

NATIONAL LAND CONFERENCE 2025
Reforming Land Governance for Sustainable Development

NAF Conference Centre Abuja (26th– 28th March, 2025)

Climate Change, Land tenure and Environmental Resilience -
Understanding the Intersection of Land Governance and Climate Adaptation Strategies

by

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Background

The world is currently facing serious challenges as a result of climate change with its diverse consequences on aquatic, terrestrial and atmospheric media. These diverse consequences work synergistically to impact life on earth. Climate change is caused by a multiplicity of factors including global warming. It manifests in extreme weather events and catastrophes such as drought and heat waves, rising sea levels, erosion, flooding, and wild fires. These extreme weather events impact heavily on land, causing loss in biodiversity and land degradation. Biodiversity plays a pivotal role in supporting various ecosystem services that are essential for human well-being.

Climate change has several contexts to it, including the social/human dimensions. The social dimensions are equally as important as the ecological or economic dimensions as they are all interconnected. With particular focus on climate change and its impact on land resources, climate change adaptation is crucial. The interconnected relationships between different elements or systems can be examined within the context of climate change, land degradation, restoration and environmental resilience.

A legally binding international treaty at the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), held in Paris in 2015, the parties signed the [Paris Agreement](#) in which they agreed on “holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change. The agreement includes agreements from participating countries, including Nigeria, to work together to adapt to climate change.

Sustainable land governance must seek to address both the causes and consequences of climate change if we are to achieve sustainability. Climate induced land degradation may also be linked with the absence of planning, poor planning or poor planning implementation. It is further aggravated by lack of sectoral cohesion or cooperation, where ministries, departments and agencies (MDA's) operate in silo's rather than together to address common issues. It is difficult to address climate change impacts in silo's because they are usually cross-cutting and require multiple actors to address them.

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1. About Climate Change

Climate change refers to long-term shifts in temperatures and weather patterns caused primarily by global warming. Since the 1800s, human activities have been the main drivers of climate change, primarily due to the burning of fossil fuels like coal, oil and gas, cutting down forests, farming livestock which release greenhouse gases into the atmosphere and results in Global warming. With changes in global weather and rainfall patterns, some areas now experience reduced rainfall (drought), others experience heat waves, while others receive much heavier and catastrophic rainfall, more intense and frequent hurricanes. To address the climate change crisis, particularly as the potential for destruction of ecosystems, life and property is high, governments around the world must act, and undertake land use and planning reforms, if necessary, to address global warming and curb climate change.

The world is currently facing three extremely serious challenges, each with diverse consequences and they work synergistically to impact life on earth as we once knew it. These three issues of which climate change is key, include pollution and the loss of biological diversity. They are often grouped together and referred to as the triple planetary crisis and further compounded by uncontrolled degradation of lands and wetlands. This can lead to planning policy and regulatory reforms that will help to halt, reduce or reverse land degradation.

According to the Global Environment Facility (GEF, 2024), about 25 percent of global land area has been degraded and 3.2 billion people are affected by land degradation, especially rural communities, smallholder farmers, and the extremely poor (GEF, 2024). Poor urban planning can increase the exposure and vulnerability of lands to climate change related degradation. In a similar manner, good planning can reduce exposure and vulnerability of lands to degradation and increase resilience.

Climate change impacts on environmental media and acts as a driver of land degradation. The diverse consequences of climate change, act independently and/or in a synergistic manner (by combining forces) as catalysts for land degradation. Land degradation is one of the leading challenges of biodiversity conservation particularly as soil is the biggest terrestrial carbon sink. The world's soils store more carbon than the planet's biomass and atmosphere combined (IUCN, 2024). This includes soil organic carbon, which is essentially biodiversity: microbes, fungi and invertebrates, as well as root matter and decomposing vegetation (IUCN, 2024). Loss of soil organic carbon is one of the principal signs of land degradation. Land degradation is a threat to global sustainability and heightened concerns over climate change impacts on ecosystem services underscore the importance of forest land cover as a carbon sink, habitat for biodiversity, and support for livelihoods and quality of life (Stanturf et al., 2015).

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Urban areas have been developed on what was previously forest land having replaced such lands with concrete and other impermeable structures that are unable to perform the same function as the forests once did. This has led to a reduction in the global carbon sink and increases in warming and its impact on climate change.

Climate Change impacts can include the following:

1. Droughts and heat waves which result in a significant reduction in soil moisture which accelerates desertification, the absence of sufficient moisture in soils to support biodiversity. Droughts are significant drivers of land degradation and when combined with heat waves, the impact is more severe. Some regions experience longer and more intense droughts, affecting agriculture, water availability, and livelihoodsⁱ.
2. Extreme weather events, heavy precipitation, intensified storms and flooding causes soil and shoreline erosion which is another form of land degradation. Soil erosion reduces soil quality and reduces crop productivity, decline in crop productivity leading to economic losses.
3. Wildfires occur as a result of rising temperatures that contribute to more frequent and severe wildfires, endangering ecosystems and communitiesⁱⁱ. Wildfires destroy soil quality, vegetation, plant species and type shifts, exotic plant invasions, wildlife habitat destruction, soil erosion, floods, watershed function decline, water supply disruption, and air pollution (Neary, 2018)
4. Rising sea levels melting polar ice and thermal expansion cause sea levels to rise, threatening coastal areas and infrastructureⁱⁱⁱ. As sea levels rise coastal wetlands in different parts of the country are vulnerable to salt water, saltwater infiltrates freshwater ecosystems, affecting wetlands, estuaries, and river intrusion, habitat shifts, erosion and shoreline changes. It also affects nutrient cycling in coastal ecosystems.
5. Climate change also disrupts ecosystems, causing species to shift their ranges or face extinction^{iv}. The challenge for land managers and planners is therefore to mitigate the impact of climate change and its consequences on land use.

2. Climate Adaptation and Resilience

Climate adaptation is a key component of building climate and environmental resilience. It refers to the capacity of communities, states, and countries to absorb and adapt to the impacts of climate change. Climate adaptation strategies involve proactive measures to minimize the negative impacts of climate change and to build resilience. Building resilience is to increase the capacity of local communities, States, and countries to absorb and adapt to the impacts of climate change and remain stable despite the shocks.

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Identifying and assessing climate risks and vulnerabilities is essential for developing effective adaptation strategies. Land restoration efforts include planning actions that can prevent further degradation.

Land use planning has a plethora of systems, methods and technology that have been used, and are currently being used to design, shape and manage urban environments. In recent times however, challenges attributed to the triple planetary crisis of climate change, nature and biodiversity loss, and pollution/waste, has placed new and urgent demands on key actors in land resources management, particularly in developing nations, to address them. Some adaptation strategies that directly impact on land include the following:

1. Infrastructure re-designing, upgrading and strengthening can be utilised in order to mitigate the impact of extreme weather events on land resources and increase climate resilience. Traditional designs may no longer be suitable without some adjustments in order to make them better able to withstand changing climatic patterns. This can be addressed by deploying engineering solutions such as constructed wetlands or nature-based solutions for treating wastewater and stormwater runoff. Certain types of infrastructure including roads and other public spaces and human settlements can be relocated to reduce the impact of events such as flooding or fire disasters on lives and property.
2. Ecosystem-based adaptation such as land restoration is another climate adaptation strategy. Wetlands play a crucial role in buffering the impacts of climate change, and their restoration can help enhance climate resilience. The impact of the flood disaster in Nigeria in 2012 claimed over 350 lives and displaced over 2.1 million people. Property and infrastructure loss was estimated at 2.6 trillion Naira as the river Niger overflowed its banks. Homes and other infrastructure constructed on sand-filled (reclaimed) coastal wetlands, and inland wetlands on the flood plains along the River Niger's trajectory were destroyed. The restoration of wetlands to their original ecosystems can mitigate flood impact as a result of climate change. Resettlement of vulnerable communities can also mitigate flooding impact and this is where tenure comes in. Citizens must be protected through careful decision-making on liveable habitats. Natural ecosystems can be utilized to adapt to climate change such as mangroves that can be used to protect coastlines from storm surges and rivers from pollution as a result of urban run-off.
3. Another form of climate adaptation is by designing cities to be resilient to climate-related hazards, such as floods and heatwaves. It is essential to integrate green spaces into urban planning as this can help reduce the urban heat island effect. Smart transportation such as mass transit buses or the use of electric cars, can curb excessive individual car usage and help reduce emissions,

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improve air quality, which are also important for addressing global warming and climate adaptation.

4. Climate adaptation strategies also include having early warning systems in place that have been formalized and are operational. Citizens should have access to disaster information. This can help communities to plan and not be taken unawares. They can also prepare for, and respond to extreme weather events. Climate justice as an adaptation strategy should seek to prioritize the needs of vulnerable populations in climate adaptation planning and implementation.
5. Housing development is one of the major challenges in Nigeria today. However, to address this means that pristine forests may be cleared to make way for concrete structures. Several other urban planning tools such as urban greening; vacant urban land revitalisation (Mohamad, 2023) city-specific policies and programmes; rightsizing; densification which includes brownfield regeneration, urban renewal, vacant land redevelopment; and building vertical extension, are some of the tools available to planners that can be utilized in climate adaptation.
6. Planning tools can be used to mitigate global warming, keep global temperatures from increasing, thereby reducing its impact on climate change and its consequences. The consequences of climate change are already affecting our planet, and they will continue to escalate.

3. Mitigating Climate Change Through Land Restoration

Climate change and land degradation have a synergistic relationship as land degradation, if left unchecked results in loss of soil carbon into the atmosphere leading to global warming and which overtime contributes to climate change. It is a continuous cycle, and can be broken through the process of land restoration. Land degradation affects climate in different ways. Unsustainable agricultural practices lead to the loss of fertile soil, releasing stored carbon, deforestation for infrastructure development releases stored carbon, contributing to greenhouse gas emissions, and reduced rates of carbon uptake due to land degradation also impacts climate.

If climate change continues unchecked and unmitigated, or if the consequences of climate change remain unresolved, the chances are that climate change will only get more severe and this is why countries like Nigeria need to take immediate action to halt or reverse land degradation from mining and other sources and promote land restoration. Nature loss or biodiversity loss has far-reaching consequences, as damaged ecosystems exacerbate climate change, undermine food security and puts people and communities at risk. Restoring degraded land is crucial for maintaining ecosystem health and more

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importantly for mitigating climate change. Land restoration promotes ecosystem health and increases its ability to support plants, animal and human life. The reason why we urgently need to restore land is to ensure that soil biodiversity is retained, and that the vegetation we need take up carbon dioxide from the atmosphere and store it in tree trunks, branches, leaves, and roots, is always available. To mitigate climate change, we must restore land and take urgent action against land degradation. It is necessary to recognise those actions and developments within urban areas that are contributing to land degradation and address these. Many climate change solutions can deliver economic benefits while improving our lives and protecting the environment.

4. Land Governance and Climate Change Adaptation

Land governance concerns the rules, processes and structures through which decisions are made about access to land and its use, the manner in which those decisions are implemented and enforced, and the way in which competing interests in land are managed. Land governance therefore encompasses statutory, customary, religious and informal institutions. It includes state structures such as land agencies, courts and ministries and municipalities responsible for land, as well as informal land developers and traditional bodies. The concept of land governance covers the legal and policy framework for land, as well as traditional practices governing land transactions, inheritance and dispute resolution. In short, it is fundamentally about power and the political economy of land. (FAO, 2024) <https://www.fao.org/land-water/land/land-governance/en/>

The intersection of land governance, tenure and climate adaptation strategies is crucial for building resilience to climate change impacts this is because effective land use planning and management are essential for sustainable development. Within the context of agricultural land use and tenure, by defining access and security of rights to land and other natural resources, this would affect how farmers decide to use the land, and whether they will invest in land improvements or otherwise to curb the impacts of climate change. Inappropriate land tenure policies and inequitable access to land and other natural resources result in over-cultivation and over-grazing of marginal lands. Good land tenure arrangements promote land use practices that enhance the environment. Farmers are more likely to invest in improving their land through soil protection measures, planting trees and improving pastures if they have secure tenure and can benefit from their investments.

Land governance for effective climate change adaptation can include the following:

1. **Ecosystem Protection:** This can be achieved by protecting vulnerable ecosystems through land governance and ensuring that the natural resources that support livelihoods and climate resilience are maintained. Conservation practices are a good example.

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2. **Adaptation Strategies:** Land governance can initiate policies and programmes that help to facilitate the implementation of various adaptation strategies, such as building seawalls or inland flood defences, providing new insurance schemes, changing crop planting times or varieties, and installing green roofs or green spaces. Responding to flood disasters can be mitigated with such policies in place.
3. **Land Tenure:** Secure land tenure is a key dimension in any discussion of land-climate interactions, as it affects how communities respond to climate change. By improving land titling, issuing customary and statutory rights of occupancy and also ensuring equal access to land, land owners will be better motivated towards climate action.
4. **Land Degradation:** Land degradation from causes such as deforestation of large expanses of land for housing and other forms of necessary infrastructure, can be mitigated by careful planning, tree planting, vertical extensions and other methods that reduce the developmental footprints.
5. **Adaptive Governance:** Adaptive governance, which involves collaborative, flexible, and learning-oriented management, is a useful framework for enhancing adaptive capacity. Strengthening local community through capacity building for climate mitigation is another helpful option.
6. **Land Indicators:** Land-use indicators can be used to monitor the long-term effects of climate and land-use changes and determine the effectiveness of adaptation policies. This constant feedback would enable land managers strengthen what works best while revising strategies that are less efficient.
7. **Local Government Integration:** A lot of land related decision making happens at the State level. However, Local governments can integrate adaptation strategies into their land-use planning by engaging public and private city departments to address aspects such as health and safety.
8. **Stakeholder Engagement:** To be effective, land governance requires the active participation of stakeholders, including local communities, civil society organizations, and government agencies, in the planning and implementation of adaptation strategies. Regular interaction through townhall meetings and other stakeholder engagement for a provides an opportunity for capacity building on the role of stakeholders in its mitigation. This would reduce the burden on land managers. Strengthening institutional capacities and improving stakeholder engagement processes are crucial for effective land use planning and climate adaptation.
9. **Integrating Traditional Knowledge:** Integrating traditional knowledge and practices into planning efforts can enhance the effectiveness of adaptation strategies. Local communities tend to have more contact with nature and the environment than in urban areas. Their knowledge can be documented and harnessed into workable and community-driven approaches to adaptation.
10. **Legal Frameworks:** Fortifying legal frameworks governing land use is essential for ensuring sustainable and equitable land management.

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11. Sustainable Livelihoods: Prioritizing the promotion of sustainable livelihoods among local communities is vital for building resilience to climate change impacts.

5. Conclusion and Recommendations

Sustainable land management and land use planning can play a pivotal role in climate adaptation. This can be achieved by:

1. strategically organizing and managing land resources, including allocation, utilization, and protection. By promoting sustainable land use practices, sustainable land governance can help reduce the vulnerability of communities to climate-related risks and enhance their livelihoods and environmental resilience. Land use planning can be deployed to prevent, halt or reverse the trends in land degradation.
2. Reactive planning can halt land degradation through interim monitoring of development projects which can identify and mitigate cases of land degradation as they occur. Land degradation trends can be reversed for instance by protecting land of agricultural significance from urban and peri urban encroachment.
3. Wetland degradation can be avoided by establishing appropriate buffers between development, and coastal estuaries.
4. Reducing or preventing greenhouse gas emissions can be achieved by transitioning to renewable energy sources like wind and solar, using energy more efficiently, adopting low carbon or carbon-free transportation modalities, promoting sustainable agriculture and land use, and changing production and consumption models and diet behaviours.
5. Enhancing carbon sinks can be achieved by restoring forests, wetlands, and marshlands, maintaining soil health, and protecting terrestrial and marine ecosystems. (UNDP, 2024)

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ⁱ <https://science.nasa.gov/climate-change/effects/>

ⁱⁱ <https://science.nasa.gov/climate-change/effects/>

ⁱⁱⁱ <https://science.nasa.gov/climate-change/effects/>

^{iv} <https://science.nasa.gov/climate-change/effects/>