

Assessment of Household Perceptions of Multiple Environmental Hazards and Risks in Lagos, Nigeria

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BACKGROUND

Lagos, Nigeria's commercial hub, is one of Africa's largest and fastest-growing urban agglomerations, with about 27 million people and over 10% of the national population. It is projected to exceed 80 million by 2100, becoming one of the world's largest megacities. Rapid growth has outpaced infrastructure, planning, and regulation, intensifying hazards such as flooding, building collapse, and urban fires.

In Lagos, risk exposure is uneven across neighbourhoods, reflecting disparities in density, socio-economic conditions, and infrastructure. Across the city, flood occurrences increased fivefold since 2000, causing the highest casualties and about US\$4 billion in annual losses. Between 2000 and 2021, Lagos recorded 167 building collapses affecting over 6,000 households resulting in estimated losses of US\$2.1 billion. Additionally, about 2,400 fires were recorded (2008–2025), with annual incidents exceeding 1,500.

OBJECTIVE

Applying the Social Psychometric Model and the Social Cognitive Theory, this study assesses household awareness of multiple environmental hazards, perceived risk severity, and socioeconomic drivers across residential density strata in Lagos.

RESEARCH QUESTIONS

- ▶ **Q1:** How does household awareness of multiple environmental hazards vary across residential density strata in Lagos?
- ▶ **Q2:** How does perceived risk severity differ across residential density strata?
- ▶ **Q3:** Which socioeconomic attributes significantly influence hazard and risk perception at the household level?

METHODS

- ▶ **Design:** Cross-sectional household survey across residential density strata in Lagos.
- ▶ **Sample:** Multi-stage (systematic + stratified); Sample size N = 544.
- ▶ **Instrument:** 5-point Likert scale measuring hazard awareness and perceived risk severity
- ▶ **Analysis:** Composite indices (HKI, RSI) → PCA → stepwise regression → ANOVA/Chi-square

CONCEPTUAL FRAMEWORK

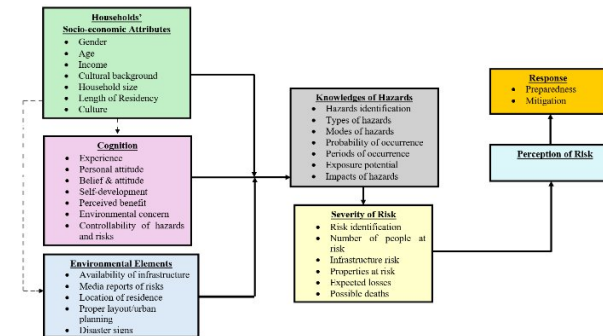


Fig 1: Determinants of Household Risk Perception

Household's perception of environmental hazards begins with awareness of threats in their environment, shaped by socioeconomic factors (age, gender, income), cognitive elements (knowledge, experience, attitudes), and physical conditions (infrastructure, media exposure, neighbourhood characteristics). These factors influence understanding of hazard types, occurrence patterns, probabilities, and exposure levels, forming the basis for risk evaluation. Households assess severity in terms of potential impacts on lives, infrastructure, and assets. This perception ultimately informs their preparedness and mitigation responses to environmental hazards.

Prevalent Hazards Examined: flood; erosion; urban fire; urban heat; structural collapse; pipeline explosion; smoke from generator; domestic gas explosions

KEY DESCRIPTIVE FINDINGS

- ▶ **Hazard Knowledge:** rises from low- to high-density areas (3.63–3.89), reflecting the impact of repeated hazard exposure on residents' knowledge.
- ▶ **Perceived Risk:** Perceived risk severity rises with residential density (3.88–4.00), indicating that residents in denser areas perceive greater risk due to higher exposure and more severe potential impacts.
- ▶ **Principal Component Analysis:** Overall variance = 63.4% — knowledge of hazard (27.8%); severity of risk (20.4%), socioeconomic attributes (15.1%).

DISCUSSION

Across the three residential density areas in Lagos, risk perception varies systematically: hazard knowledge increases from 3.63 (low density) to 3.66 (medium) and 3.89 (high), while perceived risk severity rises from 3.88 to 3.97 and 4.00, with flooding as the most prominent hazard.

PCA identifies hazard knowledge, perceived severity, and socioeconomic attributes as key drivers, with regression results showing that these jointly shape risk perception, and socioeconomic factors exerting the strongest influence (≈50%).

POLICY IMPLICATIONS

- ▶ Adopt density-sensitive interventions, prioritizing high-density areas for risk reduction and preparedness.
- ▶ Prioritize integrated flood risk management (drainage, land-use, early warning)
- ▶ Implement segmented risk communication strategies that reflect differences in awareness, vulnerability, and capacity across social groups.
- ▶ Incorporate household-level perception data into urban planning and DRM policies to improve the effectiveness, acceptance, and behavioural uptake of interventions.

CONCLUSION

Environmental risk perception in Lagos is context-dependent and strongly shaped by residential density and socioeconomic conditions, underscoring the need for people-centred, density-sensitive urban risk governance.

LIMITATIONS & FUTURE WORK

- ▶ Cross-sectional, self-reported, single-metro data limit causal inference and generalisability.