



Developing a Participatory Urban Governance Model to Improve Flood Resilience in Informal Settlements in Accra

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2025

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Abstract

In part due to dire flood risk projections in Accra, Ghana's capital and largest city, government leaders and communities have increasingly focused on adaptive and resilience-building strategies. The need for effective flood planning and response is nowhere greater than in the city's sprawling informal settlements, which are largely unplanned, face socio-economic challenges, and often are found on low-lying, marginal land at serious risk of flooding. Unfortunately, the dominant mode of response centers on technological and infrastructural solutions and largely omits community-engaged, participatory planning and governance, often to the detriment of project efficacy. Because community participation has long been recognized as an integral and beneficial component of socio-environmental planning, to better understand benefits and challenges in implementation in these communities, we employ 40 in-depth, semi-structured interviews with municipal leaders, community leaders, and community members from four at-risk informal settlements, coupled with media, documentary, and observational review. Our findings highlight seven thematic elements that contribute to the present lack of local participatory governance systems, each of which suggests ways to overcome these barriers in the future. Combining these findings with insights from the participatory literature and ongoing efforts to instill a participatory ethos in other aspects of Ghanaian life, we develop a set of guiding principles and a framework to instill community participation that may be used by informal settlement communities as well as planning and response professionals who serve them.

Keywords: Participatory flood governance, informal settlements, climate governance, urban resilience.

This work was part of a [multi-country research initiative](#) led by the Global Disaster Preparedness Center of the American Red Cross.

1. Background and Literature Review

1.1 Flooding, informal settlements, and the place of participatory urban flood governance

Flooding is a recurring concern for residents, local authorities, and political leaders in Ghana's capital Accra, with its infrastructural and socioeconomic implications disproportionately affecting vulnerable groups (Andreasen et al. 2022; Amoakoh & Boamah 2014). Due to their extensive economic and social impacts, regular flooding events are recognized as among the country's most significant and recurring climate-related events (Rain et al. 2011; Amaglo et al. 2022; Douglas et al. 2008). Emphasizing this importance, recent floods have resulted in substantial loss of lives, injuries, property damage, and destruction of necessary infrastructure; floods and rainstorms accounted for approximately 64% of all urban disasters in the Greater Accra region over the last four decades (NADMO 2024). Climate change may contribute to an increase in the frequency and intensity of extreme weather events (World Bank 2021, Siabi et al. 2024; Nkonu & Antwi 2024), including heavy and unpredictable rainfall, which will likely exacerbate these losses going forward. In the last decade, city leaders and partners have attempted to address flood challenges (Ghana Broadcasting Corporation 2022; Accra Metropolitan Assembly 2025; GARID 2024). Across Ghana and within metropolitan Accra, neither flood risk nor the need for improved flood planning is evenly distributed. This is because impacts and disruptions associated with flooding are significantly influenced by relative levels of exposure and vulnerability (Kayaga et al. 2020).

Flooding-related challenges are most pronounced in Accra's rapidly expanding informal settlements, which represent nearly 58% of the city's housing stock (Acheampong 2021). Informal settlements are residential areas where housing lacks legal claims and tenure, residents lack essential services and city infrastructure and housing arrangements exist outside of formal planning and building regulations and in many cases, they are situated in *“geographically or physically hazardous areas”* (UN Habitat 2015:1). Residents of these informal settlements face significant impacts and consequences from floods, affecting their lives, property, and critical infrastructure. This is because they are exposed to heightened risks from climate-related hazards due to the marginal location of these settlements—in areas that are more prone to flood risk—as well as limited past planning and robust construction compared to other areas of the city. Moreover, inadequate

material resources may result in limited adaptive capacity to mitigate climate-induced damage (Asumadu-Sarkodie et al. 2017; Andreasen et al. 2022), even when community members generate thoughtful and potentially productive suggestions for effective flood mitigation and adaptation.

Globally, nearly three billion people could be living in informal settlements and slums by 2050, an increase of 200% from current levels (UN-Habitat 2025). Outside of housing stock assessments, specific data regarding future trends in informal housing in Accra are not currently publicly available. The Ghana Statistical Service (GSS), however, estimates that about 30.8% of Ghana's urban population resides in informal settlements and slums. The Greater Accra region exhibits a particularly high prevalence of informal housing stock compared to this population estimate (GSS 2025; Acheampong 2021). This highlights the likelihood of significant urban housing challenges and suggests that without substantial interventions, informal settlement populations and hazard risks are likely to remain high, driven by rapid urbanization. As many more people will rely on limited housing resources in informal settlements featuring myriad climate and disaster challenges (Amoako 2018; GCA 2021), we recognize the need for targeted planning and responses. An important avenue towards adaptive flood planning is understanding community contexts and needs. Unfortunately, many top-down, centralized schemes that have dominated adaptive planning fail to account for local knowledge and community feedback in their design and implementation (Agyabeng et al 2020; Terdoo 2024). Therefore, it is crucial to evaluate conditions within informal settlements and to determine whether, and how, participatory governance, structural, and infrastructural frameworks may be designed to better serve these communities.

Enhanced recognition of flood risk has generated recent interest in the nature of flooding in Accra. Many contributory factors have been identified, such as the city's low-lying topography, rising sea levels and associated coastal erosion, increased frequency of high rainfall events, and infrastructural or land use factors such as blocked water courses, improper waste disposal, and encroachment on wetlands (Asumadu-Sarkodie et al. 2015; Appeaning Addo & Appeaning Addo 2016). This susceptibility to flooding is well documented (Owusu et al. 2019; Owusu et al. 2020) with categorical emphasis on how physical, social, and institutional features interact to exacerbate flood risk. At the nexus of global forces, geophysical conditions, local decisions, and social factors, floods precipitate a variety of impacts that go well beyond water intrusion. City leaders recognize that flooding is a primary cause of population displacement, mortality and

health concerns, loss of physical structures and material property, and economic disruption (Amoakoh & Boamah 2014); these challenges have been more commonly observed across the city's informal settlements. Ongoing responses to future flood risk projections therefore prioritize urban climate resilience through local campaigns and international development partnerships (Owusu et al. 2024).

1.2 Flood impacts, response, and governance questions in informal settlements

The proliferation of informal housing and the development of sprawling, densely packed, and underserved informal communities—particularly on the city's periphery—have resulted in heightened climate risk among populations that face ongoing social and environmental challenges¹ even in times of calm. For example, members of the communities often report difficulties in accessing social services, formal employment, and trash removal. As in many other cities, these areas have experienced rapid and minimally planned growth (Owuor and Mwiturubani 2021; Moulds et al. 2021) as a result of Accra's rapid economic growth over the past two decades which drew a substantial influx of people from across Ghana as well as neighboring countries. These trends are likely to continue: a recent flood prediction model (Nkonu & Antwi 2024) estimated a 10.9% urban growth rate for Accra over the next two decades.

Urban growth and topographic conditions combine with inadequate general infrastructure and limited access to essential services to exacerbate the disruptive effects of disaster and complicate access to aid. Moreover, recent urban policies have involved eviction projects targeting informal settlements. A perception of illegality or unsanctioned growth in these areas has meant that municipal authorities are reluctant to provide standard government services (Grant et al. 2024). Together, these have contributed to a baseline sense of residential instability (cf. Elliott & Howell 2017) and may implicate the negative consequences associated with eviction in other contexts, such as reduced access to opportunity and reproduction of poverty (Desmond 2012). More broadly across the city, real estate redevelopment initiatives, neighborhood revitalization projects, and uncontrolled rent hikes have contributed to rising housing

¹ We would like to be clear that here we separate “social” and “environmental” factors for convenience rather than as a matter of substance. Similarly to how the term ‘natural disaster’ has been criticized for separating and thus over-emphasizing the contributions of natural systems and under-emphasizing the contributions of human systems and activity (e.g., Chimutina & Von Meding 2019), we recognize that despite our use of these terms, social and environmental systems cannot and should not be viewed as wholly separate or distinctive (i.e., Catton & Dunlop 1978).

costs and an analog of gentrification (Anguelovski et al. 2019; Dramani et al. 2024; Ghana Web 2024). This is likely to displace more city dwellers from socially and economically vulnerable groups to peripheral areas of the city, including unsanctioned settlements on floodplains (Acheampong 2021). When faced with flood risks in these informal settlements, residents often turn to autonomous adaptation mechanisms - self-led pre-and-post flood event adaptation actions aimed at providing relief from flood impacts. These self-led responses reflect local capacity and community knowledge. However, such actions put flood response responsibility on people who often lack resources and can jeopardize coordinated community-level adaptation (IPCC 2001; Mulligan et al. 2016). In response, some experts have concluded that many important impediments to progress involve governance: the way that social and environmental decisions are made (or not made) and their consequences for this growing urban center (Acheampong 2021; Tieleman & Uitermark 2019).

Flood impacts are important indicators of urban resilience and local development capacities. Consequently, recent flooding in Accra has prompted an increased interest in flood management strategies that support better adaptation, mitigate impacts, and build resilience. While academic suggestions and frameworks for systems like these often usefully identify social, bio geophysical, and technological drivers of disaster risk, governance—the ways that decisions are made and implemented—sometimes fall by the wayside. This is the case in Accra. Despite the global need for strategic and institutional frameworks that integrate multiple elements of urban climate governance (Cutter et al. 2008, 2014; Shtob 2022), flood preparation in Accra has predominantly focused on technological solutions like early warning systems (World Bank 2011) and physical infrastructure like drainage and armoring mechanisms (Accra Resilience Strategy 2019). Within the city, initiatives like the Greater Accra Resilience and Integrated Development Project aim to “*improve flood risk ... and improve access to basic infrastructure and services in ... targeted flood-prone low-income communities*” (GARID 2024). However, in order to address the critical needs of informal settlement residents, these practical relief efforts must overcome social governance challenges through a focus on the processes that underline decision-making. Like planning and relief challenges, governance challenges often stem from complex combinations of unresolved land and housing tenure issues, limited existing governance and planning structures, a rapidly expanding urban population that strains scarce resources, and broader issues like poverty. Accra’s unique socio-political governance context, featuring traditional tribal, informal local, and formal

governmental systems, also interacts with housing informality to compound challenges in effective decision-making (Mahama 2009, Mengisteab & Hagg 2017).

1.3 Incorporating the complex nexus between community, governance, participation, and technological solutions

Intersecting governance dynamics present complex and unenviable urban development scenarios to Accra city leadership and flood-affected communities. Here, social, environmental, and governance complexities overlay and interact with each other to produce new conditions and uncertainties, especially over long timeframes (Mahama 2009; Shtob et al. 2025). Because of these dynamic complexities, urban governance systems that manage informal settlement-related adaptation governance systems should learn about and consider complex trends and interactions rather than attempting to simplify them away. Collaboratively employing local knowledge and creativity to craft tailored solutions to issues identified by community members may prove especially impactful (Innes & Booher 2010; Shtob et al. 2025). Solutions to urban climate governance quagmires therefore require place-specific and community-centered interdisciplinary efforts to strengthen and repair the social fabric along with urban ecologies and resource flows (Campanella 2006; Swyngedouw 2013; Erikson & Peek 2022). The engineered strategies that currently dominate flood initiatives and planning regimes in Accra would benefit from complementary approaches centered on environmental governance that are sensitive to the unique characteristics and capacities of the most affected communities. Interventions based on these principles require participatory inquiry, made in partnership with communities and municipal leaders (e.g., Thiollent 2011), that foregrounds complexity in urban disaster adaptation and governance.

Across cities, an important flood adaptation and resilience goal is to create multifaceted social and infrastructural response systems that address risk while supporting equitable climate resilience. Key to achieving this aim is place-based and community-focused efforts that understand and are responsive to local challenges, helping to bridge ecological risk, social vulnerability, and multiple decision-making sites (Ostrom 2009; Erikson & Peek 2022). Within conceptualizations of urban governance, defined as the exercise of the state's power by "*authoritatively allocating resources and exercising control and coordination*" (Rhodes 1996:652), there exists an expectation of interaction between state and non-state actors shaping urban space over different spatial and temporal scales

(Bulkeley 2005). These governance relations reflect attempts to produce various social relationships that can guide the delivery of efficient outcomes. However, city authorities are overwhelmed by the rapid growth of informal communities and therefore neglect them; they survive as “*miracles of improvisation*” (Davis 2006:175). In some cases, maladaptive governance relationships can result in uneven development that can increase the risk of displacement and other forms of harm. This can be the case even when governance has an ostensibly pro-environmental and pro-community focus, and especially when decisions are made with an emphasis on structural improvements and without robust community input (e.g. Goodling et al. 2015; Gould & Lewis 2018, 2021; Anguelovski et al. 2022).

Within complex urban systems, social and political power asymmetries shape flood vulnerability, access to flood response mechanisms, and adaptive capacity. To create inclusive flood governance systems that minimize harm from flood exposure and enhance equity in urban resilience, first, these systems should consider the nature of inequality in social and political interactions in Accra. Second, they should recognize that top-down, technologically focused, one-sided approaches have failed to achieve urban flood resilience goals for the highly vulnerable, including informal settlement dwellers. Anguelovski et al. (2019) argue that underrepresented and marginalized communities are often excluded from significant benefits that arise from environmentally protective infrastructure and resources. One reason is that these resources typically flow towards politically connected neighborhoods, leaving marginalized, informal communities with further challenges in navigating complex recovery processes (Tierney 2015). Participatory urban governance has proven to be a vital tool for enhancing equity in disaster response. A lack of participation, alternatively, may result in significant maladaptation and lower implementation success (Chu et al. 2021).

Despite ongoing infrastructural investments within urban governance systems, the challenge of flooding in Accra persists, and social resilience against flooding, especially in informal settlements, remains lacking. Preliminary literature reviews and sector engagement suggest that Accra's flood-related governance strategies lend minimal attention to social ties and governance (e.g., World Bank 2011; Accra Resilience Strategy 2019). Ignoring these components of socio-environmental complexity undermines local flood response efforts and threatens the overall efficacy of technical solutions (Erikson & Peek, 2022). The disconnect between the technical focus on flood management and participatory urban flood governance emphasizes an ongoing need to examine the socio-

political and local systems in which technical initiatives are designed and implemented. Therefore, to enhance flood governance strategies broadly, there is a need for complementary approaches that consider the distinct characteristics, capacities, and choices of local communities (Tullos 2018), employ community-centered development methodologies that are sensitive to specific needs (Thiollent 2011), and acknowledge the complexities associated with urban disaster adaptation, including through decision-making itself (Shtob et al. 2025). Ideally, such a framework would invite community members and leadership, as well as the municipal personnel tasked with critically important flood mitigation initiatives, into the process of its creation. Despite other long-term successful participatory efforts in Accra (SEND Ghana 2016), to our knowledge and that of our community and government partners, this has not yet been developed in the flood governance sphere. In this project, we seek to introduce a participatory urban governance plan and framework as a response to gaps in community engagement within flood adaptation and mitigation planning. We focus specifically on informal settlements due to their heightened risk and rapid, dynamic development that complicates and threatens non-participatory initiatives.

1. 4 Incorporating community and rights to space: participatory governance for flood resilience in informal settlements

As urban areas increasingly grapple with the challenges posed by climate change, participatory governance has emerged as a promising framework for minimizing overall harm while fostering more equitable and resilient urban futures (Bulkeley & Castán Broto 2013). Participatory governance refers to a framework of institutional structures and practices that promote active citizen engagement in public decision-making (Gaventa 2006). In practice, it represents a departure from top-down governance models: movement toward more collaborative and inclusive processes, especially where conventional state-driven methods have failed to address critical governance issues or the practical issues that underlie governance itself (Cornwall 2008).

Since its emergence in the 1970s, participatory governance models have been used to respond to the limitations of technocratic urban planning that has historically excluded perspectives of groups disproportionately impacted by climate challenges (Castán Broto & Westman 2020). These exclusions result in an analog of strategic ignorance, in which certain factors may be strategically emphasized and others ignored based on the

preferences, training, or priorities of those in positions of authority (McGoey 2012). Conversely, participatory methods provide opportunities to pay strategic attention to the complexities inherent in these social challenges. In the context of disaster risk reduction, climate resilience, and adaptation, participation is therefore positioned beyond a normative ideal into the realm of real planning for present conditions and future contingencies, allowing urban systems to become adaptive, inclusive, and responsive to local knowledge and needs (Pelling 2003; Cornwall 2008; Arup 2019). This signifies movement away from traditional top-down interventions towards collaborative resilience-building (Bhanye 2025). Here, two theoretical foundations underpin conceptualizations of participatory governance, one invoking the right to urban space and how participatory pathways can help achieve this goal, and the other focusing on the capacities, capabilities, skills, and knowledge of community members as antidotes to the persistently negative focus on urban problems and vulnerabilities that paints communities as powerless. Put another way, we should endeavor to foreground and celebrate the demonstrated and potential abilities, capacities, knowledge, creativity, and ideas of informal settlement residents rather than focusing exclusively or primarily on facets of vulnerability.

Limitations on spatial access and transformations in informal settlements lead to disputes over rights to space (Lefebvre 1991, 1996) in terms of actors operating within the informal economy and more generally informal settlement of residents. Informal settlements exemplify both urban inequality and the capacity of marginalized populations to assert their right to space within the city, even amid the absence of formal rights and conflicts over recognition, access, knowledge production, and participation. For informal settlement dwellers, these participation rights are often denied due to precarious land tenure, limited legal recognition, and systematic marginalization (Asumadu-Sarkodie et al. 2015; Appeaning Addo & Appeaning Addo 2016; Grant et al. 2024). These areas often face a perception of illegitimacy within existing urban governance frameworks, which can lead to disinvestment, evictions, and exclusion from formal planning processes (Roy 2005). This runs counter to the collective right of all inhabitants to shape, access, and engage in the creation of urban environments (Lefebvre 1991, 1996), an ideal that remains largely unfulfilled in practice in informal settlements due to exclusion from planning, services, representation, and climate response. Yet, informal settlement residents are active producers of urban space themselves, self-building housing and businesses, establishing local economies, and

creating governance structures, typically in response to the failures or absences of state support.

Cornwall (2008) and Satterthwaite (2020) have championed participatory governance to bridge exclusionary urban development practices and rights-based approaches to local adaptation strategies. They offer a framework that supports efforts by informal settlement dwellers and allies to transition from passive recipients to active co-producers of urban resilience and justice. By redirecting focus towards the rights of urban citizens as central to resilience initiatives rather than prioritizing solely physical or ecological infrastructure, Ziervogel et al. (2019) argue for grounded rights and justice orientation in urban resilience. In advocating for new urban possibilities, Parnell and Pieterse (2016) call for a fundamental rethinking of urban management systems and practices through the lens of rights-based frameworks. Titz and Chiotha (2019) further contend that adopting rights-based approaches could enhance our understanding of the unique circumstances, processes, and outcomes intricately linked to African cities, which are often characterized by high levels of informality and systemic exclusion. As cities navigate the complexities of climate change, participatory governance presents a vital avenue for addressing urban inequities and promoting resilience.

Moreover, scholarship on housing informality (Bhanye 2025) has increasingly focused on the critical assets these populations bring to flood resilience efforts. This body of research highlights the significant knowledge, skills, and capabilities inherent among residents of informal settlements. Combined with their right to the city, this underscores their potentially vital role in the development of participatory governance frameworks that support effective flood resilience strategies in informational, leadership, and other capacities, rather than being pigeonholed into a single or limited set of roles. These communities, shaped by long-standing experiences with environmental hazards, hold a unique repository of practical knowledge and self-organizing abilities that can greatly strengthen responses to flooding. However, participation and representation, in many cases, are often concentrated among certain people and may reflect longstanding, uneven leadership, access, and influence. Participatory governance provides an approach to decentralize such decision-making and actively involves citizens, especially those from excluded groups, in shaping public policy (Gaventa 2006).

Through the lens of participatory governance, experiential knowledge held by residents becomes an essential source for the co-creation of innovative, locally relevant, and

locally acceptable resilience strategies. Often, residents have sophisticated understandings of local topographies, hydrological characteristics, and seasonal flooding patterns, as well as effective coping strategies refined over time (Douglas et al. 2008). When this local community knowledge is integrated through participatory practices, its effectiveness is amplified, and ownership of adaptation practices is strengthened. This not only enhances the relevance and applicability of urban resilience strategies but also boosts their legitimacy among stakeholders (Satterthwaite et al. 2020). Despite being crucial for filling gaps within municipal flood management processes, such experiential knowledge is rarely captured in traditional datasets (Pelling, 1999; Satterthwaite et al. 2020). Reflecting what might be expected from these literatures, residents of Ghana's informal settlements possess an intimate understanding of flood pathways, drainage systems, construction materials, and variations in seasonal rainfall, often surpassing the insights of external stakeholders who typically depend on secondary data sources. Furthermore, residents' context-specific knowledge is complemented by their community mobilization skills, which have been developed out of necessity. For example, management of community upgrading systems, implementation of informal waste collection mechanisms, and the establishment of community disaster risk management committees demonstrate how grassroots' capacities can bolster resilience. When these capacities are recognized and supported, they represent powerful tools for fostering community resilience (Patel and Mitlin 2010).

To effectively integrate the experiential knowledge of the communities most affected, frameworks like SEND Ghana's (2016) Participatory Monitoring and Evaluation Manual have used key indicators such as equity, accountability, participation, and transparency to support local budget monitoring for pro-poor policies and programs. These principles have enabled SEND to ensure that policies and programs fulfill their promises through complementary local policy education, participatory research, policy advocacy, and impact evaluation. Due to its roots in other Ghanaian governance contexts, this manual serves as a template for the policy inclusion efforts that come later in this report. The principles of equity, accountability, participation, and transparency are vital for expanding the breadth and depth of community engagement, progressing from outreach and consultation to involvement, collaboration, and ultimately, shared leadership (ECDC 2020).

1.5 Drawing together participatory governance and complex decision-making

A critical element of any urban system—and particularly one that involves interactions among social structures like politics, economics, and housing and environmental systems experiencing extremes and disruption—is an embrace of multiple forms of mutually influencing complexity (Shtob et al 2025). Unfortunately, socio-environmental interventions in sub-Saharan Africa sometimes simplify the complexities inherent in urban, peri-urban, or rural systems to a single or limited set of factors that suggest one-size-fits-all or overly focused solutions. To counter this tendency globally, many have emphasized the importance of complexity-informed urban governance and planning (e.g. Rauws 2015; Moroni & Chiffi 2022; Pot et al. 2023), including in risk governance contexts (e.g. Wachinger et al. 2013, Renn et al. 2018). However, despite the global acceptance of complexity-informed approaches, even a cursory review of this literature suggests an underrepresentation of African urban contexts compared to applications in the Global North.

This suggests a need for better integration of complexity theory and complexity-informed practice in sub-Saharan African urban contexts. Specifically, this suggests the need for a better appreciation of the dynamic nature of urban risk governance systems on the continent, as well as how interactions among components of these systems change each other and create new conditions that may be difficult to foresee or predict. It includes external environmental or social conditions ranging from climatic effects on rainfall and available housing stock, to the governance and decisional systems through which choices are made (Shtob et al. 2025). In other words, a governance analysis should consider not only the predicate conditions and existing context in which a decision is made, but the way that each set of circumstances may evolve, the way that decisional environments may change, and how the intersection of all of these factors may produce new circumstances and uncertainty. In turn, these demand tailoring solutions to the local context and flexibility in application. Flexibility is needed to allow modification of current solutions, as future demands may depart from presently recognized needs. This suggests the need for longitudinal approaches that draw upon community capacity and expertise as they develop and evolve over time, rather than one-time consultations. It also suggests the strong need for community-engaged approaches to even document the myriad elements of change.

A consequent gap in literature and practice—particularly within African contexts—involves the interplay between the complexities of urban climate governance, participatory urban flood governance, and the sustenance of urban flood resilience, especially in informal settlements. While some scholars have usefully laid a foundation for research of this type (Rauws 2015; Moroni & Chiffi 2022; Pot et al. 2023), the question of how participatory urban governance processes can shape local flood resilience in Accra, and other African urban centers facing disaster risk governance questions, remains open. We build upon this existing work, leverage theories in flood resilience and participatory governance, and adapt literature on complexity to unpack how governance is (or is not) currently reflected in flood management in Accra, understand how it is incorporated into resilience building, and develop a participatory urban flood governance model to support flood management in Accra. The goal is to suggest balanced, equitable, and ultimately effective ways to minimize harm by foregrounding community knowledge and experience, enhancing access to flood response structures and involvement in flood planning, and reducing flood risk exposure in informal settlements by synthesizing external knowledge and theory with local expertise. Towards these goals, we employ semi-structured, in-depth interviews with community members and leadership, as well as members of relevant sectors of Accra municipal government to further develop and realize a participatory governance plan that, from its inception, is participatory. Our longer-range goal is that this will serve as the foundation for transformative policy paradigms that helps stakeholders redefine how resilience is conceptualized and implemented in Accra’s informal settlements and potentially in communities further afield.

2. Research design and methodology

To begin to fulfill the aforementioned goals, we employ a qualitative research approach to (1) analyze processes of urban flood governance and resilience in Accra’s informal settlements, (2) understand what power relations and asymmetries exist, (3) examine local institutional arrangements and approaches to flood governance, and (4) identify how each shapes flood resilience tactics. Our primary long-range aim is to enhance flood risk reduction strategies by supplying concrete, actionable suggestions to improve participatory flood governance to members of affected communities, their leadership, members of Accra municipal government charged with social and environmental improvement, and other stakeholders such as NGOs with an interest in disaster and related matters. One urban governance focus involves participation itself: how the

collaborative development of ideas and solutions can improve later participatory flood governance and decision-making. Another involves how to design the resulting participatory governance systems to reduce future flood risk. We adopt a multi-stream qualitative approach involving expert-informed study site selection, 40 semi-structured interviews with municipal leaders and members and leaders from four informal settlements, documentary analysis, and observational field visits. Inductive approaches like these are designed to suggest innovative conclusions that invite further study, while multistream approaches are ideal for collaborative identification of complex issues and creative pathways towards resolution (Rubin & Rubin 2005; Charmaz 2006). Moreover, our case study approach is intended to illuminate broader social and political circumstances that extend beyond the case itself, providing insights that may be applicable elsewhere (Burawoy 1998).

2.1 Selecting informal settlements

A preliminary yet important step involved site identification through a mapping exercise. Supported by urban governance and development experts in Accra, we used this exercise to determine a priority list of four informal settlements in the city where this study would be localized. Our informal, *ad hoc* advisory body consisted of four urban development and planning experts, including two municipal officials from the Accra Metropolitan Assembly, one civil society leader promoting the rights of residents in informal settlements and the informal economy, and one flood-risk, adaptation, and resilience expert. Despite the lead author's significant experience with the Accra city government, interviews with these individuals² were employed to develop an expert-informed guide to key informal settlements. This process assisted in the selection of four study sites: Glefe, Old Fadama, Agbogboshie, and Alogboshie. Part of the exercise involved the development of a foundational understanding of how the concept of informal settlements is treated in Accra. Within the settlement mapping component of this project, we also focused on several environmental, demographic, and other social indicators including the size and population of the settlement, historical flood risk and realized community flood experiences, historical flood impacts and their intensity, and past support for flood adaptation measures.

² This research was granted exempt status by the Michigan Technological University Human Research Protection Program (Protocol IRB-2025-61) and was later approved by the University of Ghana Ethics Committee for the Humanities. (Protocol ECH 162/24-25). All names used herein are pseudonyms and descriptions of potentially identifying information like job titles or community roles are left vague to comply with confidentiality, informed consent, and other human subject research protections.

These early, exploratory efforts focused on site selection were helpful to create a common understanding of the project and intended communities. Conversational prompts included open-ended questions on the most populous informal settlements in Accra, those that experience the greatest flood risk and impacts, and those that have received flood adaptation support in the last five to ten years. Open-ended questions allowed for the emergence of experts' own ideas, experiences, and priorities rather than predefined answers, creating space for unexpected insights and richer, more authentic accounts. In addition to supplying a list of communities most affected by floods, these detailed the types of adaptation support available, ranging from no support to settlement upgrading projects. They also enhanced our overall understanding of risk perception among communities; residents largely recognize current and future flood risks but face challenges implementing long-term adaptation strategies. By the end of this process, expert guidance aided in delineating the boundaries of six informal settlements in Accra that varied in terms of flood experience and adaptation support, prioritized according to risk and exposure. We selected four informal settlements focusing on those believed to have the greatest exposure and risk to flood events, and potentially the worst ecological impacts. In each case, these are compounded by significant socio-political barriers to response.

2.2 The interview process

The primary data stream for this project involved 40 semi-structured, open-ended interviews intended to assess participants' experience with urban flooding as well as flood governance. Participants were initially identified based on their engagement with informal settlements and their support networks. Thereafter, we used these networks for purposive sampling to identify municipal officials and civic leaders with knowledge and experience in informal settlement flood governance, and outreach through community organizations to identify community participants (*cf.* Rubin & Rubin 2005). Once initial relationships were established, additional community participants were identified through snowball sampling. Participation in this research was restricted to participants above the age of eighteen who have been personally affected by floods in informal settlements, had lived in the community for a minimum of three years, or were professionally tasked with managing flooding in these communities.

To navigate the ethical and logistical complexities associated with conducting research within informal settlements, we engaged a community facilitator- a locally embedded community development professional who acted as a bridge between researchers and

residents. Moreover, research in informal contexts without meaningful community mediation risks extraction, misunderstanding, and even harm (Banks 2020). Working with the facilitator in identifying research participants supported greater depth and first-hand understanding of social dynamics, spatial layouts of communities, and accepted norms in each of the four informal settlements. It also helped to ensure that inquiries and other actions were culturally sensitive without sacrificing credibility by assisting with navigation of community politics and gatekeeping. Together, these factors helped to enhance trust in the interview process. The contribution of informal economic actors is not merely instrumental but epistemological as they are co-producers of knowledge, ensuring it reflects not just externally imposed categories but insider narratives (Patel et al. 2012). This is particularly relevant in informal settlements, where power, infrastructure, and identity are often negotiated rather than fixed. Working with a community facilitator also aligns with decolonial methodologies, which position community actors as co-creators of knowledge rather than passive subjects (Chambers 1994; Smith 2012) and supported our ethical commitments to respect, relevance, and reciprocity in urban research settings (Israel et al. 2005).

Interviews were primarily focused on assessment of the structural and social sources of flood risk in Accra and institutional arrangements for flood response and governance. The eventual goal was to support the development of an interdisciplinary framework for participatory governance of flood solutions in Accra's informal settlements. Interviews were conducted between June and July 2025; nine interviews were conducted with residents of each of the four informal settlements, including local leaders, and four were conducted with municipal leaders and flood adaptation experts. Over time, interviews provided thematic and theoretical saturation of topics in a way that evidenced salience due to its focus on probing and prompting (Weller et al. 2018) to establish thematic depth.

Interview scripts were developed to explore community residents' and leaders' experiences navigating flooding and flood governance (see Appendix 2 for a sample interview script). This approach served two main analytical purposes. First, it supported an institutional analysis through discussions with key informants from entities like the Accra Metropolitan Assembly, Slum Dwellers International, GARID, and leadership in study communities. These discussions provided valuable insights into (normative) institutional arrangements, policies, and flood resilience goals at the municipal level and within specific projects, allowing for an initial assessment of how well policy frameworks

aligned with actual *in situ* flood resilience efforts as well as how fragmented institutional arrangements affected the social governance of flood resilience initiatives. Second, interviews with residents and community leaders who have firsthand experience with flooding and risk offered important context on flood impacts. These conversations not only uncovered community-specific flooding challenges; they also captured residents' perspectives on ways to improve their experiences with flood governance, including through increased inclusion and participation.

Interviews began with questions focused on demographics, housing, and other basic social factors before moving to experiences with flooding and vulnerabilities identified through a review of relevant literature and initial conversations with key informants. Subsequent inquiries focused on current frameworks for engagement and participation, as well as whether the existing flood planning systems are addressing engagement needs. Our open-ended technique allowed respondents to present a more holistic perspective of issues, and thus encouraged the sharing of unique and personal experiences. This approach was valuable as it helped us notice patterns, keywords, common opinions or perspectives, and related themes that are central to our work.

Interviews averaged 45 minutes to 1 hour and 15 minutes. While the study attempted to ensure gender parity across the research, this was not always possible, as there were more women than men generally available. Participants ranged in age from the early twenties to the early fifties, were primarily labor migrants, and had lived in their communities for at least ten years. A majority of interviewees were employed in the informal economy; others were self-employed, and a few others were unemployed. There were minor differences in land tenure and housing ownership dynamics across the respondents. Interviews were conducted in English, Ewe, Twi, and Ga, local languages in Ghana and predominant across the informal settlements. The lead author is fluent in all these languages and spoke to participants in the language(s) of their choice.

2.3 Field observation and walkabouts

In addition to the community interviews, we used field observations and notes across the study's four locations to explore the infrastructural themes raised in interviews and better appreciate community layout and demographics. Two of these visits were supported by local community leaders who engaged us in informal discussions, sharing additional histories, contextual knowledge, and overviews of the community to support interview findings. Overall, we were curious about ideas related to community

vulnerability as well as existing individual or community adaptations to flood challenges. Informal field observations and walkabouts were unstructured and led by community guides, enabling a more comprehensive assessment of communities at various levels of flood resilience and helping to integrate institutional perspectives with local realities.

2.4 Document review

Data collection and analysis also involved a review of national and local government documents, including the Accra Resilience Strategy (2019), Accra Climate Action Plan (2020), and the Strategic Flood Contingency Plan for Vulnerable Communities in Greater Accra (2024). This review was vital to assess local ambitions for flood resilience and governance in Accra, while identifying flood governance gaps and where participatory governance mechanisms were more needed within local strategies. An analysis of flood risk and vulnerability data was also conducted to understand historical flood events and evaluate existing policies related to flood management and urban planning. These data were sourced from local government publications and other local reports. Evaluating current flood management practices against these institutional frameworks helped to better perceive governance and policy deficiencies and suggest necessary regulatory changes. This underscores the importance of documentary review that complements qualitative research by facilitating deeper comprehension of policy contexts that influence public governance (Bowen 2009; Prior 2003).

2.5 Data analysis

Interview responses were analyzed by identifying common primary and secondary themes across our study sites. Themes were generally related to local flood management challenges, disconnects between community needs and governance and engagement approaches, the absence of local communities in long-term urban planning goals, and the consequent impacts of such urban governance gaps. Interview analysis was complemented by documentary analysis of the city's flood management policies and local media accounts of flood management approaches. These results were then triangulated to help ground-truth and explore claims; this helped develop a set of seven primary themes underpinning the discussion of the study. Our findings embed several key topics, including community demographics, land tenure, and housing within informal settlements, as each is applied to the dynamics of local resilience and flood management, community organizing on flood management, and community-municipal engagements on flood management. Additional discussions also focused on opportunities for community

engagement in flood adaptation and governance in Accra and how these respond to existing gaps raised by interview responses and researcher enquiries.

A critical focus was the development of a participatory model or framework to address challenges related to flooding and other disasters through the lens of urban climate governance and tailored for use in urban African informal settlements. Key insights from data analysis supported the development of such a framework that accounts for complex interrelationships among social, environmental, and technical factors. Drawing on a comprehensive review of existing literature on participatory, community-centered research in urban governance and tested participatory governance models, we identified foundational principles and best practices to inform the design of the components of the participatory urban flood governance model.

2.6 Caveats and limitations

Before moving on to our findings and discussion, it is important to note some caveats and limitations. First, we cannot and do not claim to have covered all relevant opinions and observations in these communities, nor across communities more broadly. While we focused on theoretical saturation of themes, the diversity of opinions in any community means that a project of this type cannot document them all. Second, as in any complex system, there are likely components that we failed to identify, and new conditions that will arise that require modification of our findings and framework over time. Therefore, continued attention is needed to account for the impacts of emerging socio-environmental changes. Third, while our goal is to create a more broadly applicable governance system, the current framework should not be applied to other contexts. In other words, while it provides an example of process and some suggestions for content, it needs additional inquiry to adapt it across scales. Fourth, while this report sets a foundation for participatory flood governance (in Accra), it should not be viewed as outlining a full-fledged, complete participatory process that requires no further community engagement. Rather, it is intended to serve as a part of the preliminary issue-identification stage of participation and to suggest next steps towards continued development of these ideas (in terms of the development of both participatory relationships and participatory responses to flood risk). Fifth, we recognize the risk of potential social and recall biases because this work relied heavily on participants' perceptions and experiences. These may have been shaped by other contextually relevant but independent social, political, environmental, or other dynamics. For this reason, we triangulated participant responses with documentary reviews and other

research findings to help us ground-truth and explore claims. Sixth, we emphasize that while these suggestions are supported on paper, they rely on buy-in from those in formal, informal, and traditional positions of power, as well as members of affected communities. The creation of structures that support mutual buy-in is, therefore, a necessary prerequisite to the suggestions made here and should be the focus of implementation efforts. Finally, as in all cases of co-produced knowledge, care should be taken to ensure that the benefits of such knowledge flow to those who contributed rather than solely or primarily to external stakeholders.

3. Findings and discussion

3.1 Background on study locations and site attributes

We focused on Glefe, Old Fadama, Agboghloshie, and Alogboshie, settlements within the broader Greater Accra Metropolitan Area. Glefe, a small coastal town in the Greater Accra region is a settlement of the indigenous Ga³ people with a population of about 21,000 (Climate Mobilities n.d.). A low-lying town nestled between two lagoons and the Gulf of Guinea (Agergaard et al. 2025), its lagoons are part of the Densu Delta Wetland that supports various marine and avian species (Ghana Wildlife Division 2009). All of these species are currently facing multiple risks due to recurrent flooding. Glefe has witnessed an influx of residents over the last few years, driven by an increased demand for affordable housing, a direct consequence of Accra's rapid urbanization (Agergaard et al. 2025).

Old Fadama is larger and perhaps the most popular informal settlement in the city in terms of size and population, sociocultural dynamics, and persistent challenges posed by governmental interventions, including repeated threats of forced evictions (Oppong et al. 2020). Established in 1981 as a temporary resettlement site for migrants fleeing conflicts in northern Ghana, Old Fadama now accommodates a population estimated at between 80,000 and 90,000 (MacPherson 2024). It is situated along the Odaw River and Korle Lagoon - two important water bodies within the city. Agboghloshie is an indigenous settlement of the Ga peoples of Accra, which has transitioned into a densely populated slum due to its proximity to the central business district of Accra. This settlement is located adjacent to the Old Fadama settlement and separated by a busy market street. It historically developed as an indigenous community but has increasingly become

³ The Ga People are a multiethnic group and are the indigenous inhabitants of the Greater Accra Region of Ghana.

characterized by the encroachment of commercial activity, particularly with the spillover of the CMB informal market. Interview responses reveal that the commercial pressure has led to significant housing encroachments, obscuring the visibility of Agbogboshie as a legitimate settlement in need of critical upgrades. Alogboshie is a rapidly developing low-income informal settlement. This area experiences severe flooding crises, with specific zones classified as high-risk by the Ghana Statistical Service (GSS) due to insufficient drainage infrastructure and high-density population dynamics (Awuni 2025). While each of these communities is distinctive, they share some key characteristics.

Discussions surrounding inadequacies in housing and physical space in African urban centers frequently portray these types of settlements as a continuum that spans from informal settlements to slums. Informal settlements arise from rapid urbanization and the self-organizing strategies of urban dwellers aimed at creating affordable housing and associated infrastructure. Slums, alternatively, are characterized by high population density, substandard living conditions, and high levels of deprivation (UN-Habitat 2003). In this study, we acknowledge the nuanced differences between these two categories. We also recognize inherent similarities, particularly in the context of disaster and flood response. This relates to the often insufficient and vacuous nature of urban support systems applicable to both informal settlements and slums. Consequently, we adopt the term informal settlements as a general descriptor of both types of areas throughout our research except as descriptive context demands.

For the last six decades, there has been a long-standing interest in informal economies; informal settlements are often described as their housing dimension. Particularly for the city of Accra, where this debate partially originated and the concept of the informal economy was formally named, there is an inextricable link between the members of the informal economy labor force and informal housing. Hart (1973) notes that *“many of these mobile workers were housed in the slum on the northern outskirts ...”* (pp 1). Informal settlements in Accra, Ghana, are characterized by peculiar historical, socio-economic, and sociocultural features, emphasizing complexities in evaluation, integration, and governance. This phenomenon also explains why Accra’s informality was considered a foundational site for academic enquiries into the ontology and nature of the informal sector (Osei-Boateng & Apratwum 2011).

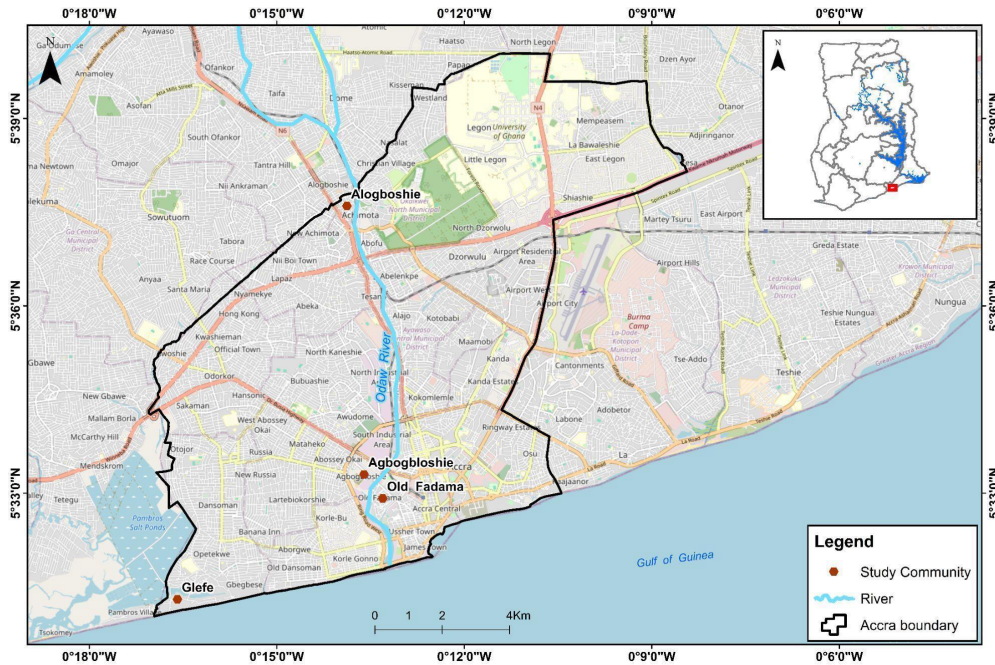


Figure 1: A map of Accra showing the four study locations

3.2 Drivers of flood risk, housing type, land tenure, and employment

Drivers of flood risk are fundamentally associated with the socio-spatial characteristics of informal settlements (Moulds et al. 2021). For instance, a major source of flood risk involves the type and location of housing. Over 90% of all participants indicated that their housing was made of wood, and these structures have been in place for at least five years (often requiring various post-flood repairs). In areas where housing was constructed with more durable materials, many homes were situated along natural water pathways. One interview participant in Glefe, who resided in a rented cement-block house, shared that her home was positioned on a floodplain about 70 meters from the lagoon. Another participant, whose house was recently demolished, lived only about 5-10 meters from the current path of the lagoon on land that had been previously reclaimed. In Alogboshie, several cement-block houses were lined up along the main river running through the settlement, with some structures as close as 50 meters from the waterway. In Old Fadama, most participants lived in housing made of wooden structures; however, recent fire outbreaks led many residents to seek more sustainable, long-term housing solutions within the settlement. Participants in this community

acknowledged the durability of cement-block structures but noted that their choices were also heavily influenced by financial considerations and limitations.



Figure 2: Photos of some study locations during lower water [1 & 2 - Market-settlement. 3 - Houses lining one of three main river courses]

Interview responses showed three distinct forms of land tenure arrangements or relationships to land across the settlements. In Glefe, most inhabitants interviewed possessed title deeds to their lands and houses, were occupying or renting houses owned by people with deeds to the land, or had some form of informalized rental arrangements with landowners who had the title deeds. This was noted to be a common dynamic within the community at large. While this grants some security to landowners and settlement residents, participants pointed out that this sense of security is overwhelmed by the intense experiences of flood and flood disruptions to livelihoods and properties. A middle-aged resident (landlady) noted that her family has faced significant challenges over the past decade, with portions of their house gradually “sinking”. This was a consequence of haphazard community expansion and development as more people buy “reclaimed” yet still marginal land, exacerbating flood risk.

In the second land tenure dynamic, there is a mix of residents who may possess title deeds and those who remain without formal ownership. Most participants with title

deeds are indigenous or early migrants, while later migrants or itinerant workers in these communities lack legal rights to land. This pattern is evident in both Alogboshie and Agbogloboshie, where some participants are indigenous landowners while others do not formally own the land on which their properties are situated. The last type of relationship to land presents the most risk for settlement eviction. This was recorded in Old Fadama, which is still considered a temporary relocation site and in recent times has become a spill-over community of the Agbogloboshie settlement (Amoako & Inkoom 2018). In this final community, it was largely established that nearly all residents possess no legal claims to the land. Here, payments for the use of land can be considered a form of rent payment. This was negotiated, however, via informal negotiations through which residents then establish various rights to residency and social contracts in quasi-formalized systems that do not reflect the expected legal procedures typically attendant to formal ownership or possession of land. Consequently, residents are not “permitted” to develop permanent structures, and informal settlements were often dotted with spraypainted mandates from municipal authorities to remove locally built structures before a deadline. Across the settlements, Old Fadama had experienced the most threats of eviction over the past decade. The presence of mixed relationships to land in informal settlements raises an important issue for urban planning and management solutions and strategies. Consequently, urban development solutions targeting informal settlements must factor in the differentiated impacts of such solutions on residents, including those related to relocation, resettlement, and in-situ upgrading (UN-Habitat 2025).

Participants’ employment status varied from being unemployed to full informal employment at the time of the interviews. A few participants were only partially employed, and one interview participant worked in the formal sector before their retirement. This observation aligns with Adjabeng et al (2022) and Sachdeva et al. (2025), who observed that residents of informal settlements predominantly engage in the informal economy. This trend can be attributed to the comparatively low barriers to entry within the informal sector. While informal employment offers flexibility to workers, it presents limited security and increased precarity. Thus, it limits upward mobility opportunities and potentially creates cycles of poverty and vulnerability for informal settlement dwellers (Hurtado et al. 2017; Ohnsorge & Yu 2022)

The informal settlements under study were revealed to be both a place of settlement and economic participation— people stay where they work and work where they stay. Over 90% of participants who stated they were informally employed or partially

employed also noted working within those communities, sometimes in a special “*work from home*” style. Jobs ranged from petty trading, operating a community grocery store, food vending, and vocational employment such as dressmaking or haircare within or next to homes. A participant in Old Fadama shared “... *I operate the shop you see there. This is also where we live.*” Another participant in Old Fadama recounted, “*When I got married, my husband moved me to this community to be with him. My dressmaking shop is just close to the house...I have lost some of my customers' fabrics due to the rains.*” This situation highlights a double bind, double impact challenge of disasters in informal settlements. Flood damage can simultaneously be infrastructural (impacting their housing and other properties) and economic (impacting their jobs). These multi-factor impacts can explain why longer-term flood adaptation solutions (such as out-migration) can be a complex and difficult choice for residents in informal settlements.

All participants interviewed for this study had lived in informal settlements for at least a decade. Although there were certainly residents who had been there for a shorter period, participant's responses suggested that this was not unusual. There is a general sense that people move there as a temporary measure and as the first settlement when they arrive in Accra (urban center), due to low initial housing costs. However, considering the high cost of formal housing, economic exclusion, and inadequate urban planning dynamics within the city of Accra, residents tended to live in informal settlements for much longer than initially expected. Infrastructural and service challenges, combined with the lack of security of tenure or land rights, contribute to residents living under frequent exposure to vulnerability and constant threat of eviction. It is worth noting that the long stay also enables residents to weave together social systems and bonds that they rely on during disasters, to fill gaps created by the sometimes-absent formal government support structures. Additionally, informal settlement dwellers tended to live in nested groups, often as nuclear families or in other closely-knit social arrangements. These could, for instance, be based on rent-splitting or other forms of temporary living arrangements related to family, affinity, or housing.

3.3 Flood support and disconnects in flood governance

At the time of the interviews, two of the study communities had received varying levels of flood adaptation support over the past five years. One settlement had a drainage project implemented. However, residents expressed concerns about its effectiveness in addressing flood issues due to post-construction of technical deficiencies. One participant noted, “*Recently, we see they are constructing some drainage, but I believe these*

gutters are too narrow and will not be helpful. When it floods, the drains become overwhelmed, and floodwater spills into the community, so it's not very effective." The other community benefiting from adaptation support is currently undergoing a settlement upgrading project financed by the World Bank, which includes road improvements, the construction and widening of drains, and the reengineering of drainage systems. The two remaining communities reported having received no flood adaptation support during the same period. While we cannot determine, in retrospect, the decision-making factors that influence which informal settlement communities receive flood adaptation support, it is clear that a gap exists between project design and community needs. This is because all four communities—whether they received adaptation assistance—reported similar levels of impacts, with only minor differences. Coupled with other social challenges, such as waste management issues and gaps in service delivery, the lack of planned adaptation and imperfectly effective adaptation heighten residents' exposure and risk to the impacts of floods. Overall, it was observed that flood response is being delivered at different scales: high-level, integrated adaptation projects that focus on several presumed infrastructural needs at once; low-level adaptation projects like smaller, government-supported gutter construction (see Figure 3 for examples); and autonomous adaptation featuring no government support at all. In all these contexts, however, it is important to recognize that residents still rely on individual and household-level adaptation practices in the face of flood risk.



Figure 3: Ongoing flood adaptation projects in some study locations. On the right is a larger infrastructural project, and on the left is a smaller gutter/drainage project, each in Alogboshie.

Our findings reveal a disconnect between the perceptions of participatory governance held by municipal leaders and the residents of informal settlements regarding flood governance and management. Community drives, advocacy campaigns, and the

distribution of relief items after disasters carry a sense of participation from the city's perspective; however, residents of informal settlements often have a different understanding of what engagement means. Given high levels of risk and exposure, residents anticipate more meaningful consultation that can lead to concrete actions and outcomes that address their pressing needs. This disparity highlights the complexities inherent in participatory governance. Thus, establishing best practices like mutually acceptable definitions and expectations is crucial for the development of bridges between variant conceptions of participatory engagement.

These initial observations highlight a need to operationalize flood adaptation and flood governance in informal settlements requiring the creation of functional, context-relevant participatory governance mechanisms. Any such mechanism—whether in Accra or elsewhere—should align with locally relevant socio-political systems and encourage participation, reduce risk, enhance access to information and resources, and contribute to overall urban resilience (Campanella 2006; Swyngedouw 2013; Erikson & Peek 2022). In the section that follows, we outline seven suggestions gleaned from participant interviews that can set a foundation for a locally relevant participatory governance plan. These include: (1) improving consideration of land tenure and informal habitation; (2) addressing the paradoxical political visibility and administrative invisibility of informal settlement residents; (3) fulfilling the need for improved, long-term, planned adaptation systems that can best take advantage of participatory principles; (4) enhancing social capital in ways that lend themselves to the development of participatory relationships; (5) enhancing understanding of how adaptive representation and participation can unfold in situ; (6) integrating these in-situ adaptation techniques as part of broader technological solutions; and (7) incorporating flood adaptation as part of overall, two-way urban development relationships.

3.4 Seven thematic elements that suggest means to improve participatory flood governance

Floods in Accra's informal settlements remain a pervasive climate and urban development challenge that severely impacts communities already facing various levels of socio-economic exclusion, governance delays, and other conditions that heighten their risk exposure and vulnerability. Urban development policies, which shape the fabric of the urban sphere, require attention to the historical, socio-spatial, and emerging needs of heterogeneous communities of informal settlements (Sorenson 2014; Obeng-Odoom

2017). Here, we seek to provide a layered, nuanced understanding of some socio-demographic, spatial, and institutional contexts within which informal settlements experience and respond to flooding. While varied responses to recurrent flood risks have been adopted in these communities, they are, in many cases, short-term and ineffective. These strategic failures can be traced to the absence of formal consultation, institutional support, or structured mechanisms for local engagement and planned adaptation, pointing to a broader governance vacuum where the voices and knowledge of informal settlement residents remain largely excluded from flood planning and policy processes. Yet the seven themes that emerged also suggest avenues for productive reform. Within each theme, we underscore not only a gap in current flood governance practices but, more importantly, various potential entry points for an improved participatory governance framework. By this systematic analysis, we hope to begin the process, with our partners and participants, of repositioning residents of informal settlements as co-producers of not only knowledge but also the resilience that results.

Element 1: Permanence in legal temporality

Informal settlements are generally seen as temporary places of residence because residents are attracted by *“impermanent economic opportunities”* (Atkinson, 2024:8). Unfortunately, the legal and temporal precarity that this creates interferes with participatory governance because of the (often unfounded) assumption that these are merely stopping points or illegal settlements undeserving of public investment. These settlements are frequently located *“on state-owned, private or communal land, with or without negotiations with the local population and/or landowners”* or *“tend to be in vacant or underutilized pockets of land, or in high-risk areas”* (UNHCR 2024). These notions of temporality paradoxically raise fundamental long-term questions about land ownership, legality of residence, security, and participation in a wider, more inclusive urbanization. Insecure land tenure remains a defining feature of Accra’s informal settlements. Different forms of unstable relationships to occupied land and unclear legal ownership reflect an implicit acceptance of limited temporal expectations across the study’s contexts. Land tenure challenges and housing rights issues faced by residents in informal settlements mean that they are locked in cycles of evictions and rebuilding on the same or similar types of land. This shapes a certain ‘permanent temporariness’ regarding their settlement, where over time they develop the skills to *“reorganize, return, and rebuild”* (Samper & Andrade 2023:301). In the words of a participant, *“well, the land issue is complicated. Here is an informal settlement. I don’t own the land in any way, but once you’re*

here, it is perceived that the land belongs to you, but we don't have any proper documentation to claim ownership, but that is the only barrier. I don't own the land, but I bought it from the chiefs, even though I don't have any proper documentation to claim ownership, I bought it from someone" (interview participant, Old Fadama).

This situation profoundly influences how residents organize their lives within informal settlements. Many scholars describe this similarly to temporary urbanisms (Andres et al. 2019:32), which allow places to be *"purposely used and activated, responding to specific economic and social needs"* while also being *"left aside and neglected by the state, the private sector and planning"* (Oswalt et al. 2013, quoted in Andres et al. 2019:32). Many participants tended to lower their expectations of what the state can or will provide, viewing themselves as *"temporal"* residents or *"residents in transit."* Some participants articulated this sentiment, reflecting a broader feeling within the community. Nevertheless, there seemed to be a covalent acceptance of some permanence within this limited temporality. This is particularly evident when they engage in various forms of an incremental upgrading process. These projects, in which residents make investments on the land despite ownership challenges, lend a sense and semblance of stability and permanence to both their housing and residency (Andersen & Hvejsel 2022).

It is also important to note that despite the perception of temporality, the typical length of residency also demonstrates a certain level of permanence. In some instances, generations of families have established their lives in these areas, further complicating notions of impermanence or short-term temporality. While a majority of interview participants expressed awareness of the risks associated with living on such marginal or *"illegal"* lands, the shortest duration of residence in these areas was 10 years, and many residents had lived there for more than 20 years. Regarding experiences with (threats of) eviction, residents noted: *"with the eviction threat, each and every three to four years, it's been the norm in this community. It's been happening. Just that in the last few years, we haven't been threatened; otherwise, each and every few years. Though it doesn't have a fixed pattern. But each and every time, about two to three years, we always have a threat of eviction"* (interview participant, Old Fadama).

Generally, the perception of temporality and illegality (despite realities that challenge this perception) creates socio-political barriers that result in local government inadequately addressing the needs of these *"temporal"* residents, while validating local governments' deprioritization of community needs. In short, the perception of illegality

or short-term residency can result in official hesitancy to direct long-term public and potentially other forms of investment towards those viewed inaccurately as interlopers. Consequently, the basic services and resources that are essential for their disaster recovery may be overlooked or deemed low priority, especially in contexts where resources are scarce or limited. *“There has never been any government intervention, be it socially, infrastructurally, culturally, or whatever. We don’t have any assistance. There has never been anything feasible or beneficial to the community entirely ... when such things [flooding] happen, it’s only the neighborhood that tries its own way to mitigate the impact on people”* (interview participant, Old Fadama). Referring to the 2015 floods that severely impacted the community, he said: *“there was nothing like government intervention. The only thing they did was to demolish structures from there [pointing to a nearby spot] to the end of the community”*.

In the absence of a communal, institutional, or legally recognized sense of land rights or ownership, residents in informal settlements will continue to respond to flood challenges with short-term, reactive solutions that lack integration with official planning; adaptation measures may be treated as mere temporary fixes. Although many are creative and provide benefit, such situations contribute to creating a cycle of impact-adaptation-impact as urban floods grow increasingly unpredictable, and short-term adaptation fixes may not sufficiently address the escalating effects of flooding. Addressing this challenge necessitates decisive actions that account for the livelihoods, housing, and safety concerns of residents and integrate them into official, better resourced efforts. These should also recognize historical trends like how perceptions of illegality and temporality (even when inaccurate) threaten the foundations of productive collaboration between communities and officials.

Element 2: Contested urbanization: Political patronage and administrative invisibility

Informal settlements face a paradox: they are politically visible yet administratively invisible. This duality is particularly salient in the context of informal settlement flood governance since the absence of formal engagement exacerbates vulnerability and mistrust as these exclusionary practices sometimes interfere with inclusion in flood risk mapping, drainage planning, early warning planning systems, and other officially sanctioned adaptive practices (Asumadu-Sarkodie et al. 2020). Where they are included, residents may not receive the financial and infrastructural attention needed for long-term adaptation. The paradox becomes evident during electoral seasons, when political

actors mobilize informal settlement dwellers for votes through promises of infrastructure and protection from eviction. However, outside electoral cycles, residents are rarely engaged in long-term development dialogues, let alone disaster preparedness. This cyclical political patronage entrenches a form of urban citizenship that is conditional and instrumental rather than rights-based (Paller 2015; Tierney 2015). One consequence is a chronic underinvestment in essential infrastructure, particularly settlement upgrading, storm drains, waste management, and resilient housing, which directly contributes to the recurrent and intensifying nature of flood risk.

Participants detailed that they are aware of the expectations to fulfil civic duties (including voting in national elections), although they have had little to no access to governance or other social benefits: *“when we vote, we get nothing in return. Community infrastructural development is what we can get, so the government should focus on it”* (interview participant, Agboghoshie). In effect, informal settlements are caught in the paradox of being politically visible due to clientelist politics yet administratively invisible through exclusion from formal or rights-based urban planning processes and protective infrastructure investment (Paller 2015).

The socio-political and temporal dynamics of the informal settlements introduced previously also contribute to, and interact with, the administrative invisibility of such communities, where non-engagement and non-investment are justified because these settlements are ‘illegal’ and deemed unworthy of public investment (Songsore, 2009). One Alogboshie resident noted *“we are upright citizens; we vote when the government needs us to. So, when we also need them to act to save us, then they have to. So that we can also respond to the national call when needed. The absence of drainage is a major challenge. I already mentioned that, but I want to reiterate it.”* Residents are, therefore, forced to exist outside the city’s usual legal and urban planning framework and while participating in various forms of urbanization in the absence of state involvement: *“those of us here can be considered as living on the margins of the town, but it’s still part of the town”* (interview participant, Alogboshie floodplains). Thus, Accra’s rapid urbanization can be considered to be (re)producing urbanization on the margins (Yeboah & Shaw 2013; Afenah 2012). Building effective long-term flood resilience in informal settlements requires understanding of the many ways in which residents exist within the above paradox, how these relationships reinforce urban inequality, and how they interfere with inclusive decision-making. Such successful long-term flood resilience requires the implementation of actions and objectives which are collectively designed and incorporated into existing

or new urban frameworks that can address systems of political patronage and administrative invisibility.

Element 3: Autonomous adaptation as coping

Flood adaptation generally moves between spontaneous actions led by private individuals to planned adaptation by the government. In informal settlements, residents participate in self-led adaptation actions (autonomous adaptation) in light of immediate and anticipated flood risks. These forms of adaptation, often with short-term impact, *“take place invariably in reactive response to climatic stimuli...without the directed intervention of a public agency”* (IPCC 2001). However, they often lack the full range of resources, information, or spatially extensive imagination (especially when reactively pressed for time) to design and implement comprehensive community-level flood management projects. This raises a collective action problem of coordinating adaptation solutions across residents’ individual priorities, where one’s adaptation actions or inactions may lead to higher flood risk for other residents (Kelsall et al. 2022). Nevertheless, these actions indicate a wide range of local knowledge and experience that can be drawn upon in the participatory design of new, collaborative initiatives that better integrate this knowledge base with broader planning strategies. This type of adaptation was observed across all the study locations, where residents in informal settlements take responsibility, especially at the household level, for things like constructing drainage ditches, redirecting natural flood paths, and modifying housing structures.

A landlady in Alogboshie noted *“before, this place wasn’t cemented, but due to the floods, the building has been going down, so we always had to be filling up the whole compound, so we decided to cement the whole compound and build this staircase to go higher because the streets get flooded.”* An informal waste sector recycler from Old Fadama accentuated this perspective, adding *“though it’s a slum, the inhabitants themselves, in their own way, manage whatever challenges because they know nobody will come to their aid... as much as we’re used to this, we also make sure we mitigate the impact on us.”* When asked how residents adapt to the flooding, a community organizer from Glefe said that *“After the rainy season, we all seem to forget about the floods. And then we get active in the next rainy season...Soon after the floods, our community gathers to dig paths for floodwater to ease into the sea.”* This peculiar adaptation situation is because a big part of this community is situated between a lagoon and the sea and has inadequate flood management

infrastructure. Thus, community residents become responsible for short-term, reactive solutions on small scales. Interview insights reveal that residents also tend to lean towards autonomous adaptation even in communities where there might be existing external community-level adaptation support.

While these autonomous adaptation techniques and capacities offer a useful mechanism for residents in informal settlements to manage impacts, they may not always be the most effective way to handle flooding in communities with diverse socio-spatial features and may shift responsibility to individuals and communities that may lack responsive resources (Tierney 2015). Factors such as information asymmetries, limited adaptive capacities, and insufficient resources can hinder the deployment of suitable design and basic construction systems for this purpose. When asked about the efficiency of autonomous adaptation for tenants in her house and the residents in her community, a landlady in Alogboshie noted that the adaptations do not always help. *“Sometimes, the floods come bigger than what we thought came before. But in my house now, it is a bit better with us building the wall around the house.”* The same may be said for larger scale technological projects; a community leader in Alogboshie showed us a massive floodwall built on the opposite side of the river that he noted redirects water towards their community. A resident in another informal settlement also said that autonomous adaptation actions can have negative consequences for overall flood management. *“Flooding in the community is very worrying, but there are some places in the community that experience the flooding most...The places I mentioned earlier are the lowlands in the community. With the nature of those places, the only thing they do is build walls at the front of their houses so that when it rains, the water doesn’t come into their houses. But what happens is...when you block a passage of water, it will find its way, so even with all their efforts, the (flood) water doesn’t get to the lagoon.”*

For autonomous adaptation to be effective, incentives, knowledge, resources, and skills are fundamental, with the government responsible for producing an environment conducive to such adaptation (Fankhauser et al. 1999). Mendelsohn (2000) further argues for government involvement in (community) adaptation on the basis that floods and flood impacts are an externality, there are high information costs for effective individual adaptation, and government-led actions are ideal for addressing the equity and justice dimensions of climate impacts. Considering that adaptation is a public good carrying high transaction costs, government involvement may be needed to facilitate

autonomous adaptation and to deliver planned adaptation (deliberate context-based policy planning) (Aaheim and Aason 2008; Malik et al. 2010).

Municipal leaders therefore should establish participatory frameworks that actively engage residents of informal settlements and prioritize more formal and more culturally organized planned adaptation as a principal strategy for flood resilience within these communities. It also suggests the importance of two-way dialogue that recognizes and reflects the long-term, involved nature of do-it-yourself flood response. Leveraging this knowledge and experiential base, about what has worked, what has not, and what could be done, promises to provide management benefits that exceed other plans where response is more government focused. Such a framework will also enhance the adaptive capacities of residents, address information asymmetries, and lower costs for adaptation. In these ways, it can empower residents to pursue autonomous adaptation strategies that are complemented by planned adaptation, improving both modes by unlocking a wealth of co-benefits and experience-based guidance.

Element 4: Social capital: Yes, in terms of bonding, no in terms of linking

Our findings indicate that community cohesion has not been fully leveraged to advance local community consultations on community-led adaptation and resilience efforts. Community-led development in informal settlements is necessary to address historical and emerging development challenges resulting from socio-spatial inequalities (Anguelovski 2016, 2018). However, it is often unclear whether (or how) social cohesion or social capital—the ‘aspects of social structure’ that provide members with access to resources that they can use to pursue their interests (Tirmizi 2005) --can be leveraged to encourage demand-responsive organizations such as local government to address the socio-spatial flooding challenges. Putnam (1993) and Woolcock (2004) organize social capital into three distinct dimensions. Bonding capital facilitates the interpersonal relationships that develop among individuals within a homogeneous community, characterized by a shared sense of collective identity and cohesion. Bridging capital extends beyond primary identities and facilitates connections across heterogeneous communities (Mpanje et al., 2022). Linking capital encompasses relationships between individuals and formal systems or institutions (Tirmizi, 2005) to establish connections with higher levels of power (Kim 2006). In these communities, a surfeit of bonding capital may help residents autonomously respond to flood risk, but a lack of bridging and especially linking capital impedes efforts to coordinate with institutional efforts.

Social bonding stood out as a key strength among the four communities. Participants indicated that there are sufficient levels of community ‘friendliness’ and cohesion, with a shared capacity among residents to support those most impacted by the floods when needed. *“When it rains, we can’t sleep. It doesn’t carry our property away per se, however, we can’t sleep because we need to keep watch for possible flooding even if the rain lasts for four hours, so we don’t lose our home (kiosk). When that happens, our neighbors from other parts of town can come to our aid.”* However, there was no evidence to suggest that this sense of community and cohesion has historically led to the development of sufficient social capital for community-led initiatives or efforts to engage with local government for flood response in these communities. This is particularly surprising considering that more than 90% of interview participants reported experiences of property loss, economic hardships, and recurrent investments in individual flood adaptation efforts for their homes and properties. This suggests another way that experiences related to flood risk, impact, and adaptation are similar across all interview participants and their communities.

This gap in community-led effort could stem from any one of several factors, including a lack of local community agency in participating in governance systems, insufficient civic awareness, and what participants described as a mindset of *“resource sufficiency for only oneself.”* Consequently, communities struggle to move beyond a narrow view of individual adaptation responsibilities in the face of disasters, as limited resources may hinder their capacity to leverage community strength to engage strategically with local governments and other institutions on disaster response.

Fuentes and Pirzkall (2020) suggest that social capital can be institutionalized through social ties and networks, which can help address service deficits. It is crucial, however, to note that social capital and, more specifically, linking capital, cannot exist in isolation, nor do they develop by themselves. Instead, they require investments by municipal leaders and other community partners to purposefully build community knowledge on community-governance relations. These could potentially stimulate the development of linking capital to engage with municipal leaders and institutions while participating in flood governance processes. Participants articulated a distinction between the actual provision of mutual support during disasters and the notion of community consultations or community-government consultations before, during, or after flood events to discuss future actions (which remains largely unrealized). This dynamic is supported by Kim (2006), who found that bonding capital can negatively affect community-driven

development, especially in highly segregated neighborhoods where low levels of social cohesion result from fragmentation and a lack of coordinated systems for idea and resource exchange.

In response, Ziorklui et al. (2024:9) propose that social capital should be utilized as a means, rather than an end, to foster collaborations between formal and informal sectors. They urge urban formal actors to “*utilize social capital to pursue equitable, inclusive, and sustainable urban development initiatives*” while “*providing access to external support and linking communities with outside essential resources.*” Cornwall (2008) further underscores the significant role of community agency in enhancing governance effectiveness in the context of environmental challenges, as it harnesses local knowledge systems that are frequently sidelined in top-down governance models. Such approaches are necessary for addressing immediate environmental challenges but also contribute to the long-term sustainability and resilience of these communities in the face of climate change. Aligning with the principles of participatory governance, particularly the emphasis on community agency, it is crucial to recognize and enhance the existing social cohesion within Accra's informal settlements and the need to develop linking capital that could contribute to long-term, co-beneficial participatory relationships with external stakeholders and institutions.

Social cohesion acts as a critical foundation for developing social linking capital and empowering residents to participate in local decision-making processes related to flood adaptation and mitigation. However, it requires local, long-term, non-technical investments aimed at developing linking capital for residents and local leaders within informal settlements, as well as their potential public sector partners. These should begin with an assessment of the types of social capital that exist in a community. Marshalling the benefit of the existing social capital system could provide an inroad for enhancing linking capital or other forms that may need more intentional efforts to develop.

Element 5: Deference of participation to local political and traditional leaders: Agency, abilities, and knowledge

Political and traditional leadership are common features in both formal and informal societies in Ghana, and in informal settlements often displaced a desire for direct participation by community members. Traditional authority is not necessarily integrated into the country's constitution, but it plays an important role in facilitating various governance arrangements within these societies (Amoako, 2019). Political leaders,

elected and non-elected, formal and informal, also exist at multiple levels of governance and are considered key stakeholders in many local governance processes. Where they exist in informal settlements, their involvement in flood management and flood governance systems can be useful, as they often have significant power, access to the corridors of urban power, and deep knowledge of local political conditions, temperaments, and decisional environments. However, these arrangements must be centered in broader communal participation to ensure that these leaders act in the best interest of communities, and their representation reflects the genuine needs and desires of the wider community.

Interview participants acknowledged the role of both informal and traditional leaders in fostering governance relationships between local government and the community, even if their influence is currently not fully utilized. Across the study communities, there was a broader inclination to view this local leadership as ‘the’ (only) legitimate means of representation in navigating complex legal and regulatory governance situations. An Agbogbloshie resident said that *“when our assemblyman notices something wrong, he is responsible for contacting the right authorities for what to do. As for community members, we don’t have the power to do that. It should be the assemblyman.”* An Alogboshie resident further reiterated that *“That’s the job for the chief and the assemblyman.”* This dynamic may stem from a broader cultural respect for local leadership structures within informal settlements, where deference is often given to elder or community leaders in decision-making processes, as well as a hierarchical stratification of political power that goes well beyond disasters.

It may also generally reflect residents’ strategies to mitigate or avoid risks associated with direct interactions with municipal authorities. For example, hesitancy to approach public officials may serve as a precaution against potential evictions linked to land tenure, settlement, and housing rights, as well as evolving legal and regulatory landscapes. Yet it is important to establish that this perspective was also shared by local indigenous residents and others who possess relatively greater legal rights to their lands (about 20% of participants). Participants nearly all pointed to the ‘assemblyman’ (a politically elected local community leader), and ‘the chief/s’ (traditional leadership through inheritance or social appointment, often in migrant communities) as the legitimate community leaders to engage with, respecting a local chain of command. This may also be attributed to historical patterns of power and governance where local government structures do not acknowledge or engage with informal settlements as

legitimate stakeholders, which informs their beliefs regarding the value of their input. Therefore, while community members often embrace autonomous adaptation to flood risk, there is little equivalent opportunity in terms of autonomous organization to get involved in governance or decision-making.

Consequently, feelings of political apathy and disenfranchisement may discourage residents from participating actively in governance processes, thereby cyclically perpetuating marginalization (Mohan & Stokke, 2000). This delegation of governance participation to traditional and local political leaders raises challenges that may hinder effective governance and community empowerment opportunities. One critical concern associated with this deference involves the development of dependency relationships. When community members rely absolutely on traditional leaders for decision-making and representation, with no interest in engagement, their voices risk becoming sidelined in favor of the interests and priorities of these leaders. This is concerning, especially where traditional or political leaders may not fully align with or advocate for informal communities, resulting in decisions that do not reflect the actual needs and rights of residents (Cornwall & Gaventa, 2001). Of course, any effort to redistribute authority in these circumstances must be done sensitively and respectfully, both culturally and practically. These governance systems often exist for good reasons: representational government, the continuation of traditional practices, and community advocacy in places that feel underserved. Nevertheless, deference to an appointed single voice may miss much of the knowledge, experience, and needs of a community, impoverishing the breadth of experience and thought represented. This phenomenon signals an important need to cultivate expanded applications of holistic community participation and leadership that complement the voices of formal, informal, and traditional leaders in the context of disaster management and participatory flood governance.

Rather than exclusively focus on the role of the assemblyman and chief, communities would benefit from a shift towards more inclusive leadership structures that encourage the active participation of individual residents in identifying environmental challenges and solutions. This may not impact who holds the ultimate decision-making authority and power. Rather, it implicates the need for more formalized, dialogue-based systems for co-generation of solutions featuring multi-directional deference. For instance, as practiced in Ghana's traditional governance systems, a chief will make a final decision but is advised by elders, subchiefs or traditionally appointed advisors. A system where ultimate decision-makers are advised by community committees (or similar) could also

encourage buy-in due to a sense of meaningful participation and empowerment. Such grassroots involvement ultimately should lead to outcomes that can be more effectively integrated with participatory discourse between ‘political and traditional leaders’ and governance agencies, contributing to bottom-up creative problem solving that serves local needs.

Through these layered participation and leadership arrangements, communities can benefit from a more holistic representation of their needs and aspirations while mitigating potential in-group and leadership biases that often hinder effective governance (Bohman, 2016). Ensuring that the structural framework and spirit of community-government engagements reflect the varied voices within the community is paramount for fostering genuine collaboration and trust (Putnam, 2000). These ideas suggest a shift towards participatory governance models that emphasize the collective input in decision-making processes even when ultimate authority rests with representatives. Fung & Wright (2003), for example, have shown that communities that engage residents in such ways tend to foster stronger civic ties, leading to enhanced social capital and improved local governance outcomes.

Element 6: In-situ adaptation as coping: When migration isn’t an option

Flood challenges present major risks to informal communities, which typically have limited resources and face information asymmetries yet need to act to limit the current and future impacts of floods. Responses that suggest that residents should simply leave, perhaps related to the incorrect perception of temporariness or illegality, are often red herrings or infeasible distractions that ignore social complexity and therefore deny community access to resources. In-situ adaptation, where residents determine and implement solutions, often remains the most feasible option in the face of various equity, capacity, and resource constraints (Rufat et al. 2020; Rufat & Kuhlicke 2025). Despite the acute awareness of historical, current, and future flood risks, residents across the four informal settlements reported that they have remained in flood-prone informal communities. This pattern emerges from a complex interaction of economic, social, and political factors (Mallick & Hunter, 2024). Most interview participants demonstrated a generally low ability and willingness to move from the communities. Although ‘willingness’ is used here, deeper analysis connects this pattern to captive adaptation (Rufat & Kuhlicke 2025), where individuals feel bound to a place due to a real or

assumed sense of limited options. Because of scant details about in-settlement migration patterns in the face of climate risk, we highlight two key interview themes.

First, between flooding events, informal settlement dwellers contend with the economic ramifications of migration as a solution to the flood challenges they face. In this case, migrating out of these settlements is considered a privilege that most informal dwellers, who are unemployed, work in the informal economy, or face significant precarity, cannot afford. When asked why people don't move, a middle-aged community leader noted, *"If you don't have it (money), can you leave? Goats can't wear the shoes of cows....Just this morning, I was telling our neighbor, may God help me find a job and save to find a better place. I'm unhappy here, but I don't have the means to leave, that's why some of us are still here."* A middle-aged resident in Alogboshie who lived on flood plains also noted that *"those of us with no money to rent elsewhere, we remain here and deal with the floods. The floods have been a big problem here since 2015. This is where we've lived with all our kids, so when it happens, it's just dzidodo."*⁴

Second, it is important to acknowledge the significant role of cultural connections, settlement-based social networks, and social cohesion in influencing individuals' decisions to remain in their communities despite flood impacts and risks (Mallick et al. 2021). Earlier, we illustrated that residents of informal settlements often share housing and other resources within the context of familial, social, or employment-related associations. These systems of social bonding and interconnectedness (and the fear of the loss of the benefits of these arrangements) create substantial obstacles to migration. Individuals are typically reluctant to abandon their groups, and groups often require adequate resources to facilitate migration of everyone together. This underscores the complex interplay between social ties, family structure, and mobility (Erikson and Peek, 2022). Moreover, just as they do for public investment in communities, prevailing perceptions of illegality, marginality, and temporality, establish significant political barriers to public investment in relocation, similarly to how barriers to protecting those who stay have developed. This is primarily due to the high costs associated with relocation projects, which governments must carefully navigate alongside complex social considerations for effective implementation—highlighting the political dimensions that contribute to why people remain in place.

⁴ Dzidodo means 'courage' in the Ewe language

In comparison to global patterns, this challenge mirrors established trends of climate-induced (im)mobility and locally grounded adaptation (Black et al. 2011; Cubie 2016) and highlights the underpinnings of adaptation decisions in the face of flood risk in informal settlements. In this context, in-situ resilience must be elevated as a necessary option for urban policymakers, first through a deeper understanding of in-situ resilience as an urban development framework and then through adopting participatory governance lenses to support these decisions. Recognition of informal settlement residents' long-term involvement and knowledge (as opposed to viewing them as just visiting) would help position them as co-creators of durable flood mitigation and adaptation solutions, tailor solutions to the socio-spatial realities of long-term residency with limited relocation options and support the use of existing social capital networks in design (Cornwall 2008; Watson 2014).

Element 7: Development as adaptation: integrated development needs beyond disaster response

Complex relationships exist between flood resilience and socio-economic development in informal settlements. These relationships often lead to a persistent reproduction of social inequality and even the erosion of social capital, making it difficult for residents to overcome socio-economic barriers or enhance their resilience to environmental shocks. This suggests a need to reconceptualize the urban-environmental development needs of informal settlements to move beyond a single focus on structural flood adaptation to approaches that address various social, economic and environmental sources of flood risk. Cities can address flooding while also achieving other development goals by designing interventions that serve multiple local purposes. For example, informal settlement upgrading projects can incorporate flood infrastructure improvements alongside solutions for improved waste management, which directly impacts health outcomes, especially for children (as well as drainage). Such upgrading projects can also improve access to services like energy and progressively address land tenure issues. This combination of solutions can positively influence educational outcomes in informal communities. These outcomes can help reduce barriers to economic development and address social and economic challenges simultaneously (Satterthwaite et al. 2020). Interview responses reveal widespread recognition of this interconnection. For example, an Agbogbloshie resident said that *“our youth have no jobs, so you can imagine how easy it is for them to be swayed during elections,”* while a Glefe interview participant noted that

“in this town, we don’t even have a market, we don’t even have a public school here and the cost of private school education is high. So, some kids are left at home. That’s not good.”

Across the four study communities, participants acknowledged that the long-term challenges posed by flooding extend well beyond immediate disaster response and emphasized the necessity of addressing flood resilience as part of broader economic development objectives, including youth employment, healthcare, and basic education; *“We are surrounded by big industries [on our land] and yet receive no benefit from them. In some other areas, local communities receive healthcare as a form of support from industries located there...during health emergencies, there are no health centers nearby for our people; this isn’t acceptable”* (interview participant, Agbogbloshie).

Interview responses show that communities see flood resilience as a positive outcome of a more integrated development approach, signaling the need for flood governance and management approaches that sufficiently address the complex web of relevant social, economic and environmental factors. Additionally, considering the dynamics of political patronage commonly observed in informal settlements, integrated development measures emerge as crucial frameworks for fostering effective local governance and encouraging participatory (flood) governance. Such measures challenge the idea of governance as merely reactive and instead reframe it as a proactive tool to plan for disaster and recovery. This approach also plays a vital role in tackling the underlying vulnerabilities that threaten well-being and urban development in informal settlements. For instance, jobs with fair wages can help residents secure more flood-resilient housing, accessible healthcare plays a crucial role in addressing health needs during environmental crises and reducing initial vulnerability, and quality education can enhance residents’ access to economic opportunities and foster long-term economic resilience.

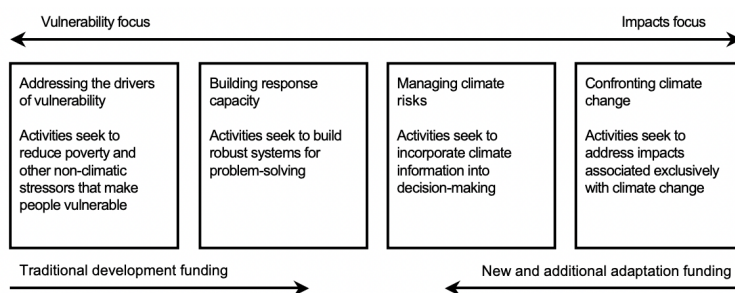


Figure 4: The adaptation-development continuum. Adapted from Mcgray et al. (2007) in Klein and Persson (2008).

Schipper (2007) introduces the ‘vulnerability reduction approach’ and ‘adaptation approach’ to link adaptation strategies and other development goals. One suggestion is that a greater focus on vulnerability reduction approaches will prove more effective for addressing adaptation challenges as people are “*vulnerable to the impacts of climate change for non-climate reasons*” (Arun et al. 2010:7). McGray et al. (2007) further proposes a continuum of development (Fig 2) which helps us view adaptation as “*a means to achieve development ends*” (pp 2), suggesting that a dual view of this continuum can help decision makers pursue development ambitions which can help lower vulnerabilities of communities that enhance their capacities to adapt to environmental crises. Consolidating these views of integrated development as an outcome of participatory flood governance reinforces the importance of such measures in disaster response and provides a blueprint for making local economic development more inclusive.

4. Using Principles of Participatory Governance to Improve Flood Resilience in Accra's Informal Settlements

Flooding in informal settlements is influenced not only by topographical features and climate variability but also by urban development and governance choices that significantly impact the resilience of these communities (Amoako & Frimpong Boamah, 2015). The absence of participatory governance mechanisms hinders both the resilience of informal settlements and Accra's broader urban fabric. If we take participatory decision-making seriously, effective flood governance requires an understanding of local knowledge and social cohesion, as community residents typically possess granular understanding of flood-prone areas, informal drainage channels, and existing adaptive capacities, strategies, and challenges. However, without formal mechanisms for their inclusion, the knowledge and experiential bases of the informal settlement, residents will likely remain insufficiently respected and underutilized. For example, participatory governance can provide essential institutional entry points for integrating local insights with comprehensive urban flood governance frameworks (Brown et al., 2018). Furthermore, a rights-based participatory approach informed by Lefebvre's concept of

the “*right to the city*” (1996) advocates for more than mere consultation, and emphasizes the necessity of co-production of knowledge, plans, and decisions. This approach requires the local government to view informal settlement dwellers as partners with rights to influence infrastructure and resilience planning. This perspective aligns with contemporary global discourses, including the New Urban Agenda and SDG 11, which strive to create cities that are “*inclusive, safe, resilient, and sustainable*” (UN 2015). After a brief recap of some salient points from the foregoing analysis, in this section we distill our findings into suggestions into a preliminary model that is usable for communities and leaders interested in implementing participatory governance approaches.

Participatory governance complements technological flood solutions yet requires partnerships among communities and municipal leaders. These, however, require mutual understanding of pre-existing impediments to partnership. Among the socio-political barriers to participatory governance are complications arising from insecure land tenure systems, the duality of political visibility and administrative invisibility of informal settlements, autonomous rather than planned adaptation, low social linking and bridging capital among residents, underutilization of residents’ agencies, knowledge and abilities, and a disconnect between local flood adaptation and the long-term development of informal settlements. We conclude with recommendations for how municipal leaders may use participatory governance approaches to address these challenges and improve flood resilience in Accra’s informal settlements.

We understand that public officials are increasingly prioritizing responses to these challenges (Owusu et al. 2024) and therefore offer our findings as tools that can be used to enhance their participatory urban flood governance objectives. In this section we use ideas developed from the nexus of relevant literature and participant interviews and then synthesize, adapt, and present them as an easy-to-digest participatory urban flood governance model. While this model is based on and influenced by current challenges and structures of flood governance in Accra’s informal settlements, the principles and values underpinning the model or framework can be transposed to similar socio-spatial and sociopolitical contexts provided they are adapted to those specific local contexts. While doing so would require further research across urban African informal settlements, we hope that our process and this model provide an example that can be used to adapt this project and our findings to the unique complexities of other urban spaces.

4.1 Indicators

Our participatory governance model is grounded in four indicators: accountability, equity, transparency, and participation. These have been adapted from SEND West Africa’s Participatory Monitoring and Evaluation (PM&E) Manual (2016:10), which was developed in Ghana and nearby West African countries and is internationally recognized for its “*bottom-up and participatory approach to enabling and strengthening citizen-government partnerships.*” SEND’s work promotes good governance practices across West Africa through the education and empowerment of citizens to “take part in the political process and access the services available to them” (pp 6). The indicators were developed by SEND as a measure of the government of Ghana’s compliance with pro-poor development policies and programs. We find a strong alignment between the outcomes envisaged from the use of our model and the objectives and proven results outlined in SEND’s PM&E manual.

Accountability	<p>Assesses compliance of duty bearers with laws, administrative procedures, and financial management systems in the planning and implementation of government pro-poor programs.</p> <p><i>This value can help ensure that participatory flood governance is recognized and institutionalized as a key component of climate and urban governance structures to avoid the risk of performative participation.</i></p>
Equity	<p>Examine the extent of spatial, social, occupational, and gender equality in the planning and implementation of pro-poor programs.</p> <p><i>This value can help ensure that intentional efforts towards participation structures can counteract disparities in participatory opportunity and that resilience and adaptation efforts do not feature reproduction or reinforcement of existing power asymmetries in informal settlements.</i></p>
Transparency	<p>Investigates coordination of implementing agencies involved and the availability of information about pro-poor projects to the public, especially their intended target beneficiaries.</p> <p><i>This value helps ensure informed deliberation and the timely distribution of key participation information relevant for flood governance in informal settlements to build public trust and encourage meaningful decision-making.</i></p>

<p>Participation</p>	<p>Assesses the involvement of the poor and their civil society allies in the planning and implementation of pro-poor programs.</p> <p><i>This value underscores the importance of long-term and continuous participation of informal settlement partners. It emphasizes depth and breadth of such relationships and ensures that participation is an ongoing commitment focused on achieving progressive improvements in flood (climate) resilience and overall development within informal settlements. This form of participation is also central to the co-production of knowledge through issue identification and the collective design of solutions for flood resilience in informal settlements.</i></p>
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4.2 Implementation Timeframes and Participatory Governance Actions

We envision participatory flood governance as a long-term, continuous endeavor to achieve flood resilience and progressive urban development in Accra’s informal settlements. Participatory urban flood governance models require extended timeframes, as they are concerned with addressing a multiplicity of issues simultaneously. These include the need to restructure power relations, build institutional capacity (for residents in informal settlements and municipal leaders), address various socio-spatial inequalities, and catalogue community capacities and vulnerabilities. Long-term engagement is necessary to lower any extractive tendencies in participation and fully account for the complexities inherent in formal-informal interactions, while recognizing that impacts of historical legacies of marginalization cannot be addressed through short-term interventions. Our model is characterized by sequential short-term, medium-term, and long-term interventions (Mitlin & Satterthwaite 2013), which are also reinforced by temporal outcomes. We have separated the necessary actions to support a temporal progression of ideas, actions, and outcomes within the framework. However, we emphasize the interconnectedness and cyclical nature of the framework to demonstrate the relationships between individuals and institutions, and the reinforcing nature of the actions and outcomes detailed in our framework.

Short term: Strengthening Agencies, Abilities, Knowledge, and Coordination

Address gaps between community and municipal perspectives of participation

The initial phase of participatory governance fundamentally requires efforts to address the gaps between rhetorical commitments to 'engagement and participation' and the actual delivery of such engagement and participation. This objective sets the scene for communities and municipal leaders to come to a common understanding of the parameters of participation. This crucially determines the collective vision of municipal leaders and residents designing a set of goals and objectives together, which then suggests specific participatory flood governance activities and outcomes. Here, municipal leaders and residents must prioritize trust-building efforts aimed at resolving legacies of marginalization and eviction experienced by residents and the impacts of administrative invisibility of informal settlements. Without trust, participation is likely to remain performative. Trust building can be achieved through various small but tangible outcomes, including initiating structures for participation, avoidance of tokenistic participation approaches, and low-effort infrastructural improvements identified by residents, where possible. Evidence from participatory design of nature-based solutions in informal settlements in Kenya and Tanzania show, for instance, that trust was actively built between communities and intermediary organizations. This was achieved through concrete, locally identified outcomes in a process which directly involved residents in identifying priority challenges and solutions and established structured participatory processes (Diep et al. 2022).

Expand understanding of participation

We earlier highlighted a pattern of deference of participation to traditional and local political leaders. The engagement of leaders is an important feature of participation. However, participatory governance further requires an expanded understanding of this participation to include various levels of community organization and self-consultation in which communities collectively determine needs and solutions. Participatory flood governance ultimately needs representational governance as well as additional engagement mechanisms. Yet it should unfold in a manner that does not offend local leaders and is otherwise culturally appropriate. This requires an understanding of how leadership responsibilities are assumed, executed, and delegated. With additional investments in self-consultation and individual participation at the community level, communities can further benefit from better grassroots-generated ideas of community flood risks and possible solutions. This can be delivered through community forums on flooding and development, cluster-based focus group discussions, resident surveys and enumeration, through a representative resident-advisory committee, and so on. These

platforms can help ensure that representation of traditional and local political leaders is sufficiently informed by residents' own knowledge and experiences. This approach can lead to outcomes that are more effectively facilitated through political and traditional representation within the formalized participatory flood governance systems.

Enhancing the social capital of informal settlements to engage

This phase of participatory governance requires the leveraging of residents' social capital to advance and coordinate engagement with city leaders. Earlier we explained how some components of social capital in informal settlements—especially linking capital that supports partnership with institutions—are limited. This limits opportunities for communities to strategically engage with municipal leaders on disaster response mechanisms, contributing to their concerns and ideas being sidelined or ignored. Community cohesion already exists as a key strength in informal settlements and forms the foundation for the development of social capital. Thus, municipal leaders should recognize and build on existing social cohesion structures to further develop social capital (in all appropriate forms) in these communities through capacity building efforts. The eventual goal should be to *“provide access to external support and linking communities with outside essential resources”* (Ziorklui et al. 2024:9). Social capital is foundational in the participation of informal settlement residents in the *“design, planning, and improvement initiatives of formal local development planning institutions”* (Ziorklui 2024).

Co-production of knowledge

Co-production of knowledge that guides near- and long-term participation and response pathways within the communities is also a crucial short-term goal that extends into the medium and long-term. We have classified some elements of knowledge to be produced in these engagements: the establishment of common ideas of rights (of residents and standards of dignity in housing), risks (of existing and potential climate impacts and urban policy development), and response (determination of a collective vision to guide flood resilience building and incorporated into urban planning policies and institutional structures). The co-production process provides opportunities for knowledge creation using participatory methodologies such as needs assessments, participatory flood risk assessment, community dialogue, and low-tech-enabled community-led flood impact reporting, among others. Short term co-production of knowledge provides an opportunity to identify flood risks and impacts from residents' perspective, understand how autonomous and other forms of adaptation have been undertaken (as well as their

efficacy), and ensure that urban flood management ideas, which are often technically focused, may be complemented by improved local and community knowledge. Initially, this process can help deepen trust between municipal leaders and community residents in Accra, support capacity development efforts, and create practical loops between community flood impacts and the technical flood adaptation solutions. Reinforcing earlier examples, such familiarity with working together (between communities and urban leaders) can help bridge participation gaps, ensure participation is non-performative, and enhance trust between parties. In addition to setting the stage for long-term partnership, this will support technological solutions that reflect the unique socio-spatial flood adaptation challenges in informal settlements, as well as urban flood planning and policy processes that effectively capture local knowledge, experiences, and needs.

Medium term: Institutionalizing Participation, Continuous Improvement, Capacity Building

Institutionalizing participation

The medium-term timeframe will prioritize the formalization and institutionalization of participation mechanisms, first transitioning from the collective visioning and trust building of the previous phase, and then using the agency, abilities, and knowledge to galvanize participation of residents of informal settlements and their representatives. One goal should be to institutionalize the responsibility of municipal leaders to facilitate these efforts, simply as part of their job responsibilities. While community buy-in and involvement are indeed required prerequisites to all of these suggestions and it is critical that community members assume leadership roles, it may be inappropriate to shift the responsibility to maintain these structures to individuals who do not draw a paycheck from their efforts. Here, municipal leaders would deepen engagement with informal communities and their representatives by continuing to develop various formal and informal structures for participation. These might include those currently required by municipal policies, such as quarterly townhalls (that can be enhanced), and new formalized participation structures needed to achieve the inclusive climate and urban resilience goals embedded in various municipal policy documents.

The Accra Climate Action Plan 2021-2025 (2020:2), for instance, aims to “*deliver an emissions neutral and climate resilient city by 2050*”, while the Accra Resilience Strategy (2019:3) envisions “*a smart, sustainable, and resilient city that anticipates and plans for*

shocks, rather than reacts to them.” Institutionalizing participation in these urban governance frameworks can blend many efforts. However, these efforts must be grounded in accountability, equity, transparency, and participation. This includes efforts such as joint data development and management processes, formalizing community representative bodies, establishing consistent engagement processes, integrating community project governance and accountability structures, and localized information management systems, among others (Blanco et al. 2021; Sachdeva & Patel 2022; Vargas-Hernández et al 2024).

The basis of institutionalization rests on two premises. First, addressing the socio-political barriers to engagement and participation requires structured institutional arrangements that progressively embed community agencies within ongoing governance systems, can be sustainable across urban political administrations, and challenge perceptions of illegality and the reality of marginalization within informal settlements. These institutionalized measures will rely on the agencies and abilities that are enhanced in the initial phase of the framework while capitalizing on the knowledge and experience base of informal settlements in the co-production of knowledge. Second, as participation without power redistribution can reflect tokenistic tendencies rather than genuine engagement (Arnstein 1969; Yusof et al. 2025), the institutionalization process should provide space to reclaim participation as both a policy instrument and a political process (Gonçalves 2025). This process of institutionalized participation could therefore contribute significantly to addressing issues related to the dual challenge of political patronage and administrative invisibility faced by informal settlements. Capitalizing on co-produced knowledge to identify community needs also means that issues related to temporality and ‘illegality’ of residence can be progressively addressed as municipal leaders factor these peculiar socio-political challenges into the design of planned adaptation mechanisms.

Continuous improvement and capacity building

Furthermore, the medium-term phase will also include various investments to improve the capacity of parties to engage. This includes improving the capacity of municipal leaders, informal settlement residents, and their representatives to engage in shared governance and decision-making processes. A key barrier to engagement is insufficient civic sensitivity to informal settlements and a lack of community agency to participate. To address this, municipal leaders and partners should invest in various community-

based civic awareness programs to enhance communities' engagement with a more fulsome set of civic responsibilities (including those relevant to participatory governance) and consequently affirm communities' right to empowered engagement. This should also involve remuneration of involved community members for time spent on these efforts. Municipal leaders will also benefit from an enhanced understanding of emerging trends and working approaches to city-informal sector engagement and inclusive urban development, as detailed by agencies focused on promoting 'socially and environmentally sustainable towns and cities and building 'inclusive, safe, resilient and sustainable cities and communities' such as UN-Habitat.

Co-production of knowledge

Co-production of knowledge and decision-making continues in the second phase of the framework to support parties' capacity building efforts and the institutionalization of participation. It is also relevant for the development of the ideas and strategies needed to evaluate and protect rights and lower flood risks through consistent improvements in participation and tangible wins from infrastructural and non-infrastructural resilience building efforts. Initial knowledge of co-production efforts can help cities and communities build a shared baseline of flood risk which is grounded in local knowledge. Medium-term co-production approaches can build on successes of the previously described short-term activities and focus on actions such as joint design of flood mitigation and adaptation measures where community knowledge is reflected in technical and infrastructural flood solutions. This may also include reflection on the process of collaborative decision-making itself, in order to pinpoint what is working well, what needs to be improved or reimaged, and ultimately how to adapt these processes to changing conditions.

Co-production of knowledge in the medium-term provides a crucial opportunity for urban flood management ideas, which are often technically focused, to draw on the knowledge and experiential bases of residents. While in the short-term this may reflect past experiences and observations, as we move to the medium-term it could also reflect ongoing observations—an analog of community-based monitoring and evaluation—that support changes to project design and flexibility in responsive decision-making. These medium-term flood adaptation and mitigation co-design functions are necessary to adequately recognize the complex range of factors influencing communities' short-term, reactive autonomous adaptation responses. They are also necessary to inform the design

of the technical solutions that address community-level flood management problems comprehensively. This way, community flood solutions can move from reactive responses with short-term impacts to proactive flood responses with longer term impacts, while also providing protection against mistakes made due to the uncertain nature of flooding and other disasters (due to monitoring, evaluation, and flexibility to make changes provided by collaborative bodies). Co-production that involves various forms of community flood risk and impact monitoring roles, where residents periodically collect and share information on emerging flood risk and impacts to support municipal leaders' (evolving) flood management strategies, also promise to develop flood adaptation and mitigation strategies that can be adapted for use in other parts of these communities or elsewhere. In turn, this would help develop a body of responsive strategies as a public good.

Long term: Technical Solutions Meet Social Governance

The ultimate goal of the participatory governance framework isn't to eliminate informality (Roy 2005) but rather to (1) recognize informal settlements as permanent urban features requiring inclusive development pathways that can enhance flood resilience, rather than temporary aberrations requiring solutions and (2) jointly determine, with residents, the best combination of outcomes that enable resilience against flood impacts in informal settlements. Long-term thinking is required for this model of participatory flood governance because short-term public management policy shifts or reforms can lead to ineffective outcomes (Rhodes 2015; Roberts 2019). The disconnect between technical flood solutions and social governance produces recurring flood impacts for informal settlements. Hence, the full benefit of the framework is realized when technical flood adaptation solutions meet social governance inputs through the participatory governance system. Two outcomes support the long-term thinking or progressive path of the framework. But, for this purpose, participation should not mean calling a single community meeting (or a few) for feedback but depend on more durable and trusting relationships. In this way, it would strongly benefit from short- and medium-term efforts that develop appropriate structures and interpersonal amity.

First, building on the results from the short- and medium-term stages, municipal leaders can achieve greater coherence of technical solutions and social governance measures for flood resilience in informal settlements. Moreover, the outcomes from earlier engagement efforts merge into transformative shifts that are not only a reflection of

preceding efforts but also a significant turning point for the city's urban climate policy goals. For instance, policy shifts can include more formal and structured recognition of informal settlements in multi-year municipal and urban development plans. While the city's climate and urban resilience strategies have idealized interests in 'inclusive cities,' limited budgets and resources often result in informal settlements being deprioritized or excluded in an almost street-level bureaucratic affair. This framework, therefore, sets the scene for municipal leaders to recognize the structural impacts of these forms of exclusions and invent and revive necessary policy shifts to respond to the multifaceted flood impacts in informal settlements.

Moreover, in the long-term, municipal leaders should focus on the implementation of technical solutions and tangible projects designed in the preceding short- and medium-term phases. By implementing the various actions to deepen participation in urban flood management, collectively designed flood response solutions will already incorporate participatory social governance and help respond to the web of complex factors that influence flood vulnerability in informal settlements. Here, municipal leaders should invariably focus on long-term flood adaptation solutions that promote overall vulnerability reduction through a focus on a blend of the social, economic, and environmental factors of flood risk. This means municipal leaders should focus on interventions that simultaneously or progressively improve land tenure arrangements, produce community-based flood infrastructural development, enhance access to healthcare and other social services, and improve access to long-term economic opportunities. This way, flood adaptation in Accra can shift to more strategically planned adaptation, while directly addressing the limitations of previous short-term, household-level-investment adaptation solutions that often fail to lower flood risk or reduce vulnerability in informal settlements.

Preconditions for participatory flood governance

We understand that, in reality, the successful implementation of participatory urban flood governance models depends on a set of essential preconditions (UN-Habitat 2017). First, participatory governance must be approached with a clear focus or goal to provide direction for what these formal-informal engagements will achieve. This will ensure that municipal leaders, informal settlement residents, and their representatives are all aligned in their efforts. This goal will also inform effective monitoring of engagement outcomes.

Second, capacity building—for all parties—is central to successful engagement, negotiations, and the implementation of agreed actions. Residents of informal settlements and their representatives will benefit from investments in the development of adequate strategies to participate in engagements with municipal leaders and other partners. These can include community-based training sessions that, with support from the city, focus on expanding residents' understanding of the city's municipal governance structures and various entry points for communities to participate in urban planning and decision-making. Such capacity building efforts can also engage community-based organizations, resident associations, and community identified leaders on community-city facilitation strategies. These strategies will support residents to more effectively use their knowledge and experience base to help shape urban flood management policies. Municipal leaders will also benefit from capacity building as their competencies are enhanced on the role and approaches to participatory governance in urban policy and development. These enhanced capacities can be obtained for city leaders and flood management leaders through direct engagements and collaborations with urban-focused development partners such as UN-Habitat, gender and informal labor focused organizations such as WIEGO (Women in Informal Employment Globalizing and Organizing), informal settlements rights organizations such as People Dialogue on Human Settlements (Slum Dwellers International - Ghana) and migrant focused organizations such as the International Organization for Migration.

Finally, within the framework, there is a need for a distinction between duty bearers (municipal leaders) and right holders (residents and their representatives). These distinctions are required to guide the (re)distribution of power and the use of a rights-based approach to engagement. Given the histories of marginalization and existing socio-political barriers to engagement, safety, particularly of residents and their representatives, is critical, as participants must feel secure contributing to discussions without fear of retaliation. Safety can be achieved within common understandings of participant rights. Recognizing the separations between duty bearers and right holders fosters a mutual understanding of responsibilities and rights, which is vital for establishing trust and accountability.

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Appendix

Layout of the participatory governance framework

Indicators	Accountability, Equity, Transparency, Participation		
Preconditions	<p>Participatory governance should be based on a clear focus or goal.</p> <p>Municipal leaders should commit to investing in capacity building of parties.</p> <p>There should be a distinction between duty bearers (municipal leaders) and right holders (residents and their representatives).</p>		
Actions	<p>Develop a collective vision and invest in trust building</p> <p>Address gaps between community and municipal perspectives of participation</p> <p>Expand understanding of participation</p> <p>Enhance social capital of informal actors to engage</p> <p>Co-produce knowledge with informal settlement residents (rights, risks, response)</p>	<p>Institutionalize participation</p> <p>Improve government and residents' capacity to engage</p> <p>Improve degree of participation: outreach>consult>involve>collaborate>shared leadership</p> <p>Co-produce knowledge with informal settlement residents (joint design of flood solutions)</p>	<p>Improve policy coherence (climate, environment, urban planning)</p> <p>Anchor participation in institutions</p> <p>Implement technical solutions which account for community experiences</p> <p>Prioritize long-term planned adaptation in informal settlements</p> <p>Co-produce knowledge with informal settlement residents (joint monitoring and iterative design)</p>
Timeframe	Short-term: Agencies, Abilities, Knowledge	Medium-term: Strengthen participation mechanisms	Long-term: Technical Solutions Meet Social Governance

Outcomes:

- Shift from reactive to proactive flood governance in informal settlements influenced by participatory development goals
- Shift focus from autonomous adaptation to planned adaptation
- Lowered vulnerabilities and increased resilience of informal settlements to flood risks

Sample interview script

Sample Interview Script.

1. Demographics, Residency, Activities, and Settling In.^[1]

- a. Initial culturally appropriate greetings.
- b. Where do you live? Have you lived there a long time or a short time? Why did you come to this place?
- c. Where do you work? What do you do for work?
- d. Can you tell me a bit about your family?
- e. Can you tell me a bit about where you live and your housing?
- f. Do you own the place you live or are you renting (either the house or the land underneath)? Do you feel confident that your housing is stable or do you feel that it may be threatened? Why?

2. Definitions of Community, and Particularly Salient Features or Attributes.

- a. What do you feel is your community(ies)?
- b. How do you define it/them and what is your role in it/them?
- c. What are the best things about your community(ies)?
- d. What challenges do these community(ies) face?
- e. What sort of interactions with people involved in government and/or planning are most common in your community?

3. Perspectives on Flooding and Flood Management.

- a. Can you describe your personal or family experiences with flooding in this area?
- b. How do members of your community or residents of this area respond to flooding (i.e. do they rebuild, do they seek aid, do they meet, do they leave and return soon or later, do they talk to government?
Do these efforts work well and/or could they be improved?

Are there any community consultations or communications within the community that focus on dealing with flood events and flood risk?

What advice would you give to people in other, similar communities about the best ways to contend with the threat of floods?

In your community, who makes important decisions about flood management and related issues like housing and safety?

c. What are the main ways that government or other large institutions (NGOs, international organizations, private sector development organizations) deal with flooding?

Were these short-term, short-lived, or long-term?

Are they completed or still in process? If completed, have they been completed in the way that your community expected?

What has their impact been on future flood concerns in your community and in this area?

Have they been successful in helping your community and residents of this area meet their needs, in your opinion?

What advice would you give government or large institutions that would like to improve experiences in areas like yours that are at risk of flooding? What conversations or ideas that are common in your community would you like to share with government leaders and/or leaders of flood planning and response efforts?

d. Have government projects (regulations, policies, and actions) impacted your communities' experience with flooding and housing?

What were the highlights of these projects and what were some of the challenges?

Please give me an example of your experience with the highlights and challenges.

Are these projects focused mostly on infrastructural solutions? Other types of solutions? What sort of solutions most interest you? What outcomes will be the most useful for the flood challenges you discussed earlier?

Do you feel that those in charge of these projects take community needs and opinions seriously? If offered an opportunity, what advice would you give about flooding and community needs?

How would these solutions meet your needs or affect your community?

e. When people in this area talk about flooding, what are the main topics they focus on? What do they say about their flood experiences that might be different from your experiences?

f. If the government or other institutions were interested in involving you and your community in designing flood solutions, how would you like to be involved?

4. Now that we've come to the end of our interview, is there anything you'd like to add to, change, or otherwise return to? In case we have any follow-up questions and/or would like to share our results for feedback, is it ok if we contact you again?

[1] Note: this is a basic framework for how we expected interviews to unfold. However, semi-structured interviews of this type are often participant-directed and topics for conversation may differ from those specifically laid out here, if participants offer new topics, ideas etc. As well, the precise script is often impacted by the specific circumstances of each participant: for example, residents of flood-affected informal communities may focus more on personal, family, and community experiences with flooding, while municipal officials who work in these areas may focus more on governance and community outreach structures.