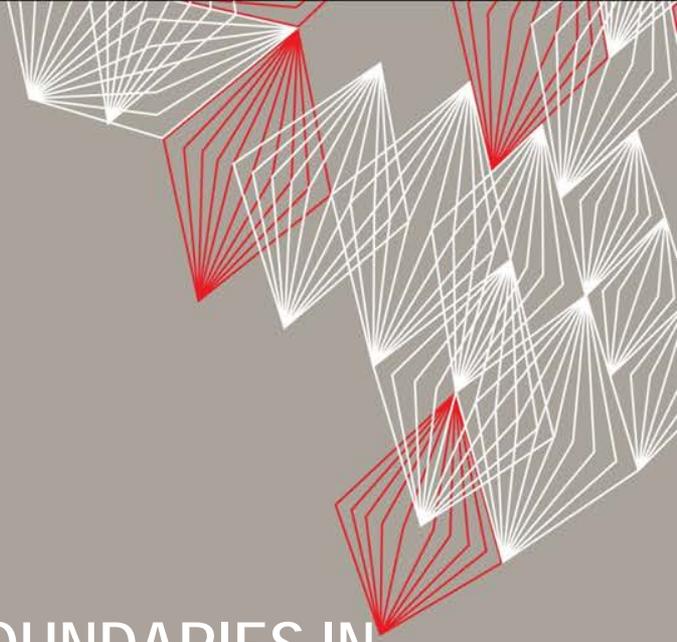
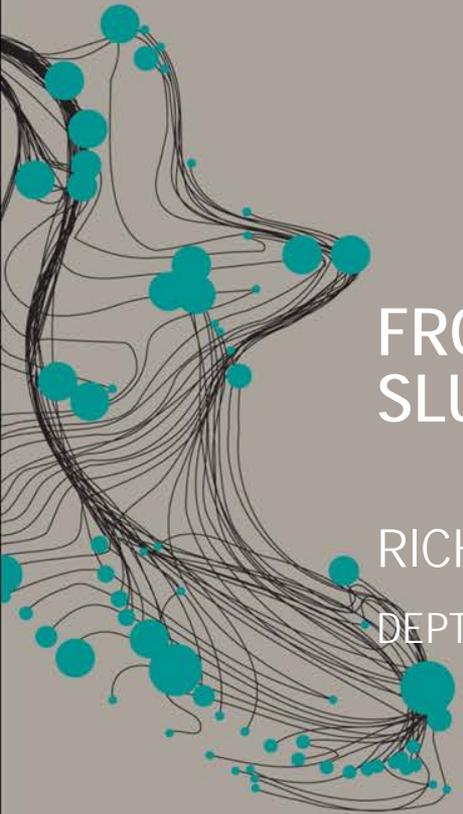


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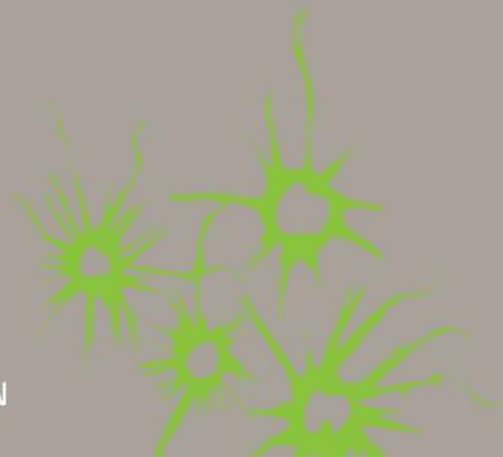
FROM PHYSICAL TO ETHICAL BOUNDARIES IN SLUM MAPPING

RICHARD SLIUZAS

DEPT. URBAN AND REGIONAL PLANNING AND GEOINFORMATION MANAGEMENT



FACULTY OF GEO-INFORMATION SCIENCE AND EARTH OBSERVATION



PARAPHRASING SUSSMAN (1997)

“THE DEVELOPMENT (*AND THE USE*) OF TECHNOLOGY INVOLVES NOT ONLY TECHNICAL CHOICES BUT ALSO POLITICAL AND ECONOMIC ONES.”





ISSUES

- **Slum dwellers, slums and slum mapping.**
 - Formal versus informal development
 - Technologies for slum mapping
 - Ethical considerations
- **Eradication of slums**
 - Typical responses
 - Upgrading, eviction and resettlement
 - Ethical issues

The nature of slum dwellers and slums

UN-HABITAT 2002

Who are slums dwellers?
Urban households lacking
at least 1 of the following:

- Adequate water
- Adequate sanitation
- Sufficient living space
- Secure tenure
- Durable housing (quality of structures & environment – hazards)

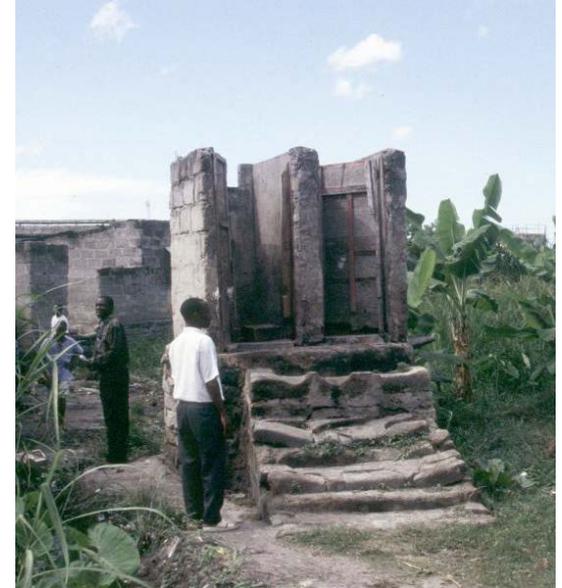
Large scale surveys:
Census, DHS

City and Settlement surveys

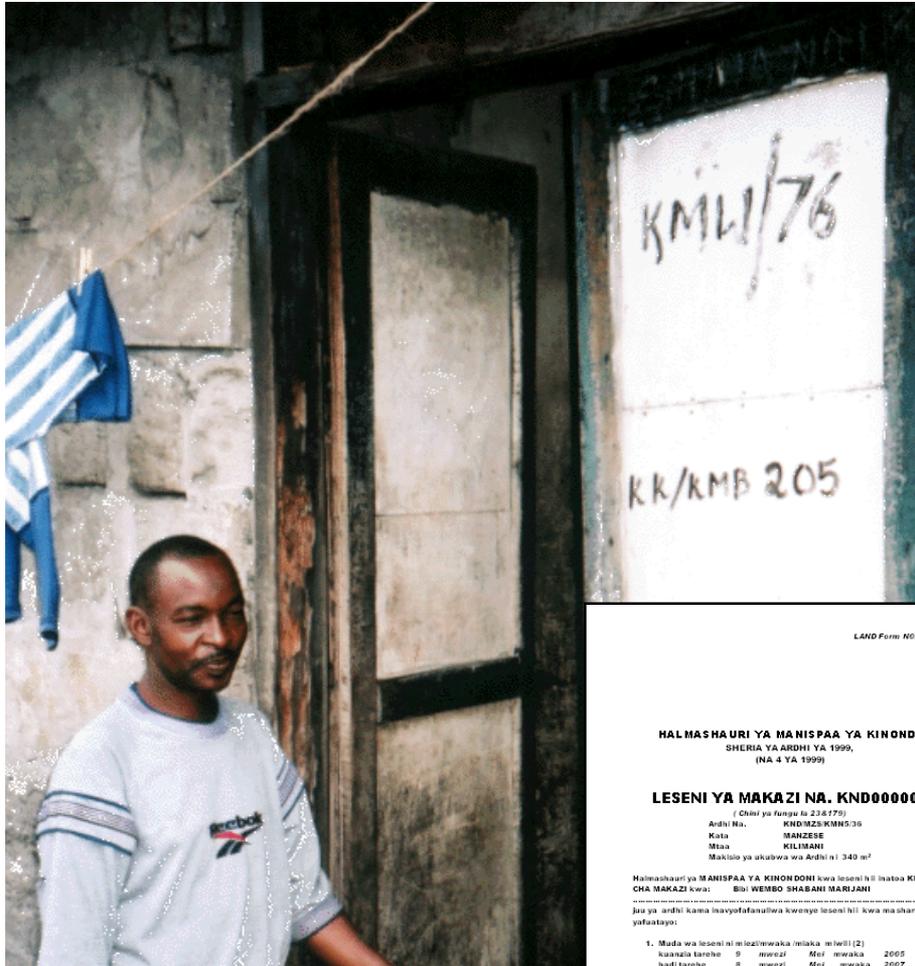


INDICATORS FOR SLUM DWELLERS

ADEQUATE WATER AND ADEQUATE SANITATION



TENURE SECURITY



LAND Form No.74

HALMASHAURI YA MANISPAA YA KINONDONI
SINDIGA YA ARDHI YA 1999,
(NA 4 YA 1999)

LESENI YA MAKAZI NA. KND000001
(Chari ya fungu la 2164775)

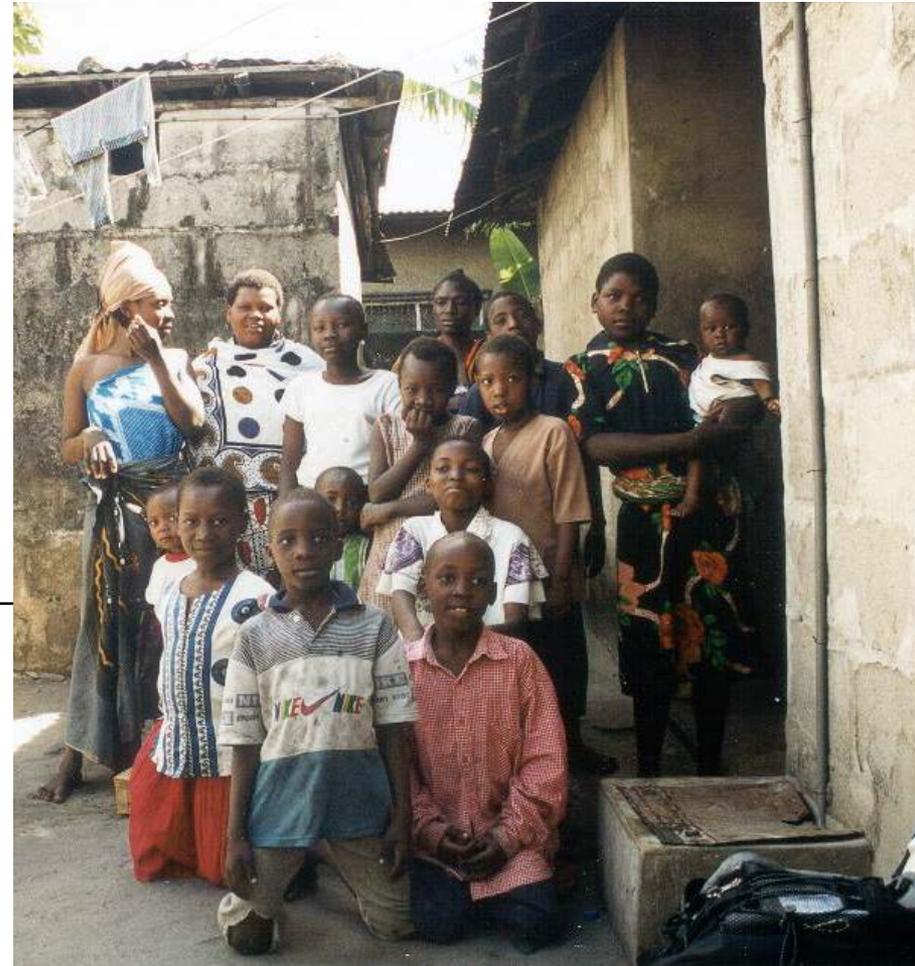
Ardhifu: **KND/22/9/MS/36**
Kata: **MANZESE**
Mtaa: **KILIMANI**
Makubwa ya akubwa wa Ardhi ni 340 m²

Halmashaari ya **MANISPAA YA KINONDONI** kwa leseni hii inatoa **KIBALI CHA MAKAZI** kwa: **Bu WEMBO SHABANI MARIJANI**

Juu ya ardhi kama inavyofanuliwa kwenye leseni hii kwa ma sharti yafuatayo:

1. Mada wa leseni ni miitazimwaka miaka mitatu (3)
kuanzia tarehe 9 mwezi Mei mwaka 2005
haditharehe 8 mwezi Mei mwaka 2007
2. Kodi ya Ardhi ya kilingi 2,720.00 italipwa kila mwaka, chini ya kifungu cha 23(3) (c), Kiwango hiki kinaweza kubadilishwa na Kamatiwa wa Ardhi kwa mujibu wa Sheria.
3. Matalizi ni Makazi na shughuli nyingine zozote ambazo zinaendana na makazi na hazitaathiri majira kinaingina.
4. Ujenzi wowote juu ya ardhi hii au umegaji wa ardhi lazima upate kibali cha Manispaa kupitia Kamati ya Mtaa ambayo ndiyo itakayamla kwa karibu utokoleaji wa masharti haya na maendeleo ya ardhi ya eneo hili.
5. Melikivamiliki wataheshimu na kuhifadhi haki za nja zilizopo.
6. Mada wa leseni hii anaweza kuongezwa.

OVERCROWDING

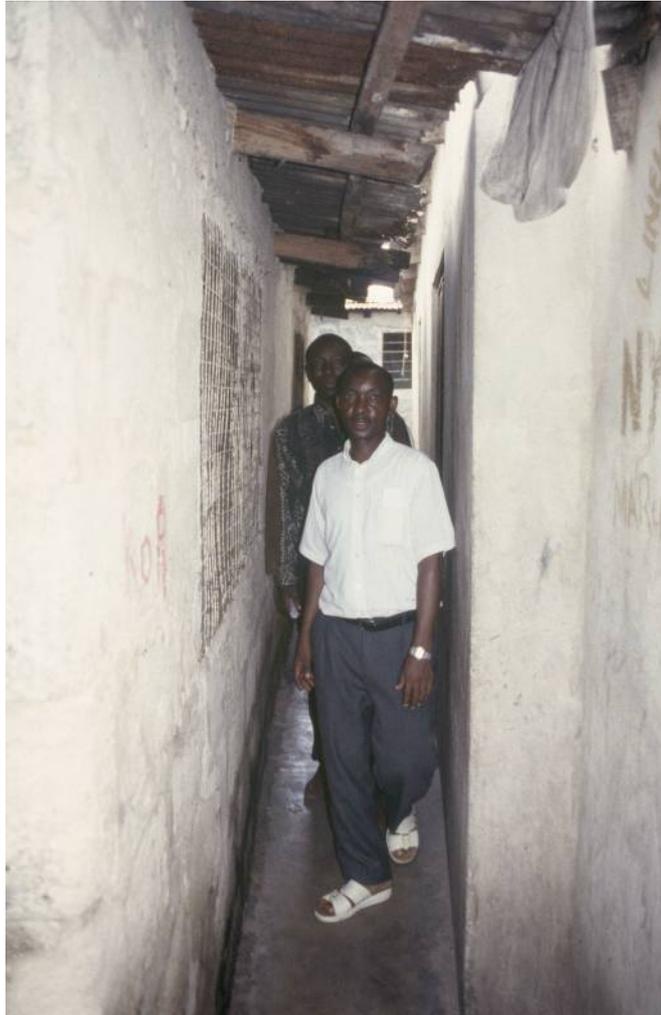


> 3 persons per room

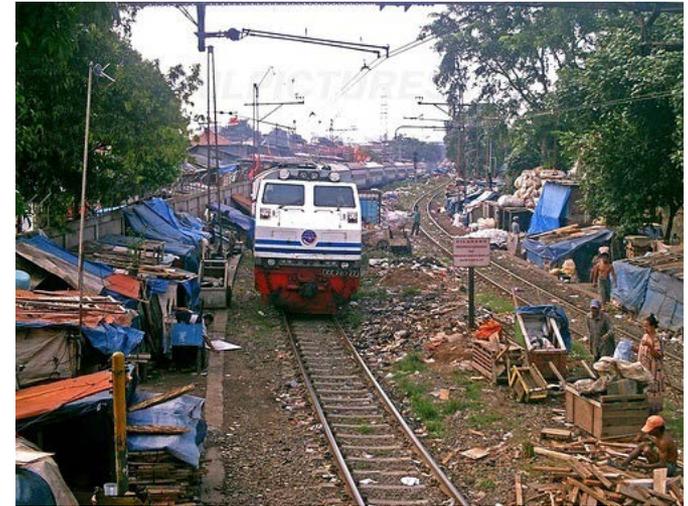


DURABLE HOUSING

PRIVATE VS PUBLIC SPACE, BUILDING AND PLANNING STANDARDS



DURABLE HOUSING: SAFE FROM NATURAL AND TECHNOLOGICAL HAZARDS



The 1984 Bhopal gas disaster

The human cost

(estimates)

- ▶ Up to 10,000 deaths in first three days
- ▶ Additional 25,000 people died of related injuries by 1994

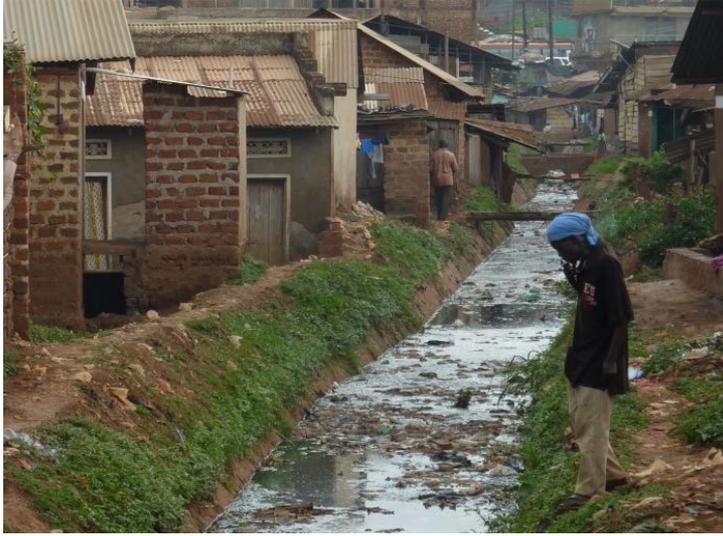
December 3, 1984
A cloud of methyl isocyanate gas leaks from the Union Carbide pesticide plant



HAZARDS AND SLUM FORMATION: DAR ES SALAAM



SLUMS: spatial concentration of slum dwellers - diversity of physical forms and settings



Kampala
Uganda



Cairo
Egypt



Kisumu
Kenya



Ahmedabad
India

City Development Phase (10-12 year cycles)

Structure Planning & Zoning



Provide Trunk Infrastructure



Land Assembly



Detailed Plans & Land Subdivision



Provide Local Services



Building Construction



Occupation & Operation

Site Development & Control Phase (PSBO - Annual cycle)

Occupation of Land



Building Construction



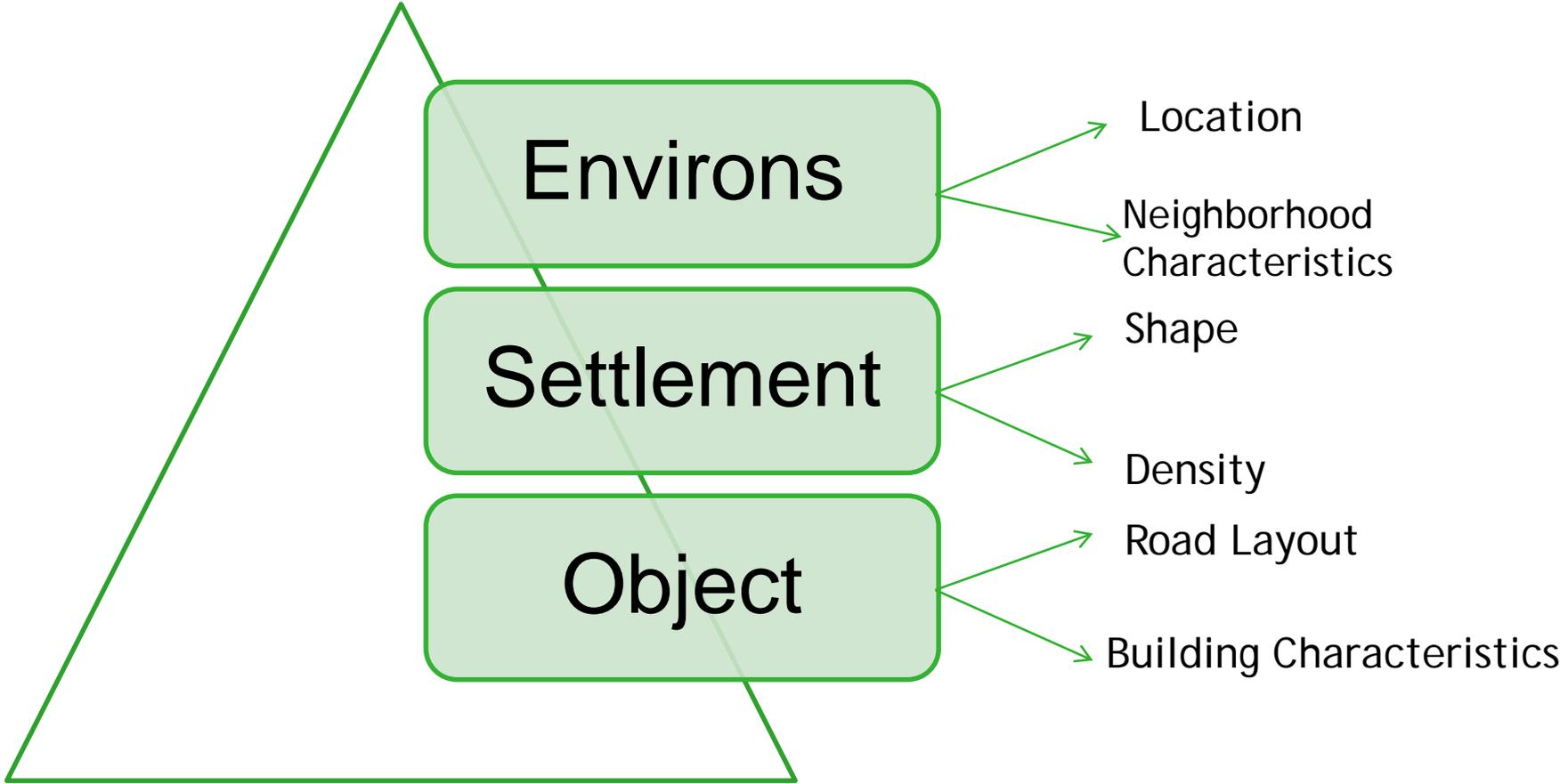
Detailed Plans &
Land Regularisation



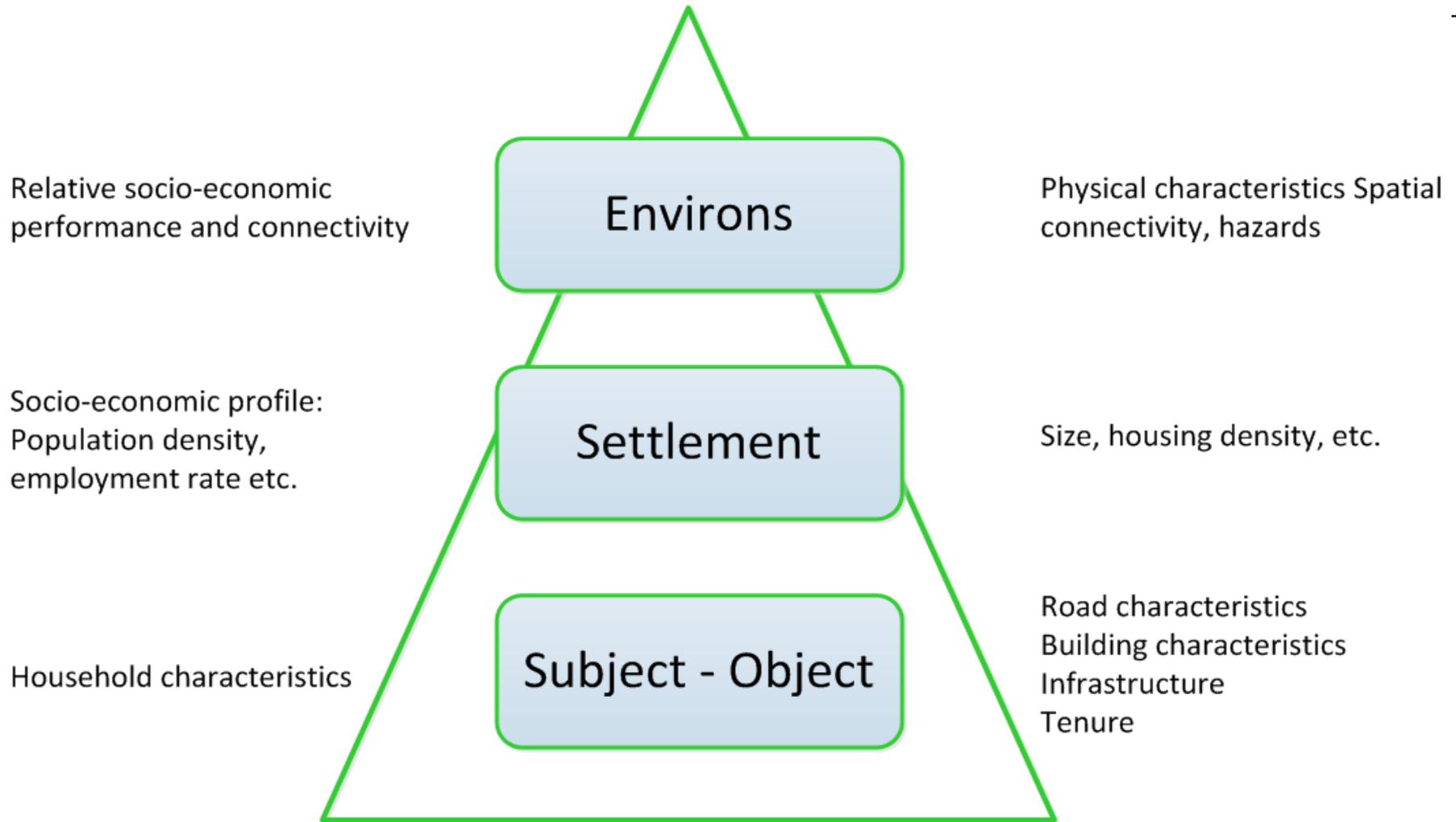
Provide Local Services

Informal Housing Process (OBPS)

GLOBAL SLUM ONTOLOGY (PHYSICAL)



COMBINE THE PHYSICAL AND SOCIO-ECONOMIC COMPONENTS OF SLUMS FOR INTERVENTIONS



Aerial views of slums in different contexts with visual interpretation



Key variables used

- Colour, shape, size, tone, pattern
- Size of houses
- Roads: Lack of or irregular
- Lack of vegetation
- Lack of open spaces
- Building Density (compactness)
- Irregularity of layout
- Roof materials
- Absence of / irregular roads
- Association with environs

SATELLITE IMAGE DATA: Cairo, Egypt

IKONOS 1 m. – WorldView 3 30 cm



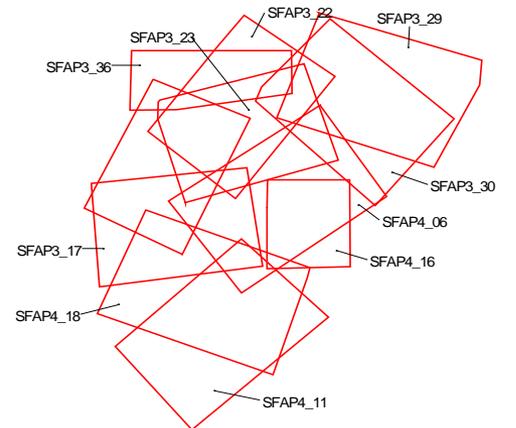
SOMETIMES 1M IS NOT GOOD ENOUGH DELHI, INDIA



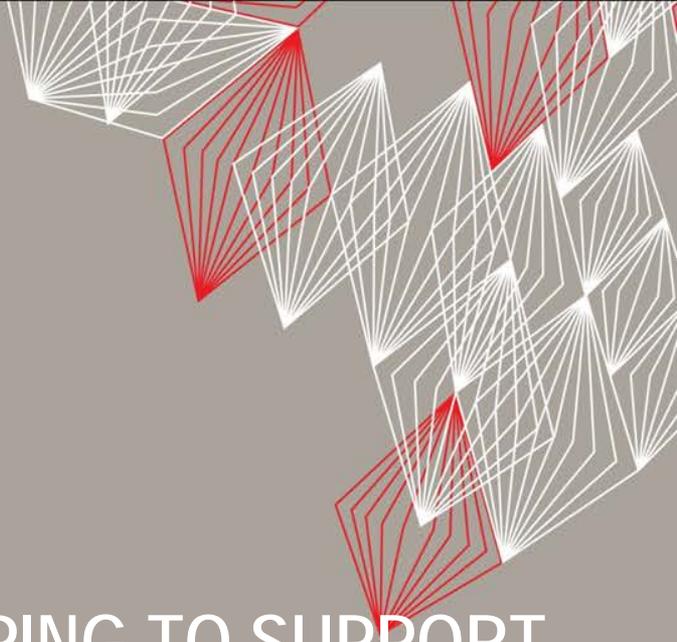
- Density of buildings – more than 80% of roof coverage
- Very small and variable dwelling size and height

DO IT YOURSELF AERIAL PHOTOGRAPHY HAND-HELD NEAR VERTICAL, DOOR REMOVED





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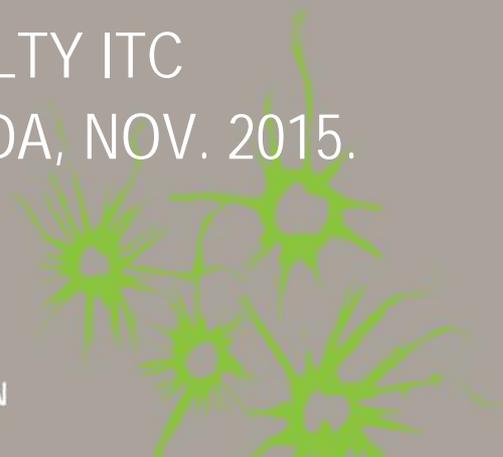
OPPORTUNITIES FOR UAV MAPPING TO SUPPORT UNPLANNED SETTLEMENT UPGRADING

Caroline GEVAERT, Richard SLIUZAS, Claudio PERSELLO,
George VOSSELMAN

UNIVERSITY OF TWENTE – FACULTY ITC
GEOTECH CONFERENCE, RWANDA, NOV. 2015.



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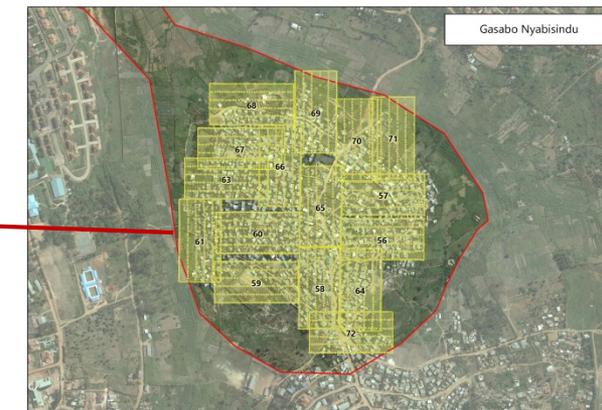
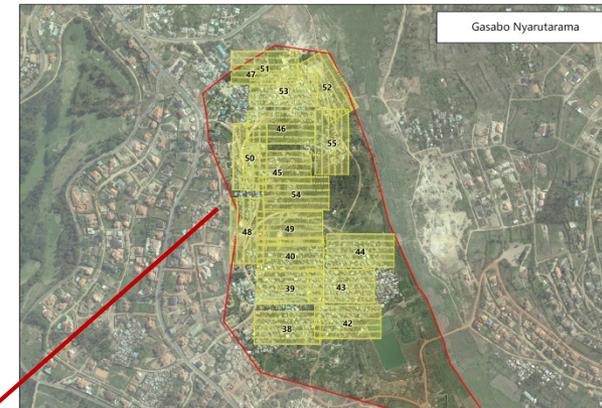
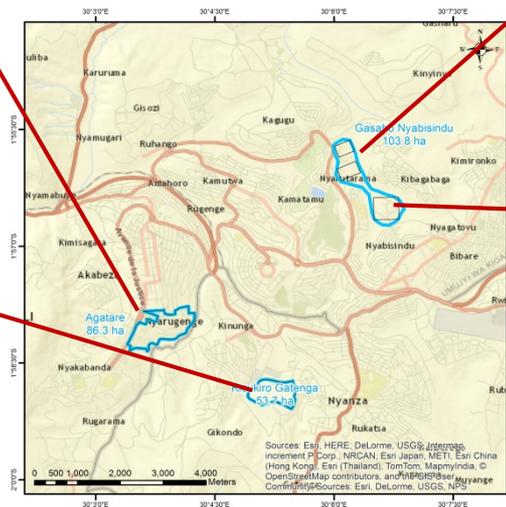
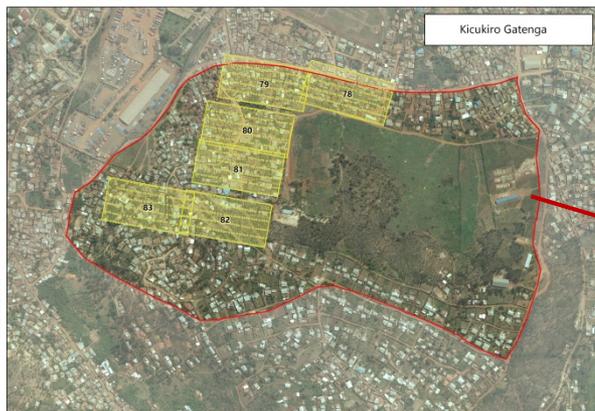
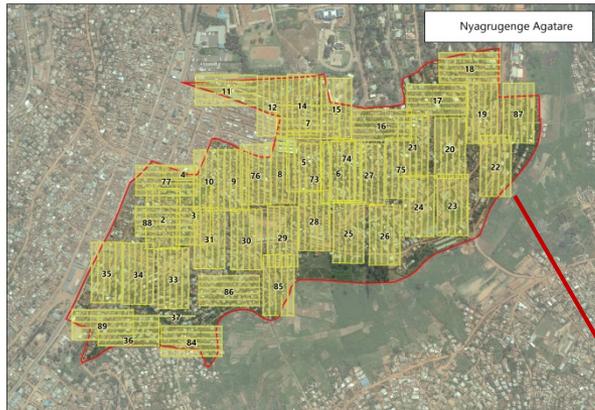


UAV FLIGHTS KIGALI MAY 2015

AGATARE: 86 HA – 4000 HOUSEHOLDS – 19000 PERSONS

11 days, 89 flights, 150 ha, 15 700 images

- DJI Phantom 2 Vision+, 1.2 kg., 14MP RGB camera, fish-eye lens,
- Flight planning with Pix4D app for smartphone



SIGNIFICANCE FOR UPGRADING PROJECTS

DESCRIBE AREA AND PRIORITIZE INTERVENTIONS

Existing Orthophoto (2008, 20 cm pixels)



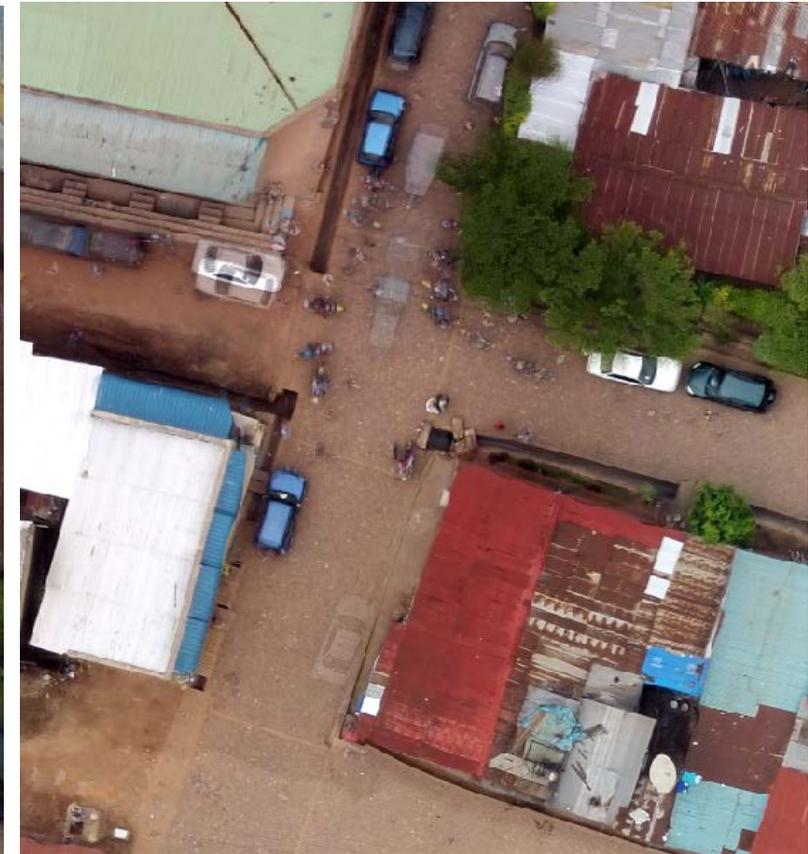
UAV Orthophoto (2015, 3 cm pixels)





Street scene from original image before adjustment and mosaic

DETAILS OF MOVING OBJECTS (INCLUDING MOST PEOPLE) ARE LOST IN FINAL PRODUCT (RIGHT)



But who controls access to the original images and derived products?

VERY HIGH RESOLUTION IMAGES CAN BE VERY INTRUSIVE



SIGNIFICANCE FOR UPGRADING PROJECTS

CURRENT USAGE – PARTICIPATORY DESIGN OF UPGRADING

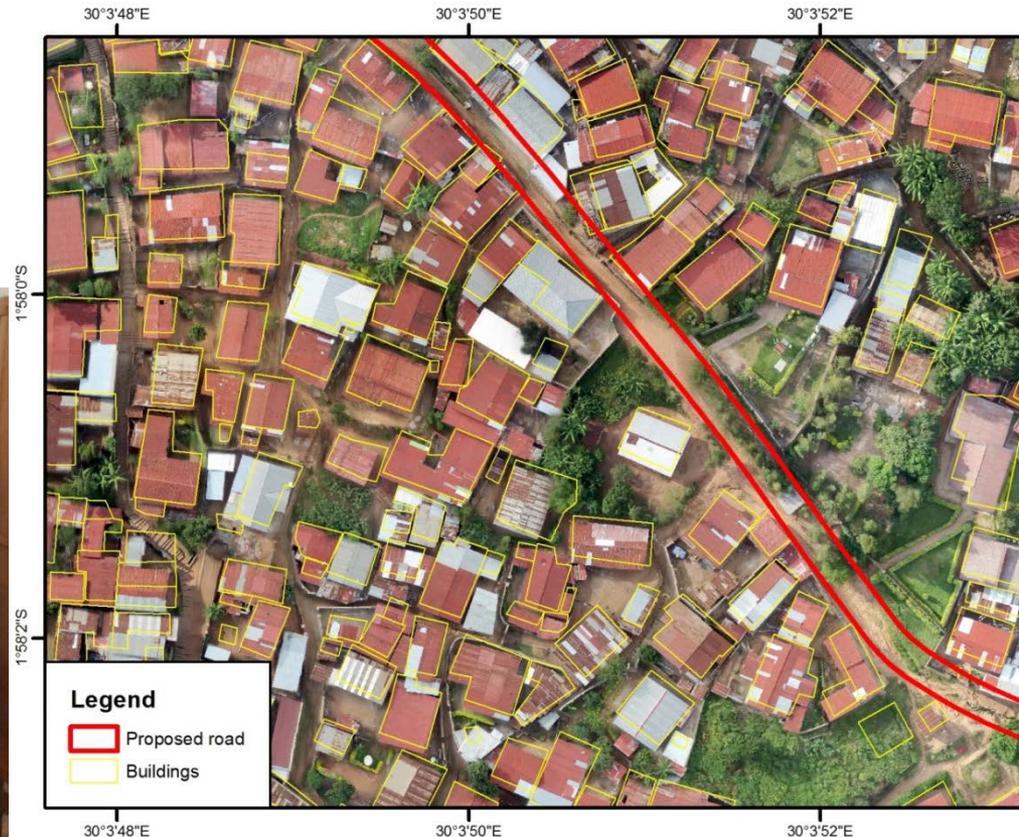
Feasibility

Prioritize

Design

Implement

- Design to mitigate expropriation
- Speed up field work
- Integrated overview of area
- Communication with residents



SOME SOCIAL AND ETHICAL CONSIDERATIONS

- Inhabitants' first reactions:
 - Interested and joking
 - Later worried - expropriation
- Who has access to which images?
- Can image acquisition be denied?



- Are there adequate safeguards during data capture and for (mis-) use of images?
- ...

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2D & 3D MODELLING OF SLUMS USING TERRESTRIAL IMAGERY

LINUS KIHARA MWANGI

SUPERVISORS

M. GERKE

F. NEX

C. PERSELLO

ADVISORS: C. GEVAERT, M. KOEVA, R. SLIUZAS



FACULTY OF GEO-INFORMATION SCIENCE AND EARTH OBSERVATION

Mapping of Mashimoni village, Mathare, Nairobi



TERRESTRIAL DATA ACQUISITION WITH SIMPLE EQUIPMENT



SHOULD PEOPLE ON THE STREET BE PROTECTED?



DO CURIOUS CHILDREN HAVE A RIGHT TO PRIVACY?



SNAPSHOT FROM POINTCLOUD



FINAL PRODUCTS MAY ALSO REQUIRE SCREENING TO PROTECT PRIVACY.

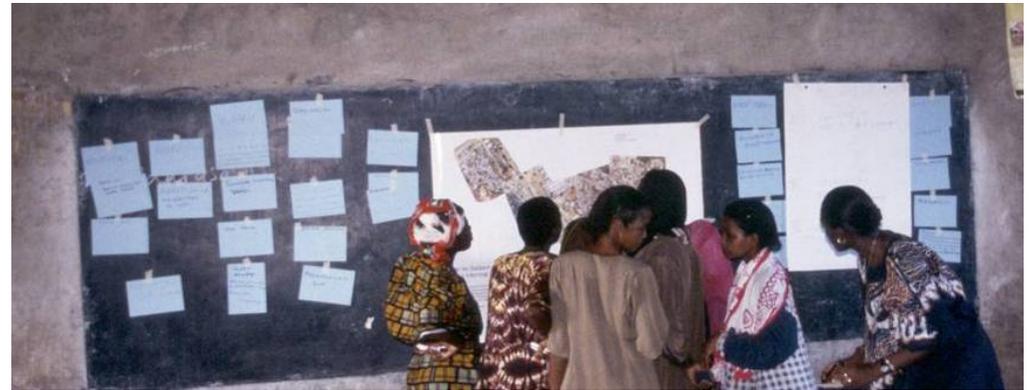
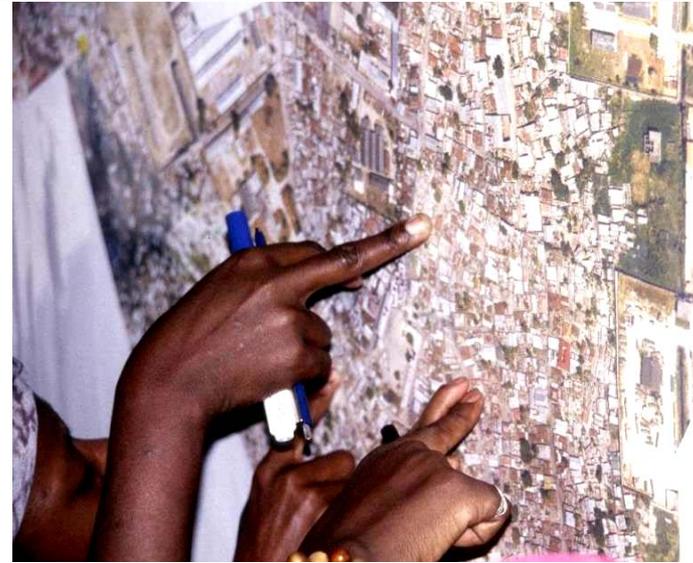


VHR images in participatory mapping for problem scoping, analysis and planning



Participatory Data Collection and Problem Analysis

Focus group approach



Who controls the process? Who owns the data and determines access rights and use?



ISSUES

- Slum dwellers, slums and slum mapping.
 - Formal versus informal development
 - Technologies for slum mapping
 - Ethical considerations
- Eradication of slums
 - Typical responses
 - Upgrading, eviction and resettlement
 - Ethical issues



TYPICAL RESPONSES TO SLUMS

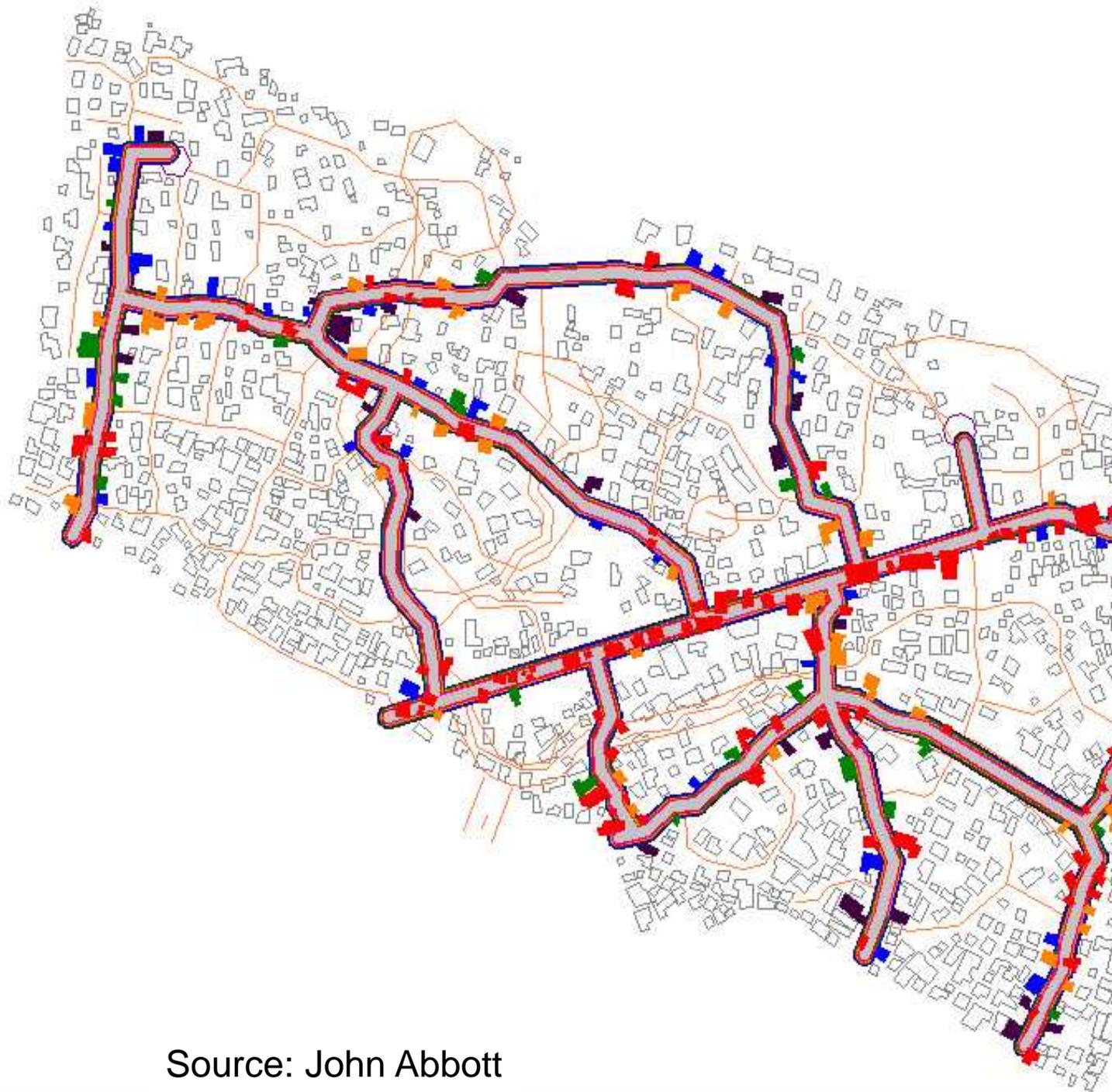
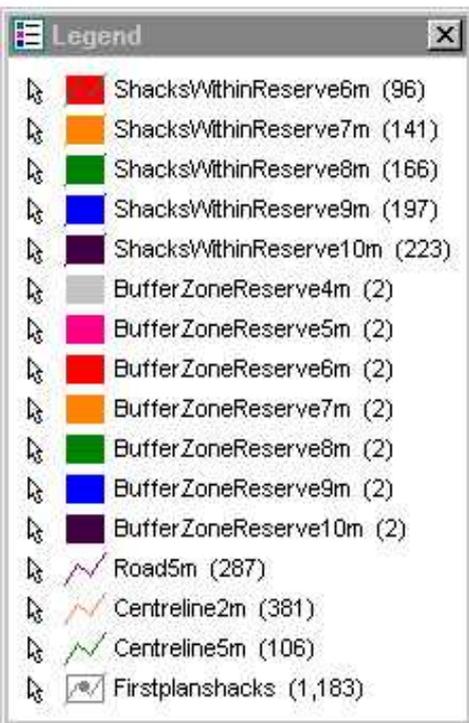
- Ignore – business as usual
- Upgrading – infrastructure and tenure regularization
- Eviction (and resettlement)
- Guided Land Development



Source: John Abbott



Source: John Abbott



Source: John Abbott

NEW REST PROPOSED LAYOUT PLAN

DRAFT



TYPICAL EXAMPLE OF INDIVIDUAL TITLE

TYPICAL EXAMPLE OF COMBINATION OF INDIVIDUAL TITLE AND COMMUNAL OWNERSHIP

TYPICAL EXAMPLE OF COMMUNAL OWNERSHIP

NOTES

- 6m service corridors
- 2m pedestrian corridors
- CRECHE
- COMMUNITY HALL
- DETENTION POND / RECREATION
- SERVITUDE AREA
- COMMUNITY SQUARES
- PEDESTRIANS ONLY
- TAXI DROP / STOP
- PUBLIC OPEN SPACE

GENERAL NOTES

1. ALL DIMENSIONS ARE APPROXIMATE AND SUBJECT TO A CERTIFIED DIAGRAM & FINAL SITE SURVEY
2. LAYOUT SUBJECT TO FURTHER COMMUNITY INPUT

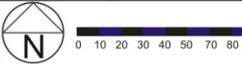
THE COPYRIGHT OF THIS DRAWING, INCLUDING THE DESIGN AND DETAILS SHOWN HEREIN, IS RESERVED BY THIS PLAN

AMENDMENTS

REV	DESCRIPTION	BY

CLIENT: NEW REST / KANANA DEVELOPMENT TRUST

PLAN NO	7 (FP/0300/206/F1)
DATE	DECEMBER 2001



DEPARTMENT OF CIVIL ENGINEERING
UNIVERSITY OF CAPE TOWN

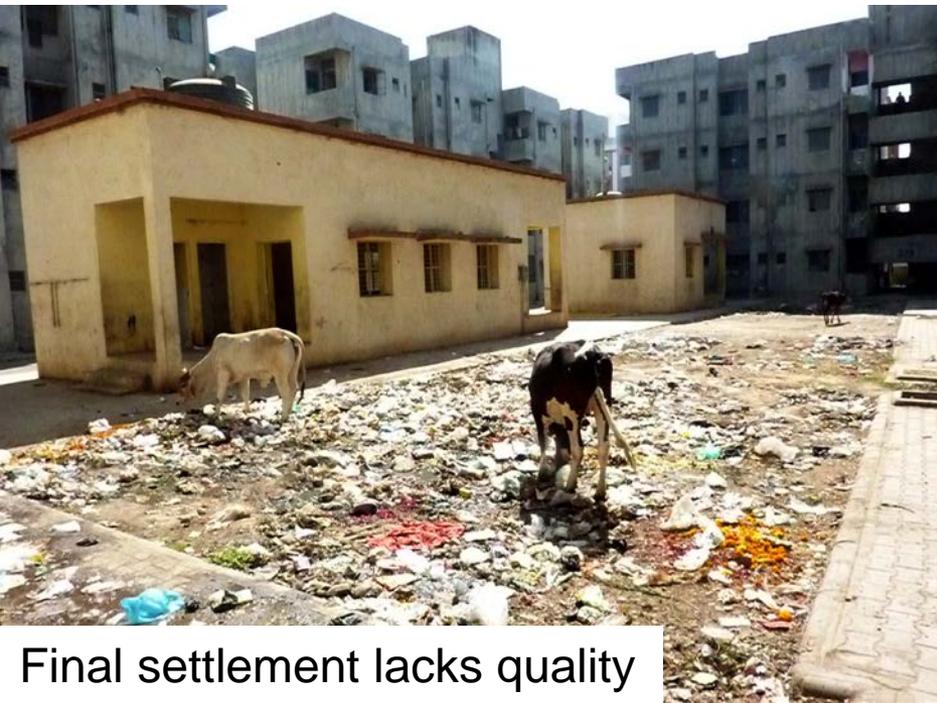
FIRST PLAN TOWN & REGIONAL PLANNERS
P.O. Box 15865
Panorama
7506
(021) 930 7183

SLUM EVICTION IN AHMEDABAD INDIA LEADS TO FURTHER DEPRIVATION RELATED MOSTLY TO SERVICE LEVELS AND LOCATION

Patel, S., Sliuzas, R., & Mathur, N. (2015).
<http://doi.org/10.1177/0956247815569128>



Many residents do not qualify



Final settlement lacks quality



Very poor temporary resettlement



ETHICAL CONCERNS IN SLUM ERADICATION

- Infrastructure upgrading (capital) and maintenance (recurrent expenditure) are both required.
- Who decides and who owns the process?
- Who is eligible for compensation and resettlement?
- Who pays? Issues of affordability and possible economic displacement – gentrification?
-

ETHICAL CONCERNS IN SLUM ERADICATION

- Need integrated approach socio-physical-economic
- Location matters (a lot) – relocation can have an enormous impact on livelihoods and lives (Cernea, 1997; Patel, Sliuzas and Mathur 2016)
 - Winners and losers
 - Cost sharing
 - Quality of life is not just about the physical infrastructure and the quality of house
 - Diversity in poverty – landowners, tenants

Slum providing laundry services to wealthier neighbours. Vizag, India.



DOES UPGRADING REMOVE THE “SLUM” LABEL?





REFLECTION

- Need to think more deeply about (geo)ethics in our slum related research.
- Guidelines are required for data acquisition (spatial and socio-economic) to protect subjects' rights.
- In research and project work ethics should play a role.
- More attention is needed for ethics in education at MSc and PhD levels.

ACKNOWLEDGMENTS

JOHN ABBOTT, LINUS MWANGI, CAROLINE GEVAERT,
MONIKA KUFFER, DIVYANI KOHLI, SEJAL PATEL AND
NAVDEEP MATHUR.