Impact of Sea Level Rise in Lagos

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Outline

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- Images of Flooding in Lagos

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This is Lagos!

Lagos is the economic capital of Nigeria, a major economic hub of West Africa, and one of the fastest growing cities in the world.

Landmass is 3,577sqkm: <0.4% of the total land mass area in Nigeria but is home to >12% of the population of Nigeria i.e. ~26 million people

It is a coastal State with a 180km shoreline and an average elevation of 2m above sea level. Over 40% of its land area is covered by water bodies and wetlands, with Lagoons and Creeks accounting for ~22% of these.

With a GDP of ~$85billion, Lagos State on its own ranks as the 7th largest economy in Africa and generates >20% of Nigeria's GDP

The State's rapid growth has resulted in urban sprawls, reclamation of wetlands and other natural areas for settlements resulting in severe stress on the city's infrastructure, basic service provision and growing greenhouse gas (GHG) emissions.

More than half of Lagos' residents live in slums/informal settlements, which render them highly vulnerable to the impacts of climate change – flooding, sea level rise and extreme heat. Past flooding events have led to displacement of thousands and loss of lives and property.

Notable Places in Lagos

Climate Impact Drivers (CID)

Sea Level Rise (SLR)

- Permanent Coastal and lagoon flooding due to SLR
- Coastal erosion

Extreme Heat

- Heatwaves
- Urban heat island effect
- Pollution
- Fires

Extreme Rainfall

- Inland flooding
- River flooding
- Flash flooding
- Erosion (sheet, gully)

Flooding In Lagos

Lagos' Vulnerability to Flooding

Some of the factors responsible for the city's vulnerability to flooding, in addition, to the CIDs include:

- Low-lying nature
- High water table
- Inadequate drainage infrastructure
- Shoreline modification leading to increasing head loss for discharge into the Lagoon.
- Uncontrolled reclamation of wetlands and natural flood buffers.
- Ineffective solid waste management system and improper management practices by residents

Cost of Inaction| ~$27-34bn at stake due to the impacts of Sea Level Rise and Extreme temperature by 2050

Physical

Inundated area

165 km² — Across 14 out of 20 Local Govt Areas

Natural ecosystems

82% — Of wetlands affected with potential loss in biodiversity & ecosystem services

0.7m — Loss of water height in waterbodies due to evaporation leading to a loss of natural cooling systems

Social

Vulnerable population

>1.4M — People affected across LGAs including >350k women

+53k — Additional people under the poverty line

Social infrastructure

>400 — Health centers disrupted

>500 — Education centers inundated

Health

+20k — Heat-related death of which 30% are children

5% — increase in food import dependency due to loss of local yield crops

Economic

Damage to infrastructures

$5bn — Incl. severe disruptions to critical systems already under stress due to rapid urbanization
- 11% of the transport network
- 12% of the power grid
- 13% of communication network

Cost of relocation

$6bn — Relocation of +700k people living in permanently flooded areas

Annual GDP loss

$17bn — GDP loss from disruption of economic activities in inundated regions

$5bn — GDP loss from 44 additional unproductive days and yield loss due to extreme temperature
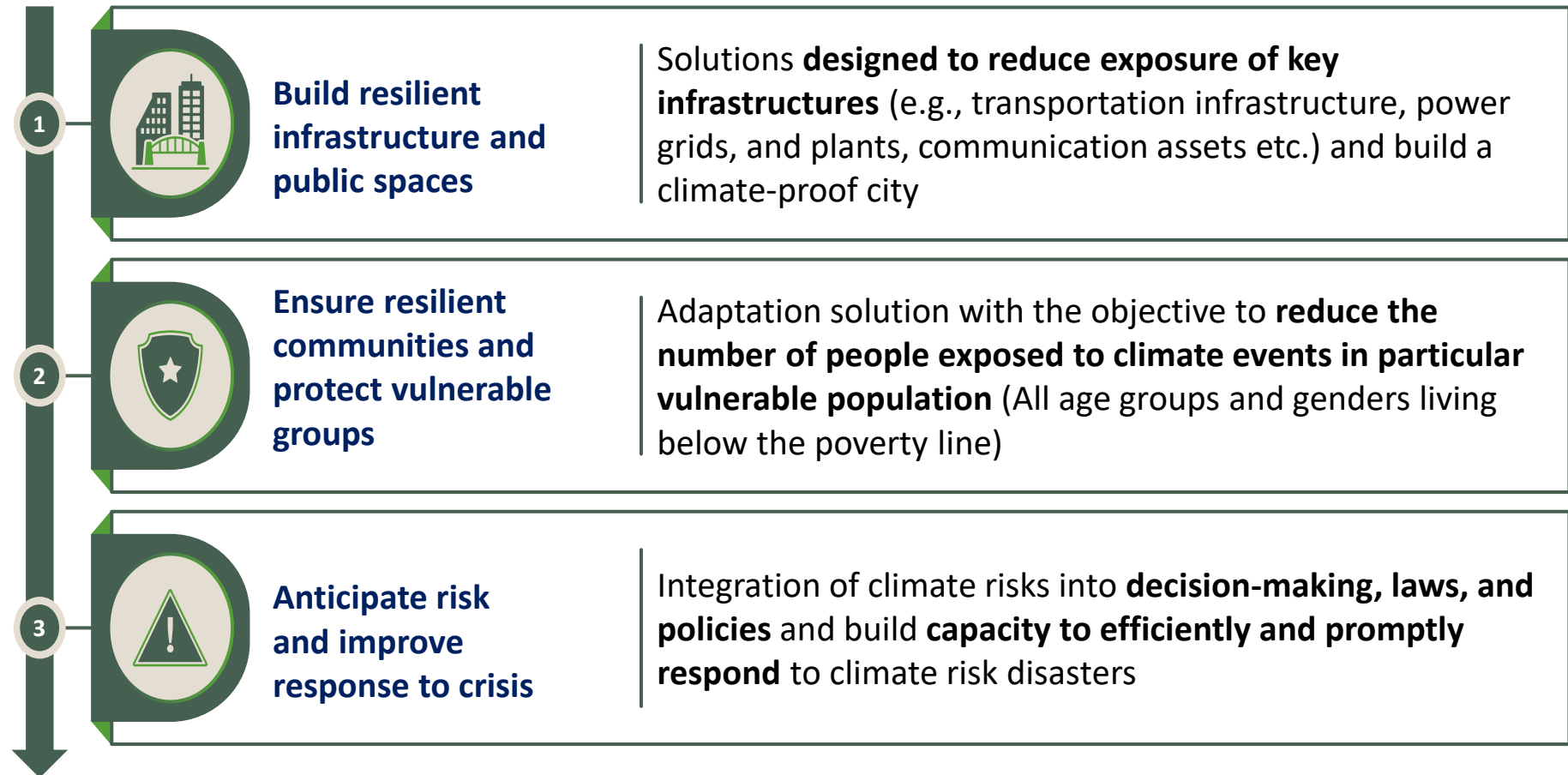
$27-34 bn
Cost of climate inaction

>12x

Lagos State 2021 annual budget[6]

Interventions

Three categories of interventions identified to put Lagos on the pathway to resilience

1 — Build resilient infrastructure and public spaces

Solutions **designed to reduce exposure of key infrastructures** (e.g., transportation infrastructure, power grids, and plants, communication assets etc.) and build a climate-proof city

2 — Ensure resilient communities and protect vulnerable groups

Adaptation solution with the objective to **reduce the number of people exposed to climate events in particular vulnerable population** (All age groups and genders living below the poverty line)

3 — Anticipate risk and improve response to crisis

Integration of climate risks into **decision-making, laws, and policies** and build **capacity to efficiently and promptly respond** to climate risk disasters

Challenges

- Inadequate finance as >$8bn investments required for the actions outlined in the State's Climate Action and Resilience Plan.
- Identification of appropriate location specific interventions in line with best practices
- Inadequate technical capacity to implement some initiatives at scale.
- Poor data management

Some of the Interventions

Build resilient infrastructure and public spaces

- Reinforcement of existing 18km of coastal embankment and building additional 10km of sea wall
- Construction of additional primary drainage channels
- Construction of new & rehabilitation of existing secondary drains
- Construction and rehabilitation of critical transport links i.e., inner-city roads that will be inundated.
- Construction and rehabilitation of inland waterways transport infrastructure including jetties and docks

Ensure resilient communities and protect vulnerable groups

- Retrofitting or relocation of ~350 public health facilities with flood protection systems
- Upgrading of facilities and equipment across these centres.
- Relocation of vulnerable populations in the exposed LGAs and enrol them in empowerment programs
- Rehabilitation and maintenance of existing urban parks (heat reduction, carbon capture, improve air quality)
- Provision of flood insurance to vulnerable households
- Planting of 50,000 trees annually

Anticipate risk and improve response to crisis

- Establishment of flood warning observation systems equipped to collect, interpret & forecast weather events and alert residents in vulnerable LGAs
- Implementation of surveillance systems for existing and new disease risks

Thank you