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Mansueto Institute for Urban Innovation

Human Development and Urbanisation in Sub-Saharan Africa

Challenges and Opportunities at the Neighbourhood Level

At the nexus of poverty, place and politics I explore the potential of local communities, institutions and technology working together.

Methodologically and practically, I wish to understand urban poor neighbourhoods systemically at the general level and contribute to tools for collecting data in standardised and verifiable ways, be they spatial, quantitative or qualitative, to advance collaborative knowledge production processes.

At the particular and neighbourhood level, I am committed to co-design with local communities and their local governments the tools, technologies and processes that will move this data and knowledge to actionable intelligence that support the kinds of localised development interventions that are sustainable and equitable with low impact on the planet and high impact for residents' prosperity.



Social Cohesion
and Equity -
Livable Cities



Spatial
Development



Urban Ecology
and Environment



Urban Economy



Urban
Frameworks

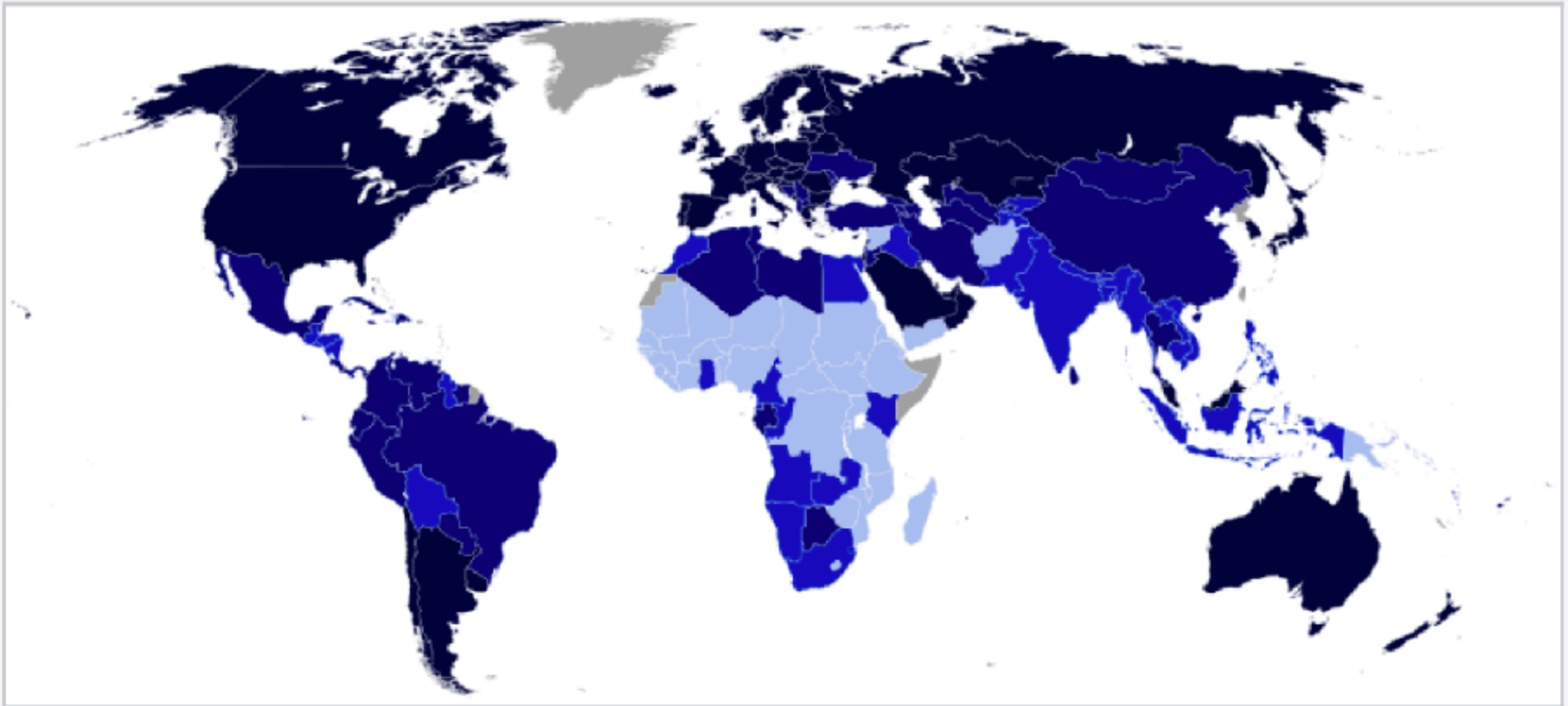


Urban Housing
and Basic
Services

Often called the **capability approach** and framed in terms of whether people are **able to "be" and "do" desirable things in life**, Amartya Sen's human development approach holds freedom of choice as central. **The choice to be well fed, sheltered, healthy and the choice to work, have an education, vote and participate in community life**, for example. This approach to understanding progress is more **focused on social justice than economics**

Brief History of HDI

- Developed in 1990 by economists Mabhub ul Huq, Gustav Ranis, Meghnad Desai at UNDP**
- Statistic composite index measuring life expectancy, education and living standards**
- Ranks countries from very high to low development along scale of 0-1**
- Updated for the 2010 HDR**
- Addition of Inequality Adjusted HDI**
- Addition of the Multi-dimensional Poverty Index (MPI) - developing countries progress on MDG**
- MPI updated in 2018 to Global MPI - track progress of SDG globally**



World map representing Human Development Index categories (based on 2017 data, published in 2018).^[6]

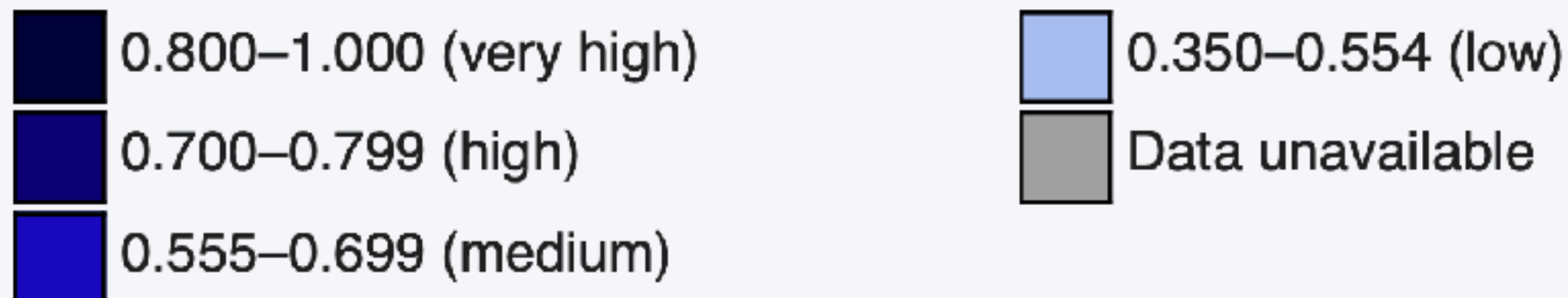
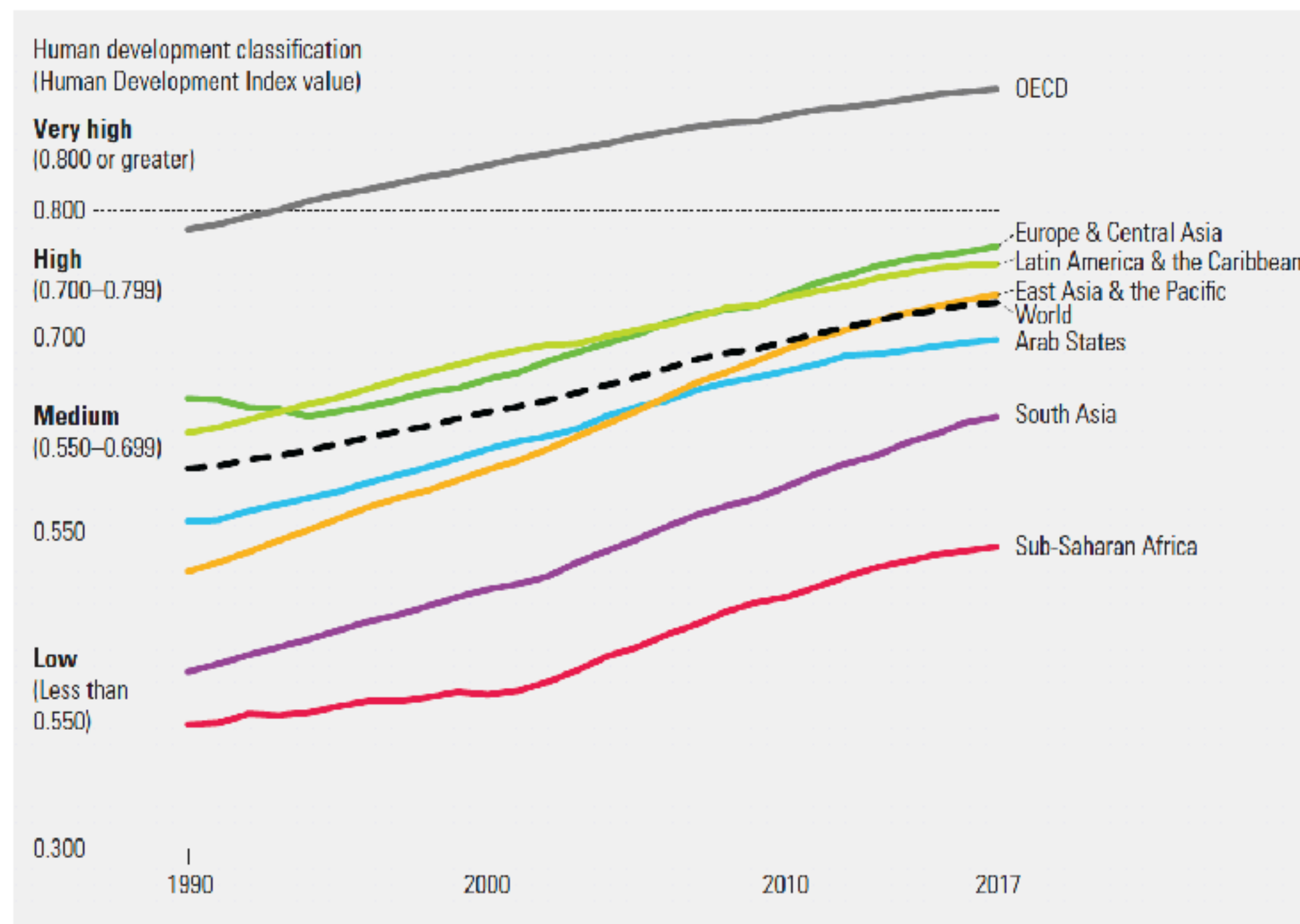


FIGURE 3

Human Development Index values, by country grouping, 1990–2017



Source: Human Development Report Office.

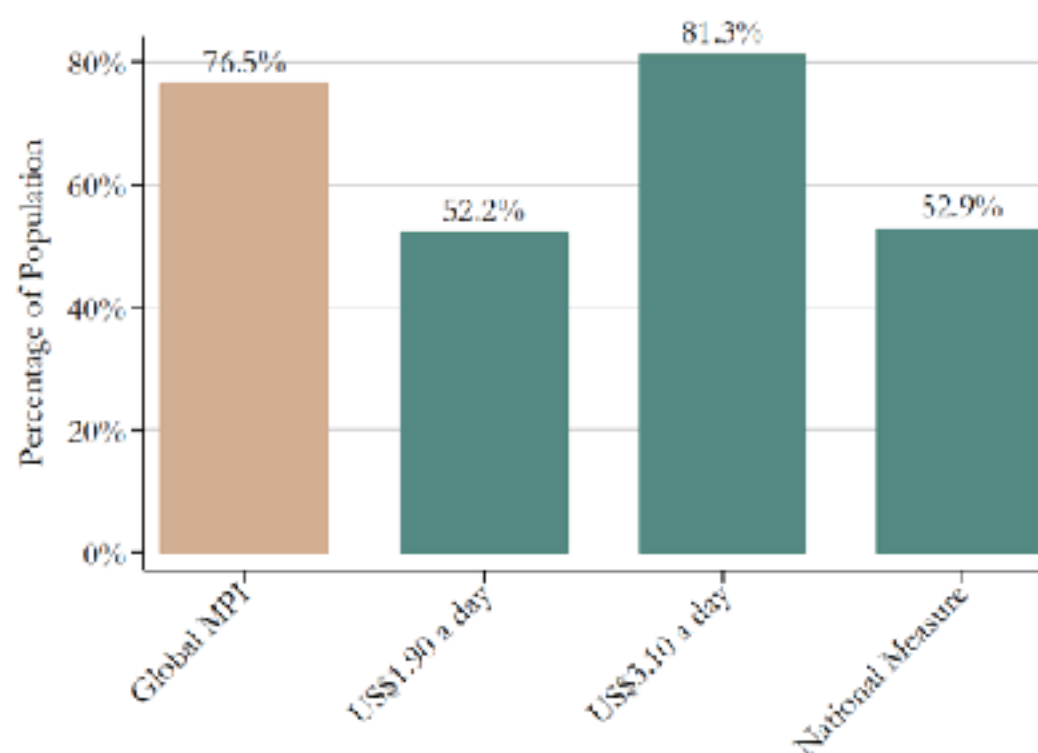
In the global MPI, a person is identified as MPI poor if they are deprived in at least one third of the weighted MPI indicators. A person is MPI poor if the person's weighted deprivation score is => poverty cutoff of 33.33%

Area	<i>MPI</i>	<i>H</i>	<i>A</i>	Vulnerable	Severe Poverty	Population Share
National	0.422	76.5%	55.2%	14.4%	48.4%	100.0%
Urban	0.225	48.2%	46.7%	26.0%	19.0%	30.7%
Rural	0.509	89.0%	57.2%	9.2%	61.4%	69.3%

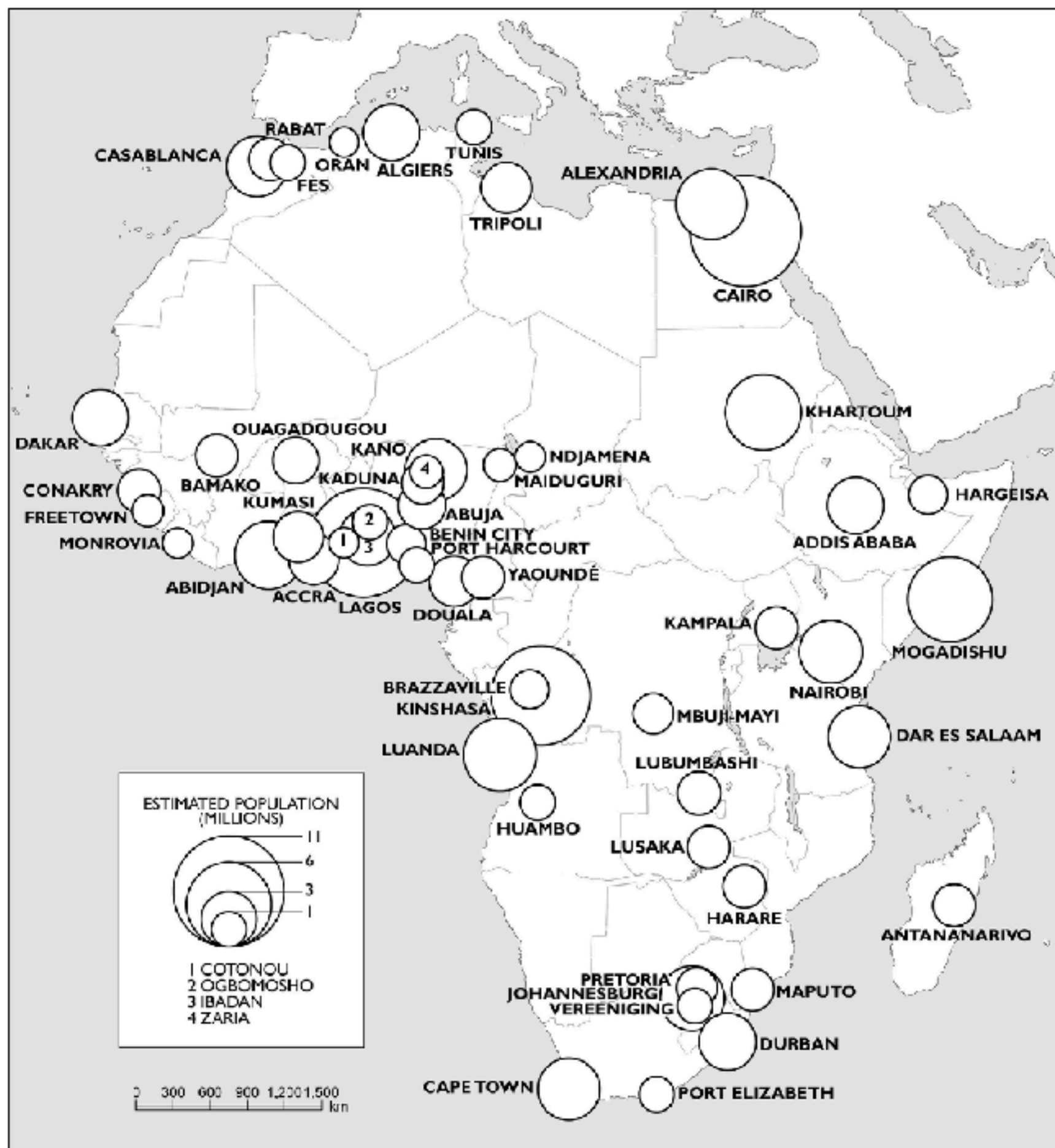
Sierra Leone

Country Briefing December 2018

Figure 2. Headcount Ratios by Poverty Measures



Notes: Source for global MPI: DHS, year 2013, own calculations. Monetary poverty measures are the most recent estimates from World Bank ([World Bank, 2018](#)). Monetary poverty measure refer to 2011 (\$1.90 a day), 2011 (\$3.10 a day), and 2011 (national measure).



“Africa’s dramatic demographic transition is a profoundly spatial story. Not only will the continent give birth to thousands of new towns and cities as it crosses the ‘magical’ 50 per cent urban threshold shortly after 2030 (UN DESA 2011), the absolute growth of population and the increasing concentration of Africa’s people in cities will transform the landscape of the urban hinterlands as demand for building materials, food, energy and water escalates. This is not a future transition; the African urban revolution is already firmly under way.”

Parnell and Pieterse 2014

Understanding urbanisation in Africa goes beyond only presenting trend data on the speed, scope and dynamics of the urban transition. It is equally important to understand Africa's urban leadership, institutions and technical domains such as design, technology and finance.

acknowledge & understand

- overlapping and even competing systems of power combined with traditional land management and outdated planning norms dating back to colonial rule
- informality and the absence of a strong local state with a clear and unchallenged mandate to manage the city. African cities have extremely high levels of 'slum' living conditions compared with other regions in the global South

acknowledge, understand and generate better data on:

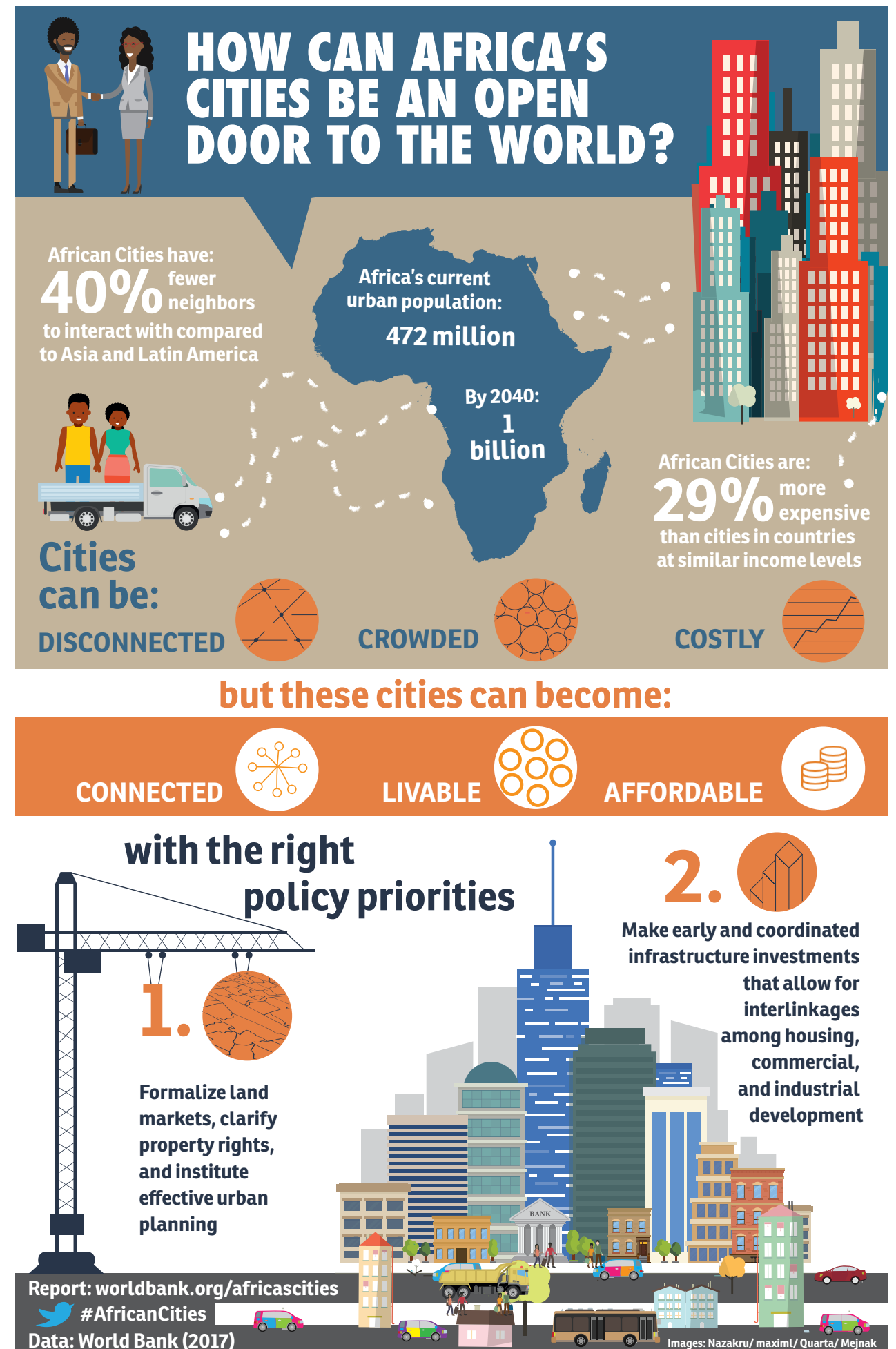
- the widespread persistence of urban poverty and the depth of chronic deprivation
- urban inequality linked to structural poverty and systemic exclusion even in cities with high average incomes and service standards such as Accra, Gaborone and Johannesburg.

Parnell and Pieterse 2014

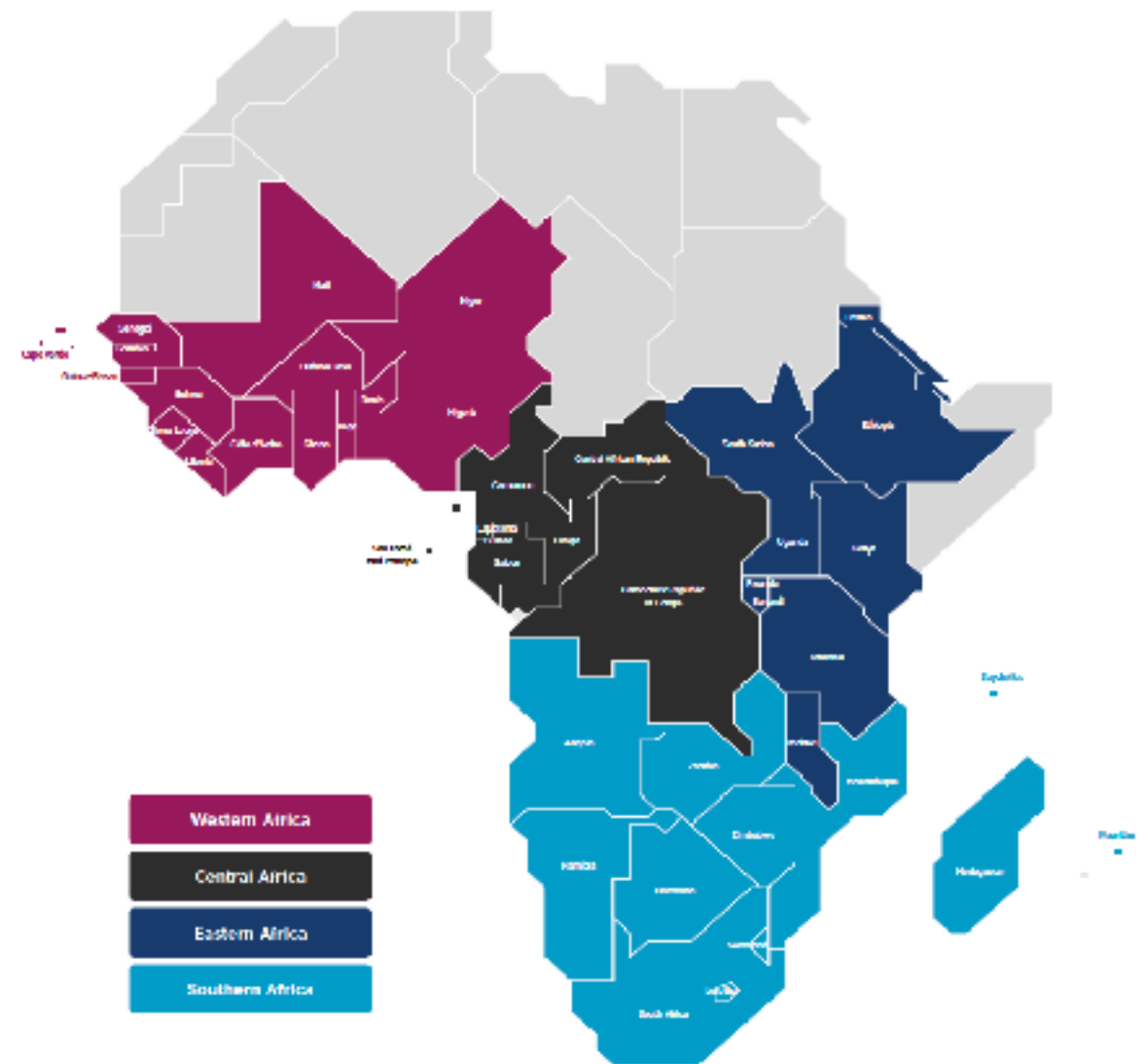
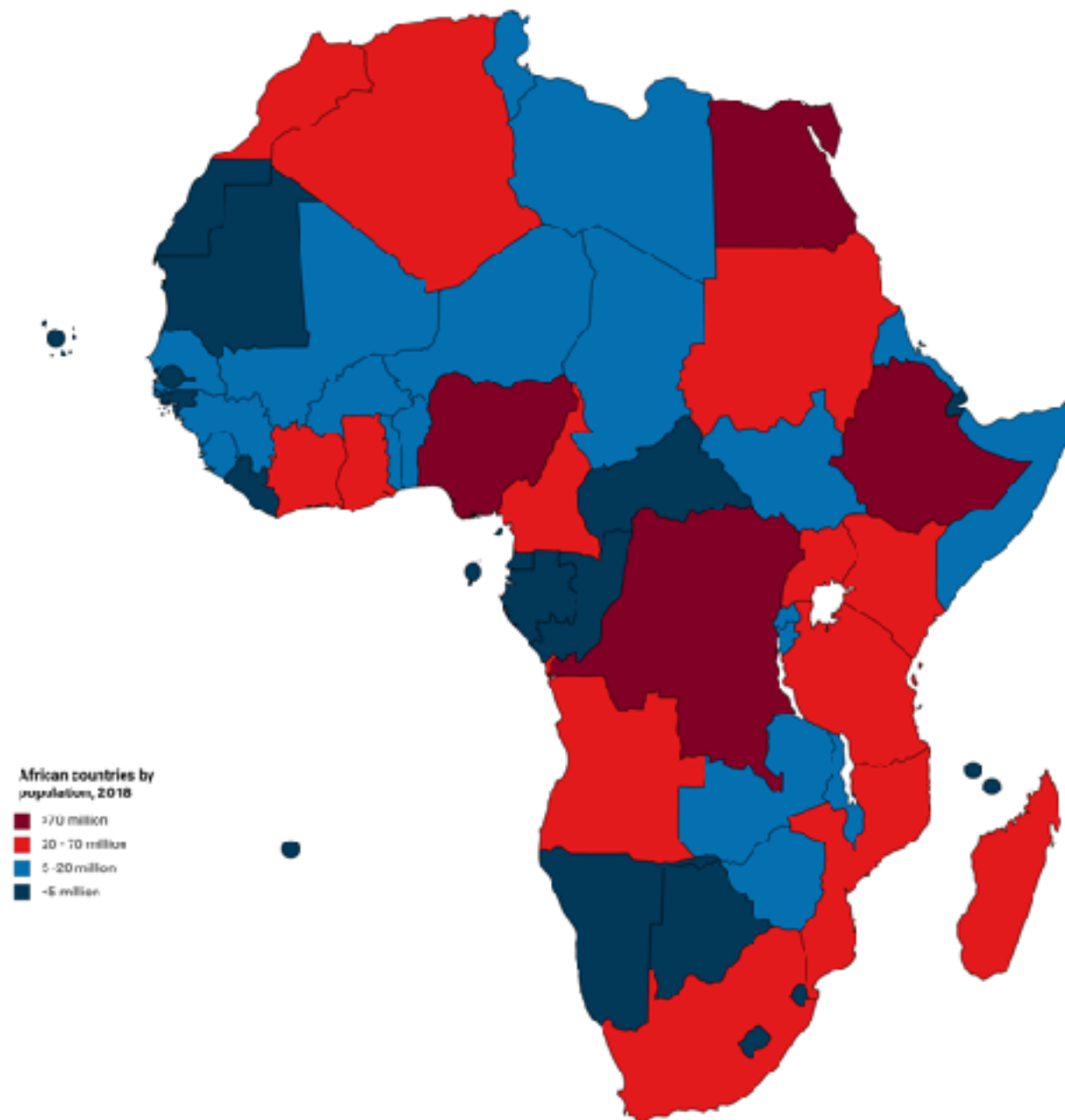
In Africa

“ the development effects of urbanization and the magnitude of agglomeration economies are very variable. There is no simple linear relationship between urbanization and economic growth, or between city size and productivity. The potential of urbanization to promote growth is likely to depend on how conducive the infrastructure and institutional settings are”

Turok & MacGranahan 2013



It is estimated that by 2050, 60 - 70% of the population of Sub-Saharan Africa will be urban. Sub-Saharan Africa comprises 46 of Africa's 54 countries according to UN Statistics.



By 2030, i.e. in 11 years time this may mean 621 million people living in urban centres in sub-saharan Africa.

The rapid urban growth in sub-Saharan Africa has not “been accompanied by structural transformation and sufficient industrialization to absorb the growing workforce, leaving the majority of new jobs in the informal sector ”.

In addition

- rapid social changes
- the growth of informality and urban fragmentation through spatial segregation and socioeconomic polarisation.

Lohnert 2015

The region faces a dual challenge of mega-city development (cities with 10+ Million residents e.g Lagos, Greater Johannesburg and Kinshasa), as well as, rapid growth in secondary cities and smaller urban areas.

Lagos, Nigeria had a population of 300 000 in 1950. In 2007 the population was estimated at 15 million, 25 million in 2015 and a projected 80 - 100 million by 2050.

D. Satterthwaite

International Journal of Disaster Risk Reduction 26 (2017) 16–23

Table 1
Distribution of sub-Saharan Africa's urban population in different size categories of urban centres in 2010 [3].

	Rural	Proportion of the population living in urban centres with:							
		Under 20,000	20,000–49,999	50,000–249,999	250,000–499,999	0.5–1.99 million	2–4.99 million	5 – 9.99 million	10 million +
Number of urban centres					60	63	15	2	1
Population	537.3 million		140.7 million		21.0 m	59.7 m	44.5 m	17.4 m	10.8 m
% of total population	64.6%		16.9%		2.5%	7.2%	5.4%	2.1%	1.3%

16.9%

15.1%

Cities in sub-Saharan Africa already lack the basic infrastructure to support a fraction of their populations due to ageing, inadequate and/or never-build infrastructure.

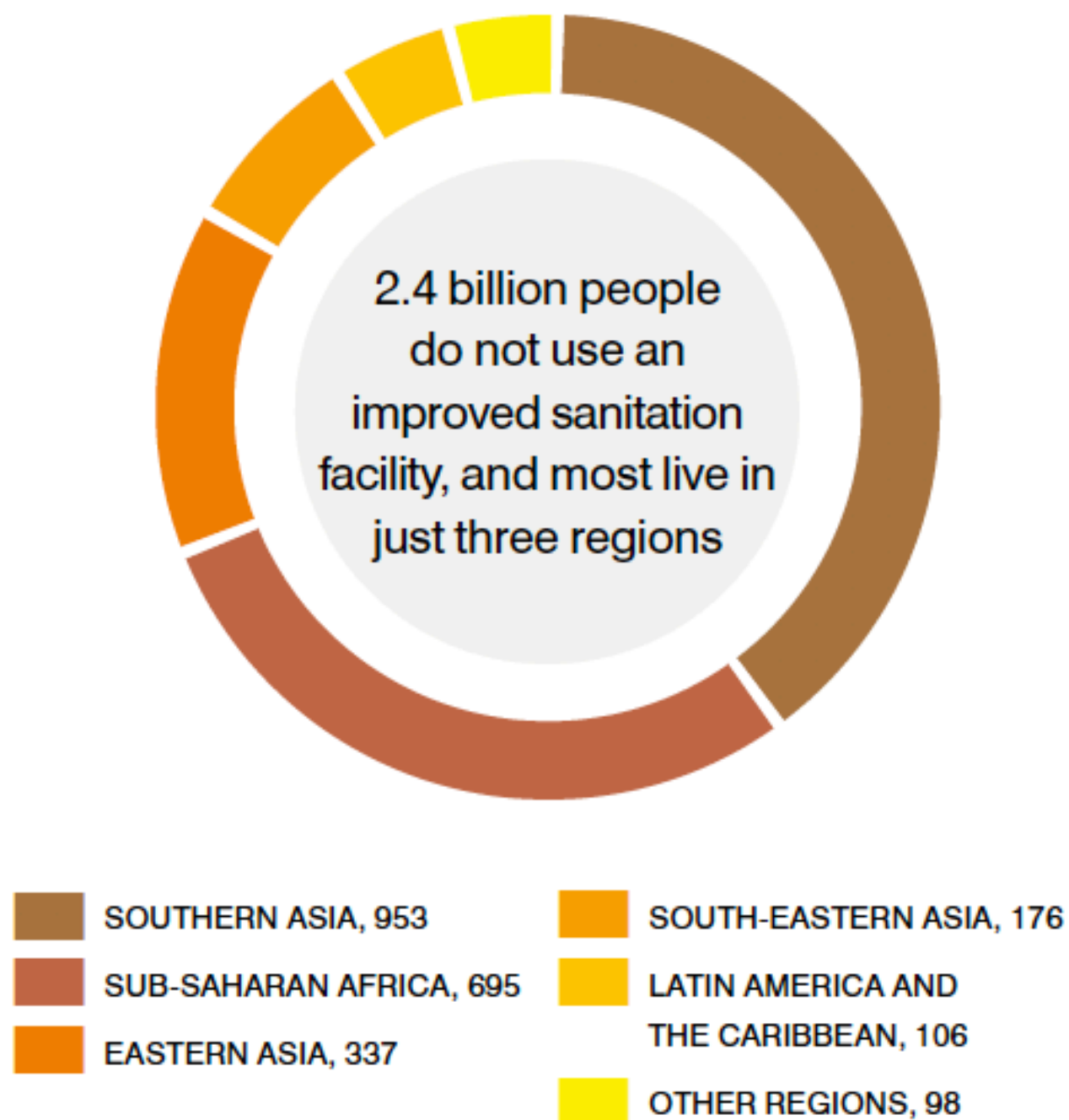
Some reasons:

- Limited revenue bases in cities
- The low priority international funding agencies give to addressing urban problems
- A historic reluctance to acknowledge the urban transition in Africa based on political reasons or the belief that cities are parasitic or have very little poverty

Impacts:

“ large sections of sub-Saharan Africa’s urban population face very large health burdens associated with a lack of risk reducing infrastructure and services”.

Satterthwaite 2017



Population without improved sanitation in 2015, by region

In 47 countries, areas or territories, less than half the population uses improved sanitation in 2015

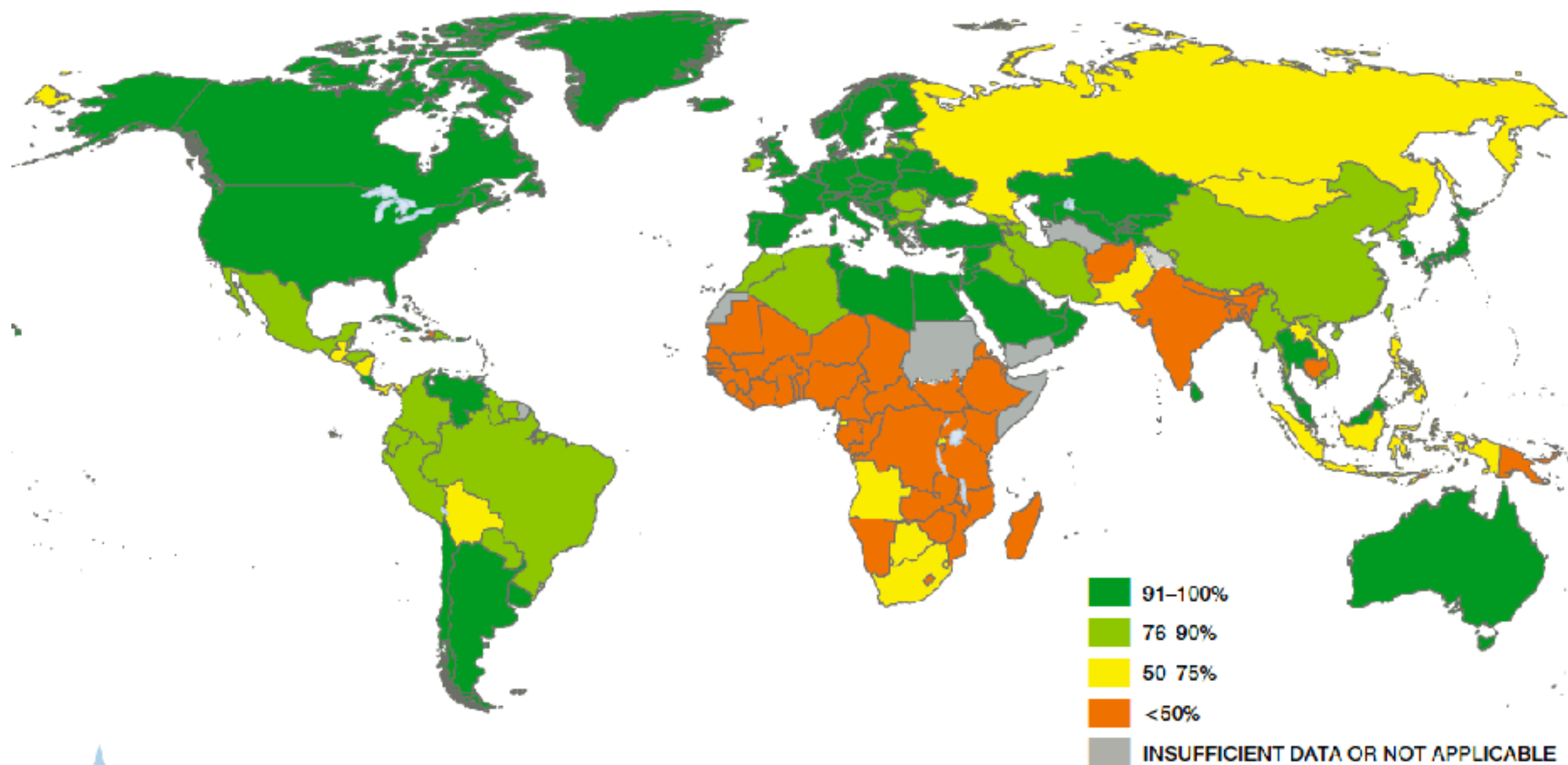
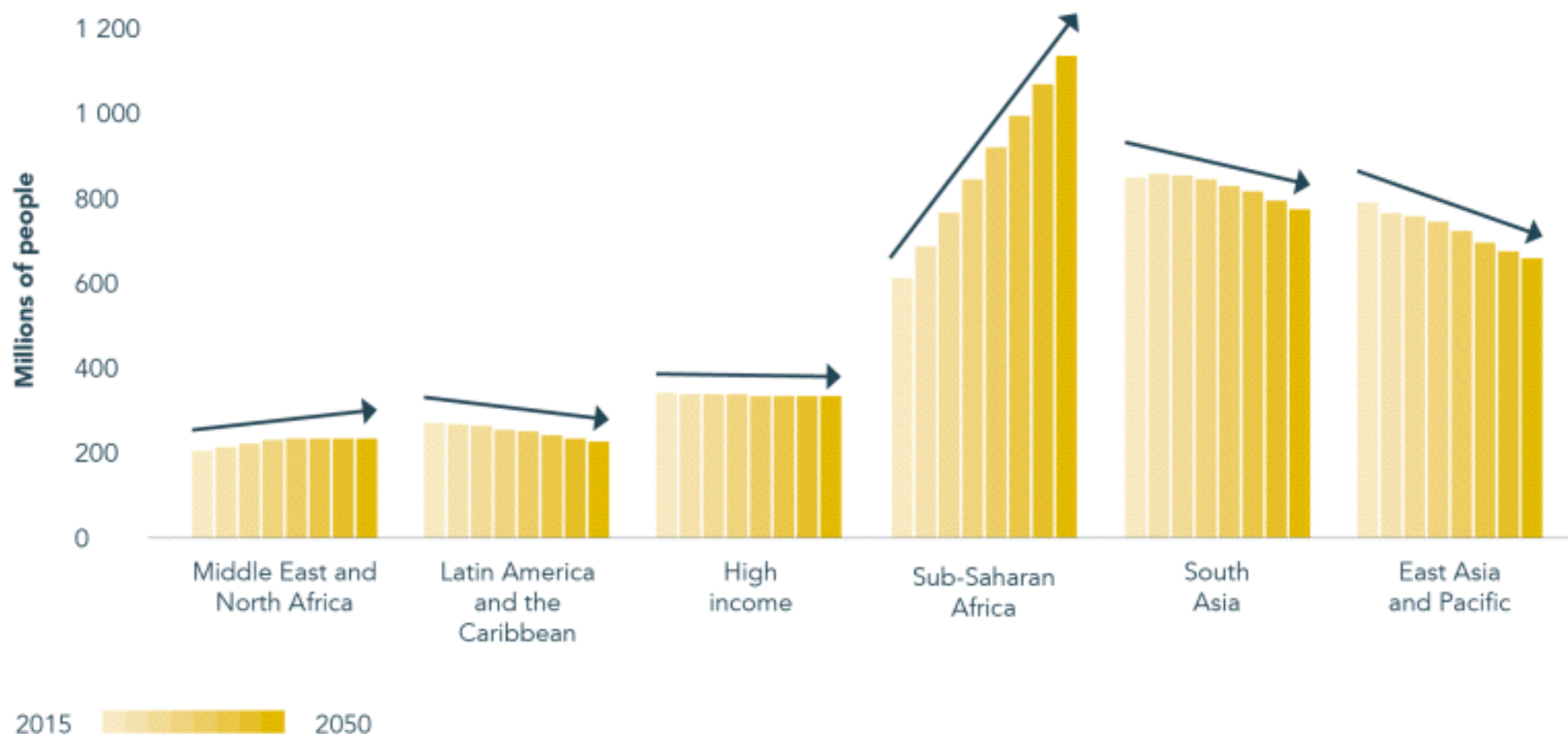


Fig. 16 Proportion of the population using improved sanitation facilities in 2015

Youngest Human Population on the Planet

Figure 3.3 Global youth population projections

Over the next three decades, sub-Saharan Africa's youth population will grow faster than any other region. By 2050, sub-Saharan Africa will make up 33 percent of the world youth population, up from 19 percent in 2015. During this period, sub-Saharan Africa's youth population will increase by 522 million while the rest of the world's youth population declines by 220 million.



Note: Country groups follow World Bank classifications. Youth defined as population age 0 - 24 years old.

Source: U.N. World Population Prospects 2017 Revision, Medium Variant Projections.



GSMA INTELLIGENCE

Fastest Growing Region for Mobile Tech

Figure 1

Source: GSMA Intelligence

Sub-Saharan Africa unique mobile subscribers and market penetration

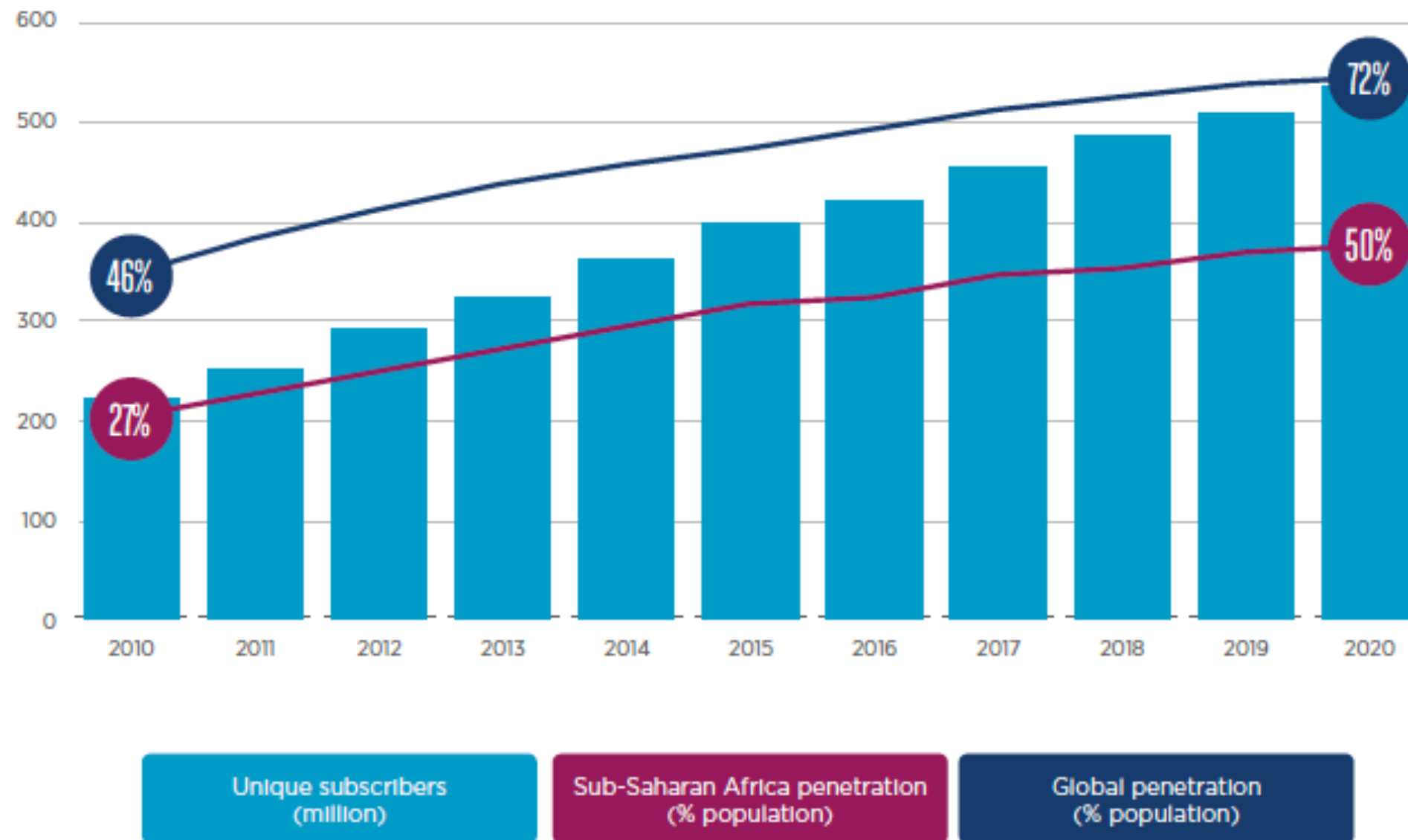


Figure 2

Source: GSMA Intelligence

Smartphone adoption growing

(Percentage of connections)

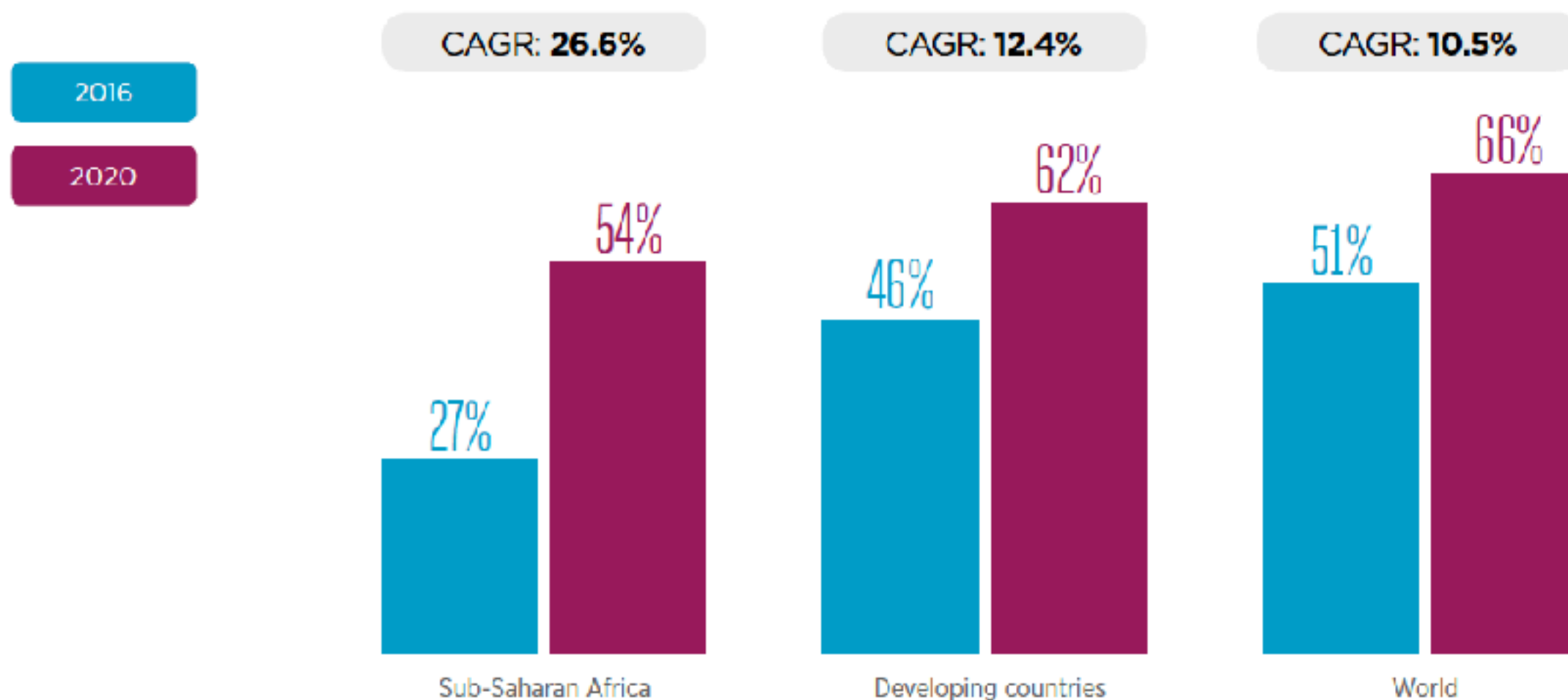
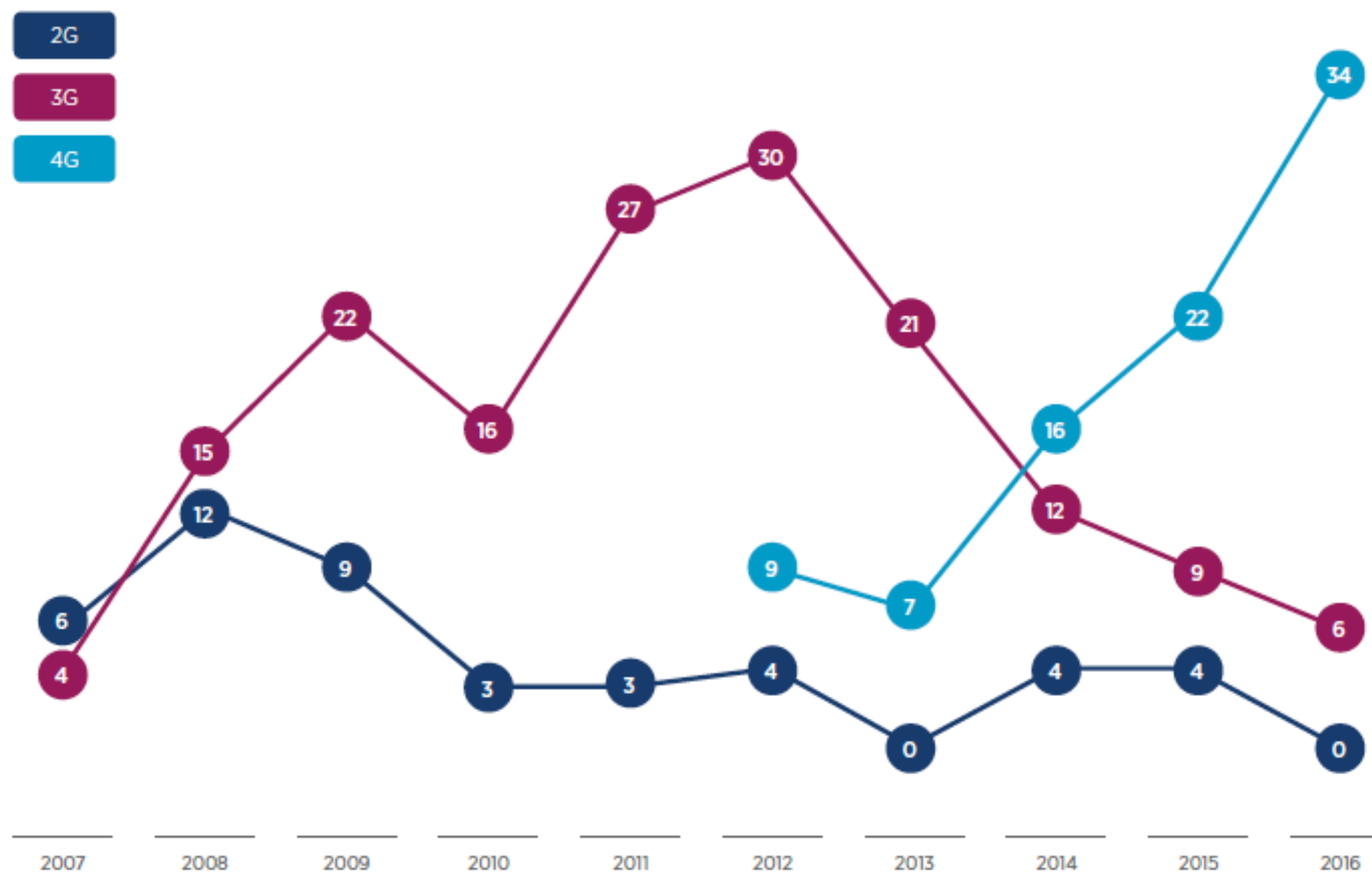


Figure 3

Source: GSMA Intelligence

Sub-Saharan Africa network launches by technology



MOBILE ECONOMY SUB-SAHARAN AFRICA

Unique mobile subscribers



SIM connections



**Including M2M

ACCELERATING MOVES TO MOBILE BROADBAND NETWORKS AND SMARTPHONE ADOPTION

Mobile broadband connections to increase from 3.3% of total in 2016 to

60%
by 2020

By 2020, there will be

498m
smartphones, growth of 300 million from the end of 2016

Mobile data traffic to grow by a CAGR of

66%
over the period 2016-2020

Data growth driving revenues and operator investments

Operator total revenues



Operator CAPEX of up to **\$31 billion** for the period 2017-20

Mobile contributing to economic and social development across Sub-Saharan Africa



DIGITAL INCLUSION
Delivering digital inclusion to the still unconnected populations.

MOBILE INTERNET PENETRATION

26% 2016 **38%** 2020



FINANCIAL INCLUSION
Delivering financial inclusion to the unbanked populations. As of December 2016 there were

140 live mobile money services in 39 countries



INNOVATION
Delivering innovative new services and apps. Number of M2M connections to reach

26 million by 2020

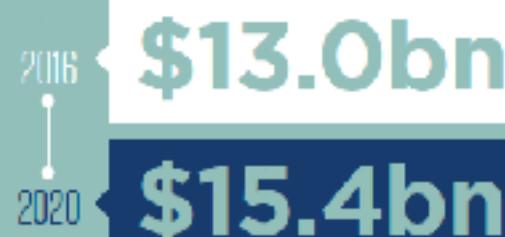


Mobile industry contribution to GDP



Public funding

Mobile ecosystem contribution to public funding (before regulatory and spectrum fees)



Employment



Jobs directly supported by the mobile ecosystem



Plus an additional 2.8 million indirect jobs supported in 2020



Producing and Aggregating Local Knowledge

Luis M.A. Bertrancourt, Anni Reukes,
and José Lobo

The power of the SDI network is predicated on the strength of collective action. The power of knowledge is predicated on its scope, quality, and credibility. At the close of 2017, SDI-affiliated slum dweller organizations had profiled 104 cities covering 1,248 settlements.

Settlement profiling is a process driven by the community for the community. It was designed by slum dweller communities to organize and empower themselves through knowledge. The process of profiling their settlement together fosters social cohesion, contributes to constructive conflict resolution and consensus building, and lays the foundation of a social infrastructure that supports long-term planning and implementation of development projects.

Over the past decade, SDI has recognized the power of aggregating local data. While the aggregated data conventionally used for city planning uses samples and averages of data from formal and informal areas, KYC takes detailed information on informal settlements and aggregates this to generate a unique global database on informal settlements.

After the initial success of data aggregation at city, metro, and country levels—the Nairobi Slum Profiles in Kenya, the Ekurhuleni Profiles in South Africa, and the Community Land Information Program (CLIP) in Namibia—SDI federations set out on an ambitious path to map all of the cities in which they had a presence, settlement by settlement. By aggregating their settlement profiles at the city level, federations could: 1) demonstrate their capacity to collect data at scale; and 2) harness the power of aggregated data to negotiate at settlement and city level with their local government. This would contribute to better and more effective planning with their local governments and better serve an international agenda for inclusive cities.

A central objective of profiling is that members of the community discuss and identify their most pressing problems, agree on priorities, listen to one another (women may experience different problems than men, the young may see things differently than the old), and harmonize the many voices that are heard. By means of a

general survey, a settlement profile collects the baseline data of a settlement, including information related to demographics, shelter, access to basic services, and community development priorities. This is often followed by a household enumeration, during which a door-to-door, household-by-household census is conducted.

KYC is a scalable data system and a common platform that will improve over time through the contributions of many different communities, stakeholders, and partner organizations. It will drive the accumulation of knowledge, which in turn will inform policy solutions and action at local, city, national, and international levels.

Data Quality, Completeness, and Verifiability

Efforts to improve the collection of data about informal settlements initially focused on issues of data quality, completeness, and verifiability. The intention was, and remains, to use data to document and tell powerful stories about communities' needs and aspirations, stories that can guide policymaking at local, city, national, and international levels. "Hard Data and Rich Stories" is the way SDI describes it.

Changes and innovations to the KYC data system follow a careful path of evolution. To avoid community processes being tool-driven, technology is used carefully as an enhancer and facilitator of human practices that were slow, burdensome, and prone to error or omission. Throughout these processes, technology (cell phones, portable GPS devices, aerial and remote photography, and mapping) is introduced incrementally to complement and facilitate the community process.

As the KYC data system moved through cycles of development and testing, valuable lessons emerged about managing and mediating the inevitable clash of perspectives among diverse stakeholders hoping to use community data. The values that underpin KYC are the core of its effective and transformative potential.

- **By and for the community:** Informal settlement profiles must be conducted in the interest of local communities, and must be carried out by the community for the community. Only then can local knowledge capture people's priorities.

Left: Youth mapping their settlement with GPS devices in Cape Town, South Africa

“to be counted in city surveys and to have documents to prove that you have been counted and have an address implies that you (and often your neighbourhood) are considered part of the legal city.

To have no official document to prove your identity or your address often means being denied access to public services and entitlements in urban areas – for instance, connections to piped water supplies and sewers, household waste collection, and even schools, health care services and the rule of law. It often means having no possibility of opening a bank account, of obtaining insurance or of getting on the voter’s register.”

Sheela Patel & Carrie Baptiste
E & U 2012

With its origins in the slums and on the pavements of Mumbai, community-organised and -led data collection of their settlements and individual households, the set of practices collectively known as ‘the enumeration’ , is one of the core practices/rituals of Slum Dwellers International (SDI).

The Enumeration includes:

- **Informal Settlement Profile**
- **Household Survey**
- **Mapping (settlements and household)**

“Doing the enumeration also helps to mobilize the people living there. Ask them to go and count the number of poles and they do so and report back. This helps to organize the community so the community does not depend on outsiders. This is doing their own documentation. It does not require a big education to count the poles. Even illiterate people can collect this information. So we used enumerations not only to collect information but also to help the community organize. ” Jockin Arputham

**Knowledge and practices are transferred via peer-peer learning.
Daily savings generates trusts and capital for loans and community projects**





Know Your City: Slum Dwellers Count



**(KNOW)
YOURCITY**

Hard Data, Rich Stories

SDI Federations

At the close of 2017, SDI-affiliated slum dweller communities had profiled 103 cities covering 1,238 settlements as part of the Know Your City campaign. In the cities listed below, organized slum dwellers have produced *hard data* to anchor constructive dialogue with local government and action aimed at leaving no one behind.

KYC is not just about data collection, sharing, and management. It is a participatory, pro-poor, people-centered approach to urban governance that rests upon a bedrock of community organizing in slum settlements.

KYC Campaign: City and Settlement Profiles

REGIONAL HUB	COUNTRY	CITY PROFILES	SETTLEMENT PROFILES
Asia	India	1	42
	Philippines	6	50
	Indonesia	1	22
Southern Africa	Botswana	1	1
	Malawi	5	60
	Namibia	27	72
	South Africa	2	115
	Swaziland	1	1
	Zimbabwe	0	39
	Zambia	1	15
East Africa	Kenya	14	268
	Tanzania	4	250
	Uganda	13	117
West Africa	Ghana	12	71
	Liberia	1	11
	Nigeria	2	57
	Sierra Leone	3	31
	Yogo	1	4

103 City Profiles

1,238 Settlement Profiles

The Tools

(KNOW) YOUR CITY

Nigeria Informal Settlement Profile (0616)

DATA VERIFICATION

WAS THE DATA THUS FAR RECORDED?

☐ YES ☒ NO

DO YOU HAVE ANY COMMENTS FOR THE PREVIOUS SETTLEMENT PROFILE?

DO YOU HAVE ANY COMMENTS FOR THE PREVIOUS SETTLEMENT PROFILE?

SEARCH FOR PLACE OR ADDRESS



(KNOW) YOUR CITY

Informal Settlement Boundaries Nigeria

A. DATE AND CONTACT

A1. DATE AND TIME OF VISIT	A2. DATE	A3. TIME	A4. NAME OF CONTACT
2022-11-02	08:00	12	
A5. NAME OF SETTLEMENT		A6. NAME OF SETTLEMENT	

B. SETTLEMENT DETAILS

B1. DISTRICT	B2. FROM SETTLEMENT
B3. CITY	B4. VILLAGE/CLAN
B5. WHAT TYPE OF SETTLEMENT IS THIS? (SELECT ONE)	
<input type="radio"/> RURAL <input type="radio"/> URBAN <input type="radio"/> SUBURBAN <input type="radio"/> OTHER	

C. SETTLEMENT GEOGRAPHIC INFORMATION

(KNOW) YOUR CITY

Informal Settlement Service Mapping Nigeria

A. DATE AND CONTACT

A1. DATE AND TIME OF VISIT	A2. DATE	A3. TIME	A4. NAME OF CONTACT
2022-11-02	08:00	12	
A5. NAME OF SETTLEMENT		A6. NAME OF SETTLEMENT	

B. SETTLEMENT DETAILS

B1. SETTLEMENT NAME

C. SERVICE POINT

C1. WHAT TYPE OF SERVICE POINT IS THIS?

(Check one for each service point. You can select multiple.)

<input type="radio"/> Toilet	<input type="radio"/> Water Point	<input type="radio"/> Garbage Disposal
<input type="radio"/> Street Light	<input type="radio"/> School	<input type="radio"/> Religious Institutions
<input type="radio"/> Electricity Transformer	<input type="radio"/> Health Centre	<input type="radio"/> Other

C2. GPS COORDINATES OF SERVICE POINT

(You can select a point on the map or enter the coordinates.)

The Online Data Platforms

(KNOW) YOUR CITY

Organization Projects

Search Projects

CityWide Settlement Profile Nigeria

Historic Settlement Data Nigeria

TEST FORMS

<https://ona.io>

(KNOW) YOUR CITY

EXPLORE OUR DATA | BLOG | PUBLICATIONS | MULTIMEDIA

<http://knowyourcity.info>

"We don't need people to collect information for us. We can do it ourselves. You might leave it in the computer. We will use it."

[Read more](#)

‘Let me tell a story about West Point’ Mr. Marshall



















12

Questions

He is asking for us
to use the information
of collecting data
in the field.

if collecting


John (Fieldwork)

3. He wants to know more
about having in debt
house.

GUEST





A man with short dark hair, wearing a light blue button-down shirt, is standing in profile, facing left. He is positioned next to a white flipchart that has several handwritten notes in green ink. The background is a solid blue wall with a door visible on the right side. The flipchart is mounted on a stand and has three binder holes at the top.

x Demographic
- population size
- structure
- house holds
- population ratio
x Settlement hist
x Economic
x Evictions
x Security







West point 402

Team Leader: ...
FGD Leader: ...
Recorder 1: ...
Recorder 2: ...
Mapper 1: ...
Mapper 2: ...
Mapper 3: ...
Mapper 4: ...

West point 403

Team Leader: ...
FGD Leader: ...
Recorder 1: ...
Recorder 2: ...
Mapper 1: ...
Mapper 2: ...
Mapper 3: ...
Mapper 4: ...

West point 404

Team Leader: ...
FGD Leader: ...
Recorder 1: ...
Recorder 2: ...
Mapper 1: ...
Mapper 2: ...
Mapper 3: ...
Mapper 4: ...

West point 405

Team Leader: ...
FGD Leader: ...
Recorder 1: ...
Recorder 2: ...
Mapper 1: ...
Mapper 2: ...
Mapper 3: ...
Mapper 4: ...

West point 406

Team Leader: ...
FGD Leader: ...
Recorder 1: ...
Recorder 2: ...
Mapper 1: ...
Mapper 2: ...
Mapper 3: ...
Mapper 4: ...

West point 407

Team Leader: ...
FGD Leader: ...
Recorder 1: ...
Recorder 2: ...
Mapper 1: ...
Mapper 2: ...
Mapper 3: ...
Mapper 4: ...

Slip way

Team Leader: ...
FGD Leader: ...
Recorder 1: ...
Recorder 2: ...
Mapper 1: ...
Mapper 2: ...
Mapper 3: ...
Mapper 4: ...



Key Messages from Focus Group
1. ...
2. ...
3. ...
4. ...
5. ...

Key Messages from Focus Group
1. ...
2. ...
3. ...
4. ...
5. ...

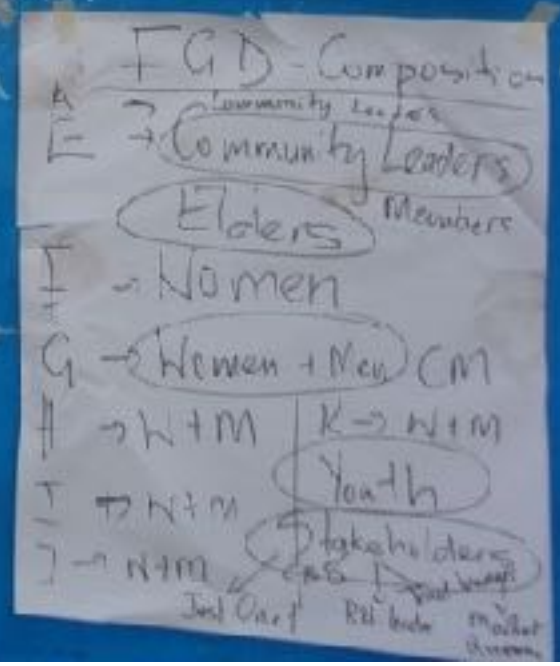
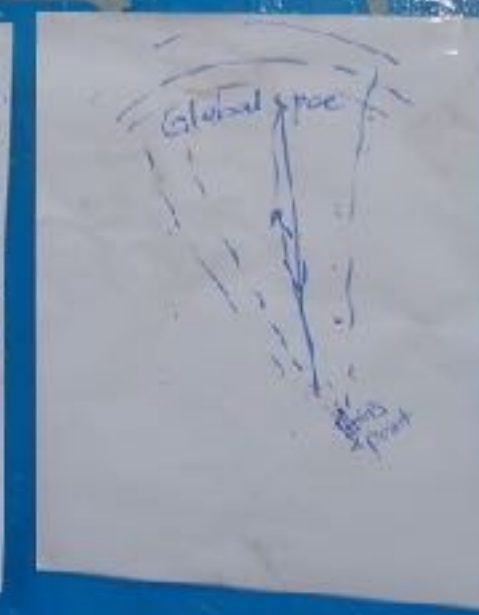
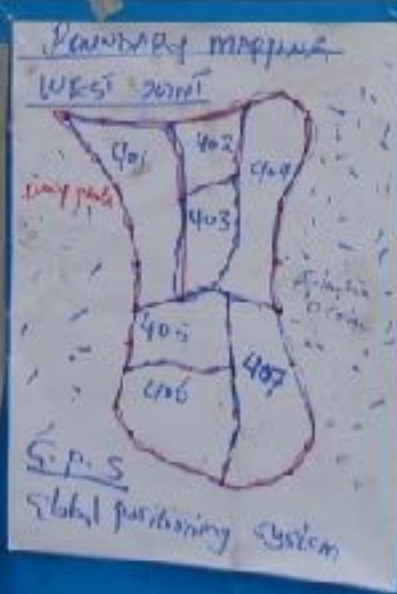




























Figure 4

POLICE
DEPT

0402

2100

LEC

Feb 8 1906
A-57102

West Point 5 04/07



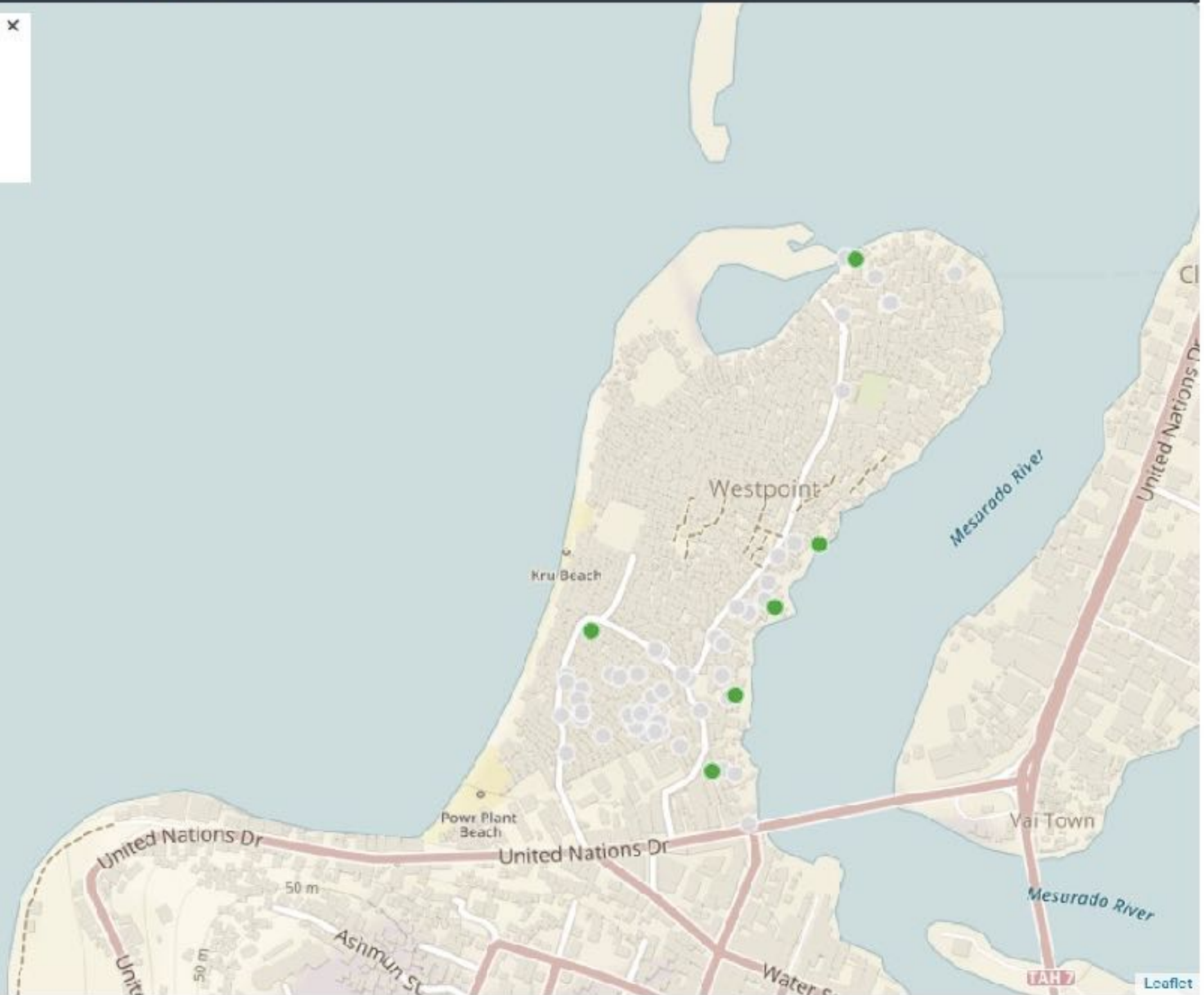


D1. WHAT TYPES OF TOILET IS THIS?

Click to filter.

● Pit Latrine (6)

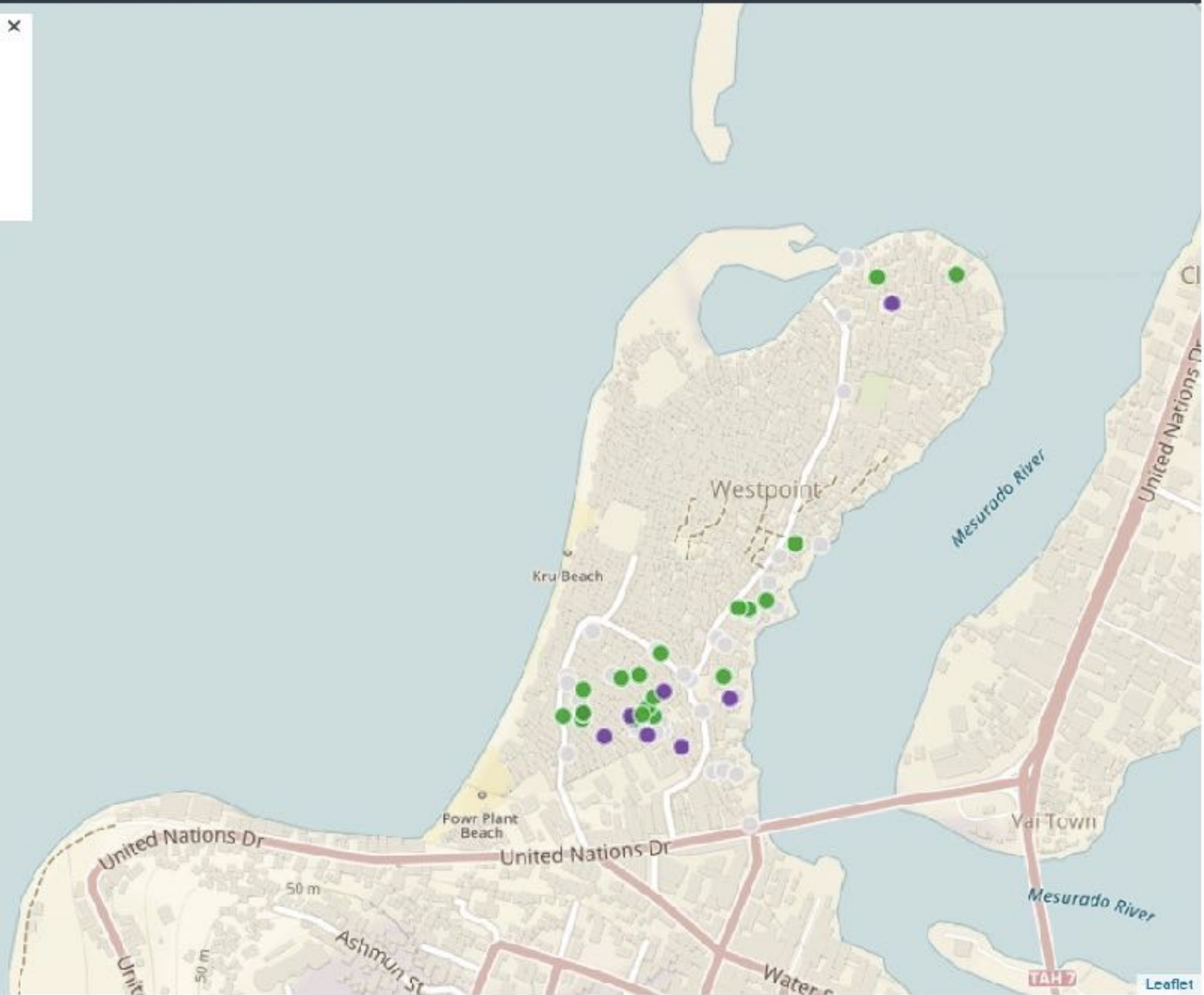
● No Answer (53)



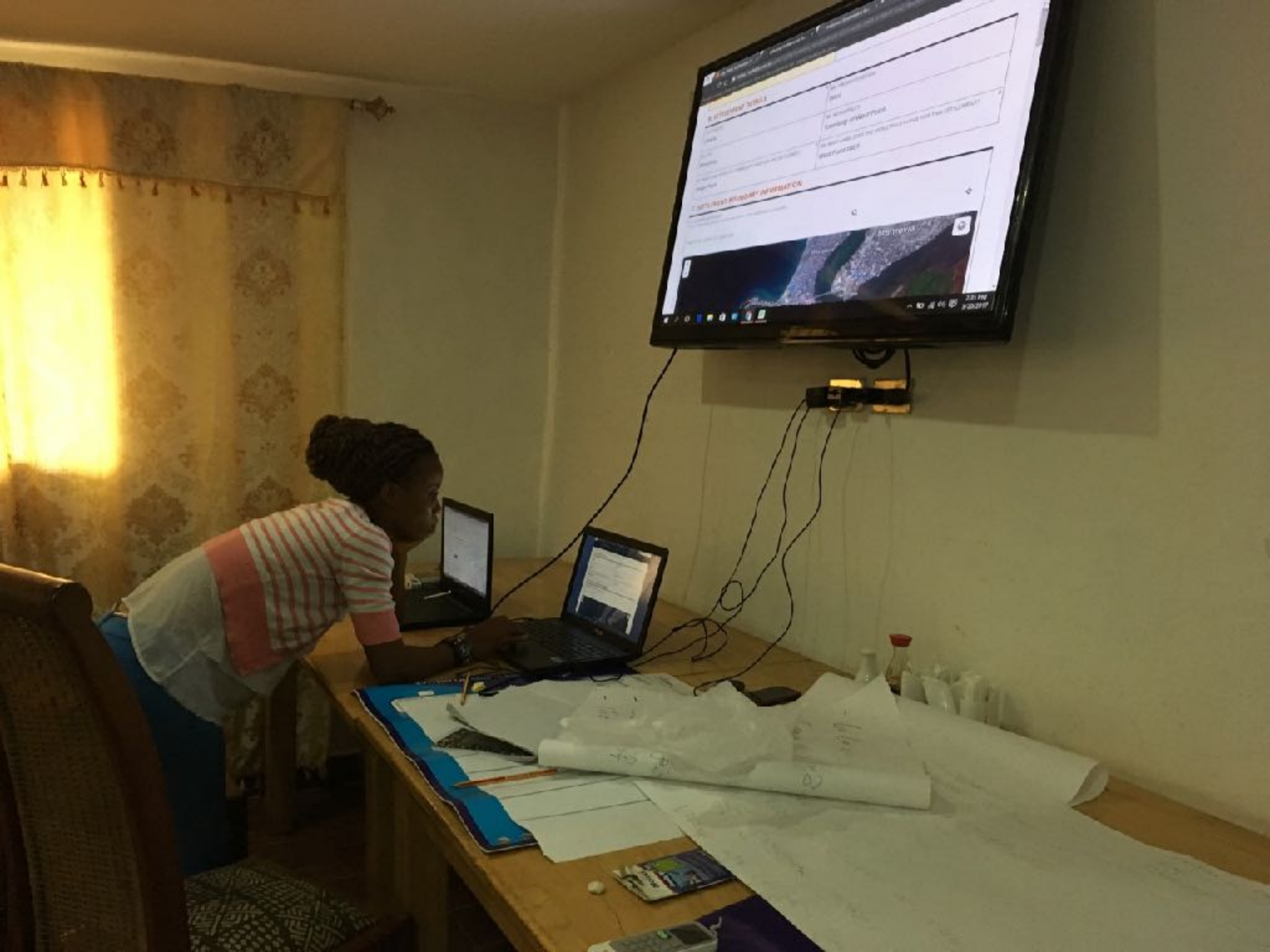
D4. QUALITY OF THE WATER FROM INDIVIDUAL TAPS: ✕

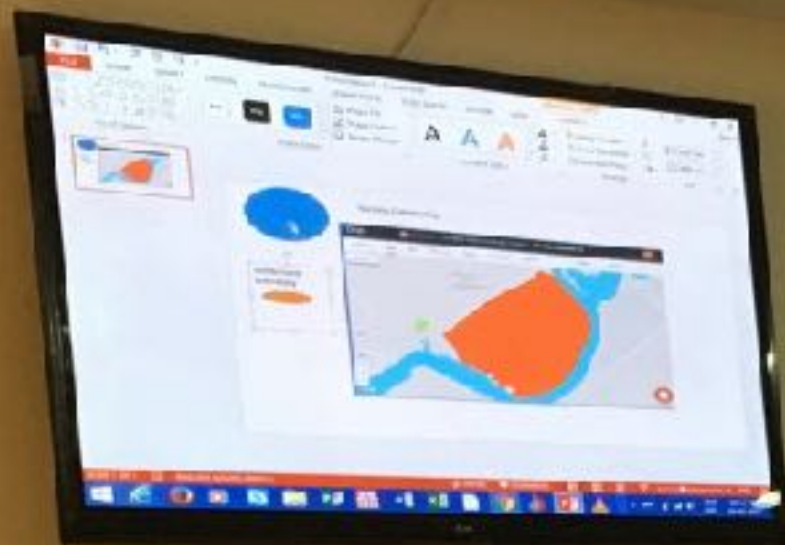
Click to filter:

- Not Safe (19)
- Safe for Drinking (8)
- No Answer (32)









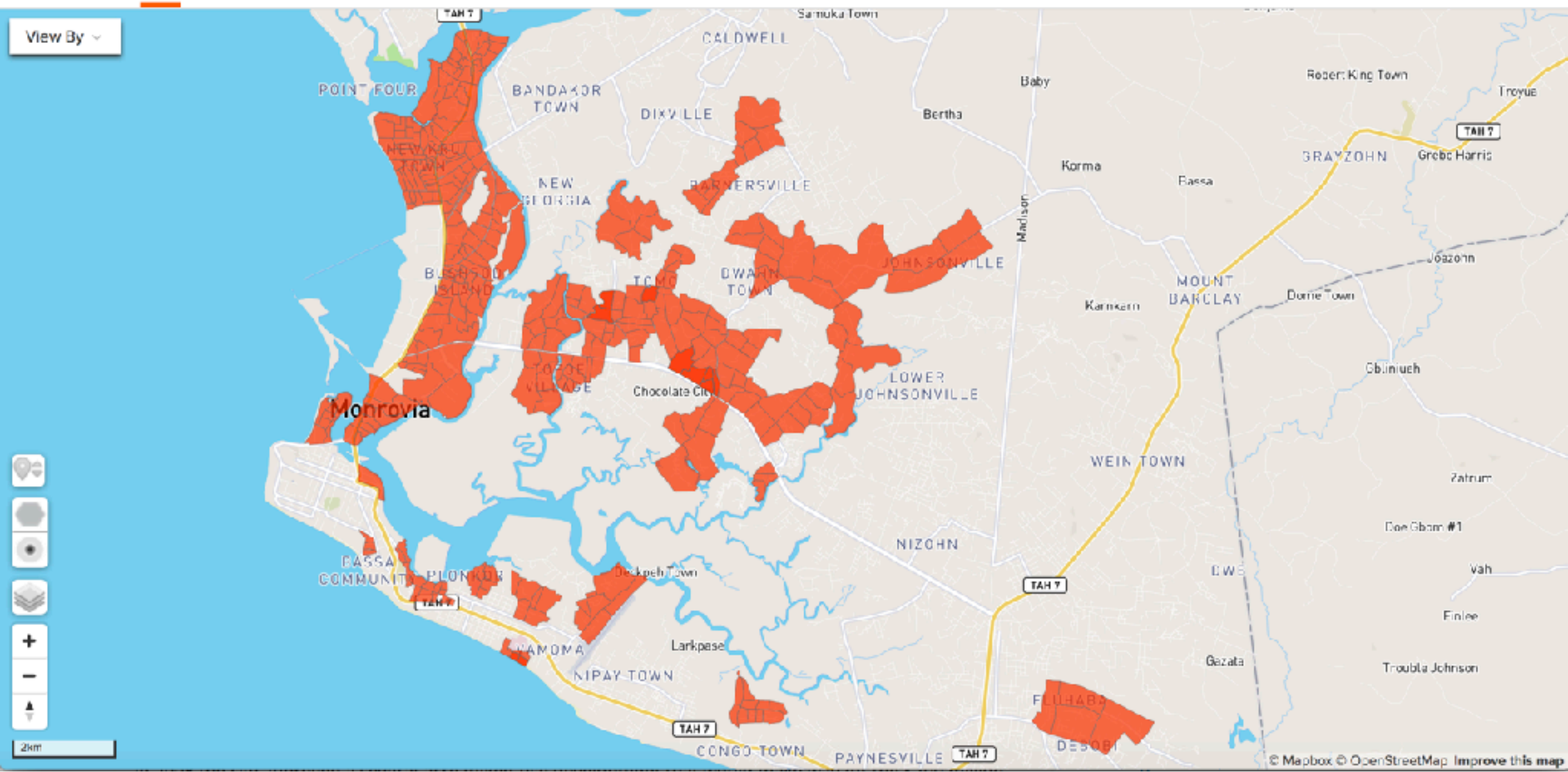
- Create a new dataset
- Select the Field
- Add the new dataset to the map
- Select the field
- Select the new dataset
- Add the new dataset to the map
- Add the new dataset to the map
- Add the new dataset to the map
- Add the new dataset to the map





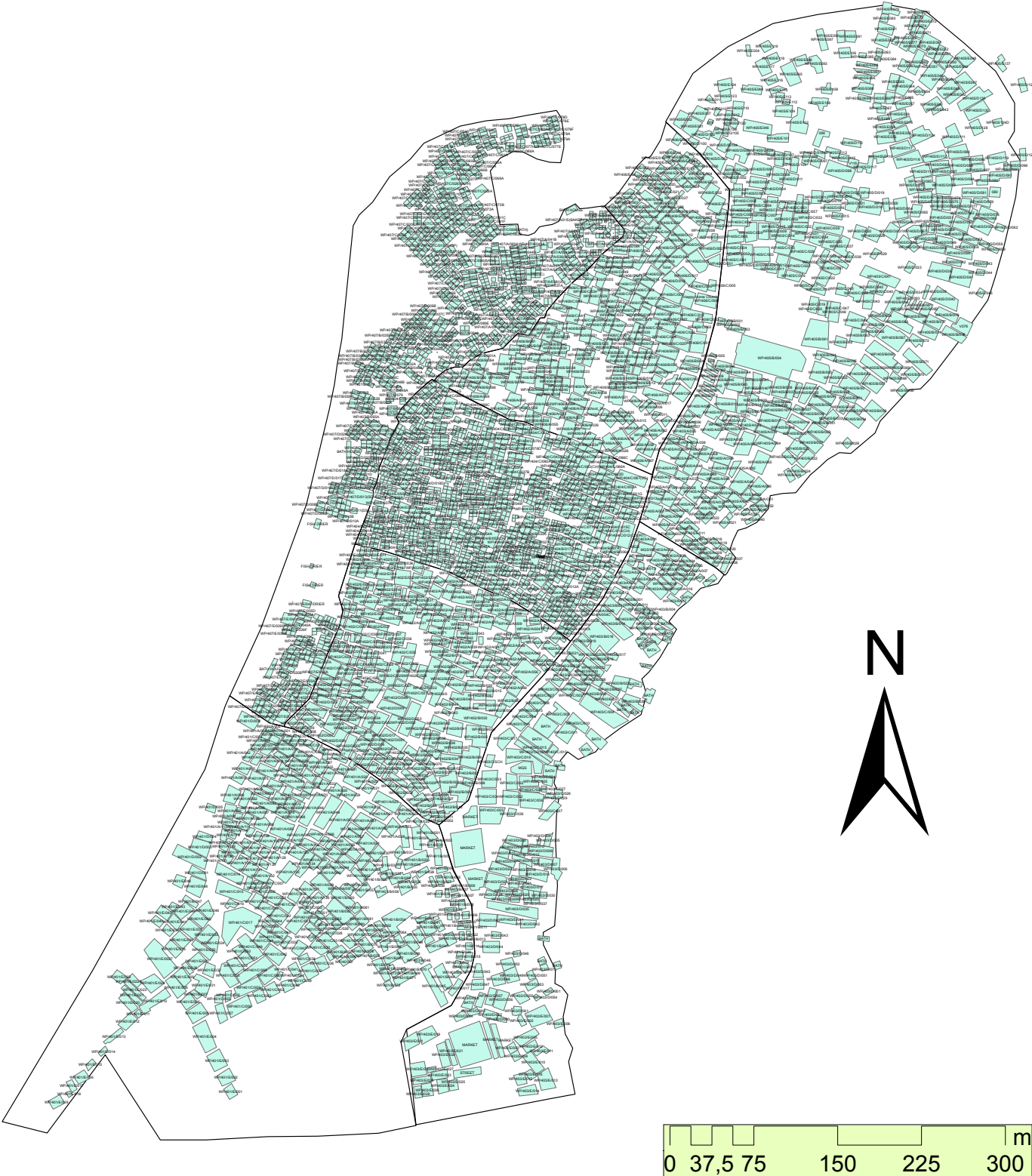


View By





WESTPOINT ENUMERATION



Legend

Westpoint Structures

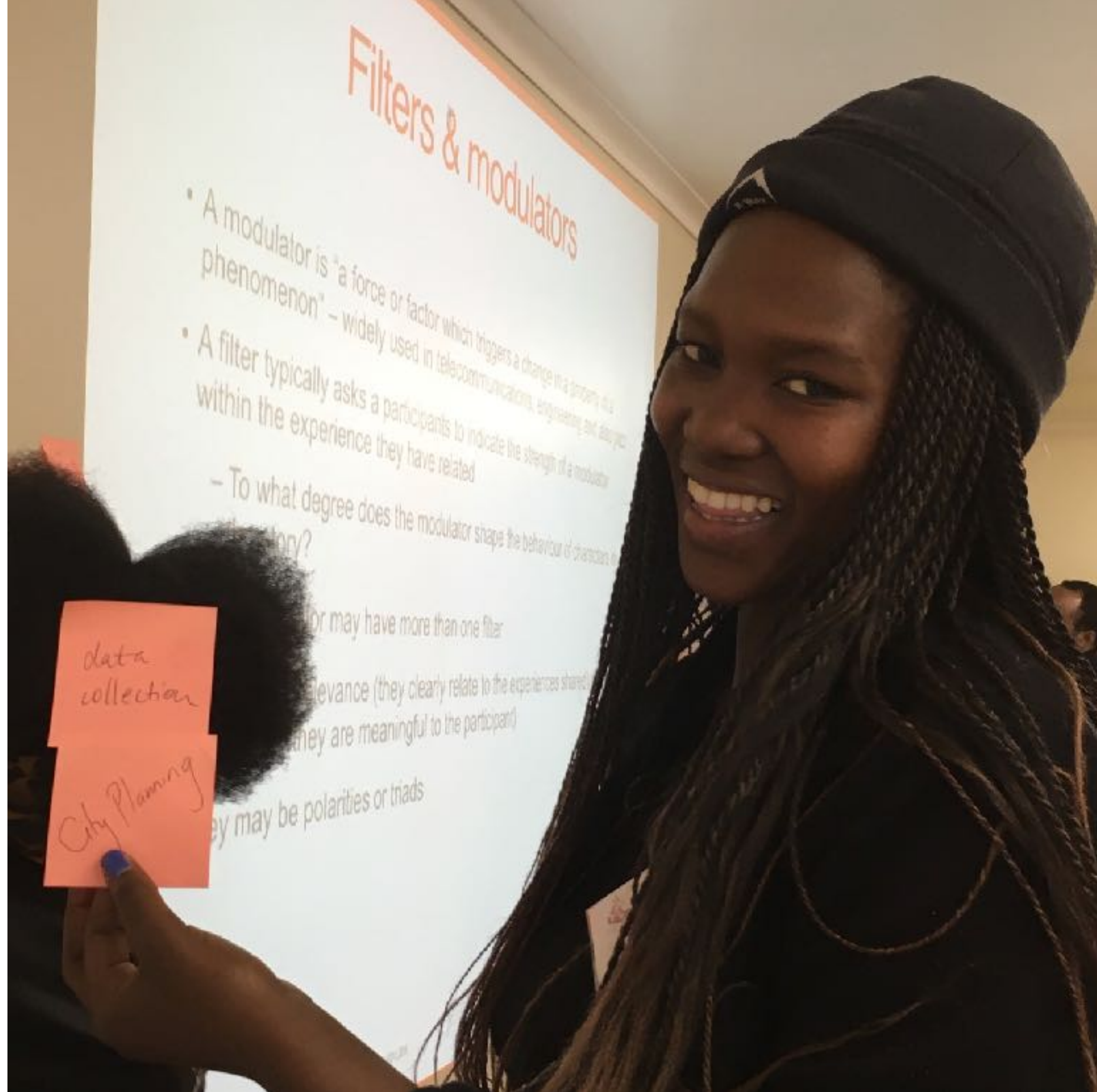
Westpoint Boundary

Zone	Number of households
401	1,092
402	952
403	491
404	883
405	1,131
406	319
407	901
Total	5,769

Source: West Point household enumeration, 2017



**Harnessing
local data,
science and
technology for
actionable
intelligence
towards
accelerating
cities'
capacity for
sustainable
and equitable
development.**



Cape Town World Design Capital in 2014



“Rebuilding and reconnecting city in structure and spirit”

One of the 4 projects submitted by SA SDI Alliance and accepted into the City’s portfolio for the bid, was the ‘re-blocking’ of Mshini Wam.

The upgrading of Mshini Wam was the first of 22 pilot projects in collaboration between ISN and the City of Cape Town as per Memorandum of Understanding (MoU) signed in April 2012.

Objective:


- Block-out entire community to improve access to public space and safety through central courtyards
- Improve protection against fires and flooding
- Improve access ratio to toilets for residents
- Develop a gutter/trench system that would connect to City infrastructure to reduce flooding

Process:

- Complete enumeration and mapping of settlement
- Mobilise community to save 20% of the cost of improved top structure (fire retardant)
- Produce preliminary layout of relocked section with cardboard pieces layer over cadastral map

Established in 2006 by backyards seeking to escape high rents and exploitation from backyard landlords charging exorbitant amounts (R200 (US\$ 15-20) for access to basic services (water and sanitation) and electricity.

497 People living in 250 shacks | 6 public chemical toilets | 2 water taps



SDI SOUTH AFRICAN ALLIANCE

Mshini Wam

August 27, 2012 Informal Settlement Upgrading

Launch Date: The ISN first had interactions with Mtshini Wam in November 2010, at which time considerable social mobilisation was initiated. The project was launched in May 2012, and was finished in March 2013.

Location : Mshini Wam is located in what used to be an open space inbetween formal RDP houses located between Democracy Drive, Hlosi Drive and Ingwe Drive in the greater Joe Slovo Park in Milnerton, Cape Town

PROJECT IN BRIEF: To open public spaces and roads by re-arranging 250 shacks in accordance to a community-designed layout plan to ensure the long-term development of the settlement.

“This place is full of water and we can’t even walk. It is raining all the time. If there is a fire, the emergency cars can’t get in [access into the settlement].” Community Voice

Supporting Reblocking and Community Development in Mtshini Wam



An Interactive Qualifying Project to be submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor Science.

Abstract

The South African government is currently facing immense pressure to provide all citizens with access to housing and basic services. In response to the historically slow and unsustainable system of housing and service delivery for informal communities across South Africa, a process called reblocking was created. The informal settlement community of Mtshini Wam and our sponsor, Community Organisation Resource Centre (CORC), invited us to observe the first reblocking project undertaken in partnership with the City of Cape Town and the Informal Settlement Network (ISN). Our project goal was to support this reblocking process as well as community development. At the partnership's request, we created a guidebook to help streamline this process as the new standard of informal settlement improvement. We also utilised momentum from the reblocking process to implement community driven initiatives addressing issues of food security, entrepreneurial job opportunities, and quality and safety of shack dwelling.

For our full project report: <http://wp.wpi.edu/capetown/homepage/projects/p2012/mtshini-wam>

For more about the Cape Town Project Centre: <http://wp.wpi.edu/capetown/>

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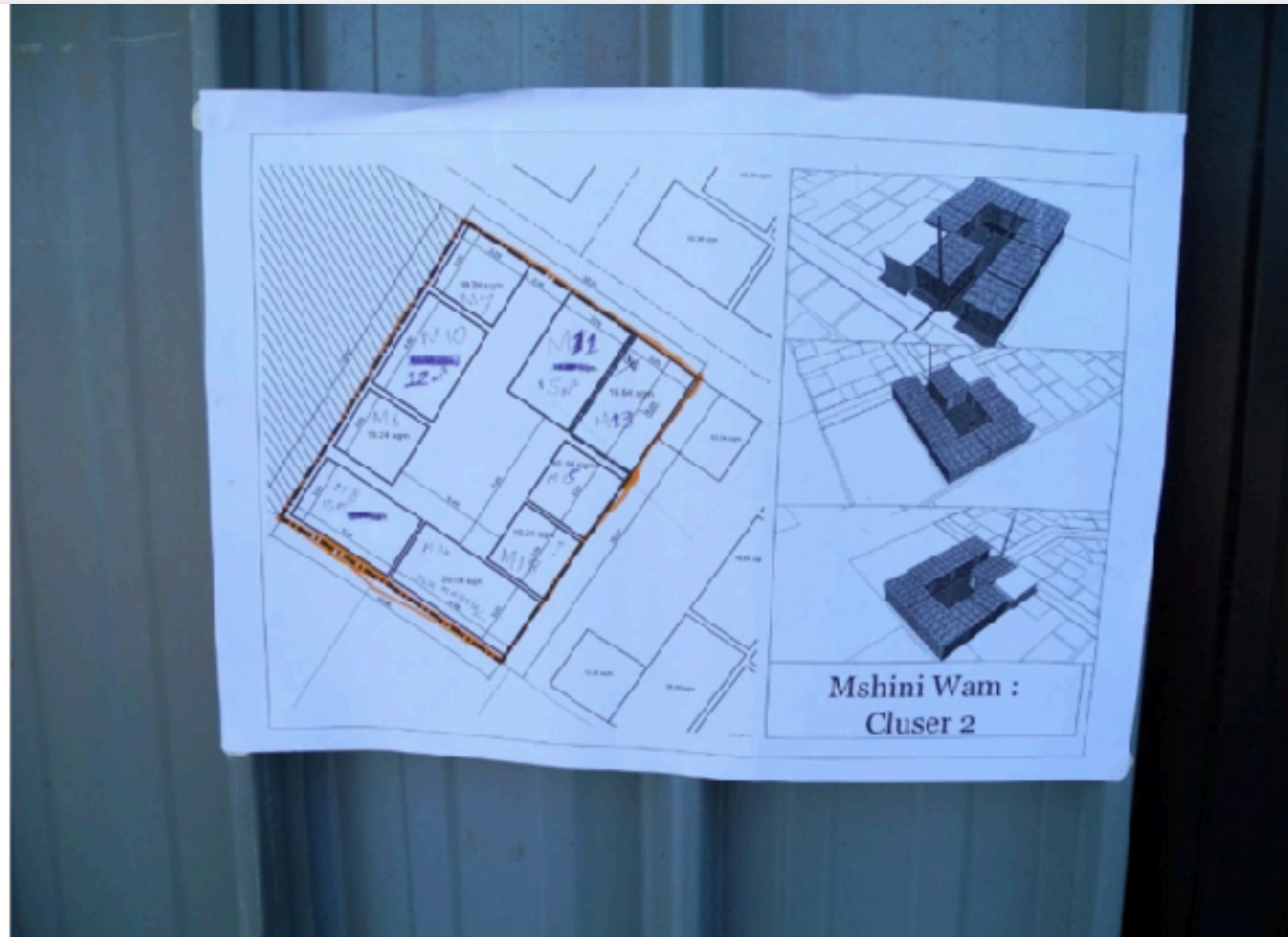
Sponsors

Community Organisation
Resource Centre





Community + Institutions + Technology



Impact: The in-situ “re-blocking” of Mtshini Wam informal settlement is making an impact on the imagination of what informal settlement upgrading could look like. More importantly, the technical interventions are lead by the community, and there is therefore considerable community buy-in and cohesion. The community has demonstrated that given the sufficient institutional support from community networks, NGOs and universities, Metropolitan government officials, and institutional enabling factors (such as the use of the EPWP), upgrading not only improves communities’ living conditions, it also builds critical “social capital” for a transformed and more active citizenry.

Toward cities without slums: Topology and the spatial evolution of neighborhoods

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“We show that it is possible to diagnose systematically the central physical problem of slums—the lack of spatial accesses and related services using a topological analysis of neighborhood maps and resolved by finding solutions to a sequence of constrained optimization problems. We set up the problem by showing that the built environment of any city can be decomposed into two types of networked spaces— accesses and places—and prove that these spaces display universal topological characteristics. We then show that while the neighborhoods of developed cities express the same common topology, urban slums fall into a different topological class. We demonstrate that it is always possible to find solutions that grow a street network in existing slums, providing universal accesses at minimal disruption and cost.”

Cape Town Project

Cape Town, South Africa

This map shows a block in Khayelitsha, a township in Capetown, South Africa. These parcels were identified from March 2009 aerial photography, in conjunction with a data collection exercise by SDI South African Alliance and the Santa Fe Institute. In this map, black lines show new roads and paths, orange outlines parcels with no direct access to roads or paths. Parcels with street access are outlined in grey.

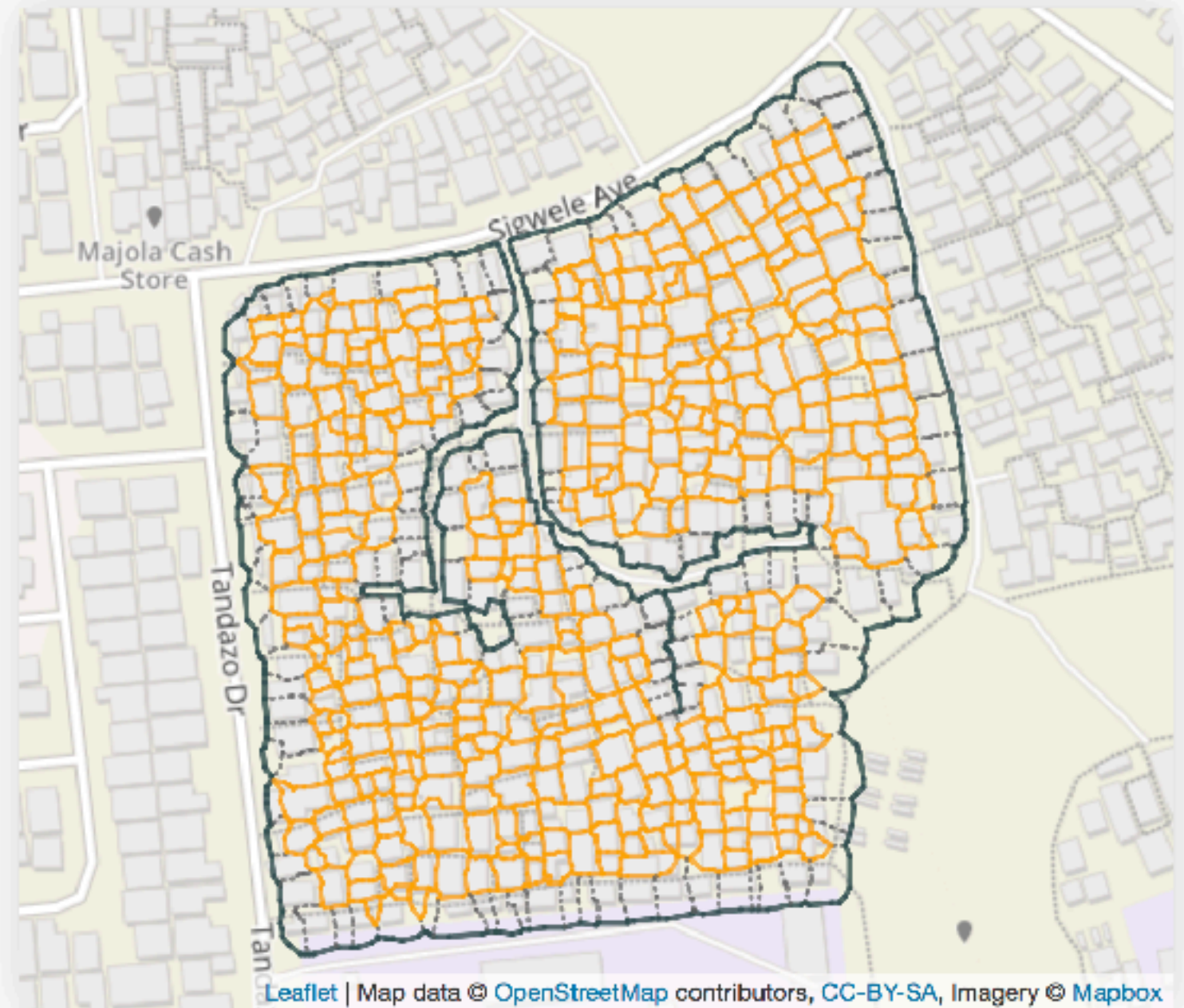
31m of paths

22,513m² of parcels

0.10% of area needed for paths

380 isolated parcels

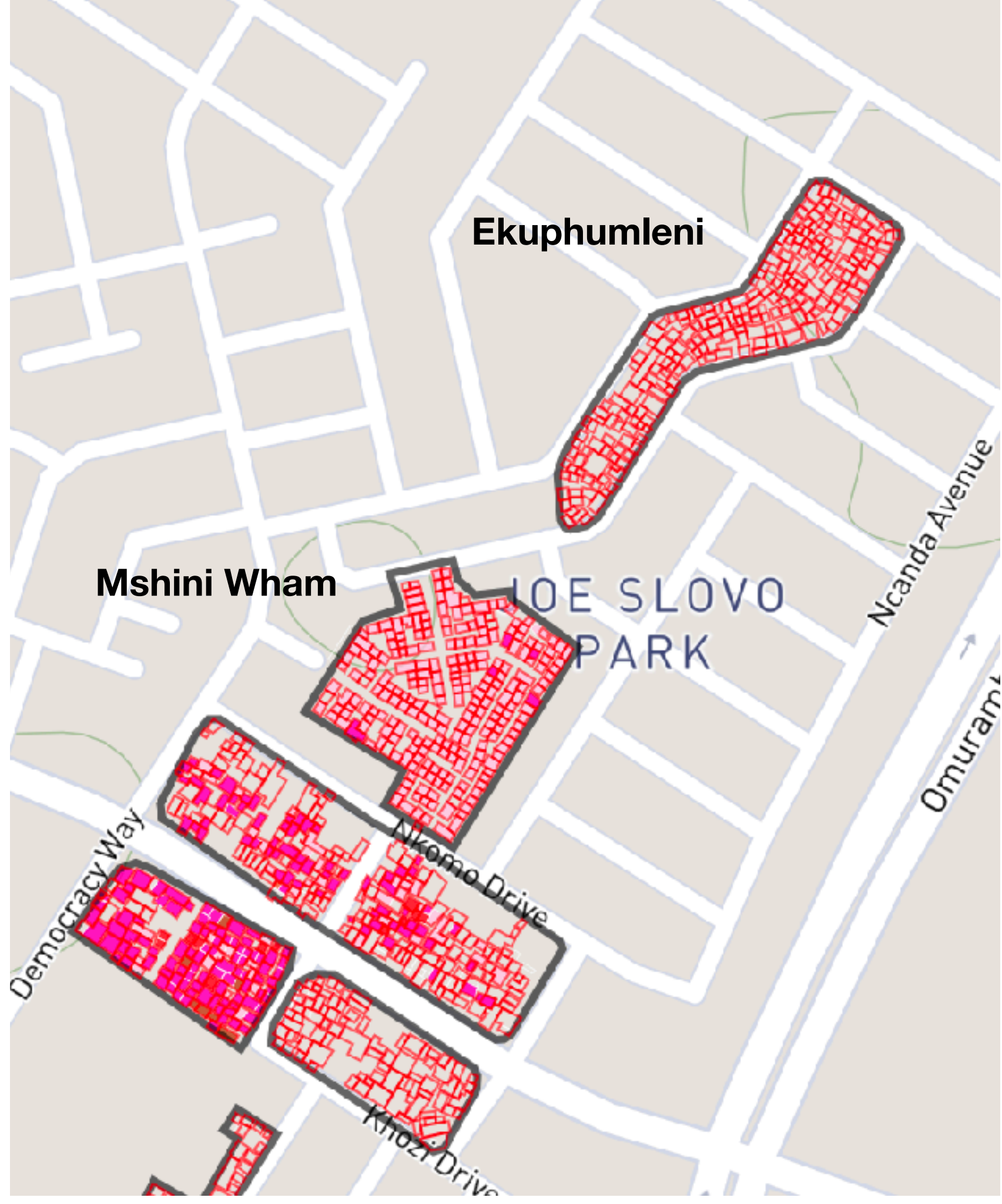
Step Selector

☐

How might urban slum communities become more resilient to the effects of climate change?

OpenIDEO/Amplify Innovation Challenge 2016





Ekuphumleni

Mshini Wham

LOE SLOVO
PARK

Ncanda Avenue

Omuram

Democracy Way


Nkomo Drive

Khozi Drive

HUMAN CENTRED DESIGN PRINCIPLES

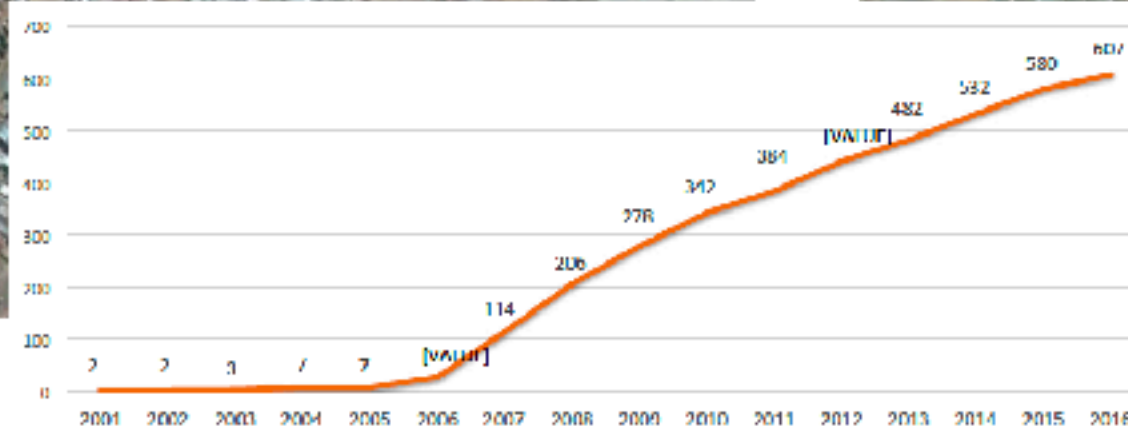
CO DESIGNED

SPATIAL RECONFIGURATION

A photograph of a man in a blue baseball cap and a dark long-sleeved shirt, looking down at a smartphone he is holding. In the background, a woman in a yellow shirt is holding a young child. They are in a room with corrugated metal walls. A small framed picture of a child hangs on the wall above a white refrigerator. A doorway is visible on the right side of the frame.

RESILIENCE DEPENDS ON

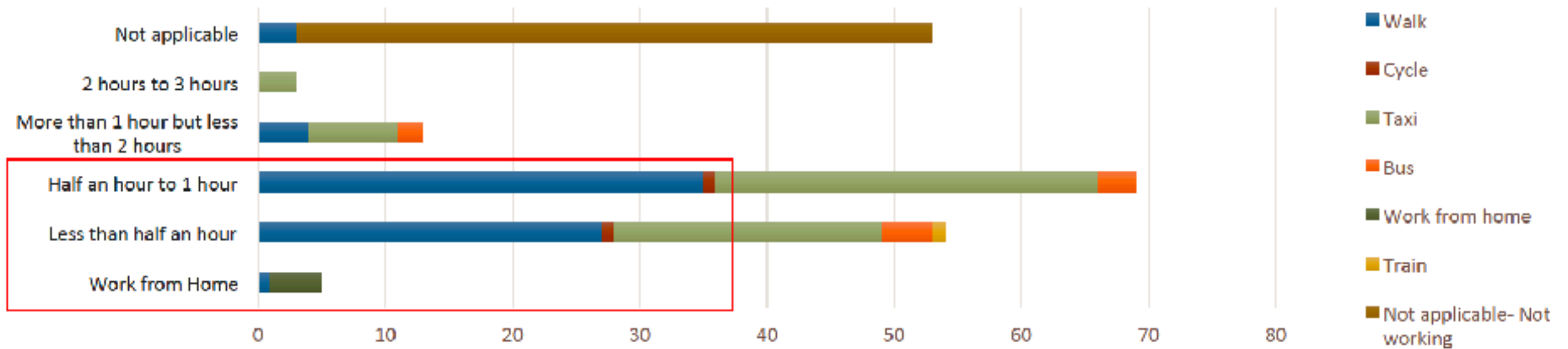
NEW &
BETTER | **KNOWLEDGE**

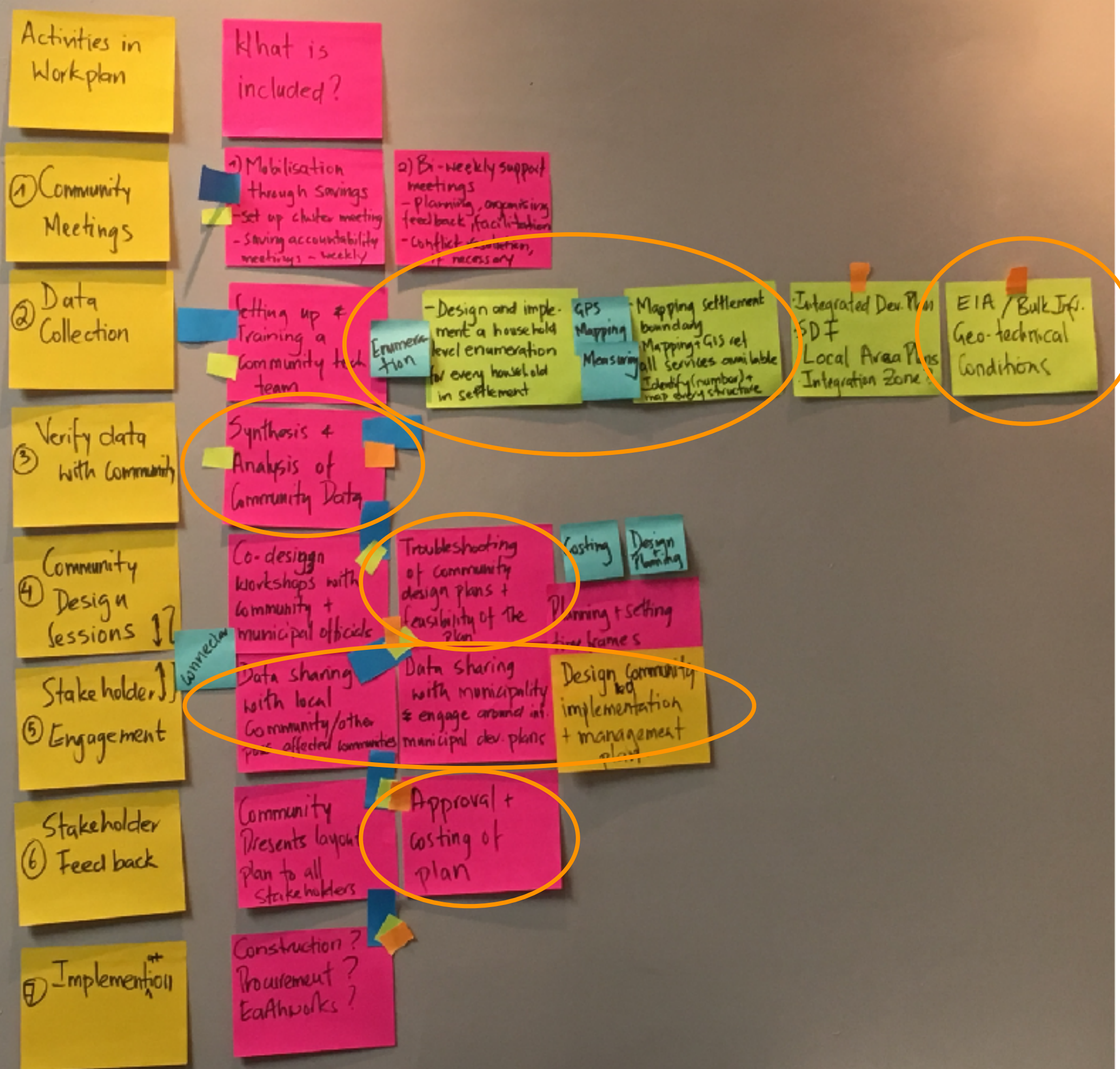












Steps of the Re-blocking process of the SA SDI Alliance

Timeframes:

Sheffield Road

Flamingo Crescent

Mshini Wam -
2012 - 2013
(Phase I)
Drainages completed in 2017

We are not Connecting Our ^{numbers} and Stories
 • We don't know what our ^{numbers} stories mean.
 • We don't give enough Feedback to our Communities so that they can know what the data means and how they can use it.

Informal Settlements Stories
 Tell meaningful qualitative stories that ~~can~~ ^{reflect} transformation and change.

Higher Level Objective
 Informal settlement dwellers produce stories that show how they are bringing change to their circumstances

ENUMERATION

Data rich -
analysis poor
 we don't analyse it enough!

Data collected from the profile should inform upgrading projects in settlements.

- Project and data teams were working in silos with little co-ordination.
- Project decisions made by top few leaders with little consultation of data or members.
- City-wide profiling stretched the capacity of the Federations to grow savings groups as quickly as the data collection was happening = community (esp. youth voices lost!)

“The crime and the unemployment are the most difficult things in Kanana and the health hazard. The problem in Kanana is that there are a lot of preschools here but they are not from government. If you have one child and you are not working, where can you get the money to feed yourself and that child and to pay the crèche? Sometimes you pay R300 per month for the crèche. If you have a R50 you can’t do anything. But there is a way: we need infrastructure here in Kanana so people can go and find the jobs [in the surroundings].”

"In Kanana we don't have any problems with water. Although we have a lot of taps people are not allowed to do their washing next to the taps. They can only take water from the tap and do their washing inside their houses because there are no drains. It's better at home because most people open holes [in the ground], put in crates and throw in the water, which can sink into the ground a little bit. It's better than to throw it in the streets."

image
nana.

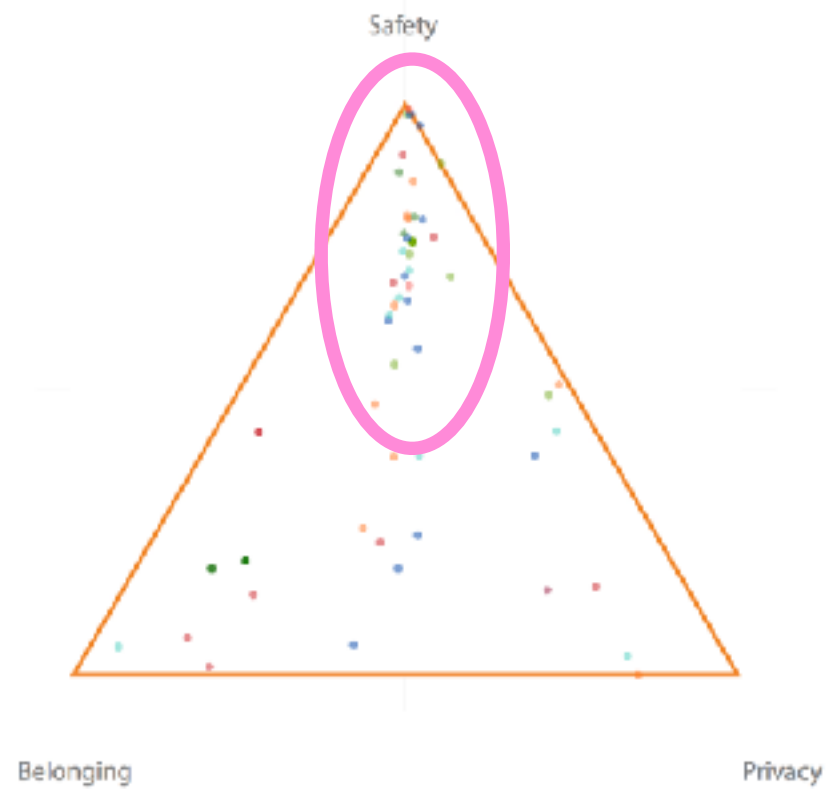
s?

Filters & problems

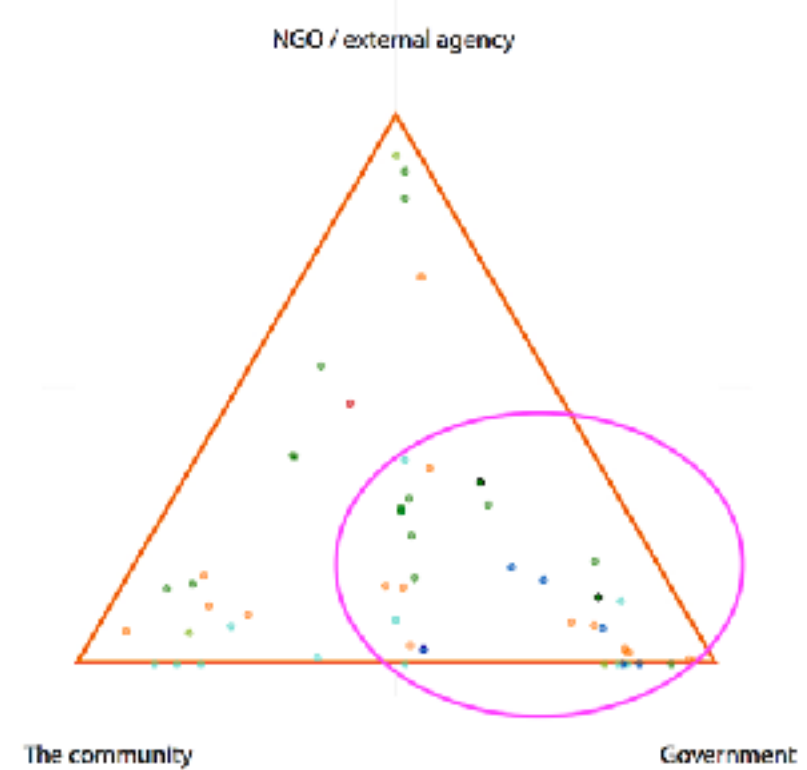
- A museum is a place where we can learn about the past and the present.
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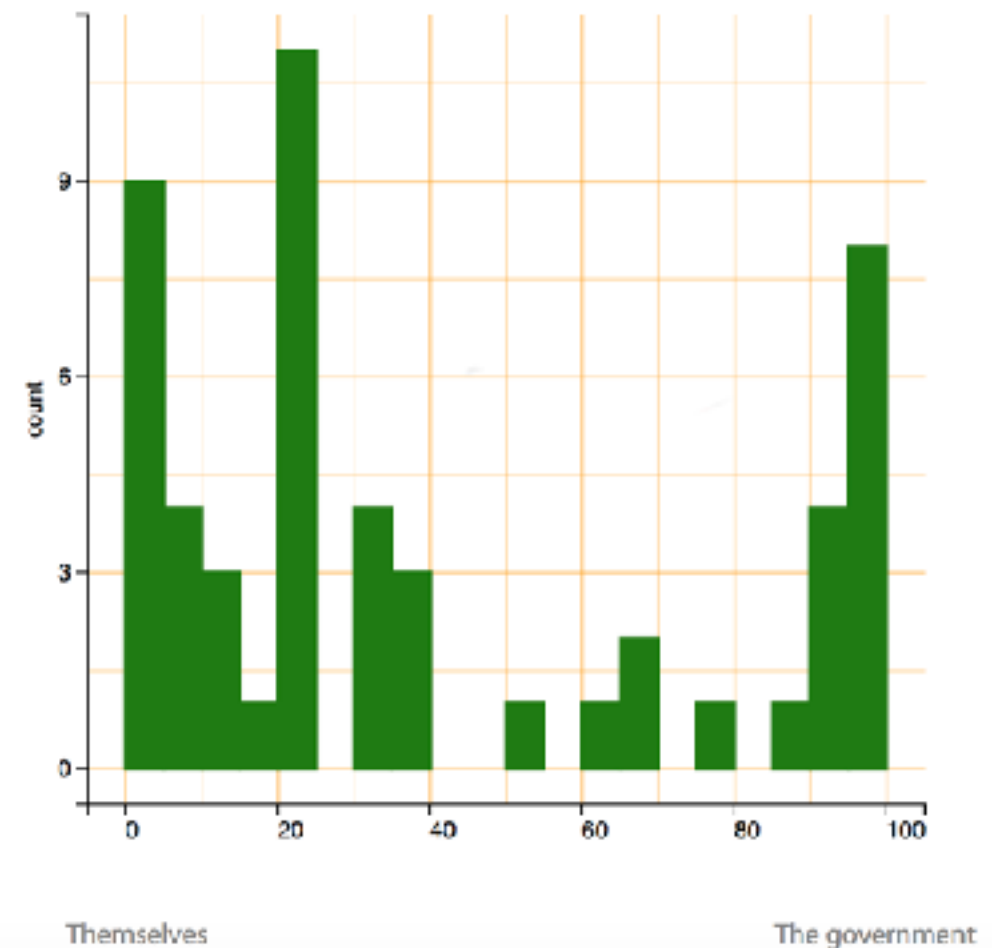
What do people value....

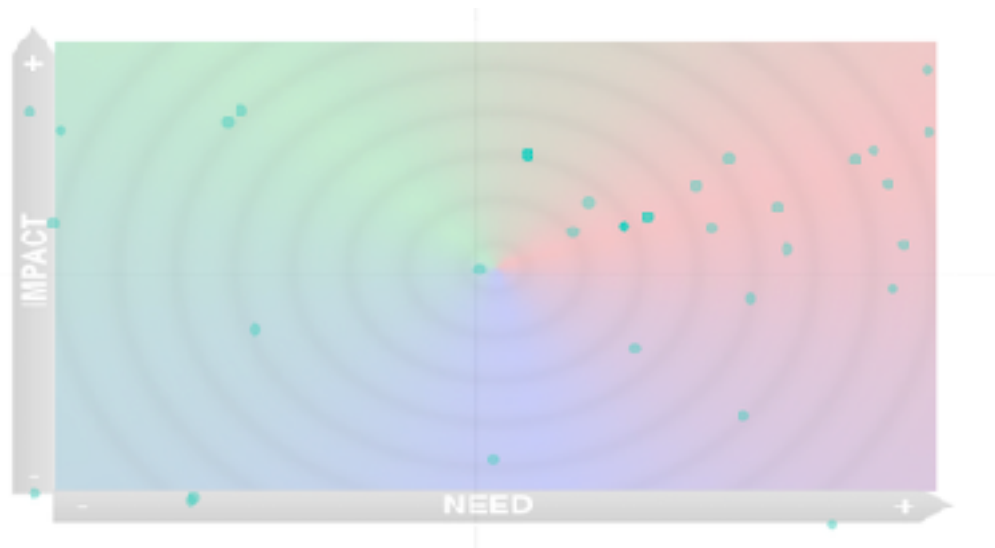


Who should hear your story....

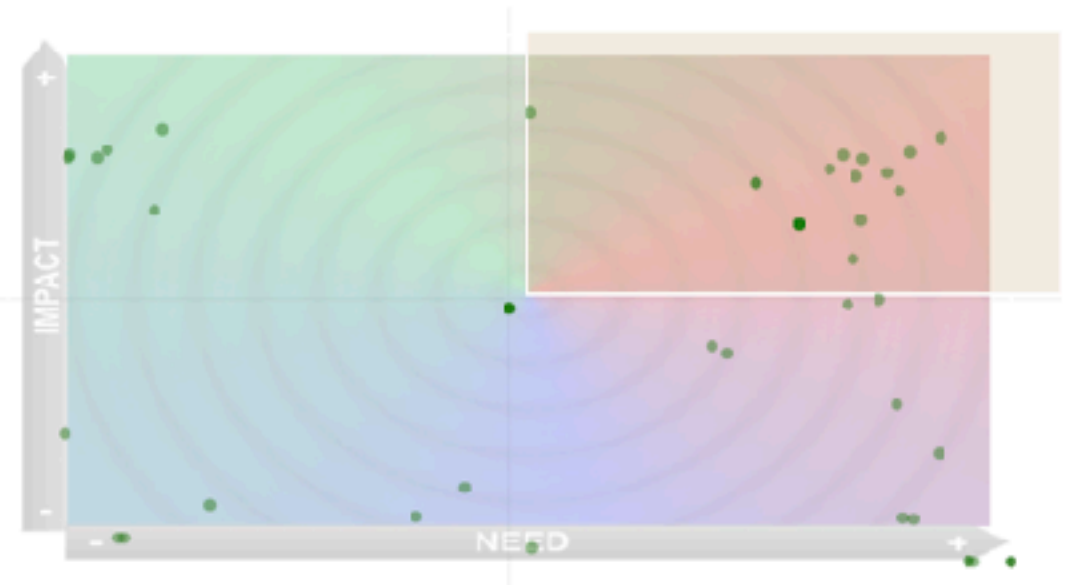


Who do people rely on to solve problems in their community....

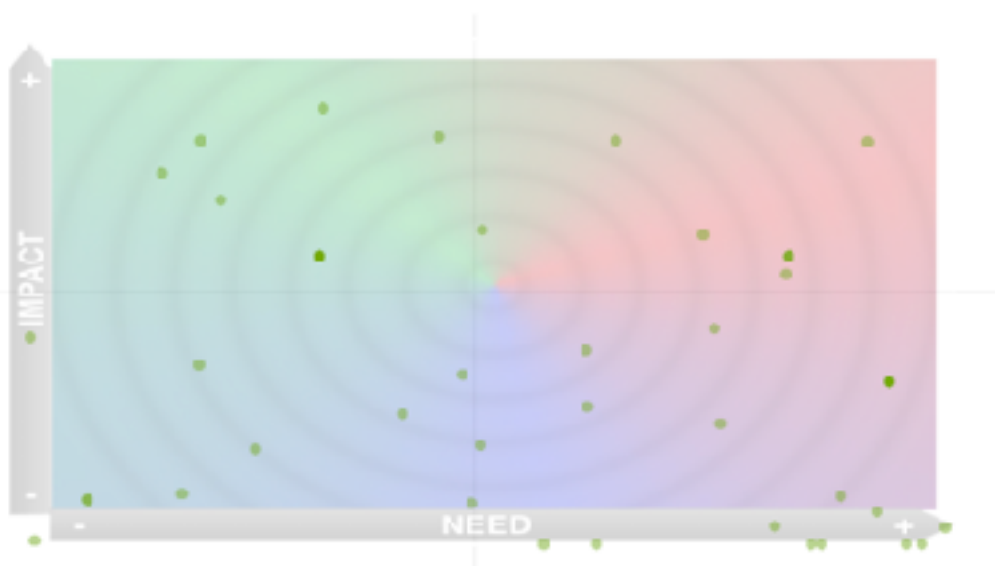




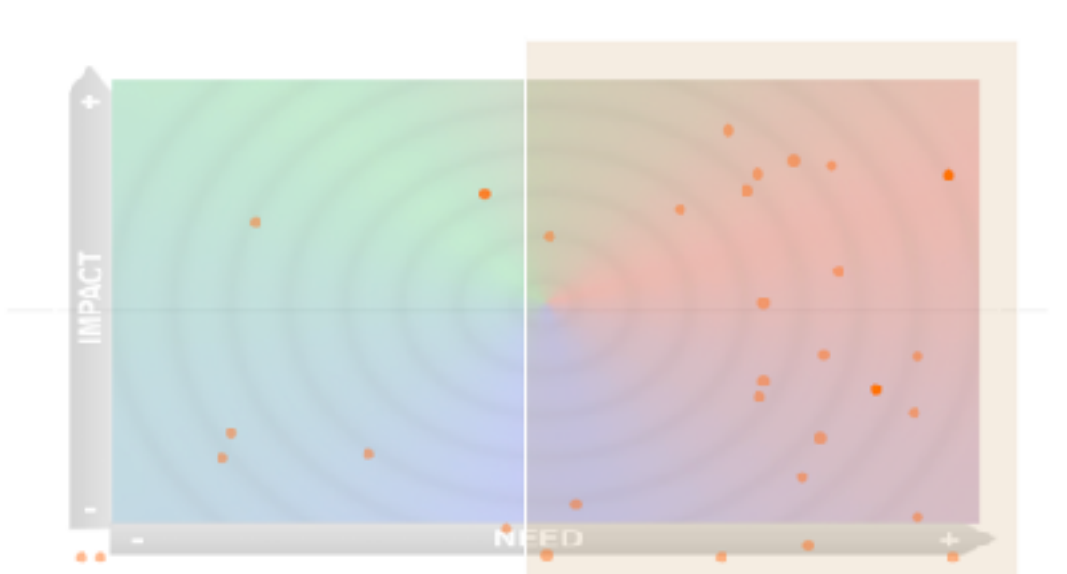
Stones1 ■ ChildCare ■ CommunityCentres ■ DisasterReleif
 ■ Policing ■ Sport ■ YouthActivities



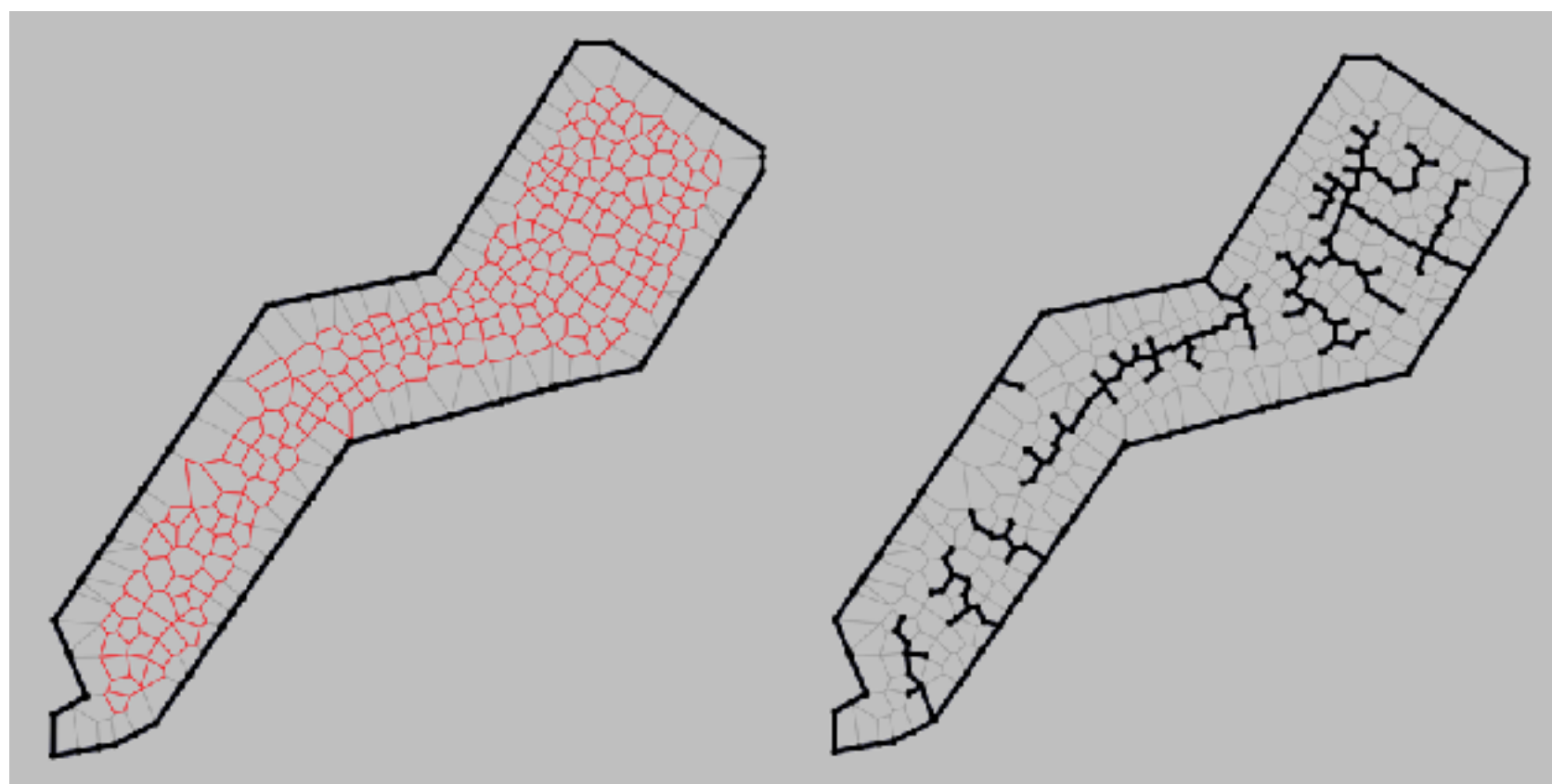
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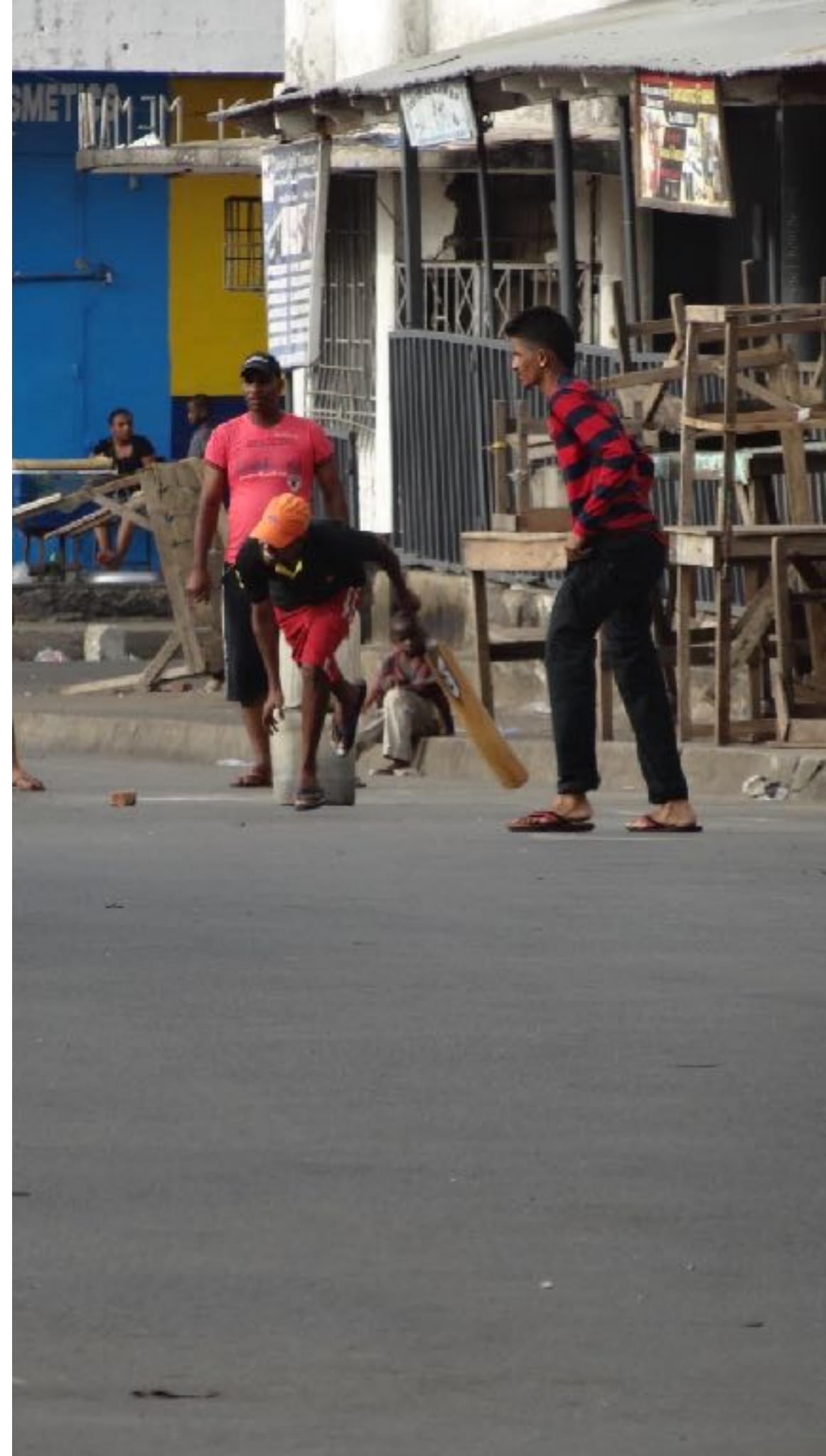


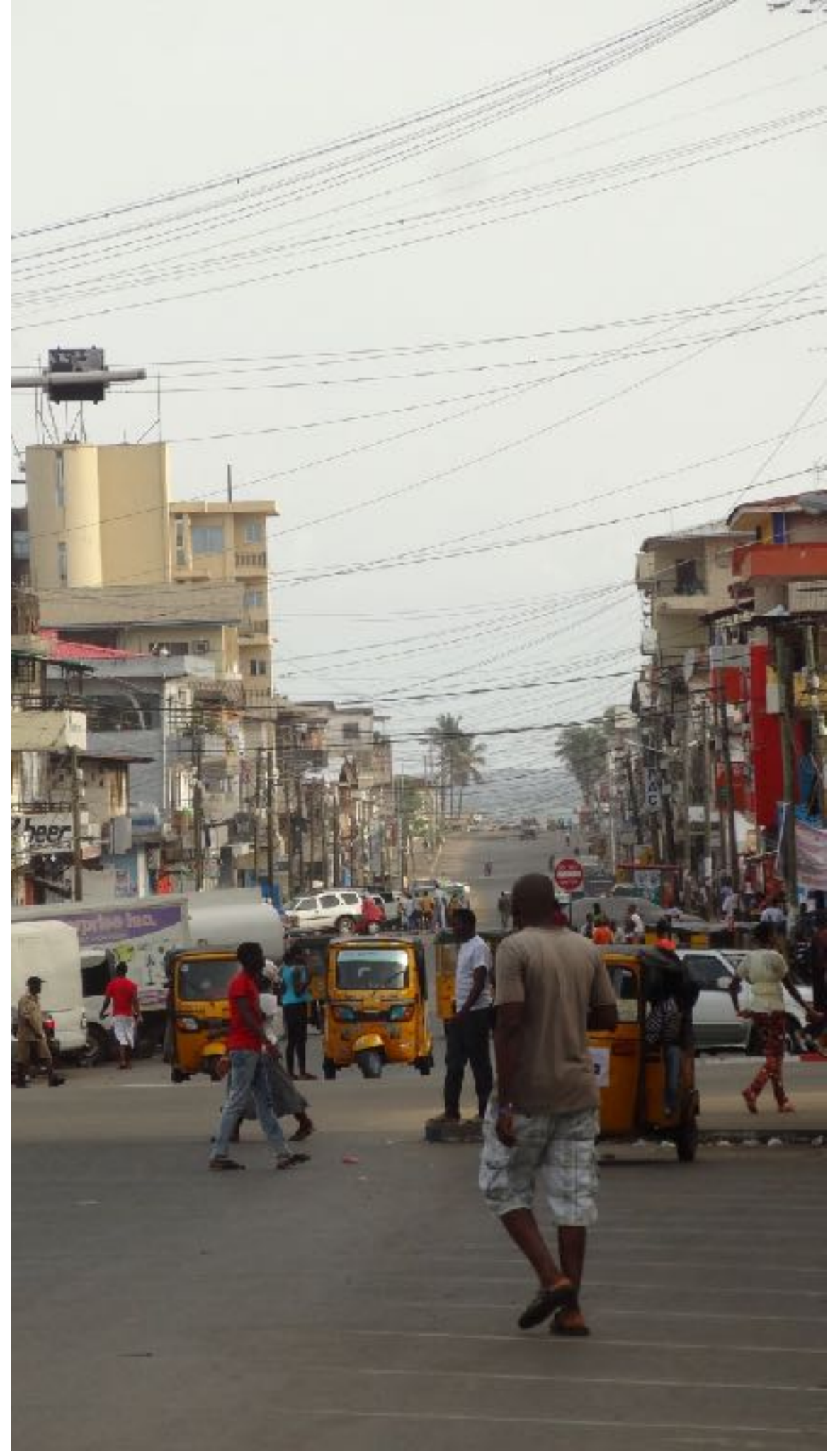


All the many things a street can be....

















Baie Dankie! beukes@uchicago.edu