



The Determinants of Stigma Affecting Development in Flood-Prone Areas of Port Harcourt, Nigeria.

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ABSTRACT

The study examined the determinants of stigma affecting development land in flood-prone areas of Port Harcourt, Nigeria. Recurrent flooding has become a major environmental challenge, leading to property devaluation, reduced demand, and declining investor confidence in affected zones. The study sought to identify and analyze the key environmental, social, economic, and institutional factors contributing to this stigma and propose strategies for sustainable urban development. Descriptive survey design, was used to obtained data through questionnaires and interviews administered to 269 respondents. The respondents include real estate developers, landowners, residents, urban planners, and policy makers. Data were analyzed using descriptive statistics such as mean, standard deviation, and the relative importance index (RII) to rank factors influencing stigma. Results revealed that frequent flooding, inadequate drainage infrastructure, perceived risks of property devaluation, weak institutional frameworks, and lack of effective government intervention were the major contributors. Limited access to flood insurance and low public awareness further intensified the stigma, discouraging investment and development. The study concluded that stigma surrounding development in flood-prone areas is multidimensional, driven by both environmental vulnerabilities and socio-institutional failures. It recommended integrated flood management, stronger urban planning enforcement, improved public education, and incentives for flood-resilient projects to restore investor confidence and foster sustainable urban growth in Port Harcourt.

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1.0 INTRODUCTION

Urban land development in flood-prone areas presents a complex set of challenges that extend beyond environmental and technical considerations to include social, psychological, and economic dimensions of stigma (Adelekan, 2019; Olanrewaju, 2020). The perception of risk and vulnerability associated with flood-prone locations often discourages investment, reduces property values, and affects the overall attractiveness of such areas for both residential and commercial development (Ajibade, 2021). This phenomenon, commonly described as flood stigma, is increasingly recognized as a critical barrier to sustainable urban development in flood-affected regions, especially in rapidly urbanizing cities like Port Harcourt, in Nigeria (Nkwunonwo, Whitworth and Baily, 2020).

Flooding in Port Harcourt has been a persistent environmental issue resulting from poor drainage systems, unregulated urban expansion, land reclamation, and inadequate planning control (Ede, 2022). These recurrent floods have contributed to the social labeling of certain neighborhoods as undesirable or high-risk zones, thereby stigmatizing development land and discouraging investment and property transactions (Eke and Nwankwo, 2023). Stigma, in this context, transcends physical damage to include a psychological and economic burden that shapes the perceptions and behaviors of developers, investors, and residents (Ameh, 2021). Consequently, even after physical rehabilitation or infrastructural improvement, flood-prone lands in Port 1-larcourt often continue to suffer reduced market value and limited development prospects.

The determinants of stigma associated with flood-prone land are multifaceted. They include historical experiences of flooding, inadequate government intervention, media amplification of flood events, risk perception, and social attitudes toward flood-vulnerable communities (Adelekan and Fatoki, 2018; Etuonovbe, 2019). Furthermore, the absence of effective risk communication, insurance frameworks, and transparent land information systems exacerbates negative perceptions and weakens investor confidence (Okoli, 2022). In Nigeria, where urban development is heavily influenced by informal land markets and weak enforcement of planning regulations, these stigmatizing factors pose serious implications for equitable and sustainable land use (Olotuah and Bobadoye, 2020).

Port Harcourt, being a major economic hub in the Niger Delta, has experienced significant real estate expansion; however, this growth is unevenly distributed, with flood-prone areas facing marked disinvestment due to persistent stigma (Nwankwo & Dike, 2021). Such stigmatization not only affects private sector investment but also undermines government efforts at urban renewal and resilience-building. Despite the growing attention to urban flooding, empirical research addressing the behavioral and perceptual aspects of flood-related stigma remains

limited within the Nigerian context (Ikecbukwu and Ofori, 2023).

This study, therefore, seeks to investigate the determinants of stigma affecting development in flood-prone areas of Port Harcourt Metropolis. It aims to identify the underlying socioeconomic, environmental, and institutional factors that shape this stigma and analyze their implications for urban development and investment sustainability. By exploring these determinants, the study contributes to the broader discourse on urban resilience, sustainable land management, and the social psychology of environmental risk in flood-affected regions. The findings are expected to provide valuable insights for urban planners, policymakers, and real estate investors in developing more adaptive and inclusive strategies for managing flood-prone lands in Port 1-larcourt and similar coastal cities in Nigeria.

2.0 LITERATURE REVIEW

Flooding is a recurrent hazard in Port Harcourt and the Niger Delta that shapes land use, housing markets, and development decisions. Beyond direct physical damage, repeated floods produce social and market effects: including stigma; that depress demand and reshape investment flows for land and buildings in affected locations. Understanding the determinants of stigma in flood-prone areas is therefore essential for policymakers, planners, valuers, and developers seeking to promote resilient development and to correct market failures that perpetuate under-investment or maladaptive land uses (Suandi et al., 2024).

In real estate scholarship, “stigma” refers to long-lasting negative perceptions attached to a property, site, or neighborhood that reduce desirability and market value even when the direct physical hazard or contamination may have been mitigated (Tachovsky, 2022). Stigma can be temporary (short-term reaction to an event) or persistent (long-term reputational damage) and arises from informational asymmetries, media coverage, institutional responses, and community narratives. Researchers distinguish environmental stigma: negative perception tied to past disasters or contamination; from other stigma types (structural, neighborhood, or phenomenological), but all converge in lowering willingness to pay and willingness to develop land (Tachovsky, 2022).

2.1 Determinants of Stigma in Flood-Prone Land

The literature identifies four interrelated determinant domains that shape stigma formation and persistence in flood-prone areas: (1) physical and environmental factors; (2) socio-economic and market signals; (3) institutional and governance factors; and (4) information, perception, and communication dynamics. Severity, frequency, and visibility of flooding events strongly condition stigma. Sites with repeated, high-impact flooding: especially those that produce visible,

recurring damage to buildings and infrastructure; are more likely to acquire a negative reputation that endures across market cycles (Wizor and Akpamgbo, 2019; Ekenta, 2022). Topography, drainage capacity, and proximity to rivers or tidal channels are biophysical drivers that both increase actual risk and provide observable cues that buyers and investors use to infer future loss (Chiadikobi et al., 2011). Empirical studies in Port Harcourt report that areas with persistent pluvial and flash flooding experience constrained development activity and lower transaction volumes.

Household income, tenure form, and relative affordability of alternatives influence whether stigma translates into reduced development. Lower-income neighborhoods often face compounded stigma because residents have limited capacity to adapt or insulate properties, while higher-income areas may attract faster remediation and reputational recovery. Hedonic and survey studies across Nigerian cities indicate that flood exposure is capitalized into lower prices and reduced buyer interest, but the magnitude depends on local market liquidity and availability of substitutes (Ekenta, 2022; Wizor and Akpamgbo, 2019).

Regulatory enforcement, land use planning, and the capacity of public agencies to provide drainage, early warning, and post-event recovery shape both objective hazard and perceived manageability. Weak enforcement of planning regulations, blocked drainage networks, and delayed public response amplify stigma by signaling systemic vulnerability and poor risk governance (Echendu, 2021; Aniramu et al., 2025). Conversely, visible, credible mitigation projects can moderate stigma by reducing uncertainty and restoring confidence. However, media coverage, word-of-mouth, property professionals' advice, and the extent of publicized loss all affect how quickly and how deeply stigma takes hold. The literature highlights that perception often diverges from measured risk: low awareness of risk or misperception can either amplify or dampen stigma depending on narratives promoted in local media and by influential stakeholders (Elum et al., 2022). Valuation professionals, estate agents, and financiers act as intermediaries who can either transmit stigma through negative appraisals or counteract it through risk disclosure and remediation finance.

The effects of stigma on land development decisions have several market outcomes. Stigma affects land development through multiple channels: decreased demand and lower land prices that reduce developer incentives, increased perceived lending and insurance risk that restricts finance, longer marketing times, and a lock-in of suboptimal land uses. Studies in Port Harcourt show that recurrent flooding discourages formal property development in the most affected corridors and can create spatial segregation, where investment flows away from high-risk neighborhoods (Wizor and Akpamgbo, 2019; Ekenta, 2022). Researchers have used mixed methods: hedonic price models, survey experiments, structured questionnaires, focus groups, and qualitative interviews; to quantify stigma and its drivers. Hedonic models reveal price discounts associated with flood

exposure, while survey instruments capture perceptions, adaptive capacity, and stated willingness to pay for mitigation. Qualitative interviewing of developers and valuers is particularly useful for understanding how professional judgments and media narratives translate into market behavior (Tachovsky, 2022; Suandi et al., 2024).

Although multiple studies document flooding's negative effects on property markets in Nigerian cities (Suandi et al., 2024; Tachovsky, 2022; Ekenta, 2022; Wizor and Akpamgbo, 2019), three gaps stand out for Port Harcourt: limited integration of hazard maps with market transaction datasets to spatially quantify stigma gradients; weak evidence on the role of institutional remediation; and sparse longitudinal studies that separate transient price impacts from long-run reputational effects. Addressing these gaps requires combining hazard layers, transaction valuation records, and stakeholder interviews to identify which determinants are most salient locally and which policy levers best restore confidence. The literature converges on the view that stigma in flood-prone land is multi-causal: biophysical events initiate negative reputations, but socio-economic conditions, institutional performance, and communication dynamics determine whether and how stigma persists. For Port Harcourt, empirical work that fuses spatial hazard exposure, market data, and stakeholder perceptions is critical to isolate determinants and design interventions that limit reputational damage and support sustainable, resilient land development.

3.0 RESEARCH METHODOLOGY

The study investigated the determinants of stigma affecting development in flood-prone areas of Port Harcourt Metropolis, Rivers State, Nigeria, comprising Port Harcourt City and Obio/Akpor Local Government Areas. The metropolis is characterized by rapid urbanization, population growth, and recurrent flooding caused by poor drainage, climate change, and improper land-use practices. Flood-prone neighborhoods such as Elekahial Rumuokalagbor, Rumuokoro, Rukpokwu, Elioza, Mgbuoba, Rumuigbo, Peter Odili Road, and Rotimi Amaechi Drive were selected due to their history of frequent flooding and declining property values. A descriptive survey research design was adopted to explore the social, perceptual, and behavioral dimensions of stigma associated with flood-prone lands. The design facilitated the collection of both quantitative and qualitative data from key stakeholders, including developers, investors, landowners, residents, and government officials. Using Yamane's (1967) formula at a 95% confidence level and 5% margin of error, a sample size of 269 respondents was determined through a stratified random sampling technique to ensure balanced stakeholder representation. Out of 384 questionnaires distributed, 296 were retrieved, representing a 70% response rate. Data were analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation to describe respondent characteristics and perceptions. The

Relative Importance Index (RII) was employed to rank the major determinants of stigma, while statistical analysis was performed using SPSS (Version 25) to ensure analytical precision and reliability of findings.

4.0 RESULTS INTERPRETATION, AND DISCUSSION OF FINDINGS

Table 1 presented flood-prone development land in Port Harcourt often perceived as undesirable, risky, and economically unviable. This stigma arises from a

complex interaction of environmental, socio-economic, institutional, psychological, and market-related factors that collectively discourage investment, settlement,

and infrastructure expansion. The mean values ($\bar{x}$), standard deviations (SD), and Relative Importance Index (RII) indicate varying degrees of influence across environmental, infrastructural, economic, institutional, psychological, social, media, and financial categories. The key contributing factors are interpreted and discussed below.

Table 1: Determinants of Stigma Affecting Development Land in Flood-Prone Areas

Category	Factor	SD (1)	D (2)	N (3)	A (4)	SA (5)	$\bar{X}$	SD	RII	Rank
Environmental	Recurrent flooding, climate variability	10	18	20	107	114	4.33	0.77	0.866	3rd
Infrastructural	Poor drainage, inadequate flood control	8	16	17	99	129	4.44	0.70	0.888	2nd
Economic	Depressed land/house values	6	12	14	93	144	4.58	0.62	0.916	1st
Institutional	Weak policy enforcement	12	21	22	104	110	4.25	0.74	0.850	4 th
Psychological	Fear, trauma, social labeling	15	23	25	101	105	4.18	0.82	0.836	5 th
Social	Low-income profiling	17	24	27	99	102	4.09	0.84	0.818	6 th
Media	Negative publicity	19	26	29	98	97	3.96	0.88	0.792	7 th
Financial	Restricted credit/insurance	20	29	30	97	93	3.83	0.89	0.766	8 th

Source: Author's Field Survey, 2026.

The findings in Table 1 revealed a multidimensional structure of stigma influencing property development within flood-prone zones of Port Harcourt Metropolis. Economic concerns were identified (RII = 0.916; Rank 1st) as the most significant contributor to flood-related stigma. Flood frequency causes capital depreciation, as properties lose value faster than in non-flood-prone areas. Recurrent flooding events in areas like Rumuigbo, Diobu, and parts of Obio/Akpor have created a perception of constant vulnerability. Also, persistent decline in property values, particularly in areas such as Elekahia/Rumuokalagbor and Rukpokwu, discourages investment and speculative buying. Residents and investors associate such areas with high risk of property damage, displacement, and financial loss. Many investors perceive flood-prone lands as financially risky, leading to reduced market activity and prolonged vacancy of properties. This finding aligns with market observations where recurrent flooding undermines asset appreciation and resale potential. Investors and real estate agents view these zones as low-return markets, which reduces demand and liquidity. The resulting economic devaluation becomes a stigma marker that signals unprofitability to other market participants. This environmental insecurity reinforces avoidance behavior, as flood-prone lands are labeled as unsafe for residential or commercial development. The

uncertainty about flood timing and intensity amplifies the stigma.

Poor drainage systems and inadequate flood control infrastructure with RII = 0.888 ranked second, reflecting a core structural challenge. Areas like Peter Odili Road and Rotimi Amaechi Drive, despite their high-end residential profiles, experience severe waterlogging during heavy rainfall. The lack of sustainable drainage design and ineffective maintenance worsens the situation, making developers hesitant to commit capital for long-term projects. When government interventions are perceived as reactive or short-term, potential investors interpret this as institutional neglect, further stigmatizing affected zones. The lack of effective stormwater management systems, blocked drains, and uncoordinated urban drainage projects exacerbate flooding impacts. Poor infrastructure thus signals low resilience and high future risk.

However, recurrent flooding and climate variability (RII = 0.866; ranked 3rd) remain major environmental drivers of stigma. The continuous overflow of stormwater and blocked channels in Rumuokoro and Elioza cause damage to properties, disrupt mobility, and escalate maintenance costs. This creates a self-reinforcing cycle where environmental degradation fuels investor withdrawal and urban decline. Flood-prone areas often lack reliable utilities (roads, power, schools, waste management). These

deficiencies both result from and reinforce stigma; developers avoid the area due to poor services, while poor services persist because of limited development. The vicious cycle of underdevelopment creates long-term market distortion.

Similarly, institutional factors of weak policy enforcement (RII= 0.850; ranked 4th) contributes significantly to stigma perpetuation. Regulatory agencies often fail to monitor construction standards or enforce zoning restrictions in flood-prone areas. Weak enforcement of land-use zoning and building regulations enables unregulated developments in flood-prone areas. In Elekahia and Rumuokalagbor, unregulated developments on flood plains worsen surface runoff, revealing governance gaps that erode public confidence in urban management systems. The absence of clear policy direction or compensation mechanisms after flood disasters signals governance weakness, reinforcing public distrust. Perceived government neglect creates a narrative that “the authorities have abandoned these areas,” thereby amplifying social and market stigma

Furthermore, psychological and social factors (RII = 0.836; ranked 5th; RII = 0.818; ranked 6th) in the forms of fear, trauma, and social labeling further exacerbate the problem. Residents who have experienced past flooding episodes express emotional distress and uncertainty about property safety. The psychological trauma of previous flood events produces collective fear and emotional aversion to affected areas. Even when physical conditions improve, emotional memory and social labeling persist, shaping neighborhood reputation. Community gossip and shared experiences create informal “risk maps” that guide avoidance behaviors. Moreover, low-income profiling of certain communities: where flood-prone lands are perceived as affordable to only economically constrained buyers; reinforces socio-spatial segregation and stigmatization. Flood-prone neighborhoods are frequently occupied by lower-income households unable to afford safer locations. This demographic association leads to social labeling of such communities as “slums” or “low-status,” adding social stigma to physical risk. As a result, flood-prone land becomes not only environmentally undesirable but also socially marginalized.

Media and financial factors (RII= 0.792; ranked 7th; RII= 0.766; ranked 8th) were also identified. Negative media coverage intensifies the perception of risk, discouraging potential buyers and investors. Media coverage that highlights flooding catastrophes without showcasing recovery or mitigation efforts tends to magnify public fear and misinformation. Residents label flood-prone areas as “disaster zones,” shaping collective memory that persists even after remediation. This perception becomes self-reinforcing: discouraging new investment and perpetuating low market value. Stories of inundation in Peter Odili axis or Rumuokoro circulate widely, framing these neighborhoods as unsafe. Simultaneously, limited access to mortgage financing and insurance for flood-risk areas restricts property transactions, perpetuating disinvestment. Financial institutions often classify flood-prone properties as high-risk assets, restricting mortgage

lending, property insurance, or requiring higher premiums. This financial exclusion limits investment opportunities, discouraging both developers and homebuyers. The absence of risk-sharing mechanisms (like flood insurance) sustains the stigma as an uninsurable risk environment.

Generally, the results underscored that stigma toward flood-prone development land is multidimensional; rooted in environmental insecurity, economic risk, social perception, and institutional neglect. The high mean scores and RII values confirm that respondents perceive these factors as major barriers to real estate development and land utilization in flood-affected zones of Port Harcourt Metropolis.

Table 2: Summary of Key Stigma-Contributing Factors

Category	Factor	Illustrative Effect on Development
Environmental	Recurrent flooding, climate variability	Increases perceived risk and property loss
Infrastructural	Poor drainage, inadequate flood control	Reduces attractiveness and resilience
Economic	Depressed land/house values	Discourages investment and lowers collateral value
Institutional	Weak policy enforcement	Diminishes confidence in governance
Psychological	Fear, trauma, social labeling	Creates long-term avoidance behavior
Social	Low-income profiling	Leads to marginalization and reputational stigma
Media	Negative publicity	Amplifies perception of danger
Financial	Restricted credit/insurance	Limits real estate participation

Source: Author's Field Survey, 2026.

In essence, stigma toward flood-prone development land in Port Harcourt arises from a multilayered interplay of physical risk, weak institutional response, market withdrawal, and social narratives as detailed in Table 2. This stigma perpetuated a self-reinforcing cycle: fear and devaluation, discourage investment as underdevelopment persists in the area which continues to be stigmatized. This implies that reducing flood-related stigma requires integrated interventions; environmental control, public sensitization, infrastructural upgrade, and improved policy enforcement. Breaking this cycle requires coordinated interventions for effective flood management, transparent communication, infrastructure investment,

and policy incentives that demonstrate risk reduction and rebuild investor confidence.

5.0 CONCLUSION AND RECOMMENDATIONS

This study investigated the determinants of stigma affecting development land in flood-prone areas of Port Harcourt Metropolis, Nigeria. The findings revealed that stigmatization of flood-prone lands arises from a combination of environmental, social, economic, and institutional factors that collectively shape public perception and investor confidence in property development within vulnerable locations. Key determinants identified include the frequency and severity of flooding events, inadequate urban drainage systems, lack of government mitigation measures, perceived risks of property devaluation, and the social fear associated with flood disasters. These factors contribute significantly to negative perceptions that discourage investment, hinder property transactions, and distort the urban development landscape of Port Harcourt.

Furthermore, the study established that poor public awareness, insufficient insurance mechanisms, and weak enforcement of planning and environmental regulations exacerbate stigma and create long-term challenges for sustainable urban growth. The stigma attached to flood-prone development land not only reduces land value but also limits the availability of safe and affordable housing options for low- and middle-income groups. This situation underscores the need for a proactive policy and institutional response to address both the physical and perceptual dimensions of flood risk. This study underscores the urgent need for proactive and inclusive policies to address the stigma affecting development land in flood-prone areas of Port Harcourt Metropolis. The study concluded that mitigating stigma requires an integrated and collaborative approach involving government agencies, real estate developers, urban planners, and community stakeholders. As reducing stigma requires a balance between infrastructural investment, institutional reform, and community participation. By enhancing flood control infrastructure, enforcing development regulations, improving public communication, and promoting adaptive land-use planning, it is possible to rebuild confidence in flood-prone areas. Ultimately, reducing stigma will promote equitable urban development, safeguard investments, and strengthen the resilience of Port Harcourt's built environment against climate-induced risks. Through implementing the above recommendations, stakeholders can foster resilient urban environments, enhance real estate market confidence, and promote sustainable property development in Nigeria.

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