Rising Waters: An Assessment of Communities' Vulnerabilities to Flooding in Lagos

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Outline

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Background

1,256 km²
Built-up area in 2020, up from 496 km² in 1990

−69%
Wetlands lost between 1986 and 2020

2.6-3.5%
Annual city built up rate

₦1.5 trn
Nigeria's flood losses in 2022

Sources: Koko et al. (2021), World Bank (2023)

Hundreds of thousands of people have been displaced since 2020

Significance

Physical setting
Low-lying coastal city exposed to pluvial, fluvial and coastal flooding.

Human drivers
Blocked or missing drains, reclamation, building on waterways and weak enforcement of planning rules.

Unequal burden
Poor settlements, women and older people suffer most. Poor disaster response

Development goals
Floods slow progress on SDGs 1, 2, 3, 6, 11 and 13.

Main Concepts

Impacts/Risk

The potential loss or damage caused by an interaction between a hazard, physical exposure, and human vulnerability, all tempered by coping capacity

Impacts=Exposure,Vulnerability ,Coping capacity

Drivers of vulnerability

The conditions determined by physical, social, economic, and environmental factors or processes that increase the susceptibility of individuals, communities, assets, or systems to the impacts of hazards

Indigenous knowledge

The understandings, skills, philosophies, and practices developed by societies through long-term, direct interaction with their natural surroundings

-It is fading, undocumented and little studied in Lagos.

Source: UNDRR (2015). The Sendai Framework

Purpose and Research Objectives

To assess the nature and drivers of flood vulnerability among coastal communities in Lagos State, and to examine the role of indigenous knowledge systems in flood management.

OBJECTIVES

1

To assess the impact of flooding on coastal communities in Lagos.

2

To assess the drivers of flood vulnerability among coastal communities in Lagos.

3

To examine the role of indigenous knowledge systems in managing floods in the face of climate change.

Conceptual Framework

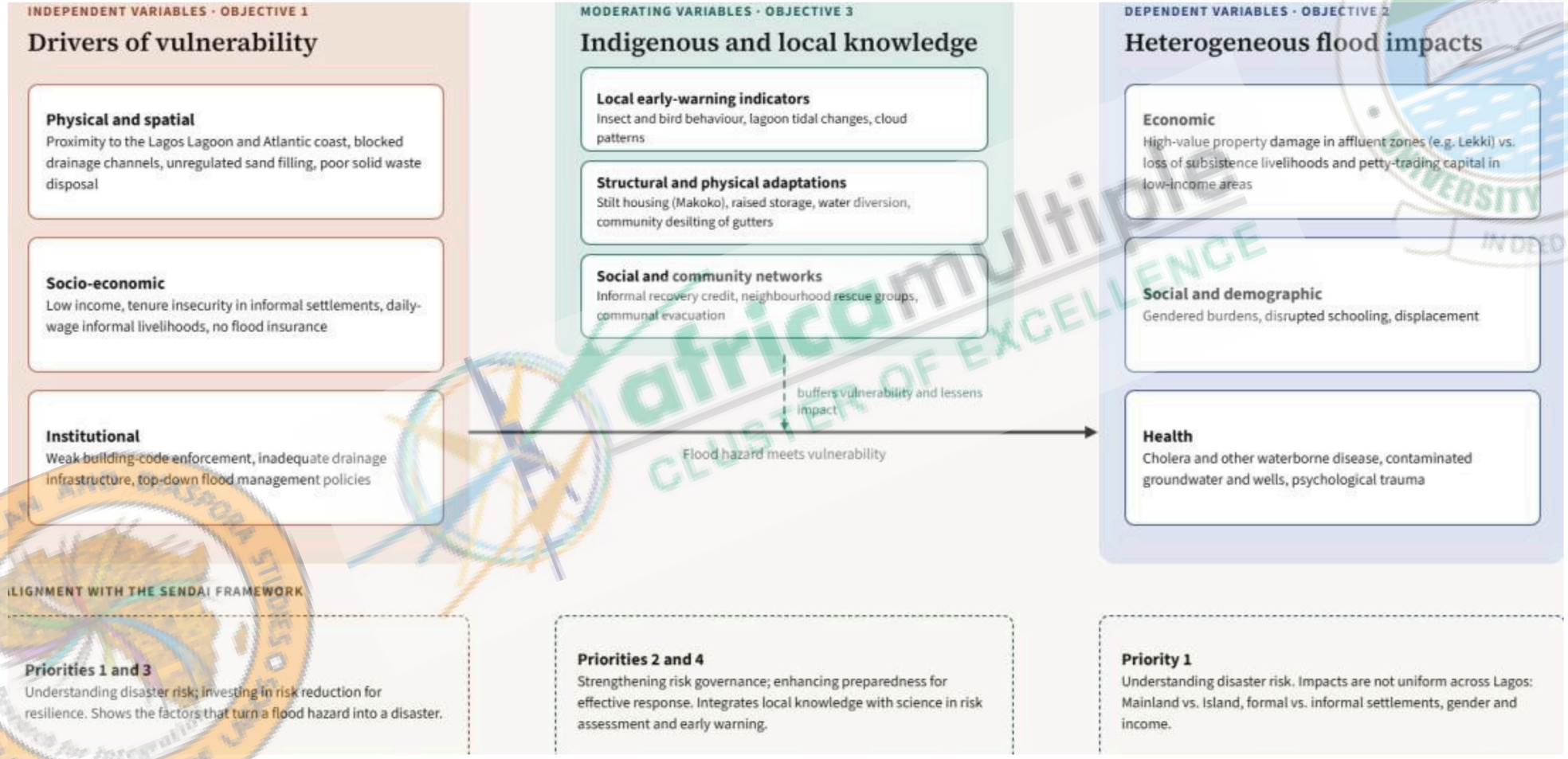


Figure 1: Conceptual framework linking drivers, indigenous knowledge and impacts, R'*a*ˢᴵᴺ*li*ᵍ*g*W*n*ᵃᵗ*e*ᵉʳ*d*ˢ ᴵᴺ*w*L*a**i*ᵍ*t*ᵒˢ*h the Sendai Framework*

Methodology: design and sites

Exploratory sequential mixed methods

Interviews came first and, with the literature, shaped the questionnaire. Interviews, survey and field observation were then integrated.

Three sites, chosen purposively

Isheri
Fluvial flooding

Lekki
Pluvial flooding

Makoko
Pluvial flooding

Methodology: samples and analysis

30

In-depth interviews with leaders, elders, young people and fishers

387

Questionnaires distributed in the survey

18+

Adults living in flood-prone areas for at least three years

Instrument

Built on the Sendai Framework: flood depth and frequency, access to services, direct impacts, early warning, relief.

Analysis

-Thematic analysis
-Frequencies and correlation

Impacts

Floods varied in depth and in how long they lasted

> *"2026 is more than the previous year. The flood was as high as my neck; you can see the signs on the wall here. It was so traumatic for all of us."*
>
> Respondent 5, Lekki



These differences directly shaped the type of impact experienced and the coping strategies adopted.

Social Impacts

Women carry extra labour: Increased workload when drying belongings, cleaning mud, protecting property and minding children.

Displacement: Temporary and permanent. Loss of documents, Deprivation of privacy and spatial exclusion

Children rights. Schools close for weeks: miss lessons, tests. Deprivation of play

Loss of dignity: Overflowing toilets, stagnant water and odour bring stigma, dependence for food

Insecurity: Evacuated homes are broken into.

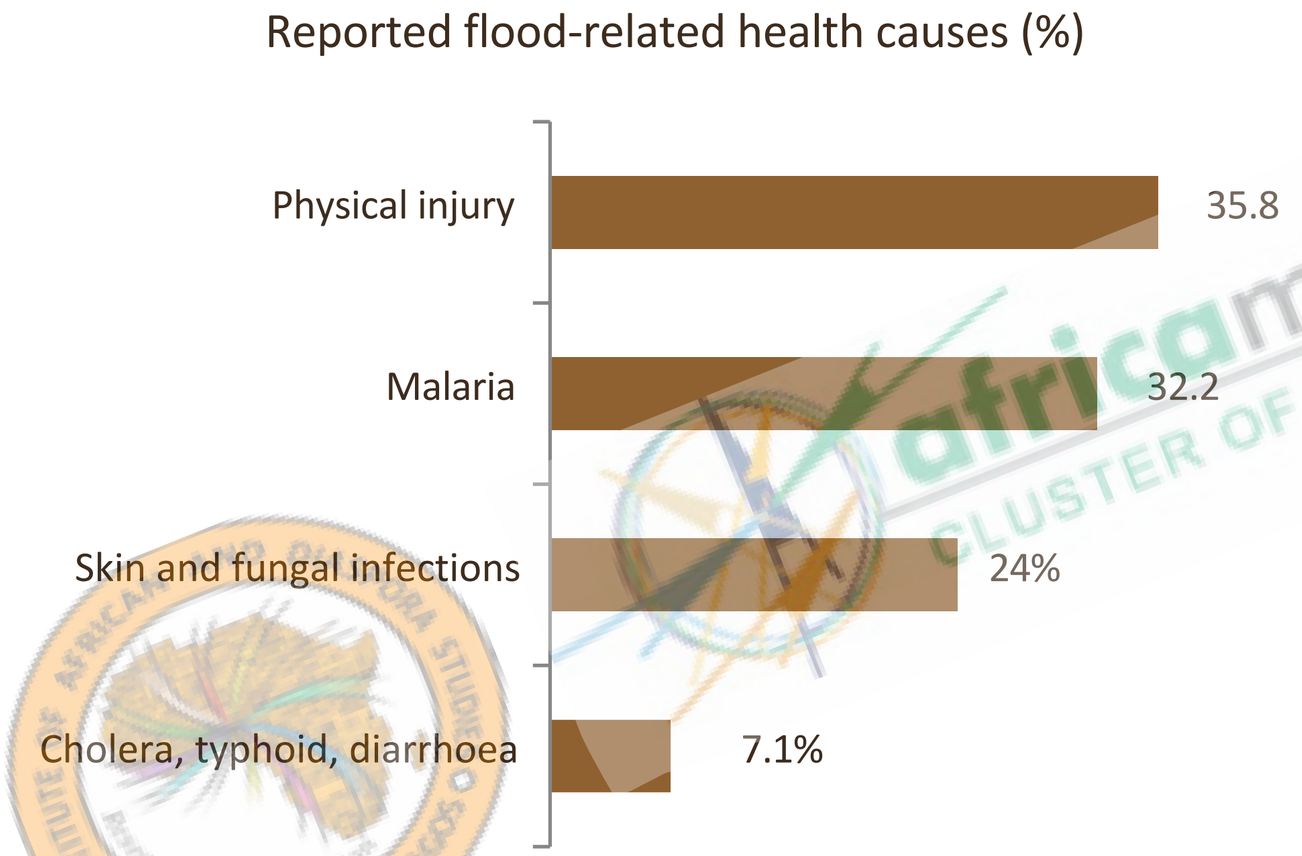
Economic Impacts

71.5%

of survey respondents reported economic losses. Fishers, traders, workers, day labourers and farmers are all hit.

- Poverty- Savings are used up, Livelihoods disrupted
- Costs spike: canoe fares of about ₦6,000, bus fares up to three times normal, temporary rent, storage.
- Cost of rebuilding and repairing
- Repeated loss of appliances
- High costs of pumps and retrofitted drains -are affordable only to better-off households.
- Properties are abandoned and landlords lose rent.

Health Impacts



- Leeches " mujemuje" , snakes, "Jomijomi" leg sores, acidic water and child drownings.
- Some leg wounds ‘take upto six months to heal,lack of proper treatment
- Movement is curtailed during floods, no clinic in Makoko.
- Respiratory issues, especially chest problem. Local remedy is hot water
- Trauma and anxiety persist after the water recedes.
- May cause serious injuries and death

Vulnerability Levels

Most respondents feel highly vulnerable

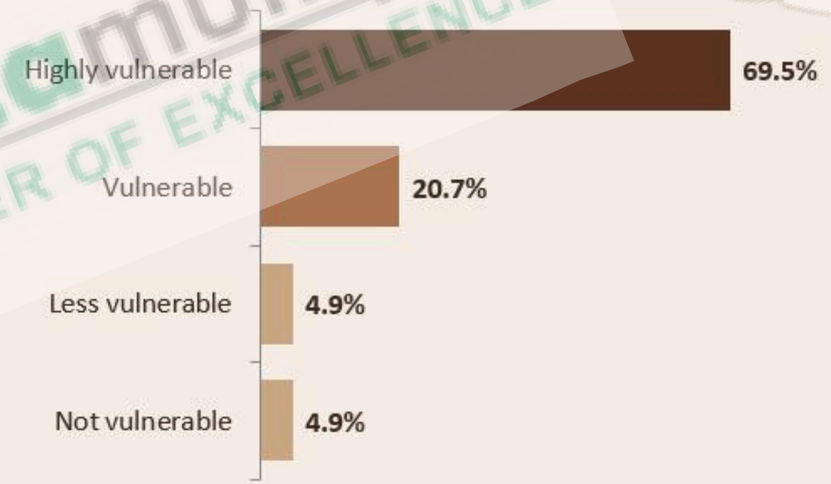
THE QUESTIONNAIRE WAS GUIDED BY A MATRIX OF THREE DIMENSIONS

1. **Proximity of services**
   Access to potable water, educational institutions and healthcare facilities

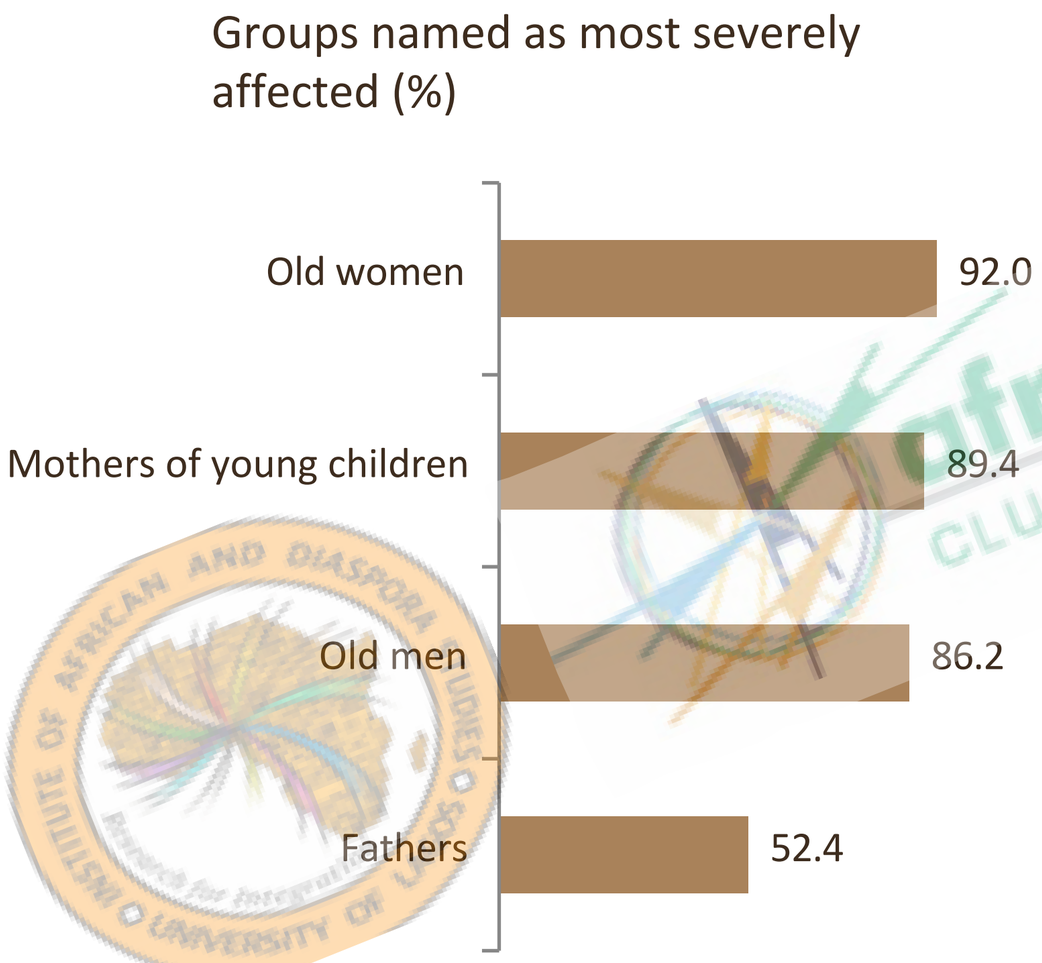
2. **Direct flood impacts**
   Displacement, morbidity, livelihood disruption, agricultural losses, and destruction of property and vital documentation

3. **Institutional support**
   Accessibility and reliability of early warning systems and emergency relief services

69.5% of respondents feel highly vulnerable to flood risks



Social Drivers



- Caregiving burden/dependency. Gender, single mothers
- Filial duty can keep adult children in flood zones.
- Fatalistic attitude is widespread in Makoko.
- Religious beliefs- Reliance on prayer alone left one church unprotected.
- Lack of medication pushes people to risky remedies such as kerosene on wounds.
- Social solidarity drives rescues, exposes youth to risks
- Attachment to home, hood and livelihood stops people relocating.
- No PLWD

Economic Drivers

r = 0.546
Income and vulnerability

r = 0.365
Housing type and vulnerability

r= 0.434
Access to reliable alerts and vulnerability

Poverty –forces people to precarious locations
Income- dependence on one livelihood, one spouse, house types

House owners can raise or retrofit homes, tenants cannot.
Permanent houses are safer than structures in IS water-dependent livelihoods such as fish mongers suffer most.

Physical and Environmental Drivers



Figure 2: Clogged drainage in Lekki (left) and garbage dumped along the highway in Isheri (right). Source: Researcher.

- Homes sit on filled, very low land. Makoko floods last two to three months.
- Raising roads and floors helps.
- Drains are inadequate and blocked by waste, and dumped waste washes back. (92.9% unsatisfied with drainage management)
- 64.1% happy with waste management
- Canals are neglected, used for other purposes
- Wall-to-wall paving affects infiltration and causes flash floods.

Institutional Inadequacies

- **Poor development control**
- Illegal building on waterways
- Reclamation in Lekki
- Over 42 poorly planned estates in Isheri
- **Insufficient feasibility studies/poor coordination**
- The Lagos–Calabar road blocking drainage
- A badly designed canal that does not drain and dried up a fishery

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- **Lack of community engagement**

Institutional Inadequacies

Flood alerts and response

15.8%
received government alerts. Only 5.5% of respondents found the alerts timely and reliable

94%
say timely alerts would reduce impacts

95.9%
can predict seasonal floods, but not accurately

5.2%
Affirmed existence of government support during floods

60.%
did not know if relief exists

94.2%
did not know of a helpline 112, 767, **LASEMA Direct Lines:** 08060907333 or 08060907000

Indigenous knowledge

Local remedies

Salt on leeches. Hot water for respiratory issues. Salt, paraffin, lime for feet

Traditional medicine

Moringa and other herbs for malaria, chest pain

Fishing

-Identify rich fishing zones
-Fishing techniques
-Fish preservation to cushion households in time of low yields

Indigenous Flood Prediction

-Seer-
-Fishermen

Indigenous communication mechanisms

-Town crier
-Fishers groups

Benefits: -Low cost, effective
Challenge: -Indigenous knowledge is fading away.
-Urbanization, disrupts traditional systems
-Lack of intergenerational knowledge transfer

Summary

Impacts are unequal

Floods cause multi dimensional exclusion. Impacts are more severe to the poor.

Vulnerability is built

Poverty, tenancy, caregiving duties and fatalism meet low land, blocked drains and weak control.

Reliable warning is the weak link

Only 5.5% received reliable government alerts. Isheri shows what works: alerts relayed by traditional rulers and modern methods.

Indigenous knowledge fills gaps

Herbs and forecasting reduce risk, but are fading and sometimes harmful.

Conclusion…Not on track

Efforts need to be doubled by individuals and government to deal with disaster risk better.

Recommendations

Four stages of flood management

What individuals and government can each do before, during and after a flood



Paved compound (left) and grassed verge beside a pavement (right)

1 Mitigation

Prevent or reduce floods

INDIVIDUALS

- Green infrastructure and low-impact development
- Property modifications

GOVERNMENT

- Levees, dams, floodwalls, diversion canals
- Zoning and building codes; no housing in high-risk floodplains
- Slum upgrading, e.g. through LASURA

2 Preparedness

Ready before the rains

INDIVIDUALS

- Clear gutters, drains and waste
- Follow forecasts; sign up for SMS alerts

GOVERNMENT

- Accurate, reliable flood alerts
- Community dredging and canal cleaning
- Designated emergency shelters

3 Response

Protect lives during floods

INDIVIDUALS

- Evacuate safely

GOVERNMENT

- Search and rescue with adequate resources and personnel

4 Recovery

Restore and rebuild stronger

INDIVIDUALS

- Safe clean-up
- Flood insurance
- Medical care if exposed to stagnant water

GOVERNMENT

- Damage assessment
- Financial and grant aid
- Psychosocial support

Asante

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africamultiple
CLUSTER OF EXCELLENCE