Artha – Journal of Social Sciences
2026, Vol. 25, No. 1, 35-58
ISSN 0975-329X/https://doi.org/10.12724/ajss.76.3

Local Governments' Responses to the Impact of Climate Change in Selected African Countries: A Review

Christopher Dick-Sagoe*

Abstract

Climate change has severe and disproportionate impacts on Africa, where vulnerability is heightened by limited adaptive capacity and overdependence on climate-sensitive sectors. While national-level adaptation initiatives have received wider intellectual investigation, little is researched on how key actors, such as local governments, respond to climate change across the African continent. Using a traditional review approach, this article examines the outcomes and challenges of local governments' climate change adaptation initiatives in selected African countries. Drawing exclusively on multi-level governance, vulnerability frameworks, and institutional theory perspectives, this article provides a synthesis of local climate change adaptation responses across diverse African countries. I find that while some African countries face nascent and fragmented climate change adaptation frameworks, a few have effectively integrated climate change into decentralised planning systems. Despite these efforts, constraints such as inadequate coordination, weak institutional capacity, limited financial resources, and dependence on donor-driven initiatives result in largely short-term and reactive interventions. There is a need to prioritise sustainable financing mechanisms, enhance coordination across governance levels, and strengthen local government capacity to support context-specific and effective adaptation.

Keywords: Climate change, Climate response, Climate adaptation, Local governments, Africa

Introduction

Globally, climate change is recognised as a developmental and environmental challenge with far-reaching implications for societies, economies, and ecosystems. Its impacts, ranging from rising sea levels and

* Department of Development Studies, University of South Africa, South Africa; dicksagoe@gmail.com

temperatures to increased extreme weather events, are unevenly distributed, disproportionately affecting vulnerable populations and developing regions. This global dimension of climate change emphasises the urgent need for context-specific adaptation strategies that are responsive to both local realities and global pressures. According to the United National Framework Convention on Climate Change, Africa's island countries and Africa's low-lying countries are some of the most vulnerable to the impacts of climate change (UNFCCC, 2008). Africa is also said to be more vulnerable to climate change due to its heavy dependence on climate-sensitive sectors such as forestry and agriculture (Rugube et al., 2019). Recognising this unique vulnerability, African countries have responded to the effects of climate change. However, these responses have mainly focused on the national level, overlooking the local level's peculiar needs for building resilience to respond to climate change (Sharma et al., 2014).

This imbalance between local-level realities and national-level policy responses brings to light a critical research gap in understanding how adaptation strategies are experienced, implemented, and conceptualised at the local scale in Africa. The success of climate change adaptation to deliver resilience rests partially on local knowledge and perspectives, which are properly gathered and integrated into the development plans of local governments. Fusing local knowledge and perspectives (local strategies) into local adaptive development plans supports and strengthens measures that the local people have proven to work. While national-level interventions provide direction, they are insufficient without grounding in local realities, necessitating a shift towards localised adaptation approaches.

In decentralised planning systems, local governments serve as the frontline in planning and implementing development (Agranoff and McGuire, 2003). Responding to climate change within the prevailing planning and governance systems has also been widely recognised for ensuring resilience across various governance tiers (Preston et al., 2011). The increased global attention to institutional adaptation has been reflected in a broad range of adaptation interventions, including adaptation finance initiatives such as the Special Climate Change Fund, the Global Environment Facility Trust Fund, the Adaptation Fund, and the Least Developed Countries Fund, all of which are being localised in various countries (Measham et al., 2011). National Adaptation Programmes of Action (NAPAs) or strategies that respond to adaptation needs in various developing countries are resulting from national adaptation planning (Hardee and Mutunga, 2010).

However, scholars such as Atanga, Inkoom, and Derbile (2017), Robinson and Herbert (2001), and Nelson and Agbey (2005) stress the importance of improved adaptive capacity in vulnerability reduction at the local level. Improving adaptive capacity in this context involves policies, programmes,

and other planned interventions that address vulnerability across multiple governance scales. Planned adaptation policies and strategies have tended to be centralised at the national and sub-national levels, without much attention being paid to the local level where the effects are felt the most (Asha & Madzivhandila, 2016; Measham et al., 2011; Agrawal, 2008; Handayani, 2021; Engel, 2006; Pasquini, Cowling and Ziervogel, 2013; Shemdoe, Kassenga & Mbuligwe, 2015). Therefore, governments of African countries, such as South Africa, have recognised the need to involve local governments to build local-level resilience and have captured this in the 2011 climate change response strategy (Hlahla, Nel and Hill, 2019).

According to Agrawal (2008), local governments are critical in climate change adaptation as they structure responses to the impacts of climate change, mediate between collective responses to vulnerability and individuals, and govern resource delivery to facilitate responses. In addition, local governments are established to work for their communities (Shemdoe, Kassenga, & Mbuligwe, 2015). It is perceived that adaptation strategies initiated at the international and national levels have not been successful. This has created an opportunity for local approaches through bottom-up climate adaptation methods. Local governments are now empowered to respond to the impacts of the changing climate at the local level to achieve the global sustainable development goals (Pilato, Sallu and Gaworek-Michalezenia, 2018).

As the effects of climate change are felt at the local level, an effective response must be handled at the local level with the active participation of local people who experience the consequences of climate change (Fünfgeld, 2015). This is important because vulnerability to climate change is felt at the local level, and local people are best positioned to design and implement effective responses to climate change (Pasquini et al., 2015; Mukonza and Makenzi, 2014; Local Government Programme 4 Climate Change, 2016). This reinforces the argument that locally driven adaptation is not only necessary but also more effective in addressing context-specific vulnerabilities, thereby strengthening resilience outcomes.

This article reviews the literature and investigates the various adaptation strategies that local governments in Africa have adopted to address climate change, as well as the results and challenges they face. Specifically, it addresses the following: (i) identify the range of adaptation strategies implemented by local governments across Africa and their outcomes in enhancing local resilience and (ii) examine the institutional and governance challenges that constrain effective local adaptation. Such an analysis is important because local adaptation solutions will enhance the sustainability of adaptation strategies. In addition, local governments' planning and implementation of climate adaptation strategies will be specifically suitable to meet the needs

of each locality, given their proximity to the communities (Bulkeley, 2010). Furthermore, climate change adaptation plans developed at the national level are implemented at the local government level; thus, ensuring local participation in these climate change adaptation plans to ensure greater local acceptance, participation, and sustainability becomes relevant (Adger, 2003; Shemdoe, Kassenga and Mbuligwe, 2015). This article argues for adaptation initiatives to emerge from the local level, where local governments serve on the frontline in the implementation and planning of climate change adaptation. The reason for proposing this structure, which differs from the current top-down approach, remains that adaptation is local, and thus, the impacts of climate change are felt at the local level.

By synthesising empirical evidence in Africa, this study contributes to the growing body of literature on decentralised climate governance by offering a continental-scale perspective on local adaptation planning, thereby addressing an important gap in existing scholarship that often focuses on case-specific or single-country analyses. The remainder of this paper is structured as follows. The literature review section explains key terms applicable to the study. The next section provides an overview of the methodology adopted in this study, followed by the sections that present and discuss the key findings. The last section concludes the article.

Context and Research Gaps

Climate change adaptation

The term adaptation refers to actions adopted to prevent, minimise, or take advantage of the negative effects of climate change (Hutcheon and O'Flynn, 2012). Adaptive responses help individuals cope with the associated consequences and take advantage of the associated opportunities. Adaptation strategies are those implemented for the adaptable system to moderate and cope with the consequences of climate change, with the view of taking advantage of these consequences of climate events. The key area of concern for local governments on adaptation is adaptive capacity, which refers to the capacity of the systems to reorder, reduce adverse effects, and maximise any positive effects from climate change (Hutcheon and O'Flynn, 2012).

Discussions on adaptation often present it in two forms: reactive and anticipatory (Easterling, Hurd and Smith, 2004). Reactive adaptation applies during emergencies, while planned adaptation, also known as anticipatory adaptation, is undertaken before the impact of climate change is apparent to enhance the capacity of the local people to cope with the consequences of climate change (Easterling, Hurd and Smith, 2004). Anticipatory/planned adaptation is achieved by mainstreaming climate change into long-term decision-making (Atanga, Inkoom, & Derbile, 2017).

A distinction is also often made between adaptation interventions based on who is planning and for what benefits: institutional or private. While institutional adaptation refers to adaptation initiated by the government or institutions for larger societal benefits, private adaptation refers to adaptation initiated for private gains (Healey, 2017). For communities to adapt, there is a need for collective capacity building through education and improved decision-making ability (Atanga, Inkoom and Derbile, 2017). Mobilising and deploying resources under the guidance and planning of the state to respond to climate change across various scales will involve institutional adaptation.

However, adaptation differs from coping strategies. Coping strategies refer to the intended and unsystematic ways through which a system may cope with the consequences of a changing climate (Plessis and Kotzé, 2014). Overall, adaptation captures adjustments, responses, and actions taken by people and natural systems to reduce and accommodate the vulnerability associated with the impact of climate change (Plessis and Kotzé, 2014).

Theoretical framing of local climate change adaptation

There are three complementary theoretical perspectives for understanding local governments' responses to climate change within a complex governance system: multi-level governance, vulnerability frameworks, and institutional theory.

Multi-level governance explains how climate adaptation is shaped by interactions across local, national, and global scales (Fairbrass and Jordan, 2004; Bulkeley & Betsill, 2013). While national policies and international frameworks establish strategic direction, their success depends on how these policies and frameworks are transformed into local-level actionable policies. Implementation gaps, according to multi-level governance, are often caused by misalignments across governance levels, thereby limiting the success of adaptation strategies.

According to the vulnerability frameworks (Adger, 2006; Marshall et al., 2009; IPCC, 2022), impacts of climate change are unequally distributed across regions and populations, shaped by socio-economic inequalities, exposure, and adaptive capacity. This perspective brings the need for context-specific and localised responses that integrate indigenous knowledge systems and prioritise vulnerable groups in the planning of adaptation.

The institutional theory advanced by Scott (2001) and North (1990) explains how formal rules, governance structures, and administrative capacities shape local adaptation outcomes. In many African contexts, institutional constraints, such as limited technical expertise, weak inter-agency coordination, and insufficient policy integration, hinder the effective mainstreaming of climate adaptation into local development planning.

According to Peters (2019), institutions spell out the rules for action, influence policy instrument choices, and determine the extent of policy compliance. Legitimacy, adaptation, and institutional strength were also introduced by Agrawal et al. (2012) and Burch (2010) as factors that determine the successful implementation of climate policy.

A critical examination of the academic approach shows two recurring themes in climate change adaptation across Africa. Firstly, there is a broad agreement that local governments are essential to adaptation planning because of their role in development planning and service delivery and their proximity to communities. Secondly, adaptation initiatives commonly include fostering partnerships with civil society and international actors, promoting community-based adaptation and mainstreaming climate change into development plans.

Research gap and contribution

Despite the large body of academic studies on local climate change adaptation, several gaps remain. Firstly, continental-scale and systematic analyses that synthesise adaptation responses across multiple African countries are lacking. Many academic studies adopt a descriptive approach, focusing on single-country case studies without engaging in comparative analysis across different contexts. This limits the ability to develop transferable policy lessons, draw generalisable conclusions, or identify broader patterns. Secondly, many studies have insufficiently integrated theoretical perspectives, particularly in linking governance structures, vulnerability conditions and institutional dynamics to observed adaptation outcomes. This constrains the analytical depth of the academic literature and limits the advancement of a more complete understanding of adaptation processes at the local level. Thirdly, while community-based and participatory approaches are widely stressed, there is limited critical assessment of how these approaches are operationalised in practice and the extent to which they sincerely impact decision-making processes.

This article addresses these gaps by using a traditional review approach to assess the responses of local governments to climate change across selected African countries. By synthesising evidence across multiple contexts, the study moves beyond country-specific case studies to provide a broader understanding of adaptation challenges, outcomes and strategies. Furthermore, the study integrates multilevel governance, vulnerability frameworks and institutional theory to offer a more complete analytical lens for assessing local adaptation processes. This theoretical integration provides deeper insights into the factors shaping the effectiveness of adaptation. Through this, the study identifies cross-cutting patterns, contributes to the literature by consolidating fragmented knowledge and offering policy-relevant suggestions for firming local adaptation to climate change in Africa.

Data and Methods

This review comes from a synthesis of published literature collected through multiple strategies. According to Petticrew and Robert (2008), clarifying the literature search inclusion and exclusion criteria from the onset is an important criterion for addressing bias in systematic reviews. The inclusion criteria for the search were: 'Local Government" and "Climate Change Adaptation." On the other hand, studies dated before 2000 were excluded. This delimitation ensured that only the contemporary state of knowledge on the topic was captured in the review.

In addition to search criteria, the choice of databases for conducting literature search, locating studies, and selecting studies also addresses bias concerns (Green and Glasgow, 2006). In this regard, Hong et al. (2000) emphasised the need for scholars to select appropriate databases for conducting a literature search. This study consulted the following key databases: ProQuest, Google Scholar, ScienceDirect, and Scopus.

The nature of the literature search conducted before and during the review is also important in the literature review (Green and Glasgow 2006). Further literature searches were conducted using combinations of keywords such as "Climate change adaptation + Local government + Africa," "Adaptation + Local government + Africa," "Climate + Local government + Africa," and "East, West, North, Central, and Southern Africa + Local government."

The collected documents were then examined for relevance, including quality assessment. Overall, 72 items were generated from the search, comprising published articles and book chapters. These were further examined manually to ensure compliance with the set criteria. A final compendium of 12 articles was used for the analysis. While this method does not explicitly employ more established approaches (such as PRISMA) for the selection of articles, it mirrors such practices in essence and was successful in identifying documents that are relevant to the scope of the review.

Responses of Local Governments to the Impact of Climate Change in Africa

Hlahla, Nel, and Hill (2019) have assessed climate change responses in South African local governments across five main areas, which have been adopted for this review. These five areas were used to assess the responses of local governments to climate change, which include integrating climate change into development decision-making, building strategic capacity, learning how to undertake climate change governance, societal mobilisation and access to financial resources.

Integrating climate change into development decision-making answers the question of the extent to which climate risks are embedded in the policies

and planning process of local governments. Building strategic capacity enhances the technical, human, and institutional capabilities required to implement and design climate responses at the local level. This requires moving beyond rhetorical policy to technically sound and evidence-based interventions, without which well-designed policies may fail during implementation. Learning how to undertake climate change governance requires continuous learning, institutional innovation, and adaptation, highlighting the importance of local governments' organisational learning process.

Societal Mobilisation brings on board a broad range of stakeholders to effectively engage in local-level climate action. This idea considers that local governments alone cannot effectively handle climate action. Thus, societal mobilisation refers to local governments empowering and engaging a broad range of stakeholders, the private sector, civil society, and the community for climate action. The benefit of this approach is that the impacts of climate change are experienced at the local level. Through societal mobilisation, climate change adaptation initiatives are successfully implemented due to behavioural change, local ownership, and collective action. Finally, access to financial resources, which assesses the ability of local governments to effectively use and mobilise financial resources, significantly affects local climate action.

Institutionalisation of climate change at the local level to build capacity

Cameroon has institutionalised climate change through the enactment of the National Climate Change Action Plan (NCCAP) in 2012, which focuses on building the capacity of local stakeholders, such as chiefs, local government officials, and farmers (Tani & Tume, 2019; African Development Fund [ADF], 2013). This aligns with broader continental evidence showing that national adaptation frameworks significantly enhance local institutional capacity and coordination (UNEP, 2018; UNDP, 2021). South Africa has also institutionalised climate change at the local level (eThekwini Municipality, 2014; Durban Adaptation Charter [DAC], 2014). Empirical studies indicate that municipalities participating in structured adaptation frameworks, such as the Durban Adaptation Charter, demonstrate a stronger integration of climate policies into local governance systems (ICLEI, 2016). A similar step is being taken in Tanzania, where the government is reportedly in the process of developing policies to institutionalise climate change at the local level (Shemdoe, Kassenga, & Mbuligwe, 2015). Uganda is also using cross-sectoral coordination through local governments' natural resource departments to integrate climate change issues at the local level. Such cross-sectoral institutional arrangements improve policy coherence and adaptation outcomes in DGSs (World Bank, 2020).

Integrating climate change into the development plan (decision-making)

Hlahla, Nel, and Hill (2019) observe that not all local governments in South Africa have adequate strategic capacity, as only a few have climate change leaders and sufficient access to knowledge and expert advice. This reflects broader evidence across sub-Saharan Africa, where gaps in institutional and technical capacity remain key constraints to effective climate mainstreaming (Ayers & Dodman, 2010; UN-Habitat, 2018). Furthermore, only a few local governments in South Africa have clearly defined their climate change priorities within their strategic policy frameworks. Not all local governments have integrated climate change adaptation into their local development plans. Empirical estimates indicate that fewer than one-third of African local governments have effectively mainstreamed climate adaptation into development planning frameworks (UNEP, 2018). Leck and Simon (2018) report that the South African government has developed the National Climate Change Response White Paper (NCCRP) (Republic of South Africa, 2011) and the National Climate Change Adaptation Strategy (Republic of South Africa, 2017), which outline national climate adaptation strategies.

The eThekwini Municipal Adaptation Plan (MAP), widely recognised as one of the world's leading municipal adaptation initiatives due to its focus on health, water, disaster management and food security, is a notable success story from South Africa (Leck & Simon, 2018; Roberts, 2010). This plan is frequently cited as a global best practice because of its measurable adaptation indicators, strong institutional coordination, and multi-sectoral integration (UN-Habitat, 2018; ICLEI, 2016). Another important aspect of eThekwini's response to climate change is that it is led by an Environmental Planning and Climate Protection Department (EPCPD), a dedicated climate team, and strong local leadership (comprising departments and key individuals). In addition, ad hoc funding opportunities and sustained international and local networking for knowledge sharing are available.

Other scholars, such as Shemdoe, Kassenga, and Mbuligwe (2015), report a step taken by the Tanzanian government to respond to the impact of climate change and help local government officials to do the same through the Tanzanian Draft Urban Development and Management Policy, in which climate change was considered a national problem and provides support to local governments to plan and implement actions to deal with the impact of climate change. Plessis and Kotzé (2014) stated that biodiversity management plans, which are prepared by local government officials and the Minister of Environmental Affairs, must be implemented by mainstreaming the plan into the local government development plan with the ultimate aim of protecting biodiversity from climate change vulnerability.

Tani and Tume (2019) also report the presence of community development plans (CDPs) in Cameroon, which have been updated to add a component called the severity of the problem and constraints to climate change adaptation. This plan assesses the sensitivity, exposure, and resilience of health, road infrastructure, agriculture, forestry, and wildlife livelihoods. Friis-Hansen et al. (2015) reported a success story of the responses of local governments to the impact of climate change in Uganda. They report an effort to enhance cross-sectoral coordination. Uganda's local governments have a natural resources department whose job is to integrate all climate change issues within the decentralised departments into the local development plans. Hlahla, Nel, and Hill (2019) report the institutionalisation of climate change response at the local government level in South Africa (eThekwini Municipality, 2014; Durban Adaptation Charter (DAC), 2014). Apart from these success stories, studies conducted in other African countries, such as Ghana, have reported poor institutionalisation.

Societal mobilisation

Local governments have made efforts to encourage the active participation of stakeholders in key socio-economic issues. Similarly, a few local governments were embarking on public education and informed public discussion on climate change. According to Leck and Simon (2018), one of the response strategies adopted under the eThekwini Municipal Adaptation Plan (MAP) is the inclusion of stakeholders, such as local leadership from the community, such as departments and key individuals, Environmental Planning and Climate Protection (EPCPD), and local and international networking. The same approach has been adopted by local governments in Cape Town and Johannesburg, with few local governments yet to embrace the response strategy (Leck and Simon, 2018). According to Plessis and Kotzé (2014), the Biodiversity Act 10 of 2004 of the Republic of South Africa indirectly protects biodiversity from the impact of climate change. The Act (Section 43) also makes provision for stakeholder engagement through consultative engagement between the local governments and the Minister of Environmental Affairs to develop biodiversity management plans and ensure implementation with the local government authorities (Section 44 of the Biodiversity Act 10, 2004). Evidence shows that participatory governance significantly improves the effectiveness, acceptance, and sustainability of climate adaptation initiatives (Lebel et al., 2012; Reed et al., 2009).

In Cameroon, the formation of Cameroon Traditional Rulers against Climate Change (CAMTRACC) in 2009 has been an effective step in engaging Cameroon's traditional rulers in the fight against climate change at the local level. In addition, all local government officials, non-governmental organisations, the media, and other influential community-based organisations are involved in an intense community sensitisation

effort on the impact of climate change on agriculture, forestry, wildlife, road infrastructure, and health (Tani and Tume, 2019). Again, they report an increasing attention and focus on climate change by international donors and NGO in Cameroon. Such community-led initiatives have been shown to enhance local ownership and resilience outcomes in climate adaptation processes (UNDP, 2021).

Climate change governance learning

Only a few local governments in South Africa have developed targets, measurable goals, and indicators for climate change adaptation projects. Despite this achievement, none of the local governments have a monitoring and evaluation framework; thus, no studies have been conducted within the local governments to evaluate the current status of the environment and the effectiveness of the local governments' environmental policies. This is consistent with broader findings that monitoring and evaluation systems for climate adaptation remain underdeveloped across many local governments in Africa (World Bank, 2020; UNEP, 2018).

Access to financial resources

Limited financial resources are a major constraint on the ability of local governments to implement climate change adaptation initiatives (Pasquini et al., 2013). Globally, less than 10% of climate finance reaches local governments in developing countries, limiting their capacity to implement context-specific adaptation strategies (UNDP, 2021; World Bank, 2020). The same observation was made by Atanga, Inkoom, and Derbile (2017), who reported the absence of statutory funding for promoting climate change adaptation programmes and projects. Friis-Hansen et al. (2015) reported funding challenges for implementing local governments' climate change adaptation plans. Furthermore, the funding structure, which is dominated by external sources such as non-governmental organisations and the central government, influences the projects and programmes of local governments in Uganda (Friis et al., 2015). This funding is top-down in nature and supports the global agenda and the agenda of external funding organisations, which, in most cases, are contrary to the local people's agenda. Such external funding discourages local participation in the planning and implementation stages of climate change adaptation projects and programmes. According to Ayers and Dodman (2010), top-down funding mechanisms reduce the effectiveness of adaptation interventions and local ownership. Ben Youssef (2022) reported limited financial resources, especially at the national level, to implement climate change adaptation policies. Ben Youssef (2022) also reported a lack of national financial resources to implement climate change adaptation.

The barriers discussed by Pilato, Sallu, and Gaworek-Michalezenia (2018) include the frequent barrier of lack of financial resources, which was expressed clearly in words by all local governments in Tanzania. Yakubu (2018) also reported financial challenges to funding climate change adaptation projects in Ghana as a major challenge with local government response to the impact of climate change. This is similar to Tani and Tume (2019), who discussed the limited financial resources to carry out local government adaptation projects in Cameroon.

Barriers to Local Governments' Responses to Climate Change Impacts in Africa

Pasquini et al. (2013) conducted an important study that identified three factors to explain the barriers to mainstreaming climate change adaptation in local governments in South Africa. These three barriers are cognitive/ individual, regulatory and institutional, and socio-cultural. These three categories are the analytical framework used for discussing the barriers faced by local governments in mainstreaming climate change adaptation in Africa. Cognitive or individual barriers refer to limited skills, perceptions, knowledge, and awareness among stakeholders and local government officials. The greatest challenge here is the limited understanding of the concept of climate change adaptation and risks among local decision-makers. Regulatory and institutional barriers are related to the formal structures, policies, governance arrangements, and administrative systems that shape the actions of local governments. Finally, socio-cultural barriers refer to social norms, values, practices, and power relations that influence how communities and institutions perceive and respond to climate change. These factors are critical in shaping the effectiveness and acceptance of local adaptation strategies.

Notably, these three categories of barriers do not operate alone; however, they are deeply interconnected. For example, socio-cultural dynamics shape both implementation and perception outcomes, whereas weak institutional frameworks reinforce individuals' cognitive limitations. A holistic approach that combines inclusive governance practices, institutional reform, and capacity building is needed to address these barriers. Therefore, strengthening the ability of African local governments to mainstream climate change adaptation depends on transforming the underlying socio-cultural, institutional, and cognitive conditions that constrain effective action and technical solutions.

Cognitive and individual barriers

Atanga, Inkoom, and Derbile (2017) note that Ghana's local government officials need the capacity to mainstream climate change adaptation into

local government plans. Local government officials' capacity to understand climate change situations and appropriate areas for intervention is lacking. Their study reported low levels of understanding, knowledge, and awareness of climate change among local government officials in Ghana. Hlahla, Nel, and Hill (2019) raised issues of low capacity and lack of understanding of climate change in their study on climate change adaptation among local governments in South Africa. Tani and Tume (2019) reported the same challenge, that is, despite their full knowledge of the impact of climate change on agriculture, water, and health, local government officials lack the requisite knowledge to manage climate change adaptation strategies, thus resulting in the lack of capacity to measure, predict, and respond to the impacts of climate change on livelihoods in Cameroon. Such capacity constraints, particularly in climate data analysis and technical modelling, have been widely documented across African local governments (UNEP, 2018; World Bank, 2020).

Generally, Ghana's local governments fail to mainstream climate change adaptation plans into their local development plans. Pilato, Sallu, and Gaworek-Michalezenia (2018) report the lack of expertise on climate change and technical resources (technology) as barriers to the implementation of climate change adaptation in South Africa. Hlahla, Nel, and Hill (2019) reported the same in their study of local governments in South Africa.

Cognitive and individual barriers become worse in instances where the influence of party politics sets in. In cases where the political appointment of senior officials for local governments influences the mainstreaming of climate change adaptation into local government development plans. The process for appointing these officials is not based on capacity (most qualified) but according to political alignment. Local governments tend to place more emphasis on local service provision, such as roads, schools, and healthcare, than on climate change adaptation. In addition, their ability to provide local services secures their re-election into power compared to climate change adaptation projects. In the case that political influences supersede the service delivery functions of local government officials, then climate adaptation has ceased to be on the priority list of local governments in South Africa.

Regulatory, institutional, and socio-cultural barriers

Another important aspect of the findings of Pasquini et al. (2013) is the issue of institutional silos as a key barrier to climate change adaptation. They further argue that institutional silos prevent collaborations among departments and institutions to truly understand the impact of climate change on climate-sensitive systems such as water resources, health, and infrastructure. Globally, institutional fragmentation has been widely recognised as a major constraint to effective climate governance (OECD, 2020). Pilato, Sallu,

and Gaworek-Michalezenia (2018) report a lack of coordination among local public sector institutions. Empirical studies have shown that weak inter-agency coordination reduces efficiency and leads to duplication of climate adaptation efforts (UN-Habitat, 2018). Institutional collaborations are important to have a holistic understanding of the vulnerabilities of climate change on climate-sensitive systems such as agriculture, water, and health (International Panel on Climate Change, 2007). The same issue on collaboration was raised by Shemdoe, Kassenga, and Mbuligwe (2015) when they observed weak institutional collaboration and raised the alarm that for local governments to effectively address the impact of climate change at the local level, weak institutional collaboration should be resolved in Tanzania.

An interesting observation by Atanga, Inkoom, and Derbile (2017) indicates that mainstreaming climate change adaptation in the existing planning structure of local governments in Ghana is lacking. Atanga, Inkoom, and Derbile (2017) further argued that despite the inclusion of climate change in national development policy documents, such as the Ghana Shared Growth and Development Agenda, institutional structures at the local government level for effective mainstreaming of climate change adaptation are lacking. They attributed this to the fact that local governments have no climate change desk officer responsible for planning, facilitating, and coordinating climate change adaptation programmes from the various departments at the local level. Similarly, Yakubu (2018) reported an inadequate number of agricultural extension officers as a major challenge in local government response to the impact of climate change. Because of the lack of local climate change expertise, most local governments in Tunisia do not have a local-level strategy for climate change adaptation. Pilato, Sallu, and Gaworek-Michalezenia (2018) raised the same challenge. Pasquini et al. (2013) also reported that local governments in South Africa do not pay systematic attention to mainstreaming climate change adaptation in local development plans.

The lack of external policy coherence between the 2025 Tanzania Development Vision and climate change was another main finding of Pilato, Sallu, and Gaworek-Michalezenia (2018). They further stated that the national development policy framework does not recognise climate change as a threat to development. Therefore, adaptation strategies are not included in the plan. Local government officials were implementing some adaptation strategies, such as planting drought-resistant crops, conservation agriculture, and diversifying livelihood activities. However, because these measures were not documented in the national development policy framework, a question is raised on their sustainability. Furthermore, it is very difficult to identify the mandate for climate change, as it is not clear which department is responsible for climate change adaptation at the local level.

Ben Youssef (2022) reported on the role of local governments in climate adaptation in Tunisia. According to Ben Youssef (2022), Tunisia's decentralisation process is incomplete, thus affecting the level of policy engagement between local government authorities and ministries at the central government level. Again, the highly centralised systems affect the local government to act proactively, thus affecting policy intentions (central government level) and operations (local level). For the scholars, weaknesses across planning, financing, and operations aspects of the projects implemented in municipalities accounted for abysmal results of adaptation planning. Municipal staff with higher education comprised a small proportion of the population, while available technology was heavily underutilised, with the few skilled people overloaded. This affected operations but also reflected the limited resources to hire the staff needed for adaptation planning.

However, the central government's important role included providing information and guidance on climate change. In doing so, local governments would be strengthened to access the information needed for adaptation. In turn, local governments are responsible for mobilising local stakeholders for participation in adaptation planning. They are deemed the most effective for making decisions about local climate actions and natural hazards, and they are close to the hazards' effects.

Pilato, Sallu, and Gaworek-Michalezenia (2018) again report the lack of coordination, manifesting in poor communication. Communication between the local government and the local people is poor, as measures used to communicate with the local people through village extension officers were considered ineffective by the local people. Some localities do not have extension officers, and there are very few in places with extension officers, and thus, information takes a long time to reach the local people. Poor communication often results in low participation and the possibility of neglecting the integration of rich community perspectives and local knowledge into the planning process for climate change adaptation. This reduces the effectiveness and relevance of adaptation initiatives, thereby affecting their implementation and local sustainability.

Discussion

Several African countries have taken steps to address climate change. Some of the good-performing countries include South Africa, Uganda, and Cameroon, although all of them face similar challenges of limited financial and human resources in managing climate change adaptation projects in their respective countries. These countries have been able to meet most of the criteria established for the proper implementation of climate change adaptation, including the institutionalisation of climate change, integration of climate change into development plans, societal mobilisation, and climate change governance.

This study demonstrates that including climate change adaptation in national development plans (which meet the criteria: integrating climate change in development plans) does not automatically lead to the mainstreaming of climate change in the development plans of local governments, as in the case of Ghana (Atanga, Inkoom and Derbile, 2017). Mainstreaming can be achieved through proper channels for local institutional collaboration (such as local farmers' associations, traditional leaders, local NGOs, and environmental organisations at the local level) and the availability of adequate funding to local governments to finance local climate change adaptation projects, especially funds raised locally or discretionary or unconditional funding for which local governments have adequate control over expenditure. In addition, proper mainstreaming through the creation and employment of qualified local officers in charge of climate change at the local government level is needed to integrate climate change adaptation activities and projects of local institutions, which can be followed by raising political interest in climate change through capacity building.

Scholars such as Pervin et al. (2013) report that vertical integration policy (integration between the national and local government climate change adaptation projects) is very common in Africa, whereas horizontal policy (integration between local government and other local stakeholders (institutions)) on climate change adaptation projects is low. Nunan, Campbell, and Foster (2012) further report that horizontal policy integration minimises inconsistencies, makes efficient use of scarce resources, and avoids duplication in climate change adaptation projects and programmes at the local level. In practice, the two are essential for successful climate change adaptation.

The most important of all is the active mobilisation and participation of the local people and other local institutions in the planning and implementation of climate change adaptation projects, as has been done in Cameroon through the involvement of local chiefs, non-governmental organisations, farmers' associations, and other relevant local organisations (which meets the criteria: societal mobilisation). One way to increase the active participation of the local people is through increased and regular public education on the impact of climate change. Societal mobilisation improves the local people's knowledge and understanding of the need to get involved and take ownership in climate change adaptation projects, a step towards localising these projects to enhance their acceptance and sustainability at the local level (Dick-Sagoe and Nyamadi, 2022). Lebel et al. (2012) concur that mainstreaming climate change is a multi-level process that involves stakeholders from local and national levels. Ben Youssef (2021) reported that non-governmental organisations play an important role in local climate change adaptation.

This article presents an observation from Tanzania, which indicates that local government officials were implementing climate change adaptation strategies, such as promoting the planting of drought-resistant crops, conservation agriculture, and diversifying livelihood activities, when climate change adaptation was not recognised in Tanzania's 2025 Development Vision, indicating a lack of integration in formal development planning. Ben Youssef (2022) reported the same in the Tunisian local government, embarking on pressing climate change adaptation without considering national policies on climate change adaptation. Therefore, the question that arises is the sustainability of the implementation of these climate change adaptation strategies that were not backed by the national development. Lack of integration reduces the long-term framework for the integration of climate change and development (Lebel et al., 2012).

Finally, the efforts of local governments in Africa to respond to the impact of climate change are bedevilled by several challenges. Thus, local and national factors strongly influence the capacity to respond to the risks associated with climate change and manage the impact of climate change at the local level (Tompkins and Adger, 2005). There are challenges with funding and human resource capacity to handle climate change issues. The problem of political interference is also relevant. Measham et al. (2011) report that competing priorities often reduce local attention to climate change issues.

The reviewed evidence gives us some important perspectives for future action. Mainstreaming climate change into local development planning has resulted in the alignment of adaptation priorities and improved policy integration within decentralised governance systems. Where this mainstreaming is effectively implemented, local governments demonstrate clearer planning frameworks and stronger institutional coordination. However, in practice, mainstreaming remains uneven and partial, thereby constraining its effects on resilience's long-term outcomes.

Improved context-specific responses to climate risks, incorporation of indigenous knowledge, and increased local participation have been made possible by using community-based adaptation approaches. These approaches have enhanced the relevance of adaptation initiatives and strengthened local ownership. However, the effective use of community-based adaptation approaches is limited by insufficient resources, institutional support, and the inclination to remain consultative rather than openly collaborative.

While the state–civil society collaboration structure has enabled knowledge exchange, the implementation of local-level adaptation initiatives and resource mobilisation need some more concentrated efforts.

State–civil society manifests in partnership between community groups, non-governmental organisations, and local governments have significantly advanced adaptation efforts in resource-constrained settings, even when there have not been any national-level backing. In light of this, concerns have been raised about the continuity and sustainability of these donor-driven and externally funded adaptation initiatives, as these collaborative adaptation initiatives solely depend on external donors.

Generally, climate change adaptation initiatives have a potential to make important contributions in building local resilience, resource availability, governance arrangements, and institutional capacity. But, adaptation outcomes are not the same across different contexts, reflecting broader spatial and structural disparities in the implementation and planning of adaptation across Africa.

Conclusion

This review examined the various adaptation strategies employed by the local governments in Africa to address climate change and the challenges they face. The findings indicate that local governments in Africa are progressively understanding their role in building climate change adaptation. However, the level of institutionalisation of adaptation planning continues to be unequal and spatially differentiated across Africa. While some countries have adequately embedded climate change in decentralised planning systems, others continue to function with nascent or fragmented adaptation frameworks. This unevenness displays broader structural disparities in policy coherence, resource allocation, and governance capacity across African countries.

The adaptation strategies of local governments are largely centred on fostering collaboration with civil society actors, promoting community-based adaptation, and mainstreaming climate change into development planning. However, the effectiveness of these adaptation strategies is limited by overreliance on donor-driven initiatives, weak institutional coordination, inadequate technical expertise, and limited financial resources. Consequently, many local governments' adaptation initiatives remain short-term and reactive, rather than transformative and proactive in addressing long-term climate risks.

This review raises the importance of local government responses to climate change risks at the level of different African countries. The findings prove that local governments are critical mediators between local realities and national policies. Through mediation, local governments translate a broad framework of adaptation into context-specific interventions. Despite this role, evidence shows a significant number of misalignments between the capacity of local implementation and national policy directives, often

undermining the effectiveness of local-level responses. This calls for reinforcing the need for a stronger coordination network linking horizontal and vertical governance. Therefore, this article argues for making adaptation mechanisms to be generated from the local level in an effort to change the existing top-down structure.

This review highlights the following practical implications. First, local governments should strengthen their administrative and technical capacities to implement and design effective local-level climate change adaptation initiatives. This includes improving data systems to support evidence-based planning, improving access to climate finance, and investing in local government staff's capacity building. Furthermore, the importance of integrating active community participation, collaboration, and local knowledge into the local-level climate change adaptation processes should be emphasised to ensure sustainable and context-specific outcomes.

Theoretical perspectives reinforce the importance of multilevel governance, vulnerability frameworks, and institutional theory in understanding adaptation to local climate change. From the institutional theory, the study portrays how the arrangement of different institutions significantly shapes local-level climate adaptation outcomes, as fragmented governance structures and weak institutional capacity limit the effective response ability of local governments to climate change. Likewise, the findings of the review fit well with the vulnerability frameworks. This is true because adaptation efforts should be geared towards environmental and local socio-economic conditions where vulnerability is most visible. Multi-level governance is also demonstrated as an effective adaptation that rests on alignment and proper actions across local, national, and global levels.

From the policy perspective, the findings call for rethinking the frameworks of climate governance that prioritise local-level adaptation. This includes embedding climate change considerations into local planning instruments and development policies, ensuring that institutional mandates are clear, strengthening decentralisation processes, and improving coordination across levels and sectors of government. In addition, more sustainable financing mechanisms are needed that support long-term local-level planning of climate change adaptation and reduce dependence on funds from external donors.

References

Adger, W. N. (2003). Adaptation to climate change in the developing world. *Progress in Development Studies, 3*(3), 179–195. https://doi.org/10.1191/146fy4993403ps060oa

Adger, W. N. (2006). Vulnerability. Global Environmental Change, 16(3), 268–281. https://doi.org/10.1016/j.gloenvcha.2006.02.006

Agranoff, R. and McGuire, M. (2003). Collaborative Public Management: New strategies for local governments. Georgetown University Press.

Agrawal, A., Perrin, N., Chhatre, A., Benson, C., & Kononen, M. (2012). Climate policy processes, local institutions, and adaptation actions: Mechanisms of translation and influence. *Wiley Interdisciplinary Reviews: Climate Change, 3*(6), 565–579. https://doi.org/10.1002/wcc.193

Agrawal, A. (2008). The role of local institutions in adaptation to climate change. In *Social dimensions of climate change: Workshop report 2008*. World Bank, Washington DC.

Asha, A. A., & Madzivhandila, T. S. (2016). Local response to the impacts of climate change in South Africa: Insights from local government integrated development planning. *Journal of Public Administration, 51*(1). https://hdl.handle.net/10520/EJC192811

Atanga, R. A., Inkoom, D. K. B., and Derbile, E. K. (2017). Mainstreaming Climate Change Adaptation into Development Planning in Ghana. Ghana Journal of Development Studies, Vol. 14 (2). DOI//http://dx. doi.org/10.4314/gjds.v14i2.11

Ben Youssef, A. (2021). *The role of NGOs in climate policies: The case of Tunisia* (Working Paper No. 1519). Economic Research Forum.

Ben Youssef, A. (2022). Climate change in the Tunisian cities: lessons learned and best practices. Environmental Economics and Policy Studies. https://doi.org/10.1007/s10018-022-00353-x

Bulkeley, H., & Betsill, M. M. (2013). Revisiting the urban politics of climate change. *Environmental Politics, 22*(1), 136–154. https://doi.org/10.1080/09644016.2013.755797

Burch, S. (2010). Transforming barriers into enablers of action on climate change: Insights from three municipal case studies in British Columbia, Canada. *Global Environmental Change, 20*(2), 287–297. https://doi.org/10.1016/j.gloenvcha.2009.11.009

Chu, E. K. (2018). Urban climate adaptation and the reshaping of state–society relations: The politics of community knowledge and mobilisation in Indore, India. *Urban Studies, 55*(8), 1766–1782. https://doi.org/10.1177/0042098016686509

Durban Adaptation Charter (DAC). (2014). *The third meeting of the Central KwaZulu-Natal Climate Change Compact – Durban, South Africa*. Retrieved October 10, 2025.

Dick-Sagoe, C., & Nyamadi, W. K. (2022). Assessing community participation in district development facility funded projects in the Adentan Municipality of Ghana. *Loyola Journal of Social Sciences, 36*(1), 41–57.

eThekwini Municipality. (2014). Durban Adaptation Charter (DAC) 2014 Annual Report. Durban: EThekwini Municipality.

Engel, K. H. (2006). State and local climate change initiatives: What is motivating state and local governments to address a global problem, and what does this say

about federalism and environmental law? *The Urban Lawyer, 38*(4), 1015–1030.

Fairbrass, J., and Jordan, A. (2004). Multi-level Governance and Environmental Policy. In Ian Bache and Matthew Flinders (eds.), Multi-level Governance (Oxford, 2004; online edn, Oxford Academic, 7 Apr. 2004), https://doi.org/10.1093/0199259259.001.0001 2004), accessed 15 Oct. 2025.

Friend, R., Jarvie, J., Reed, S. O., Sutarto, R., Thinphanga, P., & Toan, V. C. (2014). Mainstreaming urban climate resilience into policy and planning: Reflections from Asia. *Urban Climate, 7*, 6–19. https://doi.org/10.1016/j.uclim.2013.08.001

Friis-Hansen, E., Aben, C., Okiror, J. J., Bashaasha, B., Suubi, G. (2015). Local government engagement with climate change adaptation in Uganda. Danish Institute for International Studies (DIIS), Report, No. 19 Copenhagen. Available online on 10th October, 2025 at http://hdl.handle.net/10419/144735

Fünfgeld, H. (2015). Facilitating local climate change adaptation through transnational municipal networks. *Current Opinion in Environmental Sustainability, 12*, 67–73. https://doi.org/10.1016/j.cosust.2014.10.011

Govindarajulu, D. (2020). Strengthening institutional and fnancial mechanisms for building urban resilience in India. Intern J Disaster Risk Reduct 47(101549):101549. https://doi.org/10.1016/j.ijdrr. 2020.101549

Green, L. W., & Glasgow, R. E. (2006). Evaluating the relevance, generalization, and applicability of research: Issues in external validation and translation methodology. *Evaluation & the Health Professions, 29*(1), 126–153. https://doi.org/10.1177/0163278705284445

Handayani, A. (2021). Local government response to the impacts of climate change: a review of climate change strategies in Pekalongan, Central Java, Indonesia. IOP Conf. Series: Earth and Environmental Science 724. doi:10.1088/1755-1315/724/1/012088.

Hardee, K., & Mutunga, C. (2010). Strengthening the link between climate change adaptation and national development plans: Lessons from the case of population in National Adaptation Programmes of Action (NAPAs). *Mitigation and Adaptation Strategies for Global Change, 15*(2), 113–126. https://doi.org/10.1007/s11027-009-9207-7

Healey, P. (2017). Transforming governance: Challenges of institutional adaptation and a new politics of space. In *Connections* (pp. 357–374). Routledge.

Hlahla, S., Nel, A., & Hill, T. R. (2019). Assessing municipal-level governance responses to climate change in KwaZulu-Natal, South Africa. *Journal of Environmental Planning and Management, 62*(6), 1089–1107. https://doi.org/10.1080/09640568.2018.1466693

Hong, S., Zhou, Y., Shang, J., Xiao, C., & Sun, J. (2020). Opportunities and challenges of deep learning methods for electrocardiogram data: A systematic review. *Computers in Biology and Medicine, 122*, 103801. https://doi.org/10.1016/j.compbiomed.2020.103801

Hutcheon, L., & O'Flynn, S. (2012). *A theory of adaptation*. Routledge. https://doi.org/10.4324/9780203095010

Intergovernmental Panel on Climate Change (IPCC). (2007). *Climate change 2007: Synthesis report. Contribution of Working Groups I, II and III to the Fourth Assessment* Report of the Intergovernmental Panel on Climate Change.

Intergovernmental Panel on Climate Change (IPCC). (2022). Climate change 2022: Impacts, adaptation and vulnerability. Cambridge University Press.

Kyeremeh, T. A. (2016). Mainstreaming climate change into development plans of local assemblies in transitional zones of Ghana: A case study of Tain District Assembly (Master's thesis, University of Ghana).

Lebel, L., Li, L., Krittasudthacheewa, C., Juntopas, M., Vijitpan, T., Uchiyama, T., & Krawanchid, D. (2012). *Mainstreaming climate change adaptation into development planning*. Bangkok: Adaptation Knowledge Platform and Stockholm Environment Institute, 8, 1–24.

Leck, H., & Simon, D. (2018). Local authority responses to climate change in South Africa: The challenges of transboundary governance. *Sustainability, 10*(7), 2542. https://doi.org/10.3390/su10072542

Local Government Programme 4 Climate Change. (2016). Local Government Response to Climate Change. Pretoria: South African Local Government Association (SALGA).

Marshall, N. A., Marshall, P. A., Tamelander, J., Obura, D., Malleret-King, D., & Cinner, J. E. (2009). A framework for social adaptation to climate change. IUCN. https://portal.iucn.org/library/efiles/documents/ 2010-022.pdf

Measham, T. G., Preston, B. L., Smith, T. F., Brooke, C., Gorddard, R., Withycombe, G., & Morrison, C. (2011). Adapting to climate change through local municipal planning: Barriers and challenges. *Mitigation and Adaptation Strategies for Global Change, 16*(8), 889–909. https://doi.org/10.1007/s11027-011-9301-2

Mukonza, C., & Mukonza, R. (2014). An analysis of responses to climate change by local government in South Africa: The case of Capricorn District Municipality. *International Journal of African Renaissance Studies – Multi-, Inter- and Transdisciplinarity, 9*(2), 173–196. https://doi.org/10.1080/18186874.2014.987987

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.

Nunan, F., Campbell, A., & Foster, E. (2012). Environmental mainstreami-ng: The organisational challenges of policy integration. *Public Administration and Development, 32*(3), 262–277. https://doi.org/10.100 2/pad.1624

Pasquini, L., Cowling, R. M., & Ziervogel, G. (2013). Facing the heat: Barriers to mainstreaming climate change adaptation in local government in the Western Cape Province, South Africa. *Habitat International, 40*, 225–232. https://doi.org/10.1016/j.habitatint.2013.05.003

Pasquini, L., Ziervogel, G., Cowling, R. M., & Shearing, C. (2015). What enables local governments to mainstream climate change adaptation? Lessons learned from two municipal case studies in the Western Cape, South Africa. *Climate and Development, 7*(1), 60–70. https://doi.org/10.1080/17565529.2014.886994

Pervin, M., Sultana, S., Phirum, A., Camara, I. F., Nzau, V. M., Phonnasane, V., Khounsy, P., Kaur, N., Anderson, S. (2013). A Framework for Mainstreaming Climate Resilience into Development Planning. International Institute for Environment and Development: London, UK.

Peters, G. B. (2019). Institutional Theory in Political Science: The New Institutionalism. Perspectives from Central and Eastern Europe. NISPAcee Journal of Public Administration and Policy 12(2):281-285. https://doi.org/10.2478/nispa-2019-0024

Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. John Wiley & Sons.

Pilato, G., Sallu, S. M., & Gaworek-Michalczenia, M. (2018). Assessing the Integration of Climate Change and Development Strategies at Local Levels: Insights from Muheza District, Tanzania. Sustainability, 10, 174. https://doi.org/10.3390/su10010174

Plessis, A. and Kotzé, L. J. (2014). The Heat is On: Local Government and Climate Governance in South Africa. Journal of African Law, 58, 1: 145-174. https://doi.org/10.1017/S0021855314000047

Preston, B. L., Brooke, C., Measham, T. G., Smith, T. F., & Gorddard, R. (2009). Igniting change in local government: Lessons learned from a bushfire vulnerability assessment. *Mitigation and Adaptation Strategies for Global Change, 14*(3), 251–283. https://doi.org/10.1007/s11027-008-9163-4

Preston, B. L., Kay, R.C. (2010). Managing climate risk in human settlements. In: Jubb I, Holper P, Cai W (eds) Managing climate change: papers from the Greenhouse 2009 Conference. CSIRO Publishing, Melbourne

Preston, B. L., Smith, T., Brooke, C., Gorddard, R., Measham, T.G., Withycombe, G., McInnes, K., Abbs, D., Beveridge, B., Morrison, C. (2008). Mapping climate change vulnerability in the Sydney Coastal Councils Group. Prepared for the Sydney Coastal Councils Group and the Australian Greenhouse Office. CSIRO, Melbourne

Preston, B. L., Westaway, R. M., & Yuen, E. J. (2011). Climate adaptation planning in practice: An evaluation of adaptation plans from three developed nations. *Mitigation and Adaptation Strategies for Global Change, 16*(4), 407–438. https://doi.org/10.1007/s11027-010-9270-x

Republic of South Africa (2011), Department of Environmental Affairs. National Climate Change Response Policy White Paper (NCCRP). Available online on the 17th October, 2025 at Aahttps://www.dffe.gov.za/sites/default/files/legislations/national_climatechange_response_whitepaper_0.pdf

Republic of South Africa (2017). Department of Environmental Affairs. National Climate Change Adaptation Strategy. Assessed online on the 17th November 2025 from https://www.dffe.gov.za/sites/default/files/legislations/session2_draftnational_adaptationstrategy.pdf

Roberts, D. (2010). Prioritizing climate change adaptation and local-level resilience in Durban, South Africa. *Environment and Urbanization, 22*(2), 397–413. https://doi.org/10.1177/0956247810379945

Rugube, L. M., Nsibande, S. P., Masarirambi, M. T., & Musi, P. J. (2019). Factors affecting profitability of smallholder vegetable farmers in the Shiselweni region, Kingdom of Eswatini (Swaziland). *Sustainable Agriculture Research, 8*(4), 104–115. https://doi.org/10.5539/sar.v8n4p 104

Scott, W. R. (2001). *Institutions and organizations* (2nd ed.). Sage Publications.

Sharma, V., Orindi, V., Hesse, C., Pattison, J., & Anderson, S. (2014). Supporting local climate adaptation planning and implementation through local governance and decentralised finance provision. *Development in Practice, 24*(4), 579–590. https://doi.org/10.1080/09614 524.2014.907240

Shemdoe, R., Kassenga, G. & Mbuligwe, S. (2015). Implementing climate change adaptation and mitigation interventions at the local governm- ent levels in Tanzania: where do we start? Current Opinion in Enviro-nmental Sustainability, Vol 13, pages 32-41. https://doi.org/10.1016/j .cosust.2015.01.002

Tani, B. V., & Tume, S. J. P. (2019). The role of municipal councils in climate change mitigation in the North West Region of Cameroon. *International Journal of Resource and Environmental Management, 4*(2).

Tompkins, E. L., & Adger, W. N. (2005). Defining response capacity to enhance climate change policy. *Environmental Science & Policy, 8*(6), 562–571. https://doi.org/10.1016/j.envsci.2005.06.012

United Nations Framework Convention on Climate Change (UNFCCC). (2008). *Compendium on methods and tools to evaluate impacts of, and vulnerability and adaptation to climate change*. UNFCCC Secretariat.

Yakubu, R. N. (2018). The role of local government in the adaptation and mitigation of climate change in the agricultural sector in the Northern Region of Ghana. *Journal of Agriculture and Environmental Services, 7*(2), 101–108.