

WORLD
in Stockholm,
September 1–6, 2013 **WATER**
WEEK

Presentation from the
2013 World Water Week in Stockholm

www.worldwaterweek.org

Implementation of water and sanitation policies and practices within the spatial plans of Lagos, Nigeria

A presentation at the
World Water Week

Stockholm, 4th September 2013

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Presentation outline



WaterAid-supported city-wide spatial planning project

Lagos- a mega city

The challenges of urban planning in a mega-city

The challenges of delivering city-wide water and sanitation services

Existing plans

Possible ways forward

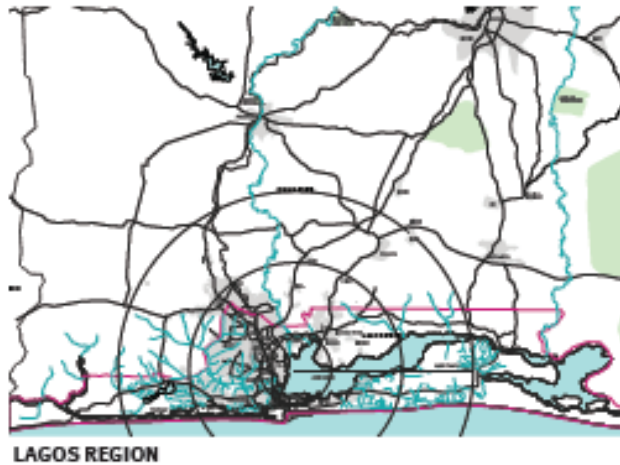
WaterAid City-wide spatial planning project...

Started in April 2012

Project to analyse infrastructure and planning for water supply and sanitation (WSS) in four African cities: Lusaka, Lagos, Kinshasa and Maputo

Aims to produce high-level plans and proposals

Close collaboration with authorities in four cities



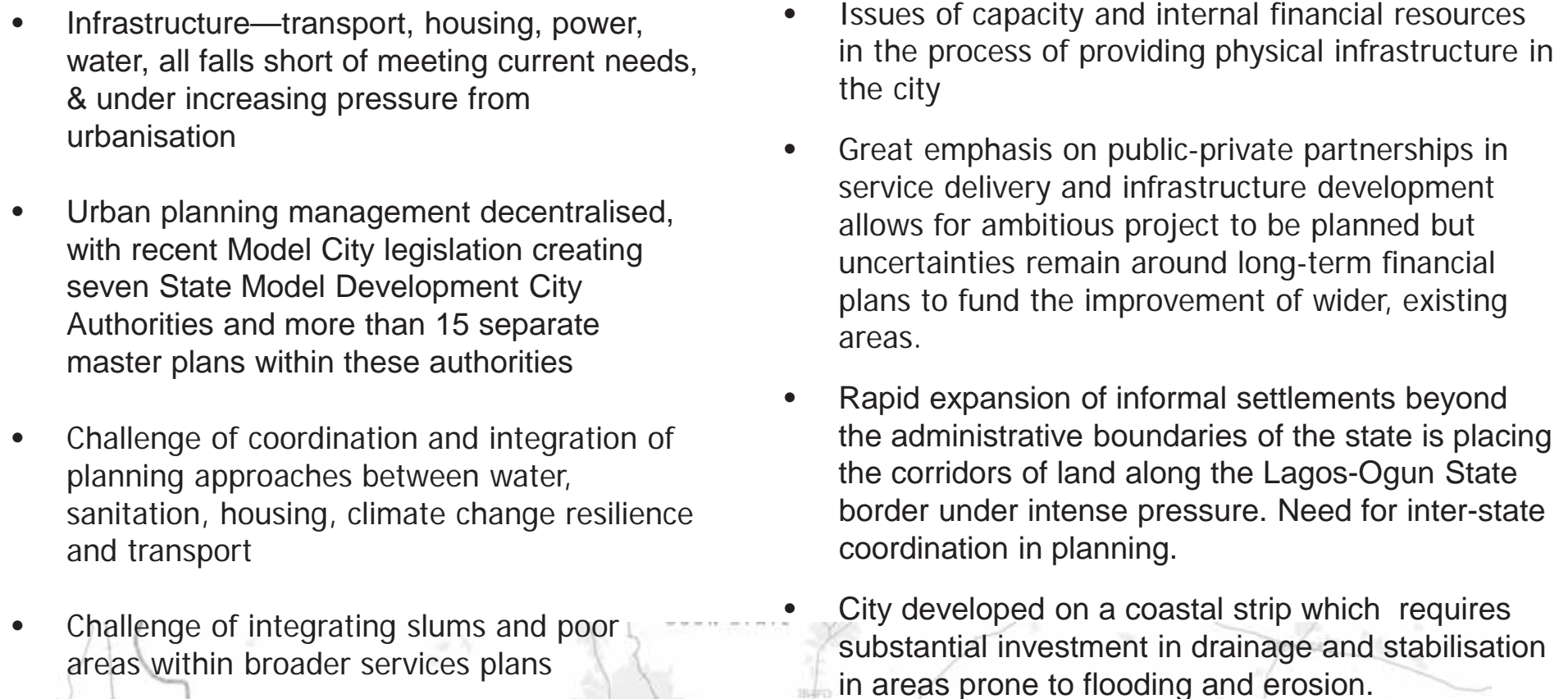
Lagos mega city



- Most populous city in Sub-Saharan Africa. Estimated population of 17 million (2009), predicted to grow to over 24 million by 2015, making Lagos the world's 3rd largest city after Tokyo and Mumbai.
- Commercial and industrial hub of Nigeria. Ambition to become a "World class city."
- Historically skewed distribution of people and activities resulting in inequalities in development across the state
- Significant housing shortages and basic services, with 60 - 70% of the population living in slums



The challenges of planning Lagos mega-city...

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- Infrastructure—transport, housing, power, water, all falls short of meeting current needs, & under increasing pressure from urbanisation
 - Urban planning management decentralised, with recent Model City legislation creating seven State Model Development City Authorities and more than 15 separate master plans within these authorities
 - Challenge of coordination and integration of planning approaches between water, sanitation, housing, climate change resilience and transport
 - Challenge of integrating slums and poor areas within broader services plans
 - Issues of capacity and internal financial resources in the process of providing physical infrastructure in the city
 - Great emphasis on public-private partnerships in service delivery and infrastructure development allows for ambitious project to be planned but uncertainties remain around long-term financial plans to fund the improvement of wider, existing areas.
 - Rapid expansion of informal settlements beyond the administrative boundaries of the state is placing the corridors of land along the Lagos-Ogun State border under intense pressure. Need for inter-state coordination in planning.
 - City developed on a coastal strip which requires substantial investment in drainage and stabilisation in areas prone to flooding and erosion.



The challenges of delivering city-wide water, sanitation and drainage services



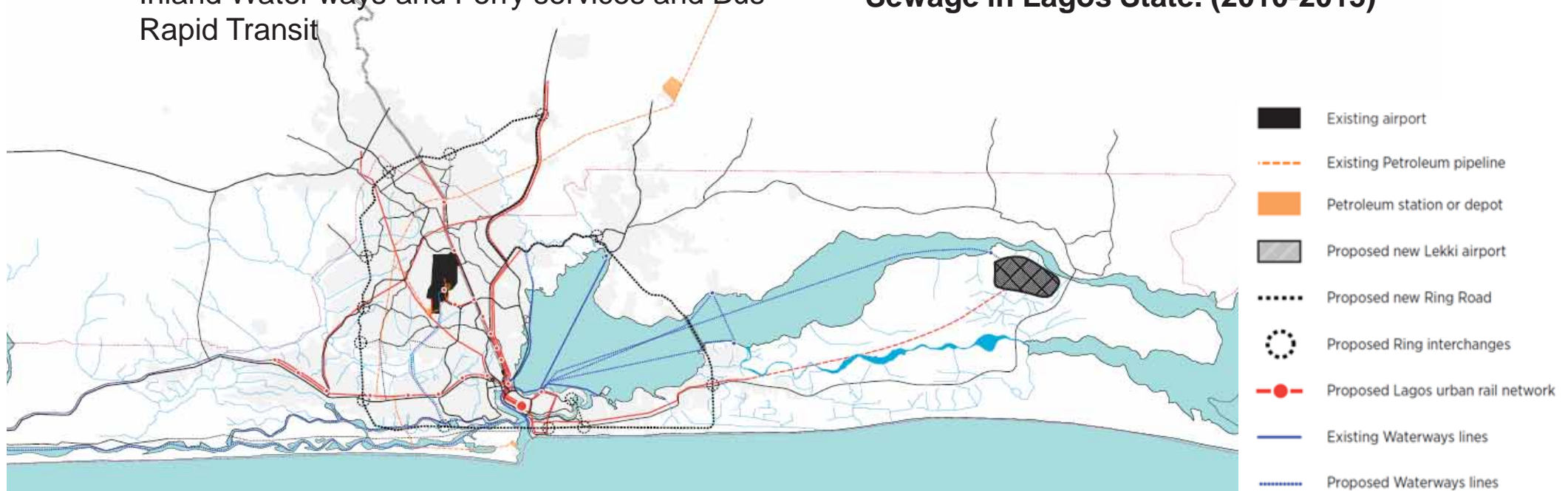
- Only about 40% of the water demand is being reached, with the gap between supply and demand estimated at 330 mgd.
 - ✓ Less than 5% of households have piped water connections.
 - ✓ High unaccounted for water losses (60%).
 - ✓ The system is subject to frequent interruption from power outages.
- The poorest groups rely on unprotected wells, and can pay more than 10 times the standard price for drinking water while buying it from informal vendors.
- Sanitation sector is lagging behind. In some LGAs up to 34% of the households use unimproved latrines.
 - ✓ Rudimentary system of sewage disposal.
 - ✓ 90% of households use septic tanks and soak away systems, with the sludge trucked to 9 official sedimentation points.
- Drainage infrastructure is limited, and often clogged or damaged.
 - ✓ The low-lying topography of the coastal area combined with its high water table make the city vulnerable to flooding during high tides or heavy rainfall.
 - ✓ Risk from the impacts of climate change, most notably sea level rise and exacerbated storm surges.
 - ✓ Much of the land in and around Lagos is less than 2m above sea level and already suffers from erosion.
 - ✓ Many slums are located in these vulnerable areas



Existing plans...

Key infrastructure programmes includes:

- Urban renewal and Mega city Programme with 20 years rolling plan
- Urban renewal and drainage channelization in all 57 LGA
- Lagos Eko-Atlantic City Project (flood defence and housing)
- Transport masterplan with: light railway system construction, road expansion programme, Inland Water ways and Ferry services and Bus Rapid Transit
- Pedestrian Safety and Foot Bridge Development initiatives
- Slums upgrading through the Lagos Metropolitan Development and Governance Project
- **The Lagos State water supply masterplan (2010-2020)**
- **The 5 Year Strategic Investment Plan for Sewage in Lagos State. (2010-2015)**

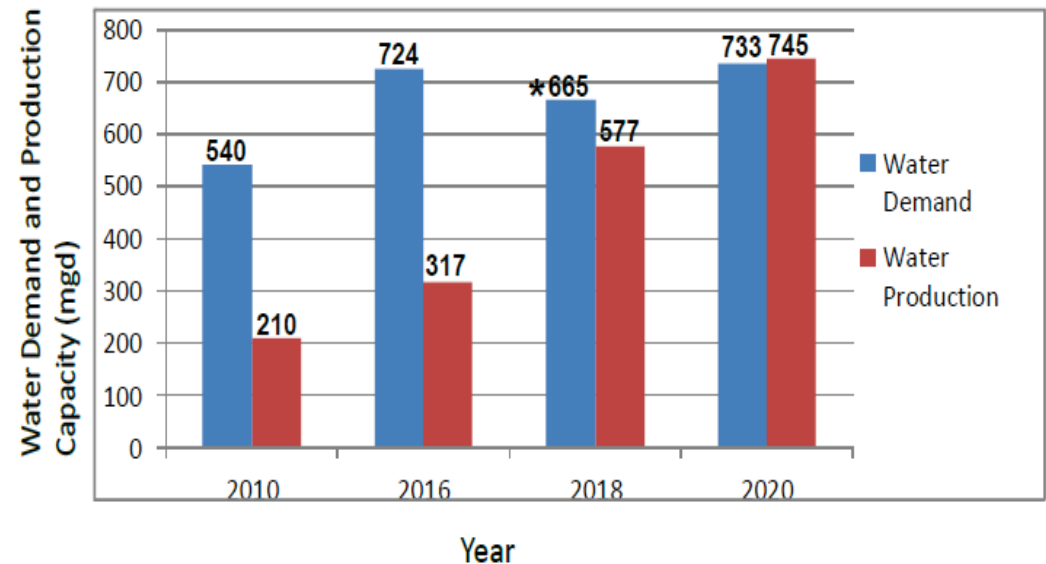


Existing plans...

Lagos State Water Supply Master Plan 2010 - 2020

- Aims

1. Increase access to potable water
2. Reduce waste and un-accounted for water
3. Increase amount of billed water and increase collection efficiency
4. Enhance re-investment



* Water demand per capita is expected to **decrease** in the medium – long term

Total cost = **USD 2,485.95 million**

To be funded through **Public – Private Partnerships**

Recent revision of the original master plan: Short and medium term phase extended; **total cost increased, total production capacity decreased and distribution networks planned increased.**

Existing plans...

Lagos State Water Supply Master Plan 2010 - 2020

Short 2010 – 2016

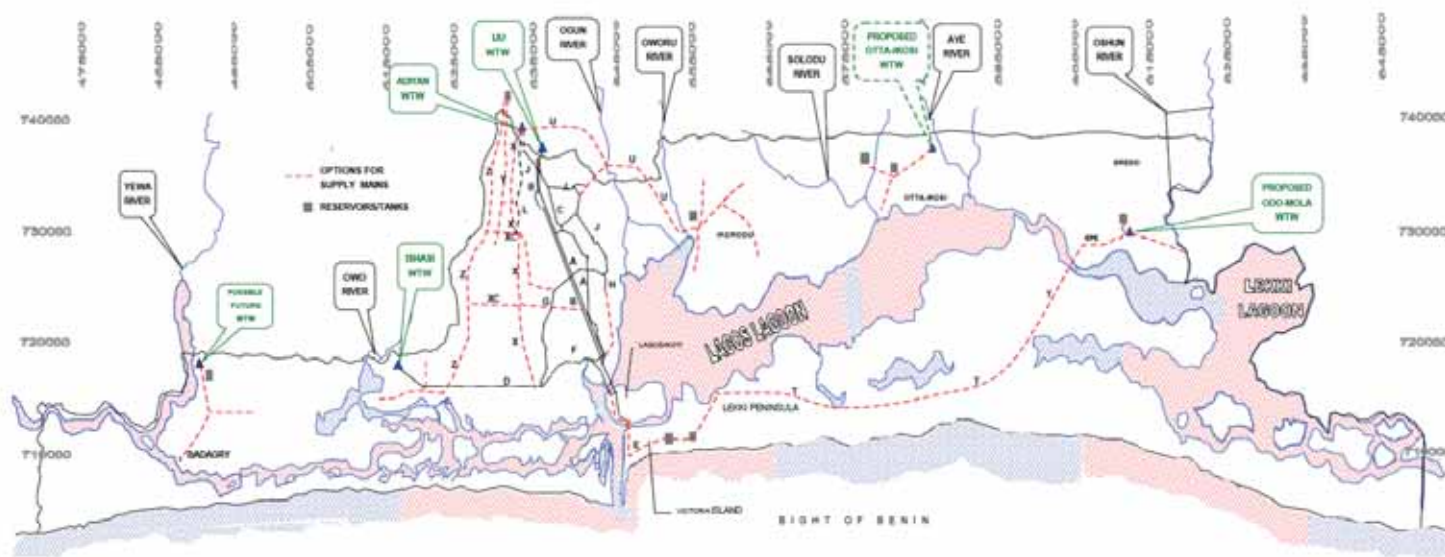
- Capacity ↑ to **317** mgd
- Upgrade **Ishasi** waterworks to 8 mgd
- New waterworks at **Ota-Ikosi** and **Odomola**
- Development of trunk and distribution networks for **Adiyan** major waterworks

Medium 2017 - 2018

- Capacity ↑ to **577** mgd
- New **desalination** plants: **Ibeshe & Yewa**
- Development of **Adiyan** and **Odomola** distribution network

Long 2019 - 2020

- Capacity ↑ to **745** mgd
- Development of **Ota-Ikosi**, **Adiyan** and **Odomola** distribution network



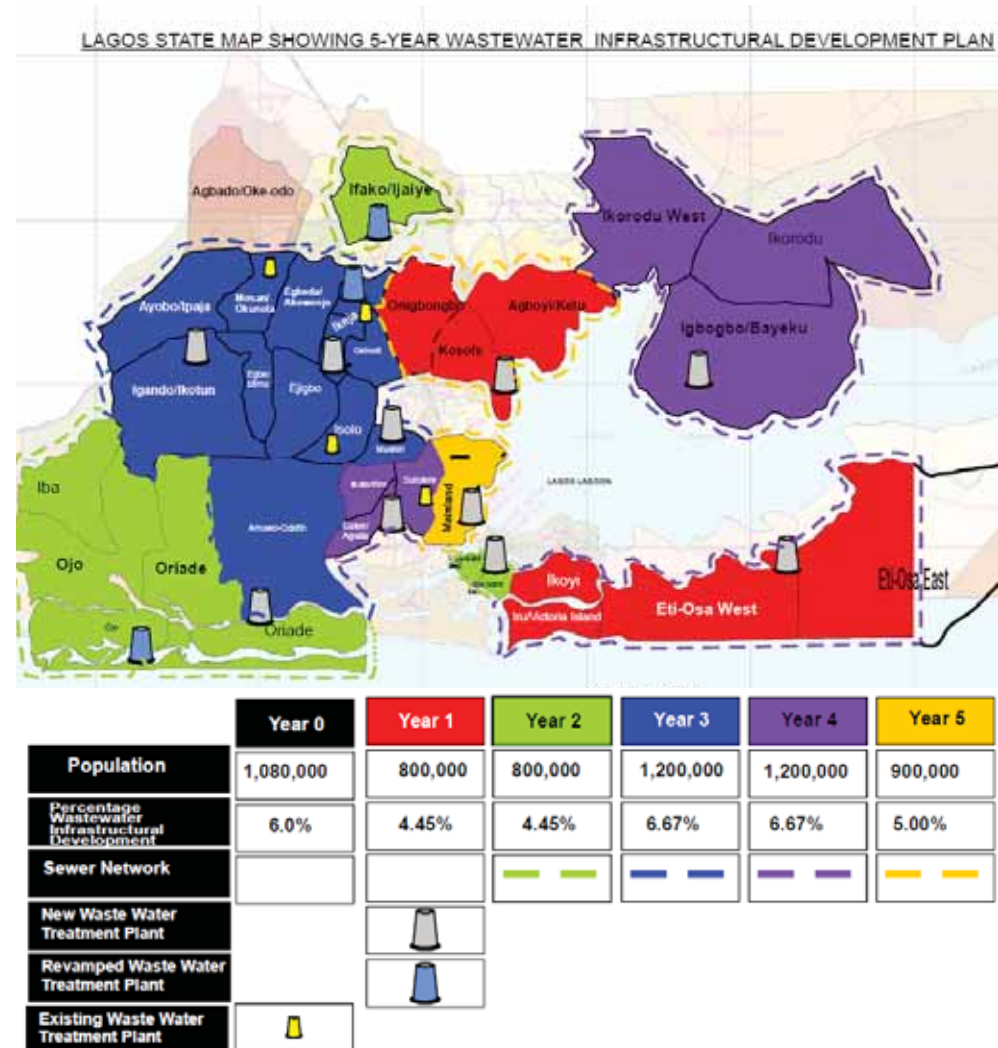
SKETCH MAP OF LAGOS STATE - SHOWING EXISTING TRUNK MAINS AND WATER TREATMENT WORKS AND FUTURE OPTIONS

Existing plans...

Sustainable Sewage and Sanitation Strategy (SSSS) & 5-year Strategic Investment Plan for Sewage in Lagos State

- Aims

1. Develop **10 new** wastewater treatment plants (WWTP)
2. Renovate **3** of the 17 **existing** WWTP: Oke-Afa, Abesan and Iponri
3. Lay **5,250** km of sewers
4. Create a **Sewage Master Plan** for Lagos State
5. Increase wastewater treatment coverage from **6%** to **34%** of the population by **2015**



Total cost = NGN 76 billion

55% **State** funded
45% **Private** equity

Existing plans...

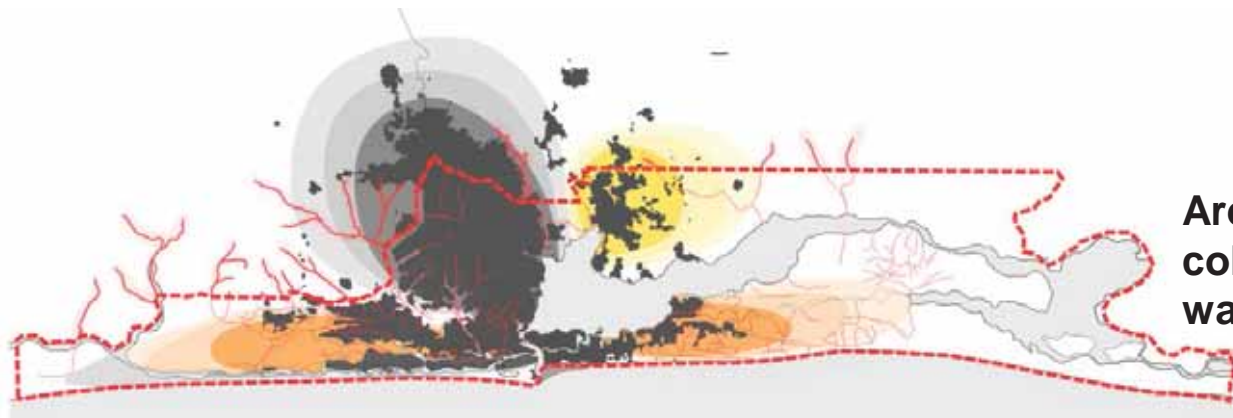
Sustainable Sewage and Sanitation Strategy (SSSS) & 5-year Strategic Investment Plan for Sewage in Lagos State

- Provision of packaged WWTP for **private** utilisation
- Reuse of sludge: A “**Sludge Village**” will be established, where by-products from sewage treatment plants can be prepared for use as fertilizer or for energy creation.
- The establishment of a **legal framework** to enforce all regulations related to sewage activities.
- Make sewage sector a **net contributor** to Lagos State Government revenue, through efficient tariff collection systems and regular tariff adjustments.
- LASG will ensure that all permanent displacements caused by sewage related activities are **adequately compensated** and that there will be a **clear public information** programs sewage activities
- Two types of system: **centralized** for large populations <100,000 and emerging communities, **decentralized** for a smaller populations <100,000 and existing settlements

Possible ways forward...

Suggested guiding principles:

- Long-term vision
- Integrate projections for population growth and climate change
- Secure the city's water supply, by protecting its fresh water resources
- Reach future peri-urban communities
- Linked to existing infrastructures
- Integrate wider infrastructure plans, such as road construction or flood protection
- Encourages cooperation between state and municipal departments

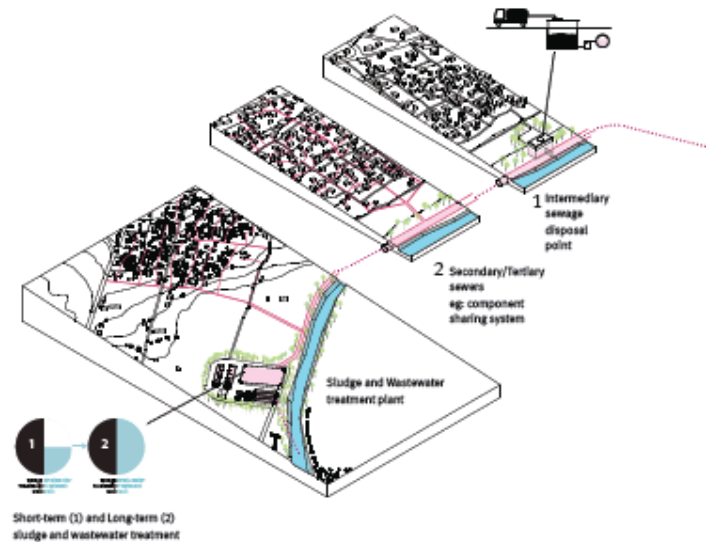


Areas of growth. Need for inter-state collaboration in planning integrated water and sanitation services

Possible ways forward...

Suggested guiding principles:

- Maximise the use of gravity: natural topography & hydraulic systems
- Maximise economies of scale but phased implementation & preserves communities
 - Long-term, large-scale infrastructure
 - Development of off-site wastewater treatment facilities
 - Integrate intermediary solutions for city-wide faecal sludge disposal & treatment
 - Sewage infrastructure adapted to context e.g. floating slums – Makoko,
- Sustainable planning & layout of WSS infrastructure is dependent on effects of climate change – particularly in Lagos.



Sewage proposal—integrating sludge management



OPTION 01: personal septic tank
once full the tank is pumped into a waste barge that removes the waste and takes it to a treatment plant off-site.



OPTION 01: personal septic tank
All human waste is disposed of into a new septic tank located under the home.



OPTION 02: communal WC block
With the cooperation of the residents a new communal WC block is built to provide sanitation for a localised area.



OPTION 03: pipe system
A pipe system is located under a series of homes which removes the waste to a treatment plant.

Sanitation proposal for floating slums

The Lagos proposition...

Opportunities for PPP in water, wastewater & sanitation

In order to encourage the private sector to investment & provide necessary technical & managerial expertise, the following actions have been taken:

- Water Sector Reform which led to the 2004 Lagos Water Sector Law
- The PPP Office established in December, 2008
- Lagos State Public-Private Partnership Bill was signed into Law in June 2011
- The PPP Office was established to:
 - ✓ acts as a liaison between the Organised Private Sector and government Ministries, Departments and Agencies (MDA's)
 - ✓ act as a 'one-stop shop' to bring prospective private investors in contact with legal and regulatory framework
 - ✓ accelerate the development of infrastructure
 - ✓ ensure that the State Government enters into a meaningful partnership with private investors across a range of Sectors
 - ✓ ensure efficient project implementation
- The PPP initiative has led to the provision of power through the Akute Independent Power Project – 12.15 MW – for key stakeholders, including the Lagos State Water Corporation is first.

The Lagos proposition...

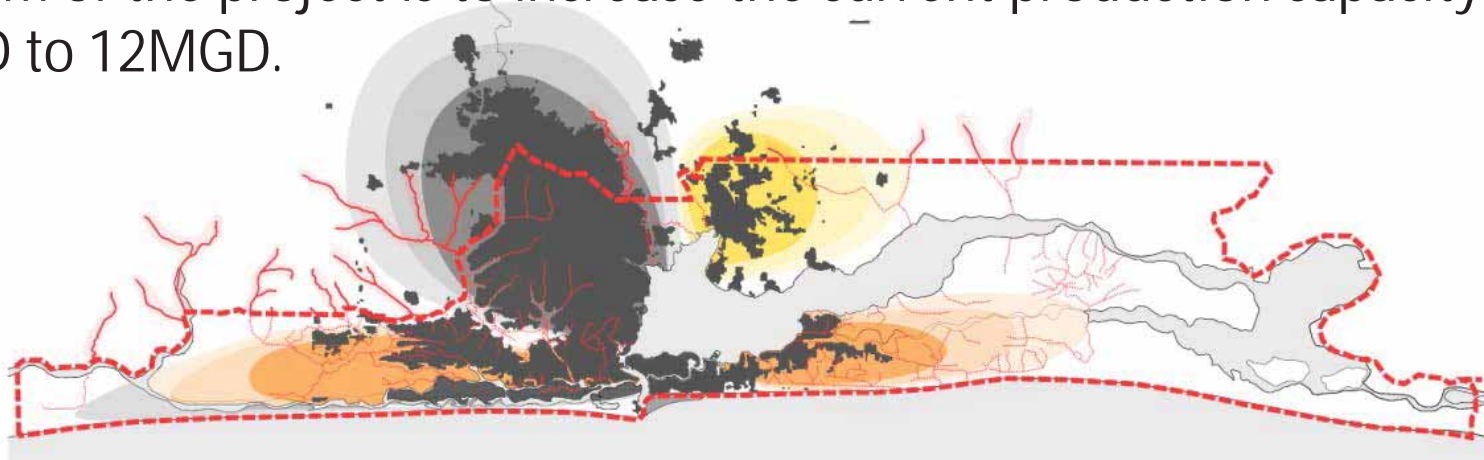
Opportunities for PPP in water supply

Odomola Water Plant

- The development of a 210 MGD water supply scheme
- To be implemented in 3 phases of 70 MDG at each stage
- To provide potable water for the residents in the eastern axis of Epe and Lekki

Ishashi Water Treatment Plant

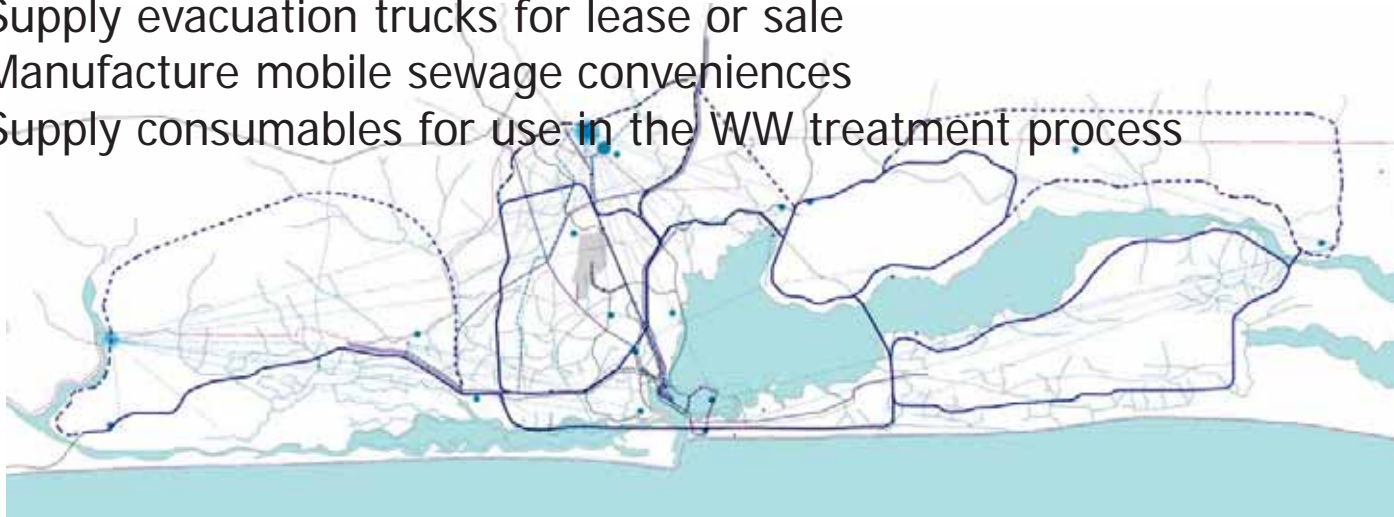
- Plans are underway for the construction of a water treatment plant (intake and head works) with associated transmission mains at western axis of Ishashi in Badagry Local Government area
- The aim of the project is to increase the current production capacity from 4MGD to 12MGD.



The Lagos proposition...

Opportunities for PPP in wastewater & sanitation

- Urgent need for investments in sewage collection, treatment and disposal infrastructure
- The State government plan to invest NGN76 billion over the next 5-year period - 55% of the required funding
- 45% is expected from private equity in co-investing in the WW sector / infrastructure:
 - ✓ The construction of 10 new WWTPs
 - ✓ The rehabilitation of 3 existing plants
 - ✓ The laying of a total of 5,250km in length of sewer networks
- Other opportunities include complimentary investment and services e.g.:
 - ✓ Provision of packaged WWTPs for private development
 - ✓ Independent power generation (IPP) of energy and electricity from WW sludge
 - ✓ Production of fertilizer
- In addition, private service providers are required to:
 - ✓ Supply evacuation trucks for lease or sale
 - ✓ Manufacture mobile sewage conveniences
 - ✓ Supply consumables for use in the WW treatment process



**WaterAid proposal
for loop mains to
strengthen the
waste-water &
sewerage treatment**

Video: <http://www.youtube.com/watch?v=gDKFxRqj3g0>

Thank you
Questions and discussion

