



At Risk: Environmental Mobility in African Coastal Cities

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Executive Summary

Migration and displacement due to environmental change have acquired considerable importance in migration policy. Africa is the most vulnerable continent to climate variability and change and already experiences significant environmental mobility.¹ Future projections indicate that climate change will accelerate and diffuse mobility patterns, and the region is expected to witness the largest environmental migration.

For many migrants searching for new opportunities and fleeing adverse climate conditions, the places of where they find refuge are often low-income informal neighborhoods that lack access to jobs, housing, and services. The location and living conditions in these settlements often put migrants and host communities at environmental risk, perpetuating a cycle of displacement and compromising the adaptation outcomes to a changing climate. Improving conditions by focusing on these destination areas is crucial to harnessing the positive effects of migration on people and cities. To do so, we need better knowledge and data for discerning environmental mobility patterns, understanding household choices, and capturing neighborhood conditions and how these could be improved.

Climate Mobilities in African Cities: Core Findings

This report summarizes findings from **Climate Mobilities in African Cities**, a participatory research initiative conducted in four African coastal cities: Accra, Ghana; Dar es Salaam, Tanzania; Freetown, Sierra Leone; and Monrovia, Liberia. It focuses on the adaptation outcomes of migration and documents the environmental risks and challenges faced by migrants and hosts in destination locations. The project addresses two crucial shortcomings regarding knowledge of environmental migration. It generates new data on mobility and the vulnerabilities occurring in informal settlements. It promotes the inclusion of local communities in documenting environmental mobility,

a complex process still poorly understood and in need of local perspectives. The participatory aspect of the initiative, in collaboration with grassroots Community-Based Organizations (CBOs) in the four cities, provides a scalable and cost-effective method that could be expanded and operationalized across cities in Africa.

Findings from the community-led data collection highlight the role of low-income neighborhoods as in-migration hotspots within the cities. In those areas, the life of migrants and hosts is shaped by both immobility and recurring mobility due to the compounding environmental risks.

The analysis points to diverse movements in terms of time and distance. The majority of recent migrants report having moved at least twice before arriving in their current neighborhood. Only a small share of respondents considered environmental change as the unique trigger of mobility. However, 11% of respondents included environmental change among the reasons influencing their decision to migrate, along with economic, social, political, conflict, and food insecurity reasons.

The results confirm that mobility can also end with migrants finding themselves in conditions of significant marginalization. The lack of physical, social, and financial capital does not leave options to households beyond settling in informal areas vulnerable to climate change. This finding points to the need for careful consideration of the adaptation outcomes of migration as well as to instances where populations might be willing but are unable to move.

¹ For the purposes of this paper, environmental mobility is defined as voluntary and forced mobility in response to environmental events, including floods, storms, sea-level rise, extreme heat, fires, drought, earthquakes, tsunamis, and other weather-related and geophysical causes.

Recommendations

Distilling from the evidence generated by local communities, we provide recommendations aiming to improve environmental mobility outcomes. These recommendations address knowledge and data, as well as actions at the neighborhood, citywide, and national levels.

Solving the Information Problem: Developing Knowledge on Climate Migration

1. Involve civil society organizations in developing local knowledge and participating in responses and actions addressing environmental mobility challenges.

The solutions to the challenges posed by environmental mobility should be developed and formulated with the strong involvement of those affected, including migrant and host populations. Donors, governments, and municipalities can support grassroots organized communities that provide inputs on the perceptions, decision-making, preferences, and challenges related to mobility. This cost-effective data collection mechanism can enhance participation and accountability, both in horizontal relations – within members of a community, and vertically – between communities, the state, and local governments.

2. Combine local data with model projections to plan before the forthcoming migration.

The combination of new technologies, methods, and models projecting future migration flows and neighborhood-level data brings tremendous potential. It offers the basis for operational monitoring of migration flows that uses both local inputs and population modeling to improve the accuracy of population projections and inform on the future movements of people.

Improving Resilience in Destination Neighborhoods and Increasing Residential Options

3. Provide targeted assistance in destination areas through investments in in-situ adaptation and infrastructure at the neighborhood level.

The targeted assistance in destination neighborhoods through investments in in-situ adaptation and infrastructure at the neighborhood level is a necessary first step to improving the outcomes of environmental mobility. For many poor areas in African cities where service provision remains informal, the most obvious, and in many cases the only realistic option, is to work with community groups to undertake and manage the local shared public goods needed at the neighborhood level. This approach can improve neighborhood conditions and mitigate the compounding risks associated with high density, lack of services, and environmental hazards in informal areas.

4. Prepare future residential areas before housing development occurs

Preparing future neighborhoods to respond to urban growth is a parallel and complementary action to the targeted assistance in neighborhoods that already represent destination areas for migrants. An effort to decongest overcrowded settlements is through the provision of serviced plots in areas where cities will be expanding their physical footprint. This effort can benefit from current technologies that allow for simplified approaches in service delivery and new building technologies that can meet the high demand for housing.

5. Develop attractive relocation options in proximity to opportunities.

Incorporating local communities in the planning and selection of sites for relocation can improve relocation processes. Community-led surveys, like those undertaken under this initiative, can provide the baseline for understanding people's preferences and needs for relocation. While existing international standards can provide guidelines, cities and communities can set principles that reflect better local concerns.

Recommendations for Citywide Responses

6. Plan ahead before the forthcoming demographic and physical expansion of cities.

In the context of rapid urban growth through the natural increase of the urban population and migration, cities need to plan for their future growth. Beyond environmental mobility projections, planning before the forthcoming demographic and physical expansion of cities and protecting environmentally sensitive areas can increase available land for housing and reduce the impact of future environmental and ecological risks.

7. Revise and adapt land use regulations and building standards to better reflect the low incomes of households and incorporate environmental hazards in urban planning.

Many zoning and building regulations in African cities were not set according to the income levels of their residents but rather, implemented under colonial rule. Revising and adapting these regulations can provide standards that respond to climate hazards and align better with residents' incomes. A more enabling regulatory environment can increase land availability for housing in safe locations.

Recommendations for National Responses

8. Mainstream migration in national urban strategies.

At the sub-national level, many countries in Africa have enacted policies that aim to reduce rural to urban migration. In contrast, national governments should be mainstreaming migration into urban agendas so that policies acknowledge that migration, though not the sole factor of urban population increase, will continue to contribute to the growth of cities.

9. Develop urban-rural linkages that facilitate mobility within and between countries.

Frameworks, norms, and processes managing mobility, internal and cross-border, have a role to play in the rural-to-urban transition through the facilitation of movements towards more productive urban areas in the region. Removing barriers to internal mobility will increase destination choices and improve labor allocation.

Introduction

Environmental mobility through migration and displacement due to environmental change has acquired considerable importance in migration policy (see Hartmann, 2010; Bettini, 2013; Piguet et al. 2018; Hoffmann et al. 2019).²

Africa is the most vulnerable continent to climate variability and change, a situation aggravated by the interaction of multiple stresses, including high dependence on rain-fed agriculture, widespread poverty, and weak adaptive capacity.

(African Union, 2014: 1)

Future projections indicate that climate change will accelerate and diffuse mobility patterns, with the region expected to witness the largest environmental migration (Rigaud et al. 2018; Rigaud et al. 2021; Clement et al. 2022).

Most environmental movements are expected to be internal, within countries, with cities increasingly becoming destination areas for migrants (Niang et al. 2014; Dodman et al., 2022). Through its ongoing rapid urbanization, Africa experiences significant population shifts toward rapidly growing cities (Kessides, 2005; Jedwab et al. 2014). Migration and displacement from climate-hit rural areas will contribute to these flows. For many migrants searching for new opportunities and fleeing adverse climate conditions, the places of refuge are low-income informal neighborhoods that lack access to jobs, housing, and services (Marx and Suri, 2013). The location and living conditions in these settlements often put migrants and host communities at environmental risk, perpetuating a cycle of displacement and compromising the adaptation outcomes of migration. Improving conditions by focusing on these destination areas and the adaptation outcomes of migrants and their hosts is crucial. To do so, we need better knowledge and data for discerning environmental mobility patterns, understanding household

choices, and capturing neighborhood conditions and how these could be improved.

Climate Mobilities in African Cities is a pioneering community-led initiative that addresses the lack of local data necessary to generate action on climate migration. It provides an underrepresented local perspective of environmental mobility in Accra, Ghana; Dar es Salaam, Tanzania; Freetown, Sierra Leone, and Monrovia, Liberia. The project highlights the community experiences and perceptions of the environment as a mobility driver. It generates evidence to support policies that address the needs of migrants and their hosts. The objective is to inform policy processes that address mobility challenges under a changing climate.

This report summarizes findings from data collection undertaken in four coastal cities of sub-Saharan Africa. It highlights settlements that are destination areas for migrants and focuses on the environmental risk and challenges in those destination locations. This initiative addresses two crucial shortcomings regarding our knowledge of environmental migration:

First, it generates new data on mobility and the vulnerabilities occurring in informal settlements, the destination areas for many migrants. Therefore, it responds to the lack of data on human mobility, specifically climate-induced mobility.

Second, it focuses on the inclusion of local communities in documenting environmental mobility, a complex process still poorly understood and in need of local perspectives. Given how individual perceptions and contextual factors influence migration decisions, mobilizing the knowledge of migrants and hosts is necessary to gain a richer understanding that can guide policies and action (Boas et al. 2019). Such perspective is essential for cities that are vulnerable to the impacts of climate change and experience significant population growth but lack information resulting in a limited ability to plan and respond to peoples' needs.

² For the purposes of this paper, environmental mobility is defined as voluntary and forced mobility in response to environmental events, including floods, storms, sea-level rise, extreme heat, fires, drought, earthquakes, tsunamis, and other weather-related and geophysical causes.

The participatory aspect of the initiative, in collaboration with grassroots Community-Based Organizations (CBOs) in the four cities, provides a scalable and cost-effective method that could be expanded and operationalized across cities in Africa. It can complement regional efforts to document and address climate mobility, such as the **Africa Climate Mobility Initiative (ACMI)**. It can also be integrated into citywide data initiatives in low-income urban settings, such as the *Know Your City* data campaign by Slum/Shack Dwellers International, a network of organized communities experienced in data collection operating in approximately 300 cities across Africa.

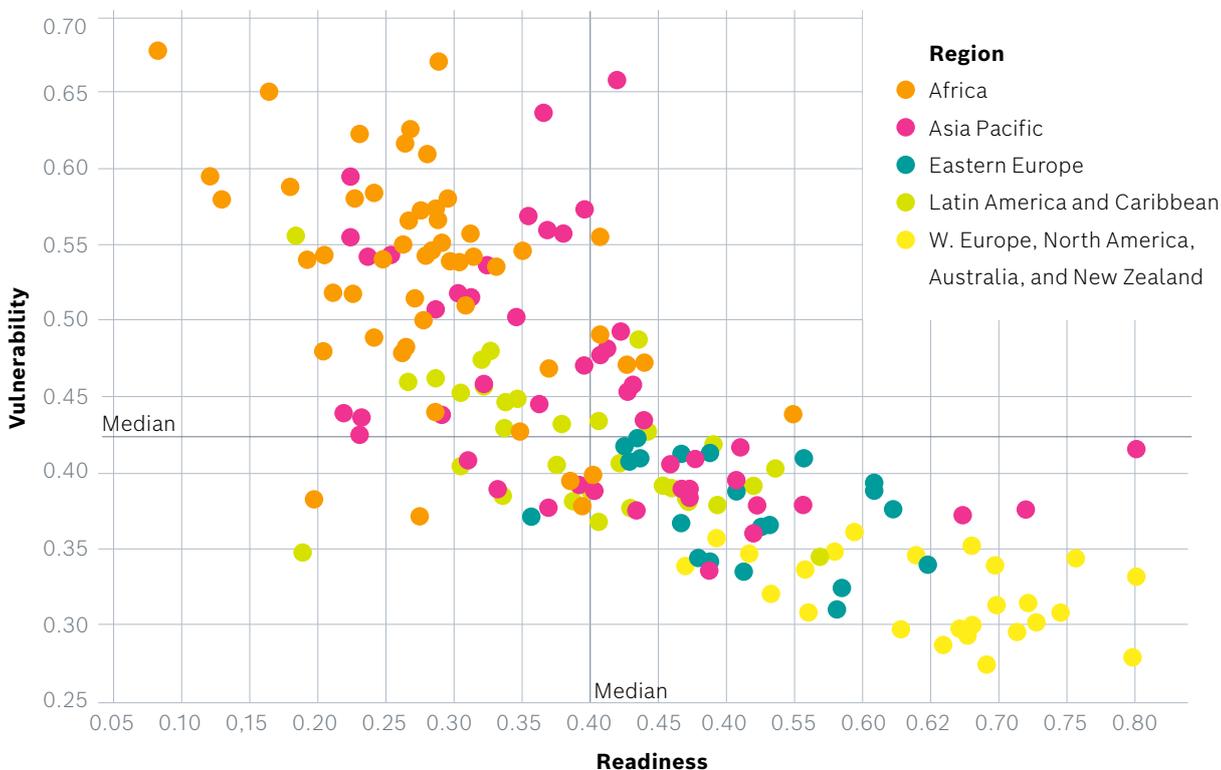
The organization of the rest of the report is as follows: a first section summarizes the recent evidence on environmental mobility in Africa. It provides a broad regional context that places environmental mobility within development trends and briefly reviews the characteristics of environmental mobility in the region. A second section discusses the main findings of the initiative, drawing from an analysis of survey data collected and focus group discussions that took place in the four cities. The third section provides recommendations for improving the governance of environmental mobility.

Environmental Mobility in Africa: the Evidence

Africa is one of the world's regions most vulnerable to climate change. Compared to other regions, it will witness significant environmental mobility (Niang et al. 2014). The effects of slow-onset environmental change and extreme weather events already impacting local livelihoods and food security will continue to contribute to regional mobility (Honda et al. 2014; Dodman et al. 2022). Environmental

migration is sensitive not only to climate factors. Countries in the region are expected to face compounding risks due to the socioeconomic, demographic, and settlement characteristics of populations and the current low adaptive capacity to a changing climate. As shown in Figure 1, most countries characterized by high climate vulnerability and low readiness are African nations (top left region of the figure).

Figure 1: Climate Vulnerability – Readiness Matrix by Country³



Source: ND-GAIN data (2019)

3 The ND-GAIN Country Index summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience and leverage private and public sector investment for adaptive actions. It aims to help governments, businesses and communities better prioritize investments for a more efficient response to the immediate global challenges ahead. More information on the ND-GAIN Country Index at: https://gain.nd.edu/assets/254377/nd_gain_technical_document_2015.pdf.

Projections indicate that internal migration due to climate change will be more significant in Africa in comparison to other world regions. More than half of the expected internal climate migration flows will occur within sub-Saharan Africa, the most vulnerable sub-region of the continent. The regional evidence points to a wide range of mobility trajectories and outcomes, from environmental change playing an indirect role to it having significant impacts on human mobility.

1. Environmental change interacts with other migratory factors.

It is difficult to disentangle the effects of environmental change on migration from other migratory reasons (economic, social, political, and demographic changes, conflict, and insecurity) occurring within and across countries (Geddes, et al. 2012). Often the main channel through which environmental change affects migration patterns is an indirect one: by enhancing the magnitude of the effect of other migration drivers (demographic, socioeconomic, and political factors) and aggravating the role of push factors such as conflict and instability (Conte and Migali, 2019). Therefore, environmental change increases the probability that people will move out in search of better economic opportunities. Environmental degradation acts as a push factor via the reduction of economic means in the place of origin and the need for diversifying income and seeking new economic opportunities (Neumann et al. 2015).

2. Environmental mobility patterns will remain largely internal and intraregional, often within sub-regions of the Continent.

By 2050 up to 86 million internal migrants will move due to slow-onset climate change.

(Rigaud et al. 2018)

By 2050, West Africa alone could see up to 32 million internal migrants due to the effects of slow onset climate impacts (water scarcity, declines in crop productivity and ecosystem productivity, sea level rise, storm surge) (Rigaud et al. 2021). Environmental mobility occurs predominantly within borders (Tacoli, 2009). There is evidence of short-distance cross-border movements, particularly in the Sahel during extensive periods of drought and also

due to flooding from high-intensity rainfall events that will increase (Hummel, 2016; Simpkins, 2018). Research also documents a few instances where movements outside the continent with drought and localized shocks to agriculture due to temperature rise increase asylum applications from conflict-prone areas (Missirian and Schlenker, 2017; Abel et al., 2018). However,

it is not expected that environmental change will systematically generate mass migration from Africa to other regions, including Europe

(Borderon et al. 2019).

3. Environmental mobility will contribute to rural-to-urban migration.

Environmental mobility contributes to migration flows associated with Africa's urbanization, a process that occurs rapidly, at high fertility rates and lower income levels than other regions. An empirical analysis of rural-to-urban migration in the region suggests that the decline in rainfall due to climate change has intensified urbanization patterns, unlike in other developing regions (Barrios et al. 2006). However, this pattern varies by city size and the socioeconomic characteristics of urban dwellers. In more developed urban economies (manufacturing and services), drier conditions due to climate change drive migration from rural areas toward cities. Conversely, in cities with less developed economies (market towns predominantly relying on agriculture), drying conditions have less impact on rural-to-urban migration (Henderson et al. 2017).

The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC: 2021: 8) notes that: "African cities represent hotspots of climate change risks and climate-induced in-migration which could amplify pre-existing stresses related to poverty, informality, exclusion, and governance." Recent models that estimate climate-induced internal migration show that urban coastal and delta areas represent destination areas. Still, by 2050 this trend is reversed, and coastal urban areas are forecast to be net source areas for climate mobility. The main driver for movements out of coastal areas is flooding from sea level rise, which is projected to be highest in the coastal areas around West Africa (Rigaud, 2021; ACMI, 2022).

4. While mobility is an adaptation response to environmental change, it is not available to the most vulnerable populations.

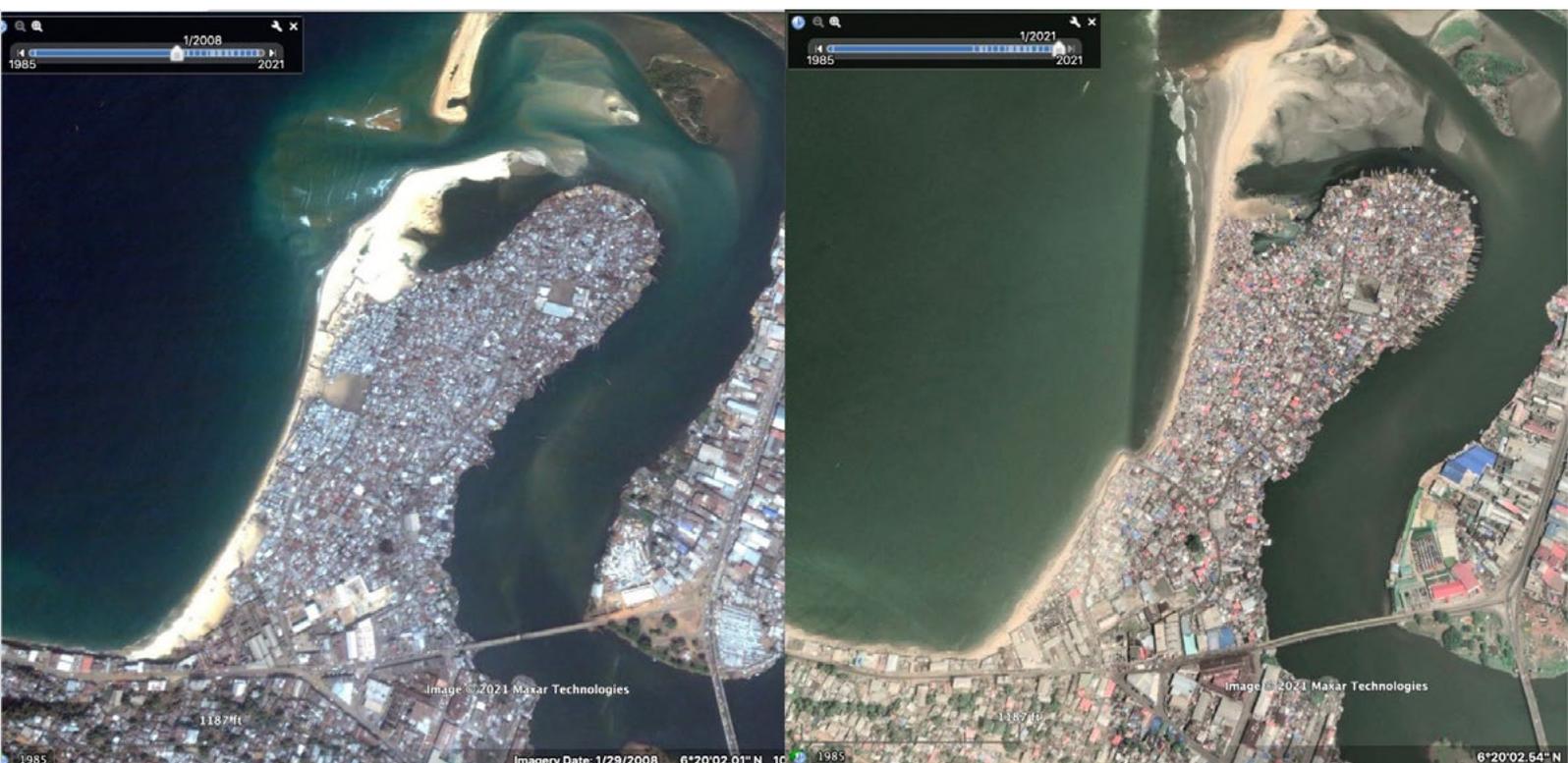
The significant poverty levels in the region mean that a large part of the population exposed to environmental risk does not have sufficient resources to be mobile. As such, careful consideration should also be given to ‘trapped’ populations in areas of environmental risk (Geddes, 2012). However, even mobile populations can experience marginalization and maladaptation. For instance, rural migrants who, upon arrival to cities, lack better options and settle in informal areas, where they experience housing insecurity, an absence of jobs, services, and amenities, and continue to be vulnerable to climate change impacts.

Many migrants settle in informal settlements where a significant share of the urban population lives (UN Habitat, 2015). Migration from rural communities to cities and periurban areas already poses challenges for cities that witness extreme densities due to overcrowding, lack of urban infrastructure, and little serviceable land available for housing and economic activities (Buckley and Kallergis, 2014; Lall et al. 2017).

Often, the location of informal settlements is in areas of high environmental risk (low-lying coastal areas, steep hills). As a result, the risk for further displacement or immobility due to exposure to climate events remains high.

This is evident in the case of West Point, one of the areas surveyed in Monrovia, Liberia. Due to its location and dense built-up area, the neighborhood is vulnerable to sea-level rise and related coastal hazards, with coastal erosion and flooding being frequent challenges. As the land area changes, structures are constantly rebuilt, and densities are shifting (Figure 2).

Figure 2: Coastal erosion in West Point in 2008 (left) and 2021 (right)



Climate Mobilities in African Cities: Findings

Aim and Approach

The Climate Mobilities in African Coastal Cities produces local data to inform actions that address environmental mobility and improve adaptation outcomes. The project focuses on the perceptions of environmental change as a mobility driver and the experiences of migrants and hosts with climate change in Accra, Dar es Salaam, Freetown, and Monrovia.

A total of 4,279 respondents (60% female – 40% male, including both migrants and non-migrants) across selected neighborhoods in each city were surveyed.⁴ Respondents provided information in person on the effects of environmental stressors and how climate change impacts their living conditions and livelihoods. Migrants in the sample were asked about their migration trajectory and the factors influencing their decision to migrate (including environmental reasons). Group interviews in the different neighborhoods supplemented the survey data.

The particularity of the approach followed here is that community groups and their local teams of surveyors are responsible for the collection of the data. At first, this might be seen as a compromise to the quality of the collected data, as those undertaking the survey are not disinterested professionals. However, given the absence of official data sources and the distinctive range of conditions in informal settlements, the participatory approach offers significant advantages. As community members, the surveyors carry essential local knowledge of the area characteristics and the living conditions of the surveyed households (Kallergis, 2018, Bettencourt, Beukes, 2015). Equally, given the

general suspicion that state agencies and researchers are confronted with when working in informal settings, the process of community-led data collection may well address some of the typical biases that occur when professionals conduct migration surveys in informal areas (Jerven, 2016, Mitlin and Satterthwaite, 2013).

Figure 3: Focus group discussion in Glefe, Accra, Ghana



⁴ The communities surveyed included* Glefe and Shaibu – Accra, Ghana; Susan’s Bay, Moa Wharf, Portee Rokupa – Freetown, Sierra Leone; West Point, Clara Town, S.K. Doe Community and New Kru Town – Monrovia, Liberia; Karakata, Mji Mpya, Keko Machungwa And Kigogo – Dar es Salaam, Tanzania. For more details on the methodology please consult the Methodological Annex.

Source: Climate Mobilities in African Cities, Know Your City TV, Slum Dwellers International.

Findings from the Data Analysis⁵

Results from the data analysis show that:

- Low-income urban areas continue to constitute in-migration hotspots within the cities, expanding their population and leading to significant overcrowding.
- Environmental reasons are far from being the dominant driver of mobility, with social and economic reasons being cited as the primary motivators for moving.
- Flooding and water shortage were the dominant reasons that prompted households to move.
- Given the characteristics of destination areas, coastal location, and neighborhood features (poor housing, absence of services and drainage systems), a third of respondents reported having experienced recurrent flooding that has affected their living conditions and livelihoods and forced some of them to move permanently within their neighborhood.
- The survey results showed that the challenges and hazards notwithstanding, the respondents report strong connections and feelings of belonging to the neighborhood as well as solidarity towards their neighbors, particularly in the face of climate threats. The majority of respondents rated highly their sense of belonging to the neighborhood and the solidarity amongst neighbors, particularly during challenging times and extreme weather events.
- When asked about government support and responses to the climate risks they face, about half of the respondents stated that the government assists those in need in the aftermath of extreme weather events. But fewer respondents elaborated on specific measures of government support (compensation, relocation, reconstruction).
- Half of the households surveyed have no plans to move, while 40% expressed plans to move out of their current location to other cities or neighborhoods in the city but remain in the country (10% were undecided).
- For those wanting to move, the main reasons stated were the need for more space and better access to work, with respondents also citing environmental reasons as their motivation.
- In the hypothetical scenario of a government program that either improves conditions in the current neighborhood or relocates residents to a new area, responses were mixed. 55% of respondents preferred in-situ improvements, while 45% opted for the relocation option.
- Both groups ranked access to household services (water, sanitation, electricity) as the most crucial feature they would like to see in current and new locations.

Overall Mobility

The areas surveyed show that mobility is prominent, with 30% of respondents stating that they have moved to these neighborhoods during the past decade and more than half of the residents in the past 20 years. This confirms that these areas continue to constitute in-migration hotspots within the cities, expanding their population and resulting in significant overcrowding. A visual comparison of satellite imagery from 2002 and 2019 of the built-up footprint of Gleffe, one of the areas surveyed in Accra, is indicative of the dramatic density increase that occurred in less than twenty years (Figure 4). A view of Susan's Bay in Freetown, Sierra Leone exhibits the high-density development (Figure 5).

Figure 4: Density in Gleffe, Accra in 2002 (left) and 2021 (right)



⁵ The analysis below provides aggregate results and does not explore variation occurring in different cities.

Figure 5: Susan’s Bay, Freetown, Sierra Leone



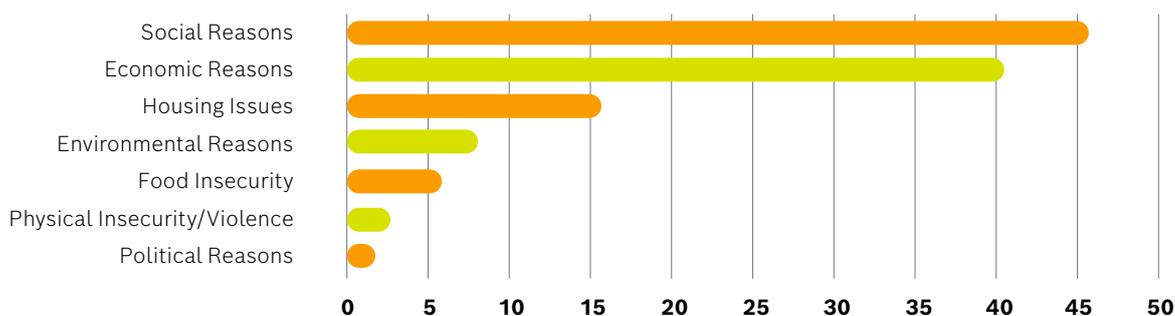
Source: Climate Mobilities in African Cities, Know Your City TV, Slum Dwellers International.

Mobility Reasons

Overall, the survey results indicate that environmental reasons are not the dominant reason for mobility. Social (marriage, education, family reunification, and others), economic reasons (lack of jobs at the origin and search for better economic opportunities at the destination) and housing (lack of affordability, evictions at the origin and/or home ownership and better housing location at destination) are cited as the

main reasons for moving. When respondents described in their own words the main reasons why they left their previous residence, only 2% pointed to environmental causes (flooding, sea erosion, drought, and water shortages). However, in a follow-up question that asked to select a range of reasons (economic, social, environmental, housing-related, political insecurity, food insecurity), 11% of those who were not born in the neighborhood stated environmental reasons among the set of reasons that prompted their movement.

Figure 6: Reasons for Mobility



Source: Climate Mobilities in African Cities

For further details on the mobility reasons provided in the survey, please see Annex Methodology.

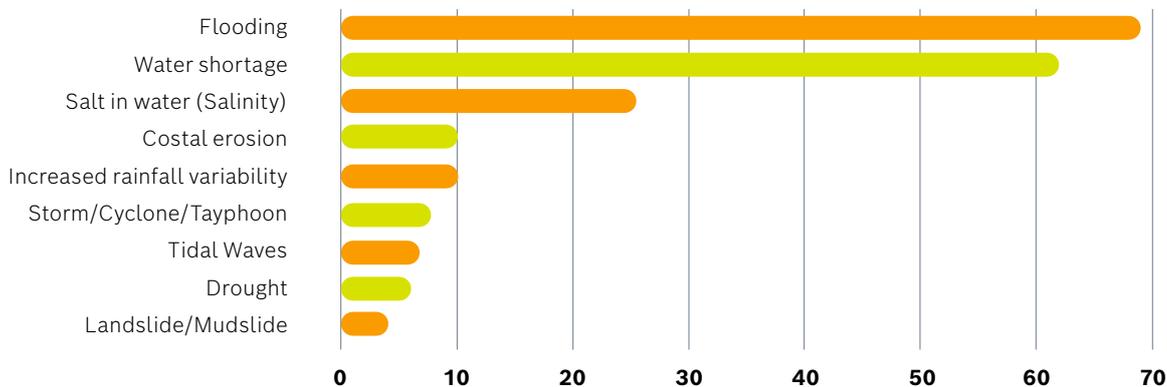
Environmental Mobility Reasons

Amongst the specific environmental reasons which prompted people to move, flooding (67% of respondents) and water shortage (61% of respondents) were the dominant reasons. Other reasons included coastal erosion (11% of respondents) and salinity (9% of respondents).

Climate Stressors in Destination Areas

Given the coastal location and neighborhood features (poor housing, absence of services, drainage systems), many respondents reported having experienced flooding and water shortages. For 35% of respondents, these weather events have resulted in damage to their housing and affected their access to services and livelihoods. 65% of those who experienced damage characterized its severity as significant, while 24% stated that damage is recurring, particularly during the rainy season. 14% of respondents experienced permanent damage to their dwelling that obliged them to leave their home in the settlement and move to a different dwelling in the same neighborhood.

Figure 7: Experience with Climate Stressors in Destination Neighborhoods



Source: Climate Mobilities in African Cities

Figure 8: New Kru Town, Monrovia, Liberia.



Source: Climate Mobilities in African Cities, Know Your City TV, Slum Dwellers International.

Attitudes towards Neighborhood and Government Support

While the results from the survey highlight the extensive environmental risk and vulnerabilities of residents, the majority of respondents rated highly their sense of belonging to the neighborhood and the solidarity amongst neighbors, particularly in challenging situations. The majority of respondents equally stated that they belong to different social groups (Religious Institutions, Susu, Saving Group Federations) and that they feel they have a future in the neighborhood.

When asked about government support and responses to the climate risks they face, about half of the respondents stated that the government assists those in need in the aftermath of extreme weather events. But fewer respondents elaborated on specific measures of government support (compensation, relocation, reconstruction).

Mobility Aspirations

Responses to questions concerning future mobility aspirations revealed that half of the population surveyed had no plans to move. At the same time, 40% expressed they were planning to move to other cities or neighborhoods in the city, but remain in the country, and 10% were undecided. For those wanting to move, the main reasons stated were the need for more space (64%) and better access to work (50%), with respondents also citing environmental reasons.

In the hypothetical scenario of a government program that either improves conditions in the current neighborhood or relocates to a new area, responses were mixed. 55% of respondents preferred in-situ improvements, while 45% opted for a relocation option. Both groups ranked access to household services (water, sanitation, electricity) as the most crucial feature they would like to see in current and new locations.

Figure 9: Susan's Bay, Sierra Leone



Recommendations

Mobility is sensitive to environmental change, socioeconomic and demographic characteristics of populations, history and existing connections, political systems, and geographic and topographic features (Jones, 2020). Therefore, responses to environmental mobility need to integrate policy responses into a broader development framework that addresses the causes and outcomes of environmental migration and promotes sustainable solutions for mobile and immobile populations as urbanization in the region unfolds.

Given that environmental mobility often occurs within borders and usually has a rural-to-urban direction, it is essential to develop policies and actions that consider both the pace of urbanization and rural-urban linkages and the conditions occurring in origin and destination communities. This approach recognizes that many policy actions that could improve environmental mobility processes and outcomes for environmental migrants are beyond the ambit of migration governance.

Measures that address the growing urban poverty, rather than simply efforts in managing migration, may prove very effective for achieving more inclusive outcomes for migrants and their hosts.

Putting environmental mobility in Africa's urbanization context, it becomes evident that climate migrants represent only a fraction of the expected rural-to-urban migration and overall natural population growth in cities. Even under a pessimistic scenario, the region is projected to witness 86 million internal environmental migrants due to slow-onset climate change by 2050. At the same time, cities, through natural increase and migration, will be doubling their population, adding one billion new residents (United Nations Urbanization Prospects, 2018).

Distilling from the evidence generated by local communities, we provide recommendations that can contribute to policy actions aiming to improve and address environmental mobility. The recommendations are organized according to the main issues they address, from knowledge and data to neighborhood, citywide, and national-level actions.

Solving the Information Problem: Developing the Knowledge on Climate Migration

1. Involve civil society organizations in developing local knowledge and creating responses and actions that address the challenges associated with environmental mobility.

The solutions to the challenges posed by environmental mobility should be developed and formulated with the strong involvement of those affected, including migrant and host populations. Local community groups have a role to play in solving the information problem of migration data. Their role is critical in providing context, framing challenges, identifying issues, and addressing priorities as to what information is needed.

Donors and municipalities can support grassroots organized communities that provide data inputs on neighborhood conditions and the perceptions, decision-making, preferences, and challenges related to mobility. These inputs are crucial for developing policies based on pragmatic assumptions. Such perspective is essential for cities that are vulnerable to the impacts of climate change and experience significant population growth but lack information resulting in the limited ability to plan and respond to peoples' needs. This approach is particularly important in Africa, where the dearth of data has historically impeded the ability of governments to improve migration prospects and the living conditions in origin and destination areas.

The data gathered offers essential indications of the factors that influence migration and future aspirations to migrate. This information is typically missing from household surveys, and it can constitute a basis for discussing neighborhood improvements, whether in-situ or through relocation programs. Notably, the approach can be scaled to provide standardized information across localities and cities.

Finally, the fact that local organizations are producing the data bears implications for policy. It raises an essential question: how can the rapidly evolving field of climate migration integrate community-gathered data into broader datasets and monitoring mobility frameworks? The development of more just and sustainable solutions is achievable through the enhancement of participation and accountability, both in horizontal relations – within members of a community and vertically – between communities, the state, and local governments, which is necessary for the development of more just and sustainable solutions. The most important aspect of the process of community data collection is that it is not merely a source of data input. Rather it represents a greater claim for recognition, an exercise in participatory citizenship that is not driven by polarizing distinctions between migrants and hosts but coalesces around the needs of those experiencing vulnerability and facing risk.

2. Combine local data with future projections to plan for future migration.

Data that functions as evidence is indispensable to planning efficiently and producing realistic projections of possible policy outcomes that address environmental mobility. The combination of new technologies, methods, and models projecting future migration flows together with community-led data brings tremendous potential for shifting towards operational monitoring systems that use both local data and scientific models to inform on future movements.

Climate migration models incorporate climate impacts with scenarios based on broader development trajectories and other known drivers of migration (economic, political, sociodemographic, diaspora networks) to estimate the number of environmental migrants and their future locations (see, Black, 2008; Jones, 2020). A beneficial outcome of this modeling approach for cities is the production of future population distributions that are currently lacking for many African cities. These projections are a necessary input for policy and planning purposes. By projecting how future populations will be distributed in space and combining information on the current density, elevation, urban extent, and land use that will affect the location of future populations in the city, municipalities can get a better indication of the number of future urban residents. As such, the power of aggregating local information with population modeling improves the ability of policy-makers and communities to use this information to initiate actions that address and prepare for the challenges associated with migration and climate change.

Improving Destination Neighborhoods and Increasing Residential Options

3. Provide targeted assistance in destination areas through investments in in-situ adaptation and infrastructure at the neighborhood level.

The targeted assistance in destination neighborhoods through investments in in-situ adaptation and infrastructure at the neighborhood level is a necessary first step to improving the outcomes of environmental mobility. Informal areas offer the only affordable options for settlement for low-income migrants. They are also responsible for a significant part of urban population growth taking place in cities.

Improvements in urban infrastructure can increase resilience to climate shocks and lead to healthier living in those urban environments. Access to basic services such as sanitation is not just desirable in terms of more sustainable and healthier living environments for low-income urban residents but also in terms of economic efficiency and resilience to environmental risks. In that sense, improving access to services constitutes a much-needed intermediate input for improving resilience.

As revealed by the responses of the surveyed population, access to basic services is a priority for households preferring to stay in their current locations and those preferring to relocate to new areas.

For many poor neighborhoods in African cities, the most obvious, and in many cases the only realistic answer, is to work with community groups to undertake adaptation measures and manage the local shared public goods needed at the neighborhood level. In the short term, this can lead to significant improvements in addressing the compounding risks associated with high-density slum areas.

Community-led programs can provide critical contributions to the amelioration of services at the neighborhood level. McGranahan and Mitlin (2016) examine how two well-documented, successful, and longstanding initiatives, the Orangi Pilot Project and the Slum Sanitation Program created incentives by providing affordable sanitation improvements at the neighborhood level. A key element of success for these initiatives was the ability to address collective action problems associated with sanitation provision through the community's involvement in the planning, implementation, and operation processes.

Finally, tools such as Special Planning Areas can be used as enabling instruments for improvements. Special Planning Areas have allowed the provision of infrastructure and services using non-conventional standards. In Mukuru, Nairobi, Kenya, this involved the large-scale mobilization through a community-wide consultation process for all residents to participate in the planning process, focusing on key focal areas, including infrastructure, economic livelihoods, education, climate resilience, and other important themes identified by the community (Dodman, 2017).

4. Prepare future residential areas before housing development occurs

Preparing future neighborhoods to respond to urban growth is a parallel and complementary action to the targeted assistance in neighborhoods that already represent destination areas for migrants. Many African cities exhibit particularly high densities in areas that often face environmental hazards.

An effort to decongest very high-density areas through the provision of serviced plots is a low-cost alternative to more expensive housing programs. This Sites and Services approach aims to deliver incremental housing for low-income households by providing small, serviced plots. In practice, the government provides serviced land, ideally after consulting with community groups in the city, for beneficiaries to incrementally build homes over time. Past efforts of these programs have shown that, ultimately, the approach resulted in mixed-income neighborhoods where infrastructure and quality of housing were superior to that of unplanned settlements. Equally, the approach was deemed cost-effective as retrofitting infrastructure is more expensive, and the residents' contribution to housing is more efficient to traditional housing provision, with residents contributing resources to produce housing (World Bank, 2022).

Today, this sites and services approach can benefit from current technologies that allow for simplified or distributive services such as sanitation, electricity, and water, providing greater accessibility and lower costs than conventional networked approaches. Finally, current building technologies and land and housing markets provide several opportunities that make the approach worthy of reconsideration (World Bank, 2022).

While this solution may not apply to all urban contexts, it is worth considering as another option to provide serviced land for housing and reduce the costs associated with retrofitting infrastructure.

5. Develop attractive relocation options in proximity to job opportunities

Planned relocations have been highlighted in the UNFCCC climate negotiations. However, few empirical cases are studying planned relocations, and there is little precedent in terms of norms and processes to be followed. The 2013 Nansen Initiative on Disaster-Induced Cross-Border Displacement has concluded that existing guidelines are insufficient for effectively planning and implementing planned relocations.⁶

While relocation guidelines exist (see World Bank Policy), in practice, their application does not always take into account the importance of local factors in shaping relocation outcomes. A consequence is that implementing planned relocations often disregards the locational preferences of households.

In the case of Westpoint, Monrovia, one of the settlements surveyed, the relocation was abandoned after a poorly planned process proved ineffective at improving living outcomes for those at risk. Poor planning and the attachment of many residents who have lived there for decades have impeded relocation plans. Initially, the housing provided consisted of zinc shacks not connected to services and was located on the outskirts of Monrovia. Given the low income of residents and the absence of jobs, transportation, and services in periurban Monrovia, the relocated households faced serious challenges due to the reductions in their livelihoods without witnessing promised improvements in their housing conditions. As a result, concerns that the relocation would place residents far from the jobs and amenities in proximity to Monrovia's center have stalled the relocation plans. More recently, the city of Monrovia decided the reversal of the relocation project in favor of in-situ upgrading.

6 There is a lack of definitional clarity as to the term 'planned relocation' and the situations it describes in different contexts. For the purposes of this paper we adopt a definition of planned relocation based on the Bellagio Consultation which describes: "a planned process in which persons or groups of persons move or are moved away from their homes, settled in a new location, and provided with the conditions for rebuilding their lives. Planned Relocation is carried out under the authority of the state, takes place within national borders, and is undertaken to protect people from risks related to disasters and environmental change, including the effects of climate change." For a detailed discussion on the topic, see Ferris, E. (2012) 'Protection and Planned Relocations in the Context of Climate Change' UNHCR Legal and Protection Policy Research Series, PPLA/2012/04.

Incorporating local communities in the planning and selection of sites for relocation can improve relocation processes. Community-led surveys, like the ones undertaken in this project, can provide the baseline for understanding people's preferences and needs for relocation. While international standards can provide guidelines, cities and communities can set principles that reflect local concerns better.

Recommendations for Citywide Responses

5. The planning ahead before the forthcoming demographic and physical expansion of cities.

An enormous demographic transformation drives the urbanization process in Africa. In the context of rapid urban growth through the natural increase of the urban population and migration, cities need to plan for their future growth. Beyond environmental mobility projections, planning before the forthcoming demographic and physical expansion of cities and protecting environmentally sensitive areas can increase available land for housing and economic activities and reduce future environmental risk.

Urban expansion planning provides a simple way for cities to plan their growth proactively. It involves gauging the amount of land needed for growth, preparing a basic grid of arterial roads in the urban periphery, and securing the rights of way for the streets before residential development happens. This approach can help manage migration and support mitigation of GHG emissions and adaptation to climate risks (Lamson-Hall et al. 2019).

Practical examples of this approach include the Cities Alliance-supported urban expansion plans in Ethiopia 18 that are now being extended to nine more cities in Ethiopia, Somalia, and Uganda to help them manage rapid population growth (Lamson-Hall et al. 2019).

6. Revise and adapt land use regulations and building standards to better reflect the low incomes of urban households and incorporate environmental risk.

Many zoning and building regulations in African cities were not set according to the income levels of their residents but rather based on the notion of "adequate" accommodation according to colonial powers and were often driven by modernizing aspirations that have little to do with the actual housing process in these cities. After independence, many building standards continued to adhere to colonial

standards as a result of the deterioration of housing affordability. The high-density patterns of slum areas have been exacerbated by such disruptive regulations that lock developable land in the city, causing formal housing to be unaffordable for most residents.

For example, in Dar es Salaam, one of the cities in our study, the minimum plot size – the amount of land necessary to build housing according to the regulations – is 400 square meters. The latest master plan for the city envisages a plot size of 300 square meters, which is still out of line for the majority of households. For instance, the Chamazi Community Based Housing Scheme in Dar es Salaam is a community-driven initiative aimed at providing affordable housing for Kurasisini, whose settlements were demolished as part of the port expansion project. The project set the plot size standard to 144 square meters.

Revising and adapting these regulations can provide standards that are in line with the incomes of residents and increase land availability for housing. Even if it does not necessarily decongest high-density areas, it can affect future density and development patterns and minimize encroachment in environmentally hazardous areas.

Recommendations for National Responses

7. Mainstream migration in national urban strategies

While the role of cities has been increasingly recognized in the growing environmental migration scholarship, little attention has been given to the contradictions that occur between international and regional norm-setting that aim to improve mobility outcomes and incorporate movements due to environmental events and local urban processes that often seek to slow, restrict, and reconfigure mobility towards and within rapidly growing cities.

At the sub-national level, many countries in Africa have enacted policies that aim to reduce rural-to-urban migration. A review of Poverty Reduction Strategy Papers (PRSPs) across the region reveals negative perceptions of migration. 51 to 73 percent of governments enacted policies that curb rural-to-urban migration (Tacoli et al. 2015; UNDESA, 2004). More recently, this number has increased to 81 percent (UNDESA, 2010; Turok and McGranahan, 2013).

In practice, most of these measures have had little success in slowing down rural-to-urban migration. However, the urban policy inertia that resulted from past approaches that neglected the protection of sensitive environmental areas, the development of land, the extension of infrastructure, and the provision of services have deteriorated the living conditions of incoming migrants in cities.

Mainstreaming migration into urban agendas is necessary so that policies can acknowledge that migration will continue to contribute to the growth of cities.

8. Develop urban-rural linkages and infrastructure to facilitate mobility within a country and between rural and urban areas.

Frameworks, norms, and processes managing mobility, internal and cross-border, have a role to play in the rural-to-urban transition by facilitating movements towards more productive urban areas in the region.

The potential of urbanization to promote economic growth in the region is likely to depend on how conducive rural-to-urban mobility frameworks are. Removing barriers to internal mobility will increase destination choices and improve labor allocation. While our knowledge of urban agglomeration economies in the region is still nascent, few studies explore the relationship between urbanization and productivity in Africa (see Turok and McGranahan, 2013; Lall et al. 2017). They show how productivity increases with city size and the presence of urban regional hubs that attract migrants, but also the costs of overcrowding manifested through rapid population growth that exceeds the supply of urban infrastructure (Castells-Quintana, 2017). Mobility frameworks can facilitate internal movements (rural-to-urban and urban-to-urban) towards higher productivity metropolitan areas.

Conclusion

Environmental migration is a reality across Africa. The critical issue that countries will face is not whether or not environmental migration will occur, as movements due to a changing climate are already occurring. Rather, it is important for policymakers to understand the scale and the need to address the current movements and prepare for future environmental mobility. This requires a shift from reactive to proactive policies.

A major setback in designing these policies is the lack of better data on the complex phenomenon of environmental mobility. A key characteristic of migration has to do with the multi-causal nature of its drivers, where environmental change constitutes both a direct driver of mobility but in many cases, has a multiplying effect and links to other, dynamic and interacting social, political, demographic and economic drivers (Gemenne, 2011, Black et al. 2011).

The approach followed by Climate Mobilities in African Cities aims to address this lack of knowledge by involving communities directly impacted by the effects of climate change. The findings from the data collection showcase that migration as an adaptation to a changing climate is riddled with risk. For many households, the destination places are not safe, and the overlapping vulnerabilities put households in harm's way.

However, an important aspect of this initiative relies upon its approach that puts at the center the communities affected by environmental change. The scientific community, governments, and the international community acknowledge the urgent need to address and improve responses to environmental mobility. This requires a shift in thinking from the idea that data is what the scientists and governments produce to one where information is co-generated with local communities taking a central place in knowledge production is a necessary step to prepare for, and accommodate environmental mobility.

A first step in the creation of local generative knowledge on environmental mobility is to recognize the important shift this approach entails. Such a form of generative local knowledge pays attention to the way migrants and hosts tend to adapt. It recognizes that in the context of scarce resources, a much richer perspective and set of data are needed to identify and address problems. One that considers how the nature of the environment and past experiences can affect current vulnerability and future outcomes. If mobility is a form of adaptation to a changing environment, then the reasons, outcomes and improvements of migration trajectories need to be rethought from the perspective of those impacted by climate change.

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Annex Methodology

The project adopted a mixed-methods approach that offers quantitative and qualitative analytical outputs.

1. Neighborhood selection criteria

Organized community groups in each of the four cities selected specific neighborhoods where the study will be conducted. Standard criteria for this selection included:

i) neighborhoods that face environmental risk based on previous profiling undertaken by local communities; ii) neighborhoods that experience significant migration and mobility; iii) neighborhoods where community-gathered data is currently lacking or needed for future in-situ upgrading and/or relocation plans.

2. Survey Questionnaire

For a systematic analysis of whether and how environmental stressors influence the decision to move, we collected data from migrant and non-migrant households. This ensured that we captured both instances of mobility towards the destination neighborhoods surveyed but also instances of (voluntary or forced) immobility occurring in destination neighborhoods.

To gather the data, the project relied on an original survey instrument co-developed specifically for this research. The survey instrument was co-developed by the research partners. The draft was revised internally by the research partners. After internal consultations, a preliminary questionnaire was submitted to a panel of experts. Their comments were included in the final version of the questionnaire.

Households were asked about the reasons that have motivated mobility.

Social Reasons: Marriage, Family/relatives at the new location, Better access to health services at the new location, Schooling – Education at the new location.

Economic Reasons: Not enough income from livelihood sources at the previous location, Unreliable harvest at the previous location, No land available for farming/agriculture at the previous location, Crop failure at the previous location, Unemployment at the previous location, Job opportunity at the new location, Higher income from a job at the new location.

Housing Issues: Inadequate, too small and/or bad quality housing, Housing was too expensive – rent was too high, Housing lacked household services (water, sanitation, electricity), I was evicted by the landlord, I was evicted by the government.

Environmental Reasons: Water shortage, Drought/Desertification, Heavy Rains/Flooding, Storm/Cyclone/Typhoon, Landslide/Mudslide, Coastal erosion or Rise in sea level, Tidal waves, Salt in water (Salinity), Unpredictable weather/rainfall variability.

Food Insecurity: Unable to access food at the last residence, Unable to purchase food at the last residence, Unable to grow food at the last residence, My household would have fewer/smaller meals, Fear of or threat of future food insecurity, Members of my household would go to bed hungry.

Physical Insecurity: To escape violence at the previous location, To escape war at the previous location, To escape conflict at the previous location.

Political Reasons: To seek political freedom, To escape political persecutions/fear of political persecution, Government provided incentives to leave, Government forced me to leave.

The questionnaire allowed for an analysis of household-level characteristics (social, economic, living conditions) and mobility decisions. The questionnaire was administered in person and consisted of personal interviews that included closed and open-ended questions. Its administration took 30–40 minutes. One member per household was asked about their experience with environmental events and provided information, such as age, profession, or education, as well as household-specific questions.

In parallel to the survey administration, we conducted a series of focus group discussions (FGDs) in the selected neighborhoods. The purpose of the focus groups was to gain further insights on the environmental challenges residents faced, in particular in relation to flooding, which has been the main reported reason in the survey and documents the coping strategies of residents.

Data collection built upon processes established under previous data collection efforts of local undertakings by the Know Your City (KYC) campaign of the Slum/Shack Dwellers International (SDI) network. The KYC campaign follows several basic principles regarding how information is gathered, organized, and disseminated (see (Bettencourt et al., 2018).

Specifically, we aimed at standardizing questionnaires with particular attention given to the comparability of results across geographic areas, the verifiability of data by third parties, and the collection and archiving of data through a shared online platform, accessible to all communities and, in principle to any stakeholder.

In practice, the first step in the survey process was the establishment and training of a team of community members that collected data at the neighborhood level. Community members, especially women and youth, are trained in digital data collection, including double-checking entered data as a core practice. Data collection and entry used tablet devices and open-source software, with each response geocoded. As a result, the information gathered is geo-referenced and provides spatial data for each survey. All surveys automatically require a time stamp and the name and contact details of the surveyor, intending to improve understanding by third parties, verifiability, and assessment over time.

Beyond the geographic information, the survey collected photographs of the dwelling of each respondent. The visual data provided another verification layer. Together with questions about the economic situation of the household (employment, education, household assets, ability to save, access to water, sanitation, electricity, housing flooring material) the photographs contributed to the assessment of the overall economic conditions of respondents, as well as a visual indication of damages (for instance signs of past flooding) that the structure may have experienced.

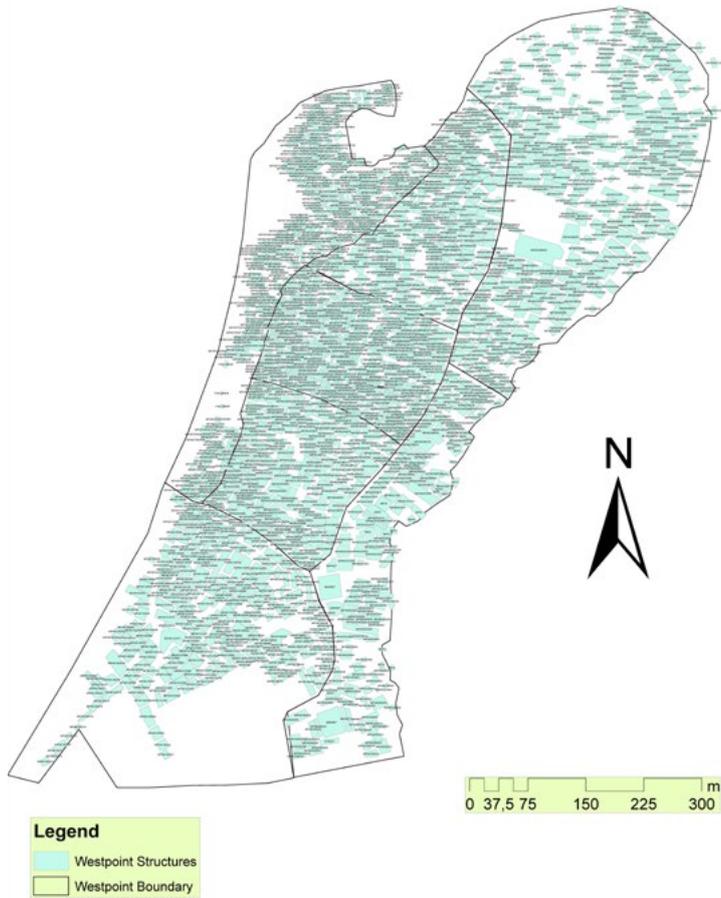
3. Sample Selection

The most common method for collecting household data is through the use of a stratified two-stage sample, with census enumeration areas selected proportional to size in the first stage and a set number of households selected with simple random sampling in the second stage (Grosh and Munoz, 1996; Himmelein et al. 2016). However, since administrative records in informal settlements are often incomplete and most structures do not have addresses, a household listing operation was not feasible.

To respond to this challenge, we used a spatial mapping methodology that involved the spatial segmentation of the surveyed areas. Segmenting is a standard field procedure of subdividing larger geographic areas into smaller units, approximately equal in terms of the number of households, for listing and selection purposes. The structures within the individual segments are selected with simple random sampling, listed by field enumerators, and households selected from these lists. In the absence of detailed household lists, this method can produce unbiased estimates but is not as costly and time-consuming as other alternatives, such as a full mapping of structures. Figures A1 and A2 provide two examples of the segmenting approach in one of the settlements surveyed.

Figure A: Westpoint, Liberia: enumerated structures in each segment drawn for sampling purposes.

WESTPOINT ENUMERATION



Partner Organizations

Zolberg Institute on Migration and Mobility

The Institute fosters concentric circles of scholarship and action – in our University, our city, and the world. It contributes to The New School community by offering courses, sponsoring lectures and events, and supporting extended visits of leading scholars. They engage deeply with New York City, supporting student work with the wide range of groups and communities in the City, and they undertake initiatives to inform and influence public debate and public policy at the national and global level.



Zolberg Institute
on Migration
and Mobility

Slum Dwellers International

SDI is a network of community-based organisations of the urban poor in 32 countries and hundreds of cities and towns across Africa, Asia and Latin America. In each country where SDI has a presence, affiliate organisations come together at the community, city and national level to form federations of the urban poor.



International Institute for Environment and Development

The International Institute for Environment and Development (IIED) is an independent research organisation that aims to deliver positive change on a global scale. IIED brings together more than 120 people from diverse backgrounds and countries to deliver high quality research, analysis and impact.



Centre of Dialogue on Human Settlement and Poverty Alleviation (CODOHSAPA)

CODOHSAPA is a non-profit and non-governmental organization founded in 2011 in Freetown, Sierra Leone. The main aim is to mobilize and provide both technical and financial support to its community counterpart, Federation of Urban and Rural Poor (FEDURP). FEDURP comprises vulnerable women, men, youth and children who are mobilized around dynamic saving schemes, networked at settlement, city and national levels to drive a collective, bottom-up initiatives influencing change towards inclusive and resilient cities and localities, and contribute to national development agenda.



Center For Community Initiatives

Centre for Community Initiatives (CCI) is the national support NGO formed by Tanzanians with a desire of providing technical and financial assistance to the community living in informal settlements and the Tanzania Urban Poor Federation (TUPF).

CCI, established in 2004, facilitates processes that develop organizational capacity at the local level and promote pro-poor policy and practice in Tanzania urban development focus.



YMCA Liberia

YMCA Liberia seeks to unite and empower young people through self-development and service to their community through support to the Federation of Liberia Urban Poor Savers. YMCA and FOLUPS work as the coordinating body to engage in the co-development and delivery of project activities.



Federation of Liberia Urban Poor Savers

FOLUPS is an organization non-political and not-for-profit establishing slum dwellers around their own savings to improve their livelihood.



Ghana Federation of the Urban Poor

The Ghana Federation of the Urban Poor Fund (G-FUND) seeks to grant homeless Ghanaians access to funds in order to provide for themselves. Created in 2010, this fund provides low-income households in Ghana with credit for housing and business development. This funding also improves infrastructure.



Peoples Dialogue on Human Settlements (PD)

PD is a non-governmental organization and operates as the professional support organization to Ghana Alliance of the Urban Poor Partners. PD was incorporated in 2003 to give voice and agency to a predominantly women constituency in Old Fadama who were facing a threat of eviction.



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