CLIMATE CHANGE ADAPTATION AND INJUSTICE IN INFORMAL SETTLEMENTS: THE CASE OF EBO TOWN, THE GAMBIA

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ABSTRACT

CLIMATE CHANGE ADAPTATION AND INJUSTICE IN INFORMAL SETTLEMENTS: THE CASE OF EBO TOWN, THE GAMBIA.

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The frequency and intensity of climate-related hazards have been increasing rapidly however, prevention, response and mitigation efforts are insufficient to cope with the corresponding effects, particularly in many developing countries. Research indicates that the impacts of climate change are unevenly distributed across both spheres of the economic spectrum. Similarly, within cities, informal settlements are the most vulnerable since they are exposed to the threats of eviction or resettlement and climate change-related hazards. These settlements are victims of both socio-economic and ecological deprivation, as most of them are located on urban fringes such as floodplains, coastal areas, and quarries. Understanding adaptation capacities in general is complex, more so in informal settlements because of the limitation in data and the in-applicability of formal adaptation techniques in informal settlements. Thus, this research aims to contribute to the knowledge gap in the interaction between climate change, adaptability and climate injustice issues in informal settlements, using Ebo Town- a flood-prone area located in the Kanifing Municipality, The Gambia, as a case study. The research shall seek to examine the risk and vulnerabilities posed by climate change in informal settlements, the

adaptation strategies employed and resident's perception of existing climate injustice. The findings such adjusting ground floor elevation can assist planners and decision-makers with evidence-based risk mitigation and adaptation methods and help integrate these with formal methods where feasible. However, not officially recognising the state of informality and therefore vulnerability constitutes injustice and thus, hinders the attainment of transformative adaptation.

Keywords: Climate change, Vulnerability, Adaptation, Informal settlements, The Gambia- Ebo Town

ÖZ

KAYIT DIŞI YERLEŞİM ALANLARINDA İKLİM DEĞİŞİKLİĞİ UYUM VE ADALETSIZLIĞI: GAMBİYA - EBO TOWN ÖRNEĞI

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İklim kaynaklı tehlikelerin sıklığı ve yoğunluğu artmaktadır. Fakat özellikle gelişmekte olan birçok ülkedeki etkilerini önleme, duruma müdahale etme ve hafifletme çabaları yetersiz kalmaktadır. Iklim değişikliğinin etkilerinin dengesiz bir şekilde dağılmış olduğu hakkında göstergeler vardır. Ancak her iki alanda da şehirler ekonomik durumlardan etkilenir. Benzer şekilde, şehirler içinde gayri resmi yerleşim yerleri en savunmasız yerlerdir. Sürekli tehdit altında yaşamak ve tahliye korkusu, birçok kayıt dışı yerleşim yeri sakininin maruz kaldıkları risk, iklim değişikliği konusunun hassasiyetini daha da arttırmaktadır. Hem sosyo-ekonomik sorunlar hem de en çok ekolojik sıkıntı içinde olan bu yerlerin çoğu sel alanları, sahil kıyıları, taşlık alanlar gibi kentsel saçak içinde yer almaktadır. Verilerdeki eksiklik ve kayıt dışı yerleşim alanlarında resmi uyum tekniklerinin uygulanamaması nedeniyle uyum kapasitelerini genel olarak anlamak zordur. Bu nedenle araştırmanın amacı, kayıt dışı yerleşim yerlerinde iklim değişikliği ile uyumluluk arasındaki etkileşimin hakkındaki eksikliği gidermektir. Bu nedenle bu araştırmanın amacı, kayıt dışı yerleşim yerlerinde iklim değişikliği, uyumluluk ve iklim adaletsizliği sorunları arasındaki etkileşimin hakkındaki eksikliği gidermektir. Araştırma, kayıt dışı yerleşim

yerlerinde iklim değişikliğinin yarattığı risk ve hassasiyetleri, uygulanan uyum stratejilerini ve bölge sakinlerinin mevcut iklim adaletsizliğine ilişkin algısını incelemeyi amaçlıyor. Araç-gereçler planlamacılara ve karar veren otoritelere bulgulara dayalı olarak riski hafifletme, uyum sağlama yöntemleri ve bunların resmi usullere uygun olarak entegre edilmesine imkan vermektedir. Ancak, kayıt dışı yerleşimlerdeki kayıt dışılık durumunun ve dolayısıyla bunların iklim kaynaklı tehlikelere karşı savunmasızlığının resmi olarak tanınmaması adaletsizlik teşkil etmekte ve dolayısıyla dönüştürücü uyumun sağlanmasına engel olmaktadır.

Anahtar Kelimeler: İklim Değişikliği, Açığı, Uyum, İklim adaletsizliği, Kayıt Dışı Yerleşim, Gambiya - Ebo Town.

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LIST OF ABBREVIATIONS

AFOLU	: Agriculture, forestry and Other Land Use
BCC	: Banjul City Council
CRR	: Central River Region
CUI	: Critical Urban Infrastructure
CUS	: Critical Urban Services
DPPH	: Department of Physical Planning and Housing
EBA	: Ecosystem-Based Adaptation
ECOWAS	: Economic Community of West African States
GBA	: Greater Banjul Area
GEAP	: Gambia Environmental Action Plan
GEF	: Global Environment Facility
GHG	: Greenhouse Gases
IMWG	: Information Management Working Group
IPCC	: Intergovernmental Panel on Climate Change
KMC	:Kanifing Municipal Council
LGA	: Local Government Act
LRR	: Lower River Region
LTS	: Long-Term Climate-Neutral Development Strategy
LTV	: The Gambia 2050 Climate Vision
LULUCF	: Land Use, Land-Use Change, and Forestry
MEAs	: Multilateral Environmental Agreements
MECCNAR	: Ministry of Climate Change and Natural Resources
NAP	: National Adaptation Plan Action
NAWEC	: National Water and Electricity Company
NBR	: North Bank Region
NBSAP	: The National Biodiversity Strategy and Action Plan
NCCP	: National Climate Change Policy

NCCRM : National Early Warning and Response Mechanism Coordinating Centre

NDMA : National Disaster Management Agency

NDP : National Development Plan

NEA : National Environment Agency

NEMA : The National Environment Management Act

NEMC : National Environmental Management Council

NMHS : National Meteorological and Hydrological Service

OCHA : The United Nations Office for the Coordination of Humanitarian Affairs

ODS : Ozone Depleting Substances

PAGE : Programme for Accelerated Growth and Development

PRSP : Poverty Reduction Strategy Paper

RF-NDP : Recovery Focused -National Development Plan

SMEs : Small and Medium-Sized Enterprises

SPRC : Strategic Programme for Climate Resilience

SSHFC : Social Security and Housing Finance Corporation

TAC : Technical Advisory Committee

TDA : Tourism Development Areas

UN HABITAT : The United Nations Human Settlements Programme

UNDAC : The United Nations Disaster Assessment and Coordination

UNDP : The United Nations Development Programme

UNEP : The United Nations Environment Programme

UNFCCC : The United Nations Framework Convention on Climate Change

UPE : Urban Political Ecology

URR : Upper River Region

WACA : West African Coastal Areas Management Program

WASCAL : West African Science Service Centre on Climate Change and Adapted Land Use

WCR : West Coast Region

CBDR : Common but Differentiated Responsibility

CHAPTER 1

INTRODUCTION

This introductory chapter aims at setting the foundation of the entire thesis. It introduces key concepts of climate change vulnerability, climate justice and informality, it also highlights the adaptation strategies employed by residents of informal settlements, and their perception of and experiences of climate injustice, which are the focus of this thesis. It highlights these issues through a case study of Ebo Town, a high-flood-risk informal settlement in The Gambia. In doing so, it provides an analysis of precipitation and temperature patterns in the country; outlines public administration in the country with emphasis on local governance and the challenges they are confronted with in addressing informality and responses to the impacts of climate change; highlights climate change governance and policies; and provides discussion on urbanization and informality in The Gambia. It also outlines the structure and scope of the thesis with an overview of each of the chapters.

The rate of urbanization has been increasing constantly over the century with half of the world population living in cities. In Sub-Saharan Africa it is projected that by 2030, a significant proportion of the region's urban population will live in cities of more than 1 million inhabitants, evidence of rapid and concentrated urban growth (Dodman et al., 2017). However, cities and urban areas do not develop at a similar rate to enable them to absorb the inward mobility of urban migrants. These consequently, create a situation of; 1) an increased urban population and 2) inadequate critical urban infrastructure to support the number of people living in cities and urban areas, and 3) the cumulation of the above two results in the formation of informal settlements. The above situation is more prominent in cities and urban areas of developing countries.

Similarly, the effects of climate change such as rising sea levels, heat waves, permutation in annual precipitation etc. are intensifying. These effects of climate change will be felt globally but rather unevenly. Research suggests that cities of the global south will bear most of the brunt of the effects of climate change. Within these cities too, the peripheries, which constitute urban fringes and where informality and consequently the prevalence of inadequate critical urban infrastructure such as drainage, paved roads and durable houses exist, will be most affected. In The Gambia, urban expansion in flood-risk areas has increased at an annual rate of 7.8 per cent between 1975 and 2014 (OECD, 2010, p. 32), which has led to an increase in exposure and vulnerability to flooding.

The IPCC, warns that "without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread and irreversible impacts globally" (2014, p. 17). In its 2021 report, the IPCC notes with high confidence that at the regional scale, abrupt responses, tipping points and even reversals in the direction of change cannot be excluded and that observations of human-induced climate change and its extremely related extremes have strengthened since the last report was published (IPCC, 2021).

This shows the urgency and importance of climate change adaptation and mitigation. There is a lot of research and technical knowledge coupled with the availability of infrastructure in cities in the Global North that could help mitigate the impacts of climate change. However, additional mitigation and adaptation measures will be needed in most cities of the Global South where the frequency and intensity of climate-related hazards have been increasing unprecedentedly because of their vulnerability while prevention, response and mitigation rates are insufficient to cope with the corresponding effects. There is mounting evidence that the impact of climate change is unevenly distributed and that its effects affect cities across both spheres of the economic spectrum. Globally, there has been a rapid increase in urbanisation rates with about half of the world's population residing in cities. In Sub-Saharan Africa, the urbanisation rate is at a staggering 4.1 per cent per annum with about 40 per cent of its population living in urban areas (UNDP/UN-Habitat

Joint Regional Programme, 2022). This is an alarming rate because the rate of service, housing provision and infrastructural development are not increasing exponentially to accommodate the growing demands of the urban population. In The Gambia, despite high urban densification rates in the country, rapid urbanization has been unfolding in an expansive and unplanned manner, usually on land not suitable for development purposes.

In the absence of the fulfilment of such demands by the formal sector, urban residents resort to the informal sector for services and informal settlements for shelter and housing. Thus, informal settlements within cities and urban areas become hotspots of climate change-related stimuli, as most are located in urban fringes such as flood plains, coastal areas and quarries. Furthermore, informal settlements are subjected to exclusion and injustice. It is with these backdrops that the research shall seek to study how vulnerable informal settlements adapt to the effects of climate change and climate injustices in the absence of this critical infrastructure and services.

The absence/insufficiency or inadequacy of what the IPCC's fifth assessment terms 'risk-reducing infrastructure and services' in many developing countries calls for the provision of such services to reduce risk and enhance adaptation capacities. While admitting that this position is necessary in reducing risk, it is quite crucial too, to look into (1) how realistic the attainment of such a development trajectory in informal settlements in developing countries is and (2) what are the costs in terms of CO2 emission and environmental degradation? This could be counter-productive against the existing mitigation efforts. Evidence indicates that the costs are high. It is estimated that if developing countries are to develop infrastructurally at a level corresponding to the level at which the developed countries have, it would cost the world about 350 gigatons (Gt) of CO2 emissions and building infrastructure for fast-growing cities in developing countries could release 226 Gt of CO2 by 2050(Bai et al, 2018, p. 25). This poses great problems to dominant theoretical perspectives and models in urban studies. Thus, there is a need to re-examine, adjust or albeit radical, seek and follow alternative urbanization patterns.

Many of the previous works on climate change adaptation focus on constraints or challenges to climate change while others focus on the adaptation capacity to climate stimuli such as floods, heatwaves, rising sea-level and seasonal changes. However, due to the impacts of these stimuli on social, economic and health sectors, adaptation research should take into account the adaptive capacities to stimuli and how such capacities affect or have been affected by social, economic and health factors and their interconnectedness, particularly in areas with large infrastructure backlogs and capacity gaps. As a result, of the frequency, intensity and severity of the impacts of climate change and its projected impacts on the most vulnerable communities including informalities, there have been calls to understand climate change mitigation and adaptation in informal settlements. Accordingly, Bai et al., highlight enabling adaptation to climate change in informal settlements as a key research priority area for urban climate change and identify a research gap in studying the relationship between formal and informal relationships and ways of incorporating the voices of the marginalised (Bai et al., 2018, p. 2). Similarly, Satterthwaite et al., (2018) highlight the importance of upgrading informal settlements as an important element for urban climate change adaptation. From a practice perspective, in recognition of the fundamental challenges posed by inequality and injustice in development, the United Nations enshrined the principle of Leaving No One Behind, to enable the attainment of Sustainable Development Goals for all members and sections of society. This acknowledges that without justice and fairness in relation to opportunities to adapt to disasters- both man-made and natural, the attainment of development goals for the most vulnerable would be hard to achieve.

Climate change adaptation implies adjusting to changes, these changes include changes in mean temperatures, changes in precipitation levels, and shortening or longing in seasonal patterns and their effects. Pelling (2011), proposes a three-layered framework for understanding the pathways through which adaptation unfolds: resilience adaptation, transitional adaptation and transformational adaptation. It is important to distinguish between two perspectives from the form-based typology of climate change adaptation: technical- scientific perspective and institutional-cultural perspective. The technical-scientific dimension of adaptive capacities emphasizes access to resources, technology, knowledge, the structure of

institutions and human capital etc. while the institutional-cultural dimension emphasizes norms, values and cultural context as facilitators for or barriers to adaptive action (Inderberg, 2015, pp. 15-16).

Satterthwaite et al., (2020, p. 144), applied the IPCC's definition of resilience to urban areas as "the ability of urban centres (and their populations, enterprises, and governments) and the systems on which they depend to anticipate, reduce, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner". The three key components of urban resilience: systems, agents and institutions, identified by Tyler & Moench (2012), have great implications for resilience building. The set of norms, perspectives and values of agents can affect urban resilience and adaptation policies and practices. Institutions on the other hand could affect how systems and agents relate in response to impacts of climate change. Regarding climate justice, institutions can enhance vulnerability through exclusion and marginalisation either in the form of non-recognition of title deeds, exclusion in decision-making and political participation or failure to recognise and articulate the plight of a group or a community.

Urban informality in the Global South, McFarlane (2012), argues, is to be understood not only as a process of exclusion involving the poor but also as a process of accumulation or extraction and negotiation by both the poor and the elite and formal agency/ actors. In addition, it is also seen as a state-induced phenomenon (Roy, 2005, p. 149) particularly in African cities where both state and local governments contribute to the production of spatial and social exclusion through laws and regulation and the commission of development projects that favour the rich, which consequently pushes the poor to informal settlements (Watson, 2009).

Urban political economy provides great insights into the causes of vulnerability, and local people's perception of and responses to climate change and vulnerability. Its early efforts to understand and explain hazard vulnerability by linking marginalisation, exclusion and poverty to environmental degradation and more recently the incorporation of climate change holds the key to unpacking the causes of vulnerability to climate change and the structural causes of informality. With respect

to informal settlements, urban political ecology recognises the unequal nature of urban settings and thus seeks to challenge and critique this phenomenon. It is an important tool in understanding the processes of informality by examining the power (political) dynamics involved in it; accounting for it from a historical and socio-economic perspective and attributing climate and environmental hazards in informal settlements as a nexus between these factors. In recognition of the socio-economic and political nature of climate and environmental change in urban areas, it offers local (location-specific) non-market-based solutions, which are non-existent or not transferable to informal settlements. However, as cautioned by D. Liverman 2015 (Perreault et al. (Eds), 2015.), the vulnerable, especially those living in informal settlements should not be considered as "passive victims without knowledge or capacity to respond to climate change (P308)". Thus, it is important to understand how informal settlements adapt to climate change albeit infrastructure deficit and backlog.

The significance of studying climate change and informal settlements has been emphasised in recent literature. In an article titled "Six Research Priorities for Cities and Climate Change", Bai et al., highlighted the importance of studying informal settlements as one of the six key research priorities because of the severity of the exposure of such settlements to climate hazards and high number of projected people who will reside in slums and informal settlements. They also stressed the need for studies to focus on formal and informal relationships and express the views of marginalised groups and that sustainable lessons might be drawn from informal settlements (Bai, et al., 2018, p. 24). Following the identification of the six research priorities, David Dodman et al. further identify three key implications of informality for adapting to climate change. These three key implications are: understanding the impacts of climate change, identifying actions and financing responses (Dodman, Archer, & Satterthwaite, 2019, p. 6). Another knowledge gap identified is the "need to build evidence based on the interaction between urban development, disaster risk reduction, climate mitigation and climate adaptation". There is also "the need to put questions of equity and justice at the heart of adaptation research agenda, including identifying who is excluded from or discriminated in the process of accessing resources such as housing, land and tenure rights" (Satterthwaite et al., 2018, p. 50).

This research will depart from these thematic issues but focus on the identification of actions taken by dwellers of informal settlements in adapting to climate change and existing climate injustice issues while also bringing forward sustainable lessons from the adaptive capacities within informal settlements. It is important to distinguish between two perspectives on adaptive capacities, which are technical- scientific perspective and institutional-cultural perspective. The technical-scientific dimension of adaptive capacities emphasizes access to resources, technology, knowledge, the structure of institutions and human capital etc. while the institutional-cultural dimension emphasizes norms, values and cultural context as facilitators for or barriers to adaptive action (Inderberg, 2015, pp. 15-16).

Furthermore, Vincent & Cundill in their study on "The evolution of empirical adaptation research in the global south" conclude that the geographical distribution of adaptation research has been uneven both across and within regions and that in Sub-Saharan Africa; a few countries dominate, with about a third still lacking empirical adaptation research. The authors' findings further show that agriculture and rural issues have predominated empirical adaptation research in the Global South (Vincent & Cundill, 2021).

Although The Gambia is a highly vulnerable country to the impacts of climate change, adaptation research has focused on agriculture: the impacts of drought on farming communities, loss and damage on agriculture (e.g Yaffa, 2013); coastal erosion (e.g Amuzu et al., 2018). With regards to informal settlements, there is a study on the experience of flooding in Ebo Town with a focus on the school children (e.g. Kavegue & I. Eguavoen, 2016). In addition to this, there is a recent research that examines the role of the environment on migration (e.g. Sweeney, 2023). However, at least to my knowledge, there has been no research that examines; the interactions between the levels of government and the victims of the impacts of climate change and how it drivers or enables adaptation; and examines adaptation in relation to climate injustice.

Thus, this thesis will contribute to the above research gaps in The Gambia. It also examines climate policies in relation to the urban policies and argues that for

adaptation policies in the country to be effective, policies need to be coordinated and streamlined to address climate change with the build-environment rather than the prevailing policies, which focus on the environment with little consideration to its connections to spatial and urban development.

1.1. Research Questions

There is a plethora of literature on climate change and adaptation, most of which uses planned cities as - the unit of analysis. However, with the exception of a few studies, little is known about adaptation techniques and capacities of informal settlements. Bearing this in mind, the research aims to; (1) identify the risks of climate change on informal settlements drawing lessons from the case of Ebo Town, (2) to discern the adaptation capacities and techniques used by residents of informal settlements and (3) to contribute to the literature on climate change adaptation, informality and the discussion on justice and climate justice. With regard to the third question, this thesis argues that climate justice needs to be integrated into the dimensions of justice instead of being considered as a subject upon which justice issues are examined. It aims to reveal that informal settlers are cognizant of the risk of climate change and thus, respond to it in the forms of local adaptation strategies. However, to achieve transformative adaptation or the ability to build long-term resilience, the underlying socio-economic and legal issues of injustice need to be addressed; collaborate with those that suffer from the impacts of climate and integrate and build on local adaptation strategies into formal strategies. The starting point is to correct the recognitional injustice since the settlement has not been formally recognized as an informal settlement which results in the consideration by the authorities of the predicament in the settlement as self-inflicted and thus non-prioritised even under disaster situations and yet being liable for tax appropriation without adequate provisioning of critical urban services and infrastructure. To achieve these aims, this research shall seek to answer the following research questions; (1) what are the adaptation capacities and techniques of informal settlements and how can these techniques be integrated into formal adaptation techniques? (2) What needs to be done to reduce the vulnerabilities of the population living in informal settlements? 3) What are the perceptions of justice amongst the

residents of Ebo Town in relation to climate change adaptation; and how it enable or drive adaptation initiatives within the community?

This research has relevance to the emerging discursion on understanding and drawing adaptation lessons from informality, the need to streamline and design climate policies that not only contribute to global commitments on mitigation but also points to the need to design policies that are responsive to eminent climate risk. Furthermore it positions climate justice at the forefront of the debates on nexus of climate change-informality, in the absence of which, global policy processes such as Sendai Framework on disaster risk reduction, the principle of Leaving No One Behind, SDGs and New Urban Agenda will be hard to achieve. In terms of practice, the research findings on adaptation strategies and response actions such as the provision of post-disaster relief support etc., organized and channelled via social networks could prove essential to policymakers as a starting point in integrating local adaptation strategies with formal strategies.

While integrated risk reduction approaches in the form of inter-municipal collaboration is an important initiative particularly amongst cities with varying levels of financial and technical capacities such as those in Sub-Saharan Africa (Dodman et al., 2017), the findings in this research show that there is intra-intuitional disconnect at the national scale and lack of collaboration between disaster risk reduction agencies, municipal authorities and victims of climate-induced risk in informal settlements.

Consequently, this research proposes stronger collaboration between institutions tasked with spatial, climate change and environment, and disaster response institutions to effectively address spatial issues that produce risk to the impacts of climate change in formal settlements, and design policies responsive to these impacts in terms of mitigation and adaptation policies. Finally, these institutions need to recognize informal settlements to remedy injustices, collaborate with victims who are affected by the impacts of climate change to understand adaptation needs, and complement strategies to yield long-term transformative adaptation or build forward-bouncing resilience.

1.2. Structure of the Thesis

This thesis is structured along three main sections: theoretical framework and methodology; background chapter on climatic features of The Gambia, its major climate impacts and local governance in relation to informality and adaption and an overview of climate change policies and governance in the Gambia; and the case study and concluding sections.

Chapter 2 reviews the literature that sets the theoretical framework of the thesis. It begins by examining how urban political ecology aids in understanding social, economic, political and environmental factors that shape complex urban processes and how themes within urban poetical ecology such as the production of environmental risk and hazards link risk or hazards, informality and climate change; which shapes the research question on vulnerability and adaptation. This is then followed by a theoretical discussion on the dimension and major paradigms of justice, upon which the research question on climate justice is framed. It then conceptualizes climate change adaptation, resilience and informality before delving into the linkages between urban political ecology, climate change and urban informality.

Chapter 3 outlines the research methodology on which the research is based. It provides the rationale for utilising a case study approach. Since the research aims to provide an account of the experiences of vulnerability and exposure to climate change, adaptation strategies used and perception of (in) justice and how it impacts the latter, it outlines the rationale for utilising the abductive research strategy. The chapter concludes by describing the research methods used and the challenges encountered while carrying out the fieldwork.

In chapters four and five, the importance of institutions and agents in enhancing response to the impacts of climate change, thus fostering resilience or enhancing vulnerability through injustices such as exclusion and marginalization are analysed in detail. The aim of chapter four is the show that The Gambia is indeed highly vulnerable to the impacts of climate change and that its impacts have been increasing

in frequency and intensity in the last two decades. It then explores the challenges faced by local authorities in responding to the impacts of climate change amidst a highly centralized governance regime. Chapter 5 provides an overview of climate the institutional and governance of climate change and major climate and environmental-related policies. It reveals a disconnect between spatial authorities, climate change mitigation and adaptation bodies and response institutions. It argues that while The Gambia is hailed internationally for its ambitious climate policies, more needs to be done in pursuing and implementing adaptation policies that shall respond to the current climate hazards, particularly flooding, along the informal settlements of the riverine areas of Ebo Town.

Chapter 6 outlines the research findings of the case study are presented. It begins by examining urbanization processes in The Gambia, introduces the case study area and then presents the findings in relation to the research questions. Chapter 7 outlines and examines the layers of injustices in the informal settlement of Ebo Town. Chapter 8, concludes by positing that climate injustice needs to be integrated into the major dimension of justice rather than being considered as a subject of inquiry upon which (in) justice is analysed and examined.

CHAPTER 2

URBAN POLITICAL ECOLOGY, CLIMATE CHANGE AND URBAN INFORMALITY

Urban processes are highly complex, as continuous relations among social, economic, political and environmental factors shape them. Urban political ecology approach provides us with an analytical framework that is quite helpful to understand the complexity of urban processes. The reason for this is that the approach focuses on the dialectical relationship between social, economic, and political factors on the one hand and environmental issues on the other, and explains how both interact in transforming and shaping urban life. Therefore, this chapter starts with a discussion of the key theoretical concepts from urban political ecology to serve as a framework for this research.

Firstly, a key theme within urban political ecology - the production of environmental risk and hazards is an important framework for connecting the relationship between environmental risk, informality, and climate change adaptation. Departing from a sheer description and explanation of physical aspects of environmental change, it puts at the core of its research, social, economic, and political factors that produce and determine the severity of vulnerability. For example, in terms of informality, residents of slums and squatters who live on the fringes of urban areas by virtue of geographic location face negative externalities such as exclusion from social services and amenities, which further compounds their vulnerability. In terms of climate change, such settlements are faced with a more severe form of exposure since they confront physical climatic risks such as the effects of extreme weather conditions like flooding and socio-economic and political risks explained above. Furthermore, informal settlements usually develop in areas that are not suitable for urban development with most developing on wetlands, flood plains, coastal areas and

quarries. The lands on which informal settlements develop are naturally prone to risks related to natural hazards such as floods and landslides. The confluence of these risks and climate change-related stimuli increases the exposure of informal settlements to climate hazards. The fact that informal settlements are unplanned settlements that are usually not built via appropriate development and construction methods makes them not only prone to hazards but also vulnerable to their impacts. Economic and social decisions such as service provision and infrastructure upgrading affect the adaptive capacities of informality settlements. It has been argued that any attempt at reducing vulnerability without addressing its root causes might yield little effect. Proponents of urban political ecology contend that the best way of addressing causes of vulnerability while empowering and strengthening the adaptive capacities of vulnerable communities is to engage them in decision-making. Thus, this research seeks to explore the coping and adaptive strategies of the residents of an informal settlement and to examine whether national adaptation policies address risk, vulnerability and adaptive capacities in informal settlements.

Secondly, another significant concept within urban political ecology that is utilized in this research is the concept of (environmental & climate) justice and more recently climate justice. The origin of environmental justice can be traced back to the 1970s. It sprang from US activists (civil rights and anti-toxic activists) and their academic allies concerned with phenomena of environmental injustice or environmental racism, which is the disproportionate impact of environmental hazard on people of colour. Cox and Pezzullo define environmental justice as:

> …not only threats to their health from hazardous waste landfills, incinerators, agricultural pesticides, sweatshops, and polluting factories but also the disproportionate burden that these practices place on the people of colour and the workers and residents of low-income communities (2016, p. 42).

The fundamental goal of environmental justice analysis was to provide empirical evidence that, there is a link between environmental hazards and marginality and indeed that environmental hazard are disproportionately located in areas with minority populations (Perreault et al. (Eds), 2015, p.586). As a field of study, environmental justice scholars seek to address the unfair distribution of

environmental bads such as health risk from exposure to anti-toxic chemicals, pollution and hazards Bullard and Johnson 2000 (as cited in Perreault et al. (Eds),2015). However, the goal of environmental justice is to bring attention to and transform the unequal socio-economic relations that both drive the production of greenhouse gas emissions and influence human exposure, vulnerability, and resilience to the impacts of climate change (Newell, 2022).

Disparities in environmental health and hazards have transcended beyond specific geographical specialities. It has taken a multi-scalar dimension (i.e., it has moved beyond race and American cities) and has taken on issues beyond its traditional focus. The discourse on environmental justice issues is expanding rapidly. Schlosberg identifies three broad categories of expansion of environmental justice: horizontal expansion to include a variety of issues, vertically to represent the global nature of environmental injustice issues and conceptually, to include humans and their relation to non-human entities (Agyeman et al., 2016, p.338). To elaborate, environmental injustice has taken a broader perspective to encompass disenfranchised areas inhabited by the socially and economically marginalized other than people of colour. For example, people residing within resource extraction sites are exposed to environmental hazards and poor environmental quality. Kozlowski and Perkins 2015, (as cited in Agyeman et al., 2016) argue that such communities are usually faced with an ultimatum between agitating for environmental quality or keeping jobs and means of livelihood and increased economic growth. More often than not, when economic choices are preferred over environmental quality or livelihood sources, the economic benefits gained from such decisions do not benefit those that forge the later choices. This is because the actual decision does not lie with those who stand to lose their livelihood sources the most or even defend environmental protection.

Key among the variety of issues that environmental justice has taken on is climate change. Global climate change and rising temperatures are the most pressing issues humanity is faced with. Its causes and effects are disproportionately distributed in society. Thus, climate justice has taken momentum to address issues of climate injustice. (Newell, 2022) “defines climate justice as a concept used to account for

and contest how climate change affects the most those that have the least responsibilities for its cause and are excluded from decision-making processes regarding responses (mitigation and adaptation) to it" (p.916)". It is a rallying call on how the poor contribute the least to climate change and yet suffer the most from its consequences. Climate justice developed directly out of the history and conceptualization of the Environmental Justice discourse; has become a dominant thread that brings together different themes under the environmental justice movement; and it is a channel and a cornerstone for global climate negotiations (Agyeman et al., 2016, p.329).

Recently, the discourse on environmental justice has shifted to issues that centre on local people's vulnerability to climate change. Schlosberg posits the shifting change subtly:

> … environmental justice is also turning much more specifically to the local experience of increasing vulnerability to climate change, and the conceptions of adapting to a life challenged by an altered climate …environmental and climate justice activists and movements regularly address the actual material experience of changing environmental conditions, impacts on everyday life, and crucially, the potential ways functioning, and development are threatened ... Overall and increasingly, the discourse of climate change justice is about vulnerability and the very functioning and resilience of communities (Schlosberg, 2013, p.147)

This has put the climate vulnerable whose everyday experiences and potential for development or wellbeing are affected by the impacts of climate change. This has led to the adoption of the Common But Differentiated Responsibility (CBDR) as a guiding principle in global climate governance. In addition to this, within specific geographical boundaries, differentiated impacts of climate change could be observed among different social groups such as between men and women (gender-differentiated impact), the politically, institutionally or economically marginalized and the rich etc. Broadly considered, differentiated impacts are categorized into:

(1) Differentiated vulnerability: actual and perceived risks affect different sections of society in varying ways.

(2) Differentiated participation in climate-decision making, policy formulation and implementation action: difference in participation in climate-decision making, policy

formulation or involvement in implementation action can be a cause be an obstacle to adaptation or trigger vulnerability and or create opportunities for participants in these processe. (3) Differentiated benefit-sharing from climate policy and actions: those who benefit from climate response actions benefit differentially (Burke, 2019).

According to T. Schinko et al, the question of justice and fairness have played a crucial role in both academic and policy debate on climate change as far back as the beginning of the UNFCCC process, as demonstrated by the principle of common but differentiated responsibilities in the Rio Declaration (T. Schinko et al, 2019, p. 90). Recognising the differentiated impacts and the capacity gap between nations to adapt and build resilience to the impacts of climate change, climate justice began to take precedence at the forefront of international climate discourse. As a result, the Loss and Damage Mechanism was established to address loss and damage associated with the impacts of climate such as extreme events and slow onset events in developing countries that are particularly vulnerable to the adverse effects of climate change. It outlined implementation approaches to address loss and damage through: sharing knowledge on risk management approaches; consolidating dialogue among stakeholders; and, providing support and action in the form of finance, technology and capacity building (UNFCCC, 2013, 2015).

In recognition of the fundamental challenges posed by inequality and injustice on development, the United Nations enshrined the principle of Leaving No One Behind to enable the attainment of sustainable development goals for all members and sections of society. Leaving no one behind requires the identification of the excluded; the reasons for their exclusion; and addressing “patterns of exclusion, structural constraints and unequal power relations that produce and reproduce inequalities through meaningful participation of the marginalized” in the policy process, particularly those relating to (re)distribution of benefits and opportunities (United Nations, 2017, p. 43). Rising inequality and inequity have led to the setting out of programmes and policy packages to fight against discrimination and inequalities at the country, regional and global levels. Recommended policies and programmes at the country level to fight against these evils include curtailing spatial and geographical inequalities and supporting “measures to protect vulnerable,

marginalized and excluded communities to prevent, mitigate and build resilience to the impacts of climate, natural disasters, desertification, land degradation and humanitarian crises" (United Nations, 2017, pp. 17–18). These principles are grounded on the principles of justice and fairness. The section below looks into the theoretical aspects of the major dimension of justice.

2.1. Dimensions/ Paradigms of Justice

Within the Marxian political economy, the work of David Harvey- *Social Justice and the City*, brought a resurgence of interest in political ecology and environmental justice. Holifield, (Perreault et al. (Eds.), 2015.), argues that by the '90s Harvey 'brought the threads of justice, political economy and the environment together in his book *Justice, Nature and Geography of Difference (1996)'*. However, prior to this, liberal theories of justice had theorized on the issue of justice and social issues. Their main departing point on the issue focused on distributional aspects of justice, which investigated the distributional mechanism that creates injustice, which dominated the discourse on justice. This dominant paradigm of justice became the focus of attention in the early 1990s when academics began to be critical of it. For example, Irvis Marion Young, 1990 criticized the distributional dimension of justice when she argued that discussion on environmental justice should go beyond the distributive mechanisms that generate injustice to examine the institutional and structural conditions (domination and oppression) which cause and maintain unequal distribution (Perreault et al. (Eds.), 2015, pp.587-88.). Laura Pulido, another staunch critic of the distributional dimension of environmental justice argued that studies that sought to determine the relation between minorities and environmental hazards in a location had a narrow focus. She argued that such an intention overlooked the structural and hegemonic forms of racism- their focus on the spatiality of environmental injustice and racism led them to overlook complex, multi-scalar processes that generate environmental inequality.

Following these critiques, the emphasis on how to analyse justice shifted to investigate the processes that generate injustice. Procedural justice emphasized the importance of the processes of inclusion and participation in decision-making.

Zerner 2000 (as cited in Perreault et al. (Eds.), 2015) in a study on conservation and protection demonstrated ways in which practices and norms of conservation and biodiversity protection include other forms of justice that do not include the dominant distributive dimension.

The third dimension of justice is recognition, which is 'conceived of as the dismantling or overcoming of institutionalized subordination preventing particular groups from full participation in social life' (Perreault et al. (Eds), 2015, p.590). Non-recognition creates and intensifies exposure to environmental and climatic risk as the vulnerable lack political voice and platforms through which they can articulate and agitate for their needs such as access to public services or mobilize against exposure to hazards; even when they succeed at mobilizing themselves, their call is ignored because the authorities do not recognize their claim. Petra Tschakert (as cited in Perreault et al. (eds.), 2015) has tanslated the analysis of recognitational dimension of environmental justice into empirical research. In a study on artisanal gold mines in Ghana in 2009, she argues that the lack of recognition of small-scale unlicensed miners by the government is a form of environmental injustice, which excludes miners from both lands rich in gold and health and welfare programmes offered by the state (Perreault et al. (Eds), 2015, p.591). In addition, more recent studies by (Chu & Michael, 2019) of climate justice and the marginality of migrant workers in informal works and settlements highlights how environmental marginality is linked to a lack of recognition of migrant workers' citizen rights and right to informal livelihood strategies. In the literature on climate change adaptation, there is a consensus that there is a need to understand the question of adaptation for whom, through what mechanism and to what end? (Chu & Michael, 2019). Some proponents of justice and human development such as Amartya Sen and Barbara Nusbaum have called for the extension of the concept of justice to capabilities, which refers to the extension of peoples' freedoms and capacities to achieve well-being while David Schlosberg (Schlosberg, 2013) has sought to incorporate all dimension.

Another important development in the environmental and climate justice discourse as observed by Agyeman et al., (2016, pp. 332–333) and more recently by Wagle & Philip, (2022) is the connection between environmental justice and identity;

community; space; place; and attachment. The space theme looks into issues that relate to urban policy and planning and how this intersects with space and place including identities and culturally inclusive spaces and practices while identity refers to how individuals and communities relate to the physical and political environment around them and the interactions and experience, they share with other members of the community. The symbolic attachment that individuals and communities have on space and place is a crucial factor to consider in examining vulnerability and informality. Planning, upgrading, urban renewal and relocation initiatives undertaken in informal settlements need to put identity, space- attachment into consideration. In the study area, public authorities have tried to no avail evicting and relocating the most at-risk residents because of the sense of attachment to and pride in the land and the community networks built. This thesis draws and utilises the concept of justice such as distributional; recognition; and procedural justice, and how they influence vulnerability and adaptation.

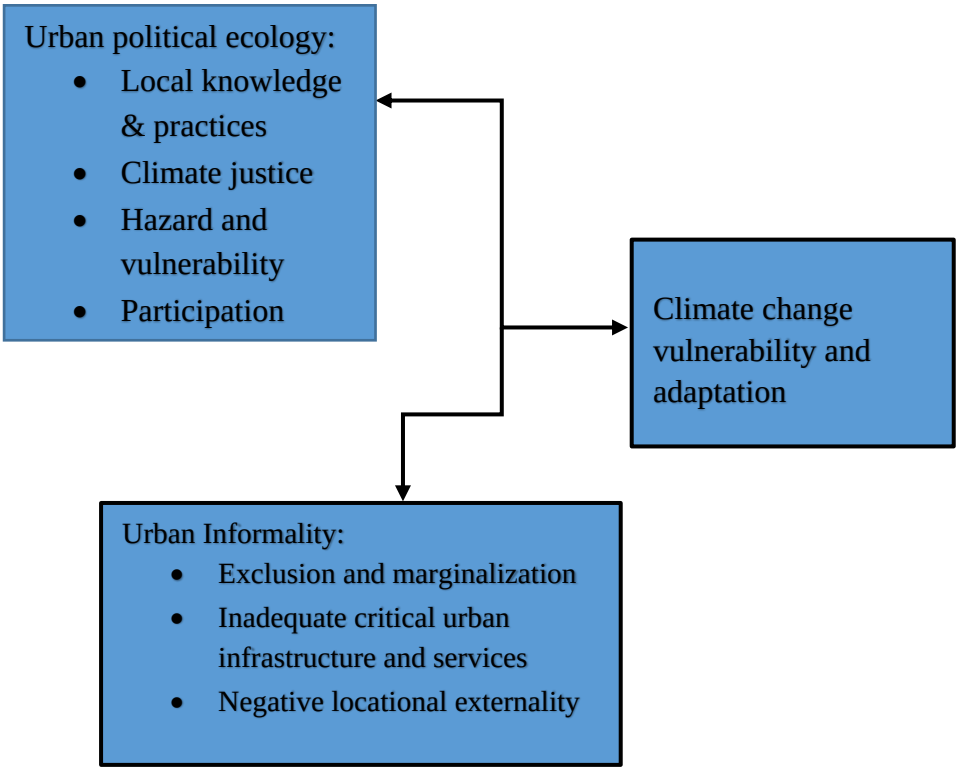

Figure 1. Theoritical Framework

Note. The chart shows how concepts from urban political ecology, climate change and urban informality form the theoritical framework for this research. Source: author's work

Finally, the reliance on scientific explanations for the causes, solutions, and the understanding of changes in the environment should not negate or reduce non-scientific explanations as rudimentary, non-evidence based or superstitious. Non-science-based understanding of climate change its causes and solutions -particularly adaptation plays a vital role in complementing global adaptation efforts. For instance, in terms of understanding, explanations from political and economic perspectives or synthesis of both have deepened our understanding of the causes of climate change. Capitalism and the desire for economic advancement have been a major focal point of climate negotiations despite the strong link between economic growth (industrialization) and global warming. How much nation-states are willing to forgo to achieve a global net emission reduction which in the long run will bear positive results in terms of global warming and climate change has provided enormous insights into the causes and solutions of climate change. Scientific knowledge based on tangible evidence or estimations has significantly increased our perception of climate change nonetheless; local people's observation and knowledge of the local environment have proven to be vital in monitoring climatic trends or changes in weather conditions. Finally, an understanding of the relationship between people and institutions at both macro and micro scales has increased our understanding of adaptation and mitigation activities. Thus, turning to alternative ways of seeking solutions to climate change whether through mitigation or adaptation will help complement the enormous role that science and technology play in understanding and dealing with the effects of climate change. This complementarity is of great significance in areas with poor or no critical urban infrastructure as it would have to rely on local solutions to adapt to climate change.

Climate change and its impacts on physical and human systems are combated through two main approaches: mitigation and adaptation. Mitigation aims to reduce or cut down on the amount of Greenhouse Gases emitted into the atmosphere, which causes global warming while adaptation seeks to adjust physical and human systems to deal with the effects of global warming. The success of any adaptation strategy is dependent on risk management approaches that are locally distinctive. Thus, locally distinctive risk management approaches must occur in a bottom-up fashion rather than a top-down imposition. Because the impacts of climate change unfold locally,

the role of local risk management agencies/ structures has gained prominence in combating the effects of climate change at the micro-scale. Therefore, local adaptive responses are quite essential. However, bottom-up approaches to adaptation are particularly vital at micro scales (neighbourhood level and community scale) where a disconnect exists between formal governance structures and inhabitants, especially when such settlements are informal- where the repercussions of climate change and its effects are more severe.

Knowledge of the occurrence of climate change and its effects determines what forms of solutions a community takes. In other words, a community's understanding of climate change and its effects including risk and vulnerability perception influences adaptation strategies and coping strategies employed against exposures to risks. Policies on climate change adaptation and the means (advice, strategies, equipment and infrastructure) through which policies are translated into practice do not only occur at a technical level. They are the outcome of a discourse. (Oppermann, 2011) in her article on the discourse of adaptation to climate change (2011, p.17), notes that there are connections between language, knowledge and power that contribute to our problematization of concepts. Language, knowledge and power shape our understanding of reality, which in turn shapes what forms of practices we conceive and develop to think of as relevant and acceptable. Thus, discourse and practice are mutually reinforcing. A specific discourse on climate change adaptation defines the boundaries and the objects through which we seek to comprehend adaptation. This boundrified discourse on adaptation contributes to a limited set of practices and politics of adaptation; therefore, determining and confining how we adapt, and the solutions we provide. The way the discourse of adaptation is constituted in society depicts or delimits adaptation practices (Oppermann, 2011, pp.17-18).

A case study conducted in Accra's poor suburbs by (Cobbinah et al., 2022) sought to understand local people's knowledge of climate change. The findings indicate that despite a skewed understanding of changes in climatic conditions, more than 85% of respondents are aware of climate change as changes in rainfall patterns and temperature variations. Although the respondents had a limited understanding of the

causes of climate change, their knowledge of the occurrence of variations in rainfall patterns shows that they can connect flooding in the community to changes in rainfall, thus prompting what actions and practices to employ in the event of a flood. Conversely, a study of two settlements on the outskirts of Dakar by Schaer 2015 (as cited in Winter & Karvonen, 2022) found that the residents had no risk perception of living in a flood-prone area arguing that flooding had not previously affected them. However, as cautioned by D. Liverman 2015 (Perreault et al. (Eds), 2015.), the vulnerable, especially those living in informal settlements should not be considered as "passive victims without knowledge or capacity to respond to climate change (P308)".

Urban political economy provides great insights into the causes, local people's perception of and responses to climate change and vulnerability. Its early efforts to understand and explain hazard vulnerability by linking marginalization, exclusion and poverty to environmental degradation and more recently the incorporation of climate change holds the key to unpacking the causes of vulnerability to climate change and the structural causes of informality. Patel et al., (2020) identify a convergence of risk factors that make urban areas more vulnerable. The convergence of risk factors includes environmental (climate change-induced hazards such as flood variations in temperature and stronger windstorms), political, social (marginalization and exclusion) and economic risks such as poverty which have an impact on the ability of cities to function in times of shocks and stress (p.2). In addition, Piers Blaikie et al. For example, their book titled At Ris*k: Natural Hazard, People's Vulnerability and Disaster (1994)* examines climate hazards such as flood and drought from a political ecology perspective using variables such as occupation, land tenure system, ethnicity etc. The authors use a two-fold model to analyse vulnerability- distance, remote "root causes", "access", and "livelihood" as determinants of variations in inter-household vulnerability. Current literature on vulnerability and risk studies utilizes socio-economic variables to explain climate vulnerability, although most do not take an urban political ecology perspective. Vulnerability: 'the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impacts of a natural hazard'. The IPCC defines vulnerability as 'the degree to which a system

is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes' (IPCC, 2008: as cited in Pelling(Pelling, 2011). Thus, Pelling, (2011, p. 22) argues that the above definition of vulnerability conceptualizes it "as an outcome of susceptibility, exposure and adaptive capacity for any given hazard".

Its approaches such as cultural ecology and analyses of historical structures have been effective in showing how particular sections, social groups or genders have been left vulnerable to climate change risk as a result of the wider effects of structural conditions like lack of infrastructure, services and access to land and resources or lack or failure in entitlements (early warning and emergency relief services). Methodological inputs from UPE such as discourse and narratives help in understanding climate change perceptions. Discourse and narrative analysis of climate change sheds light on how climate change is framed and understood and consequently helps reveal vulnerability perceptions and adaptation initiatives undertaken by individuals and communities. This research utilizes these methodologies by seeking first-hand information on residents' perceptions of vulnerability to identify the risk and vulnerabilities in the settlement and the ensuing adaptation practices used, to determine whether adaptation practices are aimed at coping, reducing risk or reducing vulnerability.

2.2. Conceptualizing Adaptation and Resilience

2.2.1. Adaptation

Adaptation is both a simple and complex concept. It is simple in the sense that its meaning appears to be straightforward but in a rather deceptive way as it describes a response to a perceived risk or opportunity. Its complexity lies in the distinction between different adaptive actors (communities, individuals, state or nations and sectors), how these actors interact with each other, what/ which assets and values need to be protected or sacrificed and how choices are made and by which actors, and how we relate our understanding of adaptation to people with contrasting opinions. This shows the epistemological complexity of the term.

Adaptation is a response in recognition of a change in conditions. Changes in conditions are not static but rather oscillating and the responses to the evolving condition too are diverse. Humans adapt to economic, social, political, cultural and environmental conditions. Within climate change adaptation these changes include changes in mean temperatures, changes in precipitation levels, and shortening or longing in seasonal patterns and their effects.

Palling, (2011) in his attempt to propose and illustrate a framework to help reveal and understand the cultural, social and political pathways through which adaptation to climate change unfolds, contextualises adaptation through three lawyers of analysis. These three lawyers are built on the starting point of the notion of:

1) Resilience adaptation: which seeks to ensure continual and progressive functioning of desired systems under changing conditions. Thus it is "politically and technocratic ally conservative" (Perrault et al. (Ends), 2015, p.38) as it aims to maintain the status quo; 2) Transitional adaptation which seeks "incremental change" (Fox et al., 2021); and 3) Transformational adaptation which has to do with wider and radical socio-political and structural changes.

The main goals of adaptation are to increase adaptive capacity (risk reduction), increase resilience and reduce vulnerability. These goals are all interrelated. For example, an increase in vulnerability can affect adaptive capacity while an increase in adaptive capacity bolsters resilience. Adaptation actions and initiatives in the urban system include activities that seek new technologies and infrastructure (Wagle & Philip, 2022), put in place governance and institutional policies and reduce exposure to climate and environmental risks.

2.2.2. Types of Adaptation

There are various typologies of adaptation from the diverse litratrature on adaptation. Broadly categorized, climate change adaptation can be grouped into autonomous (automatic, spontaneous or passive adaptations) that occur naturally "without any intervention by public agents" (Shaw et al., 2013, pp.11-12) as part of the routine of

a social system and planned (strategic or active) adaptation. Planned adaptation refers to “a set of conscious policy and financial decisions made before signs of climate impact become apparent or just after changes take place”. From an agency perspective, autonomous and planned adaptation is consistent with actions taken by private and public agents (Jabeen, 2019).

Other typologies of adaptation consider the timing of adaptation in relation to the occurrence of a stimulus. Reactive and anticipatory adaptation are time-bound responses. Reactive adaptation initiatives are activities designed after events have taken place while anticipatory adaptation are actions, practices and strategies that respond to future events and conditions. Adaptation activities can be short-term and long-term and have come to be associated with adaptation actions that are geared towards short-term stability (coping) and long-term change (adaptation) (Pelling, 2011, pp25-26). Form typology of adaptation categorises adaptation based on the forms (technological, institutional, behavioural etc.) through which it unfolds. It is important to distinguish between two perspectives from the form-based typology of climate change adaptation; technical- scientific perspective and institutional-cultural perspective. The technical-scientific dimension of adaptive capacities emphasises access to resources, technology, knowledge, the structure of institutions human capital etc. The institutional-cultural dimension on the other hand emphasises norms, values and cultural context as facilitators for or barriers to adaptive action (Inderberg, 2015, pp. 15-16).

In general, technical-scientific adaptation strategies could be more efficient in dealing with the impacts of flooding and other climate-induced hazards because they are premised on sound scientific and technological innovations. However, adopting technical-scientific adaptation strategies, particularly where replication or transfer of innovation and technology is necessary, requires huge capital investment and know-how, which are largely beyond the means of informal settlements of many under-developed countries in the Global South. Furthermore, residents of informal settlements have developed coping mechanisms to deal with the impacts of climate change amid inadequate critical urban infrastructure and services. Thus, while the use of technical-scientific adaptation strategies is considered desirable and efficient,

economic and political conditions specific to informal settlements might restrict the scaling-up of such strategies. Under prevailing conditions of informality, complementing modern adaptation strategies with existing local practices and knowledge in informal settlements as enablers of adaptation could reduce risk and impacts where modern approaches do not exist or are inadequate. For instance, the significance of cultural practices such as those revealed in this research (reliance on family ties and networks and locally led community initiatives) should not be overlooked, particularly in countries where state-led welfare systems, benefit schemes and insurance coverage are marginally available to disaster victims. The central argument lies in the inability of technical-scientific adaptation strategies to build resilience adequately and provide long-term transformative adaptation amid increasing vulnerability; and how insights from local practices and strategies could help reduce risk and vulnerability.

Humanity or human societies have always adapted when confronted with environmental challenges, so do individuals, and socio-ecological systems. Thus, responding to external pressure is not a new phenomenon. If adapting to external threats is not a new challenge to humanity, then, why is understanding the importance of climate change adaptation crucial to modern socio-ecological systems? Climate change unlike other external pressures poses a great challenge to adaptation; the challenge of uncertainty. The uncertainty of the speed and scale of the impacts of climate change coupled with how its impacts affect everyday life brings new sustainability challenges to socio-ecological systems. Thus, it is important to understand the importance of adapting to climate change.

However, the fact that individuals and societies do not possess celestial senses indicates that despite our long history of adapting to many forms of changing weather, whether it is environmental, political or economic stimuli, individuals and societies may not adapt effectively to external changes. Constraints or limits to adaptation (Satterthwaite et al., 2020) are inevitable in the process of adaptation. Constraints such as a lack of understanding and awareness of or a reluctance to accept change can affect how individuals and societies (if at all) respond to a change. Karen O'Brien and Elin Selboe argue that “if the change required is too great for the

individual, organism or society to manage, or alternatively if they are not willing to adjust, then decline and even extinction prevails" (page 8). Fragility in human societies and the resistance to act towards a given fragility are absolutes in human societies. Thus, to adapt effectively to any changes recognition and an understanding of the occurring changes and finding the right solutions are required.

2.2.3. Resilience

The concept of resilience has transverse across many academic disciplines- from its original usage in the physical sciences, engineering, and ecology to other disciplines like disaster management, planning and other social sciences (Davoudi et al., 2013). The different uses of the term lead to its varying interpretations and definitions, which creates conceptual ambiguity and vagueness (Heinzlef et al., 2022). Shifting from the conceptual domain to the empirical domain, resilience has gained popularity in policy documents and practice and has been conceived of as a response to climate change and shocks from socio-economic uncertainties. Hence, it is an important part of climate change adaptation.

Pelling, (2011) defines resilience as the "ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences". However, Heinzlef et al., (2022), provide an extensive summary of the various definition and characteristics of resilience from diverse literature including but not limited to the ability to rebuild, bounce back/forward, capacity to resist, learning capacity and adaptive capacity etc. (p:2). In addition, Davoudi et al., (2013) also provide a three-fold conceptual distinction of resilience as engineering, ecological and socio-economic resilience (p308). Briefly engineering resilience is the "ability of a system to return to an equilibrium state after a temporal disturbance", ecological resilience refers to "the ability of a system to absorb change and still persist" while socio-economic resilience is 'the ability of complex socio-economic systems to change, adapt or transform in response to stresses and strains". One of the most pressing phenomena that humanity is confronted with is climate change and resilience within climate change adaptation occurs in spatial domains (cities and rural areas) and specifically in urban areas, which are complex socio-

ecological systems. Socio-economic resilience has a more holistic approach than engineering and ecological resilience as it sees humans and nature as interconnected and part of a whole system rather than entities distinct from each other. Urban areas are complex systems composed of several but interdependent infrastructures or critical infrastructures such as sewage and drainage systems, water, transport, buildings, electricity etc. Bearing this in mind, the literature on resilience pertaining to the spatial domain can be categorised into urban resilience and community resilience.

Urban resilience is defined as "the concept that studies urban systems faced with risk" and "refers to a systematic approach that encompasses the multi layers and structures that produce an integrated vision of the urban object" (Heinzlef et al., 2022). (Satterthwaite et al., 2020) applied the IPCC's definition of resilience to urban areas as "the ability of urban centres (and their populations, enterprises, and governments) and the systems on which they depend to anticipate, reduce, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner" (p.144). The 100 Resilient Cities Initiative as quoted by the above authors, however, defines urban resilience as "the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience" (Satterthwaite et al., 2020, p.144). Urban areas are the epicentre of major climate-induced risks and hazards such as coastal and flash floods and heatwaves, consequently, urban climate resilience examines urban resilience from the perspective of climate-related hazards in urban settlements. Several studies have been conducted on the conceptual framework of urban resilience including (Tyler & Moench, 2012), (Davoudi et al., 2012), (Kim & Lim, 2016) and (Heinzlef et al., 2022).

Tyler & Moench (2012) identifies three key components of urban resilience: systems, agents and institutions (pp.15-17). Systems refers to the critical and risk-reducing infrastructure in urban areas and its support systems such as sewage and drainage, transport and buildings. Urban settlements rely on this critical infrastructure for day-to-day functioning. Failure, breakdown, or the absence of

critical infrastructure affects the effective functioning of an urban area. Retaining and maintaining effective functionality of the system becomes an important part of resilience building. Functional retention can be achieved through flexibility and diversity of the functional interdependence of the components of the system. Conceiving urban infrastructure as systems and their interdependence enhances a holistic approach to resilience building because of the different risk factors and their impacts on different infrastructures. For instance, a lack of drainage system can expose an area to flooding which in turn can have sanitary effects on pipe-borne water systems. Drawing on the perspective of socio-ecological systems, urban resilience needs to integrate social agents into institutions and ecological systems in order to support and enhance effective resilience. Social agents play a vital role in urban climate resilience because the decisions, choices, social networks and knowledge of both local and innovation and financial resources of agents may influence resilience building through the reduction of vulnerability and it may exacerbate it or impact adaptation efforts. In addition, understanding the social compositions of an urban area can enhance resilience building as different social groups, households, economic status etc. experience vulnerability and climate impacts disproportionately because they are confronted with different risk factors and possess different adaptation/ resilience capacities. Finally, institutions refer to a set of rules, conventions, norms and structures that shape the relationship and interaction between humans. In terms of urban resilience and vulnerability, institutions affect how the previous two (systems and agents) relate in response to the impacts of climate change. As discussed above (see section on climate justice) institutions can enhance vulnerability through exclusion and marginalization either in the form of non-recognition of title deeds, exclusion in decision-making and political participation or failure to recognise and articulate the plight of a group or community.

Thus, institutions play an important role in urban climate resilience, especially in informal settlements as highlighted by (Satterthwaite et al., 2018.): “Urban planning decisions such as slum resettlement can increase or decrease climate vulnerability depending on the institutions governing rights, compensation, participation, planning and consultation in the process of resettlement and upgrading”.

Socio-economic resilience is another important research focus in the literature. Numerous studies have been conducted to examine the socioeconomic resilience of communities. Societal resilience as first coined by Adger is defined as the ability of communities to withstand shocks to their social infrastructure" (Kim & Lim, 2016, p.8). Social infrastructure refers to the risk-absorptive and protective capacity of society when confronted with risk. Building societal resilience hinges on collectiveness in decision-making, participation and collaboration. These facilitate the process of adaptive learning through social relations and build aggregates of social capital. Societal resilience has come to be referred to as community resilience within climate change adaptation literature. The three main features of societal resilience are (1) the ability of a community to withstand and resist external shock, (2) recover from it, and (3) its ability to adapt to new conditions (Kim & Lim, 2016, p.9).

The concept of resilience is useful in our understanding of complex issues such as climate change adaptation. It provides a dynamic and all-encompassing view of the process of climate change and climate change adaptation. Dynamism and adaptability are two significant features of urban resilience. Dynamism has to do with entities such as cities, regions etc. that are not static but rather experience continuous change while adaptability is seen as a process in which entities and their various sections collaborate to seek solutions in the event of or in anticipation of shocks to maintain their functionality (Kim & Lim, 2016, p.8).

2.3. Informality: Context-specific

Informality does not occur in a vacuum. Its existence can be defined and perpetuated by the formal sector and its agents. McFarlane (2012) provides a critique of the concept of informality. He fostered the understanding of how the 'informal and formal actors relate to each other; this shifted the understanding of informal practices beyond the practices of residents and workers in the formal sector. Such an argument sheds light on the understanding of informality in the global south where the formal comprises a relatively smaller sector. Thus, the formal sector wittingly or unwittingly must absorb, incorporate, or even recognize the existence of informality as a part of

the larger economy. It is not to be understood only as an exclusionary process involving the poor but also as a process of accumulation or extraction and negotiation by both the poor and the elite and formal agency/ actors. If formality and informality both occur in tandem or are reciprocal, or one exists as a result of the other therefore, Banks et al. (2020), argue that there is a need for the revision of the frames through which the concept of formality is conceptualized and construed to account for the changing context, new forms and patterns of informality. The authors postulate that the potential of the concept of urban informality hinges on an understanding of it as: 1) a site of critical analysis 2) porous legalities and 3) a borderline between formal and informal (Banks et al., 2020). Thus, they suggest that a third category; 'a formal' may be needed to recognize situations where neither formal nor informal rules apply or are fragmented or unclear (227). The term is used to "highlight that while the informal may not be enforced by legal processes, it is nevertheless controlled by institutionalized processes that may be strong or (stronger) than those managed according to formal laws by the judiciary" (Banks et al., 2020, p. 227).

2.3.1. Informality as a State-Induced Phenomenon

The state, through its planning and regulatory authority, contributes to the determination of the legal or illegal status of a spatial unit and the formation of the latter. Accordingly, state actions or inactions contribute to the determination and formation of urban informality. In an attempt to depart from the dualistic conceptualization of informality, Roy (2005, p. 149), posits that informality must be viewed as a product of the state. She argues that the planning function and legislative monopoly of the state provide it with the power to determine the existence of informality and reproduce categories of legitimacy and illegitimacy. Similarly, Watson observed that in African cities, governments at both scales produce social and spatial exclusion through the enactment of inappropriate laws and regulations and the introduction of massive urban redevelopment projects, which benefit business and political elites. This dispossess and push previous residents further down to areas of locational disadvantage - rendering them with no option but move to informal settlements (Watson, 2009). To illustrate this in practical terms, at least

from a Gambian perspective, the functions and the authority of the planning department have been limited to only planning without the ability to neither approve wider city plans-, which is done by the cabinet, nor implement urban management plans and policies effectively. This is due to the centralisation of urban management at the ministerial level, which involves stakeholders from different departments and ministries. This restricts and undermines the urban management powers of the planning department and fragments its authority of control, regulation and implementation of plans and policies to different departments and ministries. In addition to this, the traditional powers of land allocation by the Alkalis which to a large extent, still exist contribute to the formation of settlements outside officially designated residential areas. Consequently, the inability of the state to ineffectively execute its planning and control function of urban management has led to the formation of illegal settlements.

This discussion on urban informality is essential in characterising the prevailing state of urban governance in The Gambia, where there has been no official recognition or designation of settlements as informal and where the boundaries between formal and informal procedures in land allocation involving the Alkalis (described above) and the institutional processes to halt informality have been unsuccessfully enforced.

Under the prevailing land governance system where traditional leaders such as alkalis and traditional chiefs have authority and control of the initial stages of land development- acquisition or purchase, leads to the establishment of unplanned settlements. To overcome policy gaps from a land use perspective, greater authority over land development should be under the authority of the DPPH or municipalities. This will ensure strict adherence to legal and environmental standards thus minimising informality. Incorporating traditional leaders in formal land administrative procedures, who lack technical expertise in land management and routine administrative tasks such as record keeping creates and re-enforces informality through the by-passing of rules and the exercise of due diligence in urban planning. Furthermore, (Banks et al., 2020, p. 227) conceptualisation of informality as the lack of enforcement of informality by legal processes renders a fitting description of informality in The Gambia.

2.4. Linking Urban Political Ecology, Climate Change and Informality

Urban political ecology provides a useful analytical tool through which urban metabolic and circulatory processes including biophysical and socio-political aspects of urban settlements are understood as it helps to identify the causes and processes that trigger inequality.

The processes that generate structural inequalities in urban settlements occur through state support (directly enhanced by the state) or through the absence of state support which has implications for service provision or a lack of it and corrodes existing public services (failure to renew and maintain infrastructure and services that are in a state of blight). These in turn can either enhance or weaken urban resilience. For instance, the uneven distribution of land can have adverse effects on land areas with important ecological and climatic benefits. Settling on wetlands as a result of socio-economic and political determinants of land ownership can contribute to a loss in urban greenspaces for conservation, biodiversity and the provision of other ecosystem services.

Historically, the IPCC has used the concept of adaptation as adjustment in its works on climate change which is a revival of the 1960s cultural ecology (Perreault et al., 2015). Within the IPCC's policy circles, academics such as Neil Adger began to incorporate concepts from urban political ecology including vulnerability, adaptation and resilience. The concept of adaptation drowned from political ecology's perspective has over the years become very instrumental in framing climate change adaption discourse. Urban Political Ecology is both an academic field as well as a practical tool, activists and scholars have developed and improved it conceptually to analyse socio-ecological and socio-physical relations. As a practical tool, it has been effective in addressing inequality and injustices that arise because of social imbalances in terms of gender, race, wealth etc. and how such imbalances affect and or are affected by power dynamics in the built environment. Epistemologically, urban political ecology has recently been revived and employed in our understanding of the complex relations between power, politics and vulnerability, and how it fosters or redresses vulnerability in urban informal settlements and informal workers.

Urban political ecology's contribution of concepts such as social vulnerability, its analysis of climate change from an economic and political context to climate change adaption practices and discourse has become essential in fostering our understanding of the causes of climate change, the complexities of mitigation and adapting to it. The notion and concept of resilience and adaptation as a prescription for climate change policies and practice at both micro and macro scales, especially amongst vulnerable and disadvantaged communities have been salient indications of the significant contribution of political ecology and urban political ecology, to climate change adaptation. It has shifted the discussion on climate change and its impacts from a phenomenon that occurs in nature to one that happens within the urban configuration and thus, seeks to redress its causes and reduce impacts from socio-economic, environmental and political factors, which determine and shape urban configurations. Urban political ecology has provided a clear distinction in terms of "exploring the intersection between urban ecology, as a field-based scientific practice, and operation of social power within the urban arena" (Gandy, 2022, p. 26). In addition, it "has focused primarily on how social forms of power transform the environment and how the non-human becomes actively enrolled in processes of uneven and combined socio-ecological production and reproduction" (Ernstson & Swyngedouw, 2018, p. 4).

In terms of climate change, urban political ecology emphasises to importance of understanding vulnerability as a phenomenon that involves both biophysical exposure to risk such as the impacts of rising temperature, seal levels and changes in precipitation levels etc. and socio-vulnerability as economic exposure to risk. It provides a strong link between climate vulnerability and socio-economic and political processes in city and urban environments. For example, it connects vulnerability as a result of "risk geography" (I.e., the propensity of a specific risk to occur in a specific location) and how such vulnerability from that specific risk is further caused or compounded by socio-economic vulnerability. Urban political ecology sees the underlying causes of vulnerability as part of wider historical and current social, economic, and political relationships or urbanization processes on one hand and environmental factors on the other hand. These processes include the historical process of urban morphology and uneven cost and benefit of climate

change and environmental problems etc. Techniques and approaches in urban political ecology such as vulnerability assessment and mapping can assist in discerning climate vulnerability and its underlying causes of exposure.

With respect to informal settlements, urban political ecology recognises the unequal nature of urban settings and thus seeks to challenge and critique this phenomenon. It is an important tool in understanding the processes of informality by examining the power (political) dynamics involved in it; accounting for it from a historical and socio-economic perspective and attributing climate and environmental hazards in informal settlements a nexus between these factors. In recognition of the socio-economic and political nature of climate and environmental change in urban areas, it offers a local (location-specific) non-market-based solution, which is non-existent or not transferable to informal settlements.

Urban political ecology provides an approach to conceiving nature and urbanization as interrelated and inseparable to the extent that social configurations like capital, status etc. are interlinked with nature and the built environment, energy consumption climate change and the environment etc. It also provides an analytical framework through which to understand urban processes as a complex relationship between social, economic, political and environmental factors. It focuses on the dialectical relationship between social, economic, and political factors on one hand and environmental issues on the other and how both interact in transforming and shaping urban life. Methodological inputs from UPE such as discourse and narratives help in understanding climate change perceptions. Individual's accounts of their plights and conditions can unravel how climate change is framed, understood, and consequently help reveal vulnerability perceptions and adaptation initiatives undertaken by individuals and communities.

2.5. Research Gaps

Most of the studies on climate change adaptation examine adaptation as a task that involves adjusting policies (Tyler & Moench, 2012) practices and plans to ameliorate the impacts of climate change. Another approach to adaptation is the application of

climate projections to forecast and predict specific risk factors and then develop response mechanisms to avert the predicted risk. However, climate change and climatic conditions are variable and uncertain. Increasing variability and uncertainty make projection difficult. For example, in many poor countries' governments (national and local) there is a limited assessment of impacts and information available to authorities mandated with adaptation policies and responses, which makes prediction a far-fetched reality. Predictions of climatic conditions are usually aimed at short-term possible occurrences; thus, a lack of long-term studies of urban climate and impacts makes it harder for authorities to plan in advance (Bai et al., 2018, p. 23). In addition, in the event of unexpected risk, response becomes much harder as the planned responses may not be suitable to address it. Where forecast prediction is done for specific risks such as flooding, the community may not be able to cope with and effectively respond to its remote impacts like landslides. Besides, the reliance on national data cannot provide the data needed for area-based planning and action (Dodman et al., 2019, p.6) and the reliance on information for planning responses implies that the response areas are linked to formal structures and institutions. However, in informal settlements where data is scarce, relying on a "predict and avert" approach would prove to be cumbersome. Thus, for this approach to be effective there should be coordination among institutions tasked with adaptation planning, responding to and projecting shocks. Finally, the over-reliance on technology for adaptation has been criticized for largely ignoring the daily experience and structural inequalities inherent between countries and different vulnerable groups (IPCC, 2014), and or failing to tackle the social causes of vulnerability (Basset and Fogelman 2013 as cited in Perreault et al. (Eds), 2015, p313.)

Urban areas are often at the epicentres of the impacts of climate change, "urban climate change risks, vulnerabilities, and impacts are increasing across the world in urban centres of all sizes, economic conditions, and site characteristics"(IPCC, 2014, p. 538). However, the severity of risks and impacts, level of exposure and the ability to reduce, cope with and recover varies across different spatial characterization, economic and social groups. Within this characterization, informal settlements, which constitute about 1 billion of urban dwellers and, projections indicate urban

growth in low- and middle–income countries will occur in, experience climate-related impacts the most. A large proportion of the residents of these settlements are not adequately prepared to adapt to the impacts of climate not only because of a lack of risk-reducing infrastructure and services that strengthen resilience but also because they are in high-prone areas such as flood plains, steep slopes etc. They are victims of "double exposure"- exposure from the physical risks of the impacts of climate change, which is compounded by marginalization, and exclusion from infrastructure and service provision. Given the extent of vulnerability and projected expansion of informal settlements, there is a need to enhance the resilience and adaptation capacities of residents at both micro (individual, household) and macro (neighbourhood, community and regional) scales (Satterthwaite et al., 2020, p.144).

Dodman et al.(2019), argue that for responses to climate change impacts in low-income countries and informal settlements to be effective, the systematic causes of vulnerability and adaptation efforts should be integrated. Reconciling climate change adaptation to economic success, poverty reduction and basic service provision, disaster risk reduction and climate change mitigation, they argue, are key urban agendas that would constitute effective responses to climate change in informal settlements. In addition, understanding impacts, identifying actions and financing responses are suggested as necessary actions that should be undertaken in informal settlements (p.6).

The role of cities and urban areas in climate change mitigation and adaptation has gained international attention and over the last two decades, there has surge in the development of adaptation responses and strategies.

A review of the IPCC's Global Assessment reports shows a gradual increase in attention accorded to cities and urban areas both as sites for its impacts and a battlefield in which the war on climate change will be won or lost. An increase in scientific understanding of the causes and impacts of climate change, more funding and a general increase in public awareness have contributed to global adaptation initiatives. At the scholarly level, there are some studies on the implications of climate change adaptation in low- and middle-income countries. Others focus on

assessing climate risks and responses such as vulnerability; e.g. Gran Castro & Ramos De Robles (2019); resilience (e.g., Jabeen (2019); Almansi et al. (2020), Seeliger & Turok (2014), Odemerho (2015) and community-based adaptation Fox et al. (2021), Ahammad (2011), Kiunsi (2013) and Schofield & Gubbels (2019).

In a paper prepared for the IPCC for the International Scientific Conference on Cities and Climate Change in 2018, the authors reified the importance of upgrading informal settlements as an important element for climate change adaptation (Satterthwaite et al., 2018). Although upgrading increases resilience, particularly those related to infrastructure and service provision, upgrading housing stock in many low-income countries where there are no state-led or municipal-led housing provisions and little NGO intervention such as The Gambia, relying on structural upgrading is not an ideal approach to adaptation. Despite its ability to strengthen climate change resilience and cure the physical blight of informal settlements, without recognition of the complexity and interconnected nature of the vulnerability, it can create improved physical structures that shelter the same pre-existing socio-economic conditions.

The literature on climate change adaptation and informality can be categorized into two major strands of studies: those that examine adaptation and resilience in informal settlements from the bottom-up, sociocultural perspective and those that take an institutional-technical approach. However, the shared commonality between these two strands is that there is an element of situational recognition and acceptance. Recognition in that the site of study is officially labelled and categorized as informal and hence the acceptance of such conditions by the residents therefore guiding actions and strategies such as upgrading, or unionization of residents internally and even collaborating with other agents to change and improve conditions in such settlements.

However, unlike these researched areas, this research presents an under-researched perspective (i.e. an informal settlement which has not been officially recognised as such and therefore its residents are liable to pay property tax while its measures and actions required to adapt to climate change have not been considered a prioritized

responsibility of the authorities) within adaption research on informality. I posit that not officially labelling and recognising blightful neighbourhoods as informal or slums by national or local governments constitutes a deprivation of entitlements to infrastructure and services and renders the initiation of transformational adaptation initiatives difficult. In addition, this research contributes to calls on the need to study the voices of the marginalized and informal settlements and understand how they respond to climate related-hazards (Bai et al., 2018) by examining the adaptation strategies in a highly vulnerable and infrastructural deprived settlement in The Gambia. Finally, discourse on injustice; exclusion; and climate change have often been studied in terms of their causal relationship built on the premise that negative locational externalities inherent in informal settlements such as being located on fringes compound their vulnerability to the impacts of climate-related risks. However, this research argues that discursions on climate injustice with regards to the build-environment should be viewed holistically within the dimensions of justice rather than being viewed as a subject of inquiry upon which dimensions of justice (distributional, compensatory etc. injustice) are examined.

Following the identification of the six research priorities, David Dodman et al. also identify three key implications of informality for adapting to climate change. These three key implications are; understanding the impacts of climate change, identifying actions and financing responses (Dodman, Archer, & Satterthwaite, 2019, p. 6). Another knowledge gap identified is the "need to build evidence base on the interaction between urban development, disaster risk reduction, climate mitigation and climate adaptation, and that there is a need to put questions of equity and justice at the heart of adaptation research agenda, including the identifying who is excluded from or discriminated in the process of accessing resources such as housing, land and tenure rights" (Satterthwaite et al., 2018, p. 50). This research will depart from these thematic issues but focus on the identification of actions taken by dwellers of informal settlements in adapting to climate change and existing climate injustice issues while also bringing forward sustainable lessons from the adaptive capacities within informal settlements. It is important to distinguish between two perspectives on adaptive capacities which are technical- scientific perspective and institutional-cultural perspective. The technical-scientific dimension of adaptive capacities

emphasizes access to resources, technology, knowledge, the structure of institutions and human capital etc. while the institutional-cultural dimension emphasizes norms, values and cultural context as facilitators for or barriers to adaptive action (Inderberg, 2015, pp. 15-16).

Furthermore, Vincent & Cundill in their study on "The evolution of empirical adaptation research in the global south" conclude that the geographical distribution of adaptation research has been uneven both across and within regions and that in Sub-Saharan Africa; a few countries dominate, with about a third still lacking empirical adaptation research. The authors' findings further show that agriculture and rural issues have predominated empirical adaptation research in the Global South (Vincent & Cundill, 2021).

Although The Gambia is a highly vulnerable country to the impacts of climate change, adaptation research has focused on agriculture: the impacts of drought on farming communities, loss and damage on agriculture (e.g Yaffa, 2013); coastal erosion (e.g Amuzu et al., 2018). With regards to informal settlements, there is a study on the experience of flooding in Ebo Town with a focus on the school children (e.g. Kavegue & I. Eguavoen, 2016). In addition to this, there is research that examines the role of the environment on migration (e.g. Sweeney, 2023). However, at least to my knowledge, there has been no research that examines; the interactions between the levels of government and the victims of the impacts of climate change and how it drivers or enables adaptation; and examines adaptation in relation to climate injustice.

Thus, this thesis will contribute to the above research gaps in The Gambia by answering the following research question: To achieve these aims, this research shall seek to answer the following research questions; (1) what are the adaptation capacities and techniques of informal settlements and how can these techniques be integrated into formal adaptation techniques? (2) What needs to be done to reduce the vulnerabilities of the population living in informal settlements? (3) What are the perceptions of justice amongst the residents of Ebo Town in relation to climate change adaptation; and how it enable or drive adaptation initiatives within the community?

It also examines climate policies in relation to the urban policies and argues that for adaptation policies in the country to be effective, policies need to be coordinated and streamlined to address climate change in relation to the build-environment rather than the prevailing policies, which focus on the environment with little consideration for its relation to spatial and urban development.

CHAPTER 3

METHODOLOGY

Although there have been several multi-country/ region case study research on climate change adaptation, because of the insights it offers by analysing the differences and similarities between the two regions, single case studies could provide a deeper understanding of the subject being studied. The challenges of setting the boundaries i.e. defining the parameters of the various cases could pose a problem of bias over-generalisation, particularly when the cases involved have varying discrepancies in terms of their socio-economic and political configurations. This is due to the fact that each of the individual cases possesses attributes such as the geographical composition, level of economic development and the scale of political engagement between the state and other actors etc. that are unique to the case or even non-existent in the other case. In contrast, single case studies do not pose the threat of definitive over-generalization of results or a weak analogy as a result of the heterogeneity of the attributes over which the analysis was drawn upon.

However, a single case study could be a more rational choice as it would "provide analysis without sacrificing the in-depth and contextual nature of the insights inherent in using the case study method in the first place" (Yin, 2013, p. 325).

Furthermore, a single case study from The Gambia was conducted because climate change adaptation in relation to spatial vulnerability and climate justice has been overlooked and understudied in the country, yet it has the potential to provide valuable lessons. By attempting to understand the case of The Gambia in detail, some lessons could be derived for adaptation and justice issues for climate policy in the Global South.

3.1. Research Strategies

While designing the research, the abductive research strategy was chosen as the most appropriate research strategy to answer the research questions. The abductive research strategy (Blaikie, 2007, pp. 90–91) was preferred since the research seeks to unveil the social world of a given set of actors and their understanding of a phenomenon (their knowledge of climate change and the adaptation strategies they employ, their perceived causes of vulnerability). It provides the researcher with the opportunity to explore the social realities of the actors through the actor's account of the subject being investigated.

Empirical research on the impacts of climate change and adaptation has been studied through an abductive research strategy relying on accounts from the lived experiences of the subjects and the use of distant observations. For example, Vink et al. utilised a distant observation approach similar to the abduction research strategy (2015). Similarly; Ellen et al., in their work on Adaptive Governance in Practices, employed a case study approach in understanding participants' actions through their own stories and views of reality (2015). From a vulnerability perspective, researchers have employed data collection methods akin to the abductive research strategy with emphasis being on the data collection method rather than on the research strategy. For instance, Gran Castro & Ramos De Robles (2019), in identifying risk and vulnerability perception among residents in the study employed data collection methods to understand the object of their study from the residents' understanding of social reality.

Furthermore, the epistemological and ontological underpinnings of the research which are grounded based on concepts and frameworks from urban political ecology such as local knowledge and justice, the utilization of an abductive research strategy proves ideal in tying the research questions to the theoretical framework and the methods of data collection. Finally, the scope of the research, which puts more emphasis on socio-cultural adaptive strategies rather than techno-institutional strategies, calls for a bottom-up approach for undertaking the research. Because of

these factors, the abductive research strategy, which provides a robust approach to the research questions, was preferred over other research strategies.

Several studies on climate change adaptation strategies aim at explaining adaptation techniques and means of adaptation or examining the effectiveness of adaptation strategies, testing theories to data in the form of hypothesization is rather peculiar. For this reason, in this study, no attempt has been made to theorize from the actions and inactions of the research participants. Instead, it seeks to provide an account of the participants' perceptions of climate change, vulnerability; adaptation; and the participants' perception of existing injustices in relation to climate injustice; and how this influences their adaptive capacity and resilience. In other words, the goal is to give an account of a social issue such as climate injustice, exclusion and action on adaptation strategies, by using an appropriate conceptual perspective or theoretical framework rather than developing or testing concepts or theories from the collected data.

3.2. Data Collection Methods

To determine climatic trends in the country, national precipitation and temperature data from 1985 to 2022 for each of the 10 metrological stations in the country was collected from the Department of Water Resources, which provides official climate data. Both national and regional data were collected to observe national trends over the studied period and to compare variations between the regions. As changes in climate patterns are observed over a longer period, the period from 1985-2022 was chosen as it could provide insights into recent changes in climate trends in the country. Availability of data was another factor in choosing the time period. Collecting accurate data reflective of precipitation and temperature for some metrological stations without a series of missing monthly values could have affected the reliability of the conclusions drawn, especially while comparing trends across different regions. In some metrological stations, there have been unrecorded precipitation values for the peak months of a season which when analysed does not generate a reliable observation. Thus, precipitation and temperature data was collected from the Metrological Unit, Department of Water Resources and analysed

to determine climate variability in the country and to link climate variability to climate-induced vulnerabilities such as flooding and drought.

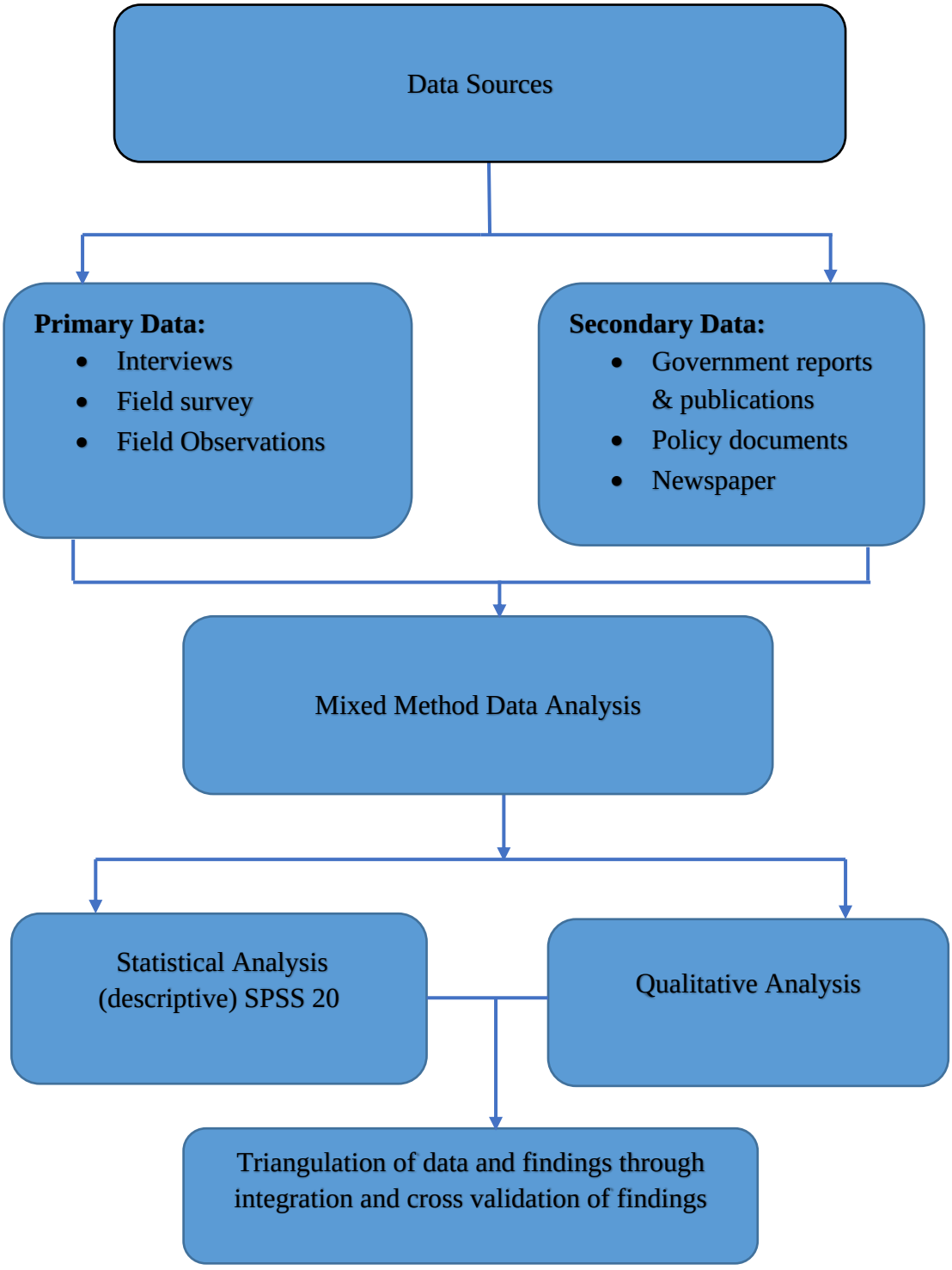

Figure 2. Research Methodology

Note. Summary of research methodology and data collection methods.

Secondary sources such as official reports and newspaper articles were utilized in the analysis of policy and strategy documents, as shown in figure 2. Secondary and tertiary data provide useful information on government interventions, for these reasons they have been used to either substantiate or supplement claims and observations drawn from the fieldwork. To some extent, they have been utilized in this research as *a* significant part of the data collection process, particularly in the part of the case study which presents an overview of climate and environmental policies.

In-depth interviews as a source of data were conducted with key informants from public institutions- central government departments and officials from Kanifing Municipal Council. Interviews were conducted with a total of 9 key informants (5 from the central government) and (4 from the municipality, including the ward councillor or the local representative for the study area at the municipal council). The key institutions, from which key informants were interviewed, were selected on criteria such as areas of intervention or mandates that have a direct bearing on the study and job position of the interviewee. Consequently, institutions that deal with climate change governance (the Ministry of Climate Change and Climate Change Secretariat); the production of climate data (the Department of Water Resources); response institutions (National Disaster Management Agency and NCCRM) and authorities responsible for spatial management (DPPH and KMC) were interviewed. With regards to the job positions of the officials, policy issues such as the level of participation in the policy formulation process and the rationale of existing or the inexistence of policies were taken into consideration. Thus, selecting officials who have been directly involved in policy formulation and informed of policy context is significant as they could provide insights into the content and context of the policies. Therefore, the interviewed officials comprised individuals in senior managerial positions such as Directors, Head of Departments and Head of Units.

Research request letters were sent in advance, to each of the institutions with which the interviews were conducted. The aim of this was to officially seek permission to conduct interviews and to ensure that the institutions identify potential interviewees. Follow-ups were made before the interviews. During these follow-ups, the key respondents were provided with a debriefing letter about the research. The interviews

were conducted face-to-face at the offices of the respondents and were recorded via voice recorder. Since these were open-ended interviews, the length of the interviews varied from 35 minutes to 1 hour 45 minutes and they were transcribed and analysed. Depending on the mandates of the institution, questions that centred on the scope of the study were asked such as climate change and vulnerability, adaptation and adaptation policies, informality and climate and infrastructure injustice.

The second set of interviews was conducted with residents of Ebo Town in order to get first-hand information on their perception of climate change and understand which hazards they are vulnerable to, the adaptation and coping strategies they employ and their perception of climate and infrastructure injustice. The questionnaires targeted household heads. However, since the research aims to uncover climate change vulnerability, climate justice perceptions and adaptation capacities, adult household members who presumably possess knowledge of this phenomenon were also interviewed in the absence or through the instructions of household heads. Taking into account the size of the population of the study area, about 215 respondents, representing approximately 5 per cent of the sample size were interviewed in all quarters of Ebo Town. Of these respondents, 138 and 77 representing about 64 and 36 per cent of the respondents were female and male respectively. The respondents were obtained through snowballing sampling methods. This method was preferred because other members of the community knew the more vulnerable households whose responses were being sought. This facilitated easy identification of households that are the most at risk of flooding. In addition to the questionnaires administered in the community, in-depth interviews were also conducted with some respondents from the community and influential members such as a religious leader, an alkali representative and a leader from a women's group locally called “Yaayi Kompin”. The accounts generated from these interviews provided insights into detailed explanations of issues that arose while responding to the questionnaires. It further offered flexibility to the respondents to elaborate their views and perceptions within the framework of the research, particularly those that were significant but not captured in the questionnaires.

The interviews were conducted with the assistance of a research assistant who had been briefed on the nature of the research before the commencement of the field

survey. The assistant who observed the original researcher during the first two series of fieldwork was only allowed to independently administer questionnaires after the briefing and observation. Because of the rate of literacy among the respondents, the assistant provided valuable support in translating and or interpreting questions to respondents who had difficulties in understanding the questionnaires. Both the interviews and the field survey (questionnaires) were carried out between 25th November 2023 and 5th February 2024.

To conduct the fieldwork in the community, questionnaires consisting of 35 questions were drawn and distributed to respondents. These questions were divided into two broad sections. The first section was designed to gather information on respondents' demographic profiles such as gender, economic status, home ownership status and method of home development. The second section centered on hazard and risk perception regarding climate change and its impacts, flooding experiences and adaptation strategies, and the final section included questions on respondents' perception of justice such as representational and infrastructure injustice, see appendix B for a sample of the questionnaires. The semi-structured interviews were transcribed and analysed based on the thematic research questions while the questionnaires were coded and inputted into SPSS 20 for descriptive statistical analysis. The data from the multiple sources were triangulated by compiling and cross-validating to determine the consistency and dependability (reliability) of the data (Yin, 2013).

3.3. Ethical Considerations and Challenges

Prior to the fieldwork, research, ethical approval was sought and obtained from the METU Human Research Ethics Committee with approval number: *0052-ODTUİAEK-2023,* and an informed consent form. A research request letter was submitted to institutions from which key informants were interviewed. The interviews with key informants from public institutions were carried out after approval from the authorities. Prior to the interview process, an informed consent form was handed out to all the participants who were required to sign it, upon consenting to take part in the research. Interviewees were also informed of their right

to withdraw entirely from the interview, retract statements or cancel the interview at any stage of the interview. By mentioning the researcher's responsibility of confidentiality, the respondents were further reassured that neither the identity of the respondents nor the content of the interview would be shared with third party entities and clarifications of doubts were also clearly addressed by the researcher. Therefore, the participants took part in the research at their own Accord. In other words, all the interviewees consented to take part in the interviews. They were informed of the scope and purpose of the research and the uses of the information collected from them, so the researcher's ethical responsibilities were carried out to the best of his knowledge at the time. Given the precarious political situation the country had emerged from, there were instances when officials were hesitant to be recorded over the voice recorder. During such circumstances, they were reassured that no part of the obtained recordings would be shared, published or used for any other reason other than that which it had been sought for.

With regards to the household interviews, the initial plan was to conduct a survey while recording their responses, however, during the first day of the survey, It was suddenly realized that a significant number of the households approached were unwilling and adamant to be interviewed while being recorded. As a result, the initial research design plan was modified to suit the preferred interview method of the respondents. This flexibility offered a high participation rate, which would have been almost impossible to achieve with the initial research, without distorting the content, scope and wording of the interview questions. In addition to this, respondents felt more at ease answering the questions and thus, provided more detail, expressed their opinions on questions that they thought were controversial and were willing to share personal photos and videos showing flooding in their household.

Despite adapting to the research preference of the respondents, just as in much fieldwork research, hurdles were still encountered. For example, there were about seven (7) to ten (10) unanswered questionnaires. When asked as to why they did not respond to the questionnaires, some responded that the question could expose illegal means of property acquisitions; others responded that it portrays the community as backward. Some of the non-respondents also indicated that the questions could be

implicatory (fear that there might be political repercussions), especially questions related to their perceptions of the actions or inactions of authorities. For example, key informants who have been asked whether there is infrastructure injustice in Ebo Town evaded the question by simply responding: “You should rather ask my superiors”. Similarly, some respondents from the community were asked whether the authorities (local government and central government) have done or been doing enough to remedy their conditions, and some responded that they do not know why the authorities have not done much for the community. Since the research relies on the subject’s narratives and understanding of issues either in their community and the phenomenon that influences it, the apparent evasion of “politically sensitive” questions from some officials or some respondents from the community or both have been problematic in terms of revealing the subjects` accounts of injustice or inactions of authorities in the area.

Another challenge encountered during the fieldwork was the residents' attitude towards public officials. There was an observed sense of “research fatigue” among residents of the community because of the numerous post-flooding surveys and needs assessments carried out by officials from the public sector and NGOs in the community. The community has over time grown sceptical of some data collectors whom they have come to perceive as intruders into their private lives and once they have exposed or revealed their “vulnerabilities” to them, have not been provided with the promised support or assistance for which the needs assessment had been carried out. This has led to a mistrust for data collectors, which has been extended to researchers, and as a result, some were unwilling to take part in the research. When such circumstances occurred, it was explicitly expressed that the research was purely conducted for academic purposes only and that no form of assistance either in kind or in cash was to be provided by the researcher after the completion of the research. This ensured that any preconceived expectations from the respondents were clarified. This point is highlighted here for some reasons that could have had effects on the responses provided by the respondents. Firstly, because the questions were designed such that both economic conditions and vulnerability of households would be uncovered, asking questions on post-flooding support provided at the individual level and the needs of the community at the community level could lead to expectations of

assistance after the interview. During and or before the interviews, some respondents had asked questions regarding which government institution the researcher was from and what form of support would be provided after the interview. Thus, clarifying these issues helped in the reliability of the data by avoiding understatement or overstatement of the respondent's conditions in the hope of fulfilling such expectations. Secondly, to gain the trust of sceptical respondents, it was necessary to indicate to them that the research was independent of any of the institutions that they have been wary of which reassured them to take part in the research and overtly express their opinions.

Another potential hurdle that could have hampered the research, after modifying the method of collecting data due to the low literacy rate in the study area particularly among the elderly, some respondents could not fill out the questionnaires. In this case, the respondents were either asked to seek the assistance of a literate to read out the questions to the head of the household or the respondent who then wrote down the answers provided. There were times when it was also necessary that the researcher volunteered to read out the questions for the respondent and then complete the questionnaire on behalf of the respondent based on the answers provided. In the latter case, additional caution was taken to ensure that the perspectives and responses of the respondents were appropriately recorded.

During the open-ended interviews, some interviewees threw back questions that had been asked to them to the researcher in order to gauge the researcher's position on the subject. To avoid subjectivity, it was explicitly indicated that the role of the researcher was to learn from the experiences and perspectives of the respondents.

CHAPTER 4

THE GAMBIA: BACKGROUND INFORMATION

Having previously laid the conceptual framework upon which this research hinges on, it would be essential to provide evidence on the empirical context of both climate change and its impacts on the country to foster an understanding between the conceptual discourse and prevailing conditions on the ground. This chapter is divided into two main sections, the first section contextualises the background information of The Gambia by analysing its location and climate patterns- specifically rainfall and precipitation data while the second section examines the major climate-related hazards in the country, their severity and scale of impacts. It aims at providing empirical evidence on climate change and variability and its consequent impacts such as loss of lives, properties and livelihood assets. It draws on the conclusion that:
1. Changes in the country's climate and its location have contributed to the increase in climate-related or induced hazards as manifested in the recent surge in such hazards in the country.

2. That spatial variations in rainfall and temperature contribute to urban vulnerability to climate change. The ensuing chapters particularly the case study and the chapters on climate policies and justice can only be duly examined in relation to the empirical realities on the ground.

4.1. Location

The Gambia, located in West Africa, lies on the furthest point of the Western Coast of the African continent. Engulfed by Senegal on the East, North and South and by the Atlantic Ocean on the West, it is a strip of land that runs across Senegal from the East to the West. The Gambia is situated along latitude 13 degrees North and

longitude 13.79 and 16.82 West. This positions the country above the equator in the Western Hemisphere. With a length of (East-West) 480 km and a width of (North-South) 48 km, it has a total size of 11,300 km2, thus, in terms of landmass it is the smallest country in mainland Africa. The population of the country stands at 2 million and a staggering population density of 273 per km^2. The River Gambia, which runs across the country from east to west, divides the country into the north and south banks. The River Gambia covers approximately 10 percent of the total land of the country while swampy areas and floodplains cover about 20% of this. The topography includes several water bodies, low-lying swampy areas, floodplains and wetlands and lowland and upper plateaus. These various types of topography provide different ecosystems such as forests, savannah grassland, mangroves and wetlands, coastal and marine ecosystems etc., thus, rendering The Gambia abundantly rich in biodiversity.

4.1.1. Climatic Features

The average elevation in the country is about 34m above sea level whereas the highest elevation is at a height of 53m. The number of the population living in areas where the elevation is below 5 meters is estimated at 5 % with the most densely populated parts of the country being located in these low elevation areas. Projections indicate that low-lying coastal zones covering 92 km are at risk of being entirely underwater under a scenario of a 1m rise in sea levels, thus The Gambia is amongst the lowest-lying countries in the world. The country is highly vulnerable to sea level rise.

4.1.2. Precipitation

The Gambia falls within the Tropical Savannah climatic zone, which is predominantly characterized by two seasons of long dry period from November to May and short wet season from June to October. Average annual rainfall ranges from 850mm to 1200mm across the country. The peak of the rainy season occurs in July, August and September with rainfall in August accounting for about 37% of annual rainfall. The spatial distribution of rainfall is highly variable in the Southwestern regions see Figure 3 below, most of which lies in coastal areas with thicker forests

that record higher rainfall than the upper-laying Southeastern regions of the country. Figure 4 shows the annual total rainfall distribution for Yundum and Janjanbureh, situated in the Western and Eastern of the country respectively.

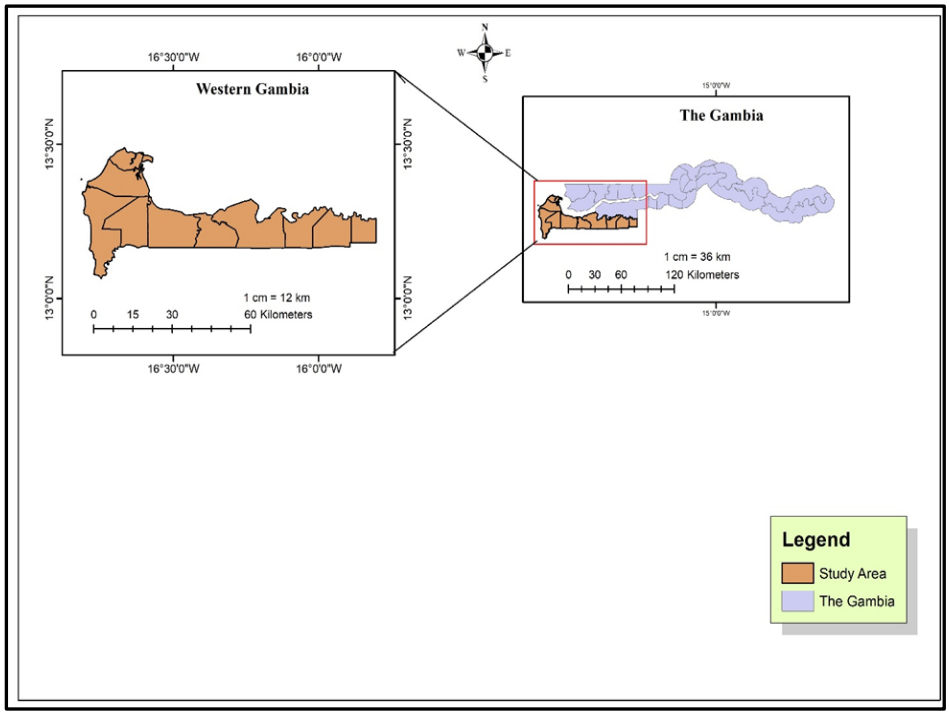

Figure 3. Map of Western Gambia

Source: Authors' work

It indicates that Yundum records higher amount of rainfall than Janjanbureh: from 1985 to 2022, the lowest annual total rainfall of 557.7 mm in 1991 and the highest of 1568.5 mm in 2022 have been recorded for Yundum while a lowest of 489.4mm in 2014 and a highest of 1375.9 in 2005 have been recorded for Janjanbureh. The JAS monthly rainfall received, particularly between 2007 and 2022, has been much higher in the Yundum metrological station than those recorded in the country and even much higher than in the Southeastern part of the country over the same period (see Appendix B**).** This pattern of spatial variation in rainfall between coastal areas and the hinterlands has been observed in many African countries. For example, Maurizio Giugni in their attempt to analyse the impact of climate change on five African cities revealed that in the coastal town of Saint Louis, Senegal, there has been a significant rise in both the intensity and frequency of severe rain events (Pauleit et al., 2015).

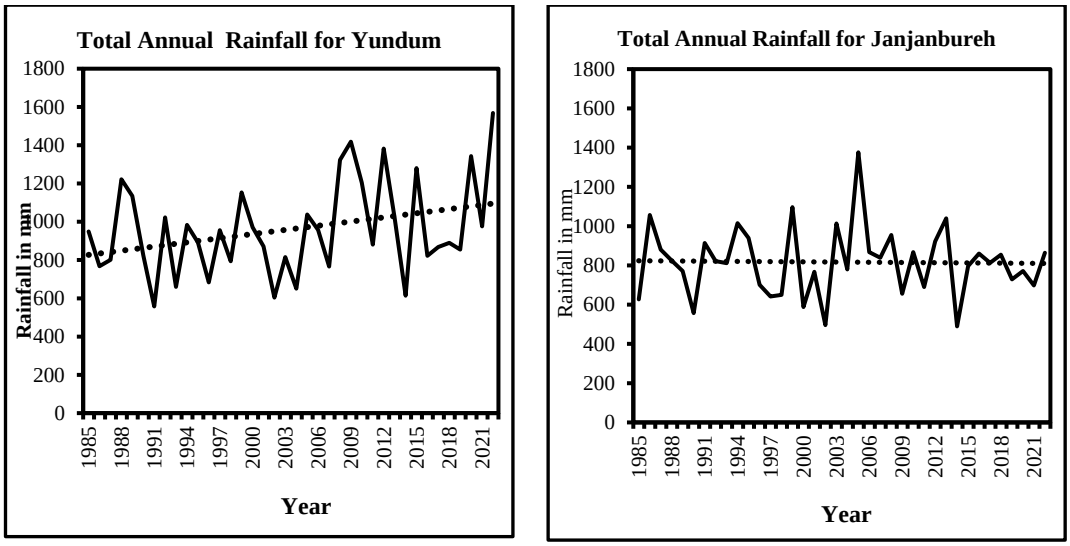

Figure 4. Total Annual Rainfall for Yundum and Janjanbureh

Note. The graphs show the variation in total annual rainfall between Yundum (Near Coastal Region) and Janjanbureh (Inland Regions). This indicates that there are stark differences in recorded rainfall in different regions of the country. Source: Author's Work

Besides, there are observed variations in rainfall patterns in the country with years of driest and wettest seasons occurring at different intervals over the data period. For example, the lowest annual precipitation levels of 590.6 mm in 2002; 602.9 mm in 2014; 644.2 mm in 1990; 664.6mm in 1991 and 676.9 mm in 1996 have been recorded, with dry frequencies occurring between 1990 and 1996. Conversely, the highest values of total annual rainfall received over the same period are 1251.0 in 1999; 1169.2mm in 2010; 1107.1 mm in 2020 and 1079.3 mm in 2022 as shown in Figure 5 below. In addition to the changes in fluctuations for rainfall received, variations in the length and onset of the rainy season are occurring in the country. Across the country, there has been a shortening of the rainy seasons with episodes of either the late onset or early withdrawal. Although rainfall has decreased in general by 1 per cent from normal levels in 2010 (MECCNAR, 2019, p. 15), there has been an observed frequent occurrence of high volumes of daily rainfall in the last decade which has increased in the magnitude, severity and frequency of windstorms and flash floods. As highlighted by the key respondent from the Department of Water Resources, rainfall has been erratic, especially during a season. The respondent noted that rainfalls have become more erratic nowadays compared with the period before 1985 because, "now we record rainfalls of more than 50, 60 and 100 millimetres in a

day and it may go up to another week or 10 days without rain". This is consistent with rainfall trends in the West African sub-region. In his analysis of rainfall in Lagos, Nigeria between 1971 and 1995 for example, Adelkan observed an increase in heavier rainstorms in the period covering 1996- 2005 than during 1971 through 1995 (Sanni et al., 2019). This phenomenon is caused by rapid and intense rains, which have been occurring in The Gambia nearly every other year in the last decade (see table on flooding frequency below). The ramifications for these could have far-reaching consequences in the event of a rise in sea levels since major cities and urban centres in the continent are located around coastal areas. The absence of critical urban infrastructures and services is another factor that compounds the risk of flash floods.

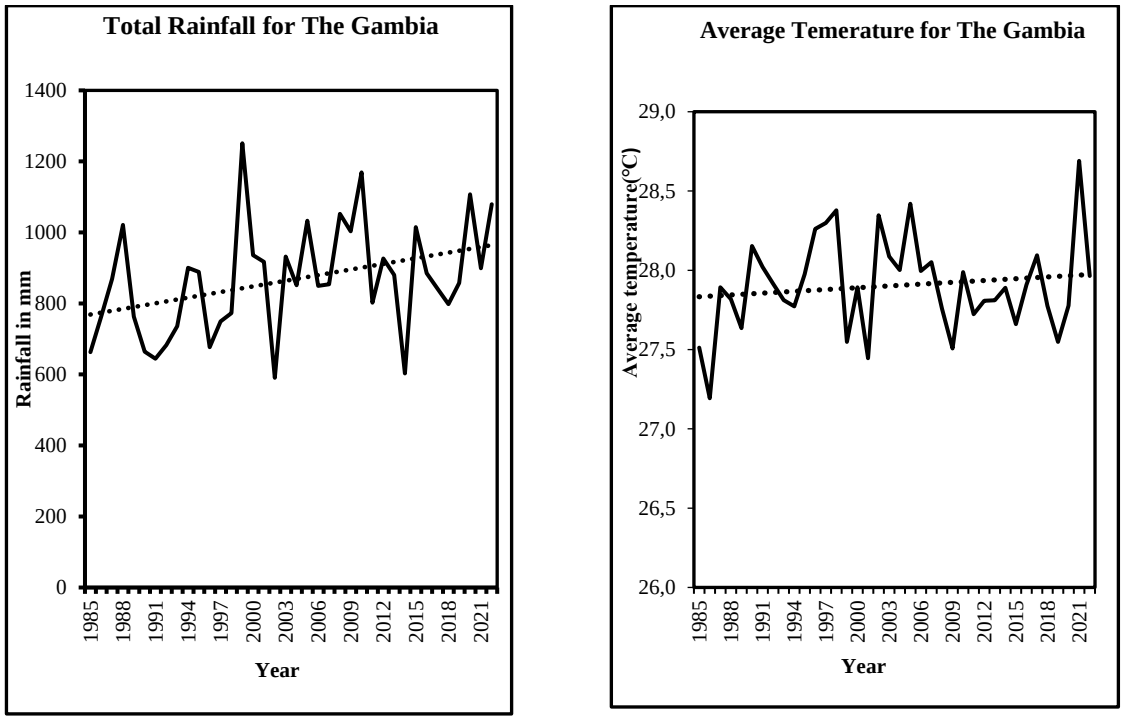

Figure 5. Rainfall and Temperature Graphs for The Gambia (1985-2022)

Source: Author's Work

4.1.3. Temperature

Average monthly temperatures in the country range from 18- 33 degrees however, seasonal variation in temperatures can be observed. In general, and across the

country, peak temperatures occur towards the end of the rainy season in September and October during which average temperatures range between 23-33 degrees while average temperatures fall to 18- 30 degrees in the dry season with January and February recording the lowest temperatures. The occurrence of climate change in the country could be observed through indicators such as an increase in mean annual temperature from 25.8°C in 1947 to 32.6°C in 2010 and a decrease in relative humidity over the same period from 75 per cent to slightly above 55 per cent (MECCNAR, 2019, p. 15).

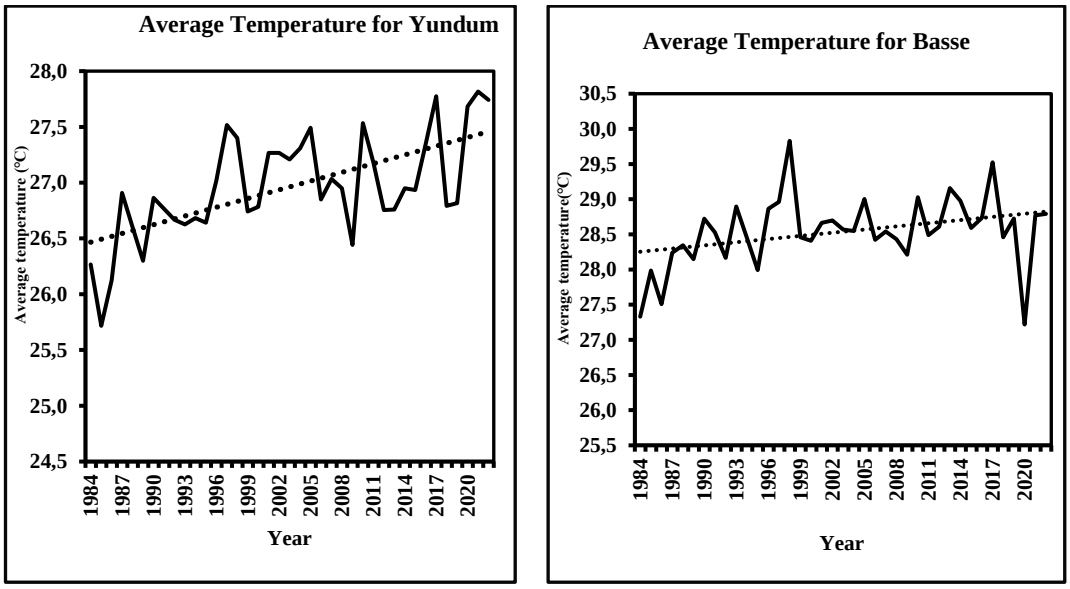

Figure 6. Average Temperatures for Yundun and Basse (1985-2022)

Source: author's work

Despite fluctuations in average annual temperatures, Figure 6 shows that average temperatures in the country have been increasing during the period under study; from 1985 to 2022 annual average temperatures in the country have risen by 1.5%. This corroborates observation made by key informants from the fieldwork. There has been a consensus among all the interviewed key informants that temperature in the country has increased over the years with observed increase in the frequency of heatwaves in the summer months. However, of recent, there have been reports of cold spells (days in which temperatures drop lower than daily mean temperatures) in and January and February in the GBA. A low average annual temperature of 27.2% was recorded in 1986 while the highest average annual temperature of 28.7% was

recorded in 2021 over the same period. An analysis of average annual temperatures in the administrative regions exhibits a similar trend to the national data. Average annual temperatures for Yundum metrological station were low at 25.7% in 1986, rapidly increasing to 26.9% in the following year and peaking at 27.5% in 1997. A dip in average temperature of 26.4% was recorded in 2009, which was then followed by a rapid increase to 27.8% in 2021.

Climate change is occurring globally with observed changes such as an increase in extreme rainfall and temperature-related events. These observed changes in global rainfall and temperatures have been occurring in the Gambia. Rainfall and temperature data indicate that there have been variations in both total rainfall and average temperature in the country as indicated in the rainfall and temperature graphs above. This is consistent with observation in the sub-region (put a citation on such studies).

An examination of rainfall data and the occurrence of flooding in the country shows that there is a strong correlation between the recent increase in extreme climate events and the frequency and severity of climate-related hazards. There has been an increase in each of the climate-related hazards experienced in The Gambia. For example, the frequency of occurrence and scale of destruction caused by floods, drought and windstorms have increased significantly during the last two decades (2000-2020) compared to the period from 1980-1999 (refer to the bar chart). The windstorm and flooding incidents that unfolded in 2021 and 2022 respectively were obvious manifestations of this, as they have affected a larger proportion of the population across the country's regions than earlier climate-related disasters. It is almost certain that the rise in climate hazards is due to climate change, as the IPCC lists The Gambia as one the top 10 countries that are most vulnerable to coastal erosion and sea-level rise and amongst the 100 most vulnerable to climate change. Yet, the country contributes less than 0.01 per cent to global cumulative co2 emission(Global Carbon Budget- – with major processing by Our World in Data, 2023). When these two factors are taken into consideration, it justifies claims that the least contributors to the causes of climate change suffer the most from its impacts (see pages 6-7 on climate justice) (UCCRN, 2018).

There are also differentiated spatial impacts of the variation in temperature and precipitation patterns between regions within the country discussed above. The concentration of economic and employment activities in the GBA (as mentioned in the section on the urbanization process in the Gambia) has created spatial inequalities in the country as other parts of the country have been left behind in terms of life-changing opportunities. These have implications for rapid urbanization and densification in the GBA, which in turn implies climate justice and vulnerability. The significant observations drawn from the analysis of spatial variation in climate trends on urbanization are:

- GBA which covers lower elevated parts of the country with coastal and swampy land, and a non-agrarian region, is characterized by an increase in rainfall and cooler temperatures while the hinterland which is almost entirely agrarian is characterized by declining rainfall and increasing temperatures;
- Declining rainfall in farming communities, which depend entirely on agriculture as a source of livelihood and therefore sustenance, has compelled the youth of the farming communities to migrate to urban areas to seek other forms of economic activities as agricultural productivity declines. These migrants end up settling in low-lying, flood-prone areas in the GBA, which increases their exposure to climate-induced hazards such as flooding and infrastructural justice since local government authorities prioritize infrastructural development in formal settlements.

Climatic factors and the low elevation of the country are contributing factors for climate and weather-related disasters such as windstorms, floods etc. These coupled with the limited financial resources of the country restrict transformative adaptation initiatives. The inherent difficulties that come with prioritizing meagre resources could result in injustice since governments (central and local governments) are faced with the dilemma of choosing between the adaptation needs of a community such as the construction of drainage systems and the development needs of another community.

In conclusion, precipitation patterns in The Gambia's climate have been changing albeit in periods of very dry and wet season and with periods characterised by severe

and erratic rainfall. Changes in the country's climate over the years can be categorized into 3 periods: 1950s- 1960s which is characterized by periods of heavier rainfalls, 1970s-1980s which were drier periods and the post-1990s which were characterized by relatively higher rainfall but falling shorter than the annual national threshold of 1200 mm in some years. The episodes of rainfall during the post-1990s have also been characterised by years of both slow onset and early or late cessation and spells of extreme and intense downpours, which have been accompanied by heavy windstorms. Trends in national temperatures have been more stable than changes in rainfall. National temperatures have risen by 1.5℃ from 1885-2022. However, when disaggregated from the national levels, regional variation can be observed. For example, coastal areas, which are more urbanized parts of the country record higher rainfall and lower temperatures, compared with the Southeastern part of the country, which records less rainfall and higher temperatures. These spatial variations contribute to urban climate change vulnerability as human mobility from the drier, agrarian regions to the coastal areas of the GBA scales up, lower lying; flood-prone areas in GBA densify leading to exposure and vulnerability to climate-induced risk. The following section examines the major climate-related hazards the country is confronted with as a result of its Climate and physical characteristics.

4.2 Major Climate Impacts in The Gambia

Cities across Africa are located in areas exposed to a single or multiple climate-related hazards or natural disasters such as cyclones, droughts, earthquakes, floods, landslides, and volcanoes (Pauleit et al., 2015, p. 6). The high rate of urbanization across the continent means that a significant proportion of the population is exposed to these risks. Soring climate-induced hazards and the fact that the vast majority of Africa's urban population is still underserviced with inadequate critical urban infrastructure to adapt to these vulnerabilities with weak institutional and governance arrangements, particularly at the local level compounds these vulnerabilities. The variations in climate patterns in the country discussed above have resulted in the occurrence of several different climate extremes across the country. Key amongst these are sea-level rise flash floods, drought, and windstorms with the former projected to severely affect the country in the event of a sea rise- levels while the

latter risks are currently being experienced. This section outlines the major climate risks that affect the country, details the frequency of their occurrences, and provides details of the scale and magnitude of the resulting damages, and losses.

4.2.1. Drought

The Sahel region has a very volatile climate- it experiences annual or decadal variations in climate conditions alternating between periods of wet spells and extreme dry spells. This variation in climate conditions has been observed in the second half of the 20th century, a period in which the Sahel experienced a significant shift in climate…from anomalously abundant rains in the 1950s and 1960s to progressively drier conditions in the 1970s and 1980s -a slow climatic onset - deviates from normal climatic conditions (Giannini et al., 2008). This is consistent with historical climatic variations in the Gambia where mean yearly rainfall has decreased sharply from 1,200 mm in the period between 1886 and 1969 to 883 and 744 mm in the 1970s and 1980s respectively (Yaffa, 2013, p. 469). However, in the 1990s and turn of the 21st century, a marginal increase of 800 mm in mean/ average rainfall has been observed albeit generally falling below the 1200m threshold. During this period of decreased rainfall, The Gambia experienced extreme and moderate droughts. In addition, droughts occurred more frequently during periods of decreased rainfall especially in the 1970s through the early 1990s. Periods of drought, with varying severity, were recorded in 1972, 1983- 1985, 1990-1993, 1996-1998/1999 and 2002 (Jallow et al., 2020), 2011, 2014 and delayed and shortage of rainfall in 2016.

Despite flooding disasters occurring more frequently than droughts in The Gambia, in terms of scale, droughts affect more households than any climate-induced disaster. Droughts are the main climate-related hazards that have the potential to directly or indirectly affect households and communities in all regions of the country. The impacts and the magnitude of droughts are compounded by socio-economic factors- about 78% of the working population is employed in the agricultural sector; the predominance of Subsistence agriculture makes it harder for poor farmers to practice ground and surface irrigation- leaving them to rely entirely on rain-fed agriculture.

The lack of diversification of agricultural practices and seasonality of the farming period also makes farmers extremely vulnerable because of the absence of alternatives (there is only one planting season) that could serve as a cushion in the event of a drought. Because of these variables, the impacts and severity of droughts are massive in geographic scale and magnitude. The cumulative effects of the above variables have resulted in droughts of varying degrees, causing devastating food shortages and food crises. For instance, during the 2011 drought, the rain was late, erratic and sparsely distributed, resulting in a total annual rainfall of 534 mm- the implications of this on food production were dire: agricultural productivity declined by more than 60% from the previous year affecting about 42% of the population nationally (Amuzu et al., 2018). Similarly, the 2014 drought resulted in a 50% drop in crop output causing severe food shortages.

Although drought is a major climate-induced phenomenon; poses significant threats to local food production in the form of declining crop yields/ failures and loss of livestock; and causes a contraction of the economy, it is not the focus of this paper.

4.2.2. Floods

Flooding is among the most pressing and severe impacts of climate change. Warming in the climate results in higher air moisture causing an increase in precipitation. The increase in heat waves as a result of global warming has a compelling connection to extreme climate events. Extreme heat and dry conditions, for example, cause parched soils, which increases flash flood risk after heavy rains. Another factor that causes flooding directly related to climate change is the intensity of the amount of rainfall that occurs over a given location. Variation in both intensity and patterns of rainfall has been the cause of severe flooding in areas that historically receive less rain while at the same time resulting in more veracious rains. The record heat waves experienced in the Mediterranean and North Africa in the summer of 2023 were followed by high rainfall that caused the flooding disaster in Libya. Other non-climate related factors such as infrastructure and land use also exacerbate flooding risks.

An aggregation of the above causes of flooding are evident in The Gambia. Rainfall variability that results in extreme rainfall and above-average rainfall have been attributed to the most frequent type of flooding in the country; flash floods, which have impacted many settlements across the country. In addition to flash floods, above-average rainfall has caused river flooding along the banks of the River Gambia. Despite the high vulnerability to coastal flooding in the country due to low elevation and the impacts of projected sea level rise, the country is more vulnerable to flash floods than coastal flooding. However, the occurrence of a major coastal flood phenomenon will cause catastrophic destructions in the country especially in the Greater Banjul Area, with severe potential inundation of Banjul, the capital city- highly likely to bring commercial, business and administration to a standstill. Climate-related factors of flooding are exacerbated by the poor land use patterns. Expansion of new settlements in the growth centres of KMC and the western region is taking place in low-lying inland and swampy areas where soils have high water retention capacity, preventing runoff thus, causing flooding in many areas even when average rainfall falls below the total average rainfall. The Gambia is not highly susceptible to landslides and mudslides as a result of heavy rainfall and flooding as has been experienced in some countries in the region. For example in 2017, Freetown, Sierra Leone was hit by a devastating mudslide following consecutive days of rainfall causing land on upper-lying parts of the city- hills and mountains to slide into neighbouring communities (IFRC, 2019).

Flooding has been the most frequent, destructive and nationally occurring natural disaster in the country. Its impacts and occurrence transcend local scales. For example, flooding has been recorded in settlements in all administrative regions, albeit at varying severity. Inter-regional dependency on trade and agriculture between the regions of the country also means that it has consequences that span across specific spatial scales. To illustrate, severe flooding in the hinterland, which is, predominantly agrarian, causes lower crop yield affecting the supply of locally produced agricultural products across the country. However, close observation of flooding incidents reveals that flooding is more prevalent in the western parts of the country (including the West Coast, KMC, BCC and North Bank) due to high rainfall

which has been exacerbated by the low elevation and population density in the affected regions.

Table 1. Major Flooding Events in The Gambia: Impacts And Geographical Scale

Year	Areas affected	Impacts			
		Loss of life & displacement	**Infrastructure**	**Health**	**Agriculture**
2023* data available for the onset of seasonal rain of 2023	URR, CRR and The Greater Banjul Area	3,793 people were affected while 1,286 people were displaced	Completely and partially damaged houses were reported	Home latrines were over flooded causing exposure to health risk	Washed away sown agricultural fields
2022	Country-wide (KMC, WCR, NBR, Banjul being the hardest-hit regions	More than 47,000 were affected with 11 reported deaths and 6000 IDP	• 7000 houses completely or partially damaged • Severely damaged electricity grids and water supply points.	Outbreak of diseases	Flooded 48,127 hectares of land
2020	Nationwide, URR reported the most causalities	About 21,000 people across 900 households were affected	School buildings were partially destroyed.	84 water points and 150 sanitary facilities were damaged	Farmlands and seed-stores damaged

Table 1. (continued)

2017	KMC WCR BCC NBR and CRR with the GBA and CRR being the most affected	20000 affected with 4,633 directly affected with 1 reported death in the North Bank. Injuries and displacements were reported although exact figures are not available	Classrooms in two schools in the West Coast region were destroyed affecting about 1800 students.		
2013	KMC and CRR	1 reported death in CRR			
2012	Ebo Town, Churchill's Town, Kotou and Manjai Kunda- all in KMC	Several households were reported to have sought shelter in the	Rendered major roads within the affected area impassable and inundated scores of houses	Declaration of Public health and emergency flood response	As commercial are several small-business owners reported a significant decrease in sale
2010	KMC and WCR	More than 34,000 people had been affected, 9000 were displaced and 12 reported death cases.	Large-scale damage & destruction of infrastructure and houses.	Increased in water-borne diseases	Overflowing of rice fields and other cereal crops caused a significant reduction in agricultural output.

Table 1. (continued)

2009	KMC, WR, URR, LRR, and NBR	14,727 people were affected of which 5,488 were internally displaced and 9 deaths	About 434 houses were partially destroyed.	Posed a great risk of cholera outbreak and childhood illnesses	Submerged rice fields in URR destroyed farm crops as the flood coincided with the harvest season. Loss of livestock and livelihood were also reported.

Note. The table provides a descriptive summary of significant flooding events, spatial dispersions and scale of impacts. Source: Author's work

The frequency of flooding incidents including occurrence, severity and damage caused (loss of lives and property) in the country have not been adequately recorded. However, certain major flooding incidents have taken place; the first major flooding incident was recorded in 1948 in Banjul. There has been an increase in the number of flooding recorded at the turn of the century with occurrences in 2002, 2006, 2009, 2010, 2012, 2016, 2020 and 2022. The September 2009 flooding was spatially limited to the towns of Essau and Barra, low-lying settlements on the shores of the Atlantic Ocean, West of Banjul, and destroying over 45 compounds. In contrast to the 2009 flooding, the 2010 flooding was much more severe in terms of spatial scale and impacts (level of destruction); affecting over 33,000 people across settlements in KMC, West Coast Region (WCR) and Upper River Region and displacing more than 9,000 people across the county. Flooding events have also been recorded in 2012 and 2020 in GBA and its suburbs with either unspecified or unreported destruction or casualties. The table above attempts to highlight flood disasters and incidents in the country and their impacts. As has already been noted, the absence of officially catalogued statistics on the scale of flood-related destruction in the country has made such an attempt gruesome. The figures and data provided in the table have been gathered from secondary sources such as newspaper archives and reports from humanitarian agencies, both local and international, including reports from state

institutions. Thus, the information contained in the table seeks to provide insight into the frequency, severity and geographical dispersion of flooding incidents in the country over the last two decades.

Finally, the most recent flooding event in the country took place on the 30th -31st of July and in August 2022. This was a unique incident compared to the most recent flooding since records of flooding began in the country. First, early warnings were made by the Department of Water Resources prior to the commencement of the rainy season. It released its seasonal rainfall forecast for July, August and September in May, predicting above-average rainfall with a high potential for causing flash floods. Despite the warnings issued in 2022, which were a huge challenge in the past, neither authorities at the national level nor those at the local government level had taken precautionary actions. In addition to this, the scale of the amount of rainfall was unprecedented; heavy rainfall of about 276 mm was recorded at the Yundum Meteorological Station, the highest ever recorded since 1999. The heavy downpour resulted in the worst flooding to have happened in over 5 decades. In terms of impacts, it claimed the lives of 11 people; over 40,000 and more than 5,900 had been affected and displaced respectively (UNDAC, 2022, p. 11). In terms of spatial scale, the impacts were felt across the country, however, KMC (Ebo Town, Kotou and Manjai Kunda), WCR, BCC (Northern Banjul) and NBR were the most affected regions. Amongst these hardest-hit regions, KMC recorded the highest number of casualties: 1,657 households were affected while the number of affected households in WCR and Banjul stood at 1,483 and 200 respectively. The actual number of casualties might have been higher than the reported figures because of the remoteness of some settlements, the number of roads that were rendered impassable during and in the aftermath of the flooding, and the limited coverage during the data collection process.

Weather-related hazards such as floods, windstorms and hurricanes cause major disruption to critical urban infrastructures. Such disruptions further slow down disaster response efforts such as evacuation, search and rescue and provision of necessities such as food & water, shelter and medication. The situation becomes direr when water and electricity supply and distribution are affected as these are core

infrastructures upon which other urban infrastructures are dependent. Thus a disruption in such infrastructures tends to have a knock-on effect on other infrastructures and services leading to collapse in the provision of urban services (Allam et al., 2020, p. 4). In the Gambia, severe impacts of flooding on infrastructure have been experienced. For instance, damages were reported on critical infrastructure such as roads, schools and health centres, especially those built with semi-permanent materials, with some either collapsing or the roofs being destroyed by the heavy wind storm. For example, the 2022 flooding destroyed or damaged over 7000 houses (UNDAC, 2022). Disruption in electricity supply due to damages to electricity grids was also experienced while the sludge at three power plants in Brikama operated by NAWEC overflowed because of the heavy rain causing oil spillage in the surrounding neighbourhoods. In Banjul and KMC, Drainages; sewage; pit latrines; community dumpsites, and water sources both underground open wells and pipe-borne water supplies were destroyed, overflown or washed away leading to major health and sanitation problems such as diarrhoea. In fact 407 water supply points including taps and wells and 1238 sanitation facilities were destroyed in the floods across the country (UNDAC, 2022). Similarly, the scale of damage and destruction to public infrastructure and private property was massive though destruction of such assets has been poorly documented due to lack of proper valuation of assets and non-insurance of assets.

Although the damages caused by flooding are more severe in the infrastructural sector, during years of severe flooding, enormous impacts have been observed in the food and agricultural sectors too. Flash floods that occur as a result of excessive rainfall can lead to waterlogging, especially in plains with soil types that have high water retention capacities, which impedes crop growth. Additionally, flash floods do cause direct damage to agriculture by eroding or washing away plants and fertilizers. During years in which the length of the seasonal rainfall has slightly increased in the harvest season, excessive rains destroy crop yields leading to lower crop production. Destructions on infrastructure -roads and bridges due to flooding which disrupts the supply chain and hinders humanitarian aid, severe flooding can have an immediate effect on food availability. For example, in the 2022 severe flooding, 48,127 hectares of land, including cultivated land, were inundated as a result of flash

floods(UNDAC, 2022). This has significantly decreased crop production, food security and farmer's income. The damages and inaccessibility to road networks impeded humanitarian assistance.

4.2.3. Sea-Level Rise (SLR) and Coastal Erosion

The impact of climate change such as a rise in both surface and ocean temperatures and its antecedents of melting ice sheets are key drivers of sea-level rise. It is evident that a rise in surface temperatures causes a further rise in ocean surfaces increasing ocean water thus, increasing the potential for sea-level rise. Forecast indicates that a failure to commit and subsequently meet the Paris Agreement of reducing carbon emissions and halting the global average temperature rise to 1.5 ℃ could cause extraordinary threats to many coastal cities around the world. According to findings by The Future We Don't Want, without a decline in the current emission rate, the number of urban populations at risk of sea-level rise could surpass 800 million across 570 cities by the mid-century (i.e., 2050). The extent of the severity of the projected damage, as has been already experienced, will be much more severe in cities with weaker critical urban infrastructure in the Global South. Research in African cities indicates that it is plausible that most of the coastal cities and those located around rivers, lakes and estuaries such as Saint Louis, Senegal, Dar es Salaam, Tanzania and Douala, Cameroun will experience sea-level rise (Pauleit et al., 2015, p. 18). In the West African sub-region, coastal low-lyıng cities of Lagos and Port Harcourt, Nigeria, Cotonou, Benin and Banjul, The Gambia are the most exposed to climate hazards (Sanni et al., 2019, p. 1964). In The Gambia, for instance, sea-level rise and coastal erosion are projected to cause severe losses as it has been ranked among the top 10 countries that are most vulnerable to sea-level rise and coastal erosion (Ampomah et al., 2012). The Gambia has low-lying coastal areas that are susceptible to coastal flooding in the event of a rise in sea levels. It has been projected that a 1-meter rise in sea levels in the country will inundate 92 km of land along the coastal areas (Amuzu et al., 2018), representing about 8.7% of the total land area of the country. The capital city, Banjul, which lies less than 1 meter above sea level, will be drowned under such a scenario. The impacts of this will lead to the destruction of major towns and high-end gated communities along the coastlines of

the Greater Banjul Area - the most densely populated area in the country, home to the Tourism Development Area (TDA) and main hub of commercial and economic activities. The agricultural sector is another sector that will be severely impacted by a 1-meter rise in sea levels. Along the low-elevated areas of the coast lies swampy lands that are fertile grounds for rice cultivation. A rise in sea levels will result in saline water intrusion into The River Gambia, which will affect lowland crop production. Furthermore, projections on the impacts of sea level rise on the forestry sector will potentially result in the inundation of 6,500 ha of woodland and 40,900 ha of mangrove areas within the North Bank, West Coast, and Central River Regions (Urquhart, 2016, p. 10).

Over the past four decades, the impacts of sea-level rise and coastal erosion have been affecting the TDAs and lowland areas on the Southern coastal parts of the country from Banjul Point to Cape Point and in Kololi, Bijilo and Sanyang. The shorelines and beaches along the TDAs in Kololi and Senegambia have been receding significantly at rates of between 2 - 4 meters per year causing loss and destruction of sandy beaches and hotels that attract tourists (Amuzu et al., 2018). This has triggered government intervention to protect and re-nourish the beaches through coastal zone management and adaptation projects worth millions of dollars. The impacts of sea-level rise and coastal erosion on low-lying agricultural land discussed above have resulted in unregulated land use change from agricultural land (rice fields) to residential land due to a boom in the real estate sector attracted by the ocean view and beaches.

4.2.4. Windstorm

In West Africa, windstorm occurrences are generally associated with rainstorms from thunderstorms. In The Gambia With the rainy season characterized by monsoon weather, seasonal changes at the onset and offset of the rainy season occur. Most of the windstorms occur either at the beginning or at the end of the rainy season. During these periods, strong winds exceeding 50 km/hour often occur causing windstorms in the country. The incidences of windstorms experienced in the country

have been preceded by heavy rainfall consequently causing flooding, further exacerbating the effects of the windstorm.

In addition to the changes in the seasonal weather, windstorms in the country are further driven by anthropogenic factors. Rapid and perpetual loss of forest and vegetation cover has been the main contributing factor to the impacts of windstorms. Since forest and vegetation cover serve as windbreaks, deforestation and overgrazing increase exposure to windstorms. Spatially, the North Bank Region, where deforestation, salination and bushfires are prevalent, has been exposed to windstorms due to the rapid loss of vegetation. Furthermore, changes in land use for agriculture (framing, horticulture and animal husbandry) and rapid conversion/ encroachment on forest covers and traditionally agricultural land areas for settlement purposes (rapid urbanization) increase exposure to the effects of windstorms. For example, between 2000 and 2010, 4 sq. km of forest cover representing 0.04 % of total forest cover has been lost (Department of Forestry, 2018, p. 11). As loss of vegetation cover increases exposure to windstorms, construction of housing with non-permanent and or semi-permanent building materials increases exposures and causes large-scale damage to assets, lives and livelihood.

Figure 7. A House Destroyed in Ebo Town during the 2022 Windstorm

NOTE. Photo of a house in Ebo town destroyed during the 2022 windstorm. Source: Author's Archive

Windstorms in West Africa are usually small to medium-scale disasters that occur at the micro-scale compared with tropical storms however, their impacts could be enormous on local livelihoods, and properties such as housing and could even affect city-wide economic activities. They have the potential to erode people's assets and cause damage to infrastructure, which decreases resilience. In The Gambia, the effects, frequency and severity of windstorms have scaled up from the period 1980-2022, with the most recent occurring in 2019-2022. Incidents of significant windstorms have been recorded in 1999, 2003, 2004, 2008, 2009, 2019 and 2021.

The pie chart in Figure 8 below shows the frequency of the three most frequently occurring climate-related hazards. For example, the 2019 windstorms affected more than 15000 people in about 67 communities in the URR, and CRR. It claimed the lives of four people as a result of collapsed building walls while more than 100 have been reported injured. More than 900 houses had been either partially damaged or destroyed, displacing about 1425 inhabitants(GRCS, 2020).

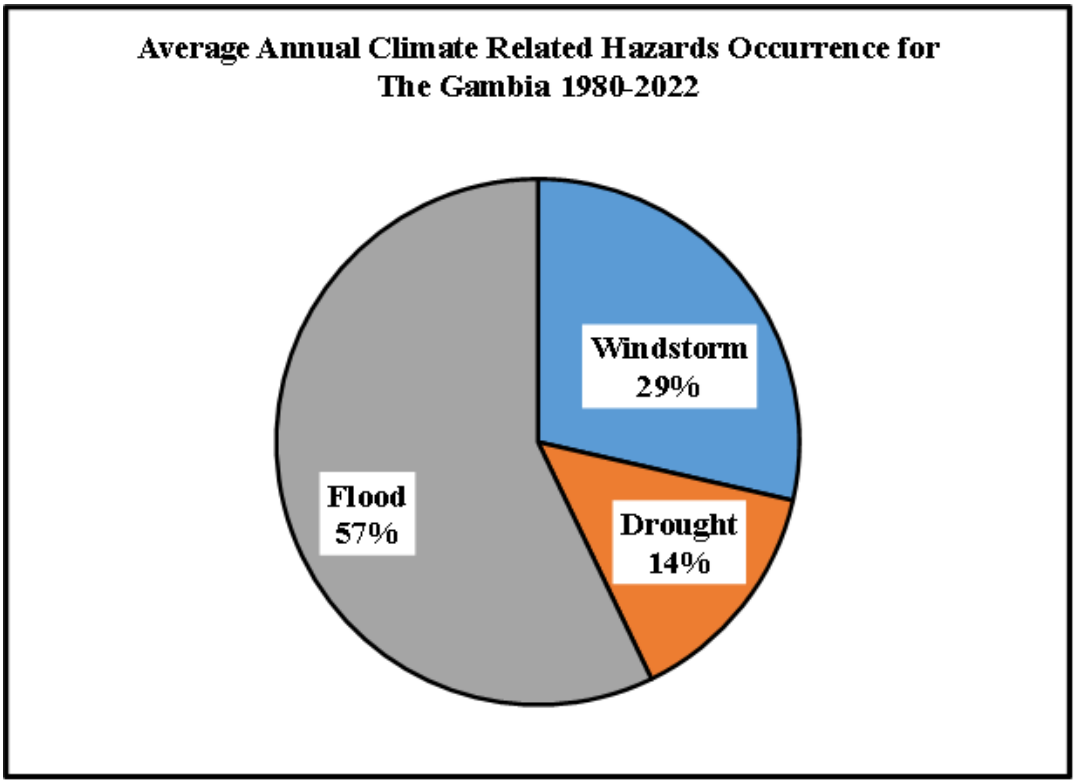

Figure 8. Most Frequently Occurring Climate-Related Hazards inTthe Gambia

Source: Author's work

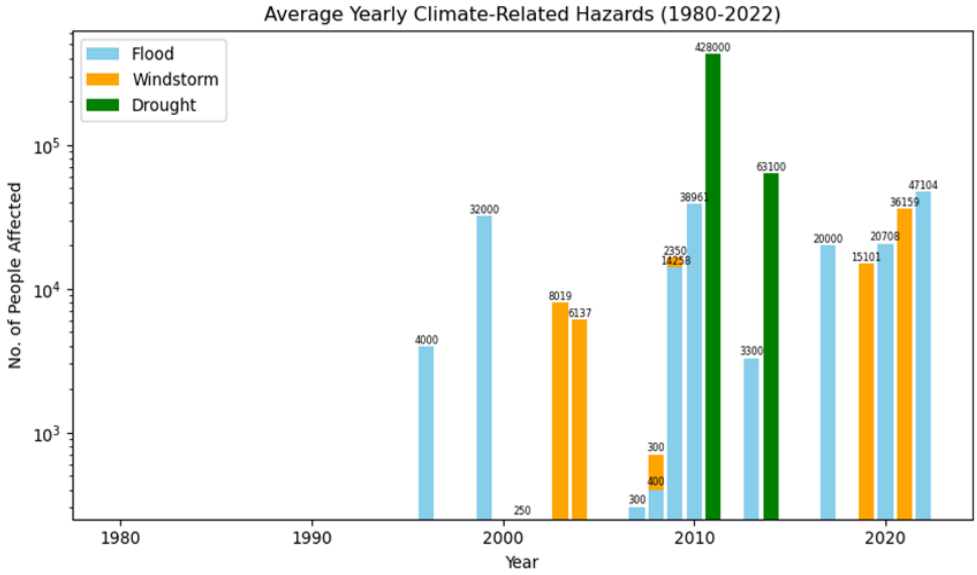

Figure 9. Average Number of People Affected per Each Climate-related Hazard (1980-2022)

Source: Author's work

In terms of damages and loss of assets, the actual scale of destruction has been unaccounted for as the assessments generally focus on assessing the destruction of houses whereas assets such as livestock and livelihood sources are hardly captured in the assessment. Another violent windstorm occurred in 2021, two windstorms storms hit the country within a week (the first, occurring on the 2nd of July and the latter on the 7th of July). As a result of the cumulative destruction that resulted from these incidents, the 2021 windstorms with a level 3 categorization, have been the worst windstorm the country has ever experienced. With wind speed surpassing 80 km per hour, it affected all regions of the country affecting more than 36000 people across 2653 households as shown in **Figure 9** above. In addition, about 14 deaths and more than 100 injured were reported. Despite its impact across the country, the NBR was the hardest hit region as recounted by the key respondent from NCCRM:

> the NBR is one of the most hit areas when it comes to windstorms because there is no thick forest that can serve as windbreakers when windstorms hit, this was why on 7th, July 2021, there was a big problem in the North Bank most of the lives lost were from the NBR; about 9- 10, lives were lost.

Significant destruction to food stocks, livelihoods and damages to private and public infrastructure such as electricity grids, schools and local markets were incurred.

Amongst the affected, many have been reported to have been left homeless with nothıng to eat. The key informant from the NDMA while describing the impact of the incident stated that: “[...] some people [victims of the windstorm] spend almost two to three weeks [sheltering] outside because they did not even have a place to sleep in”. As in many African countries (Kafi et al., 2021), these accounts and data provided are however inconclusive accounts of the scale of damage caused by windstorms as there is no comprehensive assessment of losses and damages thus causing data gaps and information on economic losses, causalities and displacement.

4.2.5. Other Climate Hazards

Just as alternation in the seasonal weather during the raıny, season causes windstorms, the atmospherıc dust, which is a major characteristic of the Sahel, ensues during the dry season. The Harmattan winds blow dust from the Sahara causing sand storms particularly ın areas undergoing rapıd loss of vegetation and forest cover. Sandstorms have been an annually occurring phenomenon ın The Gambia but with less severity when compared to other Sahelian countries and with other climate-related incidents. However, there have been relatively severe incidents of sand/dust storms in 2023 that warranted a national health warning as they caused acute and severe respiratory diseases and erosıon of fertıle soıls for agrıculture.

Interviews wıth community and official respondents reveal that other forms of climate events have been taking place in the country. According to respondents from MCCNAR, recently, there have been reported days of cold spells ın the country especially in the course of the last 5 years. The cold spells occur in the months of January and February durıng the cool-dry periods along the coast.

There have been recounts of an increase in heat intensity. Heatwaves are defined as extended periods of unusually hot days. In The Gambia, heatwaves are defined as periods of three consecutive days in whıch temperatures exceed 43°C (Department of Water Resources, 2018). In the Gambia heatwaves have been a near annual event however, there are spatıal varıatıons ın temperature across the region. Monthly maximum temperatures are lower in the coastal areas of the GBA and WCR because

of the proxımıty to the Atlantic Ocean whıch releases sea breeze along the coastal areas, whereas monthly maxımum temperatures are higher in other regions of the country such as ın CRR and URR. Thus frequency, duration and intensıty of heatwaves and extreme heatwaves have been more prominent in the hinterlands than in the coastal regions. In general, the frequency of heatwaves was less prevalent in 1975-1984 while the period from 1994 to 2019 recorded heatwaves each year with more frequency (see appendix c). Exposure to prolonged heat waves can lead to health impacts and negatıvely affect crops and livestock. Unlike windstorms and floods, there have not been reported cases of deaths ın the country directly attrıbuted to heatwaves or extreme heatwaves. With a population density of 273 per km^2 most of which is contained in the GBA and a high density of buildings in unplanned areas, an increase in heatwaves could increase urban heat intensity.

The empirical evidence from both precipitation and temperature data indicates that climate patterns in The Gambia- a low-lying country have been changing. Rainfall was higher during the 1950s through the 1960s and fell considerably lower in the 1970s and 1980s, a period marked by drought and shortage of rainfall while the 1990s have recorded relatively higher rainfall albeit falling short of those recorded in the 1950s. Furthermore, this has been characterized by periods of both agricultural drought and extreme rainfalls, huge changes in onset days and cessation periods and a decrease in the wet season as a result of delay in onset dates and early cessation. Despite a decrease in total national rainfall (as in many West African countries), the regional trends in The Gambia deviate from the national rainfall patterns. Total precipitation for the densely urbanised coastal regions has been higher compared with the predominantly agrarian hinterland regions. For example, the highest total rainfall of 1568.5mm was recorded for Yundum in 2022 while the highest recorded for Janjanbureh was 1375.9 in 2005. These regional variants have implications for urban climate change vulnerability since the densely, lower-lying urbanized coastal areas are simultaneously experiencing both higher rainfall and higher rural-urban migration plausibly as a result of lower agricultural productivity in rural areas due to low rainfall. This urban densification causes settlements on urban fringes thus increasing vulnerability to climate-induced hazards such as flooding and windstorms. There has also been an observed increase in average annual temperatures. For

example, from 1985 to 2022, average annual temperatures have increased by 1.5°C. The implications of these are an increase in heat waves and urban heat waves in particular compounded by poor building materials and urban densification.

The differentiated impacts discussed on page 8 have been observed in the Gambia at the macro scale and within the country. For example, the Gambia is ranked among the top 10 countries that are most vulnerable to coastal erosion and sea-level rise and among the 100 most vulnerable to climate change yet, the country contributes less than 0.01 per cent to global cumulative CO2 emission. Floods, windstorms and drought have been the major climate-induced hazards in The Gambia and their impacts cut across regional boundaries and sectors. There frequency, intensity and scale of damage have recently been increasing rapidly. How does an underdeveloped country with high climate vulnerability and limited resources (especially the most disenfranchised) adapt to climate change? The following section discusses the local government setting in The Gambia, its interaction with the central government and how strongly positioned it is in enhancing local adaptation capacity and visa a viz informality.

4.3. Public Administration with Emphasis on Local Government in The Gambia

This section is geared towards an understanding of the structure, roles and functions of local government authorities in the Gambia and how these impact local adaptation and justice. The system of local government and decentralization in The Gambia can be traced back to pre-colonial, colonial and post-colonial periods; however, the current system of local government is relatively new dating back to the accession of the Local Government Act of 2002.

The Republic of The Gambia, a former British colony gained independence in 1965 as a constitutional monarchy under the Common Wealth and in a referendum in 1970, The Gambia became a republic within the Common Wealth. Today, The Gambia is a multiparty Republic. Under the 1997 constitution, which took effect in 1996, the President is the chief of state and the head of government and is elected through a simple majority vote to a five-year term with no term limits.

A unicameral National Assembly holds legislative powers. The National Assembly is composed of 58 members of which 53 are directly elected in a simple majority vote to represent a single–seat constituency. The other five members are appointed by the president to represent the various groups such as women, youth etc. Members of the National Assembly serve for 5 years.

4.3.1. Local Government –Post-Independence

In the Republic of The Gambia, Attempts at providing a constitutional basis for the formulation of decentralization and devolution of authority to local government began in the mid-1980s (1986) to the early 1990s (Munawwar Alam, 2008, p. 50). However, despite the establishment of a decentralization process in The Gambia in the mid-1990s, which coincided with the second republic, local governance in the country has been characterized by high centralization in terms of state-municipal relations and little grassroots participation from a municipal–electorate relation with little regard for accountability and transparency- fundamental principles upon which effective governance hinges on.

Governance and administration in the Gambia appear to have elements of both centralized and decentralized control of power. Urban governance in The Gambia has been characterized by authoritarianism in the form of top-down state intervention, centralization of planning authorities and the provision of urban services such as pipe-borne water and electricity supply. Urban planning function and land-use planning are centralized state functions on the DPPH while utility provisions are provided through the National Water and Electricity Company, a state cooperation. This deprives municipalities of the authority over planning decisions.

4.3.2. Structure and Functions of Local Governments

A three-tier system of multi-governance system of decentralisation characterised by a unitary state, area or municipal council and ward level prevails in The Gambia, just as in many African systems of local government such as in Senegal, Tanzania and South Africa (Pauleit et al., 2015). The area or municipal councils are constituted by

elected representatives and subdivided into wards. Each ward is represented in the council (municipal or area council) by an elected ward councillor. Furthermore, for governance purposes, an executive officer is appointed by the Local Government Service Commission to each municipality or area council and is responsible for overseeing the daily operation of the council and all heads of departments are answerable to him or her. Currently, The Gambia is divided into eight (8) local government areas, each of which has established a council. Kanifing Area and the City of Banjul are designated municipalities, headed by a mayor or mayoress while the provinces are defined as area councils headed by chairpersons.

Besides these levels of decentralization, there are regional governors, appointed as representatives of the state in each of the regions. In theory, these are senior civil servants under whose supervision state services are coordinated as they work with ministerial line departments. As a result of their control of the distribution of state resources at the local level, they play an important role in the provision of relief services. Additionally, they enforce the implementation of national laws in the local government areas. However, in The Gambia, there has been the tendency of the national government to channel development initiatives for political gains through governors by bypassing mayors and or stifle municipal development initiatives as highlighted in the subsection on the challenges faced by local government on page 54.

The Technical Advisory Committees (TACs) and the Multi-Disciplinary Facilitation Teams (MDFTs) represent communities (either ward or vıllage level) in dealing with central government officials. The TACs and the MDFTs work under the Governor's office and are composed of members of the community who have knowledge of a subject matter or have an understanding of the community or influential members of the community. Thus, the composition of these community representatives comprises individuals with different backgrounds such as health, education, environment etc. or individuals with traditional functions within the community such as an alkali. With regards to climate change, institutions that deal with climate-related issues at the community level work with the TACs and the MDFTs or the ward and village development committees, WDC and VDC respectively as illustrated in **Figure 10** below.

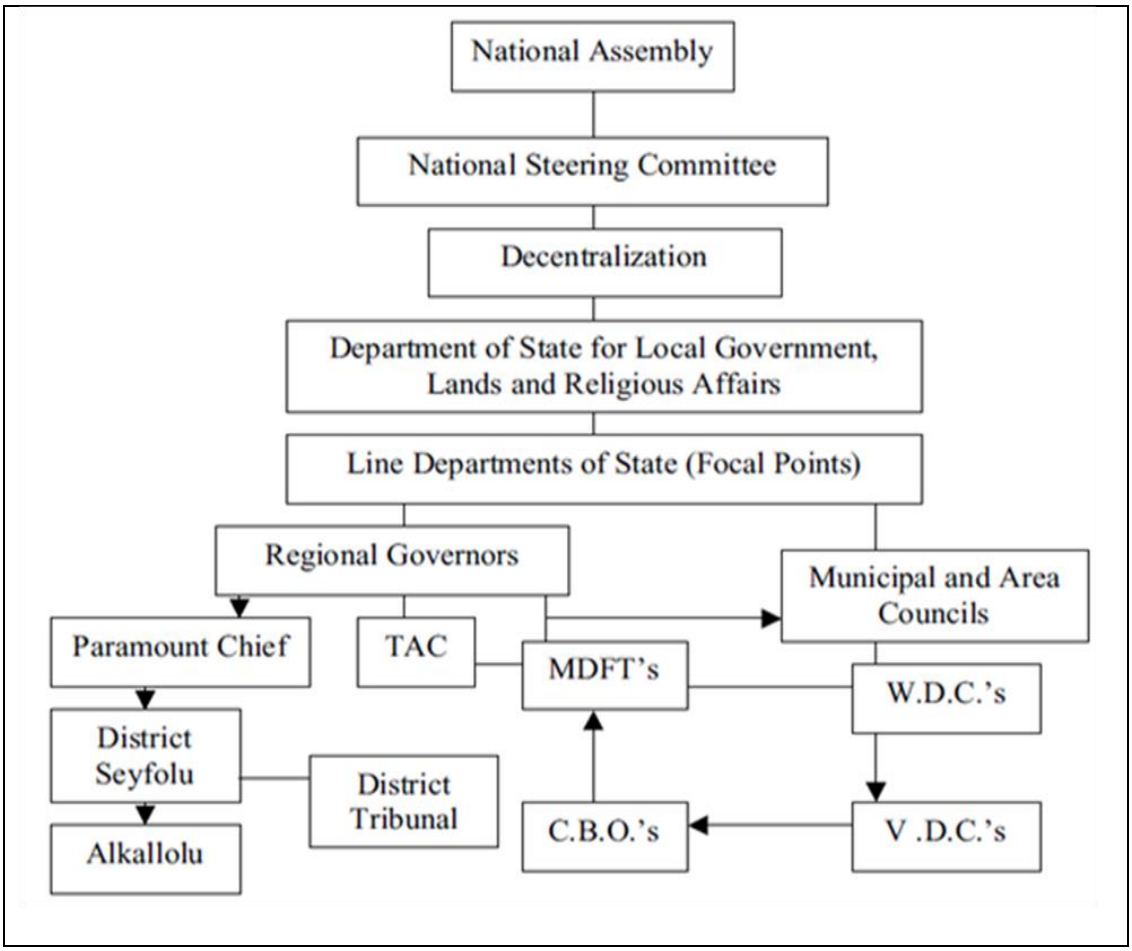

Figure 10. *Structure of local governance system in The Gambia*

Note. The chart shows the structure of the local government system in The Gambia. From "Decentralisation in The Gambia: *Report of a High-level Workshop on 'Managing Change in Local Governance*'" (P. 56), by M. Alam, 2008, Commonwealth Secretariat.

It has been a highly believed notion amongst UPE that local communities possess a better understanding of arising climate issues and the prevailing socio-economic conditions within their communities (as discussed in the framework section). Thus, bridging the administrative gap between the state and local communities via local governments could facilitate risk identification and enhance swift responses to climate risks. However, there are impediments to these. Key among which is the lack of administrative autonomy of local governments; financial constraints; shortage of technical human resource capacity; and challenges of integrating local government policies into national policies. Where these constraints do not exist, local governments face restrictions on the freedom to "innovate and to seek solutions to

the… including climate change, is limited by the competence or incompetence at another level" (Pauleit et al., 2015, p. 160). Engaging local authorities in climate change adaptation is thought to have the ability to support and strengthen local adaptation capacities. However, the key question that must be raised is: how can local governments integrate national climate change adaptation strategies that are compatible with local development needs under a centralized climate governance regime and given the financial constraints (see challenges faced by local governments below) that local government authorities are grappling with?

In many countries, the roles of urban governments in enhancing urban climate adaptation and resilience have been given due consideration. Countries like Australia and the Netherlands (Arwin van Buuren, 2015) and some cities such as the City of Baltimore (Hughes et al., 2018) have adopted regional, city-scale adaptation policies despite countrywide-national adaptation policies. Under such regimes, the city/ regional level governments have the freedom to address adaptation needs that are place-specific while contributing to the overall national climate change adaptation endeavours. However, in The Gambia, as in many African countries, where local authorities have the authority to plan and implement climate change adaptation initiatives, they become constrained by technical capacity and financial resources to pursue such plans. In fact Sanni et al. (2019), claim that there has been no West African country that has "specific urban climate change adaptation policies" (2019, pp. 1965–1966). Thus, climate change policy documents rarely address city-scale adaptation initiatives. Elsewhere, Williams et al. (2022), have also identified a similar phenomenon in Turkey, where "only ten out of thirty metropolitan municipalities had climate action plans" (p. 479).

4.3.3. Challenges Faced by Local Government in The Gambia

Despite decentralization and devolution attempts by the central government, numerous challenges hinder the effective and efficient service delivery of area councils/municipal councils. Principal among the numerous challenges is the lack of complete independence of the council over decision-making, essentially when

working in tandem with the central government in providing developed services where the authority to approve decisions and oversee implementation is held by the central government. This bureaucratic bottleneck impedes the efficiency of councils as they cannot implement or provide development services without prior approval from the central government. This becomes even more of an obstacle when the council and central government are headed by opposing political parties or have differing perspectives where the central government can utilize its oversight authority to stifle developmental programs and consequently political aspirations of mayors and chairpersons from opposing political parties. For example, the KMC, led by an opposition party laments the challenges it faces in the dispensation of its projects and grants from international partners. A key respondent from the Municipality stated that the municipality received a grant to finance the Kanifing Environmental Transformational Programme; the implementation of a component of the programme required the municipality to build recreational parks within the municipality and a community radio station. However, because the municipality does not possess reserve land, despite its powers under the local government act to acquire and appropriate land, the Ministry of Land and Local Government rejected its application to acquire land from the state reserve land. Similarly, the authorities denied applications for the operational license for the community radio station, which has already been built and equipped. Given that less than 2% of land in the Greater Banjul area is designated as public space with, no public recreational parks built either by the state or by municipalities, granting land acquisition or appropriation rights to the municipality for such a project could yield political credit for the incumbent mayor of the municipality. Fears that the political party of the mayor could use such a project have allegedly been the cause of the central government's reluctance to cooperate with the municipality, as it would have shown success on the part of the municipality in responding to demand and public outcry for public spaces which central government have failed to fulfil.

Furthermore, the central government denied operational rights for the community radio station, which should have been used for sensitization of the community on programmes managed by the municipality and as a platform for emergency outreach and accountability, allegedly because the opposition party could use it as a political

communication mouthpiece. Thus, the limited ability of local government authorities to independently make and approve decisions without central government oversight poses challenges to the authorities. The laws from which local governments derive their powers are structured such that the central government monitors, approves or works directly as the case may be through related ministries and departments with local government authorities.

Financial challenges are another major challenge that impedes local government authorities in exercising their mandates of service provision. The core revenue streams of councils/municipalities in The Gambia are too small as councils rely on property tax rates, grants and subventions from the government. These are further compounded by 1) an ineffective tax collection system, 2) financial malpractices by tax collectors[1] and, 3) the lack of transparency of government grants and subventions, as have been inadequately reported publicly.

The actions of the municipality of collecting taxes from the informal settlements and neglecting them, contradict the 'benefit model' of local government finance which advocates that wherever possible, the beneficiary of a given service should be those that pay for it (Hughes et al., 2018, p. 284). These are also against the prioritarians view of justice that the adaptation needs of the most vulnerable should be prioritized (see page 172). Sales tax and property tax generated from Ebo Town - New Jeswang constituency contribute to a modest share of the municipal revenue, yet it marginally benefits from municipal service and infrastructure provision- especially the swampy areas. This constitutes distributive since municipal fiscal resources are not proportionately or fairly redistributed amongst its communities. Non-provision of service and infrastructure resulting from the unjust redistribution of local fiscal resources has implications for reducing vulnerability and weakening local adaptation. Caught between an increasing demand for services and huge financial constraints, local governments become ineffective and inefficient in addressing local needs.

[1] In January 2023, the government of the Gambia established the Local Government Commission of Inquiry to independently review the administrative and financial operations of councils from May 2018 to January 2023. The ongoing inquiry has already unearthed numerous financial malpractices ranging from procurement malpractices, Undue processes in bidding, tendering and awarding of contracts, budgetary irregularities, illegal appropriation of taxes, rates and license fees by tax collector, market masters and other staff to nepotism.

Excessive centralization of power by either boycotting /bypassing municipal authorities and the interventionist nature of ministries and their line departments prevent municipalities from executing their mandates and accessing essential resources (Pauleit et al., 2015, p. 291). In addition, it restricts their powers in enforcing urban planning laws. For example, in the Gambia, Unlike in many Western countries and even within the sub-region, where local governments have a planning and regulatory function, in The Gambia, these functions of local governments only exist in theory or where they exist, are very narrow, trivial or disjointed. Development control and town planning which are generally under the domain of local government (subject to state planning provisions and guidelines) for instance are centralized functions despite the existence of a planning and development control department in all the councils. Planning and development control authority does not lie within the municipalities. The Alkalis and the Department of Physical Planning and Housing, Ministry of Lands, Regional Government and Religious Affairs perform Land acquisition, land use transfer and building control that are significant in planning and development control respectively. As customary land ownership is the dominant form of land tenure system and the fact that the State Land Act puts control of land within the Greater Banjul Area under the central government, councils' role in both land regulation and subsequently in development control has become redundant. Councils only work with the Alkali on transfer of ownership documentation and collection of rates from the properties. The authority to clear land for purchase, clearance of occupancy rights and the issuance of building permits are held by the Department of Physical Planning and Housing.

The challenges in the different layers of governance have been succulently described by Ben Wisner et al. as: "The complexity and overlap of this administrative and governance system leads to delays, inefficiency and also invites informal shortcuts in access to state resources and permits" (Pauleit et al., 2015, p. 184). Such shortcuts have been observed in The Gambia in the form of settlements being built on unapproved areas (illegal settlements) and buildings without documented (official) permits.

Although local governments are the closest tier of government to the electorates, ensuring that they are autonomous and efficient in carrying out their functions of service delivery remains a major challenge. The constellation of these challenges further compounds climate change adaptation, mitigation and response mechanisms to climate-related risks; because of ambiguities or lack of clear definition of roles and responsibilities between central government agencies and local government authorities. This has been emphasised for African cities by the IPCC as follows:

> Weak local government creates and exacerbates problems including the lack of appropriate regulatory structures and mandates; poor or no planning; lack of or poor data; lack of disaster risk reduction strategies; poor servicing and infrastructure (particularly waste management and drainage); uncontrolled settlement of high-risk areas such as flood-plains, wetlands, and coastlines; ecosystem degradation; competing development priorities and timelines; and a lack of coordination among government agencies (IPCC WG II, 2014, Chapter 22,28)

To conclude, local governments as the closest tier of governance can assist in the identification of perceived and actual climate threats and thus respond effectively to adaptation plans and programmes due to their proximity to the point of implementation when compared to central government. However, local and central state interaction either collaborative/supplementarity or coercive and over-regulation could affect local adaptation initiatives that build resilience, reduce vulnerability and avert or mitigate hazard impacts. Additionally, the values; decisions; perspectives; knowledge; and financial resources of agents and their institutions (micro and macro levels) as discussed on page 23, could be a major determinant of effective adaptation. Conversely, it could also act as a barrier or as a determinant of whether any form of technical-institutional adaptation initiative will be initiated in the first place. Inadequate spatial policies and the inability of the local government to execute its planning function because of excessive centralisation along with the existence of informal land control through the Alkalis for example has resulted in irreversible encroachment on vital ecosystems which further increases climate-induced risks. With regards to justice, the failure of both central and local government authorities to recognize and officially declare some settlements as informal has implications on justice since these areas have been the most vulnerable to the impacts of climate

change. However, they are the least prioritized areas for both national development and climate adaptation initiatives. Another justice issue that has emerged is the contradiction of the “benefit mode” of local governance finance and the core principle of distributive justice. This is because the inhabitants of the unrecognised informal settlements pay taxes but have relatively been marginalized from the provision of critical urban services, which can reduce their vulnerability to the impacts of climate change.

CHAPTER 5

URBANISATION, CLIMATE CHANGE POLICY AND GOVERNANCE IN THE GAMBIA

5.1. Introduction

This chapter examines urban informality and its causes; how Urbanisation unfolds in the country; outlines climate change governance; and provides an overview of key climate and environmental policies in The Gambia. It identifies coordination and policy gaps between institutions and fragmentation of spatial policies and climate and environmental policies and thus argues that in the absence of integrated and streamlined spatial and climate policies, exposure and vulnerability to climate risk will increase as more people encroach on flood-risk areas, which typically fall under ecologically protected areas. Furthermore, climate policies that do not address current climate hazards within vulnerable communities will be unsuccessful in building local resilience regardless of how ambitious they might be in addressing global warming through mitigation activities.

5.2. Informality: The Gambia Context

Urban informality in Africa is rapidly growing. In Sub-Saharan Africa, it is estimated that about 60 per cent of the population of urban areas live in informal settlements and a similar proportion of the population meets their basic needs through the informal sector. In The Gambia, there are no official data on the number of informal settlers. What are the factors responsible for the growth of informal settlements in The Gambia? The existence of an increased urban population or rapid rural-urban migration and inadequate urban planning puts pressure on the urban housing supply.

This creates a housing shortage in the market and therefore, residents who cannot meet their housing needs within the market mechanism resort to alternative forms of housing- usually informal housing. The causes and the rise in informality could be attributed to the following issues:

- Liberalization of the Housing Market

Liberal economic policies adopted in the early 1980s created a precondition for the proliferation of informal settlements in Sub-Saharan Africa. The structural adjustment programmes by the World Bank and other institutions campaigned for the privatization of services and the rolling back of the state. From an urban development and housing perspective, neoliberal urbanism focuses on the creation and extraction of value from the built environment and urban development by the private sector (Weber, 2002) and the financialization of the city (Okyere & Kita, 2015) became policies of the day. The introduction of these policies in SSA corresponded with the early stage of nation building in many countries within the region. Thus, the rolling back of the state, the downsizing of state employees and the slow rate of private sector investment hindered investment in urban development, decreased wages and earnings and therefore, decreased consumption. It resulted in the existence of, at the micro level a huge gap between housing needs and housing supply and the macro level, under-investment in critical urban infrastructure. The authors also observed that the private real estate sector supported by the above-mentioned policies, created an over-production of housing for the middle class and under-production for the low- and middle-income earners (Okyere & Kita, 2015, p. 133). Urban dwellers who could not afford to get access to housing through the market sought alternatives in the informal sector a process which Alsayyad (2004) refers to as a "quiet process of land encroachment".

- Colonial Wreath

Colonialism has left its mark on settlement patterns in many African cities and has played a crucial role in the growth of informal settlements in the continent through the negligence of colonies, the deceleration of innovation of the indigenous planning

knowledge and the continuing dependence on colonial planning legislation and policies even after post- colonialism. Njoh (2008), argues that the residential segregation policies catered for the planning needs of the European settlements while neglecting the needs of the native population. This is further elaborated in what is termed as a 'dual structure' or double mandate system of colonial township planning, under which, Home (2015) argues that the system created enclaves of townships beyond the boundaries of which lies reserves of land in which natives working or seeking employment in the townships preferred to live. From this he claims, developed the 'septic fringe of unplanned peri-urban settlements', which proliferated into slums and or informal settlements (Home, 2015). Furthermore, many post-colonial planning agencies still use colonial planning legislation with little revision and without consideration for their applicability to the local context. Thus, (Okyere & Kita, 2015) observes that the lack of adequate planning, strategy and policies as a result of the dependence on post-colonial, European policies and the failure of the locals to be innovative has created and exacerbated the existing socio-spatial problems such as informal settlements in many urban areas in SSA.

- Poverty

Poverty is another factor that contributes to the high rate of informal settlements in Sub-Saharan Africa. Many countries in Sub-Saharan Africa have a high percentage of housing deficit. Thus, the high demand for housing by the middle- and higher-income groups drive housing prices beyond the affordable capacity of the lower-income group who resort to the cheapest possible alternative means of housing or land ownership available. The available plots or housing units are usually on the fringes of the cities outside planned residential areas. These areas become permanent and expand into informal settlements. However, despite the evidence that poverty in many developing countries contributes to informality, some researchers are critical of such a position. For instance, (Roy, 2005) warns that such an explanation of the rise in informality is over simplistic and misleading. There are varieties of actors, either state or non-state, formal or informal that benefit from urban informality. Thus, the process of informality cannot be entirely reduced to the actions of the urban poor. De Soto (2000), also argues that the role of the poor in the establishment

of informal settlement is an antecedent of the inefficiency and lack of capacity of governments.

5.2.1. Urbanisation Process in The Gambia

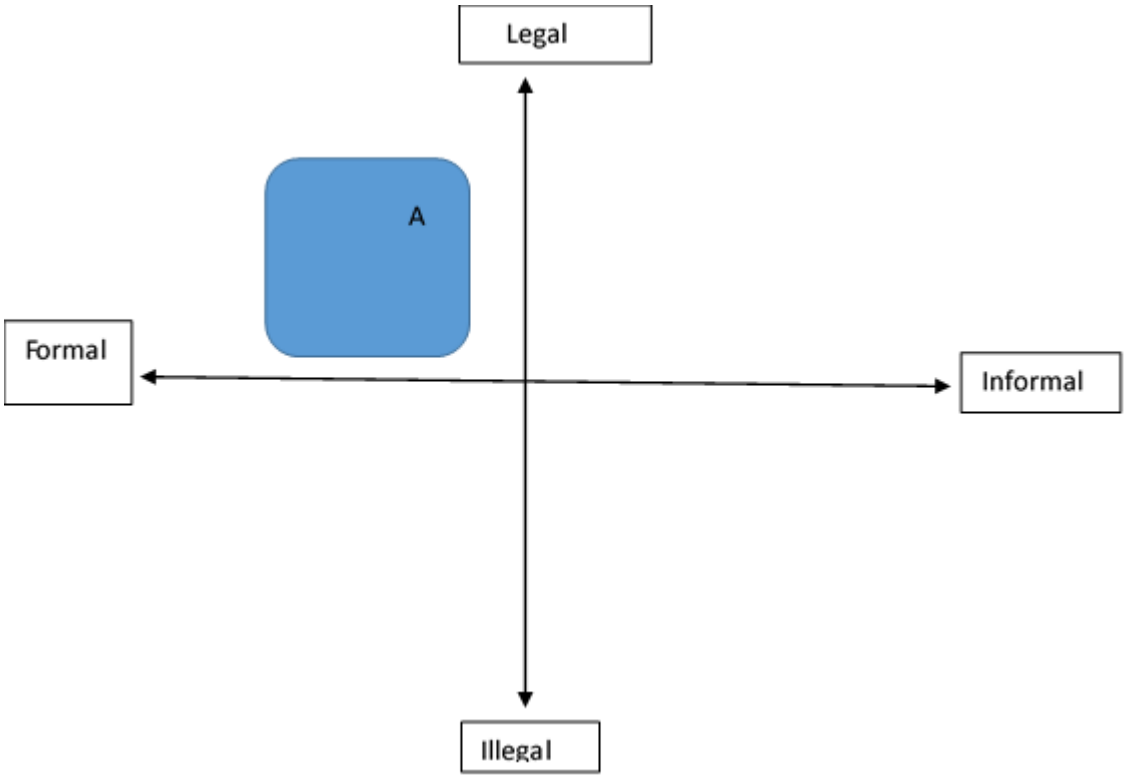

Figure 11. The Dichotomy of Formality vs Informality

The term ‘informal settlement' is less pejorative than the term slums or illegal settlements (Dodman et al., 2019). Informal settlements are defined based on contraventions (i.e. breach) of specific laws, rules and regulations. Such laws, rules and regulations are generally based on guidelines set forth by planning authorities. These defining characteristics include land occupation, location of the land i.e. whether the land is located in a designated residential area or not, contravention of official building permission, site layouts etc. For example, a settlement that is built on land which is designated as an ecological site or agricultural land without appropriate land use transfer regulation could be considered informal even if it had fulfilled all other conditions. As illustrated in Figure 11 above, the definition of informal settlements could refer to any form of settlement or housing unit outside the

‘formal’ structure. Definitions of informal settlements are based on the contravention of specific laws, rules, and regulations while that of slums are usually based on measures of housing quality, service provision and overcrowding.

However, employing such a simplistic approach to defining informality poses questions of differentiation between formality and informality. Thus, the more one ventures into such a differentiation, the more one realises that the condition for the existence of informality is laid by the existence of formality- for the latter defines itself and in the process of defining itself, defines the former. The prevalence of informality in a settlement will raise doubts about the ability of the formal sector to absorb or transform its features to include the informal or raise doubts about the legitimacy of the rules and regulations that govern formality thus, the two are interdependent.

The Gambia, urban population has grown steadily from 1960 through 1970. While in 1960 only 12% of the total population lived in urban areas, it doubled in 1975. By the 1980's the urban population began to grow sharply, thus the mid-'80s marked the period of rapid urbanisation in the country. According to the 2003 population census, the national population stood at 1.3 million. By the turn of the twentieth century, 50% of the population was urbanised. About 53% of the urbanised population lived in Banjul and Kanifing Municipalities while 34% lived in Brikama Local Government Area. These three administrative areas account for 87% of the urban population while constituting approximately 17.3% of the country’s land mass, with the remaining 13% spread unevenly across five administrative areas. According to the 2013 population census, 57.8% of the 1.8 million of the national population was urbanised and in 2018 it stood at 61.3%, putting the country as one of the fastest urbanising countries in Africa with an estimated growth rate of 3.1% (Gambia Bureau of Statistics, 2013b).

The rapid increase in the number of urban dwellers in the country has created certain socio-economic effects including a deficit in the demand for formal and affordable housing. Concrete action from the government towards this issue began to receive policy attention in 1984 when the state acknowledged that the high urbanisation

trend in the Greater Banjul Area (GBA) was spiralling out of control. A cabinet minute in 1984 succulently summarised this urgency as:

> The Greater Banjul Area is our major pressure region … the growth in population through natural increase and immigration into the area has resulted in a spate of unauthorized development … it also demands not only the provision of services in space but also shelter especially for the urban poor (McGrath, 1989, p. 326)

By 1986, the final draft of The Greater Banjul Area Development Plan was completed. However, the majority of the task of the physical planning department was plot layouts, purveyance and land allocation with little or no planning for the socio-economic (job creation, services provision and urban infrastructure) prospects of the immigrants moving into the area. Thus, the population began to grow faster than the planned area could adequately accommodate and provide service. An analysis of the policies of the planning department indicates that formal urbanisation generally involves the identification of state layouts, allocation of land within these layouts, issuance of building permits, construction of main roads or feeder roads in collaboration with the Department of Works and the Housing Finance Corporation unit of the Social Security and Housing Finance Corporation. Among the layouts that had been established during the early stages of rapid urbanisation, include the Kanifing layout and the Bakoteh layout. It is important to note that, state established layouts were beside the planning aspect, only empty plots of land, the development of which was the responsibility of the plot owners usually employees from both the state and the private sector who had to meet certain criteria set forth by authorities to benefit from the housing scheme.

The absence of an affordable planning-based mass housing model by the state led to the adoption of a land sale and owner development model by the private sector during the inception of the market-based privatisation of land and housing. Real estate investors took on the same old mantra of buying land and parcelling it out to buyers who, in turn, will finance its development. A few real estate and development investors provide upscale housing and settlement development like Brusubi, which was developed by TAF Africa Global Limited. The increase in the demand for land acquisition through the market can be attributed to:

1. Difficulties in accessing land and the non-existence of state or municipal housing, discussed above.
2. The increase in remittances from Gambians in the diaspora and the desire to own and invest in landed property.
3. Traditionally, there has been a high cultural value attached to land and housing as a form of power, social prestige and security.

This form of formal urbanisation led to a situation of:

1. Poorly developed plots within the layouts along with moderately modest houses existing adjacent to each other since contractors design and build individually financed houses based on affordability.
2. Proliferation of unauthorised (informal) residential development in the catchments of the layouts in the hope of benefiting from services due to the uncontrolled traditional allocation or selling of land by Alkalis.
3. The establishment of new settlement areas spread across the GBA through land grabbing and speculator activities of real estate agencies and property development companies.

A closer look at the institutional arrangements for climate governance in the country shows the use of a multi-level governance framework that entails different tiers of government engaging in the co-production of knowledge and policy amongst different levels of authority: the central authority and the local government. The latter deals with shared resources and concerns across regional jurisdictions while the former's role is geographically restricted to its jurisdiction (Hughes et al., 2018, p. 35). Besides this, there is also the horizontal dimension where both scales of the aforementioned levels of governments have to collaborate with multi and transnational agencies, NGOs and civil society organisations across different climate and environmental policy issues such as funding, collaboration, sharing of best practices etc. In climate change policies multilevel governance provides an easy understanding of the "relationships between cities, regions and national governments across mitigation and adaptation policy issues as well as across a widening range of non-state and non-governmental actors" (OECD, 2010, p. 172). In climate

governance, a multilevel governance framework when successfully implemented provides a governance platform where local knowledge is respected while recognising the role of the central government (Hughes et al., 2018, p. 35).

5.3 Climate Change Policies and Governance in the Gambia

5.3.1 Climate change governance

At the national scale the Ministry of Environment, Climate Change and Natural Resources is the national government institution responsible for climate change planning and governance. As summarized in **Figure 12** below, in addition to the Climate Change Secretariat, numerous layers of governance and policy institutions exist at the national level that are involved in climate change governance and planning. The National Climate Committee, which is a multi-stakeholder committee with members from academia, professionals, farmers etc., provides an advisory and consultative role to the climate change secretariat whereas the National Climate Change Council oversees all climate change institutions, monitors, evaluates policies to ensure effective delivery, and manages the Gambian Climate Change Fund.

At the local scale, the regional administrative bodies (i.e., the municipalities and area councils) are tasked with planning, governance and implementation of climate change policies and programs at the local scale. The municipalities and councils are responsible for promoting climate change mainstreaming and implementation of climate-resilient development activities in conformity with the Local Government Act 2002. The act designates Areas Councils the powers to ‘plan and implement any programs or project for developing the infrastructure, improving social services, developing human and financial resources and for the general upliftment of the community’ (The Government of The Gambia, 2008), (The Gambia - National Disaster Management Act 2008, 2008.). In climate governance, when a multilevel governance framework is successfully implemented, it provides a governance platform where local knowledge is respected while recognising the role of the central government (Hughes et al., 2018, p. 35). However, in The Gambia, The regional and district disaster committees are both obliged to have disaster plans and regional and

district disaster funds. The disaster funds at the local scales, financed through grants and donations are the main source of financing the activities and mandates of the committees. Technical, human resources and financial constraints in formulating and implementing independent climate change mitigation and adaptation policies, strategies and initiatives limit local government authorities and the ward development committees. As a result, local scale authorities usually benefit from the outcomes of mitigation and adaptation decisions in the form of project intervention but have very little influence in setting discourses or shaping decisions (see the section on climate justice).

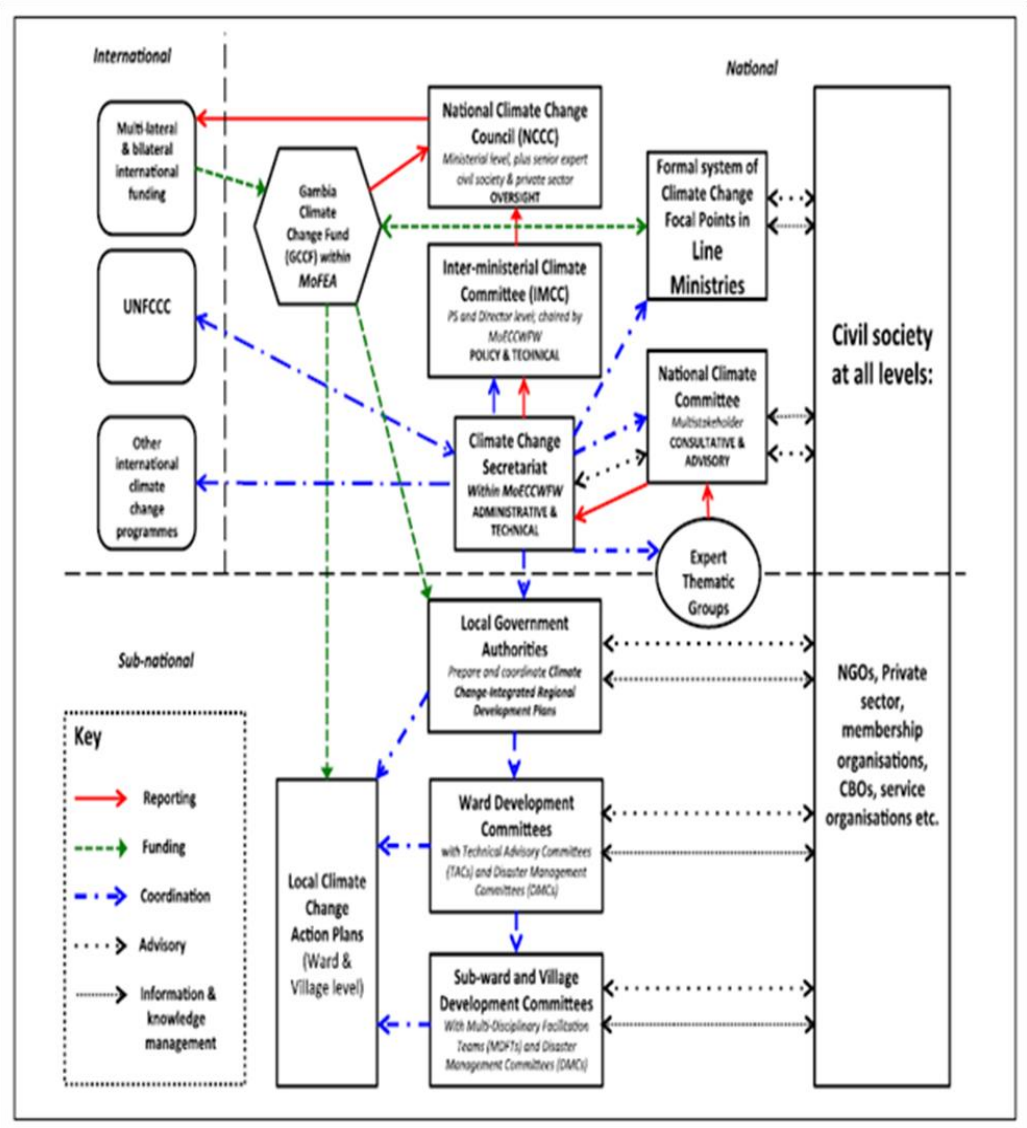

Figure 12. Organogram of Revised Institutional Arrangements

NOTE. The chart shows institutional arrangements for climate change planning. It shows the functions of central government and local government institutions. From

"National Climate Change Policy of The Gambia: Final Report: Final Draft Policy", (p.63), by P. Urquhart, 2016.

At the inter-ministerial level, the absence of concerted efforts between the Department of Water Resources and other ministries poses a huge challenge to national adaptation efforts. As the main technical institution on climate and weather-related information, the works of the department become counterproductive if the data in the form of sectoral departments that are responsible for policy or response to the identified risks do not heed early warning, seasonal rainfall prediction etc. For instance, in 2022, the department released its seasonal and rainfall prediction before the start of the 2022 wet season however, by mid-July the entire country experienced a major climatic disaster after heavy downpours accompanied by severe windstorms wreak havoc across the country. The National Disaster Management Agency had been caught off guard by the severity and magnitude of the disaster, which indicates the lack of or inefficiency of the synergy between the institutions responsible for early warning and those overseeing disaster response.

5.2.2. Overview of Climate Change and Environmental Policies in The Gambia

This section seeks to examine the climate and environmental policies in The Gambia, by providing an overview of important policy milestones. It summarizes key climate policy documents and then examines how responsive they are to emergent risks, vulnerabilities and climate-related disasters that the country is currently grappling with. Thus, it seeks to answer whether The Gambia's climate policies deal with informal settlements and their exposure to vulnerabilities, and if so in what ways or if not, what are the reasons? It will also shed light on key questions asked in the theoretical framework such as how inclusive the policy processes are and whether they have incorporated the views of the vulnerable communities or the values, interests and worldviews of the policy agents and agencies.

Climate change, resilience and adaptation are widely discussed in terms of global warming, heatwave etc. and their effects on food production; however, there is limited discourse both in academia and policy fields on climate change resilience and

adaptation in relation to settlement patterns in many developing countries. The analysis of the Gambia environment and climate change policies below indicates that greater emphasis is placed on mitigation rather than on adaptation. Because of the existence of a centralized administrative system in the country, policies are drafted at the national level and are then passed on to administrative regions or municipalities, formulation of climate change policies at the local level is almost non-existent.

There has been a recognition of the threats climate change poses to the lives and livelihoods of the majority of the population. This recognition is manifested in the frequent occurrence of climate-induced hazards and as a result the proliferation in the formulation of climate policies in the last decade as indicated in the timeline of the country's climate change policies in **Figure 13**.

Despite the recent increase in the formulation of climate policies, the fundamental question that needs to be raised is whether these actions have translated to a significant reduction of the impacts of climate-related hazards and to what extent they built on the resilience of the most vulnerable to climate risks and hazards. For instance, in 2019, the government of The Gambian government in partnership with UNESCO launched a three-year (2019-2021) state-of-the-art flood early warning project to address flood risk vulnerability through the use of drones. The drones also assisted in pre- and post-flooding disaster vulnerability and risk mapping. The respondent from the disaster management office stated that its IT staff were trained on how to operate drones and subsequently received drone items to obtain images of affected households when heavy rains occur. When asked about the impact of the project he noted, "the project has been very helpful because the drones normally capture places that are not easily accessible to our personnel on the field. It has a significant positive impact in terms of getting us images that we can also use to include in our reports to sell to the donors.

However, in 2022, a year after the closure of the project, the country experienced its worst flooding incidents in recent history yet; neither the early warning system nor the use of drones for rapid risk assessment achieved their intended targets. It took several months for the authorities to fully conduct a risk, vulnerability or need

assessment in some communities. Failure of the early warning system to reduce flood impacts and the delay in conducting risk and needs assessment meant that the project failed to reduce the impacts of flooding. Similarly, the state-of-the-art, end-to-end early warning for flood response system that the project agitated for has not been fully implemented. Since the aim of data is the enhance decision-making, the ultimate goal should be the utilisation of the data to supplement the entire disaster management process. In other words, the data should not be an end on its own but rather a means of facilitating meaningful and timely responses. These have been thus lamented by the same respondent while discussing the challenges faced by the NDMA:

> Funding is our challenge and as a result of that, the Agency to be quite honest, is not doing what is expected of it, because to me, I think if a disaster strikes according to the laws within 72 hours you should respond. But if a disaster strikes in July, you don't respond until September or October when the persons affected have already forgotten about the disaster, then you respond. That's not a disaster response.
>
> Sometimes you will have a disaster almost after five months, whereby it's no longer called a disaster, that is the time you will [provide] support to the person [victim]. And even to get that support is not now something you are certain that the government is doing as a mandate. Just look at for example this year all those that are affected in this 2023 rainy season, KMC as we are presently speaking, I have 1113 households affected by flash floods, windstorms and inundation, but out of these, only 80 households have benefited in the WFP LSR response. That's the Lean Season Response. So, if you take away [subtract] 80 from 1113, all the rest are still sitting- did not benefit anything [have not benefited from any government support] and they are still waiting. When are they going to benefit? I don't know. And they are victims of flash floods, windstorm inundation and you name it. [Up until now] none of them has benefited because we have not yet received any relief item from the government. We are still waiting.

Thus, it is necessary to have policies and programs that are complementary. Project components should be implemented in manners that will have impacts on the overall aim of risk reduction or resilient building. For the rise in recent policies to contribute to meaningful reduction of climate-related hazards and ultimately build resilience, policies need to be tied to financial commitments (budgets) for the desired action to be carried out.

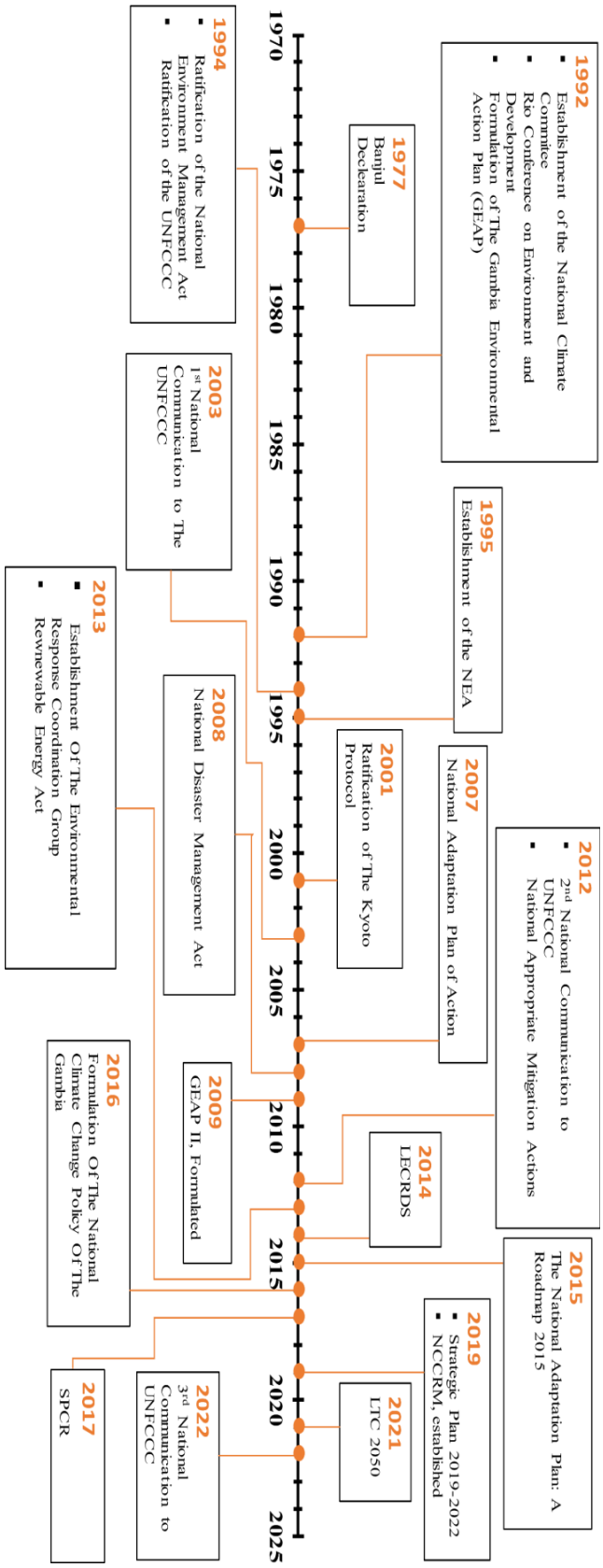

Figure 13. Timeline of key Climate and Environment Legislations and policies in The Gambia

Source: Author's Work

The responses to environmental and climate change challenges include the formulation and implementation of national policies and legislation, the development of action plans, and the ratification of international conventions etc to support national efforts in mitigating the impact of environmental degradation and promoting climate change mitigation and adaptation. These policies and establishment of institutional arrangements as highlighted in the policy timeline above, indicate that there have been some deliberate policies designed purely from a conservational perspective. However, a significant number of policies and established institutions geared towards adaptation have been planned adaptation measures despite the absence of financial commitments for their implementation. Furthermore, referring back to the typology of adaptation initiatives on page 18, some national policies such as the formulation of the Environmental Response Coordination Group, National Climate Change Policy and the Strategic Programme for Climate Resilience have been reactive, designed in response to stimuli. Others have been anticipatory policies that prepare for or aim at averting future risks such as the LTC 2050. Regardless of the types of adaptation policies formulated, there has been an observed increase in the number of policies formulated after 2007 and particularly post-2015- periods marked by an increase in the occurrence of climate hazards as indicated on the graph on Average Yearly Climate-Related Hazards (1980-2022) on page 64. Despite policy initiatives, the critical question is to what extent have these policies effectively responded to eminent climate hazards affecting the most at risk of climate-induced hazards? A detailed description of the major policies is highlighted below with an analysis of how participatory, effective and responsive they are to local climate conditions.

A first step has been the release of the Banjul Declaration in 1977 aimed at curbing the rate at which the Gambia's species and habitats are disappearing. This was followed by the enactment of the Wildlife Conservation Act of 1977, the establishment of the Ministry of Environment in 1981, and the enactment of the National Environment Management Act (NEMA) 1994. The National Environment Agency (NEA) was created under the NEMA Act the lead agency for environment policy formulation and coordination of all environment-related activities (see section

on environmental and climate change governance). The Act also provides for the establishment of the National Environmental Management Council (NEMC), with the President as the chairperson. A 10-year Environmental Action Plan (GEAP), (1992-2001) was developed in 1992 to provide a policy framework for environmental management. The Plan focused on capacity building, institutional strengthening and improving coordination of the different policy and strategy implementation of government institutions, NGOs and the private sector. Although some success was registered, institutional capacity continues to be a challenge. In 2007, efforts to integrate environmental plans into national development plans were initiated. Thus, The Poverty Reduction Strategy Paper (PRSP) II - 2007-2011 aimed at mainstreaming environmental issues at all levels of planning and promoting greater private sector participation in environment and natural resource management. Subsequently, environmental and climate change mitigation and adaptation have been mainstreamed in national development plans: The Program for Accelerated Growth and Employment (PAGE) 2012-2015; The Gambia National Development Plan (NAP) 2018-2021; and Recovery–Focused National Development Plan (RF-NDP) 2023-2027. On a regional scale, the decentralization policy, as spelt out in the Local Government Act 2002, provides for the participation of the local government authorities in the management of environment and natural resources has been factored in the constitution, albeit with poor implementation.

With regard to climate change, vulnerability studies were carried out to determine the likely impacts of climate change. With respect to Ozone ozone-depleting substances (ODS), a National Ozone Office under NEA was established in 1997 and an Ozone Action Programme was developed. In 2000, a national inventory of GHG emissions and mitigation options for emission reduction was conducted. In addition to this, a Low Carbon Development Strategy was also formulated under the PAGE. A National Climate Committee with membership drawn from various stakeholders has also been established to coordinate the implementation of ongoing climate-related interventions in different state institutions. Although the Gambia is a net sink for greenhouse gases, several measures are in place to mitigate air pollution problems, particularly those caused by the transport sector. These measures include the total ban on the importation and selling of leaded petrol in The Gambia.

In the coastal zone, the implementation of coastal protection works has been carried out to halt and or prevent coastal erosion. Soft and hard engineering interventions (beach nourishment, construction of beach groins, revetments) have been employed in affected coastal areas to help recover eroded beaches or prevent further erosion. In addition to this, a Coastal Zone Management Policy and Guidelines have been formulated for the sustainable utilization of the coastal zone and its resources.

At the international level, The Gambia is a signatory to most of the Multilateral Environmental Agreements (MEAs). Different national institutions that act as the focal points ensure coordination and implementation of these agreements. In addition to the ratification of agreements, national action plans have been developed to support the implementation of such areements. Under the UNFCCC, the Gambia prepared its First National Communication in 2003, the second in 2012 and, the third in 2022. Furthermore, in 2012, a plan for Natiagreementsonally Appropriate Mitigation Actions was developed. Similarly, The National Biodiversity Strategy and Action Plan (NBSAP) were developed in 2001 and the National Action Plan (NAP) for the Desertification Convention was completed in 2000. Through the implementation of the MEAs, the number of protected areas has increased.

In cognizant of the sensitivity, vulnerability and frequency of environmental threats that the country is faced with, an Environmental Emergency Management and Response Programme was established under the National Environment Agency. The programme is ‘holistic response-oriented’, with a special focus on preparing for and responding to environmental emergencies including but not limited to spill of harmful and hazardous substances. In addition to these, it has been set up to develop environmental legislation, arrange partnerships with both local and international entities and plan environmental contingencies on matters that threaten public safety.

Just as the above-mentioned programme is designed to manage and respond to environmental emergencies, an Environmental Response Coordination Group was established in 2013 to respond to the impacts of flooding in the country. The group, co-headed by the UNDP Country Office, comprises officials from the MECCNAR and NEA. It has been set up to serve as a disaster focal point for NEA, thus, it

provides periodic assessment of environmental hazards like floods and prepares and maintains a national environmental hazard profile.

5.2.2.1. National Climate Change Policy of The Gambia 2016

The National Climate Change Policy has been developed to guide the country's "transition to a climate-resilient society within a thriving low-emissions economy", by serving as a framework for the management of climate risks, building institutions and capacities, and identifying new opportunities for climate-resilient sustainable development (Urquhart, 2016, p. 6). It is underpinned by the need to look into effective climate change responses that require economic, social and environmental interventions embedded in integrating mitigation and adaptation efforts for national development. The policy identifies four strategic priority thematic areas for policy intervention: climate resilient food systems and landscape; low emission and resilient economy; climate resilient people; and managing coastlines in a changing environment. It also emphasizes the linkages between climate change and disaster risk reduction. From these thematic areas, it can be perceived that policy responses are anchored on a human-centred approach to addressing the impacts of climate change by holistically looking into sectoral areas that have a direct bearing on people. These thematic areas are also integrated across different sectors rather than approaching climate change through a fragmented sectoral approach that simultaneously pursues adaptation and current and long-term mitigation commitments through emission reduction. Considering that, the frequency of climate-related hazards and scale of damages and destruction to properties and loss of lives has been increasing, the respondents from the MCCNAR were asked about the positionality of the government with regard to climate change adaptation and climate change mitigation. The respondents stated that the government "have been pursuing mitigation policies or the implementation of mitigation-based projects with adaptation co-benefits". In other words, despite numerous projects that are involved in mitigating climate change impacts, components of adaptation are often incorporated into such projects. For instance, the Large-Scale Ecosystem-Based Adaptation in the Gambia (EBA Project), through its project components, engages in building climate-resilient natural resources in the country while embarking on the

restoration of forests, woodlands, and mangroves etc. increasing overall carbon net sink- a mitigation initiative.

Strategies for the implementation of the policy have been outlined in the form of recommendations to develop a National Climate Change Response and Action Plan (NCCRAP) or a Low Emissions Climate Resilient Development Strategy (and Action Plan) within one year of the publication of the National Climate Change Policy. These recommendations should serve as a framework for the implementation of the national climate change policy. The NCCRAP is to provide a budgeted operational framework for the implementation of national climate change policy and serve as an investment guide. In addition to this, as part of the process leading to the development of the NCCRAP, the development of a Long-term Climate Change Capacity Development Strategy has been recommended, to fill climate change capacity constraints at the individual, institutional and systemic levels. Furthermore, the National Climate Change Technology Development Transfer Action Plan and National Climate Change Communication and Awareness Campaign have been recommended to keep abreast with and adopt technological development to assist in improving the technological requirement for monitoring and implementing the UNFCCC targets and, sensitize the public on climate change respectively.

Another strategy outlined in the national climate change policy is the use of research on climate change to enhance decision-making. At the national level, responding to local climate change risks and vulnerabilities requires utilization and reliance on data-driven research evidence to inform response mechanisms; make projections; and guide policy directions. In The Gambia, however, limitations in climate data are compounded by the almost non-existence of research manifested in the minuscule research capacities of state institutions- except for the Global Change Research Unit under the National Meteorological and Hydrological Service (NMHS), low nationally funded research on climate and low research culture amongst the population. Recognizing the significance of data through climate change research in both response and policy direction, the national climate change policy proposed the establishment of a National Research Framework on Climate Change to direct, and streamline research efforts and produce science-based knowledge and policies.

The national climate change policy can be credited for the establishment, or transformation and harmonization of the climate change institutional governance arrangements in the country. Except for a few institutions such as the Expert Thematic Groups, the National Vulnerability and Adaptation Team etc. the majority of the existing recent institutions at the national scale have been established as a result of the recommendation of the national climate change policy. For instance, the National Climate Change Council, the Inter-Ministerial Climate Committee, the National Climate Committee and the Climate Change Secretariat have all been established under the recommendations of the national climate change policy to enable the mainstreaming of climate change across different sectors and institutions and server as implementing agencies or organization for the national climate change policy.

In light of these numerous policies and legislations, the question remains whether or to what extent have these policies achieved their goals or are there any other recommendations that have not been carried out? The national climate change policy has certainly played a crucial role in setting up, harmonizing institutional, organizational and governance framework for mainstreaming; planning; coordinating and implementing climate change mitigation, and adaptation processes in the country. For example, through the recommendations of the policy, the national climate change secretariat has been established (see section on climate change governance). Capacity constraints identified in the policy and the policy recommendation have been set up and organized. For instance, through the implementation of the national research framework on climate change, the secretariat has been partnering with stakeholders especially in training and capacity development through its partnership with the University of The Gambia via the WASCAL Program which has been training staff of the central government on climate change. The establishment of the Agro Meteorological Unit and “Strengthening of the Gambia's Climate Change Early Warning System”: a UNDP-GEF Trustee funded project (2015) have been an important milestone achievement of the national climate change policy. These initiatives have been undertaken to provide seasonal updates, support in strengthening the forecasting system and dissemination of forecast information to assist communities in preparing in advance

for extreme weather events. The project has contributed to upgrading and equipping the meteorological service with forecasting technologies, contributed to the capacity development of the institution and helped ease communication barriers between the meteorological unit and stakeholders by sharing daily and seasonal forecasts members of the Gmet[2] group and radio broadcast.

Similarly, the establishment of institutional arrangements and mechanisms has been also recommended at the local level. Specifically, the policy recommends the formulation of a Local Climate Change Action Plan: a proposed community-driven and community-led framework for the integration of local-scale climate change-related issues into regional development plans. Funding for the activities under the Local Climate Action Plans is to be catered for from The Gambia Climate Change Fund through the Local Government Councils, which shall be responsible for mainstreaming national climate change policies and programs into local development plans while factoring local climate change risks and environmental priorities.

Despite the state's endeavour to decentralize planning, monitoring, implementation or harmonizing of climate change strategies and plans at both the macro and micro scales, there has been little progress in establishing these institutional arrangements for two reasons. 1) There has been no reliable and legally binding financial obligation and funding requirements neither in the National Climate Change Policy nor in the Local Government Act. Funding for climate change adaptation and mitigation activities at both scales is dependent on grants, loans etc., which barely suffice to fund national climate, change plans, programs and activities. Thus, the absence of a financial resource allocation commitment from the national budget to fund local climate change action plans thwarts efforts to decentralize climate change mitigation and adaptation processes since area councils are already constrained financially to even fund the provision of "mandated" services as aforementioned in the section on the challenges of local governments. 2) National adaptation and mitigation plans, projects and programs have been generally designed to meet the

[2] The Gmet is a weather and climate information-sharing group that comprises of stakeholders in climate change decision making, disaster response officials and the ministry of agriculture and the department of fisheries and water resources. The aim is to disseminate timely daily forecast, which is in turn shared with the wider members of the stakeholders' communities.

funding criteria of the funding institutions. This has led to the tendencies of tailor-fitting national targets and priorities to pressing global climate change issues, thus obscuring local realities and priorities and shifting attention and actions from local priorities to fundable external activities. The ensuing result is a conflict between the two scales: on the one hand, the national government is driven by a desire to appease funding agencies and on the other hand, the dynamic realities and the pressure to act on local priorities limit local governments. Nonetheless, decentralizing adaptation planning and processes does lead to a bottom-up approach to identifying and monitoring risks by members of the communities rather than being identified by agents or agencies of the state. For example, the establishment of technical advisory committees at regional, ward and sub-ward levels has led to effective and efficient community-driven risk identification in the country. Research findings from the field trip have shown that local-level institutional arrangements can cooperate and collaborate with national institutions and take significant roles in identifying risks that affect their communities. The respondent from the NCCRM recounted that the institution has been employing this bottom-up approach by engaging local-level institutional arrangements in assessing and identifying local climate change and environmental risks. The respondent succinctly describes the process through which this is conducted:

> As a centre [the NCCRM] in conducting risk assessment, we go around the country to meet the governors with their Technical Advisory Committees (TAC) and try to assess the risk in their communities. This is done through sessions, workshops or gatherings where members of the TAC are divided into groups based on our automatic areas and [through these discussions] they will identify the risks they are faced with in their community.

However, these institutional arrangements at the local scale only exist for some sectors such as agriculture, and natural resources etc., there are no such arrangements for climate change at the local level despite the decentralization of climate change planning processes being a key priority area for the NCCP.

5.2.2.2. The National Adaptation Plan: A Roadmap 2015

The national adaptation plan was first developed in 2007 however; the state began the process of updating it in 2015. The development of the NAP ahead of other

policy documents has shown that at the onset, the country identified the significance of enhancing the country's adaptive capacity to climate change. The updated plan road map had been funded by the UNDP to initially cover a two-year implementation period to address cross-sectoral capacity and capability gaps in adaptation planning and policy processes in the country. A key goal of the NAP was to bring an end to the project-based adaptation interventions and to shift to a more coordinated, integrated and coherent approach for effective and efficient adaptation to the effects of climate change. The implementation processes of the NAP were intended to provide a costed strategy for climate change adaptation in the country.

Despite efforts to harmonize and integrate climate change adaptation planning and processes across sectors - an issue particularly emphasized in the NCCP, there still exist remnants of the prevailing sectoral-based adaptation planning, even years after the coming into effect of the NCCP. For example, in 2018, the NAP-Ag (integrating agriculture in national adaptation plans) was launched to support adaptation activities in the agricultural sector. Separate adaptation plans have been developed for the forestry and fisheries sectors.

At project levels, there has been an emphasis on a sectoral-based climate change adaptation approach to both project funding and implementation, rather than an integration of a cross-sectoral approach. There has been an integration of other sectors in climate adaptation projects, however, these usually take the form of "strengthening economic activities, opportunities" or gender "gender mainstreaming". The point raised here is in no doubt questioning the significance of these sectors, but it is rather an attempt to highlight the undermining (little consideration for) the important role of the built environment- critical urban infrastructure and tapping from the ripple effect it can have on both economic resilience and gender climate-related vulnerabilities.

5.2.2.3. Strategic Program for Climate Resilience - SPCR (2017)

The Strategic Programme for Climate Resilience (SPCR) has been developed as the implementation strategy of the NCCP and to enable the future implementation of the

long-term vision of climate resilience development. The SPRC is a comprehensive and integrated framework for adaptation planning. It has been designed to serve as a guide for adaptation planning and investment pending the development of the NAP.

In the SPRC, the following pillars or priority investment programmes have been identified to address the key challenges: “incomplete and or outdated institutional and policy environment for building climate resilience in the country; obsolete land use planning, and inadequate mapping and information systems to support national and coastal climate resilient land use planning and management; lack of climate resilient infrastructure, sanitation and solid waste management; and, multiple challenges to resilience in the rural areas, with interlinkages to urban vulnerability”(MECCNAR, 2017, pp. Xxiv–Xv). Thus with concern to this study, the proposed investment programmes of the SPRC centre on the development of climate-resilient land use planning, are discussed below.

Pillar two of the SPCR aims to develop a national land use policy and a new land policy that is extensive in scope and incorporates climate change projections and vulnerabilities in the country. It specifically focuses on addressing the resilience of coastal zones and relocation of government functions that are housed in Banjul due, largely in part to its vulnerability to the impacts of sea-level rise as indicated in feature projections. However, all its seven components are centred on theoretical exercises such as establishing a central information management system, preparing a national land use policy and reviewing and updating policies, plans, maps etc. that are already under the purview of the Department of Physical Planning and or lands and surveys. As these elements fall within the purview of these departments, strengthening capacities followed by the commissioning of the plans, policies and maps from the relevant authorities, whose main mandates are executing these tasks could solve major obstacles in land management and the underlying vulnerabilities it causes. The situation that prompts the inclusion of developing climate-resilient land use mapping, planning and information systems as part of the pillars of the SPCR, unveils the structural problems of donor-funded development trajectory. This is because the reliance on grants and aids tend to neglect sectors that are not predominantly the interest of international funding institutions like urban

regeneration and or urban renewal- predominantly left to the private sector. In The Gambia, the private sector in this regard has not been able to propel or bring about the needed administrative and legal provision required for a desired environment for urban development. Thus, since the development of the national master plan for the GBA in 1985, no significant updates have been done because the project -base work ethos in the central government meant that no (little) funding, grants or technical assistance has been channelled to the above departments rendering them incapacitated and unmotivated to embark on their mandates. The neglect of the departments is a trend that has even transcended into climate change adaptation and mitigation planning. For example, the Department of Community Development, under the same ministry, implements projects on energy efficiency through cooking stove projects to reduce the country's emissions by reducing the use of fuelwood (biomass), whereas the regulatory institutions responsible for the built environment has not been perceived as an important player in national climate change discourse.

Key activities in implementing component 3 of pillar 4 have been identified as rehabilitation of ecosystems bordering the coastal dune and riverine areas through land reclamation (vegetation cover) to serve as a buffer between the coastal zone and communities. However, when **Figure 14** below, taken while on fieldwork, was shown to one of the key respondents during an interview, the respondent was appalled that land encroachment for settlement purposes along the riverine areas has been so extensive that it has contributed to a large amount of loss in natural vegetation cover, such as mangroves. However, the rehabilitation of mangroves in other parts of the country has been the aim of several projects funded through international climate financing institutions. This shows the mismatch between national policy documents designed and prepared by either consultants or officials who, despite their well intentions and desire for coherent and effective national policy, are somewhat out of touch with existing practical realities on the ground. More often than not, policies and legal frameworks are not strictly implemented and enforced resulting in a situation of having internationally acclaimed policy documents that do not translate into concrete actions necessary to bring about societal changes or the rationale of the policies.

Furthermore, in some countries, the formulation of new climate policies is pursued while paying attention to resilience planning in the form of urban regeneration activities that decrease urban sprawl such as mixed-use development and compact neighbourhoods in Singapore (Chia, Li, & Yang, 2017). Others target climate change mitigation in transportation and mobility sector, energy consumption and efficiency, and infrastructure optimization to enhance resource efficiency such a in Kanazawa City in Japan (Balaban & Puppim de Oliveira, 2017). In The Gambia, unlike in these countries, there has been a disregard for mitigation and resilience building specific to the built environment such as urban regeneration. As a result, climate change and environmental policies have been somewhat counterproductive since these policies have been unsuccessful at halting sprawl in vulnerable areas that also provide vital urban ecosystem services.

Figure 14. A Photo of a Piece of Land Bought Along the Riverbanks of Ebo Town

Note. The two men (the property owner squatting down) shown here are deliberating on how to build on a property on cleared mangrove vegetation along the banks of the river. The photo was taken during the fieldwork. Source: Author's Archive

Findings from the fieldwork revealed that there exists a problem of harmonization of planning processes and collaborative implantation of decisions between and amongst different planning institutions respectively and amongst mutually reinforcing sectors

such as the build-environment and the physical environment. Such a disjointed and fragmented planning process in the build-environment especially between spatial planning and environmental planning leads to a sectoral-based approach to solving problems rather than a holistic approach to finding solutions to planning-related problems. The absence of an effective collaboration either in terms of policy making or implementation of spatial and environmental laws and regulations has been observed to result in a situation where, different planning institutions individually address specific urban planning issues without consulting or collaborating with other stakeholders, leaving the problem partially solved. This had been strongly lamented by the key respondent from the DPPH when a question that aimed to gauge the link between spatial planning and environmental laws and regulations that could reduce risk or vulnerability in communities exposed to environmental and climate-related hazards was posed to the respondent. He responded thus:

> When [one] look[s] at the National Environment Policy document, you see [that] it is all about the environment, but you don't see anything about the development [spatial] aspect of it, where physical planning can come in and advise, or maybe take a role; so that detachment [between environmental policies and spatial policies] is there.

Similarly, the respondent further highlighted the lack of effective collaboration between different planning authorities. He stated that the Department of Physical Planning is “mostly” invited in the validation sessions during the development of national environment and climate policy documents “[s]o, [we] just go there as observers” and that “we are not involved in the formulation processes of most of the documents”, acknowledging that there is a stakeholder gap.

This was further illustrated with two examples: In the first case, he contends that, during the 2022 flooding incident, all the institutions involved in the post-disaster response “had been working in isolation” where officials from the Ministry of Environment and NEA addressed environment-related issues only. The second highlighted example involved the construction of an artificial reservoir in Jabang Estate, which is an upscale residential estate owned by the SSHFC. The newly built estate was severely flooded during the above-mentioned flood incident and since it is owned and managed by SSHFC, a state entity, and the fact that the estate is an

upscale neighbourhood, plans were devised to prevent further flooding in the estate. Consequently, SSHFC collaborated with NDMA and the National Roads Authority to build an artificial reservoir in the estate as a flood prevention measure. The National Roads Authority contracted the construction of the reservoir to a private firm however before the completion of the project; residents began claiming that the building of the reservoir had led to flooding in areas that had never experienced flooding. As a result of this, according to the respondent, assistance was sought from the DPPH. He stated that the process was done "without consulting us, but along the way, they got stuck and they wanted us to come in. But how [could] we?" These highlighted issues indicate the challenges in climate policy formulation and implementation processes and adaptation planning in the country. A conclusion can be drawn from this that, most climate-related documents in the country fail to address or partially address spatial issues in general and informal settlements in particular.

5.2.2.4. The Gambia's Long-Term Climate-Neutral Development Strategy 2050

Led by the Ministry of Climate Change and Natural Resources and the Ministry of Finance, The Gambia Government began the formulation process of the Long-Term Climate Neutral Development Strategy of The Gambia in 2021. The LTS has been developed in consideration of two purposes: 1) to serve as an operational framework for the implementation of the country's long-term vision in the form of developing strategies, policies, action plans and programs. The LTS focuses on the main GHG-emitting sectors of the country, which are, Energy, Agriculture, LULUCF, Transport and Waste Management. Thus, the LTV sets out the visions, while the Long-Term Strategy sets out how the priorities of the vision are to be achieved. 2) To fulfil the government's obligation of the Paris Agreement which recommends Parties to formulate and communicate long-term GHG reduction strategies while taking into consideration common responsibilities, capabilities and national conditions (Ministry of Environment, 2022, p. 9). The LTS, as in many national policy and strategy documents, has emphasized its adaptation strategies in some sectors despite clear indications that it seeks to achieve resilience and mitigation through a holistic

approach. It has prioritized and identified adaptation measures in the energy and transport sector, agriculture, livestock, and LULUCF and waste management sector.

The strategic priorities include education (building capacity across government institutions and mainstreaming climate change education in educational curricula), raising awareness of climate change, advocacy and mobilization of resources. Except for mobilizing resources to finance or fund strategies identified in the national climate change documents, these strategies have very little bearing on reducing or at best reversing GHGs more so than realizing a net zero emission target by 2050. These are bold, ambitious targets and well-intend policies, the development of which evokes scepticism and their underlying rationale questionable. For instance, are policy figures in the country embarking on greenwashing campaigns to get international recognition and consequently lure international climate finance to fund national development programs? Or have these documents put forward realistic, impact-driven- actions that are cognizant of eminent national risk, that focus on the principle of "shared but differentiated responsibility and respective capabilities" to achieve set goals that will reduce impacts by building resilience and contribute to global mitigation efforts? Reducing emissions through awareness creation and mainstreaming climate change into education could increase climate awareness among the population, however not having the option to choose between choosing low- emissions energy efficient liquefied natural gas or biomass for cooking, for example, might not yield the desired behavioural change of switching to the later. Similarly, building capacities of climate change institutions could have an impact on developing better policies and even enhance monitoring of GHG levels. However, strengthening monitoring, evaluation and reporting capacities without having any concrete or implementable GHG emission action plans that will deter the use of second-hand cars or incentivise the use of vehicles with cleaner technologies, will not lead to the attainment of net-zero emission.

5.2.2.5. The Strategic Plan for the Ministry of Climate Change 2019-2022

The strategy aimed at restructuring and harmonizing responsibilities of climate change policies, programs and projects. It entrusts oversight and coordination

function of these responsibilities to the Ministry of Climate Change and Natural Resources and allocates other tasks and responsibilities to other institutions such as the Departments of Fisheries, Water Resources, Parks and Wildlife and NEA. The aim was to unify the various fragmented roles and projects related to climate change and natural resources for a coherent policy environment and ensure effective implementation of projects. The strategic plan 2019-2022 recognizes that urbanization, especially unplanned urbanization, especially rapid urbanization can further create exposure to the impact of climate change by stating that:

> ...high population growth rate and increased urbanization in the country are some of the many issues that have significant environmental and natural resources implications. Increased urbanization increases the generation of waste, which is inappropriately disposed of into the environment. Settlements established in crowded urban areas, particularly around the lowlands areas increase the risk of flooding, and present new health threats which pose significant challenges for health planners (MECCNAR, 2019, p. 13).

Although the strategy plan has been crucial in harmonizing climate change policies with the national development plans, it has some shortcomings in effectively unifying the various stakeholder institutions operating in the domain of the climate change environment. Despite attempts at streamlining climate governance institutions climate in the country since 2015, there are still several institutions that have overlapping mandates. For example, several institutions are operating in early warning such as the NCCRM and the Department of Water Resources.

However, none of its strategic objectives has been on addressing the underlying structural challenges such as the formulation of a land policy, necessary to build resilience in “overcrowded low-lying urban areas”. A question on whether climate change policies were aligned to spatial policies was posed and if there were spatial policies that could reduce the impacts of the effects of climate change such as flooding to the key informant from the DDPH. In response, the respondent stated that to reduce exposure to risk of climate impacts, the spatial policies and environmental policies on land use planning should have been dealt with by a national land use policy. “I would say no because that should have been captured in the National Land Policy document because that's the document which integrates all the stakeholders,

their aspect of land issues at the policy level… But The Gambia doesn't have a national land policy document".

To sum up, The Gambia has been commended on the international stage as a country that has contributed and is highly committed to a reduction of GHGs and an increase in its net sink through ambitious climate and environment policies. It has also played an important role in global climate negotiations, notably as the lead negotiator for the LDC Group from 2011 to 2012. However, national policies have been ad-hoc because they are project-driven, disjointed and poorly implemented as acknowledged by one of the key respondents from the DWR: "In The Gambia, we [bureaucrats] are very good at decision making. But when it comes to implementation, there is always a problem". Perhaps, the statement below, as acknowledged in The Gambia Strategic Programme for Climate Resilience (2017, p. Viii) provides a succinct description of the failure of national environment and climate change policies:

> The policy and legislative framework of The Gambia requires significant updating, to fully incorporate and guide responses to current and future climate risks and change. Much relevant sectoral legislation does not reflect the realities of climate change risks; even where legislation refers to "the environment" this tends to be from the perspective of environmental impact assessment, rather than in the broader context of preparing for climate change. There is a lack of policy coherence, with many policies and strategies containing provisions that work against climate resilience; these also cause conflict between portfolios (MECCNAR, 2017, p. viii).

This failure in policy implantation has had enormous consequences for land use, spatial planning and environmental conservation. National policies have also failed in adequately address the effects of climate change on vulnerable communities in informal settlements.

CHAPTER 6

CLIMATE CHANGE VULNERABILITY AND ADAPTATION IN EBO TOWN

6.1. Introduction to the Study Area (Ebo Town)

Kanifing Municipal Council (KMC) is one of the two municipalities together with five other administrative regions that form the local government areas of the country. Population density in Kanifing Municipal Council (KMC) according to 2023 population census data is at a staggering 4,478 people per square kilometre, the highest in the country. With a land surface of 75.5%, it is home to 20.3% of the total population. The high population density in the municipality can be attributed to two factors: rapid migration and ineffective land use planning laws.

The municipality attracts rural-urban migrants because of its proximity (commute distance) to the capital, Banjul. It is also part of the Greater Banjul Area, which is the major commercial hub of the country and home to a large proportion of tertiary educational facilities. Thus, access to economic and educational opportunities has been the major factor for internal migration into the municipality. Externally, it has been a safe haven for refugees seeking refuge from war-torn countries like Guinea Bissau, Liberia, the Casamance region of Senegal and Sierra Leone. As a result, the municipality has a highly heterogeneous population distribution in terms of its socio-cultural and socio-economic composition. The absence of urban migration policies and poorly enforced land laws also led to an increase in the population and density of KMC. Uncontrolled migration increased the demand for land and housing which caused a boom in land speculation within the GBA. However, there were no policies in place to manage or prevent land speculation, although the State Land Act was

established in 1991, which declared all land in GBA as state land, despite its poor enforcement.

The area under study is located in the most populous municipality of the country, the Kanifing Municipal Council (KMC). This is where the major commercial hubs of the country are located, with many of its residents commuting to Banjul, the capital city, to work. The high population has increased the demand for housing in the municipality. Despite the high demand for housing, there are very few, if any, state or municipal housing schemes that specifically aim at providing mass housing for low and middle-class families. Similarly, housing units within the private domain are beyond the purchasing ability of the average citizen. These coupled with the lack of housing finance and loan schemes make access to housing difficult for residents of the municipality. Consequently, plot owners resort to self-financing of houses.

According to the 2013 population census on compounds and building structures, about 44 per cent of structures and compounds at the national level are classified as permanent buildings or structures while 27.8 and 23 per cent are semi-permanent and non-permanent respectively (Gambia Bureau of Statistics, 2013a). Thus, a staggering 50 per cent of the country's building stocks are classified outside the permanent building category. At the municipal level, 84 per cent of the building stock is permanent. However, a more detailed analysis indicates that, while the above figures provide information on the quality of the building stock, it does not provide technical details of the quality of the building stock. The report defined permanent buildings as "a structure with cement walls and a roof made of either corrugated iron sheets, asbestos, tiles or concrete or their combination(Gambia Bureau of Statistics, 2013a, p. iv)". While 84 per cent of the buildings and structures within the municipality comprised the above criteria, they might not all technically be considered permanent buildings or buildings that can withstand hazards such as floods, storms and strong winds.

Basic infrastructure such as drainage and sewage systems are absent, inadequate or in poor conditions in many parts of the municipality. As outlined above, because the majority of the houses are outside the formal housing sector, many houses are not

connected to the sewage system. Open drainage systems are in place in low-lying flood-risk areas, usually next to highways, pedestrians and connecting routes. Considering other sanitary practices, the open drainage systems are potential hotspots for health hazards and vulnerability because the open drainage systems are intentionally used as littering grounds. By virtue of their proximity to commercial and residential areas, garbage on the highways is blown into the open drainage resulting in blockages that lead to overwhelming the system when heavy rains occur.

These combined factors were the cause of the 2005/6 cholera outbreak in Ebo Town as the sewage and drainage systems were overwhelmed by the heavy floods during the period of the outbreak. Thus, in terms of the built environment, demography at the local level and institutional capacity at the national level, the area under study is highly vulnerable to flood as a climate change stimulus. Therefore, the selected area is appropriate to undertake the research.

Ebo Town is located in the northern part of the municipality, bordering Old Jeswang and Talinding neighbourhoods (constituencies) in the north and south-west respectively and the Tanbi Wetland on the east see Figure 15 below for the map of the study area. Ebo Town was a rice swamp used for rice cultivation on the swampy side and oyster collection from mangroves along the shores of the River Gambia. By the 1940s, the area gradually began to be occupied by rice and oyster farmers to save travel time from rice fields to their villages. With the rapid and unplanned urbanization experienced in the country, the area became a recipient of new migrants to the municipality from rural areas who were in search of better economic opportunities. Thus, the area is an informal settlement, however, because of the planning regulations in the country, residents legalise ownership by acquiring title deeds after illegally converting rice fields into residential areas. The Ba'dalla quarter is almost entirely situated on the wetland and the rice fields. Residents filled up the wetland with solid waste materials to convert the land into residential areas. This makes eviction and relocation harder for authorities. The area now has three quarters; Mano'balla, Saataiba and Ba'dalla (riverside). According to the 2003 population census, Ebo Town had 18,363 inhabitants in 2003 however; by 2013, this figure had risen to 22,789 inhabitants (Gambia Bureau of Statistics, 2013).

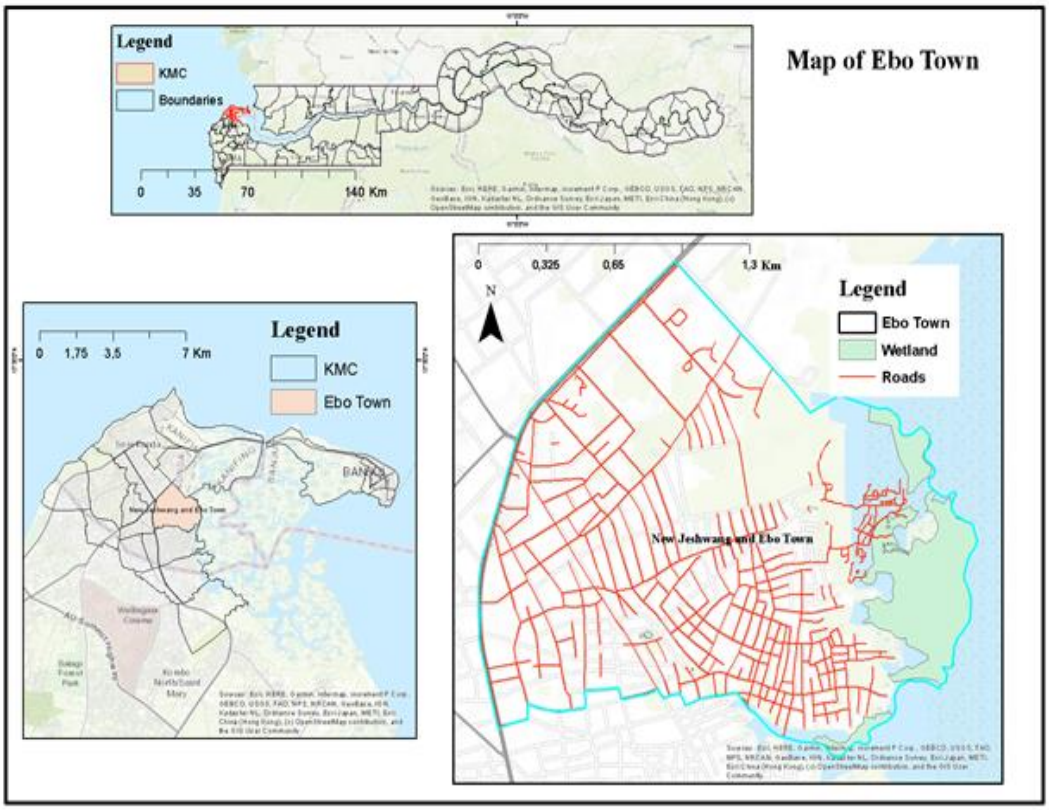

Figure 15. Map of the Study Area

Most of the land within the municipality is located on a narrow stretch lying on the coast of the Atlantic Ocean on the west and the shores of the River Gambia and Tanbi Wetland on the east, with a slightly flat terrain towards both sides of the water bodies. Topographically, Ebo Town slightly rises westerly from the Tanbi wetland towards the Mano'balla quarters with loamy soil, which is dusty and muddy during the dry and rainy seasons respectively. The sloppiness of the topography renders it as a path for the runoff water flowing toward the River Gambia and the muddiness of the soil makes the absorption of the flowing water slower due to its high water retention capacity. These coupled with the construction of houses on the waterways because of urban sprawl and the inadequacy or absence of drainage systems make the settlement vulnerable to flash floods. According to the World Bank, in Sub-Saharan Africa, The Gambia has the highest number of urban population living in areas where elevation is below 5 meters (World Bank, 2020, p. 32). Some projections show that both the coastal areas and the areas along the riverbank are vulnerable to sea level rise (Amuzu et al., 2018). Banjul, which is 1 meter above sea

level, is particularly at risk of sea-level rise. A rise in sea level of above 1 meter will inundate Banjul. The study area is prone to inundation due to flash floods as well as over-flooding of the riverbanks.

High population increases the demand for housing in the municipality. Yet there are very few, if any, state or municipal housing schemes that specifically aim at providing mass housing for low and middle-class families. Similarly, housing units within the private domain are beyond the purchasing ability of the low and middle-income earners. These coupled with the lack of housing finance loans makes access to housing difficult for residents of the municipality. Consequently, plot owners resort to self-financing of houses.

6.2. Climate Change Governance and Planning Structure in KMC

The administrative structure of KMC consists of a municipal council of eighteen ward councillors headed by the Lord Mayor. The ward councillors are elected members of the council; they represent the eighteen wards across the municipality. The wards are further divided into 74 sub-wards that are led by sub-ward chairperson. In addition to the elected ward councillors, there are six nominated councillors nominated by the Lord Mayor. In addition, the council has a Chief Executive Officer (CEO) who is responsible for the daily operations of the council. The CEO is also given an Ex- Officio membership in each of the standing committees. No department within the municipality is specifically assigned with the task of climate change planning; however, there is a Standing Committee for Environment and Sanitation. Its mandates are to design environmental protection and preservation strategies, review environment and sanitation policies and recommend health, safety and security policies to the council.

Although the municipality has the authority, in liaison with corresponding ministries, to initiate, fund and implement projects, however, technical (expertise and machinery and equipment) and financial challenges are recurring impediments to executing its mandate. The Development Unit of the municipality that oversees spatial and urban planning mandates of the municipality is short of experts. Given the multiple

authorities (alkalis, municipalities and department of physical planning) involved in the land governance management, it is a challenge to the municipality to effectively enforce development control and the planning of new settlements. The lack of coordination between these multiple authorities creates conflict in land management. For example, at the national level, the absence of urban and spatial plans, which should dictate settlement patterns, provides ground for the Alkalis to control which areas, usually brown and green fields, are open for development. After an area has been put into the market by the alkalis, the developers apply to the Department of Physical Planning for land use change and once approved, the municipality is left in limbo with regard to its development control.

The municipality does not have a climate change unit nor does it have climate change under its sectoral subunits. Besides the capacity gaps in the municipality, the lack of mainstreaming climate change in its policies poses a challenge to integrating climate change adaptation into spatial planning. Due to these weaknesses of the municipality, the governance and planning authority for climate change resides within the Ministry of Environment and Climate Change and Natural Resources.

6.3. Climate Change Adaptation in Ebo Town: Factors of Vulnerability and Tools for Protection

This section provides an in-depth description of the findings from the case study, presents individual (household) and communal (community) adaptation strategies to climate change employed in the community and provides an account of perceived climate justice issues and how these compound vulnerability and resilience building.

6.3.1. Demographic Composition of Respondents

The case study area is divided into three quarters. However, attempts to proportionately distribute questionnaires within these quarters could not be carried out because of a lack of clear demarcation of the quarters and therefore, most of the respondents could not provide information on residential location according to these divisions. Consequently, the questionnaires were administered in the study area as a

whole. A sample size of 216: 77 males (35.8 per cent) and 138 females (64.2 per cent), each from a single household were interviewed Table 2. Since age is an important determinant of relating risk perception, coping strategies and perceptions of justice and exclusion, the average age of the respondents was 41. The staggering discrepancy between male and female respondents could be because of the following reasons. Firstly, women simultaneously engage in managing households and in other economic activities like petty trading which does not require being away from homes for long periods. Secondly, they showed more interest in participating and therefore were more willingly to take part in the interviews; finally, some potential male respondents claim that since women were more often at home, they were better informed about existing conditions and daily realities, thus were better positioned to provide detail accounts of the household's condition. Because of these factors, in examining community risk and vulnerability to climate hazards, targeting women respondents could provide deeper insight into the existing daily realities of vulnerable communities.

Table 2. Demographic Composition of Respondents

Variable		**F**	**Percentage**
Gender	Male	77	35,8%
	Female	138	64,2%
Age	18-25	41	19,4%
	26-32	29	13,7%
	33-39	41	19,4%
	Above 40	100	47,4%
Marital status	Single	60	29,1%
	Married	146	70,9%
Household size	1-4	3	1,5%
	5-9	57	28,6%
	10-14	57	28,6%
	More than 15	82	41,2%
Occupation	Traders and Vocational workers	99	46,7%
	Housewife	11	5,2%
	Civil Servants	51	24,1%
	Others	51	24,1%

Table 2. (continued)

Average monthly income	Less than 5000	40	47,1%
	5100-10000	31	36,5%
	10100-15000	7	8,2%
	More than 15100	7	8,2%
Homeownership status	Landlord	164	77,4%
	Tenant	37	17,5%
	Other	11	5,2%
Age of structures	Less than 5 years	9	4,4%
	6-10 years	11	5,3%
	11-14 years	0	0,0%
	More than 15 years	186	90,3%

Source: Author's Field Survey

With regards to household size, The Gambia has one of the highest average household sizes in the sub-region- standing at "8.0 person per household" (GBOS, 2024, p. 7). The average household size in the study area, just as the national average, is significantly high with 69 per cent of the respondents having a household size of more than 10 members while less than 3 per cent comprise less than five members. This could contribute to a higher risk factor, particularly during disasters and outbreaks of contagious diseases. In addition, larger families are more likely to suffer the most from losses of property and lives when climate-related disasters occur. However, larger family sizes could help in understanding coping strategies especially in lower- and middle-income countries where the poor rely on "the economy of affection" and social safety nets that are provided through communal membership and kingship rather than state-led welfare support services, described in household-led adaptation strategies.

Despite higher household size amongst the respondents, which in theory, could translate to multiple sources of income, about 84 per cent of respondents reported an average monthly income of less than GMD 10,000 (about US $140 as of October 2024), only 7 per cent reported earnings of more than 15,000 (approximately US$ 213). In general, when considered along with household size, income levels per person per household are significantly lower than the international poverty line of US $ 2.15 per day. However, it is crucial to note that the response rate for monthly

income was very low; only 85 respondents provided figures for monthly earnings. Possible reasons for this are reluctance to share financial information, for security reasons and the fact that most depend on daily earnings rather than monthly earnings. Household's economic conditions are key determinants of vulnerability and coping and adaptation strategies. Since a signıficant proportion of the respondents fall under lower-income groups, access to quality housing and infrastructure that reduces vulnerability is limited. The cost of building a standard three-bedroom house in The Gambia was estimated at US$100,000 in 2016 (Hatfield, 2016). As the data on household income shows and the cost of home property, lower-income households tend to be compelled to reside in urban fringes prone to climate-induced hazards and have shelters and infrastructure that are less resilient or resistant to hazards.

Education is an important tool through which residents of marginalized communities could utilize to articulate their demands to agents and agencies of the state. It could be an important factor in a community's ability to self-mobilize to rally support for a change or resist undesired actions. Discourse on the causes, solutions and understanding of climate change and other social phenomena such as justice and exclusion are highly influenced by levels of education. Forty-three per cent of respondents reported that they have received no formal education and a further 43 per cent have either enrolled in (without completing) or completed basic education and about 12 per cent have completed or are enrolled in tertiary education.

Occupation and income levels are determinant factors in people's choices of location. As highlighted earlier on, initially, traditional rice farmers who farmed along the swampy area and artisanal oyster collectors who utilized the river as a source of livelihood used the settlement as a temporal or seasonal camping area. These farmers and oyster collectors lived in catchment upland areas and chose to camp closer to their sources of livelihood to avoid the locational disadvantage of commuting to and from work. Despite rapid and uncontrolled encroachment, these early settlers or their descendants continue to practice their traditional occupation albeit in smaller numbers. Regarding the respondents' occupation, there is a notable difference between the socioeconomic composition of the residents of Ebo Town and other informal settlements where informal workers are predominant. The heterogeneity of

the community is manifested in the diversity of its residents: an unexpected 24 per cent of the respondents work as civil servants while more than half work in the informal sector, which could be attributed to their level of education as, discussed above. The co-existence of different professions and by extension of different income earners could create justice issues. For example, privileged residents such as civil servants have access to credits and loans that could be used for the provision of better structures, putting lower income earners at an adaptive disadvantage.

In many African countries, the absence of public housing schemes, the absence of private sector-led affordable housing and the restriction of mortgage schemes to public servants and private sector employees leaves many to resort to self-finance of property development for shelter. In addition, cultural factors also impede the development of mass housing in The Gambia where many prefer to live in compounds along with other family members with compounds consisting of different detached low-rise structures. The symbolic significance attached to homeownership (compound style- with exclusive ownership of both the space and built area) affects the development of private sector-led and even state-led mass housing schemes in the form of high-rise apartments or condominiums. Being the smallest country in mainland Africa with a high population density and youthful population, this type of homeownership poses a spatial threat to green and brown spaces due to encroachment on areas with significant ecosystem services that are in low-lying flood-prone areas. There has also been an increase in land-related disputes in the country that is considered a major threat to national security, especially those involving different clans.

Lack of an alternative housing model provided by the municipality (shortly after the fieldwork, the municipality provided 175 plots of land to its staff (Foroyaa, 2024), a practice not only akin to the municipality most public institutions have credit unions that provide relatively cheaper land to its members. This situation has made land acquisition by non-state employees challenging and is one of the factors responsible for the proliferation of informality and the establishment of settlements in highly vulnerable areas.

Respondents have highlighted the factors discussed above as the main reason for choosing to live in Ebo Town. Many stated with a high sense of fulfilment and achievement that, the desire for homeownership was a major reason for choosing to settle in Ebo Town since land was relatively cheaper than in other parts of the GBA- 77 per cent of the respondents were reported to be property owners. Its proximity to the country's commercial hub and Banjul, the capital, is also a major contributing pull factor to the area. Thus, most respondents stated that they settled in the study area because of its proximity to their places of work and the lower cost of rentals. Despite recent buildings along the riverbanks, on average, most of the respondents have been living in the area for more than 22 years. Unlike in many countries where informal settlements developed through illegal occupation, in Ebo Town, there has been some degree of formal procedures in land acquisition. This is because almost all of the respondents claim to possess bills of sales and property transfer documents. Key respondents from public institutions corroborated these. However, the critical question revolves around the legality of the settlement. According to authorities from Physical planning, the area had been designated as a non-residential zone and therefore none of the residents has title deeds, an issue not discussed by the residents. A woman leader in the community disclosed that despite inhabiting the area for more than forty years, applications to lease her property have been declined by the authorities even though they possess a bill of sales and property tax registration and identification numbers issued by the municipality. These pose theoretical challenges to the concept of what constitutes legal settlements and informal settlements.

6.3.2. Risk Perception

Since the research aims to unpack local peoples' understanding of climate change through their account, numerical analysis of risk perceptions has not been prioritized here. To determine the respondent's perception of risk, questions were asked about their perception of changing climate patterns in the area. Accordingly, some respondents stated that the climate has been changing- "it is not static", using changes in the weather as a parameter to gauge changes in the climate. For instance, respondents highlighted that changes in weather conditions and its commencement period have been caused by a changing climate. Another respondent stated, "I

expected temperatures at this time of the year to be lower (December) but it is still warm". This comment was about the beginning of the Harmattan period, which is characterized by relatively lower temperatures with drier and dust-laden winds (indicating that climate changes affect the start and end periods of seasonal weather). The respondents have also recounted changes in rainfall and temperature patterns. There have been reports amongst earlier settlers that rainfall has been increasing recently compared to the past. This could be attributed to the fact that the area began to experience rapid urban sprawl in the 1970s-1980s, a period marked by a decrease in rainfall patterns across the country. Similar observations have been made by the respondents with regards to temperature patterns with many respondents stating that recent temperatures have been hotter than usual.

However, respondents have also observed the occurrence of extreme temperatures as thus: "There have been periods of cold spells recently but in general we have been experiencing extremely hot weather that is unusual". Perceptions of changing climate patterns within the sample population, as shown in their accounts are somehow consistent with climate data. However, there have been varying perceptions on the causes of climate change with some respondents attributing it to an act of God while others attributed it to cutting down of trees and bushfires. Nonetheless, there is a consensus amongst the respondents on the occurrence of climate change despite the variations in their perception of its causes.

A substantial number of the respondents show a high sense of awareness of the eminent risk of climate change that they are confronting every year. In contrast to what is observed Senegal by Schaer 2015 (as cited in Winter & Karvonen, 2022), where residents of the community were unaware of how the community has gradually become vulnerable to climate change over the past 30 years, the resident of Ebo Town provided detail accounts of how it has been affected by flooding including its causes and the drivers of vulnerability. A significant amount of respondents attributes it to urban sprawl, negative locational externality and how these are further compounded by changing rainfall patterns.

6.3.3. Risk Experience and Impacts of Flooding

With Regard to risks and hazards associated with climate change, flooding; windstorms and air pollution have been identified as the three most frequently occurring climate-related risks that have been affecting the community. Flooding was ranked as the most frequently occurring climate-induced risk with a mean score of 4.62; followed by windstorms with a mean score of 3.38; and air pollution: with 3.15, all on a five-point Likert scale (Figure 16 below). Heatwaves have also been regarded as frequently occurring hazards. Because of the community's experience of the damages and destruction, there has been more expressed concern with the risk of flooding and windstorms amongst respondents. In contrast to the frequently occurring climate-related disasters in the country, drought has not been considered a major threat to the community. This could be attributed to the high amount of rainfall recorded in the Western part of the country and the fact that Ebo Town is a non-farming, urbanized community, with few remaining rice cultivators depending on shallow wells and wetlands along the riverine areas.

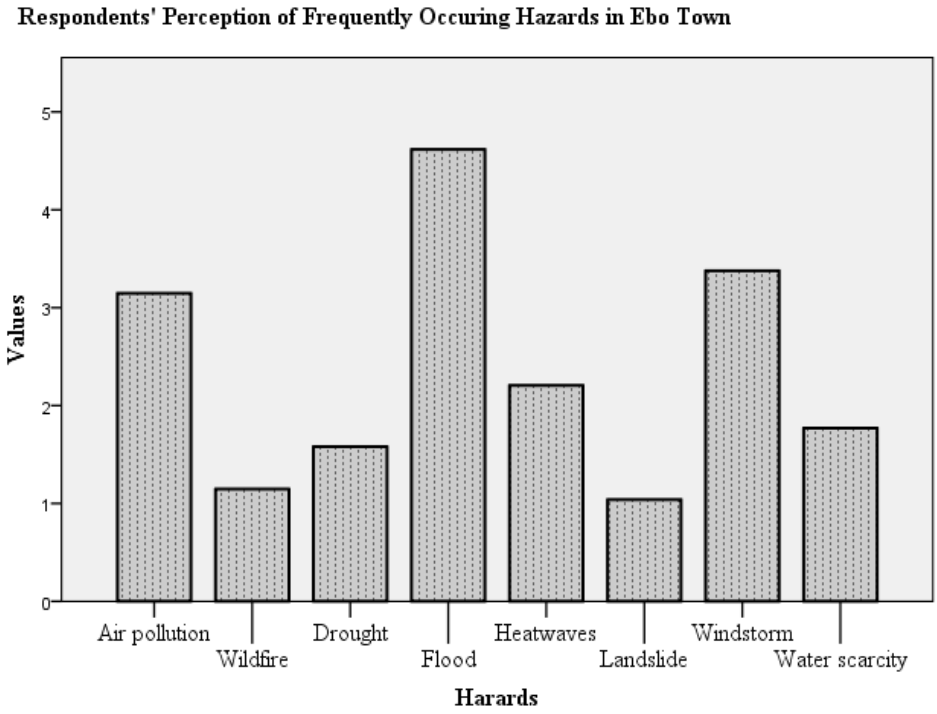

Figure 16. Respondents' Ranking of Hazards in Ebo Town

Source: Author's Field Survey

In addition to drought, climate-related hazards such as landslides and wildfires, which are prevalent within the sub-region, were ranked as non-occurring climate hazards.

Flash floods have been an annually occurring phenomenon in Ebo Town however; their intensity and severity in terms of the scale of destruction have been increasing in the last two decades. To determine the severity of flooding over the years, respondents were asked how severely they have recently been affected by flooding using the scales: severely affected (worse than before), affected but better than before and not affected. Sixty per cent of the respondents stated that they have been severely affected by flooding while 36 per cent have not been severely affected by flooding recently compared to their experience. This indicates that flooding conditions amongst many households and in the community in general have been increasing over the years. This increase could be attributed to the rise in total annual rainfall and frequency of intense rainfall in GBA over the last two decades since the majority of flooding incidents that have occurred in the area took place during this period.

6.3.4. Factors of Vulnerability

Having identified flooding as the most frequent climate-related risk, respondents' perception of the factors of flood vulnerability is highlighted here. Heavy rainfall was perceived to be the highest contributing factor that caused flooding in Ebo Town. Poor drainage facilities and the dumping of waste on drainage systems and gutters then followed this. Unplanned development along flood-risk areas was also considered a major cause of flooding by the respondents. These findings indicate that climatic factors, disenfranchisement of critical urban infrastructure & services and settlement along high-flood risk areas contribute to flood vulnerability. In addition, the eminent risk of unplanned development compounds the natural and socio-environmental risk of flooding. However, topography and low water retention both of which influence flood intensity have been reported to cause flooding in the community even with below average rainfall.

Figure 17. Inadequate Drainage System in Ebo Town
Source: Author's Archive

Given the impacts of flooding within Ebo Town, respondents were asked about the factors that contribute to these impacts. Natural factors (living along the flood risk area), economic factors (household income), and physical factors (absence/ presence of infrastructure and services) were used to examine what respondent believed exacerbated their exposures to the impacts of flooding. Whilst some respondents acknowledged that living along high-risk flood areas contributed to a worsening of flood impacts, approximately 30 per cent of respondents believed that the absence of or poor state of existing infrastructure such as drainage, sewage and paved roads (see Figure 17 above) and services such as waste collection compound the impacts of flooding in the community. Lack of support from the government was also highlighted as a contributing factor to the impacts of flooding. Meanwhile, only 14 per cent of the respondents stated that a household's poor financial condition contributes to flooding impacts. This shows a high feeling of dissatisfaction with the level of support the government provides and marginalization from infrastructure projects. Respondents believe that individual actions will bear little ameliorative effects on the overall impacts of flooding and that structural issue about the infrastructure and services when addressed through state intervention could

immensely contribute to reducing the impacts of flooding. Severe flood conditions have impacts at both household levels and community levels. Amongst the lamented impacts of flooding at the household level includes damages to and loss of property, loss of livelihoods and impact on earnings.

6.3.5. Impacts of flooding

The respondents consider destruction of houses one of the worst impacts of flooding in the community. Houses became partially or destroyed with collapsed walls and roofs blown away by accompanying windstorms during heavy rainfall. Besides this, flooded houses have been said to have caused temporal displacement of some residents. As has been stated by the key respondent from the NDMA, each year some residents along the wetland are compelled to temporally vacate their residents during the rainy season and only return at the height of the dry season because of flood inundation. These residents spend on average four to five months a year sheltering with relatives and friends. Other incurred impacts include damages to household goods. For instance, many respondents stated that they had incurred damages to household goods while others reported that they have had structures partially or completely damaged during the 2022 flooding incident and the 2023 windstorm, thus some had to temporally relocate or seek shelter from their neighbours. Furthermore, there was noticeable dissatisfaction on the scale of destruction caused by extreme rainfall on household sewage systems, which comprises mainly of pit latrines and sucker ways. A respondent lamented on this issue thus:

> "Flooding affects our sewage and sucker ways as they fill up rapidly. When this happens, the latrines overflew with the flooding water and the discharged effluent causes health problems such as skin diseases. To prevent the overflow of pit latrines and sucker ways, we have to frequently empty it which is too expensive".

The cost of hiring a conventional vacuum tanker could be as high as 30% of some respondents' average monthly income, which might be required a couple of times a month throughout the rainy season depending on the household size. This is due to the shallowness of pit-latrines because of the high water table in the area, with the

water table being less than 1 meter above the ground surface in some areas. This is further compounded by the low absorption capacity of the soil. With these factors, average to excessive rainfalls have the potential to lead to overflow of household "sewage systems". Impacts of this nature have knock-on effects on the quality of life and well-being of victims since households cover the additional cost of maintenance due to the absence of property insurance schemes in addition to the substantial amount of cost associated with emptying sewers.

With regards to loss of income and livelihood sources, as shown in the data on the occupation of the respondents, informal and daily wages constitute a significant means of livelihood earnings for the majority of the residents who commute to work to the central business areas within the municipality. The absence of road networks particularly the poor state of the main road that links the settlement with the other parts of the municipality renders the roads unmotorable during heavy rains as the roads become overwhelmed with floodwater capable of sweeping away vehicles. This puts residents at a transportation disadvantage during flood events. The respondents have described accessibility issues as a key impact of flooding on their quest for daily subsistence. During an interview with a women leader who also deals in petty trading, she describes the impacts of flooding on mobility and accessibility and its impacts on earnings thus:

> "Many of the women here engage in petty trading at different markets within the municipality, we rely on this to support our families. When it rains and the streets are flooded, we cannot go to the markets, which affects our earnings. Sometimes when it rains for two consecutive days, our merchandise gets spoiled as we cannot get to the market in two or three days because of the floods".

The contribution of these women to household income and subsistence in many African societies should not be overlooked, as their earnings constitute a significant part of supporting livelihood, financing education and serving as collateral in the event of loss means of income from the male breadwinners.

Furthermore, inundated roads and back allies prevent schoolchildren from attending school as most parents fear sending their children to school during severe floods.

This has been highlighted by Kavegue, A. and I. Eguavoen (2016) in their study on the impacts of flooding on children in the study area. Similarly, many of the key respondents have recounted the challenges of accessibility and mobility on emergency service, and waste collection. Some respondents state that during rainy seasons entire neighbourhoods become inaccessible and therefore cut off from emergency services such as ambulances and fire service. A respondent who suffered a stroke attack during the rainy season narrated the ordeal he had to go through before getting to the hospital. He stated that, "When I fell ill and had to be taken to hospital, we knew that we would not get any ambulance to come here, so my children had to carry me on their backs to the main road as we could not even get a local cab driver to drive to this neighbourhood". Considering that, about 16.39 and 29 per cent of respondents had a family member with chronic illness, lactating children and elderly persons respectively and the fact that there is no hospital or operational health centre in Ebo Town, there could be an enormous impact on flooding through inundation of roads, on healthcare and emergency medical attention in the community. This demonstrates how the impacts of climate change such as flooding differentially affect vulnerable members of society.

Finally, flooding causes severe vulnerability to health risks and loss of lives. Poor sanitary conditions as a result of indiscriminate dumping, inadequate waste collection and the overflow of pit latrines described above have been considered major public health concerns among official respondents. For example, respondents highlighted outbreaks of cholera (stated about its past occurrence), respiratory diseases from the incineration of solid waste and dermatological diseases as health issues due to flooding and or inadequacy of services such as waste collection and proper sewage system. Furthermore, a few respondents, particularly those still relying on open wells for water have expressed concern with contamination of water supply systems. In terms of loss of lives, there have been fewer reported cases in the community compared to the past loss of lives was the least recorded impact of flooding among the respondents. Fewer reported cases of death due to flooding could be a result of the high sense of awareness of the impacts of flooding even among younger children who are more prone to drowning. A reduction in contamination of drinking water sources is said to have decreased among residents. This could be

attributed to the recent upscale in the extension of pipe-borne water supply by the government and frequent public sensitisation by both public health officials and community leaders and the frequent community cleansing exercises being conducted by the community.

6.4. Adaptation Strategies

6.4.1. Household-led Adaptation Strategies

This section aims to put forth the local adaptation strategies at the household and the community levels. Several adaptation and flood vulnerability coping strategies are being employed amongst different households in Ebo Town. With regards to household adaption, the following have been identified based on field observation and responses from research participants:

1) Backfilling: Because of the sloppy topography and density of the built environment in the community, runoff water during heavy downpours flows downwards from the upper-lying parts of the municipality to the banks of the riverine areas. Densification of the built environment coupled with the inadequate drainage system obstructs the free flow of runoff water. Besides, being on a wetland reduces the water absorption capacity of the soil and the shallow nature of structural foundations makes buildings overflown with water because of water oozing from the ground. To avoid home inundation due to either of these factors, residents elevate the ground levels of their properties to the height of the adjacent upper-lying areas by filling up the surface area. This process is described by a respondent:

   "When we first moved in here more than 30 years ago, we never experienced flooding on the streets of Ebo Town because there were houses sparsely built around the community. However, we experienced flooding in our compounds because of the swampy nature of the settlements, as little rains were enough to flood compounds since the water retention capacity of the soil is low. This was tolerable. The situation became precarious as new houses began to be built and the settlements began to rapidly extend towards the shores of the riverine areas and mangrove areas. The runoff water that had been flowing unobstructed from the upper-lying parts of Churchills Town downstream to the swamps and the river began to cause flooding in the lower-lying areas of

the settlement. As we began to experience severe flooding in the compounds, we began to "backfill"- a process of elevating the entire or part of the unbuilt space within a compound to raise it higher than the surrounding area, using gravel, oyster shells, cement, litter and construction debris or a combination of all. [3]This helps minimize flooding since my compound could not be flooded with runoff water from the higher-lying areas while allowing surface rainwater within compounds to flow along the streets".

Figure 18. Household Flood Preventative Measures

Note. This figure potrays household flood preventative measures tiled flooring, elevated entrance, walls and water-outlets. Source: (Top-left image) National Disaster Management Agency.

[3] The members of the community have, over time, improved on the backfilling skills. The process is done in a way that it aligns with the height of the surface of the surrounding areas. Inappropriate backfilling can lead to flooding of the neighbors.

2) Concrete and tile flooring are other flood risk adaptation strategies used by residents as additional layers to supplement the backfilling process described above. Households that employ this strategy because they are water resistant which facilitates the easy flow of runoff water prefer ceramic and porcelain tiles. The use of "wall drains" use for either discharging excess water within a property or preventing runoff water from the streets from overflowing a property is another flood-risk mitigation strategy. The drain holes/wall drains are usually improvised low-tech ranging from holes dug on wall fences to locally designed metallic drains with lids affixed to wall fences. Prevention of runoff water from overwhelming properties during floods and discharging flooded water within the property is the rationale behind this low-tech initiative. Although uncommon amongst households, a couple of respondents bought and used their own water-pumping machine after experiencing years of flooding. With regards to the overflow of shallow pit-latrines and sucker-ways described above, some residents have resorted to raising the surface of the pits as high as a meter above ground surface level to create more space and installing holding thanks.

3) Observations from the respondents' responses reveal an important socio-economic form of adaptation used or anticipated by a substantial number of the respondents. This I describe by alluding to what Hyden terms "the economy of affection" which, "denotes a network of support, communication and interaction among structurally defined groups connected by blood, kin, community or other affinities, including religion" (Martinussen, 1997, p. 247). These forms of connection are very important as they form the basis of social safety nets through which members seek assistance during adversities and disasters.

Because of the insufficient institutional support, mechanism among informal settlers coupled with the challenges related to accessing them where available, lower-income households resort to family, social networks and community memberships for support during flood disasters and financial adversities. Amongst the interviewees, breadwinners in low-income households and informal workers in the community

express an inability to build resilient homes and employ better adaptation strategies due to a lack of economic advantage and finance. To this end, they claim, their only source of optimism lies in the prospects of younger members of the household breaking socioeconomic barriers. The prospect of breaking the cycle of poverty to improve living conditions is usually achieved through acquiring education, trade or business and migration to Western countries.

In The Gambia, as is the case in many countries in the sub-region, high youth unemployment means formal alternatives to breaking economic barriers become harder, particularly, for children already experiencing the brunt of economic marginalisation while there has been a surge in pursuant of the latter in the through irregular migration. The significant role of remittance in improving household income, which contributes to household flood risk adaptation has been emphasised by respondents. One respondent stated, “We experienced severe flooding over the years but since my son travelled to Europe, our situation has improved a lot since he has helped us backfill our compound and renovate the houses and sends money to empty the sucker way”. A more optimistic household head also stated that she hopes that the household would be relieved of the impacts of frequent flooding once her brother and son, who have embarked on the irregular route to Europe, reach their destination. Migrants also contribute substantially to their native communities and the country. This was emphasised by the religious leader interviewed during the fieldwork, he stated that diaspora from the community plays a crucial role in financing community work and rehabilitation projects on the only available paved road and even providing post-disaster support in the form of donations to flood victims. The reliance on the prospects of the youth in The Gambia, particularly through migration as a form of adapting to the impacts of climate change (declining agricultural productivity) has been observed by Sweeny 83 (2023), which shows that Gambians resort to internal and international migration as an adaptation strategy. Furthermore, The Gambia is among the countries with the highest dependencies on remittance, as formal remittances account for 60 per cent of the country’s GDP in 2021 with an estimated 26 to 37 per cent of households depending on it for sustenance (IFAD, 2023, p. 15).

The findings from the individual household adaptation strategies indicate that the quest for adaptation to flood risk among low-income households, has failed to produce long-term resilience or lead to transformational adaptation. The strategies identified are temporal and require recurrent application, the use of which in light of projected climate scenarios, under which impacts are likely to intensify, might be incapable of averting catastrophic damages to lives, property and well-being. The use of concrete and tile flooring are expensive and do not usually lead to lasting solutions of flood aversion in compounds as accounted by a respondent:

> After having backfilled the front yard for one or two seasons, we began to experience water oozing out from the ground surface inundating rooms. It is like playing a whack-mole game- whack the mole on the head and it appears elsewhere.

This strategy which has been used by several residents in the community could be an endless ongoing process of modifying, adjusting and refortifying the height and materials used for backfilling".

The cost involved shows that households with relatively stronger financial means appear to cope better than those with less financial means. The housing structure in the study area comprises some high-rise and modern as well as old, blightful and dilapidated buildings. The socio-economic fragmentation of the community is not only evident in the housing domain but also the adaptive capacities of its residents. Well-off families tend to suffer less from the impacts of flooding since the building structures are more resistant to flooding and the gushing of rainwater from underneath the building surface. Sewage systems, a major problem especially after heavy rains, are much better and are less likely to be overwhelmed since they are emptied regularly in affluent households than in others that find it challenging to erratic better sewage and empty.

Another adaptive capacity issue revolves around the issue of ground elevation methods used in the community. The process of backfilling is expensive as several layers of sand, gravel and concrete are required to raise the surface sufficiently enough to avoid stagnation and prevent built areas from 'sitting underwater'. Tiles

used to allow the flow of water are beyond the means of poor households. These holds use incremental building, which takes several years to backfill, and tile before it gets to a desired level, if it ever does as some households stated that renovations are done year in and year out. A resident stated that Ebo Town is not a settlement for the poor:

> It is very hard for the poor to comfortably live here. I have spent years raising the elevation of my property, first I allowed the neighbour to use it as a dumpsite then poured in sand or construction debris, then with oyster cells and gravel before concreting it. I spent a fortune on all of these materials, these I would not have been able to do in a year and certainly not at all, if I were less fortunate.

This prompts questions as to whether households with differing levels of income possess different adaptive capacities and employ different strategies.

In order to determine the existence of any form of relationship between household income levels and coping strategies, a parameter was devised around the employed strategies that were considered ideal practices by the respondents. Because the research aims to unearth local adaptation strategies, any form of abstraction geared towards the establishment of a correlation between the two two variables without taking into account the existing adaptation strategies would be counter-productive. Therefore, responses to the question on household adaptation strategies were categorised into higher adaptive and lower strategies based on the cost involved in carrying out the mentioned coping strategies. For example, elevating ground levels (backfilling), and concrete and tile flooring which are considered good practices were ranked higher while responses such as digging water channels within properties (which has no financial cost attached) were ranked as lower strategies. These results were then cross tabulated with income levels with a minimum monthly household income benchmark set at lower than GMD5000 (dollar equivalent).

Despite the lower responses on income status, the cross-tabulated results show that relatively better-off families adapt better to flooding and its impacts than economically disadvantaged families as shown in Figure 19 below. Of the 40 respondents within the lower monthly income category (less than GMD 5000 about

US$ 70), 18 provided responses corresponding to one of the undesirable household flood preventative measures. Similarly, half of the respondents with an average monthly income range of GMD 5000-10000 (US$ 70-140) utilise desirable coping strategies. Meanwhile, all the respondents with a higher average monthly income practised desirable adaptation strategies.

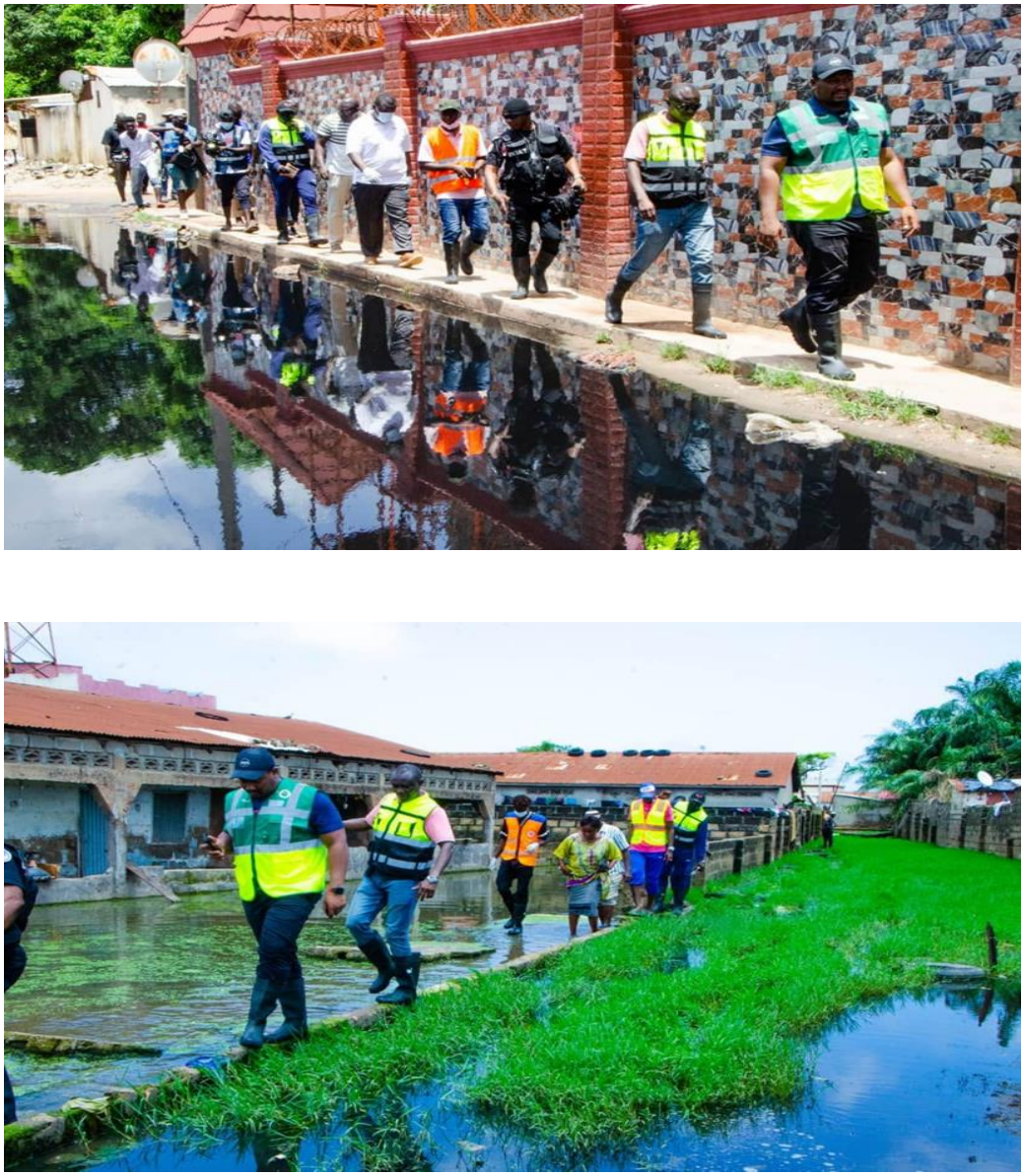

Figure 19. The Impacts of Flooding on Households with Different Adaptation Strategies

Note. The picture above shows that better-off households have bettter protection againts flooding, whereas the picture below shows that households with few options for protection are more vulnerable to flooding. Source: National Disaster Management Agency.

Another issues arising from the use of concrete and tile flooring is the associated urban heat effects of the material composition found in cement and ceramic. Employing the use of these products for flood risk prevention could potentially lead to and or intensifies heatwaves. Finally, the findings on remittance and its contribution to household adaptation strategies are similar to findings from studies on climate justice. However, a key difference between the findings from this study and other studies is that this study reveals that declining rainfall in the predominantly rain-fed agricultural areas of the hinterlands could cause migration to urban areas as agricultural productivity declines. These urban migrants are compelled to live in flood-prone areas of the GBA where total rainfall is relatively higher, further exposing them to flood risk. However, in spite of this exposure to different impacts of climate change, the only optimism of building better adaptation strategies for many is to seek remittances because of wider socio-economic conditions of unemployment and marginalisation. Although key respondents from the climate change secretariat have been sceptical that irregular migrants from The Gambia are economic migrants, not climate migrants, further research is indeed needed to provide deeper connections on how remittances foster adaptation and resilience among lower-income households in Least Developed Countries.

6.4.2. Community-led Coping Strategies

Community-driven initiatives, whether geared towards climate change adaptation or development in general provide alternative pathways for development, however, in many cases, it is necessitated by the failures in top-down adaptation strategies and development approaches (Satterthwaite et al., 2018, p. 46). This is evident in Ebo town as many respondents are sceptical of the ability of both levels of government to provide services and risk-reducing infrastructure to the community.

As a result, the community of Ebo Town has taken up several community initiatives that aim at decreasing flood vulnerability. One of the major observations from the fieldwork is the high sense of community spirit in the community. Some respondents indicated that ‘because they do not expect much from the government’ they rely on community solidarity in reducing risk and the development of the community. For

example, there are women's and youth associations such as the Ebo Town Youth Development. These associations are active and influential in advancing the needs of the community, mobilising both financial and human resources through membership contribution and mobilising participation in community works. In response to questions on collective actions taken to mitigate the impacts of flood risk, some respondents stated that neighbourhood women groups or associations frequently embark on pre-post rainy season community cleaning services to decrease the health effects of poor sanitary conditions emanating from indiscriminate dumping.

In addition to this, women's associations have initiated and coordinated the mobilisation of financial resources put into payment of utility services such as piped-borne water supply and for payments made to the National Water and Electricity Company for extension of electricity supply to off-grid neighbourhoods (see section on justice). These financial resources are entirely raised through household contributions. These initiatives have led to a drastic reduction in water-borne diseases such as the outbreak of cholera as household water sources are transformed from shallow well water, which is frequently contaminated during flooding, to pipe-borne water. Furthermore, because women are known to be more present at home and their roles as household keepers, disaster agencies and public health officials target women groups during sensitisation efforts on flood risk and its impacts who further pass the information down to other members and their respective households.

Another important community solidarity initiative comes from the Ebo Town Youth Association. This association coordinates and organises community work geared towards small-scale infrastructural works such as the construction of a footbridge, road maintenance and pavement of severely overflowed street allies with concrete slabs. It mobilises the community to participate in digging of temporal water channels before and during flooding and unblock dirt from the main drainage as stated by a respondent: “Before the rains begin, we ask the youth of the neighbourhood to do ‘set-settal’- communal cleaning exercise and households contribute to buy gravel which is poured on the street to prevent waterlogging”.

Figure 20. Members of the Community Participating in the Construction of a Foot-Bridge

Note. The picture shows the construction of a footbridge on a water-logged path Source: Shared by a Respondent.

The youth association raised funds in collaboration with the diaspora mentioned above to build a footbridge on a high flood intensity route used by schoolchildren shown in Figure 20 above. In addition to these highlighted internal initiatives, the associations also engage both local and central government authorities to raise funds and inform authorities of the plights of the community. For example, respondents stated that the youth association collaborated with the mayor of the municipality of KMC to construct a 70-meter concrete slab on a waterlogged street pavement, which had been inaccessible to vehicles. This has helped the community to deal with the transportation disadvantages described above as previously inaccessible areas become accessible.

Finally, there has been persistent resistance to encroachment on the wetland because of reasons related to the environment and out of fear that settlement expansion along the wetlands may cause flooding in the up-land areas. A high sense of place-based attachment triggers the perception of threat against a physical or socially constructed space that requires actions against such threats or in support of preserving shared experiences. Concerned members of the community mobilised against two forms of threat. First, the threat of illegal encroachment along the riverbanks, which causes

degradation of an important part of the Tanbi wetland reserve. Second, the threat of exacerbating flooding risk in upper lying part of the community due to the blockage of runoff water by newly built structures along the encroached banks. As a result, resistance to sales and purchase of "illegal land property" targeted "land dealers" and potential clients. It took the form of reporting the relevant authorities, discouragement and warning of property buyers of the legal risk involved in the completion of such transaction. However, this resistance was impeded by structural factors described in the land tenure system in the county and administrative and the inadequate enforcement of planning regulations. For instance, the organisers of the resistance claim that the authorities have not duly investigated their persistent report of illegal land acquisition along the wetlands. The respondent from the DPPH has acknowledged this, stating that a shortage of personnel hinders the department's ability to enforce compliance with land use policies, building regulations and standards. Most importantly, neither the organisers of the resistance nor the DPPH could prevent the Alkali (who controls land sales at the local level) from exercising his customary right of land allocation. Nonetheless, resistance from the community had set the ground for a powerful collective resistance against a foreign company granting leasehold rights on a huge part of the wetland.

The Collective resistance fuelled by online activism (social media platforms) and strong engagement with government agencies led to the government overturning its decision to grant leasehold rights of the swamp land to foreign corporations, whose activities would have caused the degradation of the wetland and increased exposure to flood risk in the community.

This has raised the question, whether residents of informal settlements are victims or culprits of climate change. Many studies on climate change vulnerability in low-income communities portray residents as victims of climate change; however, extensive encroachment on urban fringes by low-income earners bears huge ecological costs since encroached spaces usually consist of sites with significant ecosystem services. This raises the question of whether low-income urban dwellers in high-risk areas are indeed mere victims and or culprits of environmental degradation through the destruction of vital ecological sites that serve as carbon sinks.

6.5. Integrating Informal Adaptation Strategies with Formal Adaptation Strategies

- Household adaptation strategies like raising the height of the ground level should be integrated with formal, mandatory elevation of ground levels as part of the building code and regulation of DPPH with regulation and guidelines on how to go about it.

- Collective-preventative strategies which aim at building capacities or at reducing impacts such as the community initiatives highlighted above should be done through support and in consultation with the technical knowledge. This could prove more effective with long-lasting benefits**.**

- Lesson from other countries such as Mexico for example, where the authorities have classified municipalities based on their vulnerability to climate change and have gone further to categorise these vulnerabilities into levels of vulnerability- vulnerable and very vulnerable (Gran Castro & Ramos De Robles, 2019, p. 17) could foster the prioritisation of high-flood risk areas. The significance of this lies in the fact that adaptation policies and relief interventions are more likely to be channelled towards areas where such needs have already been identified. In other words, actions are directed at areas where there is acknowledgement, recognition and acceptance of a problem and that it needs remedial action. However, in The Gambia, the authorities have thus far, been unsuccessful in terms of providing regional risk vulnerabilities. The flood risk map created under the Greater Banjul Area 2040 Development plan should be broadened to include other regions and other hazard types such as windstorms and wildfires. These could be useful in providing rapid response and assist in the objective identification of the intervention areas based on the scale of existing or occurring hazards.

CHAPTER 7

LAYERS OF CLIMATE INJUSTICE IN EBO TOWN

7.1. Service and Infrastructural Injustice

The provision of and access to critical urban services is to a large extent the responsibility of the central government despite devolution of authority and the scaling down of power and responsibility to the local governments. In many Sub-Saharan African countries, the state or central government provides funding for local government development projects. In the Gambia, like in many poorer nations, large-scale development programs are a part of national development programs financed by the central government or supported through bilateral and or multilateral organisations. This coupled with the merger budgets of local governments creates a deficit in priority spending as the gap between service provision and infrastructure development programs and spending ability widens, leaving many communities and neighbourhoods underserviced. For example, water, electricity and sewage are provided by the National Water and Electricity Company (NAWEC). Municipalities and local governments in the country have minimal revenue and limited capital for investment in social services and local infrastructure. This has implications for better service delivery, municipalities and local governments are almost entirely dependent on the state for service provision. The higher and further the distribution mechanism of service provision is, the higher the tendency of service provision to be politicised. The politicisation of service distribution and its state monopoly yields significant asymmetries in spatial service and infrastructure provision. Thus, distributional injustices emerge because of weak local and municipal governments and the subsequent politicisation of service provision, which is usually tied to political affiliations- municipalities, and communities that provide a large support base for the incumbent to get on the top spending and planning priority. The ability of a group to

organise themselves against a state of dissatisfaction and make demands from the authorities accordingly, can influence planning policies and set spending priorities. Therefore, political representation and access to decision-making are important facilitators of (in) justice and exclusion.

Integrating or mainstreaming adaptation needs with development needs has been perceived as an important part of the solutions to climate change adaptation, particularly adaptation finance in developing countries. It has gained support from international development agencies such as The World Bank and GEF and has now become a key tool in international and national development. However, at the national and local government scales and taking into account the uneven power and the political dynamics that emerge and govern development planning, it has been marred by efficiency (WIREs Clim Change, 2016) justice and fairness issues.

Despite service provision in the country being centralised and the fact the central government is not the most representative scale of governance, urban settlements that have weaker influence and an inability to effectively mobilise political resources are less likely to benefit from state-provided urban services and infrastructure. The community of Ebo Town have been victims of at best, inadequate service provision, poor maintenance and at worst, completely ignored with no services and infrastructure since independence- 1965. For example, the community currently has no legal dumpsites and receives, an erratic, pay-as-you-throw municipal-operated waste collection system, which leaves households dumping garbage in gutters and swamps, which in turn blocks the free flow of runoff rainwater causing flash floods and other health-related problems such as the cholera outbreak that affected the community in 2006. Three successive governments have failed to either upgrade or implement planning laws in Ebo Town: in the case of the first government, it failed to halt via planning laws, the expansion of the community into the wetlands (the most vulnerable part of the community) or embark on urban transformation or renewal projects. Despite inaction by the government, the community of Ba'dala has mobilised local resources through household contributions to connect the community to the national electricity grid and has done the same for pipe-borne water, however, water supply could not reach the community because the fund raised through the

contribution was insufficient to get the water into the community (Darboe, 2022). In effect, the community has financed the provision of pipe-borne water only to benefit other communities at its own expense.

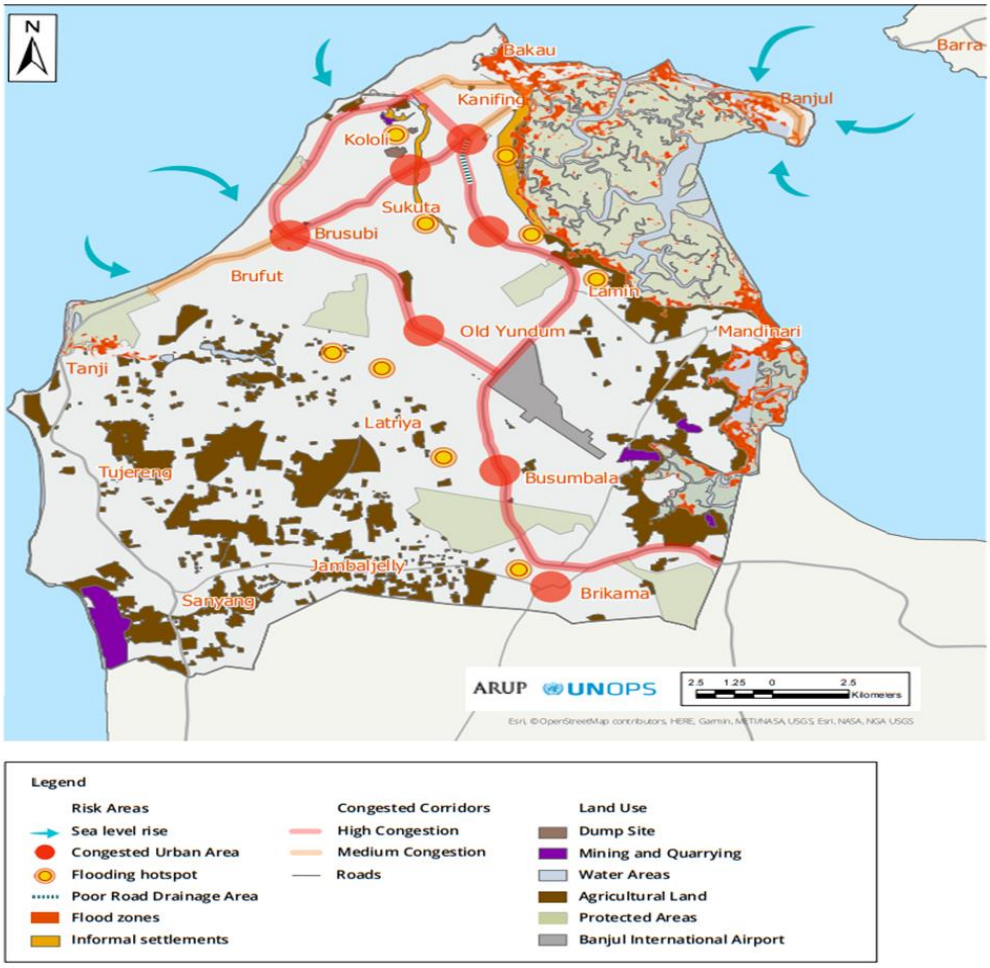

Figure 21. Restriction Map [of the Greater Banjul Area]

Note. The map shows the land use categories in the GBA, including informal settlements, flooding hotspots, flooding zones and sea-level rise. It shows Bakau and Ebo Town both lying on flood zones however; the former is not a flooding hotspot. Adapted from "Greater Banjul Area 2040 Development Plan," by African Development Bank, 2022. Copyright 2022 by the African Development Bank.

In terms of elections, the community has been very active in both presidential elections and local elections. However, participation in representational elections does not always translate into any meaningful ability/power to influence planning decisions or set development priorities Research has shown that even when the poor are politically active, this does not guarantee any access to political power. The

priorities of the more privileged communities of the municipality such as Bakou, which like Ebo Town, lies on the flood plains along the coast of the Atlantic, in one of the many flooding zones. However, as illustrated in Figure 21 below, unlike Ebo Town, it is not a flooding hotspot. Because it is a planned settlement and its residents, are comprised of middle and upper class (relatively more affluent citizens) it has better infrastructure. Additionally, it is a battleground during national and local government elections. It has been more efficient at transforming its social and political capital into "meaningful" engagement with both the central government and the municipality. As a result of these factors, it has been one of the top spending priorities of both central and local governments.

A local TV channel's interview with the residents of the community highlights the neglect and injustices experienced in the community: "We have always been active and supportive of any ruling government, during campaigns for presidential elections the candidate for the ruling party holds large rallies in Ebo Town, we complain about our deplorable situation to the candidate. They promise to build feeder roads etc. Once the elections are over, we will not have any feedback. They use us and forget about us". Although the community is politically active, it does not have a strong stalwart in government or in ruling parties nationally and locally, to articulate demand or even lobby for the community. The community, as Lefebvre (1996, p. 34) puts it, is "the right of the citizens as an urban dweller and user of multiple services" has been perpetually denied access to services for over five decades which constitutes distributional injustice. Clientelist behaviour of the middle class and the affluent also leads to procedural injustice in which the needs and the rights to service and infrastructure for example of residents of informal settlements are sidelined in favour of the needs of the middle class. The lack of resources at the local level is compounded by the lack of political will to provide some degree of financial autonomy to local governments. Thus, centralisation of access to services and its provision compounds clientelism and corruption, which affects re-distributional and procedural justice as different local authorities compete for scarce resources.

Decisions on prioritising infrastructure projects either for development purposes or for climate change adaptation can put some communities at an advantage over others

(Peter Vancura & Robin Leichenko, 2015, p. 108). In the Gambia, empirical data from the fieldwork shows that flood risk and adaptation needs of some communities are considered high-priority initiatives while those of other communities are less prioritized. The case of the West African coastal zone adaptation programme is a clear example of this, where the authorities prioritized the Kotu Stream (which lies along the affluent coastal and tourist destination towns of Kotu, Kololi and Senegambia) over the riverine areas of Jeshwang, Ebo Town, Tallinding and Abuko. Asked about the justification for the choice of the implementation site for this project, a key respondent claimed that an environmental impact assessment was conducted the result of which showed more exposure along the Kotu Stream. However, an analysis of data from the NDMA on affected households during the 2022 and 2023 floods within the KMC showed a higher proportion of households within the riverine areas were more affected than those on the coastal areas of the municipality Table 3 below.

Furthermore, a similar infrastructure investment decision by municipal authorities categorically excluded road provisions on the wetland parts of Ebo Town on the ground of the coast involved. A Key respondent from the municipality stated that "[…] even in the identification of the road project, the wetland of Ebo Town is not included, to be honest… Because we cannot afford a road on the wetland. [It] can be three times the cost of a road on the dry land…Ebo Town, the vulnerable areas cannot be considered right now". These examples are clear indications that adaptation decisions and broader infrastructure investments when taken without due consideration for fairness and justice entrenches inequality (Henrique & Tschakert, 2019) however, could also lead to differential gaps in terms of who benefits from climate change adaption finance (in the case of the WACA project) or how commissioning infrastructure projects in a low-risk community may lead to the non-prioritisation of adaptation needs of higher risk communities. These decisions are in contrast to the principles of leaving no one behind (discussed earlier), crucial for the attainment of 2030 sustainable development goals and the concept of just adaptation advocated for by the international community while also serving as major funding criteria for climate change adaptation projects.

Table 3. 2022 Household Disaster Survey for KMC

Settlement	Hazard			Total
	Flashfloods	Windstorm	Domestic Fire	
Bundung	276	0	19	295
Tallinding	556	0	6	562
Bakoteh	237	0	7	244
Latri Kunda	66	0	7	73
Abuko	42	0	0	42
Manjai	44	0	1	45
Faji Kunda	28	22	1	51
Dippa Kunda	75	1	3	80
Kotu	112	1	0	113
New Jeshwang	71	0	2	73
Old Jeshwang	17	5	0	22
Ebo Town	105	0	1	106
Kololi	1	0	3	4
Sere Kunda	84	4	6	94
Bakau	123	7	9	140
Total	1841	40	65	1948

a. Abuko, Bundung, Tallinding, Latri Kunda, Faji Kunda, and Old / New Jeshwang lie along the riverine areas while the Kotu Stream covers Bakteh, Manjai, Dippa Kunda, Kotu, Kololi, Bakau and Sere Kunda.

7.2. Recognitional

Inaction by the three successive governments at the national level and local governments to improve the plight of the residents of Ebo Town constitutes non-recognition of their dire condition as valid, a priority or even worthy of improvement. There is an existing reality that spatially, economically, and environmentally distinguishes neighbourhoods, communities and towns through which planning interventions are determined. Identifying and recognising these

distinctive attributes is crucial for both procedural and distributive justice in adaptation and development planning. Recognising communities as having equal rights to service and infrastructure, i.e. recognising their needs is a fundamental principle of democracy (Frazer, Nancy. & Honnet, 2003). However, recognising distinctive spatial indifferences is fundamental in combating climate change and climate change injustice. For example, recognising and as a result designating a low-lying settlement as flood risk can lead to the provision of flood prevention systems such as dikes, drainage systems etc. Conversely, not recognising and designating a flood-prone area as flood risk can lead to the treatment of such an area just like its adjacent uphill area which in (Rawls, 1971) conception of distributive justice, leads to unjust distribution. For him inequalities are only justifiable when it benefits the worst off, in this case, the flood risk area.

In Ebo Town, recognitional injustice is two-fold; status non-recognition and claim invalidation can be analysed from two perspectives. Status –non-recognition can be traced back to what some refer to as “structurally embedded” (Finn & Cobbinah, 2023, p. 415) or deep institutional injustice from historical patterns of a city's governance and infrastructure that are structural. Contemporary problems and injustices are perceived, from this perspective as deeply embedded in past policies and programs or inactions on land use planning and service provision. The suburbanization process, which began in the early 80s, through a World Bank Land Management and Development Project for the finance of housing in the Greater Banjul Area, provided financing for the establishment of the Kanifing Estate resulted in a proliferation of land ownership in neighbouring areas.

Although some parts of Ebo Town precede Kanifing Estate, its establishment led to further encroachment into the wetland and the creation of Badalla neighbourhood. The injustice here lies in the failure of the state planning authorities to institute planning laws and regulations that would have designated the most vulnerable parts of Ebo Town as sites of ecological significance and provide protection thus, preventing encroachment. Lapses in planning procedures resulted in failure to entirely zone areas and provide land use planning and building regulations are unjust procedural spatial injustices that failed to recognise some parts of Ebo Town as non-

residential. The suburbanisation process, which occurred because of state intervention, has resulted in encroachment into agricultural areas and wetlands and failed to enact urban planning regulations that could have prevented such expansion. Procedural injustice should not be considered only in terms of activities that obstruct claimants to or distribution of entitlements but also activities that wrongfully allow for illegal claims.

Claim invalidation happens where a community articulates a demand for or claims entitlements and rights to services and infrastructure to an authority that sees such claims as unworthy of acting. Thus, the claims of the vulnerable are not recognized as valid inputs by institutions that develop policy outputs that generate impacts via improving conditions or addressing issues. In other words, institutions to which the claims are articulated do not engage in framing discussions and making policies to solve the claims.

Claim invalidation occurs the most in informal settlements and slums where there is little or no political influence over decision-making and where governments both local and national, can act brutally through planning laws such as eminent domain, eviction, transformation and upgrading that benefit developers etc. or completely ignore conditions. Generally, a lack of recognition and specifically, claim invalidation are the onset towards a path to injustice in climate adaptation; policies cannot be made in the absence of identifying a problem and considering it as a priority.

The community of Ebo Town has been ineffectively demanding for provision and maintenance of dilapidated infrastructure and services for over 5 decades. The councillor highlighted this as thus “New Jeshwang- Ebo Town is one of the biggest wards and even in terms of the number of voters but Ebo Town does not have good road infrastructure. During elections, political parties hold rallies here and make promises to the community but after elections, we do not hear anything from them”. The community’s claim for critical urban infrastructure that reduces vulnerability or increases adaptive capacities such as clean water, drainage systems etc. has been ignored by successive governments. For example, several pleas have been made at

local and national government levels to provide pipe-borne water to the community however, residents in Badala are still without pipe-borne water. Residents walk for a few hundred meters from the community to collect clean drinking water or are left without a choice but to draw water from polluted open wells in the community. Similarly, there have been complaints of a lack of dumping sites or municipal waste collection service, which forces residents to dump on the streets, which ends up blocking gutters and drainage systems, further impacting vulnerability to flooding. The demands of the community for basic entitlements to pipe-borne water have not been recognised as a priority. Perpetual denial of entitlements has increased vulnerability, decreased adaptive capacities, and led to the pollution of the Tanbi Wet Land.

Since adaptation strategies are not only confined to physical, economic and social strategies but also firmly rooted in legal issues, deprivation of tenure rights may affect the adaptive capacities of vulnerable households. Tenure security provides an important legal safety net for residents of informal settlements as temporal eviction orders are more likely to be adhered to as occupants are assured of moving back after flooding disasters. However, there is less plausibility of adherence to temporal eviction in the absence of tenure security. Secondly, it guarantees rights to claim for restitution of property rights after upgrading and compensation under forced eviction and damages. The findings indicate that residents along the wetlands do not possess tenure security as the authorities decline to authorize leasing their properties. Although many respondents were reluctant to discuss land documentation regarding their properties, a few respondents argue that the authorities have been cautious of providing title deeds to residents along the wetlands because it does not want to assume liability in the cases of severe destruction and eviction. Lack of tenure security exacerbates the difficulties in developing flood-resilient housing and retrofitting to better adapt to the impacts of flooding because of the absence of assurance in household's investment in these undertakings (Satterthwaite et al., 2018, p. 34). Furthermore, the inability of households to use land properties as collateral to secure loans means that they are denied vital sources of investment for improved building structures that could flood risks. Furthermore, upgrading and urban renewal have been proven important flood risk adaptation strategies, particularly in informal

settlements. Despite the recommendation of the 1986 master plan (the only existing master plan in the country up until now), upgrading and urban renewal initiatives have never been undertaken in Ebo Town.

7.3. Climate and Environmental Injustice

Climate and environmental (in) justice are framed by the distribution of climate and environmental costs and benefits (Schlosberg, 2013). Individuals and communities have a sense of justice when they have no reason to doubt that the procedures and mechanism of distribution are fair and capable of rendering equity. Linking climate and environmental (in) justice can also be linked to Nussbaum's concept of capability enhancement or deprivation. In this approach, the capability of individuals and communities is defined as meeting basic needs and enhancing their capacities. In this case, environmental and climate justice ensures the realisation of high potential, reducction in environmental and climate-related hazards and risks (safety) and access to safe means of livelihood. It also includes the interaction between humans and nature or how human exploits nature for socio-economic purposes. In Ebo Town, pollution and contamination of water sources as a result of flash flooding and indiscriminate dumping of household waste have increased health-related risks. From a livelihood perspective, the native settlers of Ebo Town and many of the Jula ethnic group whose livelihood is dependent on oyster collection have been gradually deprived of their livelihood sources because of encroachment on the mangrove fields and pollution downstream along the River Gambia. In addition, the wetlands (locally called ‘farro’) which were fertile rice cultivation fields have been converted into what is now Ebo Town Farrokono quarters. In The Gambian customary land tenure system, the first settlers of a community are the custodians of the land resources including swampy land for rice cultivation and agricultural land. Permission to and acquisition of land was the exclusive authority of the elders of the first settlers. As the suburbanisation began, customary landowners began to expel (evict) rice cultivators who were seasonal users of the land and selling portions to migrants, thus depriving rice farmers of their source of livelihood. Reclamation along the banks of the river began when there was no land left for sale by the customary landowners. The practice of land reclamation has been carried out through traditional means such

as dumping garbage on a plot of land over a long period, allowing it to gradually fill up.

An increase in rainfall or variation in rainfall patterns like erratic but intensive precipitation as a result of climate change combined with poor drainage and sanitation systems like uncovered shallow wells and poor waste disposal which contaminate groundwater have severe health consequences on residents such as waterborne communicable diseases like malaria, diarrhoea and cholera. Climate-related health risks that are observed in the community include respiratory diseases caused by air pollution. There are both distributive and procedural aspects of justice regarding climate-related health risks and hazards. Besides poverty, climate-related health risks are compounded by political factors such as the unwillingness of politicians to solve general and climate-related health risks, the absence of or inadequacy of basic urban services such as piped water, waste collection and unequal distribution of resources. Additionally, land reclamation that causes the destruction of livelihood assets like swamps and mangroves has severe ecological impacts. It causes damage to important ecological support systems. This has been lamented as a contributing factor to flooding in Ebo Town thus:

> When it comes to climate change, encroachment on the wetland through the cutting of mangroves without replacing them has negative impacts and it contributes to why Ebo Town is one of the hardest-hit wards within the 19 wards of the municipality". Furthermore, residents also recounted that despite the settlement being a swampy area, intense flooding began to occur in areas that had never experienced server flooding after the encroachment on the wetlands. However, some respondents claimed that that climate injustice they are experiencing is because of the action of "others who destroy and pollute nature.

7.4. Participation

Participation of the vulnerable in climate change adaptation planning positively contributes to the impacts of adaptation programmes, however, a lack of participation leads to a lack of recognition of the interests and demands of the vulnerable. In addition, it creates ground to discredit and disregard and in effect hinders the integration of local knowledge and practices. A lack of recognition of

local knowledge and practices is reinforced by the dominance of scientific knowledge within climate change discourse. It is compounded by a lack of participation and subsequent incorporation of their perspectives, concerns and interests. In The Gambia, climate change-related projects and programme documents claim to involve the public in the policies through radio and community outreach workshops and meetings. A key respondent was asked about degree of participation during the formulation of climate policies to which he responded that "during the formulation of climate policies we engage all the stakeholders and we also invite community representatives". However, another key respondent highlighted that "most of the time, our department is not involved during policy formulation, we are invited during the validation process". The absence of effective involvement of key departments in the initial phase of policy formulation is a major concern and raises questions as to the active participation of community representatives. The questions that remain to be asked are whether the vulnerable are fairly represented and if their knowledge and opinions are influential enough to be incorporated into policies and programmes. For example, in Ebo Town, when the government decided to construct the only drainage canal that connects the adjacent highland communities, some streets that never experienced flooding and water stagnation began to be severely affected. Residents claimed that the drainage contractors had not surveyed the area nor were the residents consulted before the constructed. Due to a lack of consultation with the local people, the drainage canal, which was built to contain the impacts of flooding, has exposed an entire street to flooding because the drainage was built across the natural waterway.

Another important factor that hinders the participation of the vulnerable has been the bundling of national adaptation plans and strategy documents with multi-national and international climate change agreements. Despite the importance of multilateral climate change policies, contextualising policies to target and enhance local adaptation needs and capacities is more of a priority to residents of informal settlements than programmes that target global mitigation efforts. Similarly, national sectoral-based adaption policies designed to appease donors, but have no immediate effect on the socio-economic lives of the vulnerable tend to deflect attention from the urgent needs of the vulnerable communities. Where possible, it would be ideal for

adaptation-based policies to have a direct bearing on occurring or eminent hazards that communities are faced with. This is particularly relevant in small- and island nation countries where macro and micro policies do not exist simultaneously because local authorities do not have both the technical capacity and financial resources to allocate for and implement local climate adaptation policies. However, a close analysis of the country's national climate adaptation policies indicates that the policies are almost carbon copies of Multi-National Environmental Agreements (MEAs) or designed to appease donors. Under such a policy environment, participation becomes clouded by sheer attendance rather than by the value, it creates in agenda framing and setting. For instance, from an adaptation perspective, The Gambia's most recent climate document, the Gambia's Long-Term Climate- Neutral Development Strategy-2050 has three general targets of improving ecosystem, livelihood and economic resilience. Nowhere in a chapter on adaptation has it mentioned adaptation from a spatial perspective thus, failing to recognise that its three general targets occur in a spatial domain. Protecting infrastructure and strengthening the adaptive capacities of communities from climate-related risks and hazards are perceived as post-factum disaster responses. As a result, it can be argued that the nexus between climate change adaptation and physical planning or the built environment has not been overlooked in a country where more than 80 per cent of the urban population live on terrains that lie on less than 2 to 10 meters above sea level.

At the intra-community level, participatory justice should not be overshadowed by the sheer participation of members of the community but rather by the substantive opportunities provided to all members. Unfair opportunities for participation can exist when the opportunity to participate are distributed amongst members of the community disproportionately. For example, policy agents usually target and by extension involve the most influential members of a community under the assumption that their views represent that of the entire community. In addition to this, even where members of the community are involved in a programme, project or policy, varied weight can be attached to the opinions and knowledge of various participants based on their gender, socio-economic status etc. The injustice because of the selection of the participants and the differentiated influence attached to their

views in the participatory process constitute procedural injustice and recognitional injustice. The views and knowledge of the less influential members are unrecognised and disregarded leading to unjust distribution of benefits or unsuccessful outcomes.

7.5. Representational Injustice

With regard to effectively articulating the needs and priorities of a community forms a crucial part of the (re)distribution of national resources. Achievement of priority needs of a given community, largely, depends on the efficient representation of such needs to the authorities responsible for the redistribution of national resources. This is particularly important for highly vulnerable yet underserviced communities whose needs and priorities rarely take national precedence. To determine the effective and efficient representation of the community's needs at the national and regional scales, respondents were asked about their perception of fair representation. As shown in Table 4 below, about 70 per cent of the respondents indicated that they believe that the needs and priorities of the community are not fairly represented at both national and municipal levels. Thirteen per cent stated that the community's needs are represented however; more needs to be done to achieve tangible, meaningful outcomes while some respondents were reluctant to express their opinion probably due to fear of repression. Several respondents indicated that the local representative (ward councillor) represented the community better when compared to the national representative (Member of Parliament). The implications of this are two-fold: 1) since resource distribution and planning decisions in The Gambia are centralized, inefficient representation weakens prioritization of the needs of the community at the national scale, where meaningful changes in residents' living conditions take place. 2) There are limited interventions form the municipality and the ward council because of the limited financial resources and lack of planning authority required to support and undertake urban regeneration and renewal projects.

In addition to this, the findings further reveal that there is a high perception of misrepresentation amongst the respondents. Majority of the repondents have a high perception of misrepresentation in terms of the provision of risk-reducing infrastructure; disaster relief and, support. Within the ward, which comprises the

settlements of Ebo Town and New Jeshwang, respondents claim that the ward councillor better represented the needs of New Jeshwang and that it benefited more from post-disaster relief intervention than Ebo Town. The unfair representation of the community's needs by its elected representatives and the limited participation of its residents in climate change adaptation policy initiatives at the national level constitutes a violation of their rights to participate in deciding on matters that affect them, consequently affecting the scale at which they benefit from disaster response initiatives. This inherent injustice of exclusion from decisions and marginalization from resource distribution contradicts the core concepts of climate justice: participation of the vulnerable in decisions on climate change adaptation and prioritizing the needs of the most vulnerable.

Table 4. Respondent's Perception of Fair Representation at National and Local Scale

		Frequency	Per cent	Valid Per cent
Valid	No	138	64,2	69,7
	Yes	34	15,8	17,2
	Yes but not enough	26	12,1	13,1
	Total	198	92,1	100,0
Missing	System	17	7,9	
Total		215	100,0	

Another hindrance to just and effective representation is clientelism. The relationship between the councillor and the community is usually marred by clientelism and the representative might have the perception that he is in fact 'doing a favour' to the community who should be grateful for his/her services. Rather than narrowing down the power gap between the state and the community, these forms of representational relationships further widen the gap, thus the representative fails to effectively articulate the demands of the community as a result of this power gap. Under the above circumstances, a form of procedural injustice can be observed because the

representative does not fairly represent the community or representation is dependent on a favour to be paid for by indebtedness to the representative.

7.6. Distributive Injustice

From a distributional perspective, a lack of landownership rights and title deeds are regarded as the most critical factors that increase exposure to climate variability and its health-related impacts. A lack of access to landownership leaves most urban dwellers to settle on temporal low-lying and flood-risk areas that gradually become semi-permanent or permanent dwelling areas. Similarly, a lack of title deeds and ownership rights prevents settlers or owners from improving and building permanent structures because of fear of eviction. This increases their vulnerability to climate risk and its related health impacts. Before 1981, there were no state-led housing support schemes in The Gambia. This led to the establishment of the Social Security and Housing Finance Corporation in 1981 to ease housing finance. Its key aims were to facilitate access to credit and mortgages to lower-income groups who were previously denied the possibility of having access to adequate housing finance and to encourage to development of serviced land.

However, the SSHFC re-enforces exclusion in property ownership in two ways:
Firstly, it continued with the individual-based housing models where individuals were given plots of land on a credit or mortgage basis and were expected to finance the construction of the house on their own which took years to complete. This practice was seen as a huge burden on the state to provide services to those areas. According to a World Bank report, this practice of "allocating raw land for house construction, without the benefit of an infrastructural plan has put the government in a difficult and costly position of attempting to finance the extension of basic services to these areas after they have been inhabited" (World Bank, 1984, p. 2). With the exception of the Bakoteh Housing Project 1980-1983 and Brusubi Housing Project 1995-2003, which are two/three-bedroom serviced housing units, all the housing projects under SSHFC have been implemented through an individual-plot allocation model. Thus, the government had failed to utilise the opportunity to embark on sustainable mass/ community housing schemes that were in existence in other

countries. Thus far, there are no state-led sustainable mass housing schemes in the country that would decrease the demand for housing.

Secondly, access to its so-called housing schemes is beyond the reach of most of the working class. The lack of access to the SSHFC's housing and mortgage schemes has led to a domino effect of the above-mentioned practice within Unions such as the Teachers' Union, Police Union etc. These unions, representing the interests of various public sector workers, purchase or are allocated mass un-serviced land which is then mortgaged out to qualified members of their respective unions. The conditions for qualification for SSHFC housing or land support scheme make it hard for lower and even middle-income earners. For instance, the pre-condition to qualify for the housing finance scheme is to be a full-time employee of an organisation or institution that is a member of the national pension scheme and for the mortgage scheme, a financial statement indicating ability to fulfil repayment of the mortgage is mandatory. These conditions limit access to housing and mortgages to civil servants, public sector employees and employees of selected private sector organisations. In a country where about 78 per cent of the total workforce works in the informal economy (Oladipo, 2021), limiting housing finance and mortgage schemes entrenches inequality and access to housing. An important observation from a distributive perspective is the failure to replicate the housing schemes of the late 1980s because of the high default rates in mortgage repayment meant that such housing models could not be expanded.

In Ebo Town, as shown Table 5 below, none of the interviewed respondents reported acquiring property through SSHFC schemes or bank mortgages. In practice, the housing schemes are in high-end gated communities- like neighbourhoods that are built for senior government and private sector workers- the upper middle class. Claims made by a key respondent that "access to SSHFC's housing schemes are not only limited to civil servants" might be theoretically accurate; as the analysis of the methods of homeownership from the questionnaires indicates that none of the respondents had acquired their property through SSHFC or private mortgage schemes. Several respondents stated that they live in Ebo Town 'because they could

only buy property there because of its affordability'. When asked about why they knowingly bought property in a flood zone, one of the respondents from the community responded thus: "Who would choose to live in these conditions? We would not live here if we had a choice. As we speak [right now], if the government offers to relocate me to a better place, I would leave". However, the authorities are very skeptical of the successful outcome of any voluntary relocation plan. Nonetheless, this account is suggestive of disproportionate access to distributive mechanisms of state-led housing has necessitated people to resort to settling in flood-prone areas.

Table 5. Methods of Property Acquisition among Respondents

		Frequency	Per cent	Valid Percent
	Inherited	44	20,5	21,2
	Bought via individual savings	119	55,3	57,2
	Others	45	20,9	21,6
	Total	208	96,7	100,0
Total		215	100,0	

Note. Others include tenants, residents lodged by relatives and residents under property guardianship.

Another distributive injustice issue that arose from interviews with key respondents and the questionnaires is the limited distribution of post-disaster relief and support packages to the community members. The key respondent from NDMA, in justifying its limited post-disaster support to residents of the wetland part of Ebo Town stressed that 'the NDMA Act clearly states that, the agency is not mandated to provide support to those that "deliberately settle" on waterways. However, we can conduct a needs assessment to determine the scale of impact but in terms of disaster support; we prioritise victims that reside in legal settlements. This could be responsible for the low response rate among respondents on post-disaster support from the government. This distributive injustice is contrary to calls for prioritisation of victims regardless of social status, ethnicity, race and or gender etc.

7.7. Procedural Injustice

Finally, another important procedural injustice in The Gambia that hinders access to land and ownership rights is the exorbitant fees and the procedures required to convert or acquire a title deed. For example, In the Kanifing municipality where the study area is located, the cost of land ownership transfer is D4000 and an additional 40,000 payment in capital gain tax (UN-HABITAT, 2011). The public has not been well informed about the procedures involved in registering and acquiring titles. These issues have reinforced informality in the country as observed by a report on land sector governance: "The processes before formal registration are cumbersome, bureaucratic and opaque and encourage informality to grow." (Bensouda, 2013, P. 21). Both the financial cost and the administrative bottlenecks encountered during the process of land registration deters many property owners from registering properties. Because of these, across the municipality about 57% of properties were registered in 2013 (Bensouda, 2013) and property owners with secure tenure in the municipality stood at 42% (UN-HABITAT, 2011).

The councillor of the ward confirmed that most of the residents of the settlement do not possess proper documentation but emphasised that most have bills of sales. When asked about tax appropriation without recognition he stated that

> No one in those swampy areas or very few of them have authentic documentation, by that I mean complete documentation. They have bills of sales. But most of them do not have occupancy certificate from the physical planning department. So at times, there are illegal transactions everywhere… So I don't know how they got those illegal documentation. But, something is wrong somewhere which I have to admit, to be honest. However, I think, they are still there illegally because those areas are not settlement areas.

Some respondents corroborated this. They stated that their application to lease their properties were rejected by the government. The inconsistencies surrounding the legality of property sales for residential purposes and the illegality of occupancy rights highlights the challenges of corruption due to the varying institutional arrangements in land administration and development. For a summary of the layers of injustices identified in the study area, see Table 6 below.

Table 6. Layers of Injustice in Informal Settlements

Dimensions of injustice	Sub-dimensions	Examples from EboTown
Procedural injustice	• Recognition	Has not been formally recognized as an informal settlement. Thus, with regard to informality, there have been no formal surveys and data collection.
		Knowledge and opinions of influential figures dominate during policy framing and community needs assessments.
	• Participation	A lack of prioritisation of the needs of the community at both state and municipal level as a result of discriminative policies and clientelism behaviour that supports the development needs of more affluent communities.
		Lack of substantive participation, as it is mostly confined to the alkali and key figures whose needs are not always reflective of those of the community.
	• Representation	The community feels that it should be a constituency with its representative. Unfair and unequal representation of their needs and interests by a councillor residing in another constituency.
	• Title deeds and land registration	Complex, opaque and expensive procedures in acquiring title deeds and ownership transfer increase informality and vulnerability.

Table 6. (continued)

Distributive injustice	• Access to CUS/l	Poor sewage drainage systems. Erratic power supply and limited access to pipe-born water supply.
	• Provision of and facilitation of access to capability-enhancing goods and services.	The unjust distribution of life-changing opportunities.
	• Housing support, Property rights and tenure security.	The absence of state-led mass housing policy and building& development control triggered informality. Lack of access to SSHFC's housing and mortgage scheme.
Climate& environmental injustice	• Destruction of livelihood and ecological support systems.	Encroachment and subsequent destruction of wetlands and mangrove areas deprived rice cultivators and oyster collectors of means of livelihood generation.
	• Expose to hazards and air and underground water pollution due to rampant dumping.	Open dumping due to a lack of municipal waste collection and garbage dumping on plots along the banks of the river for reclamation purposes.
	• Participation in adaptation planning and environmental policies.	Policies seem to target international commitment and donor needs rather than improving immediate and medium-term adaptation needs as evident in the lack of spatial/human-centred adaptation policies.

Note. This table highlights the different forms of injustices identified in Ebo Town.

CHAPTER 8

CONCLUSION

The Gambia has internationally commendable climate change policies with adaptation co-benefits. However, as one of the high-risk countries to the impacts of climate change such as sea-level rise and flooding, national climate change policies should be directed more towards addressing the climate risk that its inhabitants are currently confronted with to reduce loss and damage and build resilience. The tendency to greenwash to lure funding from climate finance and the absence of transformative adaptation mechanisims could lead to and indeed at least to this point has led to a situatıon of yearly perpetual occurrence of floodıng in flood zone areas without addressing the purpose for which such funds have been secured for in the first place. A community leader as thus has succinctly highlighted the situation:

> "The conditions in Ebo Town have been as it is for several years now and it is getting worse as the population increases and more buildings built. Yet, year in and year out we [the residents of Ebo Town], receive the same form of assistance. We get flooded, they come for needs assessment and they provide handouts and cash vouchers to us, this was done the previous year, and wıll be done this year and next year as well. If they continue to carry on like this, we wıll be flooded every year. To make [my point] clearer, if they give every one of us a million dalasi [indıvidually], we will spend it and still be flooded the next rains. What we need here in Ebo Town is drainage and gutters that will carry both runoff water from uphill areas and sewage from households. As long as this is not done, the community will always be flooded"

Another respondent posed a question while discussing post-disaster relief support provided by the authorities: "What significance does it hold to provide relief handout of 50 Kgs worth of a staple food to a household that has lost three months' worth of its food stock and how could it bounce back or even bounce forward with this marginal assistance?" Given that flooding in the community is an annual recurring

phenomenon, residents, with this meagre assistance and resources are the unheard victims of climate change injustice since they are affected by the impacts of climate change and injustice in terms of the provision of critical urban infrastructure and services needed to enhance adaptive capacities and build resilience.

This implies that as long as structural transformations of the infrastructure in the community are not carried out, no form of assistance will permanently resolve the situation in the study area. The current form of assistance provided serves as a way in which institutions express their presence to the community without any commitment to long-term transformative adaptation actions. It is a clear indication of a vicious cycle in which, the community gets flooded, receives support and waits for the same plight the next year. The intriguing question is whether this form of adaptation can indeed lead to maladaptation, as it tends to make members of the community over-reliant on assistance and serve as a disincentive to public officials to find long-term solutions.

The findings presented in this study point to the need to not only look at climate justice as a sectoral issue but rather as part of the dimensions of justice. Emerging research on differentiated responsibility and impacts, and discussions on structural injustices that trigger socioeconomic vulnerability and adaptation injustice show the need to incorporate climate justice as part of the dimensions of justice.

Although, it is beyond the scope of this paper to develop tools for evaluating just adaptation plans, policies and programs are, highlighting evaluation criteria for achieving Harvey's (Harvey, 1973, p. 116) description of justice as “just distribution justly achieved” in climate change adaptation in informal settlements is crucial in determining injustice and mapping out the layers of injustices in urban informality. The following criteria are used here in determining just urban climate change adaptation:

1. Participation: including the vulnerable in the planning process of climate change adaptation legitimises (from the perspective of the vulnerable) adaptation plans and guarantees ownership and consequently leads to

involvement in the implementation plans. The involvement of the vulnerable gives them a sense of “affiliation” and “control” over their environment (Nussbaum, 2003)and presents them with opportunities to carry out things that they “have reasons to value” (Sen, 2009, p. 23).

2. Involving the vulnerable also ensures that adaptation processes and plans are just as if properly done can eliminate injustice in adaptation planning and enhance their capacity to bring positive change in their communities. Furthermore, adaptation planning processes that include the most vulnerable are more likely to be successful than those that are not.

3. Recognition: the core of any urban climate change adaptation planning process is the setting of needs centred on the most pressing needs of the vulnerable. Setting priorities that recognise and frame adaptation discussion on the adaption needs of the vulnerable urban dwellers leads to just adaption plans by blocking out the vested interest of urban elites in the overall urban political economy of the city and allows for the utilisation of resources for high adaptation needs of the urban poor and vulnerable. Recognizing the plight and prioritising the needs of the vulnerable can subsequently lead to interventions and policies that enhance their conditions, improve adaptive capacities and serve as a tool for corrective justice within neglected communities, especially in formal settlements. Thus, the institutions (outputs) involved in adaptation initiatives and the plans/ policies (outcomes) that have been generated reflect equity and fairness. The vulnerable articulate their needs and claim for their entitlements, thus, recognising and prioritising the needs of the vulnerable leads to the fulfilment of their entitlements.

4. Impacts: although the above two criteria are undoubtedly important, the success of any adaption plan and programs are evaluated based on tangible impacts that ensue from adaption plans and programs. From a climate change perspective, the impacts of climate change adaptation plans and programs should ensure that the freedoms and assets of the vulnerable are enhanced. Enhancing the freedoms of choices (to carry out a range of activities before

and in the aftermath of climate change-related shocks) and providing a guarantee of assets should be the goal of any adaptation plans and programs as it strengthens capabilities and increases resilience.

Inclusivity and recognising the needs of the vulnerable are important means-based criteria through which climate change adaptation plans and programs can be evaluated. Framing and setting climate change adaptation discourse on the needs of the vulnerable and involving their participation in planning processes are vital tools that reduce vulnerability, enhance adaptive capacity and ensure justice in adaptation planning and implementation. Thus, the ensuing impacts strengthen capacity and enhance the freedoms and assets of the vulnerable.

Adaptation governance is a political process in which preferences are expressed, trade-offs negotiated and approved and differentiated outcomes are generated. The entire process of adaptation decision making as in any decision-making process is the outcome of dominant values and interests within the unequal power relations that manifests during the decision-making process. Thus, adaptation governance and planning are processes that either include or reinforce disenfranchisement of the values, knowledge and choices of the less power lacking in its unequal power-laden process.

The politics of adaptation decision includes both the politics of distribution of outcomes (who gets a share of the pie) and the process (procedural) of distribution (whose values, preferences and interests are highly valued). Because of the unequal power relations involved in the processes of framing, taking decisions and implementing climate change adaptation plans, programmes and policies, from a distributional perspective, yield positive outcomes for some individuals, groups and communities, although, they might be less deserving of it than those who do not benefit from the distributional process. The outcome of the decisions, which are a factor of the procedures involved in the decision-making process, can alter or reinforce dominant values, knowledge and hegemonic power relation.

Despite scholarly advancement and growing activism in the field of climate justice, climate justice has been and still is analysed using traditional parameters or

indicators of justice: distributive and procedural justice. While these indicators offer invaluable insights into understanding cost and benefits; loss and damage; compensation and other forms of restitution; and mitigation responsibilities, it tends to articulate climate justice to or as a part of classical dimensions of justice (see the diagrams below). Should the consequences of climate change-related risks and hazards be categorized and conceived in terms of social injustice and therefore seek corrective measures from the socioeconomic and political realm in other words, should climate justice be analysed within the framework of the classical dimension of justice (distributive and procedural)? Alternatively, should it be examined not as the consequences of failure in the distributive and procedural mechanism that guides and governs resource allocation but rather as part of the dimension of justice? In climate change adaptation in informal settlements, there is an existing reality, a desired state and the means via which the desired state can be achieved. The reality which is informality is a consequence of injustice and the desired state which is achieved through resilience, adaptation plans and policies and corrective justice. The impacts of Climate change become a derivative of both informality and ensuing injustice.

Theories of justice in climate change adaptation are based on a distinction between the logic of equality, needs and sufficiency (Pelling, 2011, p. 49). Egalitarian accounts of justice require that equality be the cornerstone of any distributable element or in terms of climate change adaptation, equality in post-adaptation vulnerability and equality in terms of adaptive capacity. Prioritarians emphasize that the adaptation needs and priorities of the most vulnerable must have precedence over that of the least vulnerable and; the sufficientarian are of the view that justice should ensure that all individuals have enough basic needs to leave a sufficiently enough standard and ensure the protection of capabilities (Ziervogel et al., 2017, pp. 127–128). These distinctions have been based on traditional dimensions of justice: distributional, recognitional, and procedural justice.

Within climate change adaptation, corrective justice should entail linking response mechanisms to the vulnerability that emerges from structural inequality such as lack of tenure rights and security, resources and services and capabilities. At the national

and local scale especially in informal settlements, corrective justice in climate change adaptation should be a matter of the state and its affiliated institutions and agents. The responsibility of the state entails safeguarding lives and assets/ livelihoods through the preparation of adaptation plans, laws and regulations in anticipation of climate-induced risks. It entails responding to climate disasters promptly to minimize loss. Corrective justice also entails a recognition of and thus, acceptance of the state's role in enhancing inequality and uneven distribution of resources and adopting measures to compensate, redistribute, or provide non-existent services and infrastructure that decreases adaptive capacity and increases vulnerability through the Implementation of positive discrimination policies.

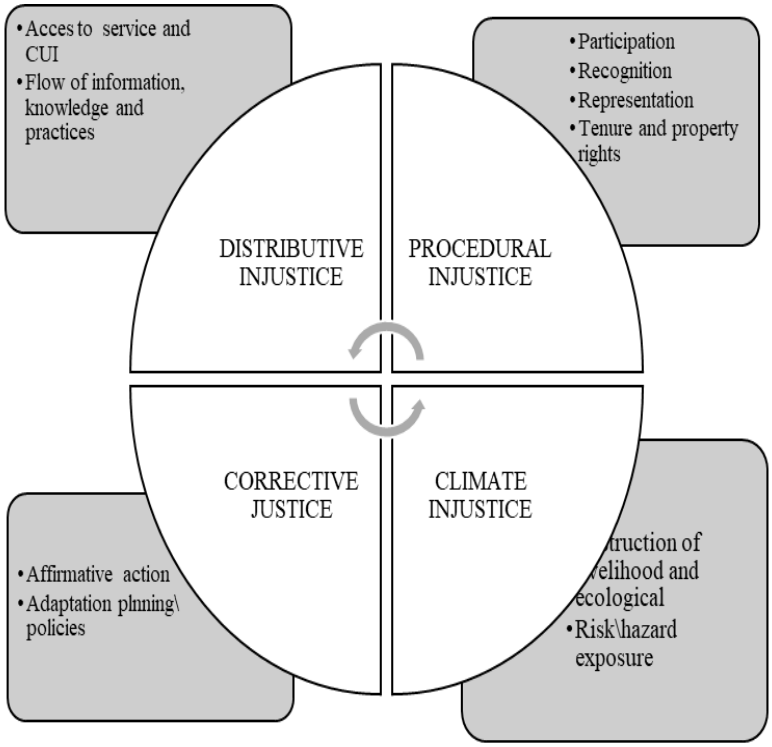

Figure 22. Proposed Dimensions of Justice

Source: Author's work

The lack of or absence of effective institutional coping strategies, the limited provision of risk-reducing infrastructure such as limited access to mortgage and housing schemes; the unsuccessful enforcement of land use policies and building regulations; and the lack of temporal shelters for disaster victims indicate major deficiencies in both national spatial and climate change adaptation policies.

Therefore, to reduce exposure to the impacts of climate change, national adaptation policies should simultaneously address spatial and environmental policies, and focus on building adaptive capacities in vulnerable communities rather than long-term mitigation action.

Climate justice as Daniel Aldana Cohen argues, "is the right to the city"(2022, p. 335). However, for the majority of the urban population affected by the impacts of climate change- particularly those residing in informal settlements, this can only be achieved and safeguarded if deep-rooted, structural inequalities and injustices issues that deny individuals access to land, housing and tenure security and at the communities access to critical urban infrastructure and services are addressed.

While at the international level, corrective justice entails compensatory and reparative actions, which have been at the center of global climate negotiations, at the national level, corrective justice should be geared towards:

1. The expansion of access to the housing market.
2. Consider differentiated impacts at the national scale and thus (re)distribute resources towards resilience building through the provisioning of risk-reducing infrastructure and services.
3. In the case of non-recognition of informal settlements, recognize and designate informal settlements could pave the way for upgrading and transformation.
4. Ease administrative bottlenecks that impede procedural justice particularly those related to the legalisation of tenure security, which encourages voluntary relocation and evacuation.
5) Re-direct efforts towards addressing adaptive challenges rather than the response model that provides temporal respite without addressing long-term resilience.

Beyond its normative value, corrective justice has practical implications for vulnerability reduction and raises solutions to minimise the impacts of climate change. In terms of climate change injustice, corrective justice has the potential to facilitate restitution of rights and privileges in excluded communities and informal

settlements. It could also lead to radical policy shift to transform conditions and factors that lead to the proliferation of informal settlements. This could achieved through strict enforcement of planning laws and regulations, provide affordable mass housing and encouraging voluntary evacuations from highly vulnerable areas.

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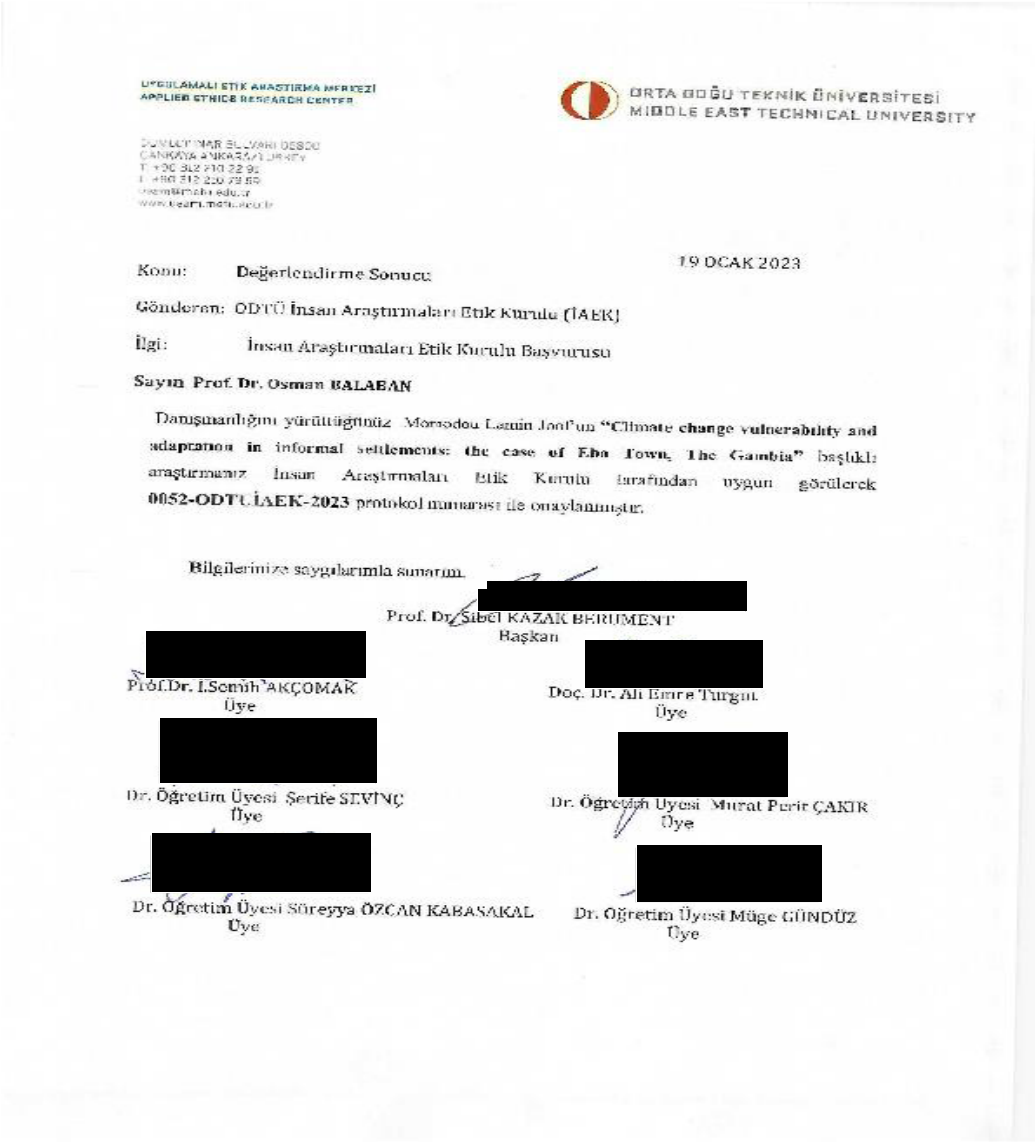
APPENDICES

APPENDIX A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE



UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

19 OCAK 2023

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Prof. Dr. Osman BALABAN

Danışmanlığını yürüttüğünüz Mamadou Lamin Joof'un **"Climate change vulnerability and adaptation in informal settlements: the case of Ebo Town, The Gambia"** başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek **0052-ODTÜ-İAEK-2023** protokol numarası ile onaylanmıştır.

Bilgilerinize saygılarımla sunarım.

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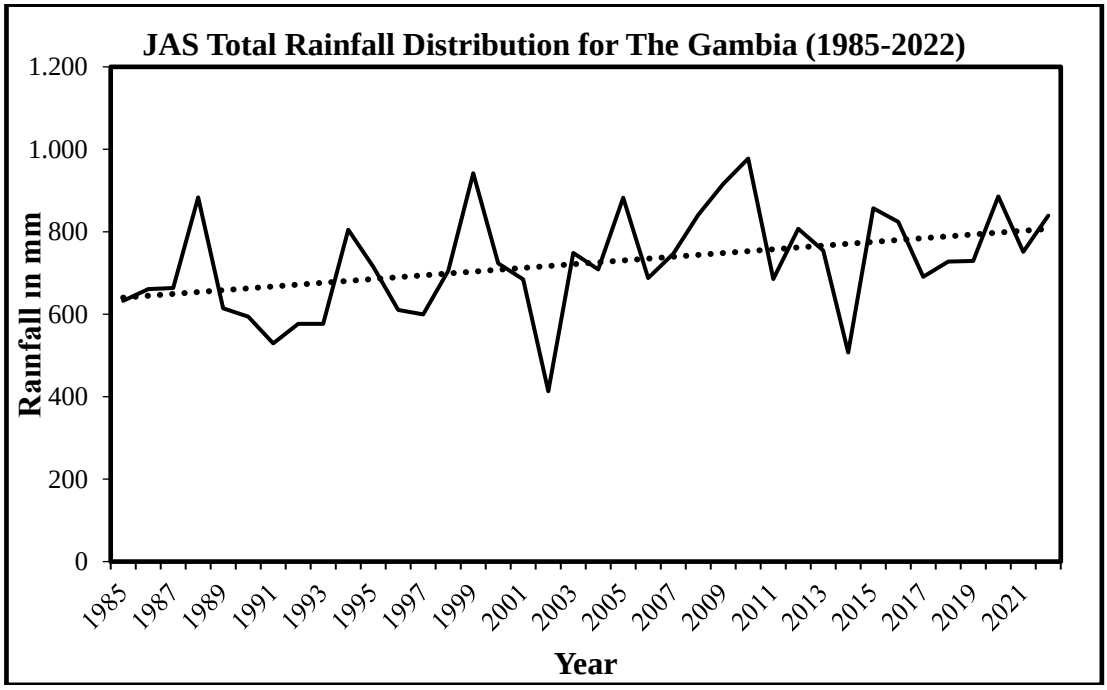
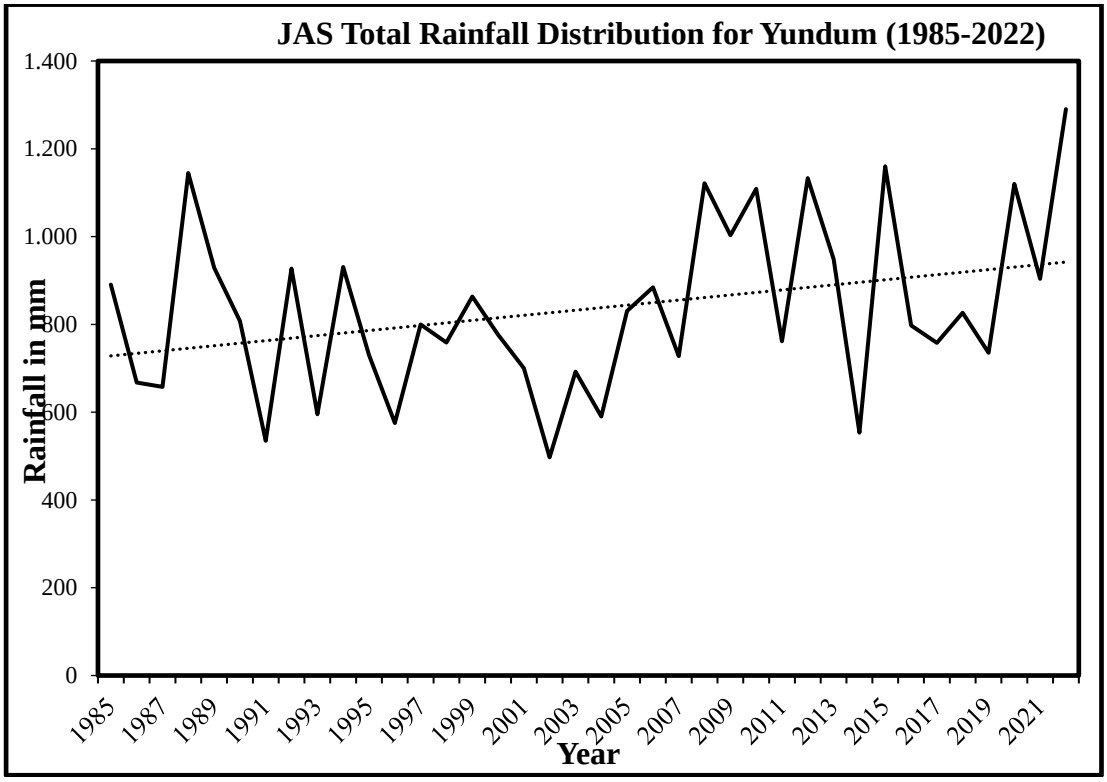
APPENDIX B. PRECIPITATION AND TEMPERATURE GRAPHS

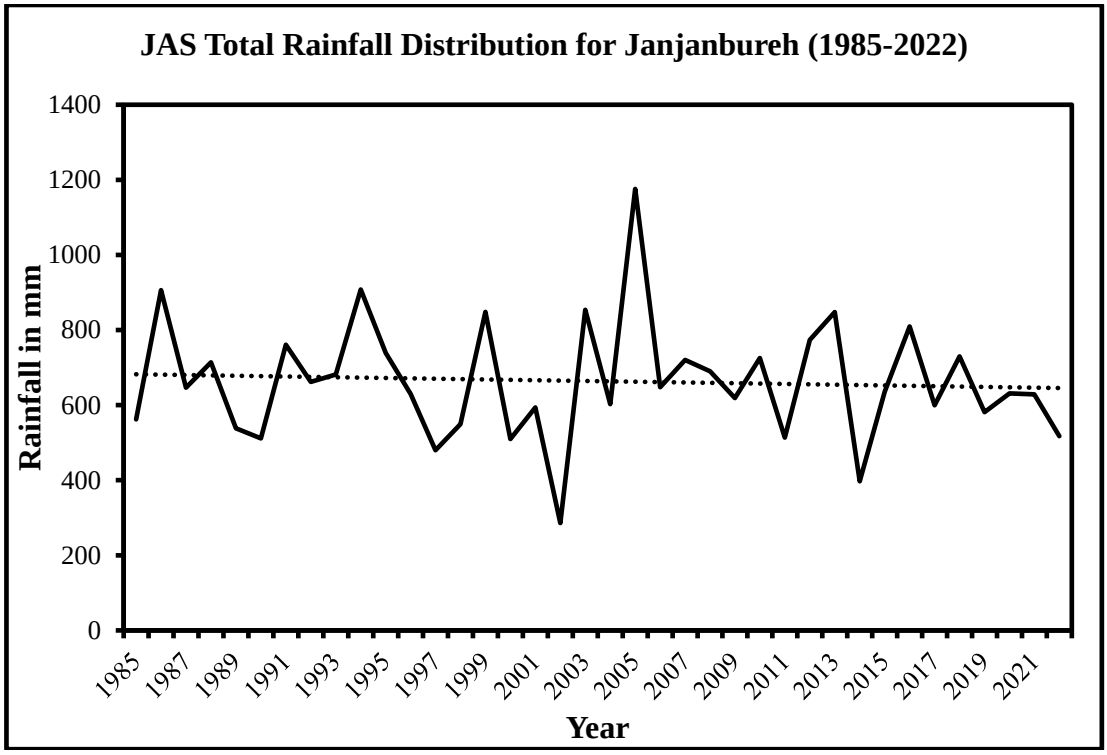
GRAPH B.1. JAS Total Rainfall Distribution for The Gambia (1985-2022)



GRAPH B. 2. (Continued) JAS Total Rainfall Distribution for Yundum (1985-2022



GRAPH B. 3. (Continued) JAS Total Rainfall Distribution for Janjanbureh (1985-2022)



GRAPH B. 4. (Continued) Total Rainfall for The Gambia (1985-2022)

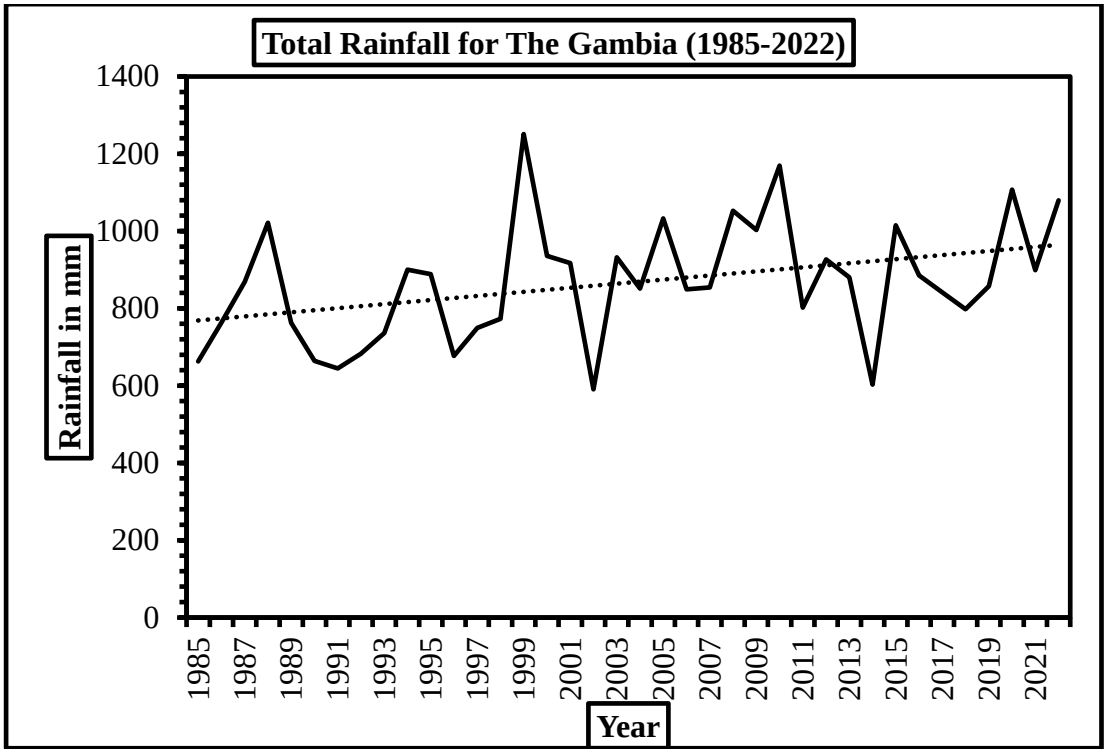


TABLE B. 1. (Continued) Years in Which Temperatures Exceed 40 Degrees

	TEMP >40°C		TEMP >41°C		TEMP >42°C		TEMP >43°C		TEMP >44°C		TEMP >45°C	
YEAR												
1975	0	42	0	18	0	4	0	0	0	0	0	0
1976	0	22	0	7	0	1	0	0	0	0	0	0
1977	0	32	0	14	0	2	0	0	0	0	0	0
1978	0	31	0	9	0	1	0	0	0	0	0	0
1979	0	39	0	17	0	6	0	2	0	0	0	0
1980	2	50	1	27	1	15	1	7	1	1	1	0
1981	0	31	0	8	0	3	0	0	0	0	0	0
1982	1	20	0	8	0	2	0	0	0	0	0	0
1983	13	33	4	11	0	4	0	0	0	0	0	0
1984	2	19	0	9	0	1	0	0	0	0	0	0
1985	1	34	0	11	0	3	0	2	0	1	0	1
1986	1	32	0	17	0	5	0	3	0	0	0	0
1987	4	38	1	17	0	7	0	2	0	0	0	0
1988	4	62	3	43	1	17	0	3	0	1	0	1
1989	4	46	1	28	0	12	0	2	0	0	0	0
1990	4	87	1	52	0	24	0	7	0	0	0	0
1991	5	64	2	31	0	12	0	3	0	1	0	0
1992	3	38	0	20	0	9	0	1	0	0	0	0
1993	1	64	1	42	0	14	0	3	0	1	0	0
1994	7	66	1	46	1	21	0	7	0	2	0	1
1995	3	64	0	40	0	19	0	4	0	0	0	0
1996	10	77	6	53	4	31	1	11	0	3	0	0
1997	2	55	1	30	0	9	0	1	0	0	0	0
1998	9	119	4	85	0	58	0	23	0	7	0	0
1999	0	70	0	48	0	22	0	5	0	2	0	0
2000	4	75	1	49	0	21	0	5	0	3	0	1
2001	4	80	2	48	0	23	0	5	0	1	0	0
2002	5	71	4	44	1	22	0	7	0	1	0	0
2003	5	82	2	46	2	20	1	9	1	3	0	0
2004	4	70	4	46	0	22	0	5	0	1	0	0
2005	5	72	2	52	1	30	1	10	0	1	0	0
2006	4	66	0	40	0	16	0	4	0	0	0	0
2007	6	88	1	60	1	28	0	7	0	0	0	0
2008	3	89	2	56	0	24	0	6	0	1	0	1
2009	0	69	0	48	0	26	0	6	0	1	0	0
2010	13	96	6	59	3	33	1	13	0	3	0	0
2011	3	80	1	57	1	21	0	8	0	0	0	0
2012	5	69	1	33	0	13	0	4	0	0	0	0
2013	1	83	0	57	0	25	0	8	0	3	0	0
2014	1	63	0	38	0	18	0	6	0	0	0	0
2015	4	60	2	30	2	5	0	2	0	1	0	0
2016	9	82	4	48	4	22	1	7	1	2	0	0
2017	9	84	7	55	7	21	0	2	0	1	0	0
2018	6	86	3	42	3	18	0	3	0	0	0	0
2019												

Source: Department of Water Resources. (2018). *The Gambia Annual Climate Report, 2018.* http://www.rainwatchafrica.orghttp//owc.enterprise.earthnetworks.com/OnlineWeatherCenter.aspx?aid=7144&stat=L2GAM&pid=3&layerID=Radar.Global&Units=1

APPENDIX C. SAMPLE QUESTIONNAIRES

Interview Guide (sample)

The survey will take approximately 10 minutes to complete.
This interview is being conducted in Ebo Town, Kanifing Municipality. We are asking heads of households or adults to answer questions about climate change and its effects on their households and community

* This form will record your name, please fill your name.

Socioeconomic Profile

1. Gender

- ◯ MALE
- ◯ FEMALE

2. Age

3. Marital Status

4. Occupation

5. Level of education completed

6. Number of people living in the household

7. Are there any of the following in your household?

- ◯ Elderly
- ◯ Person(s) with chronic illnesses
- ◯ Person(s) with impairments
- ◯ Lactating children

8. What is your role in the family?

- ◯ Father
- ◯ Mother
- ◯ Child
- ◯ other

9. What is your households monthly income?

10. Are you a -------- in the property in which you are living in?

- ◯ Landlord
- ◯ Tenant
- ◯ Other

11. How did you acquire this property?

- ◯ Inherited
- ◯ Bought via individual savings
- ◯ Bought via bank mortgage
- ◯ Bought via the Social Security and Housing Finance Cooperation's Housing Support Scheme
- ◯ Other

12. When did you move to this community?

13. Why did you move to this community?

14. How old is your house(s)

- ◯ 0-5 years
- ◯ 5-10 years
- ◯ 10- 15 years
- ◯ 15 years and above

15. What are the building materials used in the construction of your house(s)

- ◯ Cement blocks
- ◯ Mud blocks
- ◯ Bamboo
- ◯ Others

16. How would you describe the condition of the building(s) in your compound?

- ◯ Good condition
- ◯ Needs major repair
- ◯ Needs minor repair
- ◯ Needs expansion
- ◯ other

Hazard and Risk Perception

17. On a scale of 0 (never) to 5 (very frequently) how frequent does the following climatic events occur in your community?

	Never	Rarely	Sometimes	Often	Very often
Floods	○	○	○	○	○
Windstorms	○	○	○	○	○
Landslide	○	○	○	○	○
Bushfire	○	○	○	○	○
Weater pollution	○	○	○	○	○
Water scarcity	○	○	○	○	○
Heatwaves	○	○	○	○	○
Drought	○	○	○	○	○

Section

18. What do you think about climate change?

19. Which of the following impacts of have you or the community incurred as a result of the climate events you experience?

- ◯ Lost and or damage to property
- ◯ Lost and or damage to public property
- ◯ Communicable diseases
- ◯ Lost of life
- ◯ All of the above
- ◯ None of the above
- ◯ Other

20. What are the cause of the above mentioned impacts?

- ◯ Lack of/ inadequacy of infrastructure
- ◯ Lack or inadequacy of services
- ◯ Lack of knowledge on how to protect ourselves
- ◯ Lack of support from the government
- ◯ Lack of family income
- ◯ Location (flood prone)

flooding

21. How much have you or the community been affected by flooding in recent years?

- ◯ Severely affected (worst than before)
- ◯ Affected but not severe (better than before)
- ◯ Not affected

22. what are the particular results of the major flooding issues in the community loss of life, health problems communicable diseases, damage to infrastructure and sewage system, water problem accesability

23. On a scale of 1-5, how would you rank the following causes of flooding in your community

	1	2	3	4	5
Heavy rainfall	○	○	○	○	○
Building along floodplain	○	○	○	○	○
Slope and topography of the area	○	○	○	○	○
Poor drainge facilities	○	○	○	○	○
Soil type	○	○	○	○	○
Impervious surface	○	○	○	○	○
Dumping of waste and refuse on drainage and gutters	○	○	○	○	○
Blockage of drainage and channels	○	○	○	○	○
Unplanned development along flood plain	○	○	○	○	○

Household and Community Adaptation Response

24. What does the government do in order to protect you or the community from flooding?

25. Do you think government support is enough? Why or why not?

26. What preventative measures does the community carry out in order to prevent or reduce flood risk?

27. what preventative measures do you as a household or individual carry out in order to prevent or reduce flood risks?

28. On a scale of 1 (LOWEST)-5 (HIGHEST) which of the following pre-flood adaptation strategies do you as an individual or community use the most?

	Option 1	Option 2	Option 3	Option 4	Option 5
Clear waterways to remove dirt	○	○	○	○	○
Di-Siltation	○	○	○	○	○
Use of sandbags	○	○	○	○	○
widen drainage channels	○	○	○	○	○
Build fences and water barririers	○	○	○	○	○
other	○	○	○	○	○

29. On a scale of 1 (lowest) - 5 (highest) which of the following coping strategies do you as in individual or community practice the most during flooding ?

	Option 1	Option 2	Option 3	Option 4	Option 5
Relocate temporarly	○	○	○	○	○
Move to a safe location	○	○	○	○	○
Digging channels to drain off the water	○	○	○	○	○
Do nothing and wait for assistance from the authority	○	○	○	○	○
communicate with authorities	○	○	○	○	○
Take care of the childreen and the needy	○	○	○	○	○
other	○	○	○	○	○

30. on a scale of 1 (lowest) - 5 (highest) which of the following coping strategies do you as an individual or community use the most after flooding ?

	Option 1	Option 2	Option 3	Option 4	Option 5
seek for help to drain and claer blocked drainages	○	○	○	○	○
inform the authorities	○	○	○	○	○
sensitize the community on the risk	○	○	○	○	○
equally distribute relief aid and resources among the most affected	○	○	○	○	○
other	○	○	○	○	○

31. Do you know of any actions carried out by any government institution to prevent flood and or protect life and property during flood.

Services and Infrastructure

32. Is there a lack of or inadequacy of infrastructure (roads, drainage, sewage systems etc.) and services (pipe-borne water, electricity and waste collection) in Ebo Town? If so please explain

33. Do you think that the residents of Ebo Town are subjected to exclusion and injustice?

34. Do you think that other settlements, towns or villages within KMC are provided with better infrastructure and service than the community of Ebo Town?

35. Do you think that the needs and interests of Ebo Town are fairly and effectively represented by your ward councillor and member of parliament?

APPENDIX D. CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Joof, Momodou Lamin

Nationality: [redacted]

Date and place of birth: [redacted]

Marital status: [redacted]

Phone: [redacted]

Email: [redacted]

EDUCATION

Degree	Institution	Year of Graduation
Ms	Gazi University Urbanization and Environmental Problems	2018
BA	University of The Gambia Devlopment Studies	2013
High School	Essau Senior Secondary School	2009

FOREIGN LANGUAGES

Turkish C1

PUBLICATIONS

1. Joof M.L., "Gambiya'da Tarim ve Gida Üretimi: Politikalar, Zorluklar ve Ilerisi", Gazi Üniversitesi Sosyal Bilimler Dergisi, 5(12), 28-33 (2018)

AWARDS

METU Course Performance Award (2018-2019)

APPENDIX E. TURKISH SUMMARY / TÜRKÇE ÖZET

Bölüm 1: Giriş

Kentleşme oranı yüzyıldır sürekli artmakta ve dünya nüfusunun yarısı kentlerde yaşamaktadır. Sahra Altı Afrika'da, 2030 yılına kadar bölgenin kentsel nüfusunun önemli bir kısmının 1 milyondan fazla nüfusa sahip kentlerde yaşayacağı öngörülmektedir; bu, hızlı ve yoğun kentsel büyümenin bir göstergesidir (Dodman vd., 2017). Ancak, kentler ve kentsel alanlar, kentsel göçmenlerin içe doğru hareketliliğini karşılayacak oranda gelişmemektedir. Bu durumlar sonucunda şu sonuçlar ortaya çıkmaktadır: (1) artan kentsel nüfus, (2) kentlerde ve kentsel alanlarda yaşayan insan sayısını destekleyecek yetersiz kritik kentsel altyapı ve (3) yukarıdaki ikisinin birikmesi, gayri resmi yerleşimlerin oluşumuna yol açmaktadır. Bu durum, gelişmekte olan ülkelerin kentlerinde ve kentsel alanlarında daha belirgin bir şekilde gözlemlenmektedir. Bu kentlerin içinde, kentsel kenarları oluşturan ve gayri resmiliğin yanı sıra drenaj, asfalt yollar ve dayanıklı evler gibi yetersiz kritik kentsel altyapının yaygın olduğu bölgeler en çok etkilenecektir.

IPCC, "bugün yürürlükte olanların ötesinde ek azaltma çabaları olmadan ve hatta adaptasyonla bile, 21. yüzyılın sonuna doğru ısınmanın küresel çapta şiddetli, yaygın ve geri döndürülemez etkilere ilişkin yüksek ila çok yüksek riske yol açacağı" konusunda uyarıda bulunmaktadır (2014, s. 17). IPCC, 2021 raporunda, bölgesel ölçekte ani tepkilerin, dönüm noktalarının ve hatta değişim yönündeki geri dönüşlerin dışlanamayacağını ve insan kaynaklı iklim değişikliği ile ilişkili aşırı uçlara dair gözlemlerin son raporun yayınlandığı tarihten bu yana güçlendiğini yüksek bir güvenle ifade etmektedir (IPCC, 2021). Bu durum, iklim değişikliğine yönelik adaptasyon ve azaltma çabalarının aciliyetini ve önemini vurgulamaktadır.

Küresel Kuzey'deki şehirlerde iklim değişikliğinin etkilerini azaltmaya yönelik çok sayıda araştırma, teknik bilgi ve altyapı mevcuttur. Ancak, iklimle ilgili tehlikelerin

sıklığı ve yoğunluğundaki artış, kırılganlıkları nedeniyle benzeri görülmemiş bir seviyeye ulaşmış ve önleme, müdahale ve azaltma oranları, ilgili etkilerle başa çıkmak için yetersiz kalmıştır. Bu durum, Küresel Güney'in birçok şehrinde ek azaltma ve uyum önlemlerine ihtiyaç duyulmasına yol açmaktadır. Gambiya'da, ülkedeki yüksek kentsel yoğunlaşma oranlarına rağmen, hızlı kentleşme genellikle geliştirme amaçlarına uygun olmayan arazilerde geniş ve plansız bir şekilde gerçekleşmektedir.

IPCC'nin beşinci değerlendirmesinde "risk azaltıcı altyapı ve hizmetler" olarak adlandırılan unsurların yokluğu veya yetersizliği, birçok gelişmekte olan ülkede riski azaltmak ve uyum kapasitelerini geliştirmek amacıyla bu tür hizmetlerin sağlanmasını zorunlu kılmaktadır. Bu durumun riski azaltmada gerekli olduğu kabul edilirken, (1) gelişmekte olan ülkelerdeki gayri resmi yerleşimlerde böyle bir kalkınma yoluna ulaşmanın ne kadar gerçekçi olduğu, (2) CO2 emisyonu ve çevresel bozulma açısından maliyetlerin değerlendirilmesi de son derece önemlidir. Mevcut azaltma çabalarına karşı üretken olmayabileceği öne sürülmektedir. Kanıtlar, maliyetlerin yüksek olduğunu göstermektedir. Gelişmekte olan ülkelerin, gelişmiş ülkelerin sahip olduğu seviyeye denk bir altyapı geliştirmeleri durumunda, bunun dünyaya yaklaşık 350 gigaton (Gt) CO2 emisyonuna mal olacağı ve gelişmekte olan ülkelerdeki hızlı büyüyen şehirler için altyapı inşa etmenin 2050 yılına kadar 226 Gt CO2 salımına yol açabileceği tahmin edilmektedir (Bai vd., 2018, s. 25). Bu durum, kentsel çalışmalardaki baskın teorik bakış açıları ve modeller için önemli sorunlar ortaya çıkarmaktadır. Bu nedenle, alternatif kentleşme modellerinin yeniden incelenmesi, ayarlanması veya radikal bir şekilde araştırılması ve takip edilmesi gerekmektedir.

İklim değişikliğinin etkilerinin sıklığı, yoğunluğu ve ciddiyeti ile gayri resmi topluluklar da dahil olmak üzere en savunmasız gruplar üzerindeki öngörülen etkileri nedeniyle, gayri resmi yerleşimlerde iklim değişikliğinin azaltılması ve adaptasyonunun anlaşılması için çağrılar yapılmıştır. Bu bağlamda, Bai ve arkadaşları, gayri resmi yerleşimlerde iklim değişikliğine adaptasyonun kentsel iklim değişikliği için temel bir araştırma önceliği olduğunu vurgulamış ve resmi ile gayri resmi ilişkiler arasındaki etkileşimi ve marjinalleştirilmiş bireylerin seslerini dahil

etme yollarını incelemede bir araştırma boşluğu tespit etmiştir (Bai vd., 2018, s. 2). Benzer şekilde, Satterthwaite ve arkadaşları (2018), kentsel iklim değişikliğine adaptasyon için önemli bir unsur olarak gayri resmi yerleşimlerin iyileştirilmesinin önemini vurgulamaktadır. Pratik bir bakış açısıyla, kalkınmadaki eşitsizlik ve adaletsizliğin yarattığı temel zorlukların kabulüyle, Birleşmiş Milletler, Sürdürülebilir Kalkınma Hedeflerine toplumun tüm üyeleri ve kesimleri için ulaşılmasını sağlamak amacıyla "Kimseyi Geride Bırakmama" ilkesini benimsemiştir. Dolayısıyla, hem insan kaynaklı hem de doğal afetlere uyum sağlama fırsatları konusunda adalet ve hakkaniyet sağlanmadığı takdirde, en savunmasız kesimlerin kalkınma hedeflerine ulaşmasının zor olacağı kabul edilmektedir.

İklim değişikliği ve adaptasyon üzerine geniş bir literatür mevcuttur ve bu çalışmaların çoğu, analiz birimi olarak planlı şehirleri ele almaktadır. Ancak, birkaç istisna dışında, gayri resmi yerleşimlerin adaptasyon teknikleri ve kapasiteleri hakkında sınırlı bilgi bulunmaktadır. Bu bağlamda, araştırmanın aşağıdaki hedefleri bulunmaktadır. İlk olarak, Ebo Kasabası örneğinden hareketle gayri resmi yerleşimlerdeki iklim değişikliği risklerini belirlemek. İkinci olarak, gayri resmi yerleşim sakinlerinin kullandıkları adaptasyon kapasitelerini ve tekniklerini ayırt etmek. Araştırmanın üçüncü amacı, iklim değişikliği adaptasyonu, gayri resmilik ve adalet ile iklim adaleti konularındaki literatüre katkıda bulunmaktır. Üçüncü soru bağlamında, bu tez, iklim adaletinin adalet sorunlarının incelendiği bir konu olarak ele alınması yerine adalet boyutlarına entegre edilmesi gerektiğini savunmaktadır. Gayri resmi yerleşimcilerin iklim değişikliği riskinin farkında olduklarını ve bu nedenle buna yerel adaptasyon stratejileri ile yanıt verdiklerini ortaya koymayı hedeflemektedir. Başlangıç noktası, yerleşimin gayri resmi bir yerleşim olarak resmen tanınmaması nedeniyle oluşan tanınma adaletsizliğini düzeltmektir; bu durum, yetkililer tarafından yerleşimdeki durumun kendi kendine yapılmış olarak değerlendirilmesine ve dolayısıyla afet durumlarında bile önceliklendirilmemesine yol açmakta, yeterli kritik kentsel hizmetler ve altyapı sağlanmadan vergi tahsisine tabi tutulmasına neden olmaktadır. Bu hedeflere ulaşmak için, bu araştırma aşağıdaki sorulara yanıt arayacaktır: (1) Gayri resmi yerleşimlerin uyum kapasiteleri ve teknikleri nelerdir ve bu teknikler resmi uyum tekniklerine nasıl entegre edilebilir? (2) Gayri resmi yerleşimlerde yaşayan nüfusun kırılganlıklarını azaltmak için ne

yapılması gerekmektedir? (3) Ebo Kasabası sakinleri arasında iklim değişikliğine uyum konusunda adalet algıları nelerdir ve bu, toplum içinde uyum girişimlerini nasıl mümkün kılar veya yönlendirir?

Bu araştırma, gayriresmîlikten uyum dersleri çıkarma ve anlama konusundaki ortaya çıkan söylemle, yalnızca azaltma konusundaki küresel taahhütlere katkıda bulunmakla kalmayıp aynı zamanda belirgin iklim riskine duyarlı politikalar tasarlamanın gerekliliğine işaret eden iklim politikalarını düzenleme ve tasarlama ihtiyacıyla ilgilidir. Ayrıca, iklim adaletini, Sendai Çerçevesi gibi küresel politika süreçlerinin yokluğunda afet riskinin azaltılması, Kimseyi Geride Bırakmama ilkesi, Sürdürülebilir Kalkınma Hedefleri ve Yeni Kentsel Gündem gibi küresel politika süreçlerinin elde edilmesinin zor olacağı iklim değişikliği-gayriresmîlik bağına ilişkin tartışmaların ön saflarına yerleştirir. Uygulama açısından, binaların zemin kotunun artırılması ve afet sonrası yardım desteği ile sel mağdurlarına geçici barınak sağlanması gibi müdahale eylemleri, uyum stratejilerine ilişkin araştırma bulgularının sosyal ağlar aracılığıyla örgütlenip yönlendirilmesiyle, politika yapıcılar için yerel uyum stratejilerini resmi stratejilerle bütünleştirmede önemli bir başlangıç noktası oluşturabilir.

Bölüm 2: Kentsel Politik Ekoloji, İklim Değişikliği ve Kentsel Gayriresmîlik

Kentsel süreçler, sosyal, ekonomik, politik ve çevresel faktörler arasındaki sürekli etkileşimler tarafından şekillendirildiğinden son derece karmaşıktır. Kentsel politik ekoloji yaklaşımı, bu karmaşıklığı anlamada önemli bir analitik çerçeve sunar. Bu yaklaşım, bir yandan sosyal, ekonomik ve politik faktörler ile diğer yandan çevresel sorunlar arasındaki diyalektik ilişkiye odaklanarak, her iki unsurun da kentsel yaşamı nasıl dönüştürdüğünü ve şekillendirdiğini açıklamaktadır. Bu nedenle, bu bölüm, bu araştırma için bir çerçeve oluşturacak şekilde kentsel politik ekolojinin temel teorik kavramlarının tartışılmasıyla başlamaktadır.

Bu bölüm, tezin teorik çerçevesini belirleyen literatürü gözden geçirmektedir. Kentsel politik ekolojinin karmaşık kentsel süreçleri şekillendiren sosyal, ekonomik, politik ve çevresel faktörleri anlamaya nasıl katkı sağladığını ve kentsel şiirsel

ekolojideki çevresel risk ve tehlikelerin üretimi gibi temaların risk, gayriresmîlik ve iklim değişikliği ile nasıl ilişkilendiğini inceleyerek başlamaktadır; bu da kırılganlık ve adaptasyon üzerine araştırma sorusunu şekillendirmektedir. Bunu, iklim adaleti üzerine araştırma sorusunun çerçevelendiği adalet boyutu ve başlıca paradigmalar üzerine teorik bir tartışma takip etmektedir. Daha sonra, kentsel politik ekoloji, iklim değişikliği ve kentsel gayriresmîlik arasındaki bağlantıları incelemeden önce iklim değişikliği adaptasyonunu, dayanıklılığı ve gayriresmîliği kavramsallaştırmaktadır. Tez, dağıtımsal, tanınma ve prosedürel adalet gibi adalet kavramlarını ele almakta ve bunların kırılganlık ve adaptasyon üzerindeki etkilerini kullanmaktadır.

Bölüm 3

Gambiya'dan yalnızca bir vaka çalışması gerçekleştirilmiştir; zira iklim değişikliği adaptasyonu, mekansal kırılganlık ve iklim adaleti konularında ülkede göz ardı edilmiş ve yeterince incelenmemiş olmasına rağmen, önemli dersler sağlama potansiyeline sahiptir. Gambiya vakasını derinlemesine inceleyerek, Küresel Güney'deki iklim politikası için adaptasyon ve adalet meselelerine dair bazı dersler elde edilebilir.

Dokuz kilit bilgilendirici (merkezi hükümetten 5 kişi) ve (belediye meclisindeki çalışma alanı için yerel temsilci olarak mahalle meclis üyesi dahil) (belediyeden 4 kişi) ile görüşmeler gerçekleştirilmiştir. Kilit bilgilendiricilerin görüşüldüğü kilit kurumlar, doğrudan çalışma ve görüşülen kişinin iş pozisyonu üzerinde etkisi olan müdahale alanları veya yetkiler gibi kriterlere göre belirlenmiştir. Son olarak, ikinci veri seti Ebo Kasabasında yürütülen anketler aracılığıyla elde edilmiştir. Anketler, hanehalkı reislerini hedef almıştır. Çalışma alanının nüfus büyüklüğü dikkate alınarak, Ebo Kasabasının tüm mahallelerinde örneklem büyüklüğünün yaklaşık %5'ini temsil eden yaklaşık 250 katılımcıyla görüşülmüştür. Bu katılımcılardan sırasıyla yaklaşık %64 ve %36'sını temsil eden 138'i kadın, 77'si erkek olmuştur. Toplulukta uygulanan anketlere ek olarak, topluluktan bazı katılımcılarla derinlemesine görüşmeler gerçekleştirilmiştir. Katılımcılar kartopu örnekleme yöntemiyle elde edilmiştir. Hem görüşmeler hem de saha araştırması (anketler) 25 Kasım 2023 - 5 Şubat 2024 tarihleri arasında yapılmıştır.

Yarı yapılandırılmış görüşmeler, tematik araştırma sorularına göre yazıya dökülmüş ve analiz edilmiştir; anketler ise kodlanarak tanımlayıcı istatistiksel analiz için SPSS 20'ye aktarılmıştır. Birden fazla kaynaktan elde edilen veriler, verilerin tutarlılığını ve güvenilirliğini belirlemek amacıyla derlenmiş ve çapraz doğrulama ile üçgenleştirilmiştir (Yin, 2013).

Bölüm 4: Gambiya: Arka Plan Bilgileri

Konum

Batı Afrika'da yer alan Gambiya, Afrika kıtasının Batı Kıyısı'nın en uç noktasında konumlanmaktadır. Gambiya, 13 derece Kuzey enlemi ile 13.79 ve 16.82 Batı boylamları arasında bulunmaktadır. Bu durum, ülkeyi Batı Yarımküre'de ekvatorun üzerinde yerleştirmektedir. (Doğu-Batı) 480 km uzunluğunda ve (Kuzey-Güney) 48 km genişliğinde, toplam 11.300 km²'lik bir alana sahiptir; bu nedenle kara kütlesi açısından anakara Afrika'nın en küçük ülkesidir. Ülkenin nüfusu 2 milyon olup, km² başına 273'lük dikkat çekici bir nüfus yoğunluğuna sahiptir. Gambiya Nehri, ülkenin toplam arazisinin yaklaşık %10'unu kaplarken, bataklık alanlar ve taşkın yatakları bu arazinin yaklaşık %20'sini oluşturmaktadır. Topografya, çeşitli su kütleleri, alçak bataklık alanlar, taşkın yatakları ve sulak alanlar ile alçak ve yüksek platoları içermektedir.

Gambiya, dünyanın en alçak rakımlı ülkeleri arasında yer almaktadır. Ülke, deniz seviyesinin yükselmesine karşı son derece savunmasızdır. Yıllık ortalama yağış miktarı, ülke genelinde 850 mm ile 1200 mm arasında değişiklik göstermektedir. Yağışlı mevsimin zirvesi Temmuz, Ağustos ve Eylül aylarında yaşanmakta olup, Ağustos ayındaki yağış miktarı yıllık toplamın yaklaşık %37'sini oluşturmaktadır. Yağışın mekansal dağılımı, ülkenin üst kesimlerindeki Güneydoğu bölgelerine kıyasla daha fazla yağış alan ve daha sık ormanların bulunduğu kıyı bölgelerinde, özellikle Güneybatı bölgelerinde oldukça değişkendir. Sıcaklık desenleri açısından da benzer bir eğilim gözlemlenmektedir; Yundum meteoroloji istasyonu için yıllık ortalama sıcaklıklar 1986 yılında 25,7% ile düşük iken, ertesi yıl hızla 26,9%'ye yükselmiş ve 1997'de 27,5% ile zirve yapmıştır. Mekansal değişkenliğin hareketlilik

ve savunmasızlık üzerindeki etkileri bulunmaktadır. Bu mekansal değişimler, GBA'nın daha kuru tahıl bölgelerinden kıyı bölgelerine insan hareketliliği arttıkça ve GBA'daki daha alçak, sel eğilimli alanlar yoğunlaştıkça kentsel iklim değişikliği kırılganlığına katkıda bulunmaktadır. Bu durum, mekansal değişimlerin yanı sıra iklim kaynaklı riske maruz kalmaya ve kırılganlığa yol açmakta; son on yılda günlük yüksek hacimli yağışların sıkça meydana geldiği gözlemlenmiş ve bu, rüzgar fırtınalarının ve ani sellerin büyüklüğünde, şiddetinde ve sıklığında artışa neden olmuştur. Ancak, ülkedeki yağış desenlerinde, veri periyodu boyunca farklı aralıklarla en kurak ve en yağışlı mevsimlerin yaşandığı yıllar gözlemlenmiştir.

Gambiya'da Büyük İklim Etkileri

Kuraklık

Sahel bölgesi, yağışlı dönemler ile aşırı kurak dönemler arasında değişen yıllık veya on yıllık iklim koşullarıyla karakterize edilen son derece değişken bir iklime sahiptir. Gambiya'nın ortalama yıllık yağışı, 1886 ile 1969 arasındaki dönemde 1.200 mm'den 1970'lerde ve 1980'lerde sırasıyla 883 ve 744 mm'ye keskin bir düşüş göstermiştir (Yaffa, 2013, s. 469). Ancak, 1990'larda ve 21. yüzyılın başında ortalama yağışta 800 mm'lik marjinal bir artış gözlemlenmiş olsa da, genel olarak 1200 mm eşiğinin altına inmiştir. 1972, 1983-1985, 1990-1993, 1996-1998/1999 ve 2002 (Jallow vd., 2020), 2011 ve 2014 yıllarında değişken şiddette kuraklık dönemleri kaydedilmiş, 2016 yılında ise yağışlarda gecikme ve eksiklik yaşanmıştır.

Sel baskınları

Taşkın, ülkede en yaygın, yıkıcı ve ulusal düzeyde meydana gelen doğal afet olmuştur. Etkileri ve oluşumu yerel ölçekleri aşmaktadır. Örneğin, taşkın, farklı şiddetlerde de olsa, tüm idari bölgelerdeki yerleşim yerlerinde kaydedilmiştir. Ülkenin bölgeleri arasındaki ticaret ve tarıma olan bölgesel bağımlılık, bunun belirli mekansal ölçeklere yayılan sonuçları olduğu anlamına gelir.

Ülkede meydana gelen sel olaylarının sıklığı, şiddeti ve neden olduğu hasar (can ve mal kaybı) yeterince belgelenmemiştir. Ancak, bazı büyük sel olayları yaşanmıştır;

ilk büyük sel olayı 1948'de Banjul'da kaydedilmiştir. Yüzyılın başında kaydedilen sel sayısında bir artış gözlemlenmiş olup, 2002, 2006, 2009, 2010, 2012, 2016, 2020 ve 2022 yıllarında meydana gelmiştir.

Deniz seviyesinin yükselmesi (SLR) ve Kıyı Erozyonu

Gambiya'da deniz seviyesinin yükselmesi ve kıyı erozyonunun ciddi kayıplara yol açması beklenmektedir; zira bu ülke, deniz seviyesinin yükselmesine ve kıyı erozyonuna karşı en savunmasız ilk 10 ülke arasında yer almaktadır (Ampomah vd., 2012). Gambiya'nın deniz seviyelerinde bir artış olması durumunda, kıyı taşkınlarına maruz kalabilecek alçak kıyı alanları mevcuttur. Ülkede deniz seviyelerinde 1 metrelik bir artışın, kıyı alanları boyunca 92 km'lik bir arazinin sular altında kalacağı öngörülmektedir (Amuzu vd., 2018), bu da ülkenin toplam kara alanının yaklaşık %8,7'sini temsil etmektedir.

Rüzgar kasırgası

Gambiya'da rüzgar fırtınalarının etkileri, sıklığı ve şiddeti 1980-2022 döneminde artış göstermiştir; en sonuncusu 2019-2022 yıllarında gerçekleşmiştir. Önemli rüzgar fırtınası olayları 1999, 2003, 2004, 2008, 2009, 2019 ve 2021 yıllarında kaydedilmiştir.

Yerel Yönetimler

Gambiya'daki yönetim ve idare, hem merkezi hem de merkezi olmayan güç kontrolü unsurlarını barındırıyor gibi görünmektedir. Gambiya'daki kentsel yönetim, yukarıdan aşağıya devlet müdahalesi, planlama yetkililerinin merkezileştirilmesi ve boru hattıyla su ve elektrik temini gibi kentsel hizmetlerin sağlanması biçimindeki otoriterlikle tanımlanmaktadır. Kentsel planlama işlevi ve arazi kullanım planlaması, DPPH'de merkezileştirilmiş devlet işlevleridir; kamu hizmetleri ise bir devlet işbirliği olan Ulusal Su ve Elektrik Şirketi aracılığıyla sunulmaktadır. Bu durum, belediyeleri planlama kararları üzerindeki yetkiden mahrum bırakmaktadır.

Birçok ülkede, kentsel iklim adaptasyonunu ve dayanıklılığını artırmada kentsel yönetimlerin rolleri gerektiği gibi dikkate alınmıştır. Avustralya ve Hollanda (Arwin van Buuren, 2015) gibi ülkeler ile Baltimore Şehri (Hughes vd., 2018) gibi bazı şehirler, ülke genelindeki ulusal adaptasyon politikalarına rağmen bölgesel ve şehir ölçeğinde adaptasyon politikaları benimsemiştir. Bu tür rejimler altında, şehir ve bölge düzeyindeki hükümetler, genel ulusal iklim değişikliği adaptasyon çabalarına katkıda bulunurken, yerel adaptasyon ihtiyaçlarını ele alma özgürlüğüne sahiptir. Ancak, yerel yönetimlerin iklim değişikliği adaptasyon girişimlerini planlama ve uygulama yetkisine sahip olduğu Gambiya ve birçok Afrika ülkesinde, bu tür planları sürdürmek için teknik kapasite ve finansal kaynaklar açısından kısıtlamalarla karşılaşmaktadırlar. Aslında (Sanni vd., 2019), "özgül kentsel iklim değişikliği adaptasyon politikalarına sahip" hiçbir Batı Afrika ülkesinin bulunmadığını ve Gana ile Nijerya hariç, iklim değişikliği politika belgelerinin şehir ölçeğinde adaptasyon girişimlerini ele almadığını iddia etmektedir.

Bölüm 5: Gambiya'da Kentleşme, İklim Değişikliği Politikaları ve Yönetimi

Bu bölüm, kentsel gayriresmîliği ve nedenlerini; kentleşmenin ülkede nasıl geliştiğini; iklim değişikliği yönetimini ana hatlarıyla ele alır; ayrıca Gambiya'daki temel iklim ve çevre politikalarına genel bir bakış sunar. Kurumlar arasındaki koordinasyon eksikliklerini ve politika boşluklarını belirlerken, mekansal politikaların yanı sıra iklim ve çevre politikalarının parçalanmışlığını da vurgular. Bu durum, entegre ve akıcı mekansal ile iklim politikalarının yokluğunda, daha fazla insanın sel riski taşıyan alanlara, genellikle ekolojik olarak korunan bölgelere girmesiyle iklim riskine maruz kalma ve kırılganlığın artacağına işaret eder. Ayrıca, savunmasız topluluklar içindeki mevcut iklim tehlikelerini ele almayan iklim politikaları, küresel ısınmayı azaltma çabaları ne kadar iddialı olursa olsun, yerel dayanıklılık oluşturma konusunda başarısız olacaktır.

Gambiya'da Şehirleşme Süreci

Gambiya'nın kentsel nüfusu 1960'tan 1970'e kadar sürekli bir artış göstermiştir. 1960 yılında toplam nüfusun yalnızca %12'si kentsel alanlarda ikamet ederken, bu oran

1975'te iki katına çıkmıştır. 1980'lere gelindiğinde kentsel nüfus belirgin bir şekilde artmaya başlamış, böylece 1980'lerin ortaları ülkede hızlı bir kentleşme dönemini işaret etmiştir. 2003 nüfus sayımına göre, ülke nüfusu 1,3 milyon olarak belirlenmiştir. Yirminci yüzyılın başında nüfusun %50'si kentleşmiştir. Kentleşmiş nüfusun yaklaşık %53'ü Banjul ve Kanifing Belediyelerinde yaşarken, %34'ü Brikama Yerel Yönetim Alanı'nda ikamet etmektedir. Bu üç idari alan, kentsel nüfusun %87'sini oluşturmakta ve ülkenin kara kütlesinin yaklaşık %17,3'ünü kapsamaktadır; kalan %13 ise beş idari alana eşit olmayan bir şekilde dağılmıştır. 2013 nüfus sayımına göre, 1,8 milyonluk ülke nüfusunun %57,8'i kentleşmiş olup, bu oran 2018'de %61,3'e ulaşarak Gambiya'yı %3,1'lik tahmini büyüme oranıyla Afrika'nın en hızlı kentleşen ülkeleri arasına sokmuştur (Gambiya İstatistik Bürosu, 2013b).

Gambiya'da İklim Değişikliği ve Çevre Politikalarına Kapsamlı Bir Bakış

İklim değişikliğinin nüfusun büyük bir kısmının yaşamları ve geçim kaynakları için oluşturduğu tehditler kabul edilmiştir. Bu kabul, iklim kaynaklı tehlikelerin sıkça meydana gelmesi ve bunun sonucunda ülkenin iklim değişikliği politikalarının zaman çizelgesinde belirtildiği gibi son on yılda iklim politikalarının formülasyonundaki yaygınlaşmayı yansıtmaktadır. Ancak, ulusal politikalar, DWR'den önemli bir yanıt verenin de belirttiği gibi, proje odaklı, bağlantısız ve kötü uygulanmış oldukları için geçici kalmıştır: "Gambiya'da biz [bürokratlar] karar almada çok iyiyiz. Ancak uygulamaya gelince her zaman bir sorun vardır." Belki de, Gambiya İklim Dayanıklılığı Stratejik Programı'nda (2017, s. VIII) kabul edildiği üzere, aşağıdaki ifade ulusal çevre ve iklim değişikliği politikalarının başarısızlığının özlü bir tanımını sunmaktadır:

“Gambiya'nın politika ve yasal çerçevesi, mevcut ve gelecekteki iklim risklerine ve değişimlerine yönelik yanıtların tam olarak entegre edilmesi ve yönlendirilmesi için önemli güncellemeler gerektirmektedir. İlgili sektörel mevzuatların çoğu, iklim değişikliği risklerinin gerçeklerini yansıtmamaktadır; mevzuatın “çevre”ye atıfta bulunduğu durumlarda bile, bu genellikle iklim değişikliğine hazırlığın daha geniş bağlamından ziyade çevresel etki değerlendirmesi perspektifine odaklanmaktadır.

Birçok politika ve stratejinin iklim dayanıklılığına karşıt hükümler içermesi, politika tutarlılığı eksikliğine yol açmakta ve bu durum portföyler arasında çatışmalara neden olmaktadır" (MECCNAR, 2017, s. vii).

Politika uygulamasındaki bu başarısızlığın arazi kullanımı, mekânsal planlama ve çevre koruma açısından büyük sonuçları olmuştur. Ulusal politikalar, ayrıca gayriresmi yerleşim yerlerindeki savunmasız topluluklar üzerindeki iklim değişikliğinin etkilerini yeterince ele almakta yetersiz kalmıştır.

Bölüm 6: EBO KASABASINDA İKLİM DEĞİŞİKLİĞİNE YÖNELİK DUYARLILIK VE UYUM

Kanifing Belediye Meclisi (KMC), ülkenin yerel yönetim alanlarını oluşturan beş idari bölgeden biri olan iki belediyeden biridir. 2023 nüfus sayımı verilerine göre KMC'nin nüfus yoğunluğu, kilometrekare başına 4.478 kişi ile ülkenin en yüksek yoğunluğuna sahiptir. %75,5'lik kara yüzeyi ile toplam nüfusun %20,3'üne ev sahipliği yapmaktadır. Topografik olarak, Ebo Kasabası belediyenin kuzey kesiminde yer almakta olup, kuzeyde ve güneybatıda Eski Jeswang ve Talinding ile doğuda Tanbi Sulak Alanı ile komşudur.

Risk Algısı

Araştırma, yerel halkın iklim değişikliği anlayışını kendi hesapları aracılığıyla ortaya çıkarmayı hedeflediğinden, risk algılarının sayısal analizi burada önceliklendirilmemiştir. Katılımcıların risk algısını belirlemek amacıyla, bölgedeki değişen iklim kalıplarına dair algıları hakkında sorular yöneltilmiştir. Bu bağlamda, bazı katılımcılar iklimin değiştiğini, "durağan olmadığını" ve iklimdeki değişiklikleri ölçmek için bir parametre olarak havadaki değişiklikleri kullandıklarını ifade etmişlerdir. Örneğin, katılımcılar hava koşlarındaki ve başlangıç dönemindeki değişikliklerin değişen iklimden kaynaklandığını vurgulamışlardır. Başka bir katılımcı, "Yılın bu zamanında (Aralık) sıcaklıkların daha düşük olmasını bekliyordum ama hala sıcak" demiştir. Bu yorum, nispeten daha düşük sıcaklıklar ve daha kuru, toz yüklü rüzgarlarla karakterize edilen Harmattan döneminin

başlangıcıyla ilgilidir (iklim değişikliklerinin mevsimsel havanın başlangıç ve bitiş dönemlerini etkilediğini göstermektedir). Katılımcılar ayrıca yağış ve sıcaklık kalıplarındaki değişiklikleri de dile getirmişlerdir. Önceki yerleşimciler arasında, yağışın geçmişe kıyasla son zamanlarda arttığına dair raporlar bulunmaktadır. Bu durum, bölgenin 1970-1980'lerde hızlı bir kentsel yayılma yaşamaya başlamasıyla ilişkilendirilebilir; bu dönem, ülke genelinde yağış desenlerinde bir azalma ile karakterize edilmiştir. Katılımcılar sıcaklık desenleri ile ilgili benzer gözlemlerde bulunmuş ve birçok katılımcı son zamanlardaki sıcaklıkların normalden daha yüksek olduğunu belirtmiştir. Ancak katılımcılar aşırı sıcaklıkların da şu şekilde meydana geldiğini gözlemlemişlerdir: "Son zamanlarda soğuk hava dalgaları oldu ancak genel olarak alışılmadık derecede aşırı sıcak hava yaşıyoruz." Örneklem popülasyonu içinde değişen iklim desenlerine ilişkin algılar, hesaplarında gösterildiği gibi bir şekilde iklim verileriyle tutarlıdır.

Taşkın Deneyimi ve Etkileri

İklim değişikliğiyle ilişkili riskler ve tehlikeler açısından, sel, fırtına ve hava kirliliği, toplumu etkileyen en yaygın iklimle ilgili üç risk olarak tanımlanmıştır. Sel, 4,62 ortalama puanla en sık görülen iklim kaynaklı risk olarak değerlendirilmiş; bunu 3,38 ortalama puanla fırtına ve 3,15 ortalama puanla hava kirliliği izlemiştir; hepsi beş puanlık Likert ölçeğinde yer almaktadır. Sıcak hava dalgaları da sıkça karşılaşılan tehlikeler arasında kabul edilmiştir. Topluluğun yaşadığı hasar ve yıkım nedeniyle, katılımcılar arasında sel ve fırtına riski konusunda daha fazla endişe ifade edilmiştir. Ülkede sıkça görülen iklimle ilgili afetlerin aksine, kuraklık toplum için büyük bir tehdit olarak algılanmamaktadır. Ani seller Ebo Kasabası'nda her yıl meydana gelen bir durumdur; ancak yıkım ölçeği açısından yoğunlukları ve ciddiyetleri son yirmi yılda artış göstermiştir. Yıllar içinde taşkınların şiddetini belirlemek amacıyla katılımcılara, şu ölçekler kullanılarak son zamanlarda taşkınlardan ne ölçüde etkilendikleri sorulmuştur: ciddi şekilde etkilendi (öncekinden daha kötü), etkilendi ancak eskisinden daha iyi ve etkilenmedi. Katılımcıların yüzde altmışı taşkınlardan ciddi şekilde etkilendiklerini belirtirken, yüzde 36'sı deneyimlerine kıyasla son zamanlarda taşkınlardan ciddi şekilde etkilenmediklerini ifade etmiştir.

Güvenlik Açığı Unsurları

Ebo Kasabası'nda taşkınlara yol açan en önemli etkenin yoğun yağış olduğu düşünülmektedir. Bunu, kötü drenaj sistemleri ve atıkların drenaj sistemlerine ve oluklara dökülmesi takip etmektedir. Katılımcılar, taşkın riski taşıyan bölgelerdeki plansız gelişimin de taşkınların başlıca nedenlerinden biri olduğunu ifade etmektedir. Bu bulgular, iklimsel faktörlerin, kritik kentsel altyapı ve hizmetlerin eksikliğinin ve yüksek taşkın riski olan bölgelerdeki yerleşimin taşkın hassasiyetine katkıda bulunduğunu göstermektedir. Ayrıca, plansız gelişmenin belirgin riski, taşkının doğal ve sosyo-çevresel risklerini bir araya getirmektedir. Ancak, taşkın yoğunluğunu etkileyen topografya ve düşük su tutma kapasitesinin, ortalamanın altında yağış olsa bile toplumda taşkınlara neden olduğu bildirilmiştir.

Şiddetli sel koşullarının hem hane halkı hem de toplum düzeyinde önemli etkileri bulunmaktadır. Hane halkı düzeyinde selin olumsuz etkileri arasında mülke verilen zarar ve kayıplar, geçim kaynaklarının kaybı ve kazançların etkilenmesi yer almaktadır. Katılımcılar, selin günlük geçim arayışları üzerindeki en belirgin etkisinin erişilebilirlik sorunları olduğunu ifade etmişlerdir. Temel katılımcılar, acil hizmetler ve atık toplama konusundaki erişilebilirlik ve hareketlilik zorluklarını dile getirmişlerdir. Bazı katılımcılar, yağmurlu mevsimlerde tüm mahallelerin erişilemez hale geldiğini ve bu nedenle ambulans ve itfaiye gibi acil hizmetlerden mahrum kaldıklarını belirtmektedir. Son olarak, sağlık risklerine ve can kaybına karşı ciddi bir kırılganlık da ortaya çıkmaktadır. Yukarıda bahsedilen gelişigüzel çöplükler, yetersiz atık toplama ve çukur tuvaletlerin taşması sonucu oluşan kötü hijyen koşulları, resmi katılımcılar arasında büyük halk sağlığı endişeleri olarak kabul edilmiştir.

Hanehalkı Liderliği Kapsamındaki Uyum Stratejileri

Saha gözlemleri ve araştırma katılımcılarının yanıtlarına dayanarak aşağıdaki hanehalkı liderliğindeki uyum stratejileri tespit edilmiştir:

1. Dolgu: Bu faktörlerden herhangi biri nedeniyle evlerin su altında kalmasını önlemek amacıyla, sakinler yüzey alanını doldurarak mülklerinin zemin seviyelerini bitişikteki üst alanların yüksekliğine yükseltmektedirler.
2. Beton ve fayans döşeme, sakinler tarafından yukarıda açıklanan geri doldurma sürecini tamamlamak amacıyla ek katmanlar olarak kullanılan diğer sel riski adaptasyon stratejileridir. Suya dayanıklı olmaları ve akan suyun kolay akışını sağlamaları nedeniyle bu stratejiyi benimseyen haneler, seramik ve porselen karoları tercih etmektedir. Bir mülk içindeki fazla suyu boşaltmak veya sokaklardan gelen akan suyun mülke taşmasını önlemek için kullanılan "duvar giderleri", başka bir sel riski azaltma stratejisidir. Drenaj delikleri/duvar giderleri, genellikle duvar çitlerine kazılan deliklerden, duvar çitlerine tutturulmuş kapakları olan yerel olarak tasarlanmış metal giderlere kadar uzanan doğaçlama düşük teknolojilerdir. Sel sırasında mülkleri ezici su baskınından korumak ve su basmış suyun mülk içinde boşaltılmasını sağlamak, bu düşük teknolojili girişimin temel amacıdır.
3. Katılımcıların yanıtlarından elde edilen gözlemler, önemli bir kısmı tarafından kullanılan veya tahmin edilen belirgin bir sosyo-ekonomik uyum biçimini ortaya koymaktadır. Bunu, Hyden'ın "sevgi ekonomisi" olarak adlandırdığı kavrama atıfta bulunarak tanımlıyorum; bu, "kan, akrabalık, topluluk veya din gibi diğer yakınlıklarla birbirine bağlı yapısal olarak tanımlanmış gruplar arasında bir destek, iletişim ve etkileşim ağı" anlamına gelir (Martinussen, 1997, s. 247). Bu bağlantı biçimleri, üyelerin zorluklar ve felaketler sırasında yardım aradıkları sosyal güvenlik ağlarının temelini oluşturduğu için son derece önemlidir.

Topluluk Liderliğinde Başa Çıkma Stratejileri

Topluluk odaklı girişimler, iklim değişikliğine uyum sağlama veya genel kalkınma hedefleri doğrultusunda alternatif yollar sunar; ancak birçok durumda, yukarıdan aşağıya uygulanan uyum stratejileri ve kalkınma yaklaşımlarındaki başarısızlıklar bu girişimleri zorunlu kılar (Satterthwaite vd., 2018, s. 46). Bu durum, Ebo kasabasında belirgin bir şekilde gözlemlenmektedir; zira birçok katılımcı, her iki hükümet

düzeyinin de topluma hizmet etme ve risk azaltıcı altyapı sağlama yeteneğine şüpheyle yaklaşmaktadır.

Sonuç olarak, Ebo Kasabası topluluğu, sel riskini azaltmayı hedefleyen çeşitli topluluk girişimlerini üstlenmiştir. Saha çalışmasından elde edilen en önemli gözlemlerden biri, topluluktaki yüksek topluluk ruhu duygusudur. Bazı katılımcılar, 'hükümetten fazla bir şey beklemedikleri için' riski azaltma ve topluluğun gelişiminde dayanışmaya güvendiklerini ifade etmişlerdir. Örneğin, Ebo Kasabası Gençlik Gelişimi gibi kadın ve gençlik dernekleri bulunmaktadır. Bu dernekler, üyelik katkıları ve topluluk çalışmalarına katılım yoluyla hem mali hem de insan kaynaklarını harekete geçirerek topluluğun ihtiyaçlarını ilerletmede aktif ve etkilidir. Sel riskinin etkilerini azaltmak amacıyla gerçekleştirilen kolektif eylemlerle ilgili sorulara yanıt olarak, bazı katılımcılar mahalle kadın gruplarının veya derneklerinin, gelişigüzel çöplüklerden kaynaklanan kötü hijyen koşullarının sağlık etkilerini azaltmak için sıklıkla yağmur mevsimi öncesi ve sonrası topluluk temizlik hizmetlerine katıldıklarını belirtmişlerdir. Ayrıca, kadın dernekleri, borulu su temini gibi kamu hizmetlerinin ödenmesi ve şebeke dışı mahallelere elektrik sağlanması için Ulusal Su ve Elektrik Şirketi'ne yapılan ödemeler için kullanılan mali kaynakların seferber edilmesini başlatmış ve koordine etmiştir (adalet bölümüne bakın). Bu mali kaynaklar tamamen hanehalkı katkılarıyla toplanmaktadır.

Son olarak, çevresel nedenler ve sulak alanlar boyunca yerleşim genişlemesinin yüksek alanlarda su baskınlarına yol açabileceği endişesi nedeniyle sulak alanlara yönelik tecavüze karşı kararlı bir direnç ortaya çıkmıştır. Yüksek bir yer temelli bağlılık hissi, bu tür tehditlere karşı eylem gerektiren veya paylaşılan deneyimleri korumayı destekleyen fiziksel ya da sosyal olarak inşa edilmiş alanlara yönelik tehdit algısını tetikler. Topluluğun kaygılı üyeleri iki tür tehdide karşı harekete geçmiştir. Birincisi, Tanbi sulak alan rezervinin önemli bir kısmının bozulmasına yol açan nehir kıyıları boyunca yasadışı tecavüz tehdididir. İkincisi, tecavüz edilen kıyılar boyunca yeni inşa edilen yapıların akış suyunu engellemesi nedeniyle topluluğun üst kesiminde su baskını riskini artırma tehdididir. Sonuç olarak, "yasadışı arazi mülkü" satışına ve satın alınmasına karşı gösterilen direnç, "arazi satıcılarını" ve potansiyel alıcıları hedef almıştır. İlgili makamlara bildirimde bulunma, mülk alıcılarını

caydırma ve bu tür işlemlerin tamamlanmasında yer alan yasal riskler konusunda uyarma biçiminde tezahür etmiştir. Ancak bu direnç, ilçedeki arazi kullanım sisteminde tanımlanan yapısal faktörler ve idari ile planlama yönetmeliklerinin yetersiz uygulanması nedeniyle engellenmiştir.

Bölüm 7: EBO ŞEHRİNDEKİ İKLİM ADALETSİZLİĞİNİN KATMANLARI

Hizmet ve altyapı eşitsizliği

Ebo kasabası, hizmet ve altyapı adaletsizliğinin bir örneği olmuştur. Örneğin, belediye yetkilileri tarafından alınan altyapı yatırım kararları, Ebo Kasabası'nın sulak alan kısımlarında, ilgili kıyı şeridinde yol düzenlemelerini sistematik olarak hariç tutmuştur. Belediyeden bir ana katılımcı, "[...] dürüst olmak gerekirse, yol projesinin belirlenmesinde bile Ebo Kasabası'nın sulak alanı dahil edilmemiştir... Çünkü sulak alanda bir yol yaptıramayız. [Bu] kuru arazideki bir yolun üç katı olabilir... Ebo Kasabası, savunmasız alanlar şu anda dikkate alınamaz" şeklinde ifade etmiştir. Bu örnekler, adalet ve hakkaniyete gereken önem verilmeden alınan uyum kararlarının ve daha geniş altyapı yatırımlarının eşitsizliği pekiştirdiğinin (Henrique ve Tschakert, 2019) açık göstergeleridir; ancak, iklim değişikliği uyum finansmanından kimlerin yararlanacağı açısından farklı boşluklara da yol açabilir.

Tanıma eşitsizliği

Ebo Kasabasında, tanıma adaletsizliği iki yönlüdür; statünün tanınmaması ve iddianın geçersiz kılınması iki perspektiften incelenebilir. Statü-tanımama, bazıları tarafından "yapısal olarak yerleşik" olarak adlandırılan duruma kadar izlenebilir (Finn ve Cobbinah, 2023, s. 415). İddianın geçersiz kılınması, bir topluluğun bir otoriteye hizmet ve altyapı için talepte bulunması veya bu tür iddiaları harekete geçmeye değmez olarak değerlendirmesi durumunda ortaya çıkar. Bu nedenle, savunmasızların iddiaları, koşulları iyileştirerek veya sorunları ele alarak etki yaratan politika çıktıları geliştiren kurumlar tarafından geçerli girdiler olarak tanınmamaktadır.

İklim ve Çevresel Eşitsizlik

İklim ve çevresel adalet, iklim ve çevresel maliyetlerin ve faydaların dağılımı ile şekillenir (Schlosberg, 2013). Bireyler ve toplumlar, dağıtım süreçlerinin ve mekanizmalarının adil ve eşitliği sağlayacak nitelikte olduğuna dair hiçbir şüpheleri olmadığında bir adalet duygusu taşırlar. İklimle ilgili sağlık riskleri ve tehlikeleri, hem dağıtımsal hem de prosedürel adalet boyutlarını içerir. Yoksulluk ve iklimle ilgili sağlık riskleri, politikacıların genel ve iklimle ilgili sağlık sorunlarını çözme konusundaki isteksizliği, şebeke suyu, atık toplama ve kaynakların eşitsiz dağıtımı gibi temel kentsel hizmetlerin yokluğu veya yetersizliği gibi politik faktörlerle daha da karmaşık hale gelir. Ayrıca, bataklıklar ve mangrovlar gibi geçim kaynaklarının yok olmasına neden olan arazi ıslahının ciddi ekolojik etkileri bulunmaktadır. Bu durum, önemli ekolojik destek sistemlerine zarar verir. Ebo Kasabası'ndaki taşkınlara katkıda bulunan bir faktör olarak şu şekilde ifade edilmiştir: "İklim değişikliği söz konusu olduğunda, mangrovların kesilerek yerine yenilerinin konulmaması yoluyla sulak alanlara yapılan tecavüzün olumsuz etkileri vardır ve Ebo Kasabası'nın belediyenin 19 mahallesi içinde en çok etkilenen mahallelerden biri olmasına katkıda bulunur." Dahası, sakinler, yerleşim yerinin bataklık bir alan olmasına rağmen, sulak alanlara yapılan tecavüzden sonra daha önce hiç taşkın yaşamamış bölgelerde yoğun taşkınların meydana geldiğini belirtmişlerdir. Ancak bazı katılımcılar, yaşadıkları iklim adaletsizliğinin "doğayı tahrip eden ve kirleten diğerlerinin" eylemlerinin bir sonucu olduğunu savunmuşlardır.

Katılım

İklim değişikliğine uyum planlamasında savunmasız grupların katılımı, uyum programlarının etkilerine olumlu katkılar sağlarken, katılım eksikliği bu grupların çıkarlarının ve taleplerinin göz ardı edilmesine yol açmaktadır. Gambiya'da iklim değişikliğiyle ilgili projeler ve program belgeleri, radyo ve toplumla iletişim atölyeleri ve toplantıları aracılığıyla halkı politikalara dahil etme iddiasındadır. Önemli bir katılımcıya iklim politikalarının oluşturulması sürecinde katılım derecesi sorulduğunda, "İklim politikalarının oluşturulmasında tüm paydaşları dahil ediyoruz ve ayrıca toplum temsilcilerini de davet ediyoruz" yanıtını vermiştir. Ancak bir diğer

önemli katılımcı, "Çoğu zaman departmanımız politika oluşturma sürecinde yer almıyor, doğrulama aşamasında davet ediliyoruz" demiştir. Politika oluşturmanın ilk aşamasında önemli departmanların etkili katılımının olmaması, büyük bir endişe kaynağıdır ve toplum temsilcilerinin aktif katılımı konusunda soru işaretleri doğurmaktadır. Sorulması gereken hususlar, savunmasız grupların adil bir şekilde temsil edilip edilmediği ve bilgi ile görüşlerinin politikalara ve programlara yeterince etkili bir şekilde dahil edilip edilmediğidir. Örneğin, Ebo Kasabası'nda hükümet, bitişikteki yayla topluluklarını birbirine bağlayan tek drenaj kanalını inşa etmeye karar verdiğinde, daha önce hiç su baskını ve su durgunluğu yaşamamış bazı sokaklar ciddi şekilde etkilenmeye başlamıştır. Sakinler, drenaj yüklenicilerinin bölgeyi araştırmadığını ve inşaattan önce kendilerine danışılmadığını iddia etmektedir. Yerel halkla istişare eksikliği nedeniyle, su baskınının etkilerini sınırlamak amacıyla inşa edilen drenaj kanalı, doğal su yolunun üzerine inşa edildiği için tüm bir sokağı su baskınına maruz bırakmıştır.

Temsili Adalet Eksikliği

Bir topluluğun ihtiyaçlarını ve önceliklerini etkili bir şekilde ifade etmek, ulusal kaynakların (yeniden) dağıtımının kritik bir bileşenini oluşturur. Belirli bir topluluğun öncelikli ihtiyaçlarının karşılanması, büyük ölçüde, bu ihtiyaçların ulusal kaynakların yeniden dağıtımından sorumlu yetkililere etkin bir şekilde iletilmesine bağlıdır. Bu durum, ihtiyaçları ve öncelikleri nadiren ulusal öncelik haline gelen, son derece savunmasız ancak yeterince hizmet alamayan topluluklar için özellikle önemlidir. Topluluğun ihtiyaçlarının ulusal ve bölgesel düzeylerde etkin ve verimli bir şekilde temsil edilip edilmediğini belirlemek amacıyla katılımcılara adil temsil algıları sorulmuştur. Katılımcıların yüzde 70'inden fazlası, topluluğun ihtiyaçlarının ve önceliklerinin hem ulusal hem de yerel düzeylerde adil bir şekilde temsil edilmediğine inandıklarını ifade etmiştir. Yüzde 13'ü, topluluğun ihtiyaçlarının temsil edildiğini ancak somut, anlamlı sonuçlar elde etmek için daha fazla çaba gösterilmesi gerektiğini belirtirken, bazı katılımcılar muhtemelen baskı korkusu nedeniyle görüşlerini dile getirmekten çekinmişlerdir. Birkaç katılımcı, yerel temsilcinin (mahalle meclisi üyesi) ulusal temsilciye (Milletvekili) kıyasla topluluğu daha iyi temsil ettiğini ifade etmiştir.

Dağıtım Adaletsizliği

Dağıtımsal bir perspektiften bakıldığında, arazi mülkiyeti haklarının ve tapu senetlerinin eksikliği, iklim değişkenliğine ve bunun sağlık üzerindeki etkilerine maruz kalmayı artıran en önemli faktörler arasında yer almaktadır. Arazi mülkiyetine erişim eksikliği, çoğu kent sakininin zamanla yarı kalıcı veya kalıcı konut alanları haline gelen, alçak ve sel riski taşıyan geçici alanlara yerleşmesine yol açmaktadır. Benzer şekilde, tapu senetlerinin ve mülkiyet haklarının yokluğu, yerleşimcilerin veya sahiplerin tahliye korkusu nedeniyle kalıcı yapıları iyileştirmesini ve inşa etmesini engellemektedir. Kilit bir katılımcının "SSHFC'nin konut planlarına erişiminin yalnızca kamu görevlileriyle sınırlı olmadığı" iddiaları teorik olarak doğru olabilir; çünkü anketlerden elde edilen ev sahipliği yöntemlerinin analizi, katılımcıların hiçbirinin mülklerini SSHFC veya özel ipotek planları aracılığıyla edinmediğini ortaya koymaktadır. Birkaç katılımcı, Ebo Kasabasında yaşadıklarını, "sadece uygun fiyatlı olduğu için orada mülk satın alabildiklerini" ifade etmiştir. Neden bilerek bir taşkın bölgesinde mülk satın aldıkları sorulduğunda, topluluktan yanıt verenlerden biri şu şekilde yanıt vermiştir: "Bu koşullarda yaşamayı kim seçerdi? Bir seçeneğimiz olsaydı burada yaşamazdık. Şu anda, hükümet beni daha iyi bir yere yerleştirmeyi teklif ederse, ayrılırdım."

Usul Adaletsizliği

Son olarak, Gambiya'da arazi ve mülkiyet haklarına erişimi engelleyen bir diğer önemli usul adaletsizliği, tapu senedini dönüştürmek veya edinmek için gereken yüksek ücretler ve karmaşık prosedürlerdir. Örneğin, çalışma alanının bulunduğu Kanifing belediyesinde, arazi mülkiyeti transferinin maliyeti 4000 D'dir ve bunun yanı sıra 40.000 sermaye kazancı vergisi ödemesi gerekmektedir (UN-HABITAT, 2011). Kamuoyuna tapuları kaydetme ve edinmeyle ilgili prosedürler hakkında yeterli bilgi sağlanmamıştır. Mahalle meclis üyesi, yerleşim yerindeki sakinlerin çoğunun uygun belgelere sahip olmadığını doğruladı, ancak çoğunun satış faturalarına sahip olduğunu vurguladı. Tanınmadan vergi tahsisi sorulduğunda şunları söyledi:

“Bu bataklık alanlarda, gerçek belgelere sahip olan çok az kişi bulunmaktadır; burada tam belgelerden kastettiğim, satış faturalarıdır. Ancak, çoğu kişinin fiziksel planlama departmanından alınmış oturma izni belgesi yoktur. Bu nedenle, bazen her yerde yasadışı işlemler gerçekleşmektedir... Bu yasadışı belgelerin nasıl elde edildiğini bilmiyorum. Ancak dürüst olmak gerekirse, bir sorun var. Yine de, bence, hala yasadışı olarak oradalar çünkü bu alanlar yerleşim alanları değildir.”

Bu, bazı katılımcılar tarafından onaylandı. Mülklerini kiralama başvurularının hükümet tarafından reddedildiğini ifade ettiler. Konut amaçlı mülk satışlarının yasallığı ve işgal haklarının yasadışılığına dair tutarsızlıklar, arazi yönetimi ve geliştirmedeki farklı kurumsal düzenlemeler nedeniyle yolsuzluk sorunlarını vurgulamaktadır.

Bölüm 8: SONUÇ

Gambiya, ortak faydalarla uluslararası alanda takdire şayan iklim değişikliği politikalarına sahiptir. Ancak, deniz seviyesinin yükselmesi ve su baskını gibi iklim değişikliğinin etkilerine karşı yüksek riskli ülkelerden biri olarak, ulusal iklim değişikliği politikaları, kayıp ve hasarı azaltmak ve dayanıklılık oluşturmak amacıyla sakinlerinin karşılaştığı iklim risklerini ele almaya daha fazla odaklanmalıdır. İklim finansmanından fon çekmek için yeşil aklama eğilimi ve dönüştürücü uyum mekanizmalarının eksikliği, bu tür fonların güvence altına alındığı amaca ulaşmadan, taşkın bölgesi alanlarında her yıl sürekli taşkın meydana gelmesine yol açabilir ve aslında en azından bu noktaya kadar yol açmıştır. Bir toplum lideri durumu şu şekilde özetlemiştir:

Ebo Kasabasındaki koşullar birkaç yıldır sabit kalmakta ve nüfus artışı ile birlikte inşa edilen yeni binalar nedeniyle daha da kötüleşmektedir. Yine de, her yıl Ebo Kasabası sakinleri olarak aynı yardımları almaktayız. Sular altında kalıyoruz, ihtiyaç değerlendirmesi için geliyorlar ve bize yardımlar ile nakit kuponları veriyorlar; bu geçen yıl yapıldı ve bu yıl ile gelecek yıl da devam edecek. Böyle devam ederse, her yıl sular altında kalmaya mahkum olacağız. Daha açık bir şekilde ifade etmek gerekirse, her birimize bir milyon Dalasi bireysel olarak verseler bile, bunu

harcayacak ve yine bir sonraki yağmurda sular altında kalacağız. Ebo Kasabasında ihtiyaç duyduğumuz şey, hem yokuş yukarı bölgelerden gelen su akışını hem de hanelerden gelen atık suların taşınmasını sağlayacak drenaj ve oluklardır. Bu önlemler alınmadığı sürece, topluluk her zaman sular altında kalacaktır.

Bu, toplumdaki altyapının yapısal dönüşümleri gerçekleştirilmediği sürece hiçbir yardım biçiminin çalışma alanındaki durumu kalıcı olarak çözemeyeceği anlamına gelir. Sağlanan mevcut yardım biçimi, kurumların uzun vadeli dönüştürücü adaptasyon eylemlerine herhangi bir taahhütte bulunmadan topluluğa varlıklarını ifade etmelerinin bir yolu olarak işlev görmektedir. Bu, topluluğun sular altında kaldığı, destek aldığı ve bir sonraki yıl aynı sıkıntıyı beklediği kısır bir döngünün açık bir göstergesidir. İlginç olan soru, bu adaptasyon biçiminin gerçekten de uyumsuzluğa yol açıp açmayacağıdır; zira topluluk üyelerini yardıma aşırı bağımlı hale getirme eğilimindedir ve kamu görevlilerini uzun vadeli çözümler bulmaya teşvik etmemektedir.

Bu çalışmada sunulan bulgular, iklim adaletine yalnızca sektörel bir mesele olarak değil, adaletin boyutlarının bir unsuru olarak yaklaşmanın gerekliliğini vurgulamaktadır. Farklılaştırılmış sorumluluklar ve etkiler üzerine yapılan araştırmalar ile sosyoekonomik kırılganlık ve uyum adaletsizliğini tetikleyen yapısal adaletsizlikler konusundaki tartışmalar, iklim adaletinin adaletin boyutlarının bir parçası olarak entegrasyonuna duyulan ihtiyacı ortaya koymaktadır.

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