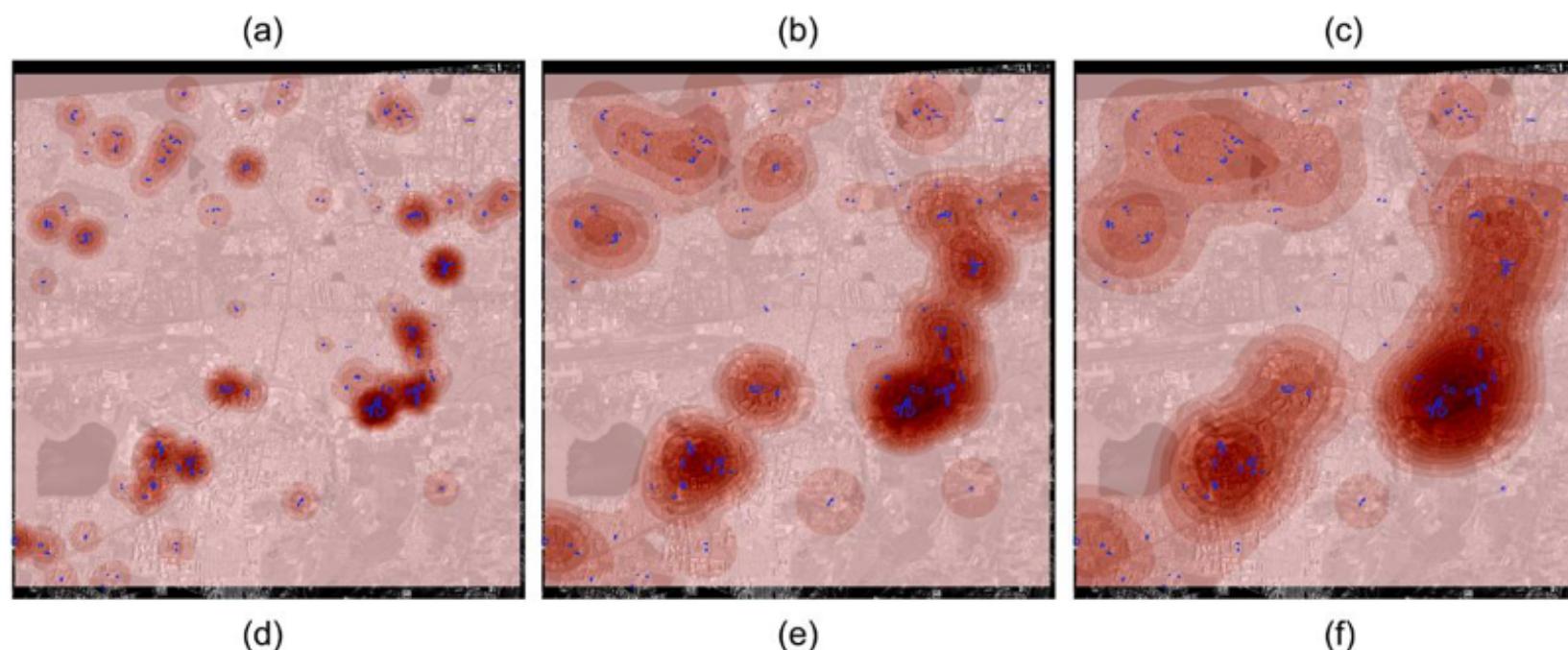
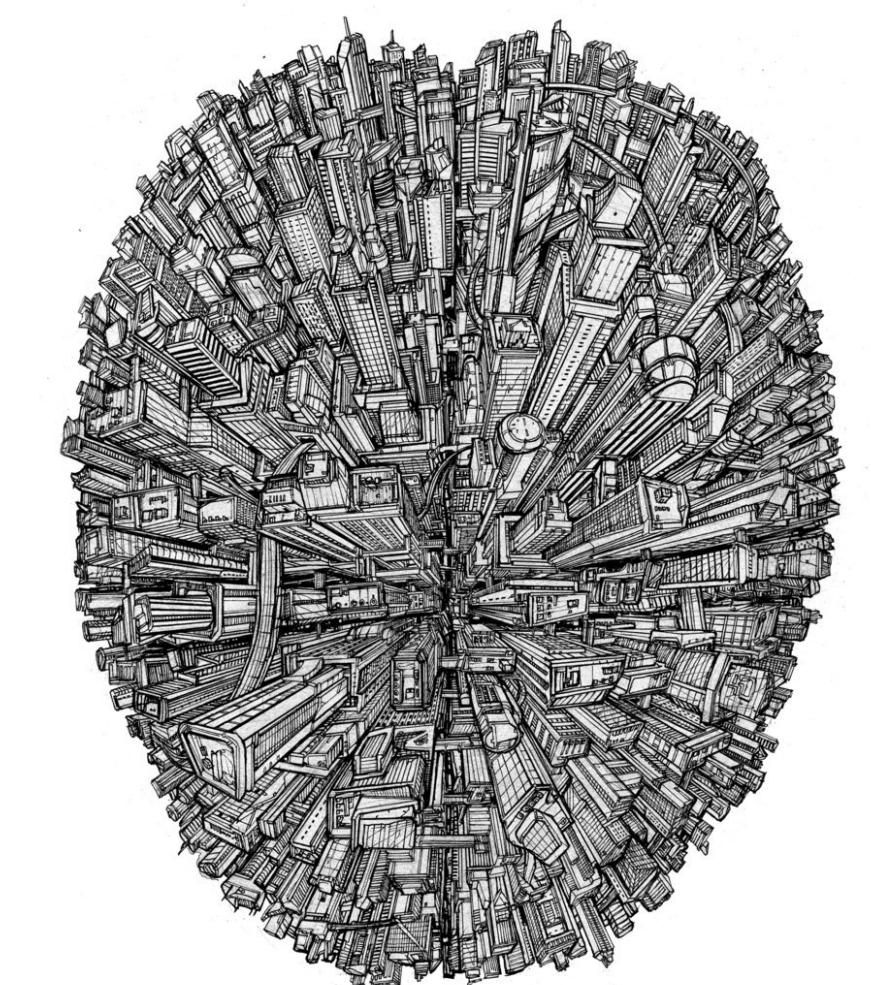
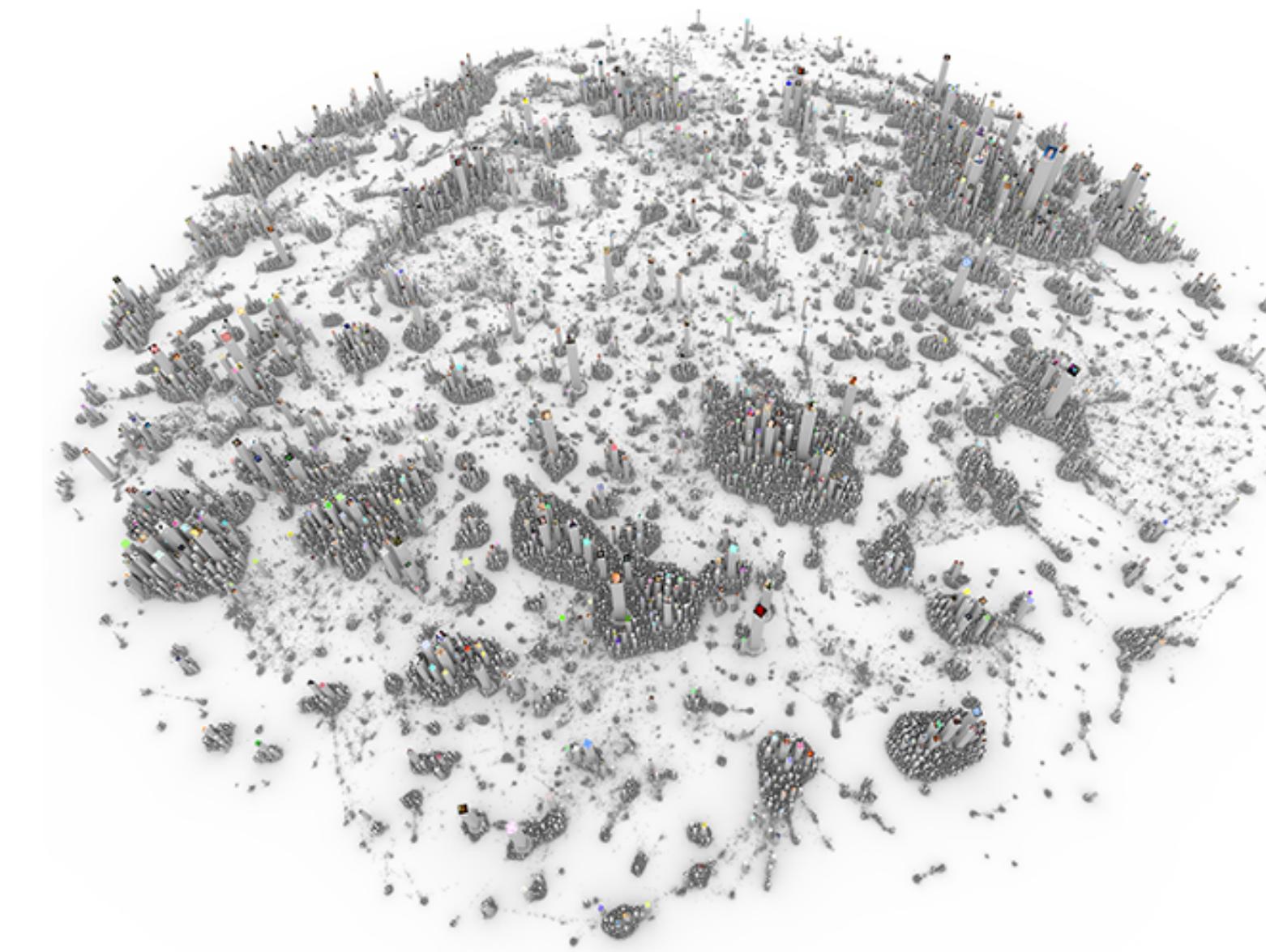


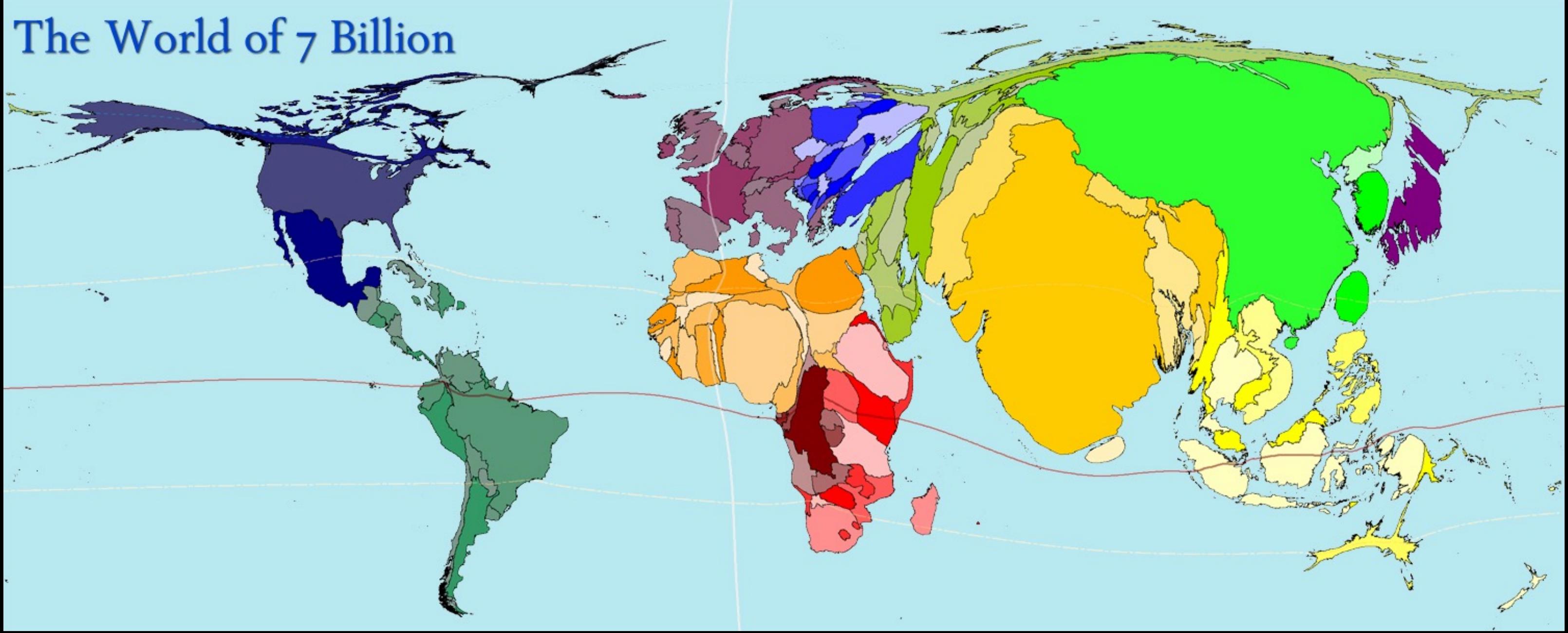
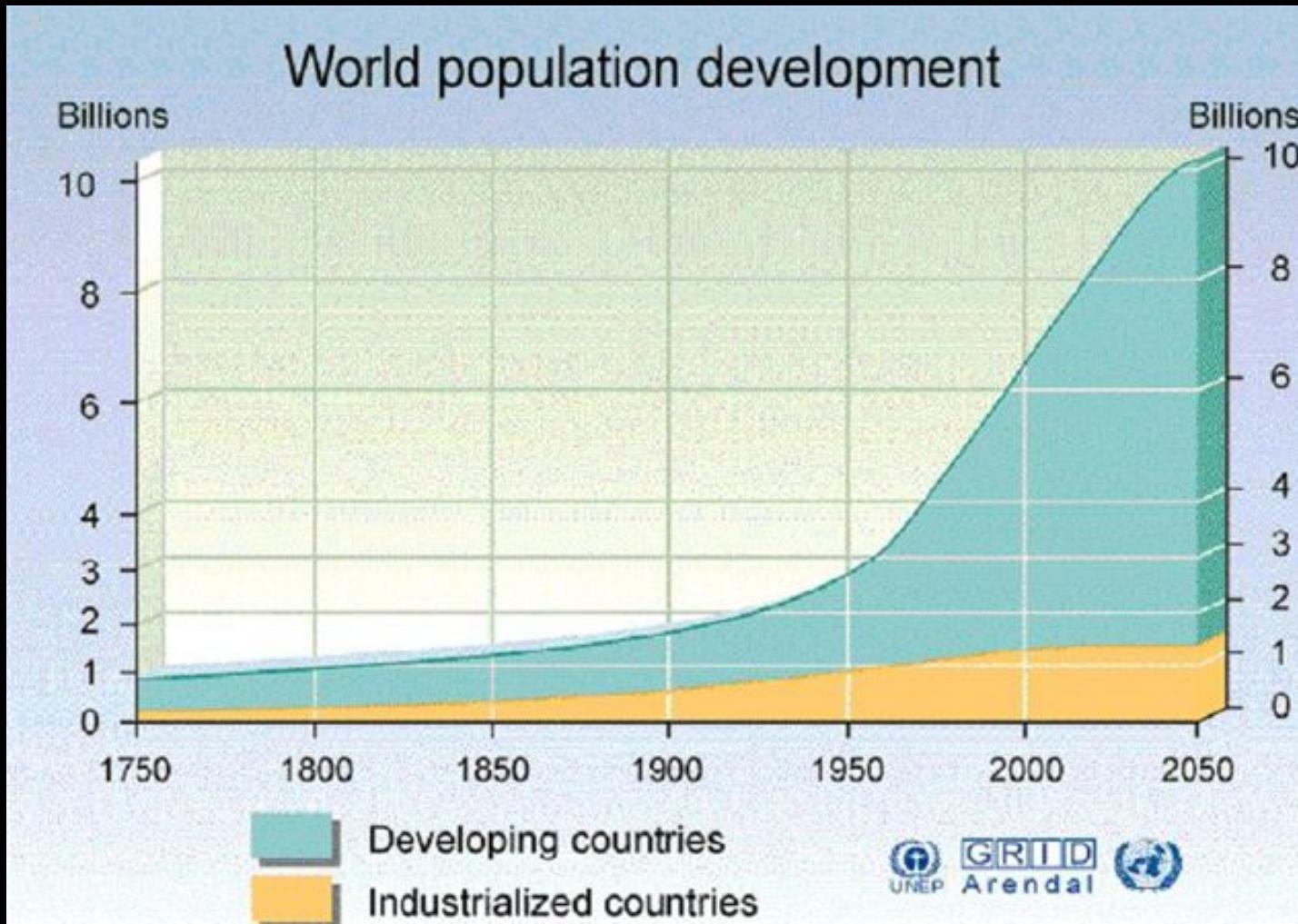
Modelling And Measuring Slums - Slum Detection From Satellite Images



[Http://Audicity.Tumblr.Com/Post/27345598290/Networked-Cities-Computer-Networks-Are-Merging](http://Audicity.Tumblr.Com/Post/27345598290/Networked-Cities-Computer-Networks-Are-Merging)

Michael Lees, m.h.lees@uva.nl,

Computational Science Lab, UvA



Population Growth - Urban Challenges

“The United Street Sellers Republic — the USSR — [would be] the second-largest economy in the world after the United States.”



Robert Neuwirth
The Power of Informal Economy

In 2008, For The First Time
More People Lived In Cities
Than In Rural Areas.

One-Third Of The Urban
Population, Or **I Billion** Live
In Slums.

In India, Slums Are Fastest
Growing Human Habitat,
Double In Next 20 Years (Un-
Habitat).

Dynasylum

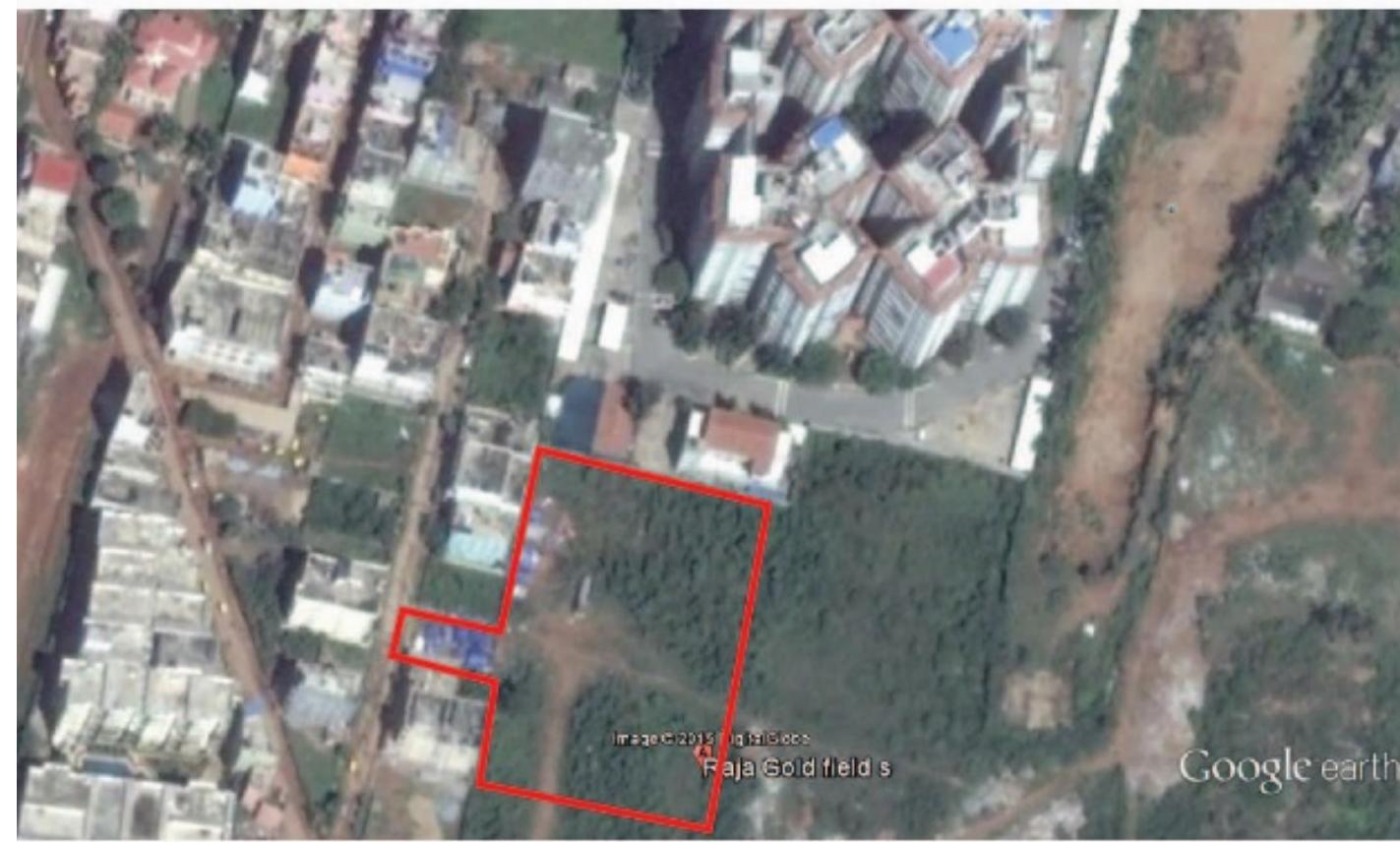
“Can we understand the dynamics of slum growth in developing countries?”



A) 2008



B) 2012



C) 2013

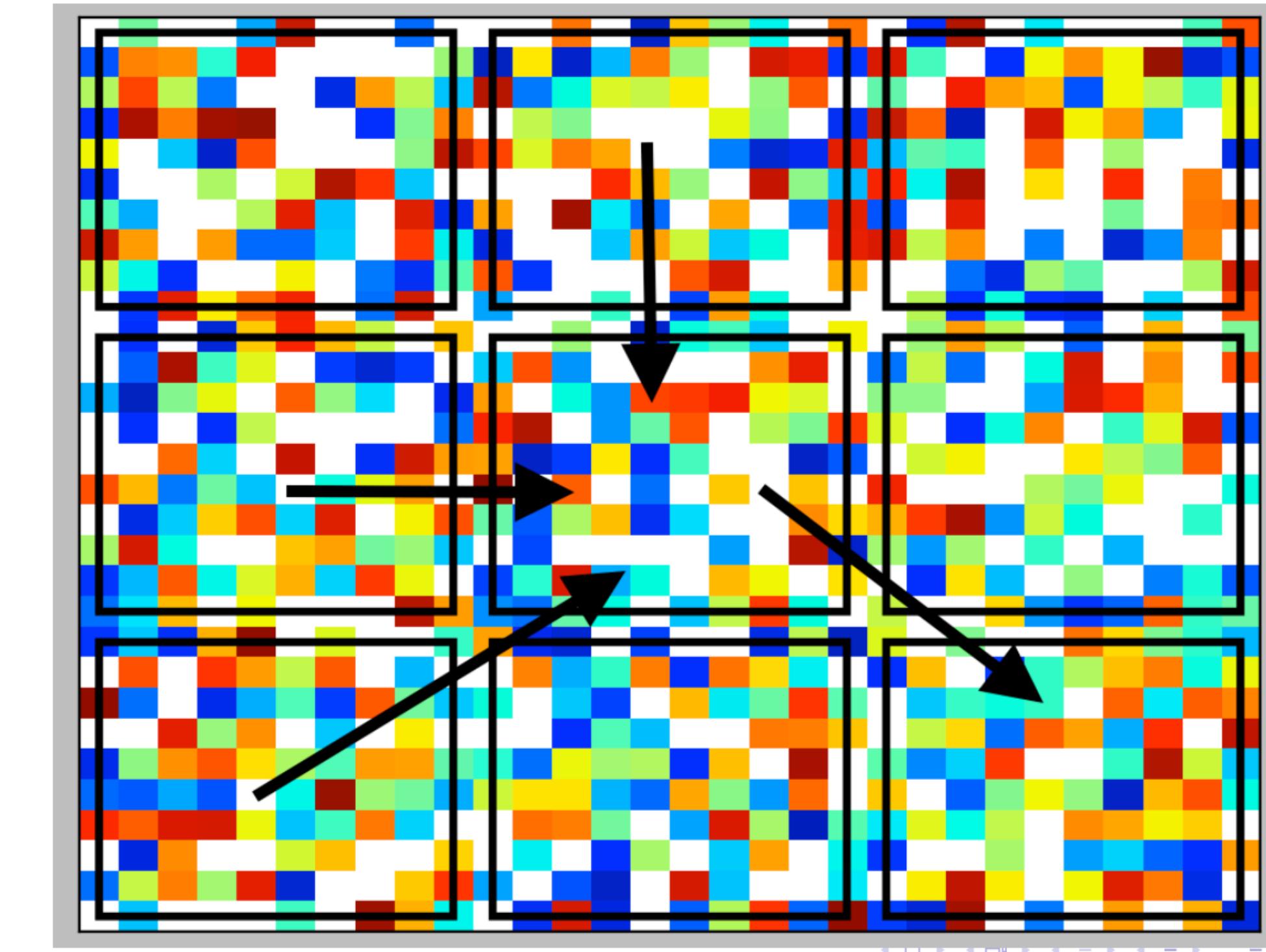
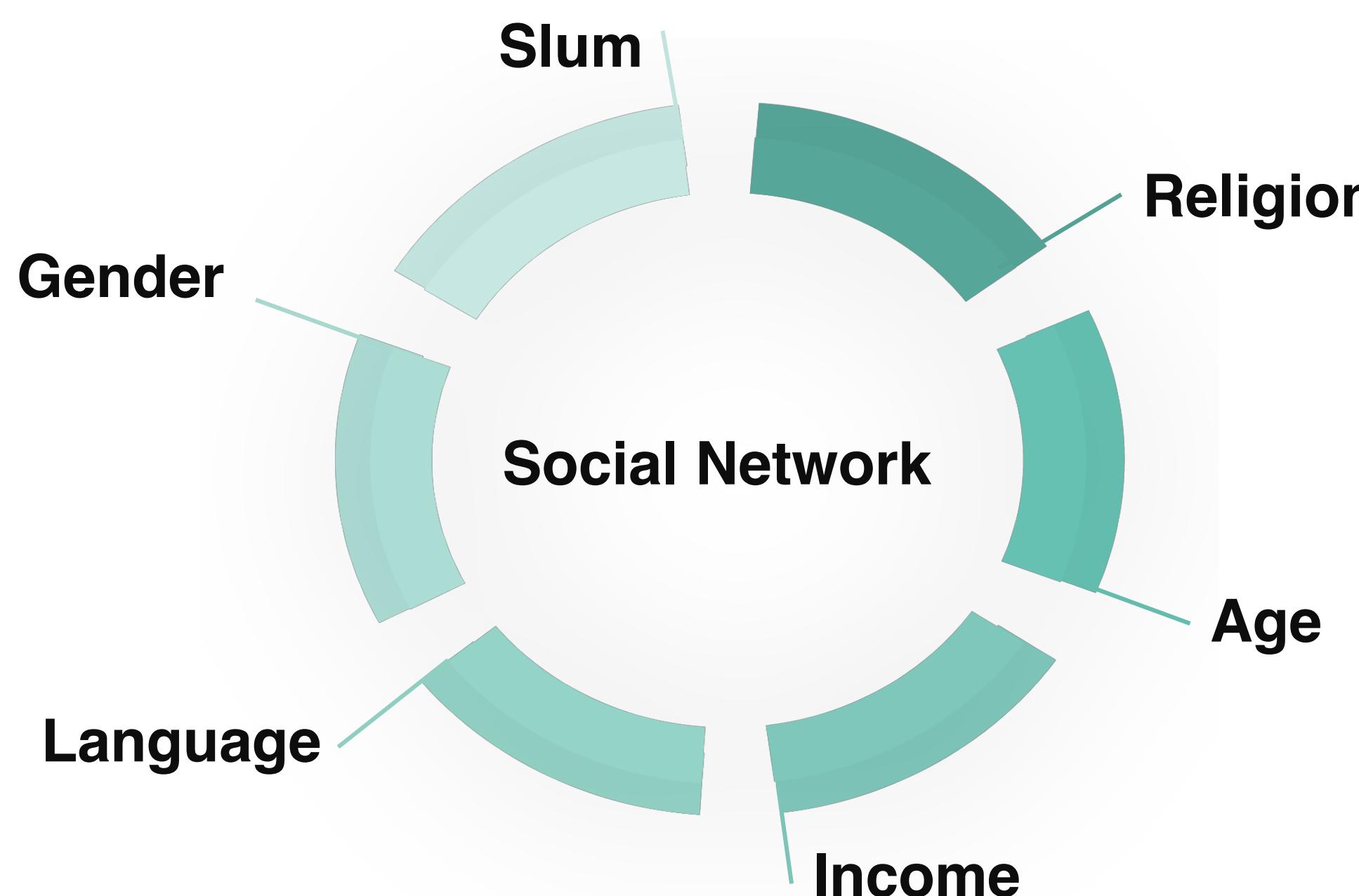


D) 2015

(IMAGE SOURCE – Google Earth)

Agent-Based Model

- Develop a **agent-based model** to understand *how*, *when* and *where* slums grow in developing countries.
- Applying the model to:
 - **Population Dynamics of a slum.**
 - **Slum migration within Bangalore.**
 - **Pressure for slum emergence.**



Modelling the impact of household life cycle on slums in Bangalore
D Roy, MH Lees, K Pfeffer, PMA Sloot
Computers, environment and urban systems 64, 275-287

Spatial segregation, inequality, and opportunity bias in the slums of Bengaluru
D Roy, MH Lees, K Pfeffer, PMA Sloot
Cities 74, 269-276

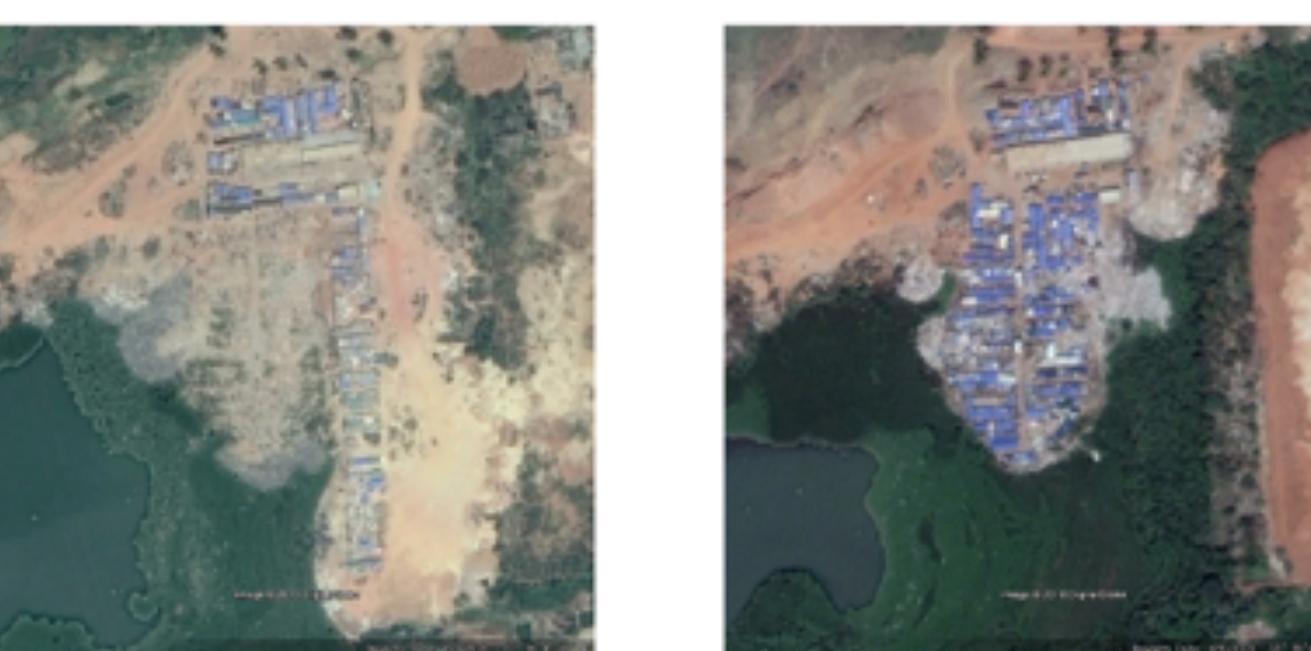
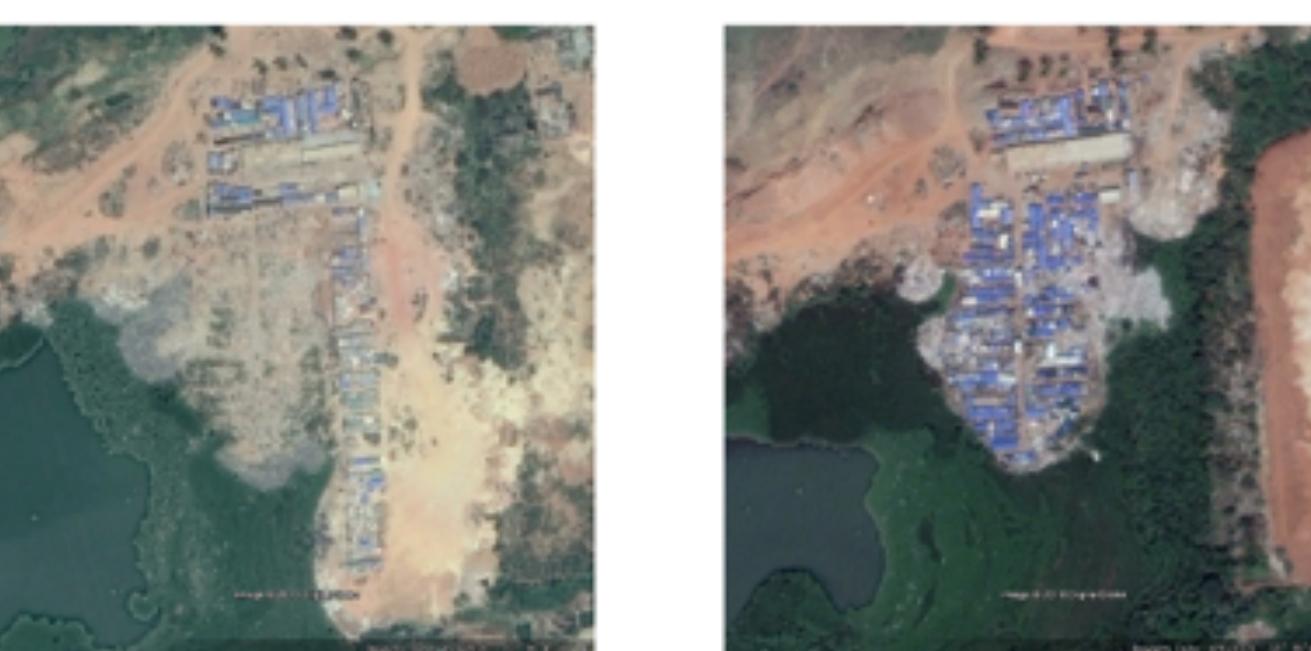
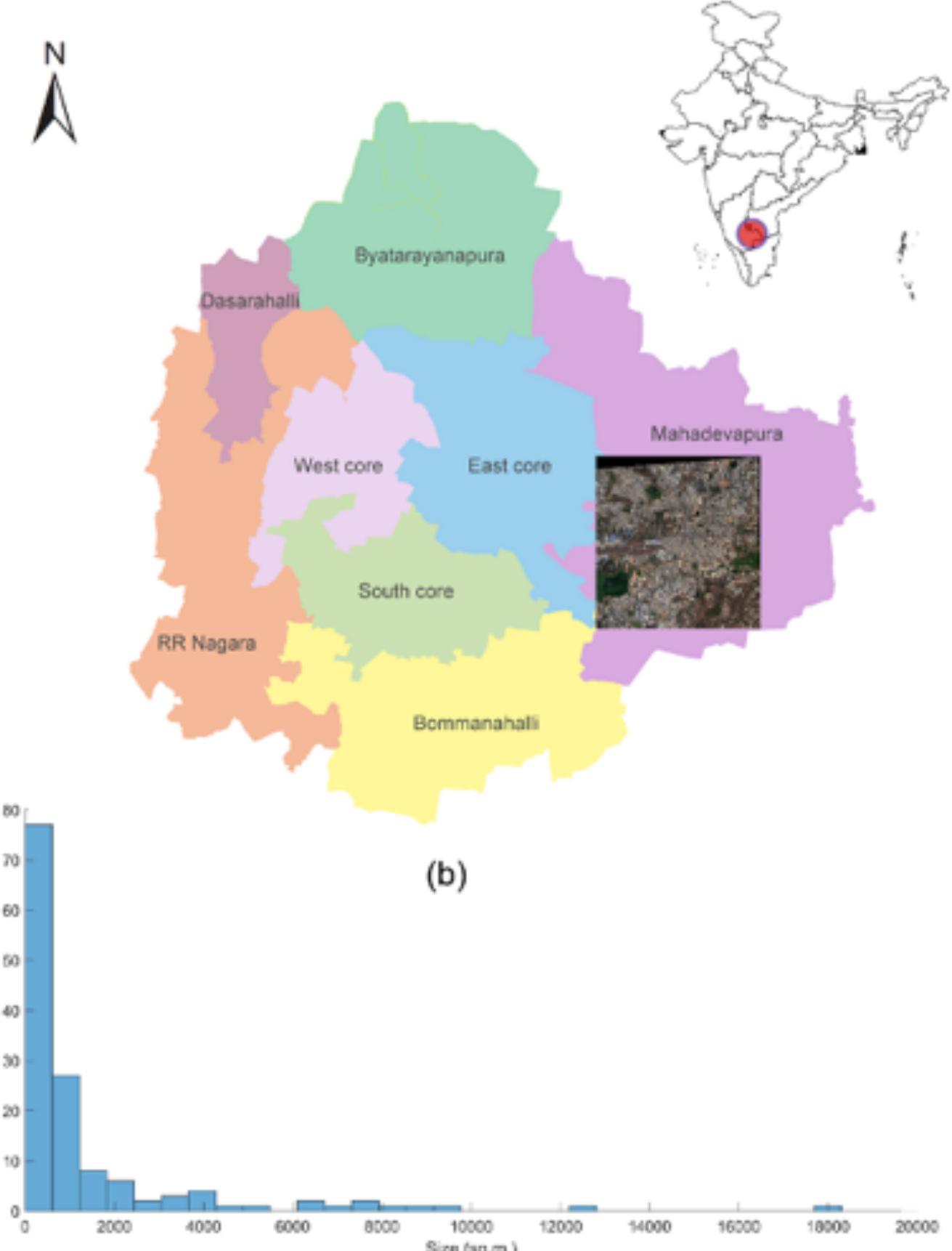
The emergence of slums: A contemporary view on simulation models
D Roy, MH Lees, B Palavalli, K Pfeffer, MAP Sloot
Environmental Modelling & Software 59, 76-90

Remote Sensing

An Ideal Way To
Obtain Temporal
Data



(d)



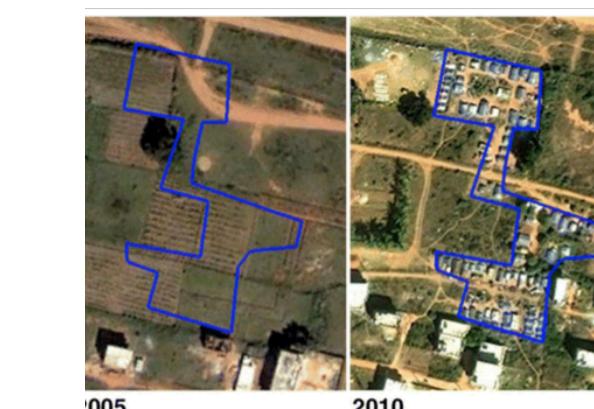
The very low-income settlement of Khata Nagar



Change Detection In Hudi



The low-income settlement of Kodigehalli



Change Detection In Atturu



Change Detection In Manjunatha Layout

Data

What Are Bangalore Slums?

- Demographic profile
- Age of Marriage
- Literacy & Occupation
- Income & Expenditure
- Rent & Commute
- Welfare Benefits
- Security of Tenure
- Migration Statistics
- Physical Infrastructure
- Slum choice

nature.com > scientific data > data descriptors > article

MENU ▾ SCIENTIFIC DATA

Altmetric: 18 More detail »

Data Descriptor | OPEN

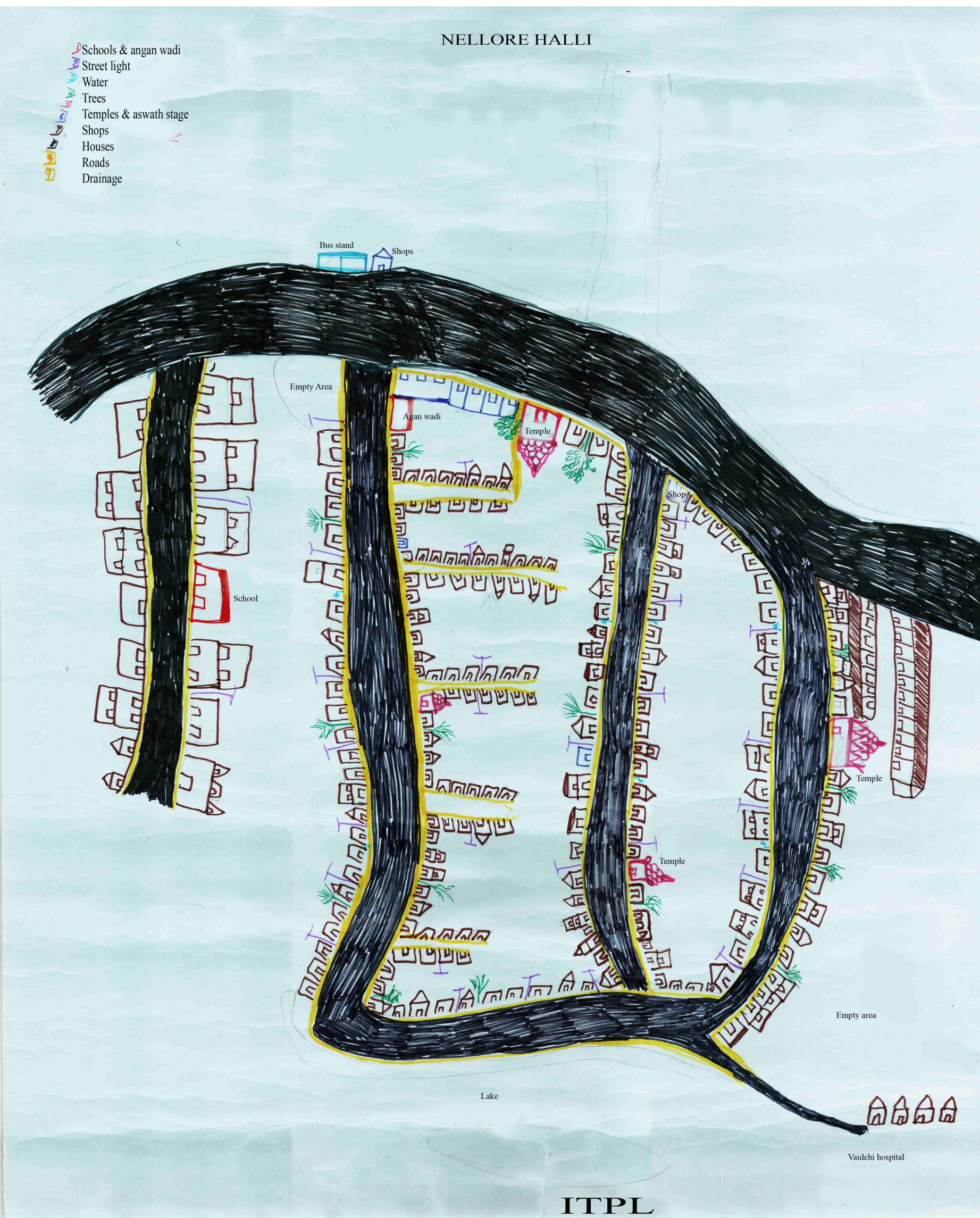
Survey-based socio-economic data from slums in Bangalore, India

Debraj Roy✉, Bharath Palavalli, Niveditha Menon, Robin King, Karin Pfeffer, Michael Lees & Peter M. A. Sloot✉

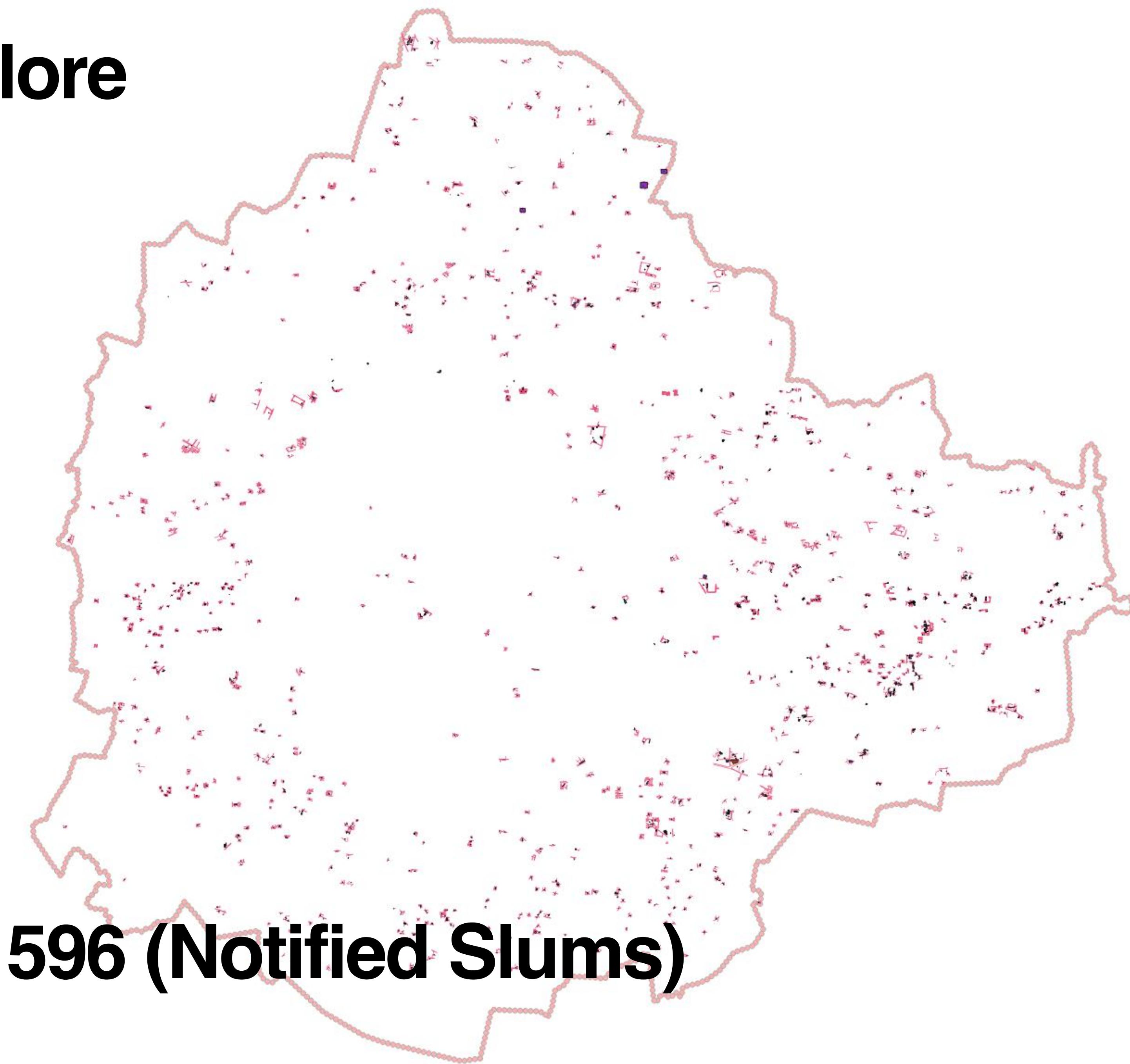
Scientific Data 5, Article number: 170200 (2018) doi:10.1038/sdata.2017.200 Download Citation Socioeconomic scenarios Sociology

Received: 19 June 2017 Accepted: 28 November 2017 Published online: 09 January 2018

Survey-based socio-economic data from slums in Bangalore, India
D Roy, B Palavalli, N Menon, R King, K Pfeffer, M Lees, PMA Sloot
Nature Scientific data 5, 170200



Slums In Bangalore

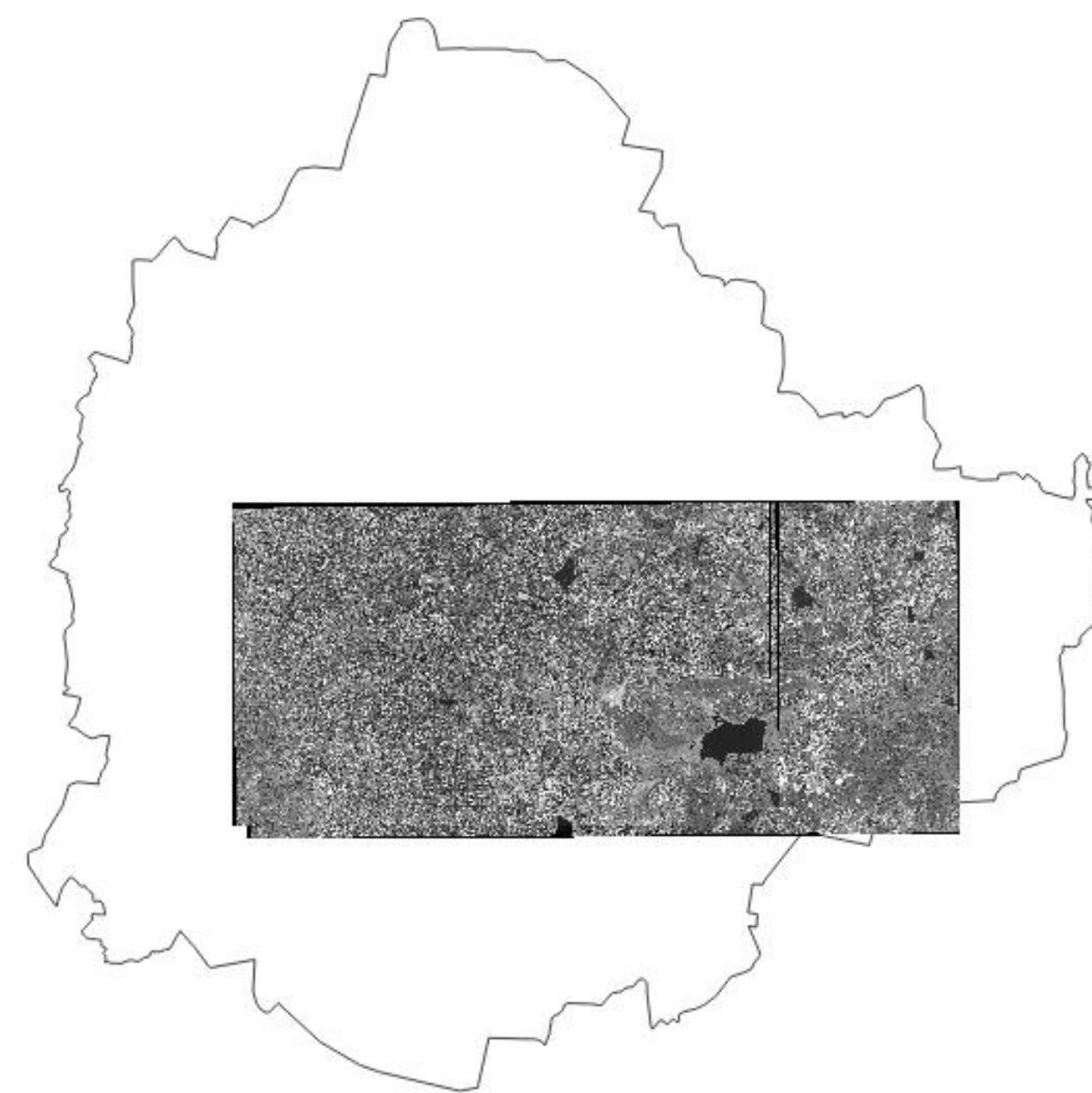


Census (2010): 596 (Notified Slums)
Our Data: 1521

Satellite Images

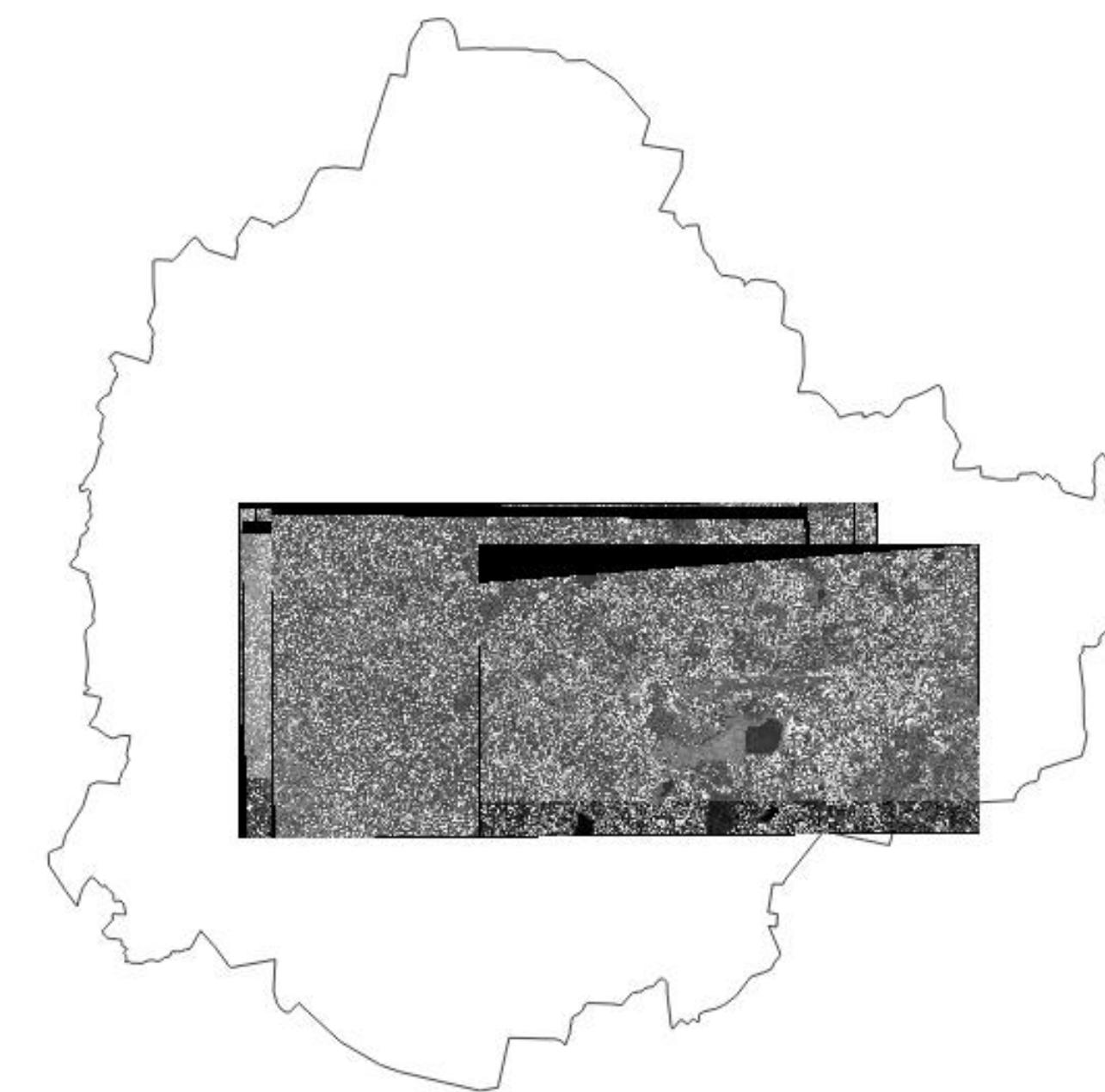
QuickBird II

panchromatic
0.61 m resolution
and 2.4 m multispectral (2001 -
2010)



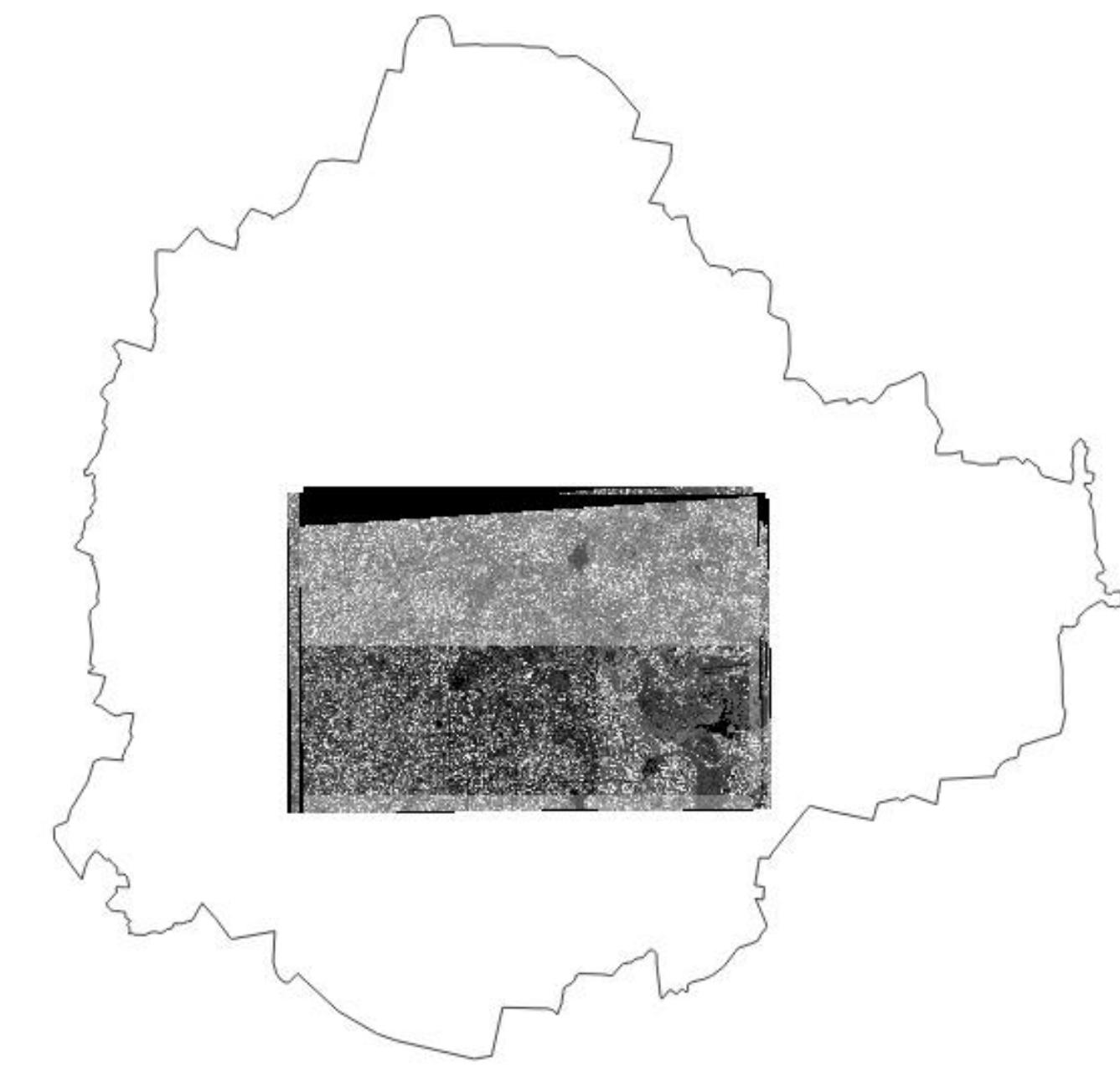
World View 2

panchromatic imagery
0.46 m resolution,
eight-band multispectral imagery with
1.84 m resolution (2010 -2014)



World View 3

panchromatic imagery
0.31m resolution
eight-band multispectral imagery with
1.24 m resolution (2015 -2017)



Supplemented by Cartosat 2(PAN) and GE images(RGB) for entire Bangalore.

Ethics Of Slums

Slum Relocation

Slum Eviction

Slum Redevelopment/Upgrading

Voting Banks

Economic Benefit (Labour)

Arrival City

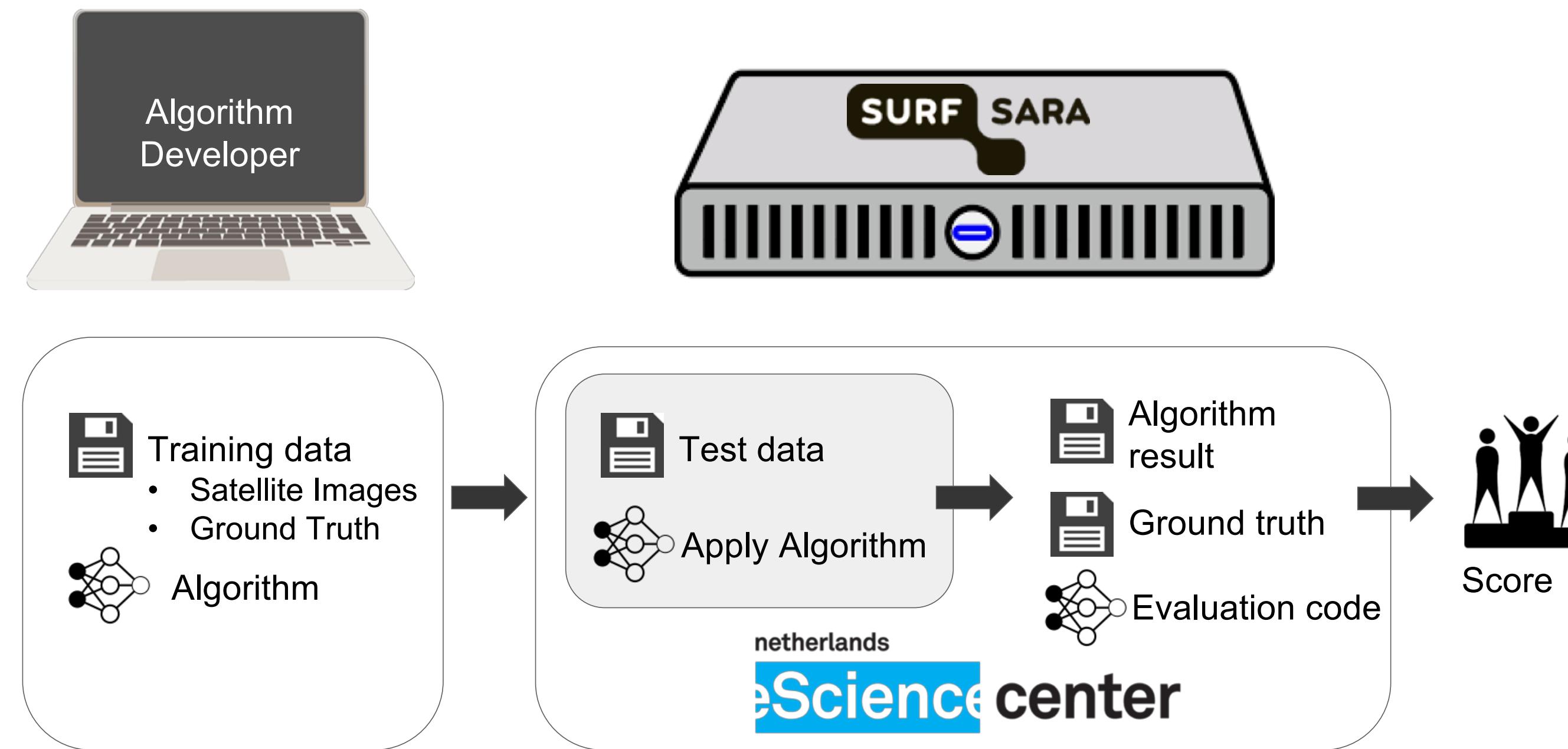


Identifying Slums Can Have Huge Impacts For Dwellers

- Notified Slums Easier To Evict
- Access To Public Distribution System (Not All Can Have It)

The Challenge

1. We Release A Sample Set Of Satellite Images And Partial Ground Truth
2. Players Test/Develop Their Algorithms On Sample
3. User Submit Their Algorithms Online
4. Algorithms Executed On Full Data Set
5. Predictions Tested Against Ground Truth Shape File



DynaSlum Team



Dr. M.H. Lees (PI)
IVI - Computational Science



Prof. P.M.A Sloot
IVI- Computational Science



Prof. Dr. K. Pfeffer
ITC Twente - UvA



Dr. D. Roy



B. Weel



B. Andela

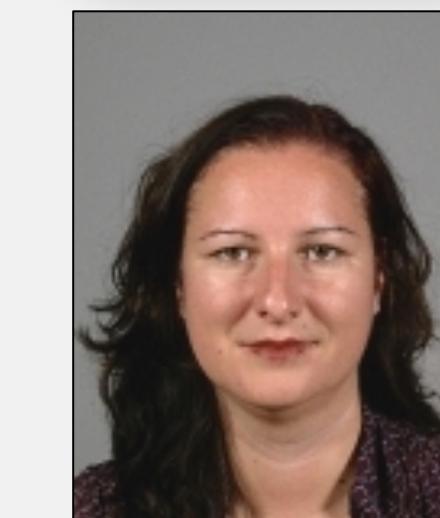


E. Ranguelova

Collaborators



Mr. B. Palavalli
Fields of View



Ms. M. Kuffer
ITC - Twente



Dr. I. Altintas
UC San Diego

Dr. R Sliuzas (Twente)

Thanks