

An Analysis of Legal and Institutional Framework for Sustainable Urban Climate Change Management in Kenya: A Case of Nairobi

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Abstract

The purpose of this paper is to analyze the legal and institutional framework for sustainable urban climate change management in Kenya, focusing on Nairobi City. Objectives include: examine the extent to which climate change legal and institutional framework affect the urban systems in Nairobi; analyze the effectiveness of existing legal and institutional framework that guide climate change in the urban systems; identify the challenges and prospects of integrating climate considerations into various urban planning and development instruments policies, projects and programs; and to recommend practical integrative, legislative and institutional strategies that can be adopted to enhance climate change management in Nairobi. The paper is key to addressing policy deficiencies and legal gaps that include legislations, policy, government strategies, as well as institutional issues including governance organs and leadership arrangements on climate change. The study employed content analysis, with a focus on qualitative analysis through interpretative methods and a closer reading of four key documents guiding climate change frameworks at the County level. These include: County stakeholders consultative workshop on the Development of the national climate change response strategy's action plan 2012, County Fiscal Strategy Paper for the Financial Year 2016/2017, Nairobi County Integrated Development Plan, 2014 and the Nairobi City County 2015-2025 Strategic Plan. Data analysis was by content analysis technique to make replicable and valid inferences by interpreting and coding textual (documents/reports) material. The study established capacity gaps and needs throughout the four key documents analyzed; several other challenges linked to institutionalization, mainstreaming, and governance were also identified. These include: difficulty in mainstreaming climate change into existing county departmental functions, difficulty in implementing policies that require collaboration between national and county government agencies and lack of coherent documents related to climate change and adaptation. The study concluded that the significance of legal and institutional framework on climate change in urban settings as Nairobi is based on the need to concurrently strengthen the enabling environment, institutional roles and functions of various administrative levels, stakeholders, and management instruments, including effective regulation, monitoring and enforcement of laws. The study recommended the County government need to institutionalize coordination bodies for climate change adaptation beyond the key sectors and ministries; develop a mechanism and frameworks for coordination and exchange between them and to promote awareness.

Keywords: Adaptation, Climate change, Climate change responses, Emissions, Environment, Governance, Institutional structures, Kyoto protocol, Legislative initiatives, Legal and institutional frameworks, Management, Mitigation, Policies, Regulations, Vulnerability.

1. INTRODUCTION

In the recent years, there have been efforts in enhancing the legal and institutional framework to facilitate the necessary direction, guidance, coordination and high-level to mainstream climate change. For the developed economies, cities have created a range of institutional mechanisms to implement climate-related policies. Nevertheless, climate change policymaking has been characterized by a lack of focus on adaptation issues (Bulkeley & Moser, 2007). The urban strategy aims to ensure that urbanization is managed for resilient, inclusive, and sustainable growth. To date, existing climate change action plan focus on mitigation. In the U.S., Corfee-Morlot and Teasdale (2009) point out that only a handful of cities (New York, Seattle, Portland, Boulder) and states (Oregon, Washington State) incorporate both adaptation and mitigation in their responses to climate change.

For the developing countries, emerging institutional structures do vary considerably across nations, even those with similar levels of economic development (World Rydin, 2008). However, establishing effective legal and institutional frameworks is crucial to its management to enable the effective implementation of actions to address climate change. Climate change legal and institutional framework is important for countries towards establishing active mitigation and adaptation policy regimes that confront and prepare for the impacts of climate change. On the same note, Meadowcroft (2009) points out that part of this involves realigning economic focus, interlinking climate change and national development policy, establishing effectual institutional frameworks, adjusting legal rights and political responsibilities and changing accepted norms to address the impacts of climate change. Different countries have adopted a range of legislative and institutional structures and approaches in dealing with climate change. While integrated urban planning have been initiated, preparing and implementing climate change action plans to facilitate planning for sustainable urban growth remains a challenge in Kenya (World Bank, 2016).

Adaptation is often described as a complementary activity to mitigation, and refers to the efforts of analyzing the impacts of climate change and preparing to adapt to these very impacts (Smit and Wandel, 2006). Adaptation to climate change is now considered a necessity to ensure that basic human needs can be met. Strategies include prioritizing food security, preventing disruption of social systems and assuring that livelihoods are not compromised (Adger, 2010; Lobell et al., 2008; Scott et al., 2003). The United Nations Framework Convention on Climate Change (UNFCCC) has been suggesting a movement towards adaptation and mainstreaming since 2000 (Olmos, 2001). The most recent report by the IPCC, the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, contains even more of an emphasis on adaptation in the different sectors such as freshwater and marine ecosystems (IPCC, 2014). Different governments and non-governmental organizations have taken diverse approaches to how mainstreaming should be carried out. Although there exist many climate change adaptation frameworks, most do not consider the importance of policy capacity. Without translation in to policy, these frameworks, which contain management recommendations and a large volume of knowledge but limited information on developing and implementing policy options, do not lead to evidence based policy (Wellstead and Stedman, 2015).

In Africa, many countries are currently examining the legal framework with the hope of addressing the effects of climate change. In Nigeria or example, despite the existence of several institutions in the country like NESERA and SCCU in the Federal Ministry of Environment, NIMET, the nation's institutional capacity to respond effectively to climate change has remained very weak (Ademola (2017). According to Ademola (2017), this is because there are no formal institutional structures at state and local government levels to address climate change. On the other hand, Ghana has demonstrated its commitment to contribute to finding global solutions to the myriad of problems relate to climate change through strategic efforts towards multilateralism, regional cooperation and partnerships.

Africa's rapid urbanization challenges many aspects of sustainability. The concept of urban environmental sustainability calls for African municipalities, companies and citizens achieve a better urban environment (Dietz, 2017). Consequently, Africa's cities cope with huge demands and challenges, with many unplanned residential areas, and many dangerous working and living conditions.

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Nevertheless, cities, including in Africa, are often at the forefront of efforts to meet the challenges since they are today both major sources of emissions and key locations where the effects of environmental change and variability are felt (Dietz, 2017). According to Kuhla (2016), African cities are struggling to implement measures to respond to climate change due to the lack of municipal assets. Chirisa and Bandaiko (2016) consent that most African cities exhibit critical bottlenecks towards emulating the Asian prototypes. Despite efforts to become 'green cities', and promote changes in urban design and lifestyles that try to become more sustainable, coping with climate change remains one of their problems.

In the majority of cities, climate change mitigation and adaptation strategies are developed by municipalities in collaboration with experts from the fields of climate science, energy, economics, technology and urban planning. Besides ambitious goals, African cities are struggling with economical and human resources to implement sustainable measures due to the lack of municipal assets such as administrative power, financial resources and urban development tools (ARUP and C40 cities, 2015). Meanwhile, the same cities act as the breeding grounds for innovative bottom-up solutions and creative start-ups that are transforming urban environments and shaping urban systems on the base of limited resources and finances (Seyfang and Smith, 2007).

Kenya has been integrating climate considerations into various legal and governance instruments for some time. "Kenya ratified the Kyoto protocol in 2005, and supports the UNFCCC process-the constitution has a legal commitment to attain ecologically sustainable development which forms the basis for its climate change policy framework" (CDKN, 2012). Otieno (2009) argues that the main policy challenge facing developing countries like Kenya, is on how to formulate a regulatory and incentive urban planning and development policy framework which will strengthen the potential of the urban areas to grow and develop substantially. Nairobi metropolitan plan is envisaged to address the problems such as poor housing, crime, traffic jam, infrastructure problems and environmental problems associated with the Nairobi city. The plan is anchored on the country's Vision 2030, which aim at enabling the country to be globally competitive and prosperous with high quality life (Otieno, 2009). This spirit gives urban planners and other professionals an opportunity to transform the metropolis to achieve desirable and stable urban environment with minimum pollution, especially the ones resulting from land use planning decisions.

Nairobi is experiencing rapid growth facing and emerging challenges in mainstreaming climate policy objectives with local development needs, especially regarding the provision of adequate infrastructures and access to basic services such as clean water and sustainable energy beg for research. These priorities are enshrined in Kenya's "Vision 2030" and key targets of designated Sustainable Development Goals. The climate change narrative has changed from one of mitigation to one of adaptation. At the national level, the government of Kenya has made steps through climate change frameworks to address how the country can better cope with the expected and unexpected changes due to global climate change. In an effort to do so, County governments have also come up with outline documents which outline what steps must be taken to adapt to these changes. However, not much is mentioned about how these steps will be translated in to policy, and how that policy will eventually be implemented. Moreover, the legal and institutional frameworks that focus on climate change management in urban settings is sparsely researched.

Statement of the Problem:

The need for profound transformation of urban cities into urban futures that meet the challenges of climate change to reduce vulnerability and promote resilience through substantive adaptation strategies is now widely recognized across much of the continent. More recently there have been efforts by the international community to engage other levels of governance in mitigation and adaptation response. While the framework for international action on climate change continues to evolve, demands for consideration of climate change management issues in local policy making have remained a research rhetoric and have not yet translated into planning action. As policy makers accept climate change as an irrefutable threat, adaptation planning has emerged as a necessary action for countries, states, and municipalities. This gap between planning research and practice is probably due to lack of evidence based research on this issue.

Nairobi County has made progress over recent years, and adaptation strategies and action plans are steadily emerging. At the same time, like many other cities in developing countries, Nairobi County is experiencing simultaneous challenges including infrastructure, water, waste management and energy. Large populations, high densities, presence of informal settlements, and industries within the city have made them vulnerable to climate extremes. Urban infrastructure is also at risk from climate change events including intense precipitation, flooding, and heat events. Despite these potential strengths, climate change management and or adaptation has yet to

become a prominent agenda amongst city leaders/governors and planners and new approaches are needed to understand and react effectively to urban adaptation challenges and opportunities. It is also clear that the development of a collaborative approach to reposition and mainstream urban planning and climate change into urban development is still work in progress. A lack of appropriate policies and legislative frameworks may present barriers to the implementation of adaptation responses, and possibly increase the vulnerabilities. Although the impact of urban planning patterns is gaining momentum, there is lack of research analyzing the influence of legal and institutional frameworks on climate change and urban planning policies. This evident gap in research needs immediate attention.

Justification of the Study:

Kenya like other sub-Saharan African countries faces the uncertainty and potential risks of climate change. A main obstacle for policy formulation is that policies have often been developed without an integrated urban planning framework. Many actions seem to be selected on an ad hoc basis according to the feasibility to implement short-term visible actions rather than clear criteria of priorities to obtain effective results. Were climate change goals and recognition of long-term risks of climate change fully integrated into urban development plans, the prospects for effectiveness of "climate change" actions would be improved. In particular local authorities might achieve a better balance between mitigation and adaptation, reduce unintended negative consequences of those actions, and better link urban development objectives with climate change actions.

Climate change actions are thus not solely linked to the environment but should be an integral part of urban development and planning strategies. Yet in many regions of Nairobi County, there is a lack of integration of climate policy into urban planning. For example in Japan, Sugiyama and Takeuchi (2008) found that climate change is treated as a distinct policy issue, rather than one whose solution will require integration of climate change awareness into all policy areas, ranging from transport, to finance, education, and zoning. Integrated planning schemes would be able to better address urban sprawl, which as mentioned in the introduction, is an indirect contributor to CO₂ emissions. The County is currently coupled with increased urban growth and drivers of economic development. As such, the high level of production and consumption activities in the County is also associated with highest carbon dioxide emissions. Thus, the

case study area has a key role to play in managing climate change.

II. LITERATURE REVIEW

Institutional framework and climate change:

Climate change as a policy problem is a challenge of its own: Its causes and implications are global, thus going beyond the domestic reach of national governments. Moreover, it is related to a myriad of other environmental, economic and social concerns. Therefore, the actors involved in finding solutions coming from a cross-sectoral and cross-institutional background are likely to have a widely different set of values and worldviews, thus making it necessary to have an extraordinary coordination framework to manage the over-boarding stakeholder participation. Finding solutions becomes even more difficult as there is a lack of scientific certainty about causes and consequences of the problem. Thus, climate change does not give decision-makers the opportunity for 'trial and error learning' (Rayner and Okereke 2007) as its consequences are long-term and unclear to predict. These specific characteristics make climate change a political problem which poses various policy coherence and institutional coordination problems, thus turning out to be a 'governance issue.'

These institutions and their relations have to adapt to handle a complex problem like climate change since their narrow mandates and experiences are not geared to govern cross-societal problems. Dealing with the increasing complexity of environmental problems, most countries are striving towards reaching a more cooperative form of government in which governmental bodies are working in closer cooperation. However, very often one tier of government does not know what the others are doing and even if they are aware there might be a lack of clarity about each other's institutional mandates (Goldblatt and Middleton 2007). This is especially the case regarding climate change since the level of practical experience with instruments for policy coherence and coordination is still very low in most countries especially in developing countries. Hence, for development related research, paying attention to legal, procedural and institutional issues relevant to policy coherence and institutional coordination capacities is crucial for supporting developing countries' attempts to formulate a successful climate policy. For developing countries such as Nigeria, characterized by low adaptive capacities, weak political institutions (especially in the environment sector) and a multitude of other problems to solve, climate change represents an overall threat to its development (Goldblatt and Middleton 2007).

Carter (2007) observes that there is a historically manifested problem for environmental policy-making in general which also affects climate policy: Governments' administrative and political structures are usually separated into different policy sectors. The problem is that the sectoral administration bodies are likely to follow their primary objectives without having too much attention for environmental implications. This system represents a policy style which is geared towards the fulfillment of individual sectoral interests where each department advocates for its key group within its individual policy sphere. This also forces environmental decision-making into a sectoral framework: Fearing the infiltration of established sectoral arrangements for policy-making by 'outsiders', ministries shy away from coordinated strategies and cross-sectoral problem-solving to keep up their territories and to avoid conflicts with each other. In the end, this system leads to the marginalization of environmental concerns in public decision-making. Environment has thus been considered as an own discrete policy area without recognizing its special trans-sectoral character and the need to create a connection between ecosystems and political, economic, social and cultural systems.

Legislative and institutional perspective on climate change management in Kenya:

From a legislative and institutional perspective, Kenya has made some impressive progress on climate change response to date. This includes the constitutional recognition of sustainable development, public participation in environmental decision making, and socio-economic rights, the intensification of forest rehabilitation and reforestation through a set level of mandatory forest cover, and the requirement for agro-forestry practices on all farms, amongst many others. Most recently, draft climate change legislation has been developed with significant civil society involvement and put forward as a private member's Bill. Regarding the current institutional framework, a range of institutions have been created that have a specific mandate to address climate change or have substantial engagement with the issue.

These include the Climate Change Secretariat within the Ministry of Environment and Mineral Resources, the Climate Change Coordination Unit within the current Office of the Prime Minister and the establishment of 'climate desks' in key sectoral ministries. Some of these institutions were created on an interim basis or may be reformed with the implementation of the Constitution of 2010, as discussed more thoroughly below. Therefore, despite its achievements, Kenya at present lacks a long-term and

overarching legislative and institutional framework that can facilitate the necessary direction, guidance, coordination and high-level political buy-in to mainstream climate change across government and enable the effective implementation of actions to address climate change. This Report responds to this gap and seeks to analyze potential options available to the Government of Kenya given the current context and provides a series of recommendations for climate change related legislative and institutional reform.

National Climate Change Response Strategy and Action Plan in Kenya:

Kenya published the National Climate Change Response Strategy (NCCRS) in April 2010 in order to put forward the broad response strategy and strengthen nationwide focused actions towards adapting to, and mitigating against, a changing climate. The NCCRS is aimed at addressing climate change in a systematic manner and among others, assesses the climate change impacts, vulnerability, adaptation and mitigation needs, and proposes the establishment a climate change governance structure, action plan and resource mobilization plan. It notes that Kenya currently has no policies or laws that deal directly with climate change and recommends a comprehensive climate change policy and related legislation be put in place by either reviewing and updating the draft National Environmental Policy or developing a completely new climate change policy. This should be followed by a review of existing laws, including the EMCA, to make them climate change responsive and/or enactment of a new and comprehensive climate change law. The NCCRS recommends the latter, a process which could run concurrently with the policy formulation. Institutions currently in place to govern climate change affairs are also considered inadequate. A dedicated and adequately funded climate change secretariat to oversee climate change issues and implementation of the NCCRS, as well as establishment of other supporting institutions are recommended.

Institutional mechanisms for implementing climate-related policies in urban cities:

Cities have created a range of institutional mechanisms to implement climate-related policies. Nevertheless, climate change policymaking has been characterized by a lack of focus on adaptation issues (Bulkeley & Moser, 2007). To date, existing climate change action plan focus on mitigation. In the U.S., Corfee-Morlot and Teasdale (2009) point out that only a handful of cities (New York, Seattle, Portland, Boulder) and states (Oregon, Washington State) incorporate both adaptation and mitigation in their responses to climate change.

The City of Zurich, for instance, created a special unit for environmental protection in charge of supervising the city's climate policy with cross-departmental tasks within the city administration. This special administrative unit is responsible for assessing every planned development and construction project in terms of its impacts and the departments responsible for the implementation of such developments need to account for the results of this assessment (Aall, Groven, & Lindseth, 2007). In San Francisco, the Office of Climate Protection Initiatives is funded to co-ordinate the multiple climate initiatives undertaken by several programmes, lobby for climate protection legislation at the federal level, and for example, work with local private companies to encourage the use of vehicles that run on biodiesel (Betsill & Bulkeley, 2006).

However, most cities do not pursue such a systematic and structured approach and, instead, prefer to concentrate competencies for climate change policy in an environment department or agency. Traditionally environmental departments have been weaker politically and in terms of resources than other departments in sub-national administrations. For example, this is the case in approximately two thirds of German cities (Kern *et al.*, 2005). This may lead to coordination and integration problems if the environmental agencies do not have the power nor necessarily the competence to implement comprehensive or sectoral policy. In adaptation, local level decision-making is important for at least three reasons (Puppim de Oliveira, 2009). First, climate change impacts are manifested locally, affecting local livelihood activities, economic enterprises, human health, etc. Second, vulnerability and adaptive capacity are determined by local conditions. Regional or national vulnerability indices often mask the dramatic variations in vulnerability at local levels. Third, adaptation activities are often best observed and implemented at the local level. Decisions about livelihood strategies and investments drive adaptation (Puppim de Oliveira, 2009). Consequently, local monitoring and evaluation of how policies, programmes and projects are supporting adaptation are essential as they also provide a basis for learning, adjusting and eventually scaling up actions that are successful (OECD, 2009).

Integration of climate change management into urban development:

The successful integration of adaptation into local development processes depends on a number of enabling conditions. There needs to be broad and sustained engagement with and participation of local stakeholders, including local governments, communities, civil society and businesses. Local authorities need to adopt a collaborative approach where local actors are seen as legitimate decision-making agents. In addition, there needs

to be greater awareness raising and targeted messaging on climate change, as local actors need to know why they might have to take different decisions or call on different or additional resources in shaping their livelihoods. Furthermore, appropriate information needs to be gathered and used to inform local-level adaptation decisions (OECD, 2009).

In adaptation, local level decision-making is important for at least three reasons. First, climate change impacts are manifested locally, affecting local livelihood activities, economic enterprises, human health, etc. Second, vulnerability and adaptive capacity are determined by local conditions. Regional or national vulnerability indices often mask the dramatic variations in vulnerability at local levels. Third, adaptation activities are often best observed and implemented at the local level. Decisions about livelihood strategies and investments drive adaptation. Local monitoring and evaluation of how policies, programmes and projects are supporting adaptation are essential as they also provide a basis for learning, adjusting and eventually scaling up actions that are successful (OECD, 2009).

According to Opiyo (2010), climate change is challenging the livelihoods of the poor throughout Kenya, including in Nairobi city. The new Kenyan constitution (2010) recognizes- but there is a general lack of policies, instruments and strong institutions for regional and city management and governability. County governments have often been named as key actors in the transformation towards a more sustainable society. Local authorities have considerable authority over land use planning and water management, and thus they play a significant role in containing major contributors to urban climate imbalance such as the transportation and energy sectors – all of which have implications for climate change.

Kerr & Menadue (2010) argue that planners and policy-makers are making efforts to adapt to various global processes that impact cities today. However, these are often related to spatial (i.e. urban densification), economic (i.e. economic crisis) and environmental (i.e. global warming) changes and tend to leave out the complex of problems regarding social costs (Kerr & Menadue 2010). This includes social exclusion elements such as poverty, deprivation, poor housing and other types of social change within urban areas. The challenge here lies within planners' ability to forecast and react to these changes, or else there will be an unbalance between planning policy intention and impacts (Ward, 2004).

Local development plans and climate change management

With the understanding that urban settlements are important drivers of climate change, there is an urgent need for research to identify a viable role for developmental

planning in managing climate change. World over, various forms of local development plans are utilized to manage urban ecological impacts and growth patterns (Berke & Godschalk, 2008). Logically, such local development decisions impact social, economic and urban form characteristics of a settlement, which in turn influence local greenhouse emissions and vulnerability to climate change. For example, Godschalk (2003) has suggested a vision of “resilient cities” that recommends proactive allocation of resources for moderating the impacts of natural hazards. Researchers also suggest the need to integrate developmental requirements with the considerations of natural resource conservation and ecological sustainability (Rees & Wackernagel, 1996). However, research on active consideration of the institutional frameworks within urban planning in climate change management is still lacking. Local development plans are the primary policy documents that guide and shape urban form. Previous research has highlighted the role of plans in dealing with a variety of development issues within the broad umbrella of sustainability (Blakely, 2004). Researchers focusing on quality of plans have come with numerous content characteristics that ensure better sustainability, livability and resiliency performance of urban settlements (Berke et al., 2006; Berke & Godschalk, 2008). Similarly, climate change researchers have identified desired policies and actions that can facilitate effective mitigation and adaptation (Brody, 2003). However, very few of the researchers of beyond rhetorical calls and identify tools for local implementation of climate change management policies. The current study focuses on Nairobi County which is of national importance. The County is currently coupled with increased urban growth and drivers of economic development. As such, the high level of production and consumption activities in the County is also associated with highest carbon dioxide emissions. Thus, the case study area has a key role to play in managing climate change.

Climate Change management Framework:

The framework integrates theoretical and empirical knowledge of the factors contributing to resilience with processes for translating those concepts into practice. In the case of urban climate adaptation, an approach based on resilience encourages practitioners to consider innovation and change to aid recovery from stresses and shocks that may or may not be predictable. Resilience-building as a strategic approach has many advantages over conventional system management for complex social-ecological systems that are dynamic and facing high uncertainty (Walker, 2002). In this way, the application of the concept of resilience to urban climate adaptation practice would help

to address some of the weaknesses of a ‘predict and prevent’ approach and prepare for climate change even under high uncertainty. In order for city-level planners and professionals to deliberately build urban climate resilience, they need a framework that provides guidance for what climate resilience means in practice and points to how it can be strengthened. For this to be applicable by local practitioners in a wide range of circumstances, it should be simple and comprehensible.

- **Systems**

Cities require high levels of infrastructure to deliver essential services. Cities are also linked across multiple scales to other systems, such as regional food production that relies on ecosystems to deliver provisioning services. At the global scale, cities are connected through international trade and investment patterns, which can have direct effects on local employment and livelihoods as well as on supplies ranging from pharmaceuticals to imported staple foods. For example, in the Bangkok floods of October–November 2011, the flooding of local manufacturing facilities affected global supply chains for computer and automobile components and led to temporary factory closures and layoffs in many cities outside Thailand (Chachavalpongpun, 2011). The underlying support systems that enable networks of provisioning and exchange for urban populations are therefore an essential element of urban resilience. They include physical infrastructure and ecosystems, either within the city, immediately adjacent or remote ecosystems that provide key services such as food production, runoff management or flood control. These systems include water and food supply, and the ecosystems that support these, as well as energy, transport, shelter and communications. In assessing the potential for these systems to fail under climate-induced stress, it is crucial to recognize the interdependencies of complex linked systems because failures of one system often lead to cascading failures in linked systems (Kirshen, Ruth, & Anderson, 2008).

- **Agents**

Agents, or actors in urban systems, comprise the second key element in the resilience framework. They include individuals (e.g. farmers, consumers); households (as units for consumption, social reproduction, education, capital accumulation); and private and public sector organizations (government departments or bureaus, private firms, civil society organizations). They have identifiable but differentiated interests and are able to change behaviour based on strategy, experience and learning. In order to work effectively with agents it is important to recognize the

opportunities and constraints they face and the incentives to which they respond. Agent behaviour can be changed, but depending on the circumstances this may not be any easier than modifying complex technical infrastructure systems. Many agents (e.g. households) depend on urban systems and demand services but are not proactively involved in the creation, management or operation of those systems. Other agents are directly concerned with management of critical urban systems. In the case of water supply, for example, these might include the municipal water utility, key water quality or regulatory agencies, private water market suppliers and civil society organizations involved in water-related advocacy.

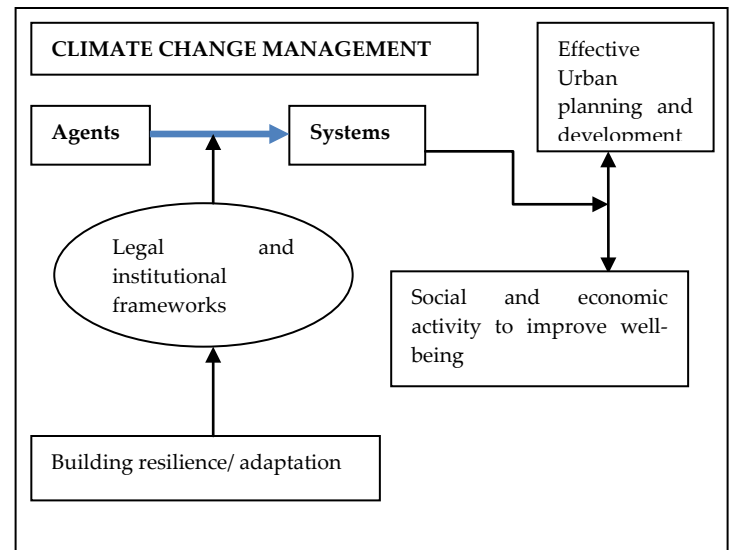
- **Institutions**

The concept of institutions in social sciences refers to the social rules or conventions that structure human behaviour and exchange in social and economic interactions (Hodgson, 2006). Institutions may be formal or informal, overt or implicit, and are created to reduce uncertainty, to maintain continuity of social patterns and social order, and to stabilize forms of human interaction in more predictable ways (Campbell, 2008). Institutions condition the way that agents and systems interact to respond to climate stress, so this is the third element of the resilience framework. Institutions of property and tenure, of social inclusion or marginalization and of collective action influence the vulnerability of particular social groups (Adger et al., 2005).

Institutions that enable or constrain individuals to organize or to engage in decision making (i.e. who is seen as a legitimate 'stakeholder') determine whose interests are considered in political decision making. Similarly, the standards to which systems are designed and managed, as with building and engineering codes, have a strong influence on whether those systems will reliably meet the needs of users (Satterthwaite et al., 2009). Finally, the pricing structure for urban services is an institution that influences access to infrastructure systems and the resilience they offer, particularly for the urban poor (McGranahan, 2002).

Institutions may enable and support, or constrain and inhibit, the capacities of vulnerable urban groups (Moser & Satterthwaite, 2010). With inadequate consultation or participation, minimal rights and only token compensation, resettlement could increase impoverishment and vulnerability. However, under different institutional conditions, the outcomes could be opposite. Institutions for collective action and governance can also be designed to

strengthen resilience by supporting ecosystem restoration and sustainability (Adger et al., 2005).



The key elements of the framework for urban resilience as outlined above are infrastructure and ecosystems (both captured under the rubric of 'systems'), social agents and institutions. For analytical purposes, we separate these elements, although we recognize that other analysts frequently refer to 'urban systems' that are integrated to include all these categories (da Silva et al., 2012).

While we characterize infrastructure and ecosystems alike as 'systems' in our categories above, each of these elements requires quite different kinds of analytical methods in order to understand their resilience characteristics. In addition, by identifying and treating these elements separately it is easier for local government or civil society organizations, with limited sectoral or thematic interests, to engage in the framework and to identify relevant issues. With a variety of entry points and analytical approaches available, local experts and practitioners should be able to relatively easily identify starting points that relate to their own domain and expertise. Within this conceptual framework, building urban climate resilience means:

Theoretical analysis:

Liberalists tend to see international relations as facilitating cooperation. They believe that states can overcome conflict through the pacifying influence of economic interdependence, international institutions and the spread of liberal democratic political systems. In fact, liberalists argue that international organizations, institutions and regimes have a measurable impact on global relations and the behavior of states (Adger & Arnell, 2005). Regimes, like the environmental regime, are instances of international cooperation. A regime is defined as "Government

arrangements constructed by states to coordinate their expectations and organize aspects of international behavior in various issue areas. Regimes thus comprise a normative element, state practice, and organizational roles" (Habib, 2011).

The environmental regime includes several organizations and international institutions which have a large influence on state behavior and foreign policies with respect to climate change mitigation. For instance, The United Nations is a major international organization that has been instrumental in developing international legal frameworks for biodiversity conservation and climate change. One of the most influential bodies that have been formed to address climate change is the UN Intergovernmental Panel on Climate Change (IPCC), which was established in 1988 by the UN Environmental Programme (UNEP) and the World Meteorological Organization (Pittok & Finlayson, 2016).

For instance, the IPCC has published five assessments on global warming since 1990. The UN General Assembly, which has sponsored major international environmental conferences and has played a vital role in advocating attention to climate change. Furthermore, The United Nations Environmental Programme (UNEP), is another intergovernmental organization which has served as an "institutional hub" for the UN's many environmental initiatives (Pittok & Finlayson, 2016). Neoliberal institutionalism further explains the challenges and benefits of cooperation, as it focuses mainly on how cooperation is achieved in the world. Keohane (1984) a firm advocate of neoliberal institutionalism, has noted under this theory that cooperation is hard to achieve, but, regimes, like the environmental regime and its institutions, could benefit states by incorporating cooperative strategies. Keohane defines cooperation as a process whereby states, "adjust their behavior to the actual or anticipated preferences of others, through a process of policy coordination" Furthermore, according to political scientist John Ruggie, regimes are "a set of mutual expectations, rules and regulations, plans, organizational energies and financial commitments, which have been accepted by a group of states."

As illustrated through the environmental regime, neoliberal institutionalism argues that states pursue such policies because it is usually in the best interest of all involved to do so (Soroos, 2011). This approach contributes to the understanding of how material realities gain meaning through social interaction. Accordingly, interpretations of climate change are shaped by social and material forces. The social construction of climate change in political science, specifically how politics have been incorporated into the science of climate change, is illustrated in recent literature (Pettenger, 2007).

In contrast to liberalists, realists would assert that states interests are defined in terms of power and each state wishes to dominate in the anarchical international system. Under realism, all nations are distrustful and would not normally cooperate because this would be against their top priority of self-interest and goal of power preservation and maximization. Furthermore, under realism, states must constantly ensure that they have sufficient power to defend themselves and advance their material interests necessary for survival. With that said, the past failure of states to collectively act to find a solution to the climate change problem can be illustrated under this theory (Pittok & Finlayson, 2016).

Global efforts to reduce the adverse effects of climate change requires countries to reduce greenhouse gas emissions to safe levels and adopt alternative environmentally-friendly technologies. However, the international community has not developed a unified solution regarding global mitigation efforts because reducing capabilities required for climate change mitigation threatens the economic development of a country, and in turn, disrupts the goal of power maximization. For example, energy and food security are all vital to a country's survival and makes them feel powerful, thus they will likely want to develop capabilities, such as agricultural and industrial practices, in order to preserve and enhance their economic development. As a result, cooperation is not likely to happen. Furthermore, given the existing distrust of science surrounding the evolution of climate change, there is the notion that states may perceive that implementing efforts to mitigate climate change is a plot to get them to stop developing. In this case, international collaboration is unlikely to occur and the climate change problem will not be resolved (Pittok & Finlayson, 2016).

III. RESULTS AND DISCUSSION

The study established progress that institutional framework has not fully provided mechanisms to ensure climate change vulnerability assessment. The County documents content analysis revealed a weak coordinated process to engage the public, develop adaptation priorities, coordinating agency responsibilities, and share data and information on climate change.

The **Nairobi County Integrated Development Plan, 2014 and the Nairobi City County 2015-2025 Strategic Plan** offer general policy guidance and are limited in scope as far as procedures to ensure clear coordination between the central and devolved governments on climate change management.

County stakeholders consultative workshop on the Development of the national climate change response

strategy's action plan 2012, however, is a positive measure on stakeholder engagement and climate change response at the top level. However, obstacles remain and throughout the legal an institutional framework which hinder the policy-to practice process and challenge the climate adaptation process in the city.

The County Fiscal Strategy Paper for The Financial Year 2016/2017, consequently, indicates a missing link to the broader development efforts on the role of institutions for climate adaptation and development. While there is evidence of deliberate efforts for governance systems that help respond to climatic and other challenges, it falls far short of the requisite capacity to effectively coordinate and implement climate change initiatives. Within the analyzed categories, institutional and political contexts are also considered to influence the climate change adaptive capacity.

The study results demonstrate evidence of lack of transparency and inclusivity by governance structures and organizations in their interactions and interventions with each other. Institutional efforts towards local level institutions to widen the regulatory approach to understand the climate change management initiatives are still weak.

Table1: Overview of typical aims, methods, and findings in content analyses of climate change management in Nairobi City

				Climate Change Action Plan 2013-2017
What challenges hinder integration of climate change policies into urban planning projects?	Qualitative analysis	Nairobi City County 2015-2025 Strategic Plan	Most do not consider the importance of policy capacity;	Opiyo (2010)
What integrative, practical and legislative strategies can be adopted for sustainable climate change management ?	Qualitative analysis Inductive	County stakeholders consultative workshop -2012	Stakeholder involvement and capacity development is weak and disjointed.	Otieno (2009)

Typical aims/research questions	Method	Samples	Typical findings	Exemplary documents
Does climate change affect urban systems in Nairobi?	Qualitative analysis	County Fiscal Strategy Paper For The Financial Year 2016/2017	Coverage of climate change has increased over the last decades	(Smit and Wandel, 2006)
Are existing legal/institutional frameworks effective to guide climate change in urban systems?	Qualitative analysis	Nairobi County Integrated Development Plan, 2014	Policy gaps with disjointed implementation of existing frameworks	(Adger, 2010; Lobell et al., 2008; Scott et al., 2003). National

Conclusions

The significance of legal and institutional framework on climate change in Nairobi urban system is based on the need to concurrently strengthen the enabling environment, institutional roles and functions of various administrative levels, stakeholders, and management instruments, including effective regulation, monitoring and enforcement of laws. A coherent and coordinated regulatory framework must therefore guide the County at the local level responses to the impacts of climate change. The absence of internal coherence in laws and policies has resulted in duplicity and overlap in execution of institutional mandates, with a suboptimal outcome for Nairobi urban planning.

Successful implementation of policy linked to the adaptation process is greatly dependent on local institutions facilitating these factors from within their own organization as well as in a network with other institutions. This has a wide a range of implications on how it affects and diverts the adaptation decision making process. In the absence of sufficient knowledge or instruction on climate change, institutional frameworks present future risks and vulnerabilities of turning policies into practical strategies.

Taken together, these findings beg for a clearer understanding of the uneven success of legal and institutional frameworks on climate change management, and of the limited application and success of formal approaches to institutionalization.

Recommendations

First, promoting policy and institutional coherence is key to enhancing climate change legal and institutional framework in the urban systems in Nairobi. Ensuring policy coherence at a national level enhances institutional capacity for coordinating climate change mechanisms. Policy coherence will provide an enabling environment for political will and future national policy implementation, capacity development, overcoming institutional challenges and assessing the results of policy coherence efforts.

Second, the Nairobi County government should work closely with institutions linked to climate change to raise the need to develop a mechanism or mechanisms (frameworks) for coordination and exchange between them. These mechanisms should link political institutions, research institutions and the community level (civil society, NGOs) but they should also enable coordination and exchanges between different subject areas.

Third, partnerships should be reinforced and extended. Indeed, while some institutions collaborate quite easily with others, they are often unaware that other partnerships are possible. It is also important that not only the institutions at the national level, but also the County level existing programmes and international organizations operating in the country are involved and integrated in

coordination and exchange processes, thereby allowing them to rationalize their experiences and investments.

Fourth, institutional frameworks should be enhanced to promote awareness. This framework should be guided by UNFCCC principles; recognize the urgency of developing and implementing robust and practical approaches to address loss and damage; address the needs of vulnerable countries; transform the scale of mitigation and adaptation ambition; be facilitative instead of punitive; and be based on the best available science and national circumstances.

Fifth, the County government should institutionalize coordination bodies for climate change adaptation beyond the key sectors within its ministries. These committees should represent all relevant agencies, civil society, and the private sector. Sufficient resources should be provided to maintain and encourage participation from representatives who have decision-making ability within their respective entities. The decisions and outcomes of these bodies should be made transparent for public comment. Formal policies and procedures may be needed to provide guidance.

Lastly, information collection and management systems need to be maintained, consolidated, analyzed, and disseminated in an appropriate manner. The National and County governments should develop, adapt, or revitalize platforms for managing and disseminating relevant climate change information. The existence and promotion of these platforms have the potential to raise public awareness and participation in climate change adaptation. Greater emphasis should be given to providing for greater public participation and review procedures in the development of priorities and monitoring of policy implementation on climate change management, and strengthening dialogue, coordination, coherence and synergies among relevant stakeholders.

References

1. Aall, C., K. Groven, and G. Lindseth (2007), *The Scope of Action for Local Climate Policy: The Case of Norway*, Global Environmental Politics, Vol. 7.2, pp. 83-101.
2. Adaptation Knowledge Platform, 2011. *Desktop Study on Capacity Gaps and Needs of South East Asia Countries in Addressing Impacts, Vulnerability and Adaptation to Climate Variability and Climate Change*.
3. Adger, W. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change, *Journal of International Development*, 13 (7) (2001), pp. 921-931.
4. Adger WN, Arnell NW, Tompkins EL (2005) Successful adaptation to climate change across scales. *Global Environ Chang* 15:77-86.
5. Adger, N. W., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., Naess. L. O., Wolf, J., Wreford, A., 2009. *Are there social limits to adaptation to climate change?* [e-journal] 93(3-4). Pp.. 335-354.
6. Agrawal, A., 2008. *The role of local institutions in adaptation to climate change* [pdf] Washington: World Bank.
7. Baker, M.Hincks, S. & Sherriff, S. (2010). Getting involved in plan making: Participation and stakeholder involvement in local and regional spatial strategies in England, *Environment and Planning C: Government and Policy*, 28 (2010), pp. 574-594.
8. Banhe, A. & Lopes, J. (2015). Climate change risk management: an analysis of opportunities for collaboration between local governments and businesses in Latin America.
9. Bastein, V. (2013). Developing Countries and Challenges of Climate Change- Related PPMs within WTO Institutions.
10. Baumert, K., Perkaus, J. and Kete, N., 2003, "Great Expectations: Can International Emissions Trading Deliver an Equitable Climate Regime?" *Climate Policy* vol.3, n°2, 137-148.
11. Becken, S., Hay, J., & Espiner, S. (2011). The Risk of Climate Change for Tourism in the Maldives. In J. Carlsen & R. Butler (Eds.), *Island Tourism: Sustainable*.
12. Berke, P., & Godschalk, D. (2008). Searching for the good plan: A meta-analysis of plan quality studies. *Journal of Planning Literature*, 23(3), 227-240.
13. Betsill, M., and H. Bulkeley (2006), "Cities and the Multilevel Governance of Global Climate Change," *Global Governance*, Vol. 12, No. 2, pp. 141-159.
14. Beuchampy, Z. (2014). One big winner in the US-China climate deal: the global poor. EDT.
15. Biesbroek, G. R., Termeer, C. J. A. M., Klostermann, J. E. M., Kbat, P., 2013. *On the nature of barriers to climate change adaptation*. *Regional Environmental Change*. [e-journal] Available through: Uppsala University.
16. Blakely, J. E. (2004). Suburbs as sustainable communities: A paradigm for the future. *Australian Planner*, 40(4).
17. Bonyhady, T., Macintosh, A., & McDonald, J. (2010). *Adaptation to Climate Change: Law and Policy*. Annandale, N.S.W: The Federation Press.
18. Brody, S. D. (2003). Examining the role of resource-based industries in ecosystem approaches to management: An evaluation of comprehensive plans in Florida. *Society & Natural Resources*, 16(7), 625-641.
19. Bulkeley, H. and S. C. Moser (2007), "Responding to Climate Change: Governance and Social Action beyond Kyoto." *Global Environmental Politics*, Vol. 7.2 pp. 1-10.
20. Bulkeley, H., & Betsill, M. (2005). Rethinking sustainable cities: Multilevel governance and the urban politics of climate change. *Environmental Politics*, 14(1), 42-63.
21. Carter, G. & Kazmeirczak, A. (2013). Climate change and the city: Building capacity for urban adaptation. *Progress in Planning*, Volume 95, 1-66.
22. Carter, J. G. & Lindley, J. (2012). European cities in a changing climate: Exploring climate change hazards, impacts and vulnerabilities, The University of Manchester, Manchester (2012).
23. Corfee-Morlot, J., I. Cochran and P. Teasdale (2009), "Cities and Climate Change: Harnessing the Potential for Local Action," *Competitive Cities and Climate Change*, OECD, Paris, pp. 78.
24. Defra,(2013). Department for Environment, Food and Rural Affairs (Defra. The National Adaptation Programme – Making the country resilient to a changing climate, The Stationary Office, London (2013).
25. Engle, L. N. (2011). Adaptive capacity and its assessment *Global Environmental Change*, 21 (2) (2011), pp. 647-656.
26. EPA (2012). *National Climate Change Adaptation Strategy (NCCAS)* Accra: Environmental Protection Agency.
27. Grover, H. (2010). *Local Response To Global Climate change: The Role Of Local Development Plans in Climate Change management*. Texas A&M University.
28. IPCC (2007) *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge, UK: Cambridge University Press.
29. IPCC, (2012). *Intergovernmental Panel on Climate Change (IPCC). Managing the risks of extreme events and disasters to advance climate change adaptation. A special report of working groups I and II of the Intergovernmental Panel on Climate Change* Cambridge University Press, Cambridge, UK/New York, USA (2012).
30. Kazmierczak, A. & rmitage, R. (2010). Urban green spaces: Natural and accessible? The case of Greater Manchester, UK, *Landscape and Urban Planning*, 103 (2) (2011), pp. 185-197.

31. Kithiia, J. (2011) 'Climate Change Risk Responses in East African Cities: Need, Barriers and Opportunities', *Current Opinion in Environmental Sustainability*, 3(3):176-180.
32. Kondracki, N. L., & Wellman, N. S. (2002). Content analysis: Review of methods and their applications in nutrition education. *Journal of Nutrition Education and Behavior*, 34, 224-230.
33. Kruger J., Grover K., and Schreifels J (2003): "Building Institutions to Address Air Pollution in Developing Countries: The Cap and Trade Approach", OECD Global Forum on Sustainable Development: Emissions Trading, Paris.
34. Lindley, S. O'Neill, J., Kandeh, J. Lawson, N. & Christian, M (2011). Climate change, justice and vulnerability Rowntree Foundation, York (2011).
35. Lwasa, S. (2010) 'Adapting Urban Areas in Africa to Climate Change: The Case of Kampala', *Current Opinion in Environmental Sustainability*, 2:166-171.
36. Lwasa, S., Koojo, C., Mabiriizi, F., Mukwaya, P. and Sekimpi, D. (2009) *Assessment of Cities and Climate Change in Kampala and Uganda (2009)*. Prepared within the framework of the Cities and Climate Change Initiative, Nairobi, Kenya: United Nations Human Settlements Programme.
37. M., O'Brien, K., Ruitenbeek, J. and Tompkins, E. L., 2011. Resilience implications of policy responses to climate change. *WIREs Climate Change*. [E-journal] 2(5). Pp. 757-766. Available through: Uppsala University.
38. Martin-Ortega, J. Markandya, A. (2009). The costs of drought: The exceptional 2007-2008 case of Barcelona (No. 2009-09). (BC3 Working Paper Series).
39. Mubaya, P. (2016). The role of institutions in managing local level climate change adaptation in semi-arid Zimbabwe. *Climate Risk management*, 16, 93-105.
40. Norrington-G. & Thornton, N. (2011). Climate Change Financing and Aid Effectiveness Kenya Case Study. OECD.
41. OECD (2009), *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation*, OECD, Paris.
42. Olulu, M. (2013). Climate Change Governance: Emerging Legal and Institutional Frameworks for Developing Countries.
43. Opiyo, R. (2010). Planning and climate in Nairobi.
44. World Bank (2009), *Cities and Climate Change: Sharpening the Tools of Diagnosis and Dialogue*, World Bank, Washington D.C.
45. Pittok, J. & Finlayson, M. (2016). Institutional challenges of adopting ecosystem-based adaptation to climate change. *Regional Environmental Change*, Vol. 16 (2), pp 487-499.
46. Puppim de Oliveira, J.A. (2009), "The implementation of climate change related policies at the sub national level: An analysis of three countries," *Habitat International*, Vol. 33, N. 3, pp. 253-259.
47. Satterthwaite, D. (2009) *The Implications of Population Growth and Urbanization for Climate Change*, paper presented at the Expert Group Meeting on Population Dynamics and Climate Change, 24-25 June, London, UK: United Nations Population Fund and International Institute of Environment and Development.
48. While, A. & Whitehead, W. (2013). Cities, urbanization and climate change *Urban Studies*, 50 (7) (2013), pp. 1325-1331.
49. Wikstron, A. (2013). The Challenge of Change: Planning for social urban resilience, an analysis of contemporary planning aims and practices. Stockholm University.
50. Wilson, E. & Piper, J. (2010). Spatial planning and climate change. Routledge, Abingdon/New York (2010).
51. Winkler, H. et al., 2002, "Sustainable Development Policies and Measures: Starting from Development to Tackle Climate Change (Chapter 3)" in Baumert et al (eds.) *Building on the Kyoto Protocol: Options for Protecting the Climate*, World Resources Institute, Washington, DC.