

A TECHNICAL PAPER ON

# Ecosystem - Based Adaptation (EBA) Approaches to Climate Change Governance in Turkana County

**3** GOOD HEALTH  
AND WELL-BEING  
September, 2020



## Table of Contents

Table of Contents.....	ii
<i>Executive Summary</i> .....	iii
Abbreviations and Acronyms.....	v
1. Introduction .....	1
1.1. Mandate for the technical examination process on Ecosystem Based Adaptation (EBA). ....	1
1.2. Overview of the Technical Examination Process on EBA.....	2
1.3. Objective, Scope and Structure of the paper.....	3
1.4. Meaning of EBA.....	3
1.5. Key Messages.....	3
1.6. EBA Interventions .....	5
2. The EBA approach in Turkana County.....	5
2.1. EBA for vulnerable Ecosystems.....	7
2.2. EBA for Vulnerable Communities.....	7
2.3. EBA for Vulnerable Groups .....	8
2.4. Enabling EBA Approaches and Support through Finance, Technology and Capacity-building... 10	
2.4.1. Finance .....	10
2.4.2. Technology.....	13
2.4.3. Capacity Building.....	13
3. Barriers and Challenges to Adaptation Planning & Implementation.....	13
3.1. Stakeholder involvement.....	13
3.2. Access to Technical & Financial Support on EBA .....	14
4. Opportunities to Enhance EBA.....	15
4.1. Enhance stakeholder involvement .....	15
4.2. Improve Access to Financial & Technical Support on EBA.....	15
4.3. Apply & Scale-up Ecosystem Based Adaptation.....	16
5. Conclusion.....	17
6. Recommendations .....	18
Further readings.....	20

## Executive Summary

This technical paper explores opportunities and options for, as well as barriers to, enhancing Ecosystem Based Adaptation (EBA) approach, with special consideration of the vulnerable groups, communities and ecosystems in Turkana County. It draws primarily on the review of existing secondary information among them project documents (i.e. Trocaire’s “Promoting Eco-System Based Adaptation Approaches to Climate Change and Governance in Turkana County” project documents & reports), the currently being developed Climate Change Policy, Bill and Fund Regulations in Turkana County, Turkana County Integrated Development Plans (2018 – 2022), Turkana County Environmental (Regulation and Control) Act 2018, The Turkana County Water and Sewerage Services Bill 2018, Turkana County Disaster Risk Management Policy 2017 and the Turkana County Environment Policy 2018. It also draws on the scanning of the existing climate change domestic (Kenyan) legislation, policies, and strategies that are pinned on international climate policies and agreements.

The mandate of this technical paper is to raise awareness on climate change effects, empower citizens and community groups on their rights to demand better planning to enable climate change adaptation and mitigation; and to assist the county government develop policies geared towards climate change adaptation in Turkana County.

In Turkana County, Climate change has significantly affected ecosystems, their functions and the many benefits and services that they provide to local people, including the ability of ecosystems to regulate water flows and cycle nutrients. As these services erode, the impacts are being felt by people, communities and economies throughout the county and beyond. Food insecurity, water scarcity, altered disease patterns, extreme weather events, displacement of communities, migration, population growth, and human conflict are among the reported effects of climate change on human health that were identified from the literature materials reviewed and also what the Key informant community members shared.

The paper presents case studies and other information on links among vulnerable ecosystems, groups and communities and the challenges associated with integrating them into Ecosystem Based Adaptation (EBA) approaches and action with a view to identifying concrete opportunities for strengthening resilience, reducing vulnerability, increasing understanding and implementation of EBA in the context of Climate Change governance in Turkana county.

A key message emerging from the Technical paper is the need to move away from the notion that vulnerable communities, groups and ecosystems are victims of climate change; rather they are agents of change and purveyors of climate adaptation solutions. The importance of participatory adaptation has been stressed, acknowledging the challenging but necessary nature of the EBA approach.

The importance of mainstreaming traditional indigenous knowledge systems – knowledge that has been accumulated over many generations – into EBA planning and Disaster Risk Reduction (DRR) has been highlighted. Rather than portraying indigenous peoples as victims of climate change, it is more effective to emphasize their contribution to participatory adaptation.

There is need to adopt climate-sensitive, ecologically appropriate approaches to natural resource management. This is through national and county governments’ development and implementation of

climate change policies, laws, regulations and budgets that are pro-poor, gender sensitive and youth inclusive. Furthermore, efforts need to be focused on raising awareness on climate change effects, empower citizens and community groups about their rights to demand better planning to enable climate change adaptation and mitigation; while assisting the county government develop policies geared towards climate change adaptation in Turkana County.

Promoting Eco-System Based Adaptation (EBA) Approaches to Climate Change and Governance in Turkana County is therefore of paramount significance.

## Abbreviations and Acronyms

ASAL	Arid and Semi-Arid Lands
CBO	Community Based Organization
CBD	Convention on Biological Diversity
CC	Climate Change
CIDP	County Integrated Development Plans
CIP	County Investment Plans
DRR	Disaster Risk Reduction
EBA	Ecosystem Based Adaption
EDEP	Ending Drought in Emergencies Plan
FY	Financial Year
IP	Internet Protocols
LOWASCO	Lodwar Water and Sewerage Company
NAP	National Adaptation Plan
NDMA	National Draught Management Authority
NDCs	Nationally Determined Contributions
NRM	Natural Resources Management
MTP	Medium Term Plans
NGOs	Non-Governmental Organizations
NRM	Natural Resource Management
TCCCP	Turkana County Climate Change Policy
TCG	Turkana County Government
TP	Technical Paper
UKAID	United Kingdom Agency for International Development
UN	United Nations

## 1. Introduction

This technical paper explores opportunities and options for, as well as barriers to, Ecosystem Based Adaptation approach, with special consideration of the vulnerable groups, communities and ecosystems in Turkana County. It draws primarily on the review of existing secondary information among them project documents (i.e. Trocaire's "Promoting Eco-System Based Adaptation Approaches to Climate Change and Governance in Turkana County" project documents & reports), the currently being developed Climate change policy and legislation in Turkana County, Turkana County Integrated Development Plans (2018 – 2022), Turkana County Environmental (Regulation and Control) Act 2018, The Turkana County Water and Sewerage Services Bill 2018, Turkana County Disaster Risk Management Policy 2017 and the Turkana County Environment Policy 2018. Other documents reviewed include the County Integrated Development Plans (CIDP) II, Kenya National Climate Change Action Plan (2013), the National Adaptation Plan (NAP), Turkana County Climate Change Policy, Ending Drought in Emergencies Plan; NDMA reports, County Budgets and Fiscal policy plans and Turkana County Water Services Regulation 2018. It also draws on the scanning of the existing climate change domestic (Kenyan) legislation, policies, and strategies that are pinned on international climate policies and agreements, in particular, the Climate Change Response Strategy 2010, Climate change Act 2016, National Adaptation Programme 2015-2030, Energy Act, Nationally Determined Contributions (NDCs) amongst others, with a view of cascading these national documents into an Ecosystem Based Adaptation approach for the Turkana county and local communities.

### 1.1. Mandate for the technical examination process on Ecosystem Based Adaptation (EBA).

Trócaire has been working in Kenya for over 30 years. Working with local partner organizations, Trócaire aims to contribute to the development of a "just and peaceful Kenya in which poor women, youth and other vulnerable groups realize their rights and improve their quality of life in dignity and safety". Trócaire seeks to achieve this goal by implementing programmes in four thematic areas: Accountable Governance, Resilient Livelihoods, Women's Empowerment and Humanitarian Preparedness and Response.

Trócaire supports individuals and communities to withstand and recover from shocks and stresses relating to climate change. The organization supports communities, together with the Kenyan Government, to adopt climate-sensitive, ecologically appropriate approaches to natural resource management. To date, Trócaire has supported national and county governments to develop and implement climate change policies, laws, regulations and budgets that are pro-poor, gender sensitive and youth inclusive.

Trócaire and her partner i.e. Caritas Lodwar is implementing a Climate Change Adaptation project funded by UKAID in Turkana targeting the County government representatives, communities and the Civil Society. The project dubbed, 'Promoting Eco-System Based Adaptation Approaches to Climate Change and Governance in Turkana County aims to raise awareness on climate change effects, empower citizens and community groups about their rights to demand better planning to enable climate change adaptation and mitigation; and to assist the county government develop policies geared towards climate change adaptation in Turkana County.

Trocaire is building capacity of Turkana County Government on climate change governance through support in the development of Turkana County Climate Change Policy, Bill and Fund regulations. Whilst this piece of work is still in progress, there is need to advice the County Government on Ecosystem Based Adaptation (EBA) approaches on climate change governance. This is to be conducted through this technical paper and a policy brief on ecosystem based adaptation (EBA) approaches to climate change governance in Turkana county. The technical paper and policy brief on EBA seeks to:

- a. Facilitate the sharing of good practices, experience and lessons on EBA;
- b. Identify actions that could significantly enhance the implementation of EBA, including actions that could enhance economic diversification and have mitigation co-benefits;
- c. Promote cooperative action on EBA;
- d. Identify opportunities to strengthen enabling environments and enhance the provision of support for EBA in the context of specific policies, practices and actions.

Through the 'Promoting Eco-System Based Adaptation Approaches to Climate Change and Governance in Turkana County' project, Trocaire aims to raise awareness on climate change effects, empower citizens and community groups on their rights to demand better planning to enable climate change adaptation and mitigation; and to assist the county government develop policies geared towards climate change adaptation in Turkana County.

## 1.2. Overview of the Technical Examination Process on EBA

To develop this paper, the focus was on EBA in relation to vulnerable communities, groups and ecosystems. The overall approach was based on a mixed methodology where both consultations and desk-top review work was conducted. Work entailed reviewing existing secondary information, project documents, Trocaire's "Promoting Eco-System Based Adaptation Approaches to Climate Change and Governance in Turkana County" project reports, the currently being developed Climate change policies and legislations in Turkana County.

It also entailed scanning all the existing climate change domestic (Kenyan) legislation, policies, and strategies that are pinned on international climate policies and agreements, in particular, the Climate Change Response Strategy 2010, Climate Change Act 2016, National Adaptation Programme 2015-2030, Energy Act, Nationally Determined Contributions (NDCs) amongst others, with a view of cascading these national documents into an Ecosystem Based Adaptation approach for the Turkana county and local communities. Further, virtual meetings and discussions (IP Communication based interviews) were conducted with relevant county department officials (particularly those serving in the departments relating to climate change e.g. Agriculture, Environment, Natural Resources management, Mining), stakeholders in the private sector, development partners, Community Base Organizations, community members and Natural Resource Management (NRM) groups and policy officers from Climate Change Policy research organizations.

This involved analyzing the content of policies, legislations and the Key Informants' feedback around climate change governance. Identifying the major goals of the policy, and specifying mechanisms intended to achieve Ecosystem Based Approaches. Technical examination focused on EBA planning, how to enable that planning, how to support the implementation of EBA through finance, technology and capacity-

building. The focus throughout was on showcasing good practices, approaches and experience in relation to local EBA that has benefited vulnerable communities, groups and ecosystems, conveying how these practices, approaches and experiences contribute to county and national policies, and identifying barriers to the successful implementation of local EBA practices. Key to this work was the consideration of gender and youth as crosscutting issues and how the Ecosystem Based Approaches adaption will affect them.

### 1.3. Objective, Scope and Structure of the paper

The objective of this paper is to **identify opportunities and options for, as well as barriers to, enhancing EBA approach and mechanisms** to support the implementation of both policy and non-policy options, with special consideration of vulnerable groups, the communities and ecosystems in Turkana County. Inspiration should be drawn from good practices and lessons learned to improve EBA planning and implementation with a view to identifying concrete opportunities for strengthening resilience, reducing vulnerability and increasing understanding and implementation of EBA in the context of climate change in Turkana County.

The paper provides an overview of the specific strategies, policies and actions identified during the technical examination but does not imply consensus among Parties and non-Party stakeholders on the content discussed.

Chapter 1 provides an introduction, including key messages. Chapter 2 contains information on EBA in relation to vulnerable ecosystems, communities and groups, as well as on technology, finance and capacity-building – three necessary means of pursuing EBA and for the transition from planning to implementation. Chapters 3 and 4 addresses relevant challenges and opportunities, respectively. Lastly, Chapter 5 concludes the paper by providing recommendations.

### 1.4. Meaning of EBA

The Convention on Biological Diversity defines EBA as “the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. It includes the sustainable management, conservation and restoration of ecosystems to provide services that help people adapt to the adverse effects of climate change. It involves the management of ecosystems and their services to reduce vulnerability of human communities to the impacts of climate change<sup>1</sup>.

### 1.5. Key Messages

- **EBA should be a participatory process.** Facilitating participatory processes is not easy but such processes are necessary. Engaging with the public and private sector, civil society and NGOs, research institutes and knowledge institutions such as universities through partnerships allows policymakers to gain crucial local knowledge in order to understand all perspectives and their synergies, thus facilitating the joint identification of more suitable EBA

---

<sup>1</sup> CBD (2009). Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. Montreal, Technical Series No. 41, 126 pages.



approaches and plans. Furthermore, participatory processes are more likely to illicit beneficial behavioral and practical change at the individual level; they contribute to establishing the necessary buy-in to ensure the continuation of activities after a project has terminated; and, moreover, they increase the chance of stakeholders taking ownership of and implementing adaptation measures.

Article 7 of the Paris Agreement, which established the global goal on EBA, recognizes the importance of the inclusion of vulnerable groups, communities and ecosystems in adaptation planning, and the use of, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate.

In the Constitution of Kenya, 2010 public participation is within the provisions of Article 10, 181, 124, 201, 221 and 232. Public participation guarantees involvement of those affected by a decision in the decision making process. It is premised on the idea that all citizens are equally entitled to have a say in decisions affecting their lives<sup>2</sup>.

- It is important to recognize the **synergy that exists between county and national policies vis-à-vis EBA**. Eco-System Based Adaptation is an iterative process in which local decisions have the potential to shape future national planning, while national systems often guide local decisions and projects. It is important for local work to be aligned to the national processes. Harmonized local and national policies are more likely to yield cohesive and effective adaptation plans.
- **Inter-sectoral approaches** are fundamental to ensuring that EBA and other related programmes are sustainable and supported by the respective sectors.
- **Ecosystem-based Adaptation approaches** can be cheaper and more effective than hard infrastructure measures and can deliver additional benefits for people and conservation. EBA can complement 'grey' or 'infrastructural' approaches.
- Integrating **gender perspectives** into EBA frameworks involves the consideration of comprehensive elements such as where people live, what resources they have access to, and their ethnicity, decision-making power and rights.
- **EBA processes are not an end in themselves** but a means to catalyze action and investment at the local and national level. Effective EBA not only provides the opportunity to identify the most vulnerable groups, communities and ecosystems, as well as associated needs and concrete policy options, but also enables capacity-building, helps to establish buy-in and contributes to the effective implementation of adaptation measures.
- EBA is strongly **linked to sustainable development and Disaster Risk Reduction (DRR)**, as enhancing resilience to climatic risks also enhances the sustainability of socioeconomic systems.

---

<sup>2</sup> [http://www.parliament.go.ke/sites/default/files/201804/27\\_Public\\_Participation\\_in\\_the\\_Legislative\\_Process.pdf](http://www.parliament.go.ke/sites/default/files/201804/27_Public_Participation_in_the_Legislative_Process.pdf)

- **Capacity-building is needed for long-term planning**, which requires investment across the spectrum from the individual, through the institutional, to the county and national scale.

### 1.6. EBA Interventions

Ecosystem-based Adaptation is defined by the Convention on Biological Diversity (CBD) as “**the use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change**”. As further elaborated by Decision X/33 on Climate Change and Biodiversity, this definition also includes the “**sustainable management, conservation and restoration of ecosystems, as part of an overall adaptation strategy that takes into account the multiple social, economic and cultural co-benefits for local communities**”. EBA embraces ‘the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way’, in the context of supporting communities in coping with climate change impacts. It therefore employs familiar tools and measures but conceptualizes and implements them specifically for adaptation to climate change.

The following are examples of Ecosystem-based Adaptation interventions and their benefits:

EBA interventions	Benefits
Restoring fragmented or degraded natural areas	Enhances critical ecosystem services, such as provision of water, food & fisheries
Protecting groundwater recharge zones & restoring floodplains	Secures water resources to assist communities in coping with drought & flooding
Connecting expanses of forests, grasslands, reefs & other habitats	Enables people, flora & fauna to migrate as climate changes
Protecting and restoring natural infrastructure such as barrier islands, dunes & forests.	Protects communities & infrastructure from Lake level rise, natural hazards, erosion & flooding

## 2. The EBA approach in Turkana County

In Turkana County, Climate change has significantly affected ecosystems, their functions and the many benefits and services that they provide to local people, including the ability of ecosystems to regulate water flows and cycle nutrients. As these services erode, the impacts are being felt by people, communities and economies throughout the county and beyond. Food insecurity, water scarcity, altered disease patterns, extreme weather events, displacement of communities, migration, population growth, and human conflict are among the reported effects of climate change on human health that were identified from the literature materials reviewed and also what the Key informant community members shared. Climate change has further put pressure on ecosystems and on the people who are already negatively affected by extreme weather conditions (droughts and floods), pestilences, pest outbreaks, deforestation and land degradation. Majority of the residents of Turkana County depend on nomadic pastoralism, fishing and weaving as their source of livelihood. Climate change is becoming a serious social

and environmental problem. Climate change is becoming a serious social and environmental problem. The increasing frequencies of drought, related to climate change, has a disproportionate effect on women and children, contributing to worsening food insecurity, gender inequalities and increasing protection risks.

Food insecurity contributes to poor health, school dropout rates, increased child labor and the out-migration of youth, which is of major concern in Turkana County; a county where only 18% of the population is literate.

In Turkana County, food security and livelihoods options are limited by ecological factors. More than 70% of the county is arid/desert. Temperatures average 30°C, rising to over 40°C during dry periods, and precipitation averages 120-500mm per year. These environmental conditions severely constrain the livelihoods options available to the population. Generally speaking, agriculture is not viable outside capital-intensive irrigation projects in Turkana County. Mobile livestock keeping remains the most effective way of generating value within the constraints of the highly variable environmental conditions available. Climate change has had a negative impact on the pastoralist livelihoods base.

Land degradation is a major consequence, and cause, of climate change. The root causes of land degradation include: a lack of community knowledge and ability to identify invasive species, lack of sustainable grazing planning through organized rangeland management structures, differentiated access to land, the need for fuel, lack of policy implementation, the demand for alternative income and for energy. Increasing vulnerability to drought and other shocks pushes pastoralists towards unsustainable livelihoods alternatives.

Turkana is vulnerable to conflict, which worsens during dry periods. Traditionally, conflict was fueled by cattle raiding for dowry and livestock restocking. However, the nature of conflict is shifting as communities seek to increase their control over resources, particularly water and pasture.

Turkana is the poorest county in Kenya with a poverty rate index of 94.3% and has among the worst food security and nutrition indicators in the country. Food insecurity and malnutrition have multiple, complex causes but are significantly impacted on by the degradation of ecosystem services upon which traditional livelihoods depend (pasture, trees, soil and water) due to climate change.

The unsustainably exploitative use of local natural resources has further resulted in conflicts. The majority of residents in Turkana are poor pastoralists or agro-pastoralists who depend upon the natural resource base of the county for their food and livelihood security.

Increasingly intense and recurrent droughts have resulted in the loss of livestock herds and other assets for many households. A lack of viable livelihood alternatives has led many such households to resort to livelihood practices that further undermine the livelihoods base by unsustainably exploiting natural resources (e.g. overgrazing, unsustainable charcoal production and sand harvesting), creating a vicious cycle that further contributes to poverty and food insecurity.

Including biodiversity and ecosystem services in an overall adaptation strategy is known as an ecosystem-based approach to adaptation. The underlying principle is that healthy ecosystems play a vital role in

maintaining and increasing resilience to climate change and in reducing climate-related risk and vulnerability.

Addressing vulnerable communities and groups is crucial to effective EBA. In many regions of the county, women, indigenous people, refugees and other marginalized groups, among others, lack the agency and resources to fully participate in EBA approaches, even though they are critical to the implementation of adaptation measures (UN 2012).

### 2.1. EBA for vulnerable Ecosystems

Ensuring healthy ecosystems is already an integral part of many Ecosystem Based Adaptation strategies. Healthy ecosystems will provide the aesthetic aspect of ecosystem services, the socioeconomic benefits of EBA and the integration of ecosystem and community-based approaches to adaptation. Healthy ecosystems are more resilient to climate-related events and play a role in DRR as well as in increasing people's resilience to such events. Both mitigation and adaptation opportunities exist in relation to ecosystem services. Healthy ecosystems offer mitigation co-benefits, such as the sequestration and storage of carbon in healthy forests, increasing the resilience of communities and ecosystems leading to other desired outcomes.

Additionally, the less material benefits of ecosystem services, beyond food, water and clean air, were examined, including aesthetics and cultural value. The importance of the nonmaterial benefits that ecosystems offer people, such as inspiration, aesthetic value, social relations and a sense of place, was recognized. It was highlighted that, if EBA were to be implemented, the multiple uses of ecosystem services should be considered.

EBA contributes to the restoration of ecosystems and biodiversity and delivers socioeconomic benefits. Successful EBA requires the engagement of local people whose livelihoods depend on the ecosystems, and focuses on maintaining and enhancing ecosystem services. This approach may be especially relevant to Turkana County, which tend to rely heavily on ecological resources.

EBA tends to be cost-effective because it utilizes the existing ecosystem services and is generally less costly than built infrastructure. EBA can also complement 'grey' or 'infrastructural' approaches. However, despite the success of ecosystem-based solutions at the site level, scaling up has proven difficult

### 2.2. EBA for Vulnerable Communities

EBA is a bottom-up approach. It is a community-led process, based on communities' priorities, needs, knowledge and capacities, to empower people to plan for and cope with the impacts of climate change. EBA emphasizes the importance of engaging local communities, especially vulnerable groups and people, in the adaptation process. It is in part a response to criticism that previous adaptation policies were carried out in a top-down manner, without taking into account the priorities, needs, existing knowledge and capacity of the people who are in the community and benefiting from the adaptation action. EBA responds to the needs of vulnerable people through a decentralized, inclusive, participatory approach that enables local and community perspectives to be integrated into adaptation planning (see Box 1).

**Box 1**

Turkana pastoralists, like other nomadic communities, have traditionally used risk-spreading strategies over the years that include moving livestock to access the best quality pasture and water available, keeping species-specific herds to take advantage of the heterogeneous nature of their disequilibrium environment, and diversifying economic strategies employed including keeping herds containing a mixture of different livestock species as insurance against total loss of livestock in case of extreme drought conditions. The livestock species kept include camels, cattle, sheep, goats and donkeys, all of which have different forage and water requirements and variable levels of resilience to drought. The camels, cattle and goats provide milk, which is consumed by the households. The small stocks are sold when cash is required to meet other domestic requirements such as to purchase food or to pay school fees. For a long time, a majority of the Turkana community raised their livestock mainly to meet subsistence and sociocultural obligations. However, this practice has been changing in response to ecological and socioeconomic change dynamics as households increasingly embrace the market economy and offer more animals for sale than before.

Climate change severely affects the living conditions of poor people who do not have the option of moving away from geographically vulnerable areas. Moreover, the livelihoods of many Turkana county people heavily depend on natural resources, such that climate impacts on ecosystems, including loss of biodiversity, livestock and other assets, also impair their sources of income. The uncertainty associated with climate change further complicates the situation for the vulnerable Turkana county rural people who are already facing significant social and economic challenges and often have little influence on political decision-making. By taking an integrated approach to addressing the needs of local communities, and especially of these vulnerable population, EBA strives to deliver benefits directly to those who might otherwise be left out of adaptation decision-making processes.

Lack of community knowledge on climate change and people's perception of risk were highlighted as areas that need to be addressed in EBA for climate change adaptation & mitigation in the broader context of development. Partnerships with research organizations and knowledge institutions, such as universities were identified as critical, because universities are the engine for knowledge production and can contribute significantly by providing data and human resources at the local level. The need for a participatory approach that integrates local knowledge into adaptation planning is therefore critical.

### 2.3. EBA for Vulnerable Groups

The full participation of vulnerable groups, with particular reference to refugees, displaced persons, indigenous peoples and women in EBA, policymaking and implementation was identified as a key need. Local communities and indigenous peoples in Turkana county are disproportionately affected by climate change impacts because they rely on the fragile ecosystem for their livelihoods. For example, forest ecosystems are a source of food and water for millions of people, and at the same time play a crucial role not only in adaptation but also in mitigation by regulating the climate and absorbing vast amounts of carbon dioxide.

Indigenous land rights and education are vital for preserving those carbon stocks by means of reducing deforestation, managing forests sustainably and restoring tree cover as part of productive rural

economies. Ecosystem-based approaches have been practiced to protect and enrich ecosystem services and increase carbon storage by restoring forests (see Box 2).

**Box 2**

In the study area, pastoralism is the predominant livelihood, and engages the attention of a bigger proportion of the population, which is mainly pursuing extensive nomadic livestock rearing in communal open access rangelands. Most of the land in Turkana County is communally owned, which is an important strategy in support of effective drought adaptation and coping mechanisms. Recently efforts have begun to revise the land tenure system in Turkana to meet the needs of a variety of resource users, including changes associated with the discovery of oil in the area. With land fragmentation, resource conflicts are likely to arise. For the Turkana pastoralist, the communal land tenure system is pivotal to livelihood security because it allows for livestock mobility to take advantage of pasture and water resources that are only seasonally accessible. Turkana herders own a wide range of indigenous livestock species, which are selected on the basis of survival and productivity and are well adaptation to the prevailing climatic conditions. The livestock species kept include camels, cattle, sheep, goats, and donkeys. Limited small-scale irrigated crop cultivation is spread along the riverine areas, and mainly is focused on growing sorghum, maize, green grams (mung beans), cowpeas, vegetables, watermelon, pumpkins, gourds, and bananas.

With the recent discovery of oil in Turkana and changing land tenure systems from communal to private ownership in the rangelands, mobile pastoralism is becoming increasingly constrained. Although our study did not quantify factors affecting mobility, the literature materials reviewed show that declining livestock mobility in the area is driven by a combination of factors including increased individualization and disruption of social structures, increased competition and violent conflicts over resources, and lately, the increased acquisition of land by investors following oil discovery. Even though most pastoralists have become increasingly semi-sedentary, their herds are still quite mobile. A key issue to consider in the future in order to retain mobility as an Ecosystem based adaptation strategy will be the ability of pastoralist to continue managing the rangelands at a communal scale, rather than fragmenting rangelands into private and individual tenure systems.

Women's unequal participation in decision-making processes and labor markets compounds inequalities and often prevents women from fully contributing to climate-related planning and implementation. Gender inequality occurs in numerous ways – gender-based violence, restricted participation of women in politics, unpaid labor, limited access to resources and opportunities – and decreases women's capacity to adapt to the impacts of climate change. Studies have shown that women are 14 times more likely to die or be injured due to a disaster than men (see Box 3).

**Box 3**

Vulnerability is influenced by age, gender, education and disability. Elderly women are considered to be the most vulnerable to climate variability and change because they are the poorest in the community, followed by elderly men, the disabled, female-headed households, married women, men and, finally, the youth. The ability to access, control and own productive assets such as labor, land, finance and social capital enables people to create stable and productive lives. It is evident that women's control of assets is associated with positive development outcomes at the household and individual levels. A research study by [Sonwa et al. \(2016\)](#) revealed that in Turkana, in northern Kenya, female-headed households lacked labor for herding and access to better pastures, which tend to be located in conflict-prone areas. Women play a vital role within the pastoral production system. Though their role is often overlooked, women have been referred to as the "hidden hands" of pastoral production. Pastoral women engage in cultural activities, socio-economic conservation and management of natural resources. They are responsible for household food supply, taking care of smaller, younger and sick animals around the homestead. They are also responsible for milking, milk processing and marketing. When men migrate for longer periods to satellite camps in search for pasture or livestock markets, women are left responsible for taking care of the home.

Yet women can (and do) play a critical role in the response to climate change thanks to their local knowledge and leadership in relation to, for example, sustainable resource management and practices at the household and community level. Women's participation at the political level has resulted in greater responsiveness to citizen's needs, often increasing cooperation across party and ethnic lines and delivering more sustainable peace. Women's leadership at the local level has improved the outcomes of climate-related projects and policies. In contrast, implementing policies or projects without women's meaningful participation can increase existing inequalities and decrease effectiveness.

#### 2.4. Enabling EBA Approaches and Support through Finance, Technology and Capacity-building

Successful implementation of EBA measures will require capital investment and technical support. Lack of financial resources and capacity to technically support Ecosystem Based adaptation initiatives and projects is a common challenge for many similar interventions, and especially for the historically marginalized geographies like Turkana County, posing a barrier to planning, integrating, implementing and learning from EBA efforts.

##### 2.4.1. Finance

Devolution of power and resources as is stipulated in Article 174 of Constitution of Kenya 2010, provides that communities through their respective county governments have greater access to climate finance. Some financial mechanisms have been put in place to provide support to the county with the aim of enhancing its adaptation to the adverse effects of climate change. Nonetheless, the County Government of Turkana should have a clear EBA investment vision and strategy for each priority adaptation measure identified and can use grants to catalyze larger investments from both public and private funds.



In the development of the third Medium Term Plan 2018-2022 (MTP III) and the second generation CIDPs for the county of Turkana, the issues of climate change financing have aptly been considered (see Box 4). However, the actualization of plans will heavily rely on good will of the county government and effective tracking and monitoring of appropriate indicators to measure progress and achievements.

#### Box 4

Turkana County investment on Climate Change Action at the time of the technical examination was majorly guided by the Turkana County Investment Plan 2016-2020 (CIP) and the Turkana County Integrated Development Plans 2018-2022 (CIDP). The CIP 2016-2020, highlights the untapped potential of green and renewable energy such as geothermal, wind power, solar energy and bio-fuels. However, the CIP does not show clear commitments or mechanisms for investment in Turkana County. The report qualitatively projects the Turkana County wind power potential through the Lake Turkana Wind Project, based in Marsabit County, which is estimated to be able to feed the 310 megawatts to the national grid. The CIP plan innovatively presents the ecological menace posed by *Prosopis juliflora* as an investment opportunity to engage in cogeneration or at least commercial charcoal production. The potential for mini-hydro generation along the Kerio and Turkwel Rivers is highly emphasized. Some of the flagships related to climate change and especially green energy are: geothermal power generation; wind energy, and solar energy for domestic use (policies for alternative sources of energy e.g. solar panels); Eco-jiko and biogas for schools; and feasibility studies for nuclear energy.

Turkana County Budget has some key budget provisions that are very particulate to climate change action.

Based on the review of the Budget, for FY 2020/21, Turkana County has prioritized to finance climate related investment for Kshs 2,738.1 million against aggregate budget of Kshs 11,869.1 million. This will represent 23% by proportion of all budget for the Turkana County which is an improvement from an estimated 19% for the Revised Estimates FY 2019/20. Some of the unique climate change financing in Turkana county are:

- Emergency Fund has an allocation of Ksh. 100 million and it is under Accounting Services as a programme.
- Under the vote of Water Environment and Mineral Resources, the programme of General Administration, Planning and Support Services has a pending bill of Kshs 111 million. The water supply and sanitation takes a share of Kshs 407 million that covers construction of dams, desilting water pans, drilling and equipping boreholes and rehabilitation of water infrastructure and Development of Napuu, Lokitipi and Kachoda Aquifers.
- Water and Catchment Projects have a budget of Kshs 13.3 million where Kshs 10 million covers Drought mitigation and the remainder is for water resources
- Water Sector Governance contribution to budget was Kshs 11.3 million and it covers budget of Kshs 3 million for LOWASCO company.
- Climate Change and Adaptation function is allocated Kshs 4.3 million against an estimated requirement of Kshs 10 million.



- Early Childhood Education Feeding Programme got an allocation of Ksh.180 million; which takes 95% of the recurrent expenditure in the directorate.
- Disaster Risk Management was allocated of Kshs 261 million.
- Livestock Risk Management (restock, offtake, response, water tracking, and livestock insurance), and livestock feeds got Kshs 23 million and Kshs 17 million respectively.
- Irrigation and Land Reclamation was allocated Kshs 216.6 million.
- Agriculture programme was apportioned Kshs 103.5 million of the budget. Smart Agriculture practice (Innovation technology to mitigate effect of Climate Change) was allocated Kshs 4.1million.
- *Prosopis* Management was allocated Kshs 4 million against a requirement of Kshs. 25 million

The literature reviewed revealed that some of the desired EBA strategies, such as irrigation farming, development of water sources, and insurance for livestock assets, require an initial investment capital that is beyond the reach of many households. Similarly, although many households may be interested in grain and fodder storage facilities as an EBA strategy, few would be interested in investing in these facilities because of pasture scarcity in the study area. While improved livestock breeds were mentioned as a desired effective adaptation measure to drought, access to livestock breeds and suitable veterinary services are problematic because of financial constraints, the poor social and economic status of most households, and infrastructural challenges such as poorly developed markets in Turkana.

Similarly, investment in education to improve literacy levels, which is a major constraint to many desired adaptations, is key in addressing cyclic drought vulnerability in the area. To ensure effective learning and deep understanding of the subject matter, climate change education should be integrated across school curricula at all levels. To promote climate change education, it is also crucial to strengthen teachers' and educators' capacities to deliver accurate information, integrate local content, promote critical thinking about and take action on climate change mitigation and adaptation. Therefore, specific activities have to be developed and tailored according to age, school type and level as well as contexts and particular needs.

Lack of access to affordable credit facilities was frequently mentioned as the single most significant constraint to desired adaptation and coping strategies that have been identified as feasible such as development of water resources, irrigation farming, improved livestock, etc. Credit and banking facilities are only found in the towns of Lokichogio, Kakuma and Lodwar, which according to the Key Informants are only accessible to established members of the business community and a few livestock traders. Banking based on mobile phones is increasingly becoming a common and well-developed service in the area. Results showed that households are slowly embracing mobile phones for receiving cash remittances through the MPESA system from relatives in urban centers. So far mobile phones are not used by many community members because of the poor network coverage in Turkana County. As part of the oil exploration process, network coverage is likely to improve, and will possibly offer the largely pastoral community better access to banking options in the future.

#### 2.4.2. Technology

Climate change is projected to affect the flow of goods and services. The increase in extreme weather events and changes in the spread of diseases will increase exposure to risk, with the most vulnerable communities and groups being most exposed. Ecosystem-based adaptation approaches using technology will be an important means of ensuring adequate access to basic goods and services in changing climatic conditions. Examples include using digital applications to access commodity markets, or to provide training, extension and capacity building of the local communities. The application of technology in EBA is meant to reduce the vulnerability, or enhance the resilience, of a natural or human system to the impacts of climate change.

#### 2.4.3. Capacity Building

Capacity building, particularly in the marginalized geographies, is critical for the implementation of EBA strategies and associated actions. This includes the institutional capacity to build policy frameworks, the human capacity to understand scientific knowledge, and the technology for planning and implementing adaptation measures.

The majority of constraints to adaptation and coping strategies are driven by the low level of development in Turkana which in turn is the result of a long history of political and socioeconomic marginalization by the central government.

In the context of EBA, there is a need to reconsider or adjust existing approaches to education, especially their potential to provide learners with the necessary knowledge and training to help them respond to diverse and rapidly changing climate. In order to promote EBA education, decision makers need to develop and implement relevant policies and strategies, as well as integrate these in education plans and budgets. To adjust educational planning to EBA, it is also important to take into account the impacts of climate change on migration patterns and school enrolment, infrastructure maintenance and personnel, as well as disaster risk management.

### 3. Barriers and Challenges to Adaptation Planning & Implementation

#### 3.1. Stakeholder involvement

Insecurity and conflicts associated with livestock raids and competition for resources (such as pasture and water) are a major constraint to some of the desired EBA and coping responses in the study area. Despite there being devolution since 2013 and the expectation that county governments could help resolve some of the insecurity related issues, banditry attacks have been witnessed in the past year at the border between Turkana, West Pokot counties, regions neighboring Tiaty constituency, including Turkana East, Turkana South, Marakwet South, Samburu West and North, Baringo North and South and Laikipia West constituencies. The underlying issues of the conflict include encroachment of land by non-locals, cattle rustling attacks and retaliatory attacks to be key causes of the attacks. A study by Schilling et al. (2012) contends that violent conflicts in Turkana, if not managed, are likely to undermine the gains made so far in supporting the adaptation program in the area (see also Scheffran et al. 2014). The Key Informants contacted indicated that water and pasture resources can only be accessed in areas with security. More

emphasis on peace-building initiatives is needed in conflict hot spots along the borders of Turkana to promote effective adaptation strategies.

Furthermore, the literature materials reviewed highlighted the crucial role of local governance (e.g. chiefs) and informal institutions (e.g. council of elders), political leadership (e.g. Members of Parliament and County Assembly), and administrative structures (e.g. police) in improving market access and upholding the rule of law in Turkana.

Cross-sectoral and interdepartmental collaboration can also be challenging for a number of reasons. It is not always apparent how the activities of different ministries and departments within the county interrelate, and coordination across institutions can be difficult. Various stakeholders, implementing partners, financiers and planners may have different ideas of how project implementation should proceed or what the project goals are.

Inclusion of women, and gender is rarely addressed in EBA planning. In spite of women's key role in food production, ensuring food and water security, and managing food shortages during and after climate-related disasters, there remains a low level of women's participation and influence in planning adaptation and shaping policy (see Box 5).

**Box 5**

In Turkana County, based on cultural traditions women are generally excluded from community decision-making processes and customary law restricts them from owning large livestock. They are responsible for food production from small livestock (sheep, goats, chickens) but men own the animals and take the largest share of the products. The burden of daily tasks for women increases when access to resources, such as water, food diminishes and when caring for ill household members. Men (adults and youth) are responsible for large livestock and migrate in search of pasture, to find employment and other resources and face increasing challenges to support their families.

Indigenous peoples and local communities are not participating fully in EBA planning and implementation. A recurrent problem is that many processes strive to undertake planning for vulnerable groups rather than with them. Engaging local communities through a participatory process from the beginning of the discussion on EBA and throughout planning and implementation is important.

### 3.2. Access to Technical & Financial Support on EBA

As earlier on discussed (under the Finance section above), financial resources and technical support are central to planning, implementing, maintaining and evaluating activities to advance EBA. EBA stakeholders require finance, technology transfer and capacity-building support for pursuing their Ecosystems Based Adaptation agendas.

Financing EBA was identified as challenging. The Key Informants consulted highlighted the challenges of justifying and prioritizing investment and emphasized the need for strong collaboration across sectors on replicating and upscaling projects.

Challenges in implementing EBA also were found to be relating to:

- ❖ The differing application of EBA in urban contexts from rural areas. Many climate change risks are concentrated in urban areas and hamper economic development. The role of EBA as it relates to urban infrastructure systems and essential services, such as water and energy supply, sanitation, drainage, transportation and telecommunication, is poorly understood;
- ❖ Inadequate technical capacity & guidance as well as insufficient business incentives for implementation of EBA, particularly in urban contexts;
- ❖ The issue of transboundary coordination as it relates to managing ecosystems that cross county and national boundaries (e.g. the management of water resources along a river and in this case, Lake Turkana, that traverses multiple counties and countries, where a project to secure water or generate renewable energy in one country has negative impacts, including ecosystem impacts, in another);
- ❖ The need to enhance the confidence and trust of local communities in their county governments, especially in the light of their limited capacity to participate in policy-setting, which acts as a barrier to the effective implementation of EBA.

## 4. Opportunities to Enhance EBA

### 4.1. Enhance stakeholder involvement

Many Parties have successfully coordinated the complex set of actors involved in adaptation and sustainable development. For example, to reduce vulnerability, with a focus on vulnerable communities, Turkana County has ambitious plans for reviving public infrastructure, the finance sector, and urban and land-use planning. To accomplish its ambitious plans, the County Government of Turkana is working with funders, the private sector, development & humanitarian organizations and Civil Society Organizations using a multi stakeholder approach.

To ensure the full participation of women and youth in the process of EBA decision-making, planning and implementation, there is a need to engage men in activities that help to address the factors underlying gender inequality and discrimination in Turkana County.

To be more inclusive of vulnerable groups and local communities, including indigenous peoples, it is helpful to modify the narrative and, instead of portraying vulnerable groups as victims, to consider them as agents of change and opportunity for EBA adaptation. The technical examination exercise prior to the development of this technical paper identified that bottom-up approaches involving all stakeholders are essential to developing resilient infrastructure and that community engagement and the involvement of businesses can trigger and maintain the change process. From the consultations with Key Informants, participants emphasized the need for enhanced county and national collaboration and a dedicated space for sharing knowledge and identifying opportunities. Stakeholders need to provide a platform for different actors to share knowledge and mobilize EBA actions.

### 4.2. Improve Access to Financial & Technical Support on EBA

Some financial institutions, development organizations and supporting agencies have made suggestions on facilitating access to credit to support EBA adaptation. EBA funding can be effectively channeled to support adaptation, including ecosystem-based adaptation initiatives, in natural resource dependent

dryland environments. EBA could be mainstreamed into national and county level government (in this case in Turkana county) planning, with finances made available accordingly. To acquire funding, proposed EBA measures must be actionable and robust. Funding approaches should strive to support local development and adaptation priorities as set out in the County Integrated Development Plan (CIDP) through greater involvement of local communities. Both funding approaches have significant potential in terms of scaling up support for adaptation, when they are participatory, cross-sectoral (especially the nationally managed fund), compatible with the governance and institutional structures that manage dryland ecosystems, and can operate at scale. To craft such measures, risk analysis and management need to be conducted to identify and prioritize actions. Cost-benefit analysis and clear selection criteria can expedite funding approvals. Also, it is not only the amount of funding that matters but also the approach used to deliver them.

Multi-stakeholder proposals have a higher chance of approval. The funding process can lay the foundation for more inclusive participatory EBA planning. As competition for funding increases, proposals with a higher level of multi-stakeholder buy-in are more likely to come out on top.

In relation to technical support, there is need for enhanced understanding of EBA in the vulnerable regions of Turkana County. Incorporation of EBA approaches into the relevant development agendas and strengthening capacity (with government institutions, private sector, community, civil society, all other stakeholders) on EBA tools and their application is important. Such tools include funding, training, legislation, among others. There is also need for an increased knowledge base necessary for the development of long-term actions and activities on EBA. Such knowledge can also be obtained from successful case studies from projects interventions within the county and other areas of similar context in the promotion of EBA.

#### 4.3. Apply & Scale-up Ecosystem Based Adaptation

When implementing EBA it is important to build on existing natural infrastructure. Potential co-benefits include enhanced biodiversity. Potential pathways to scaling up EBA include:

- (a) Raising community awareness and training local communities;
- (b) Using simple language for engaging and creating buy-in among vulnerable local communities, the private sector, and county, national and international actors;
- (c) Establishing a registry for EBA and using simple technologies and indicators.

## 5. Conclusion

A key message emerging from the Technical Examination exercise is the need to move away from the notion that vulnerable communities, groups and ecosystems are victims of climate change; rather they are agents of change and purveyors of climate adaptation solutions.

From the reviewed literature materials and consultations with key informants in Turkana County, the importance of participatory adaptation was stressed, acknowledging the challenging but necessary nature of the EBA approach. Horizontal collaboration is required to link EBA planning across relevant sectors; while vertical collaboration is needed to engage local stakeholders in the county planning processes.

To enhance implementation of EBA it was recommended:

- i. To use success stories of similar projects within the county and elsewhere to promote EBA;
- ii. To raise community awareness and undertake training of local communities;
- iii. To agitate for the inclusion of EBA in nationally determined contributions and note interlinkages with mitigation and DRR.

The importance of mainstreaming traditional indigenous knowledge systems – knowledge that has been accumulated over many generations – into EBA planning and DRR was highlighted. Rather than portraying indigenous peoples as victims of climate change, it is more effective to emphasize their contribution to participatory adaptation.

Awareness-raising and a gender-sensitive approach to adaptation planning require the involvement of both men and women. Other social markers such as gender and class also often place women at a disadvantage in contributing to adaptation planning.

There is need to adopt climate-sensitive, ecologically appropriate approaches to natural resource management. This is through national and county governments' development and implementation of climate change policies, laws, regulations and budgets that are pro-poor, gender sensitive and youth inclusive. Furthermore, efforts need to be focused on raising awareness on climate change effects, empower citizens and community groups about their rights to demand better planning to enable climate change adaptation and mitigation; while assisting the county government develop policies geared towards climate change adaptation in Turkana County.

It is clear from the technical examination that there is need for EBA to be planned and implemented on different scales (long, medium and short term) and across different levels and sectors. The importance of integrating new knowledge into EBA planning was also noted, acknowledging that adaptation processes should be cyclical and iterative, integrate the best available knowledge, include monitoring of implementation and results, and improve based on ongoing learning.

Promoting Eco-System Based Adaptation (EBA) Approaches to Climate Change and Governance in Turkana County is therefore of paramount significance. Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. EBA focuses on the benefits humans derive from biodiversity and ecosystem services, and how these benefits can be utilized in the face of climate change. Consequently, EBA is a people-centric concept, but one that acknowledges that human resilience depends critically on the integrity of

ecosystems. EBA approaches include, for example, agroforestry, integrated water resource management, livelihood diversification, and sustainable forest management interventions that use nature to reduce vulnerability to climate change.

## 6. Recommendations

The Technical Examination highlighted many good practices, success stories and possible actions at the county level that could be used to advance EBA in relation to the vulnerable communities, groups and ecosystems in Turkana county in line with Climate change.

### Recommendations for County Government of Turkana

- i. Employing participatory methods for EBA planning and implementation. This will promote citizen empowerment, the generation of new, diverse and innovative ideas and actions, enhancement of citizen and county government relationship, legitimization of county government EBA programs, appropriate prioritization of projects, improved delivery of public services and county government responsiveness. Also, input from vulnerable groups and communities empowers them to become agents of change.
- ii. Through the participatory approach, there is need to include indigenous knowledge and community experience in EBA processes as this is likely to lead to more robust outcomes and broader ownership of initiatives. This should include inviting Parties and subnational/county level actors to mainstream gender considerations at all stages of the EBA process, including at the planning and the implementation of EBA actions.
- iii. There is a need for both horizontal and vertical integration in EBA processes, the former linking EBA planning with other planning processes across all sectors and departments within the county government, and the latter linking local stakeholders to county-wide EBA planning and implementation processes.
- iv. Consideration of finance, technology and capacity-building on EBA should form an integral part of the County Integrated and Development Plans and all other county development plans, as well in the county budget allocations each financial year.
- v. Working closely with the national government EBA financing projects at the national level and between multiple counties thereby providing an opportunity to improve the EBA process as well as to strengthen cooperation, including the management of shared resources.
- vi. Development of the relevant institutions and structures within the county government systems to spearhead EBA processes and activities. Implementing effective EBA measures requires the institutional capacity to build policy frameworks and the human capacity to understand and develop scientific knowledge.
- vii. Aligning EBA processes at county level with NAPs, could be critical to increasing resilience and reducing vulnerability. The NAP process can serve as a mechanism for stimulating new funding proposals and catalysing investment at county level to enhance EBA for vulnerable communities, groups and ecosystems.

#### Recommendations for Community members

- i. As earlier on mentioned, the communities living in Turkana County, indigenous peoples and women can make important contributions to EBA processes and therefore they should actively participate in EBA planning and implementation activities.
- ii. Inviting Parties, climate funds and multilateral banks to mobilize financial flows consistent with the EBA processes, taking into consideration, the vulnerability of groups and communities.

#### Recommendations for the development and civil society organizations implementing Climate Change programs in Turkana County

- i. Vulnerable groups and communities in Turkana county should be viewed not as victims of climate change but as agents of change. This is to enhance climate resilience, and the communities must be involved in the EBA programs process from project development at the beginning to program phase-out and beyond.
- ii. Establishment of a knowledge management portal on EBA that shares field-proven knowledge and experience on Ecosystem Based Adaptation in different regions and ecosystems of similar context to Turkana County will also be helpful. Using existing information on participatory EBA, including ecosystem-based and community-based approaches, available through the EBA knowledge portal and other resources, will allow stakeholders to benefit from the experience of others.
- iii. Efforts should also be made in encouraging Parties and interested organizations to share case studies of initiatives that focus on EBA in relation to vulnerable communities, groups and ecosystems via an EBA knowledge portal.
- iv. Inviting climate funds and multilateral banks to consider intra-county, national and regional projects and their potential to strengthen cooperative relations, including on the management of shared natural resources and transboundary cooperation.
- v. Working closely with existing and constituted bodies on technology development and capacity-building such as research and higher learning institutions in Turkana County to continue providing assistance in the generation of contextualized knowledge, building individual as well as institutional capacity in the planning and implementation of EBA processes. Encouraging continued collaboration on climate science and furthering cooperation opportunities



## Further readings

Connecting Biodiversity and Climate Change mitigation and adaptation- Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change under the Convention on Biological Diversity (CBD).

CBD (2009). Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. Montreal, Technical Series No. 41, 126 pages.

UN, (2012), 'Strengthening Human Security in the Borderlands of Turkana', United Nations Trust Fund for Human Security, Nairobi, Kenya

Neumayer E and Plümper T. 2007. The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2012. *Annals of the Association of American Geographers*. 97(3): pp.551–566. Available at [http://eprints.lse.ac.uk/3040/1/Gendered\\_nature\\_of\\_natural\\_disasters\\_%28LSERO%29.pdf](http://eprints.lse.ac.uk/3040/1/Gendered_nature_of_natural_disasters_%28LSERO%29.pdf).

Sonwa, D.J., Dieye, A., ElMzouri, E.H., Majule, A., Mugabe, F.T., Omolo, N., Wouapi, H., Obando, J. and Brooks, N. (2016), "Drivers of climate risk in African agriculture", *Climate and Development*, pp. 1-16.

Schilling, J., M. Akuno, J. Scheffran, and T. Weinzierl. 2014. On raids and relations: Climate change, pastoral conflict and adaptation in northwestern Kenya. In *Conflict-sensitive adaptation to climate change in Africa?* ed. S. Bronkhorst and U. Bob, 241–268. Berlin: Berliner Wissenschaftsverlag.

Scheffran, J., T. Ide, and J. Schilling. 2014. Violent climate or climate of violence? Concepts and relations with focus on Kenya and Sudan. *The International Journal of Human Rights* 18(3): 369–390.

A group of children and an adult woman are gathered in a rural setting. The woman, wearing a colorful patterned shirt, is smiling and looking towards the camera. Several children are standing around her, some looking at the camera and others looking away. The background shows traditional thatched-roof huts and a sandy ground.

## CONTACT

### **Trócaire Kenya**

Hse No. 337, Donyo Sabuk Lane

Westlands, off Peponi Road

P.O.Box 66300-00800

+254722220086

Email: [infoNairobi@trocaire.org](mailto:infoNairobi@trocaire.org)

Website: [www.trocaire.org](http://www.trocaire.org)