



Climate extremes and housing rights: A political ecology of impacts, early warning and adaptation constraints in Lagos slum communities



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ABSTRACT

Slum communities in Lagos, Nigeria, are vulnerable to contemporary flooding and to the potential impacts of climate change. Such vulnerabilities have been linked to rapid urbanization, environmental degradation and weak disaster response, but little attention is paid to the factors that engender these problems in the first place or to why the poor have persistently been at greater risk. Poverty does not always mean vulnerability. Often several elements come into play to exacerbate conditions of impoverishment and susceptibility to risks. By using a political ecology framework, this paper shows that limited access to housing and weak housing rights are two crucial factors that have pushed the urban poor not only to encroach on hazardous landscapes but also to adopt environmentally intolerable coping and livelihood strategies which undermine the biophysical integrity of land and human settlements and also erode natural resilience against flooding. This relationship between housing rights and flooding is explored by a historical review of land and housing policy in Nigeria and its links to slum development and expansion. A mixed method approach involving a household survey, interviews, and focus group discussions, was employed to generate primary data. The results show that conventional approaches to flood prevention have masked structural inequality and social stigma contributing to high vulnerability and low adaptive capacity in slum communities. To boost adaptation, a number of actions are required including eliminating marginalization in housing and land use, promoting good urban governance, and fostering participatory environmental management.

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Introduction

The interrelationship between housing issues and flooding raises particularly profound concerns when climate change and variability are taken into consideration. Scientific studies demonstrate that climate change will increase the variability and incidence of extreme weather events such as heat waves and droughts in some locations, and heavy precipitation, storm surges, and potential sea level rise in others (IPCC, 2012; Bicknell et al., 2009; Hanson et al., 2011). In places where people lack adequate shelter, storm surges and floods could directly affect their health through injuries, transmission of infectious diseases and displacements (IPCC, 2012, 2014; Bicknell et al., 2009); or indirectly affect their living conditions through impact on properties, social infrastructure and livelihoods (Wahlstrom, 2003; Cannon and Muller-Mahn, 2010). Such negative impacts could compound existing vulnerabilities while also having retrogressive effects on poverty eradication, social stability, and the enjoyment of human

rights especially housing rights (O'Brien and Leichenko, 2000; UNDP, 2007; Barnett, 2010).

Flooding can be particularly devastating for the urban poor and disadvantaged groups who live in substandard housing conditions in low-lying areas or in lands ill-suited for building (e.g., swamplands and floodplains). This group of people are more likely to be displaced by floods but less likely to have the resources, information, or social protection necessary to mitigate their increasingly unsafe situations (Feiden, 2011). This link between poor housing conditions and vulnerability to climate change impacts including flooding has been acknowledged in the literature (Douglas et al., 2008; Adelekan, 2010; Satterthwaite, 2013), but to date, very little planning and investment are directed towards housing for the urban poor. For example, 70 percent of the Lagos population live in slum settlements characterized by extreme flooding that lasts several hours and sweeps raw sewage and refuse into living spaces (UN-Habitat, 2010; World Bank, 2006). In Mumbai, India, a large proportion of the 1000 people who died from the 2005 devastating cyclone were the poor in slum settlements (De Sherbinin et al., 2007). Also, in Addis Ababa, in 2006, flooding killed more than 100 poor people and destroyed several houses in slum areas

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(Douglas et al., 2008). These examples reinforce the importance of adequate housing for the urban poor and also provide an added impetus to realise the Millennium Development Goal of “achieving significant improvement in the lives of at least 100 million slum-dwellers by 2020” (United Nations, 2000).

Adequate housing in the context of climate change goes beyond a development goal; it is a human rights issue. Slum/informal settlements have formed mainly because of unequal and unfair allocation of state resources, rising land prices, distortion in pricing policy in the housing market, and forcible eviction of people from indigenous lands (Morka, 2007; Yeung, 1991). These concerns have not been effectively addressed in past research on human vulnerability to climate change. Among the few studies that highlighted some connections between housing rights and climate change was an Action Aid, 2006 report which explored the local perceptions of floods in five African cities with a focus on housing for the poor (Action Aid, 2006). Displacement Solutions in its 2010 report explored housing, land and property dimensions of climate-induced displacements and offered a range of rights-based approaches as remedial measures (Displacement Solutions, 2010). Recommendations from the report hold promises for the resettlement of displaced persons, but missing therein was a discussion about social vulnerability which facilitated displacement and other impacts in the first place. In the context of Lagos, Adelekan (2010) examined the vulnerability of the urban poor to flooding but constructed the causal factors mainly as a managerial issue; that is, poor urban policies and unplanned development translate flood risks into disaster with a higher impact among the poor. The author made reference to social vulnerability but did not discuss the structural inequalities and deprivations that tend to foster higher risk and lower adaptive capacity among poor communities. Apart from these few studies, information about how the lack of housing right exacerbates vulnerability or how its realization enhances adaptation are still sparse.

Since informal settlements generally embody a human rights problem on account of the political, economic and social marginalisation of disadvantaged populations, we make a case for a housing rights-based approach in evaluating vulnerability and adaptation to climate change in slum communities. In this study, we argue that understanding the role of housing rights will assist in providing the theoretical foundations required to develop both fair and equitable solutions to dealing with extreme events and their disproportionate impact on marginalised groups. This study adopts a political ecology approach which draws together historical, structural and spatial dimensions of marginalisation in housing and land use policy to show how vulnerability to climate extremes are produced and maintained over time. A micro-political ecology analysis of the housing conditions of the Badia communities (Abete, Badia Central, and Better Life) in Lagos and the events surrounding the July 10, 2011 rainstorm were used to provide critical insights into the current vulnerabilities of slum communities in Nigeria. In the end, we make a strong case for slum upgrades, security of tenure, increase investment in risk-reducing infrastructures, and increase participation of slum dwellers in urban governance and management. We show that adequate housing for the urban poor is both an end in itself and a means to fostering sustainable adaptation.

Political ecology approach to vulnerability and exposure

Vulnerability and exposure are concepts that need to be carefully defined and examined to understand their specific meaning in a particular context. In much of climate change literature, vulnerability is considered to be a function of exposure, sensitivity and adaptive capacity (McCarthy et al., 2001). Exposure refers to

the presence of people, livelihoods, resources, infrastructures, and settlements, in places that could be adversely affected by a climate hazard (IPCC, 2012, p. 5). Sensitivity means susceptibility to harm, while adaptive capacity is defined as a combination of the strengths, attributes, and resources available to an individual, community, or country, that can be utilized to prepare for, moderate, or reduce the adverse effects of climate change (IPCC, 2012). This interpretation of vulnerability draws on hazard literature's focus on the extent to which people, infrastructures and biophysical systems are exposed to climate change and the degree to which they can cope and adapt to its effects (O'Brien et al., 2004). A downside of the hazard approach is that the majority of analyses are based on speculations of exposure to climatic risks and an appraisal of aggregate adaptation and adaptive capacity (Adger and Kelly, 1999). While useful, such an approach offers little explanation as to why climatic hazards do not affect social groups uniformly and why adaptive capacity is unevenly distributed among equally exposed populations.

In contrast, a number of scholars argue that vulnerability and exposure are socially and politically constructed. They are simultaneously determined by the political and socio-economic structures that amplify the effects of hazards and by people's capacity to cope and adapt to them (Blaikie et al., 1994; Pelling, 1999). Political ecology explains vulnerability to environmental hazard as evolving from a dialectic relationship between ecology (natural including built environment), a broadly defined political economy (macro-structural constraints), social traditions, and individual agency (Blaikie and Brookfield, 1987; Wisner et al., 2004). This approach incorporates place-based interactions between physical vulnerability (i.e., exposure) and social vulnerability (i.e., structural constraints) in an overall determination of differential social burdens of hazards and how this relationship changes over time and across space (Cutter et al., 2009). In essence, vulnerability is an inherent inability of individuals or communities to cope with external pressure due to a chain of causes and multiple processes occurring at the local, national and global scale (Blaikie et al., 1994; O'Brien et al., 2004). The United Nations Development Program (UNDP), for example, defined “vulnerability as a human condition or process resulting from physical, social, economic and environmental factors, which determine the impact of a given hazard” (UNDP, 2004, p. 11). Such factors include social and economic systems, location and condition of human settlement and infrastructure, environmental assets, and public policy and administration. This understanding makes the role of place and human agency explicit and also draws attention to the environmental, social, political and economic pressures that constrain individuals' capacity to avoid risks in advance and recover from crises when they occur (Adger, 2006).

According to Watts and Bohle (1993), central to an individual's adaptive capacity is the totality of their rights and their social entitlements to basic resources such as information, housing, health care, social welfare, and technological support from the state, civil society and the international community. Entitlements to these resources, however, are restricted or denied for many reasons including gender, race, class or economic status, ethnicity, sexual orientation and political preference (Barnett, 2010). Research suggests reduced adaptive capacity is common where people live in precarious conditions and are deprived of basic rights. Poor people of colour in New Orleans, for example, suffered disproportionately from the impact of the 2005 Hurricane Katrina because of their physical proximity to the source of hazard as well as their pre-existing conditions of poverty and lack of human rights attainment (Mutter and Barnard, 2010). On the other hand, communities that enjoy basic human rights are more likely to have higher adaptive capacity, especially when they can call on their government for social security including social insurance aimed at disaster

prevention and recovery (Barnett, 2010; Adger, 2003). In essence, human rights are powerful organising and entitlement tools (Sen, 1981) that allow people to call on certain resources from the State to sustain their communities both in normal and disaster times.

In this paper, we draw upon the concept of housing rights as an analytical lens to understand the underlying causes of vulnerability as well as the constraints on adaptation to flooding in urban poor communities. Housing rights is examined in a broader sense of creating enabling strategies and ensuring non-discrimination in access to housing. We argue that such an approach to climate change and housing problems can open up political avenues to redress existing inequalities that worsen vulnerability for marginalized groups. It can also promote norms of fairness, accountability, and non-discrimination in urban policy on adaptation.

Lagos megacity: background information

Climate and flooding problems

Lagos serves as a classical example to illustrate the theoretical discussion above. The city is located in southwestern Nigeria and encompasses a land mass of 3577 square kilometers (km²), with water and wetlands covering more than 40% of its total land area (Agbola and Agunbiade, 2009). The climate is tropical with high temperatures and humidity throughout the year. Lagos has two main seasons; the wet/rainy season extends from April to October, with a brief dry spell in August, and the dry season is from November to March. The average temperature in Lagos is 27 °C and average monthly rainfall in rainy season is 244 mm.

Lagos is one of the world's rapidly urbanizing coastal cities at risk from climate change (Kreimer, 2003; Baker, 2012). Scientific studies predict higher temperature, intense precipitation, and potential sea level rise in Lagos (Major et al., 2011). In an assessment of 136 port cities, Lagos ranked fifteenth for populations exposed to flooding and sea level rise within a future climate scenario for the 2070s (Hanson et al., 2011). French et al. (1995) estimated that a sea level rise of 0.3 meters could displace close to 2 million people in Lagos and affect a million others. Furthermore, Braimoh and Onishi (2007) observed that excessive rain above 100 mm per day are occurring more frequently between June and September resulting in flooding that causes serious hardship and development setbacks in the city. While, climate change is a crucial risk factor, it is not the major cause of flooding in Lagos. The regular causes of flooding in the built-up areas are poor land management, inadequate drainage systems, and increased encroachment of urban facilities on flood plains (Adelekan, 2010). Flooding occurs in all parts of Lagos, but slum communities are the most at risk and often have limited adaptive capacity to cope with such events (Ajibade et al., 2013).

Slum development and housing crisis in Lagos

Research into the implications of flooding in Lagos cannot be separated from the study of slum dwellers that bear its toughest impacts. In this section we trace the underlying historical, social, political and economic factors that create and perpetuate the expansion of slum settlements in Lagos.

Lagos is the least planned but fastest growing city in Nigeria (Fig. 1). It grew from 252,000 in 1952 to 10.5 million people in 2010, and is projected to be 15 million by 2020 (UN-HABITAT, 2010). Currently, two-thirds of the Lagos population lives in slum settlements ranging in size from clusters of shacks underneath highways to entire districts such as Badia, Ajegunle, Agege and Mushin (Morka, 2007). These settlements are characterized by overcrowding, substandard housing, lack of clean water and

sanitation, and insecurity of tenure. Lagos has long had a record of slum conditions, which can be traced back to the bifurcated system of urbanization inherited from the colonial era (Gandy, 2005). The city became a British colony in 1861 after its re-configuration from a slave *entrepôt* to a leading locus of exportable economic surpluses to the Western World (Mabogunje, 1990). During this period, the small island which constituted 'old' Lagos or Isale Eko was transformed from a collection of villages of fishermen and farmers to a planned colonial settlement with a clear separation of residential and commercial areas (Udoka and Anyinyang, 2010). Extensive development projects such as roads, port systems, railways, schools and modern houses, put in place to facilitate the colonial agenda became a major attraction that pulled people from rural areas into Lagos to work in its urban production and agricultural sectors (Immerwahr, 2007). Since the British administrators neither anticipated nor approved the growth of a large African population, its Treasury Office rendered little financial assistance in support of the growing indigenous populace (Gandy, 2005). Far-reaching policies that could provide water, public health, and sanitation across the board were abandoned for strategies of segregation between wealthy British enclaves and the African parts of the city (Nwaka, 2005). Investment in urban infrastructure was therefore disproportionately concentrated in the wealthy enclaves on Lagos Island and its surrounding Ikoyi and Victoria Island while other areas were left to develop haphazardly with houses built quite close together, of inferior quality, overcrowded, and lacking basic amenities (Olukoju, 1993; Gandy, 2005). This state of congestion and unhealthy housing conditions in the African areas stimulated the rapid spread of influenza epidemics and bubonic plague which ravaged the city between 1923 and 1930 (Abiodun, 1976). In response, the Colonial Government established the Lagos Executive Development Board (LEDB) in 1923, with the mandate, among others, of extensive slum clearance and relocation of families from the Island to the mainland, thus marking the genesis of forced eviction and expansion of slum settlements across the city (Peil, 1991; Olukoju, 1993).

The legacy of a dual city entrenched through forced evictions and restrictive land policy still persists in Lagos (Immerwahr, 2007). Access to land, housing and related services in post-colonial Lagos became increasingly skewed in favour of the rich and political elites. For example, the subsidized housing reservation that used to be set aside for the colonialists became Government Residential Areas (GRA) occupied primarily by the new Nigerian administrators and the upper class citizens (Olotuah and Bobadoye, 2009). Further entrenchment of the GRA scheme in the late 1960s and 70s ensured that the housing divide between low-income groups and upper-class Nigerians was spatially visible (Ilesanmi, 2010). Policies and measures taken to address this housing crisis met with unprecedented failure. Prominent among such measures was the establishment of a UN-backed Master Plan for Metropolitan Lagos (1980–2000) which among other things, called for the provision of about one million housing units for low income households and the upgrading of informal settlements (Morka, 2007). By the year 2000, only 10% of the recommended housing needs were met (Abosedo, 2006). Yet, over the same period the population of Lagos had quadrupled with more people needing decent housing.

Factors responsible for the failed post-independence housing initiatives included economic and political instability, rapid urbanisation, clientelism, accelerated globalisation and the adoption of neoliberal policies (Forrest, 1993; Herbst and Olukoshi, 1994; Morka, 2007). Major distortions and corruption in the Nigerian local economy caused by the 1970s' oil windfall exacerbated its socio-economic crisis. As a member of the Organisation of Petroleum Exporting Countries (OPEC), Nigeria generated enormous national revenue from increase in domestic production of oil and

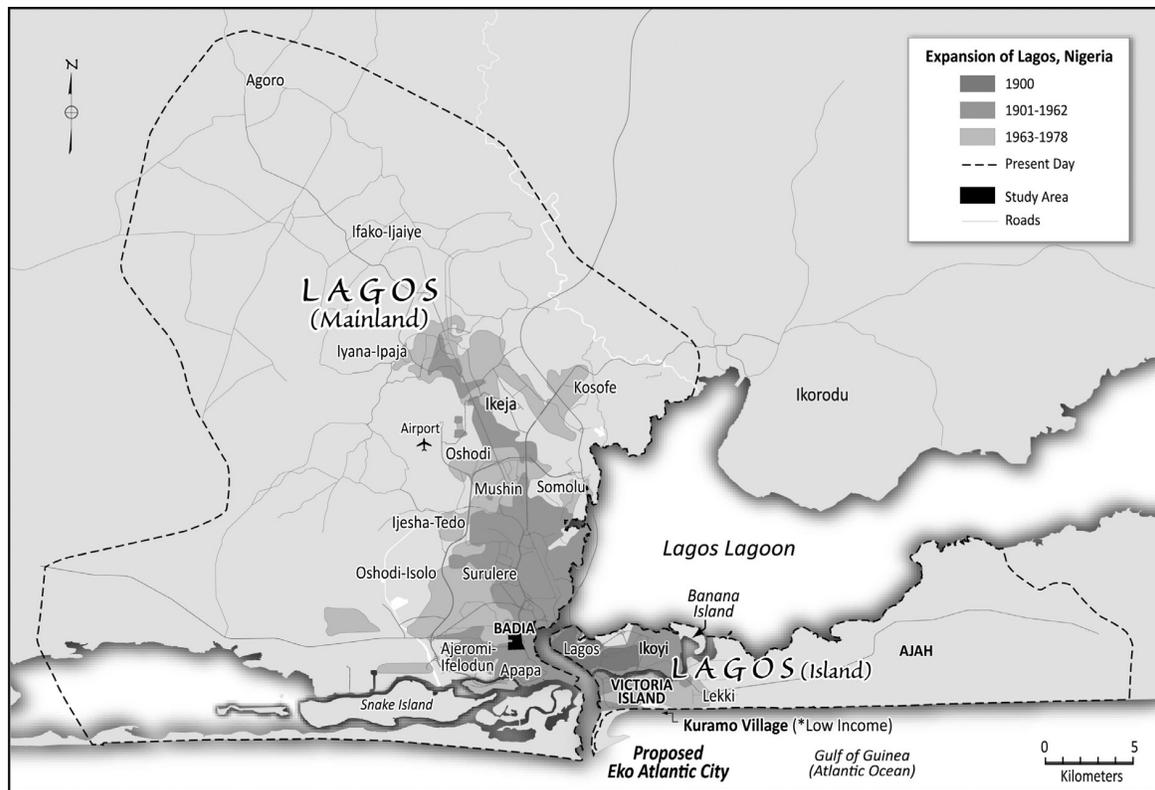


Fig. 1. Map of Lagos showing city expansion.

increase in price hike in the 1970s. With this financial boom, the rank of patron-client networks in the indigenous trading, contracting, and manufacturing classes expanded with many of them depending on the State for their continued existence (Herbst and Olukoshi, 1994). The Nigerian State also saw an opportunity to rebuild the country's urban base after the ravages of 1967 civil war which claimed over 1 million lives (Morka, 2007). Lagos, being then the capital city received massive investments in construction, public housing, commerce and administrative services (Nwaka, 2005). These investments triggered a second wave of migration into the city. However, the industrial development euphoria was short-lived as the government could no longer fund projects when oil revenue declined from US \$26 billion in 1980 to about US \$6 billion in 1986 due to the falling global demand for oil following the 1979 energy crisis (Ibem, 2010).

On the political end, the country endured series of repressive military dictatorships, with one interruption by a civilian government from 1979 to 1983. The civilian administration of Governor Jakande in 1979 oversaw the provision of free primary and secondary education as well as the construction of 20,000 housing units in Lagos targeted mostly towards the poor and middle-income groups (Filani, 2011). However, these programs vanished after the military took over in 1983. Under the military regime, political freedoms were repressed, development was distorted, and enormous resources earmarked for housing and other social purposes were misappropriated or diverted to the construction of military barracks and other dubious projects (Nwaka, 2005). With these governance deficits, corruption and patronage became entrenched and were exacerbated by political arbitrariness, lawlessness and human rights violations which had catastrophic consequences on the Nigerian economy and people (Morka, 2007).

To restore macroeconomic stability and growth, the Federal military government of Ibrahim Babangida adopted the World

Bank and International Monetary Fund (IMF) Structural Adjustment Programs (SAPs) in 1986 (Ibem et al., 2011). SAP conditionalities requiring civil service reform, privatization of state industries, and cutbacks in social services, exacerbated urban unemployment in Nigeria and left millions of people poorer with little to no access to education, health care and decent housing (Odulana, 1997). The government's capacity to provide adequate housing in the subsequent years was undermined by a combination of currency collapse, capital flight, and debt servicing which further contributed to the socio-economic crisis in the country (Udoka and Anyinyang, 2010). To date, the Nigerian government have not found a practicable policy or strategy that could solve the housing problems in Lagos.

Housing rights, urban poor and enabling strategies

The importance of housing to human development, health, and dignity has been acknowledged in the human rights literature and in international treaties (Kenna, 2005; Bratt et al., 2006; Adams, 2009). Nigeria is party to international and regional treaties that recognise housing as a human right (ICESCR, 1976 Art 11 (1); UDHR, 1948 Art 25; ACHPR, 1981 Art 4), but is yet to provide constitutional guarantees for its realisation (Fajemirokun, 2004). This means the Nigerian State has not taken all necessary legislative, budgetary, and administrative measures possible to guarantee housing rights particularly for the urban poor. In South Africa, advocacy by human rights groups and the shack dwellers movement triggered the adoption of a constitutional approach to housing rights, and this has proven to be relatively successful in helping slum dwellers secure access to low-cost housing, safe land, infrastructures, and basic services (Oldfield, 2000; Chenwi, 2011). Such an approach, however, is riddled with its own challenges as people have to wait several years on a long government list to

secure housing. There are also concerns about the social and economic sustainability of this approach (Goebel, 2007). If anything is abundantly clear since the international codification of housing rights, it is the simple fact that no State has been able to accommodate all people in need of housing in state-built housing resources. It is true that social housing remains a crucial dimension of the total approach towards satisfying housing rights; however, it can only solve part of the problem. Consequently, housing policy in most countries has shifted discernibly away from a social housing approach, to what are generically labelled as 'enabling strategies' (Leckie, 1995). 'Enabling strategies' fit into a broader notion of rights expressed in this study, and may involve the construction of some housing resources by the State, but primarily it infers the responsibility of the State to create maximally conducive conditions throughout society whereby everyone can have sustained, suitable, affordable and accessible housing (Leckie, 1995). This means that the State must regulate land use, housing and land costs, and landlord-tenant relations, stimulate self-help housing initiatives, ensure the universal provision of tenure security, and prohibit forced evictions. This approach is particularly relevant in the context of climate change where a State may not have the resources to provide housing for its citizens or has to prioritize among other competing needs. The role of housing rights (in an enabling sense) has hardly been addressed in an elaborate manner in past research on climate change and slum dwellers' vulnerability. We bring these issues to light in our case study of the Badia slum communities.

Methodology

In our study of the Badia communities, a mixed qualitative and quantitative method, namely in-depth interviews, a survey and focus group discussions (FGDs), were utilized at different stages of a field study carried out from May to November, 2011. The communities were selected because of their swampy terrain, sub-standard housing quality, and collective classification as a slum (Jimoh et al., 2013). In-depth interviews for this study were conducted in June 2011 with the goal of gaining a deeper understanding of people's pre-existing housing and environmental conditions, access to vital social and economic resources, participation in local governance and decision making processes, and attitudes to flood prevention and early warning. Based on random sampling, a total of 30 households were interviewed, with additional contacts made through snowballing; that is, key informants suggested respondents. The first author conducted the interviews and time spent on each ranged from 45 to 90 min. Respondents included: renters and homeowners; young and old; educated and non-educated; as well as people of different ethnic groups. Selection of participants ceased with thematic saturation, that is, when no new idea emerged (Baxter and Eyles, 1997). Interviews were tape recorded and transcribed, then coded and analysed using NVivo 9. Thematic and content analyses were used in analysing the interview data. To guard against concerns of credibility and dependability, key themes that emerged from the interview data were double-checked with participants during the survey and focus group discussions.

The survey conducted in mid-July 2011 coincided with Lagos receiving 264 mm of rain in 18 hrs; a volume equivalent to what is usually recorded in a month (NIMET, 2011). The rain began around 12 noon on Sunday July 10 and did not stop until 6 am the next day. The rainstorm was one of the worst in decades; the water level rose to about 1 m high as the channels that were meant to discharge water from the roads and drainage systems were completely blocked due to high tide along the Atlantic Ocean, thus causing heavy flooding across the city. About 100 people were killed, thousands were temporarily displaced, and properties worth over 50 billion Naira (\$USD 320 million) were destroyed

across the state (Oladunjoye, 2011). Two days after the flooding, the first author with the assistance of 10 trained enumerators administered questionnaires to participants in the study areas, using a systematic random sampling of households ($n/10$; where n is the sampling interval) to ensure a representative coverage of people in the three communities. The household survey aimed to identify clear patterns and differences in the nature of impacts, coping strategies, and assistance received in the communities. The survey covered information on demographic and socio-economic status (including age, gender, income, educational level, and marital status) as well as environmental and housing conditions, flood impacts, coping strategies and social assistance. Each survey took an average of 1 h to administer. A total of 607 households were interviewed over a two-week period. SPSS 18 (Statistical Package for Social Sciences) was used in coding and analysing the survey data. The data was subjected to descriptive statistical analysis which involved grouping of data, computation of frequencies, percentages and cross-tabulation of key variables.

The last part of the study consisted of two focus group discussions (FGDs) which were conducted two months after the July flooding. This was done to learn about post-disaster coping strategies and recovery and to validate findings from the previous studies. This member-checking approach, otherwise referred to as triangulation, offered an opportunity to clarify themes, assumptions, perceptions, and alternative viewpoints emerging from the previous research methods (Greene et al., 1989; Kidd and Parshall, 2000). The FGDs were conducted separately for male ($n = 10$) and female ($n = 10$) groups. They were tape recorded and data were analysed in NVivo 9. The study received ethical clearance from Western University Ethics Board and all ethical processes of confidentiality and informed consent were followed. All names used in this paper are pseudonyms.

Results and discussion

Badia communities in the context of the study

Badia is a vulnerable space marked by fragile ecological conditions and high population density. This swampland is located in Apapa-Iganmu Local Council Development Area (LCDA) of Lagos State. It has a total land mass of about 1.6 km² and a population of 600,000 people (Morka, 2011). Badia had a few settlers in the early 20th century but became a sprawling slum after it received a population boost in 1973 with the resettlement of the Oluwole villagers. These were people forcibly evicted from their ancestral land in Central Lagos following the decision of the Federal Military Government to acquire their land for the construction of Nigeria's National Arts Theatre (Morka, 2007). Apart from land allocation, the Federal Government rendered no assistance with reclamation and housing, and also failed to address the host community's pre-existing lack of basic infrastructure such as good roads, drainage systems, hospitals, and waste disposal facilities. The resettled families therefore had little choice but to hurriedly reclaim parcels of the swamp to build shelters of various shapes and sizes as each could afford (Makinwa, 1987). These governance failures exacerbated by poverty and social marginalisation have come to shape the level of decay and weak housing rights in Badia.

Today, the Badia community is highly differentiated and heterogeneous although most people live in extreme poverty. About 67.5% of the total survey respondents (i.e., Badia Central, Abete and Better Life) were engaged in trading and other informal activities such as truck driving, security, casual labour and clergy work. Only a few (0.3%) were employed in high-skilled professional jobs. Respondents' engagement in informal activities was likely linked to their low level of education (primary education: 50.8%; secondary education: 42.4%; tertiary education: 4.4%). Low educational

attainment and employment in low waged informal sectors often translate into low job security and low income (Blanden and Gregg, 2004). Hence, it was not surprising that the average monthly household income in all three communities ranged between N15,000 – N25,000 (\$100 to \$166). Such low wages offer people little economic power to change their conditions or to build up financial capital that could foster resilience against economic or climatic shocks.

Living conditions and pre-existing vulnerabilities

Lived experiences and economic vulnerability

Residents' lived experiences were precarious with many exposed to frequent shocks and stresses arising from ill-health, hunger, outbreaks of fire, crime incidence and violent conflicts. In terms of the specifics, Better Life was a place of expansive freedom and lawlessness where people engaged in prostitution, pocket-picking and other criminal activities in order to earn a higher income. There were no basic services in the area and accidental fire outbreaks were common since most households live in a wooden shack and rely on kerosene lanterns and candles for lighting. Badia Central and Abete, on the other hand, had some degree of self-organisation and self-regulation enforced by community chiefs, landlord associations and youth groups. This does not mean they were free from the social menace that besets Better Life; violent conflicts were also common in Badia Central and Abete due to poor communication and misunderstanding among community members and youth groups. Compared to Better Life, minimal basic services such as borehole-water supply and electricity were available in Badia Central but the user fees paid to access these services compounded residents' poverty. Interview participants, for example, reported spending N2000 (\$15) monthly on water supply, N4000 (\$26) monthly on electricity, and N20 to N30 (\$0.20) per use of a privatized bathroom or pit latrine. These findings corroborate the UNDP 2006 report which noted that slum dwellers rarely have access to basic social services and often pay 5 to 8 times more for water and others services compared to high-income urban residents (UNDP, 2006, p. 52). User fees payment in Badia translates into low purchasing power and reduced personal savings, thus adding to residents' economic vulnerability and limited financial capacity to cope with disasters.

Waste utility and contradictions

A major source of environmental vulnerability was waste-filling. While many of the world slums suffer from a 'garbage dump syndrome' (that is, where 'outsiders' dump waste in poorer districts considered marginal) (Davis, 2006), the situation in Badia is different. Here, residents embrace waste as a part of their daily life. All three study communities were immersed in heaps of waste, with normal activities such as buying, selling, and cooking being carried out in unhealthy environmental conditions. Waste is voluntarily collected and serves three purposes in Badia. First, it is used as a cheaper alternative to sand filling when constructing a foundation for a house – otherwise referred to as 'waste-filling'. Second, it is used as a material for flood control during heavy rains and storm surges. Third, it generates income for garbage-collectors and unauthorized developers who waste-fill parts of the canal for sale. The latter factor was perpetuated by the presence of a weak municipal government which, due to corruption, was unwilling and unable to regulate the reclamation of prohibited areas. Under such a complex political economy of waste, susceptibility to flood risks becomes inevitable since waste-filling benefits some residents economically and materially. However, waste-filling has wide-ranging negative effects. It pollutes the local environment and atmosphere through off-gassing of methane generated by decaying organic matter, thereby contributing to climate change. It also prevents the free

flow of water, contaminates groundwater, harbours disease vectors (such as rats, flies and mosquitoes), and can accelerate land and housing subsidence (Kohl, 2001). A decade of waste-filling in Badia has effectively eroded natural buffers against flooding, blocked available drainage systems, and increased housing subsidence in the area (Figs. 2 and 3), thus contributing to environmental vulnerability.

Strong disagreements exist among and within the communities about the value and utility of waste-fills. Community chiefs and youth leaders in Badia Central fiercely condemn the culture of waste-filling calling it a public nuisance. Nevertheless, the majority of residents in Abete and Better Life consider waste-filling as a symbol of their struggle to access basic shelter and maintain livelihoods in the face of poverty and structural marginalisation. In the three communities, women tend to worry more about having some form of shelter (no matter how intolerable) because of their gender roles as mothers and caregivers, and because their petty-trade businesses were attached to the home. A single mother in Abete, for instance, said:

"We never use to allow dirt in this community. It was the rain that made us to start accommodating it. We are poor people; we need shelter for our children and a place to sell our goods."

[(Sandra, Interview, Abete, June 16, 2011)]

In essence, many were trading off vulnerability to flooding for shelter and livelihoods, accepting increases in the former to enhance their daily struggle against the latter (Pelling, 1999).

Housing quality and structures

Poor housing quality was another source of vulnerability. Most of the shelters were made from cheap quality wood and perched precariously on stilts over waste and excrement-clogged canals. Many respondents lived either in a wooden shack on ground or in cabins suspended up to six feet atop the brackish lagoon (Abete: 68.4%; Better Life: 74.9%; Badia Central: 35.2%) (Table 1). The shelters were often too weak to offer protection against inclement weather. They were vulnerable to heavy rain due to damage from aging, accidental fires, inadequate repair, and neglect. Such poor housing structures can transform the character and magnitude of a hazard into a disaster.

Housing affordability and congestion

High rental cost in other parts of Lagos was an indirect source of health vulnerability in Badia. Accommodation in Badia was among of the cheapest and offers some protection from rising land values in the city. The majority of the total survey respondents (53.7%) said they live in Badia because of the low cost of housing. Others live there owing to livelihood activities (27.8%) or family ties (18.5%). Most dwellings in the area were congested and had a high occupancy rate consisting of 5 to 6 persons per room. Although residents find the low cost of rent as favourable (Table 1), it has also made the area an attractive haven to a large number of migrants, thus contributing to more congestion in an already crowded settlement. Sharma et al. (1998) noted that overcrowding puts slum residents at risk of respiratory infections such as asthma and meningitis, and can slow down evacuation efforts during an emergency (Litman, 2006).

Insecurity of tenure and land use governance

Insecurity of tenure contributed significantly to broader issues of marginalisation and social vulnerability. In the total survey, 10.4% of respondents were home-owners, 89.5% were renters, and squatters were 0.2%. The number of respondents who reported they had no secure tenure was 50% in Badia Central, 79.5% in Abete and 65.7% in Better Life. Home-ownership and rental status made



Fig. 2. Blocked drainage channels and flooding in Badia Central.



Fig. 3. A sinking house in Abete.

little difference when it comes to tenure security in Badia because of the perceived illegality of the area. This problem originated from the jurisdictional dispute between the State and Federal Government. Historically, Badia was acquired by the Federal Government in 1929 for the construction of a railway but the land was later transferred in 1973 to the Oluwole evictees for occupancy purposes with no legal title. Since the transfer offered no title, the Lagos State Government has refused to recognize occupants' ownership claims or rights, and would persistently subject them to forced eviction. State centralization of land ownership enabled by the 1978 Land Use Act also played a role in the community's predicament. The Act among other things granted significant power to state governments over lands in their jurisdiction including power to obtain land for development purposes and power to deny or approve statutory 'right of occupancy' through the issuance of a Certificate of Occupancy (C of O) (Nigeria Land Use Act, 1978; Braimoh and Onishi, 2007). This power engendered mismanagement and corruption in land use and distribution across Nigeria, but nowhere else has it been more grossly abused and

misapplied than in Badia where residents face constant threats of eviction and demolition on account of urban development, beautification and renewal (Agbola and Jinadu, 1997; COHRE, 2006). Consequently, such threats have ensured that residents only build temporary and often weak housing structures to meet immediate shelter needs. Julia, a 45 year-old food vendor who survived two eviction exercises stated that:

"It is wooden houses that are common in this area; people are not building concrete houses anymore. When my house was demolished, I fainted and almost died because I just built seven rooms. I completed it on January, 1st 2009, rented it out January 7, and when it was Feb 7, the house was demolished, so I was really indebted. I almost died. It is not as if we can't build better houses but we don't want them to be pulled down again."

[(Julia, interviewee in Better Life, June 16, 2011)]

Divisive politics and poor local governance

Divisive community politics and a tense political environment also fostered social and environmental vulnerability. The struggle for control in Badia has been between the two dominant parties in Lagos, Action Congress of Nigeria (ACN) and People's Democratic Party (PDP). The ACN administration that came into power in 2008, although popular during the election, later lost the support of the majority of residents. This was because its Chairman showed favouritism to party loyalists in his selection of cabinet members and also concentrated community development projects in neighbourhoods supportive of his administration rather than across the board. In his four years of tenure, there was little to no improvement in the conditions of many communities. Instead of investment in risk-reducing infrastructures and environmental rehabilitation, party loyalists were placed on a payment roster in return for their services of suppressing dissidents and other groups demanding for good governance and stronger attention to environmental issues. An interview participant that complained about divisive politics and poor local governance stated:

"There are politicians in this community who do not want interventions that will improve the community because they are profiting from the rotten system. They use their paid thugs to suppress us."

Table 1

Housing structures, rental cost and percentage of respondents in Badia. Source: Author's field survey data of 607 households.

Building type	Annual cost per room (=N=)	Badia central (n = 48)%	Abete (n = 288)%	Better life (n = 271)%
Wooden shack	12,000 (\$80)	14.6	34.7	30.6
Wooden on stilts	18,000 (\$120)	20.6	33.7	44.3
Mud	NA	0	2.4	0.4
Bungalow (concrete)	24,000 (\$160)	62.2	26.0	24.6
One storey (concrete)	36,000 (\$240)	2.4	3.2	0.4

n = sample size for each location, =N= Naira, NA = not available

They tell people, don't complain about your environment otherwise the State Government will evict you and will you suffer."
[(William, Badia Central, June 20, 2011)]

Not only did these politicians fail to deliver good and accountable governance, the fear mongering messages they peddled prevented the formation of an organized protest movement that could champion residents' causes. The messages also served as a social control to keep people docile and accommodating of their abysmal environmental and social *status quo*.

These pre-existing political, economic, social and environmental situations in Badia suggest the communities were highly vulnerable prior to the occurrence of the July, 2011 flooding. Their exposure and susceptibility to harm was further stimulated by the denial of housing rights, that is, the lack of 'enabling strategies' facilitated by the government to aid proper land reclamation, adequate shelter, decongestion, and good municipal governance. This confirms Cutter's (1996) argument about vulnerability being heightened by the co-existence of 'hazards of place' with structural inequalities that constrain individuals' rights and their ability to cope with hazards (Wisner et al., 2004; Watts and Bohle, 1993).

July 2011 rainstorm: Impacts and coping in Badia communities

The July, 2011 rainstorm left Badia submerged after Lagos received an unusual magnitude of rain in 18 hrs. About 70% of the total survey respondents mentioned that the flood water reached more than 3 feet in their living spaces and their dwelling was inundated for a week. Impacts of the flood on livelihoods, health and household properties are presented in Table 2. The data revealed many residents had to leave their accommodation to take shelter in the dilapidated Badia primary school and church premises. Some residents slept outdoors while others moved into relatives' houses in other parts of Lagos. Little financial assistance came from extended family members since many of them were affected by the city-wide flooding. Children and stay-at-home mothers were the most at risk due to the rapid accumulation of flood water around their homes and living spaces. Poor sanitation and structural inadequacies of shelters also significantly increased impacts on residents' health and safety. Sinking houses coincided with run-off accumulation causing injuries and death (Fig. 3). Flood waters swept urine, sewage and refuse from dumpsites into homes contaminating water sources and food, thereby increasing the spread of diseases such as typhoid, cholera and diarrhea (Fig. 2). More than 40% of the total survey respondents mentioned that at least one family member fell ill during the period. In total, 27 people reported the death of a household member. The highest impacts were experienced in Abete and Better life, and among women. Esther, a resident in Abete, stated that four women died in her community. She said:

"When it rained on July 10, the water could not flow. I know women who died on my street. The ones I know of were two

Table 2

Impacts on Badia slum households during the July rainstorm. Source: Author's field survey data of 607 households.

Impacts	Badia central % (n = 48)	Abete % (n = 288)	Better life % (n = 271)
Loss of assets/properties	100	100	94.1
Dwelling got damaged	91.7	79.5	78.6
Household members fell ill	56.3	60.8	48.7
Loss of family income	47.9	59.7	44.3
Children missed out on school	45.8	50.3	46.9
Displaced from home	14.6	81.9	37.6
Injured household members	10.4	19.4	14.4
Severe health problems	8.3	46.5	23.6

n = sample size for each location.

Yorubas and two Ghanaians. I hope you understand. In fact, on that day we could not sleep at home. There was stagnant water everywhere, which is not supposed to be so."

[(Esther, FGD, September 29, 2011)]

Residents' inability to engage in regular trading and livelihood activities during the period led to loss of income for most households (Table 2), thus making coping with the stress of paying for hospital bills, property replacement and home reconstruction, more difficult. To the dismay of many residents, external aid from government, civil society or private companies was not offered. With no source of income and limited social support, many families faced extreme hardship during the period. Coping strategies employed in the communities included the construction of temporary bridges with sandbags and transportation of victims to safer sites by canoes. These were facilitated by male volunteers. Women, on the other hand, attended to the ill and injured administering local herbs and drugs bought from the local chemist.

Factors responsible for low coping and reduced adaptive capacity

Weak pre-disaster preparedness and early warning

In much of disaster literature, early warning is considered a crucial lifesaving aspect of disaster risk reduction. It can enhance coping and also save lives when given in a timely manner and through appropriate medium. A question arises therefore: did the Badia residents receive early warning about the pending July rainstorm? Could early warning make a difference for a people with weak housing rights?

The Lagos State Government in collaboration with the Nigerian Meteorological Agency gave some general early warning a month prior to the July rainstorm. This was done via television, radio, and newspapers media and also through a bus-advocacy information team operating under the auspices of the Lagos State Waste Management Authority (LAWMA). LAWMA's mandate includes waste management and disposal service, flood control, evacuation, environmental pollution, and search and rescue operations. In early June 2011, the LAWMA team embarked on a street-by-street campaign asking people to clear their drainage channels and relocate from flood-prone areas such as Ajegungle, Iwaya, and Badia. These warnings of flood risks had little effect in Badia for three reasons.

First, *the medium of information transfer was inadequate*. About 59.3% of the total survey respondents reported that they did not receive the radio and TV warnings owing to the lack of electricity supply. Also, only a few people in Badia Central and Better Life acknowledged seeing the LAWMA bus-team. In Abete, 60% of respondents reported that they missed the bus-warning because there was no access road to their area. This meant that those who needed early warning the most did not receive it.

The second reason was *the distrust of the source of warning*. Approximately 27% of the total survey respondents that received the early warning and relocation directives did not act because of their lack of trust in the government. Corruption and public manipulation which has been the bane of governance in the Nigerian society has had a deleterious effect on people-to-government relationships. This problem prevented the people of Badia from trusting any information from government sources and agencies. FGD participants expressed the view that residents believed the relocation directives were a tactic to evict them from the area under the pretext of flood prevention. Such negative interpretation of the flood warning was not surprising given that Governor Raji Razaki in 1990 used a similar line of argument to forcibly evict over 300,000 slum residents from Maroko, an informal settlement in Victoria Island (Adelekan, 2010). The same Maroko land was later developed into an enclave for the Lagos elite, in spite of its susceptibility to sea level rise (French et al., 1995). Murray et al.

(2012) have shown in their case studies of disaster risk reduction, the importance of trust, good governance and the participation of people at risk in decision making processes including on early warnings.

A third reason why the Badia residents dismissed the flood warning was because of the lack of alternative shelters. Emergency shelters are part of an enabling strategy that can guarantee the safety of vulnerable groups during flood disasters. Without provisional shelters, interview participants mentioned that the flood warning made no difference to them since they had nowhere else to go. Some participants even referred to the warning as '*an unnecessary burden*' that served to create more anxiety in a high risk community. This shows that early warnings are alone never enough to save lives and properties in disaster situations; often poor people need additional assistance such as refuge places and transportation to these places (Murray et al., 2012). In the absence of such assistance, early warning given to vulnerable communities may be ineffective as the Badia case study suggests.

Diminished sense of environmental stewardship

Households and communities capacity to cope and adapt to climatic extremes depend in significant measures on the ways institutions and external actors regulate and structure their interactions with the communities and on the provision of a larger underpinning of resilience (Agrawal, 2010). Individual and collective actions that could foster resilience against flooding in Badia were constrained by the State Government's treatment of the area as being outside of the accepted urban regulatory and planning systems. Although Badia is demographically strategic to the government due to its voting weight, the community remains marginal in terms of having enabling support-systems and risk-reducing infrastructure (i.e. good roads, drainage systems, sewerage, and piped water) and services (including schools, health care and emergency services). Most roads in Badia, especially those along Church, Ireti and Giwa Street, remain swampy with no drainage channels. A branch of the Lagos Water Corporation is situated close to the community but residents are disconnected from access to piped water. Furthermore, access to health care services is a challenge as the closest public hospital is located in Apapa, about 6 km from Badia. Despite the fact that residents pay land-use tax to the State Government and tenement rates of N5,025 (\$43) per house to the Local Government, no commensurate improvement is seen in the provision of public services. Furthermore, rather than co-production of solutions to flooding in the area, the State Government adopts slum clearance as its preferred flood prevention strategy (SERAC, 2012). Within the last 20 years, Makoko and Badia have experienced frequent eviction and demolition on account of flood prevention and urban development. During an eviction exercise, not only are homes and properties destroyed, people sometimes die from a heart-attack caused by the trauma of watching their life-investments being damaged or from injuries inflicted by gun-toting security men. Worry and feelings of powerlessness over forced evictions has increased personal distress, diminished environmental stewardship, and also undermined proactive adaptation efforts in Badia. FGD participants, for example, expressed a reluctance to invest in quality housing because of the fear of forcible eviction and demolition. This was corroborated by survey respondents (Badia central 50%; Better Life 49.8%; Abete 61.8%) who reported little to no interest in engaging in communal actions to improve their local environment. Yet, without such collective efforts, residents' vulnerability may become heightened, consequently increasing the chances of negative impacts from future climatic hazards.

Stigma and social resources

Studies show that social resources such as micro-credit, and material and non-material assistance, can increase slum dwellers'

adaptive capacity and also enable them to overcome the negative effects of a disaster (Adger et al., 2003; Pelling and High, 2005; Braun and Abheuer, 2011). Such resources can come from government, private companies, civil society or social networks. In Badia, building up social resources was a struggle, especially for women. This was because of the high rate of crime, prostitution and violent conflicts which stimulated an undesirable public perception of Badia as a '*Bad Area*'. The phrase '*Bad Area*' carries a negative connotation and stigma that undermine women's ability to secure decent jobs, generate higher income and expand their social networks outside Badia. Two female graduate FGD participants, for example, expressed that they do not include their residential address on their curriculum vitae (CV) because of the fear of rejection by employers who believe they live in the '*Bad Area*'. Similarly, a market woman mentioned that she kept her residential address from other market women due to the fear of being ridiculed or ostracized on account of living in the '*Bad Area*'. The public's reluctance to employ or associate with Badia women creates an added hurdle to building up social resources and accessing micro-credit. In fact, savings groups that most low-income women generally rely on to manage risks and increase resilience by having quick access to loans were scarce in Badia. This was partly because the women had little money to save but also many were excluded from such safety nets due to their residential status. The irony here is that opportunities available for shelter in slums, also limits people's chances of escaping poverty, improving their marginal social status, forging stronger social networks, and building safer homes and safer environmental conditions to withstand climatic stress.

Under these circumstances, a human rights framework can serve as an organizing tool to bring visibility to the hidden and socially constructed limitations on the adaptive capacity of diverse groups and communities in Badia. Since such a framework is inherently concerned with issues of discrimination, vulnerability and those whose rights are most at risk, it can also be utilized as an empowerment tool to put more pressure on the government to implement enabling strategies that can facilitate self-help housing initiatives including other innovative efforts by residents to upgrade their homes, improve health and environmental conditions, create a more resourceful community, build stronger social networks and, by extension, build up their adaptive capacity.

Conclusion

The findings from this study build upon the literature on slums, housing and climate change vulnerability. The study demonstrates that impacts of climatic hazards on slum communities are influenced by multiscaled historical, social, economic, environmental, and political factors and their interaction with housing issues and associated tenure rights. Empirical data from the Badia case study revealed that forcible evictions, poor environmental conditions, waste-filling, inadequate housing, and the lack of risk-reducing infrastructures, all served to engender vulnerability to flooding. Successful coping and adaptation to the changing climate was constrained by inadequate early warning, lack of tenure rights, marginalisation in governance, and social stigma. These factors affected the chances of building a strong base of social and economic resources that could enhance adaptive capacity. Broadly speaking, these are problems linked to the State's failure to create maximally conducive conditions that could allow people to have sustained and suitable housing in safe locations including opportunities to improve their own standard of living and social structures for joint-problem solving.

This study underscores the need for a new mode of engagement with slum communities and for renewed efforts at strengthening their adaptive capacity through inclusive urban governance and

realization of housing rights. A first step towards inclusion is to formally recognise slum communities as an integral part of the urban fabric with cultural, political, economic and social contributions. This recognition should go beyond having voting rights during elections to more meaningful participation in governance via institutional structures that facilitate genuine representation and give a voice to the concerns of slum dwellers. Integrated and inclusive urban development is, of course, difficult particularly in a socially divided and class-based city such as Lagos. Nonetheless, proactive efforts made to legally enforce the 'active participation' of low-income groups in urban planning and management will go a long way.

Furthermore, incremental slum upgrade programs are needed to reduce long-standing environmental risks, improve housing quality, and increase available risk-reducing infrastructures and services. In addition to upgrades, security of tenure should be granted in order to foster a sense of co-ownership that could promote the development of better housing structures and healthier environmental conditions. Poverty alleviation programs are also necessary to strengthen the asset base of low-income households so they can have the wherewithal to invest in household facilities that can aid resilience against flood disaster. In the event of extreme weather conditions, informal warning strategies that are based on community communication structure should be used to augment formal early warning systems. Furthermore, urban planners and policy makers have to make a shift from a top-down technocratic approach to flood management to bottom-up approaches that embrace citizen's perspectives and appreciate their personal struggles in negotiating between 'a place to live' and 'spaces of vulnerability'. In other words, an integrated approach that offers a more holistic response to flood prevention should be given more credence over piecemeal measures such as slum clearance which undermines the housing rights of the urban poor. Over the last six decades, the language of rights has proven to be successful – from civil rights movements, to women's issues, and to the demands of indigenous people. It has also been relatively successful in the context of South Africa with the shack-dwellers movement's struggle for delivery of housing, land and basic services (Bryant, 2008). This language can and should be appropriated by slum communities in Lagos to negotiate and resist the reproduction of asymmetrical power relations and structural inequalities that serve to perpetuate their vulnerability to flooding and related-climatic hazards.

Since climate change and extreme weather events are likely to become more common in the future, it is expected that findings and recommendations from this study will motivate urban planners and policy makers to consider housing and the associated rights of the urban poor as part of an integrated strategy on adaptation and urban resilience. Further research on how housing for the urban poor can be integrated into cities' adaptation planning and policy is therefore warranted.

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References

Abiodun, J., 1976. Housing problems in Nigerian cities. *Town Plann. Rev.* 47 (4), 330–348.
 Abosede, F., 2006. Housing in Lagos megacity: improving livability, inclusion and governance. In: International Conference on "Building Nigeria's Capacity to

Implement Economic, Social and Cultural Rights: Lessons Learned, Challenges and the Way Forward". Abuja, 27–28 September.
 African Charter on Human and Peoples' Rights (ACHPR), 1981. Adopted June 27, 1981, OAU Doc. CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), Entered into Force October 21, 1986.
 Action Aid, 2006. Climate Change, Urban Flooding and the Rights of the Urban Poor in Africa: Key Findings from Six African Cities. London, UK: Action Aid International. <http://www.actionaid.org.uk/doc_lib/urban_flooding_africa_report.pdf>.
 Adams, K., 2009. Do we need a right to housing? *Nevada Law J.* 9, 275–323.
 Adelekan, I., 2010. Vulnerability of poor urban coastal communities to flooding in Lagos, Nigeria. *Environ. Urban.* 22 (2), 433–450.
 Adger, N., 2003. Social capital, collective action, and adaptation to climate change. *Econ. Geogr.* 79 (4), 387–404.
 Adger, N., 2006. Vulnerability. *Global Environ. Change* 16 (3), 268–281.
 Adger, N., Kelly, P., 1999. Social vulnerability to climate change and the architecture of entitlements. *Mitig. Adapt. Strat. Glob. Change* 4, 253–266.
 Adger, N., Huq, S., Brown, K., Conway, D., Hulme, M., 2003. Adaptation to climate change in the developing world. *Progress Develop. Stud.* 3 (3), 179–195.
 Agbola, T., Agunbiade, E., 2009. Urbanization, slum development and security of tenure: the challenges of meeting Millennium Development Goal 7 in Metropolitan Lagos, Nigeria. In: De Sherbinin, A., Rahman, A., Barbieri, J., Fotso, C., Zhu, Y. (Eds.). *Urban Population-Environment Dynamics in the Developing World: Case Studies and Lessons Learned*, pp. 77–106 Paris.
 Agbola, T., Jinadu, A., 1997. Forced eviction and forced relocation in Nigeria: the experience of those evicted from Maroko in 1990. *Environ. Urban.* 9 (2), 271–288.
 Agrawal, A., 2010. Local institutions and adaptation to climate change. *Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*. Washington DC, World Bank, pp. 173–198.
 Ajibade, I., McBean, G., Bezner-Kerr, R., 2013. Urban flooding in Lagos, Nigeria: patterns of vulnerability and resilience among women. *Global Environ Change* 23 (6), 1714–1725.
 Baker, J., 2012. Climate Change, Disaster Risk, and the Urban Poor: Cities Building Resilience for a Changing World. Washington, DC: World Bank. <<https://openknowledge.worldbank.org/handle/10986/6018>>.
 Barnett, J., 2010. Human rights and vulnerability to climate change. In: Humphreys, S. (Ed.), *Human Rights and Climate Change*. University of Cambridge, UK, pp. 257–271.
 Baxter, J., Eyles, J., 1997. Evaluating qualitative research in social geography: establishing rigour in interview analysis. *Trans. Inst. Br. Geogr.* 22, 505–525.
 Bicknell, J., Dodman, D., Satterthwaite, D., 2009. Adapting Cities to Climate Change Understanding and Addressing the Development Challenges. Earthscan, London, UK.
 Blaikie, P., Brookfield, H., 1987. *Land degradation and society*. Methuen.
 Blaikie, P.C., Cannon, T.T., Davis, I., Wisner, B., 1994. *At Risk: Natural Hazards, People's Vulnerability, and Disasters*. Routledge, London.
 Blanden, J., Gregg, P., 2004. Family income and educational attainment: a review of approaches and evidence for Britain. *Oxford Rev. Econ. Policy* 20 (2), 245–263.
 Braimoh, A., Onishi, T., 2007. Spatial determinants of urban land use change in Lagos, Nigeria. *Land Use Policy* 24, 502–515.
 Bratt, R., Stone, M., Hartman, C. (Eds.), 2006. *A Right to Housing: Foundation for a New Social Agenda*. Temple University Press, Philadelphia, United State.
 Braun, B., Abheuer, T., 2011. Floods in megacity environments: vulnerability and coping strategies of slum dwellers in Dhaka/Bangladesh. *Nat. Hazards* 58 (2), 771–787.
 Bryant, J., 2008. Towards delivery and dignity community struggle from Kennedy Road 1. *J. Asian African Stud.* 43 (1), 41–61.
 Cannon, T., Muller-Mahn, D., 2010. Vulnerability, resilience and development discourses in context of climate change. *Nat. Hazards* 55, 621–635.
 Chenwi, L., 2011. Socio-economic gain and losses: the South African constitutional court and social change. *Soc. Change* 41 (3), 427–444.
 COHRE Report, 2006. Forced Evictions: violations of human rights – Global Survey No. 10. <http://www.cohre.org/sites/default/files/global_survey_on_forced_evictions_10_dec_2006.pdf>.
 Cutter, S., 1996. Vulnerability to environmental hazard. *Prog. Hum. Geogr.* 20 (4), 529–539.
 Cutter, S., Emrich, C., Webb, J., Morath, D., 2009. *Social Vulnerability to Climate Variability Hazards: A Review of the Literature*. Hazard and Vulnerability Research Institute, Final Report to Oxfam America.
 Davis, M., 2006. *Planet of slums*. Verso, London; New York.
 De Sherbinin, A., Schiller, A., Pulsipher, A., 2007. The vulnerability of global cities to climate Hazards. *Environ. Urban.* 19 (1), 39–64.
 Displacement Solutions, 2010. Climate change displaced persons and housing, land and property rights. Preliminary Strategies for Rights-based Planning and Programming to Resolve Climate Induced Displacement. <http://displacement-solutions.org/files/documents/DS_Climate_change_strategies.pdf>.
 Douglas, I., Kurshid, A., Maghenda, M., McDonnell, Y., McLean, L., Campbell, J., 2008. Unjust waters: climate change, flooding and the urban poor in Africa. *Environ. Urban.* 20 (1), 187–205.
 Fajemirokun, B., 2004. Gender perspectives in access to adequate housing in Nigeria. In: International Conference on Adequate & Affordable Housing for All Research, Policy, Practice. Toronto, June 24–27.
 Feiden, P., 2011. *Adapting to Climate Change: Cities and the Urban Poor*. International Housing Coalition, Washington, DC.

- Filani, M., 2011. A City in Transition: Vision, Reform, and Growth in Lagos, Nigeria. <<http://www.foresightfordevelopment.org/sobipro/55/160-a-city-in-transition-vision-reform-and-growth-in-lagos-nigeria>>.
- Forrest, T.G., 1993. Politics and Economic Development in Nigeria. Westview Press, Boulder, CO, pp. 68–69.
- French, G.T., Awosika, L.F., Ibe, C.E., 1995. Sea-level rise and Nigeria: potential impacts and consequences. *J. Coastal Res.*, 224–242.
- Gandy, M., 2005. Planning, anti-planning and the infrastructure crisis facing metropolitan Lagos. *Urban Studies* 43 (2), 371–396.
- Goebel, A., 2007. Sustainable urban development? Low-cost housing challenges in South Africa. *Habitat Int.* 31 (3), 291–302.
- Greene, J., Caracelli, V., Graham, W., 1989. Towards a conceptual framework for mixed-method evaluation designs. *Educ. Evaluat. Policy Anal.* 11 (3), 225–274.
- Hanson, S., Nicholls, R., Ranger, N., Hallegatte, S., Corfee-Morlot, H., Chateau, J., 2011. A global ranking of port cities with high exposure to climate change. *Climatic Change* 104, 89–111.
- Herbst, J., Olukoshi, A., 1994. Nigeria: economic and political reforms at cross purposes. In: Haggard, Stephan, Webb, Steven (Eds.), *Voting for Reform: Democracy, Political Liberalization, and Economic Adjustment*. Oxford University Press, USA, pp. 453–502.
- Ibem, E., 2010. An assessment of the role of government agencies in public-private partnerships (PPPs) in housing delivery in Nigeria. *J. Constr. Develop. Count.* 15, 1–22.
- Ibem, E., Anosike, M., Azuh, D., 2011. Challenges in public housing provision in the post independent era in Nigeria. *Int. J. Human Sci.* 8 (2), 421–443.
- International Covenant on Economic, Social and Cultural Rights (ICESCR), 1976. Adopted and Opened for Signature, Ratification and Accession by General Assembly Resolution 2200A (XXI) of 16 December 1966, Entry Into Force 3 January 1976.
- Ilesanmi, A., 2010. Urban sustainability in the context of Lagos mega-city. *J. Geogr. Region. Plan.* 3 (1), 240–252.
- Immerwahr, D., 2007. The politics of architecture and urbanism in postcolonial Lagos, 1960–1986. *J. African Cult. Stud.* 19 (2), 165–186.
- IPCC, 2012. Summary for policymakers. In: Managing the risks of extreme events and disasters to advance climate change adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge University Press, UK, pp. 1–19.
- IPCC, 2014. Summary for Policymakers. In: Field, C.B., Barros, V.R., Mastrandrea, M.D., Mach, K.J. (Eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Jimoh, H., Omole, K., Omosulu, B., 2013. An examination of urban renewal exercise of Badia East of Lagos State, Nigeria. *Int. J. Edu. Res.* 1 (5), 1–14.
- Kenna, P., 2005. Housing rights – the new benchmarks for housing policy in Europe? *URB. Law.* 87, 92, 37.
- Kidd, P., Parshall, M., 2000. Getting the focus and the group: enhancing analytical rigor in focus group research. *Qual. Health Res.* 10 (3), 293–308.
- Kohl, M., 2001. Subsidence and Sinkholes in East Tennessee. A Field Guide to Holes in the Ground. State of Tennessee Department of Environment and Conservation, Division of Geology. Public Information Series No. 1. <<http://www.tn.gov/environment/tdg/maps/pdf/sinkhole.pdf>>.
- Kreimer, A., Arnold, M., Carlin, A., 2003. *Building Safer Cities: The Future of Disaster Risk*. World Bank Publications.
- Leckie, S., 1995. The justiciability of housing rights. The Right to Complain about Economic, Social and Cultural Rights-SIM Special, vol. 18, p. 35.
- Litman, T., 2006. Lessons from Katrina and Rita: what major disasters can teach transportation planners. *J. Transport. Eng.* 132 (1), 11–18.
- Makinwa, A., 1987. Management of social services for the poor: The case of Badiya Lagos. *Regional Development Dialogue* 8 (4), 138–162.
- Mabogunje, A., 1990. Urban planning and the post-colonial state in Africa: a research overview. *African Stud. Rev.* 33 (2), 121–203.
- Major, D., Omojola, A., Dettinger, M., Hanson, R., Sanchez-Rodriguez, R., 2011. Climate change, water, and wastewater in cities. In: Rosenzweig, C., Solecki, W.D., Hammer, S.A., Mehrota, S. (Eds.), *Climate change and cities: first assessment report of the urban climate change research network*. Cambridge University Press, UK, pp. 113–143.
- McCarthy, J., Canziani, J., Leary, N., Dokken, D., White, K. (Eds.), 2001. *Impacts, adaptation, and vulnerability. Contribution of working group II to the third assessment report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, UK, pp. 343–379.
- Morka, F., 2007. A place to live: a case study of the Ijora-Badia community in Lagos, Nigeria. Case Study prepared for Global Report on Human Settlements. <<http://www.unhabitat.org/grhs/2007>>.
- Morka, F., 2011. A Place to Live: Resisting Evictions in Ijora-Badia, Nigeria. In: White, L., Perelman, J. (Eds.), *Stones of Hope: How African-Activists Reclaim Human Rights to Challenge Global Poverty*. Stanford University Press, Stanford.
- Murray, V., McBean, G.M., Bhatt, M., Borsch, S., Cheong, S., Erian, L. S., Nadim, F., Nunez, M., Oyun, R., Suarez, A., 2012. Case studies. In: Field, C.B., Barros, V., et al. (Eds.), *Managing the risks of extreme events and disasters to advance climate change adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC)*. Cambridge University Press, UK, pp. 487–542.
- Mutter, C., Barnard, K., 2010. Climate Change, evolution of disasters and inequality. In: Humphrey, S. (Ed.), *Human rights and Climate Change*. University of Cambridge, UK.
- Nigeria Land Use Act, 1978. <<http://www.nigeria-law.org/Land%20Use%20Act.htm>>.
- Nigeria Meteorological Agency (NIMET), 2011. Nigeria: Flooding will Continue. <<http://aidnews.org/nigeria-flooding-will-continue-nimet-niomr/>>.
- Nwaka, G.I., 2005. The urban poor, the informal city and environmental health policy in Nigeria. *Soc. Sci. Socio-Econ. Transform. Africa* 237, 1–18.
- O'Brien, K., Leichenko, R., 2000. Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environ. Change* 10 (3), 221–232.
- O'Brien, K., Sygna, L., Haugen, J., 2004. Resilient or vulnerable? A multi-scale assessment of climate change impacts and vulnerability in Norway. *Climat. Change* 64, 193–225.
- Odulana, J., 1997. Effects of employment on the families of African working mothers: the case of Nigeria. In: Frankel, J. (Ed.), *Families of Employed Mothers: An International Perspective*. Garland, New York.
- Oladunjoye, M., 2011. Nigeria: July 10 flooding –Lagos gives relief materials to victims. *Daily Champion Newspaper*. <<http://allafrica.com/stories/201109080792.html>>.
- Oldfield, S., 2000. The centrality of community capacity in state low-income housing provision in cape town, South Africa. *Int. J. Urban Reg. Res.* 24 (4), 858–872.
- Olotuah, A., Bobadaye, S., 2009. Sustainable housing provision for the urban poor: a review of public sector intervention in Nigeria. *Built Human Environ Rev.* 2, 51–63.
- Olukoju, A., 1993. Population pressure, housing and sanitation in West Africa's premier port city: Lagos, 1900–1939. *Great Circle* 15, 91–106.
- Peil, M., 1991. Lagos: The City is the People. Belhaven Press, London.
- Pelling, M., 1999. The political ecology of flood hazard in urban Guyana. *Geoforum* 30 (3), 249–261.
- Pelling, M., High, C., 2005. Understanding adaptation: what can social capital offer assessments of adaptive capacity? *Global Environ. Change* 15, 308–319.
- Satterthwaite, D., 2013. The political underpinnings of cities' accumulated resilience to climate change. *Environ. Urban.* 25 (2), 381–391.
- Sen, A., 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Clarendon, Oxford.
- SERAC – Social and Economic Rights Action Center, 2012. Lagos State demolition of Makoko. <<http://www.serac.org/newsDetail.asp?id=111&News=true>> (retrieved 30.11.12).
- Sharma, S., Sethi, R., Rohtagi, A., Chaudhary, A., Shankar, R., et al., 1998. Indoor air quality and acute lower respiratory infection in Indian urban slums. *Environ. Health Perspect.* 106, 291–297.
- Universal Declaration on Human and Peoples Rights (UDHR), 1948. G.A. res. 217A (III), U.N. Doc A/810 at 71.
- Udoka, C., Anyinyang, R., 2010. Relationship between external debt management policies and economic growth in Nigeria (1970–2006). *Int. J. Finan. Res.* 1 (1), 1–13.
- UNDP, 2004. *Reducing Disaster Risk: A Challenge for Development*. A Global Report. UNDP, New York.
- UNDP, 2006. *Beyond Scarcity: Power, Poverty and the Global Water Crisis*. Human Development Report 2006. New York: UNDP.
- UNDP, 2007. *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World*. Oxford University Press for UNDP.
- UN-HABITAT, 2010. *State of the World's Cities 2010 – 2011 – Cities for All: Bridging the Urban Divide*. Earthscan, London.
- United Nations, 2000. *United Nations Millennium Declaration adopted by the UN General Assembly*. <<http://www.un.org/millennium/declarationareas552e.htm>>.
- Wahlstrom, M., 2003. Meeting the Long Term Challenge of Global Warming: A European Perspective. In: Michel, D. (Ed.), *Climate Policy for the 21st Century: Meeting the Long-term Challenge of Global Warming (Center for Transatlantic Relations)*, pp. 17–25.
- Watts, M., Bohle, H., 1993. Hunger, famine and the space of vulnerability. *GeoJournal* 30 (2), 117–125.
- Wisner, B., Blaikie, P., Cannon, T., Davis, I., 2004. *At risk: Natural Hazards, People's Vulnerability and Disasters*, 2nd ed. Routledge, London.
- World Bank, 2006. Project appraisal document on a proposed credit in the amount of US\$200.00 Million to the Federal Republic of Nigeria, for the Lagos Metropolitan Development and Governance Project (Report No. 36433-N).
- Yeung, Y.M., 1991. The urban poor and urban basic infrastructure services in Asia: past approaches and emerging challenges. Occasional Paper No. 7. Hong Kong Institute of Asia-Pacific Studies. The Chinese University of Hong Kong.