REGIONAL INTEGRATION IN AN ERA OF POLYCRISIS AND GEOSTRATEGIC COMPETITION IN THE COMESA REGION

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The Deployment of the East African Community Regional Force in the Democratic Republic of Congo

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Abstract

In November 2022, the East African Community Regional Force was deployed in the eastern Democratic Republic of the Congo as authorised by the 2nd Conclave of the East African Heads of State in April 2022. The regional force was mandated to help contain and, where necessary, fight the negative forces that have continued to cause insecurity in eastern DRC. When the force deployed, it faced many challenges, with the main one being the eventual lack of support from the host government, leading to its withdrawal. Nevertheless, on a positive note, the regional force was able to negotiate a ceasefire between the government of the DRC and the March 23 Movement (M23) insurgent group. This goes to show that regional interventions such as that of the EAC can advance the cause of peace by lessening the occurrence of violence in intractable intra-state conflicts. In the end, however, due to the challenges highlighted in this chapter, including funding and differences in interpretation of the mission's mandate, the EAC regional force withdrew from the DRC only after one year, leaving the security situation in eastern DRC still festering.

Keywords: EAC, Eastern DRC, EAC-RF, Negative Forces

Introduction

The Second Conclave of the East African Community (EAC) Heads of State on the peace and security situation in the Democratic Republic of Congo, held in Nairobi in April 2022 decided to create a regional force made up of troops from partner states. The force was to be deployed to the troubled provinces of North Kivu, South Kivu and Ituri (in the eastern DRC) to help combat insecurity (Government of Kenya, 2021).

Subsequently, at the beginning of September 2022, the Minister of Foreign Affairs of the DRC and the Secretary General of the EAC signed an agreement paving the way

for the deployment of the EAC Regional Force on the DRC (EACRF-DRC) (Nation Africa, 2022). Specifically, the EAC-RF was mandated 'to help contain, and where necessary, fight the negative forces' that have continued to cause insecurity in eastern DRC (Nation Africa, 2022).

This chapter examines the EAC's intervention in eastern DRC, posing the question: Can regional intervention in an intractable intrastate conflict in a member state lessen the occurrence of violence? In the case of eastern DRC, the question is answered in the negative as the EAC's intervention faced many challenges, including funding, differences in the interpretation of the EAC's intervention mission mandate and toxic regional politics. In the end, the EAC's intervention ended without consequence. Nevertheless, the lessons learned from the EAC's unsuccessful intervention are useful for other regional blocs in Africa seeking to intervene in intractable regional conflicts.

The chapter argues that while the deployment was able to somewhat lessen the fighting between the armed forces of the DRC government and the M23 insurgents by establishing a ceasefire between them, the mission faced many challenges.

The main one was the eventual lack of support from the host government as a result of a nuanced interpretation of the mission's mandate. Other challenges included funding and the issue of dealing with 'negative groups' such as the Democratic Forces for the Liberation of Rwanda (FDLR) from Rwanda, the National Liberation Forces (FNL) from Burundi and the Allied Democratic Forces (ADF) from Uganda, among others. The term 'negative forces' denotes those non-state armed groups that continue to destabilise regional peace and stability. In the end, however, the EAC-RF was forced to withdraw from eastern DRC one year after its initial deployment.

Methodologically, the paper is a product of reviewing primary documents, including EAC-RF deployment papers, namely, the concept of operations and status of forces agreement, and EAC papers, supplemented by secondary information from books, journal articles and book chapters.

Context and Conceptual Issues

The armed conflict in the DRC is one of the most serious and protracted of any since the Second World War (Okowa, 2006: 205). Although the Republic of Zaire (now DRC) had been in a state of upheaval for most of the 1980s, the roots of the conflict can be traced to 1996, when the first Congo War directed at the overthrow of Mobutu began. This war formally ended in May 1997 with the overthrow of Mobutu and the

Chapter Two

A Critical Analysis of the Nexus Between Environmental Diplomacy and Climate Action in the COMESA Region

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Abstract

Environmental diplomacy promotes dialogue and multilateral cooperation among state and non-state actors to address transnational environmental challenges. It acknowledges multilateralism as a cornerstone of global peace, security and development. Climate change is one of the major challenges of the 21st Century, with extensive and far-reaching impacts that are particularly acute in Africa, where climate-related disasters increasingly exacerbate insecurity and conflict.

Eastern and Southern Africa face rising vulnerabilities, temperature variations, erratic rainfall, droughts, cyclones, and flash floods, further compounded by limited financial and technological resources. Within this context, the COMESA a regional diplomatic bloc of 21 African states historical united by political, economic, and social bonds, has extended its cooperations beyond trade to address climate change through initiatives such as the COMESA Climate Change Initiative (2009-2013) and COMESA Climate Change Strategy (2020-2030). However, multiple challenges continue to hinder the realisation of its climate action goals. Against this background, this chapter provides a critical examination of the relationship between environmental diplomacy and climate action in the COMESA region, drawing exclusively on secondary data.

Keywords: Climate Action, COMESA, Environmental Diplomacy, Multilateralism, Regional Integration

Introduction

Environmental diplomacy has emerged as a crucial tool in the global fight against pressing environmental issues, particularly climate change. It provides a platform for fostering international, regional, and sub-regional cooperation to address environmental challenges through collective action (Knaepen and Dekeyser,

2023). Climate change, predominantly driven by human activities such as fossil fuel consumption, deforestation, and industrial processes, has far-reaching impacts on ecosystems, economies, and societies (IPCC, 2021). As the Intergovernmental Panel on Climate Change (IPCC) has repeatedly highlighted, there is an urgent need to implement robust mitigation and adaptation strategies to combat global warming and safeguard both the environment and human livelihoods.

This chapter investigates the critical intersection of environmental diplomacy and climate action within the region, aiming to respond to the escalating environmental threats and examine how diplomatic efforts can strengthen regional climate policies and cooperation.

The key research question guiding this inquiry is: *How can environmental diplomacy contribute to advancing climate action and sustainability in the COMESA region?* In particular, the chapter engages debates on the role of diplomacy in securing commitments to the Paris Agreement and the Sustainable Development Goals (SDGs), especially SDG 13 on climate action. It explores whether these diplomatic engagements are sufficient in driving the necessary policies and strategies needed to mitigate greenhouse gas emissions, transition to renewable energy sources, and enhance resilience against climate-induced disruptions.

The analysis is situated within the broader discourse on the nexus between environmental diplomacy and climate action, emphasising the need for integrated approaches that combine diplomatic negotiations with on-the-ground climate measures.

Framed against the persistent rise in global temperature, approximately 1.1 degrees Celsius over the past century (IPCC, 2021), the study underscores that without effective diplomatic frameworks fostering cooperative mitigation, global warming is projected to exceed 1.5 degrees Celsius by 2030, leading to severe ecological and socio-economic consequences.

Methodologically, this chapter adopts a mixed-method approach, integrating qualitative analysis of policy frameworks and treaties with quantitative assessments of emission trends, regional climate data, and the effectiveness of implemented mitigation measures. This approach allows for a comprehensive understanding of how environmental diplomacy can be leveraged to drive substantive climate action in the COMESA region.

The nexus between environmental diplomacy and climate action in the COMESA region is therefore becoming increasingly relevant, as these rising temperatures undermine agricultural productivity and contribute to food insecurity. Regional cooperation under the umbrella of environmental diplomacy is essential for addressing these challenges through the joint implementation of climate action plans, resource-sharing initiatives, and enhanced resilience across borders (Smith et al., 2020).

In addition to rising temperatures, extreme weather events such as cyclones and prolonged droughts have become more common, further complicating the region's ability to adapt to climate impacts. For example, Madagascar and Mozambique have experienced increasingly intense cyclones, resulting in flooding, the destruction of infrastructure, and the displacement of communities. At the same time, countries such as Zambia and Zimbabwe have faced persistent droughts that severely affect rain-fed agriculture.

In this context, vnvironmental diplomacy within the COMESA region is vital for coordinating collective responses. Through collaborative frameworks, member states can pursue cross-border initiatives, such as early warning systems for cyclones and joint drought mitigation measures, that strengthen regional resilience and promote sustainable development (Smith et al., 2020).

The increasing frequency of climate-induced events also underscores the importance of linking environmental diplomacy with climate action to safeguard vital resources like water. Prolonged droughts and erratic rainfall patterns are placing immense pressure on water resources, disrupting agricultural production and limiting access to safe drinking water.

In response, COMESA countries must continue leveraging environmental diplomacy as a tool to negotiate transboundary water agreements, promote sustainable water management practices, and share technological innovations to mitigate these risks. This intersection between diplomacy and climate action is critical to addressing the region's environmental and socioeconomic vulnerabilities, ensuring that the adverse effects of climate change are mitigated through coordinated regional strategies and policies (Smith et al., 2020).

Changes in Temperature, Precipitation Patterns, and Drought

According to the IPCC, Africa is a climate change hotspot, experiencing some of the most severe and far-reaching impacts globally. Simultaneously, African states

often have limited financial and technological capacity to respond effectively. Within this context, the COMESA region (encompassing eastern and southern Africa) has recorded a noticeable temperature rise in temperature and shifts in precipitation patterns.

The region is also experiencing increases in mean wind speed and more frequent tropical cyclones associated with sea storms (IPCC, 2022). According to a 2020 World Bank report, the annual rainfall in the regions has declined by approximately 10 per cent over the past two decades (Jones et al., 2018).

These changes have triggered a series of adverse impacts, exacerbating existing challenges in the region. The reduction in rainfall has led to prolonged and recurring droughts, destabilizing the fragile balance of water availability. Water scarcity, intensified by these extended dry periods, has had far-reaching effects on agriculture, industry and the daily life of citizens. Agriculture, a cornerstone of the COMESA region's economy, has been notably affected.

With less rainfall, water for crops is increasingly scarce, making it difficult for farmers to sustain production. As a result, crop yields have declined, and food production hindered, intensifying the issues of food security and heightened risks to nutrition and public health (Jones et al., 2018).
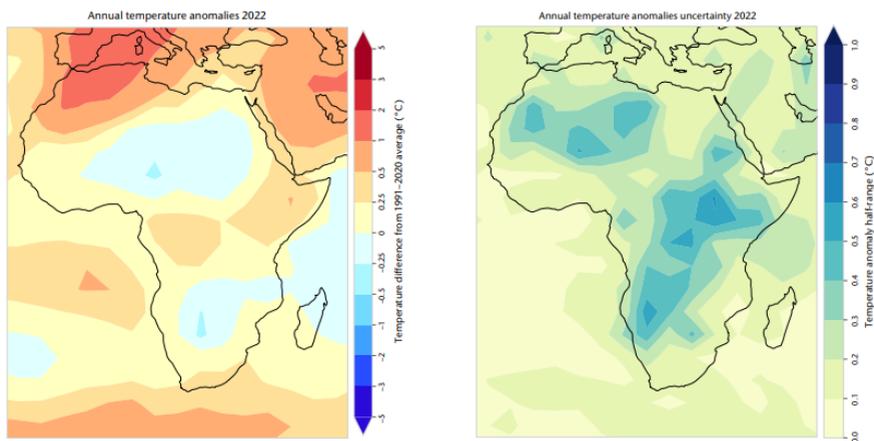

Figure 1: Near-surface air temperature anomalies for 2022 relative to the 1991–2020 average (left) and estimated uncertainty in temperature anomalies for 2022 (right).
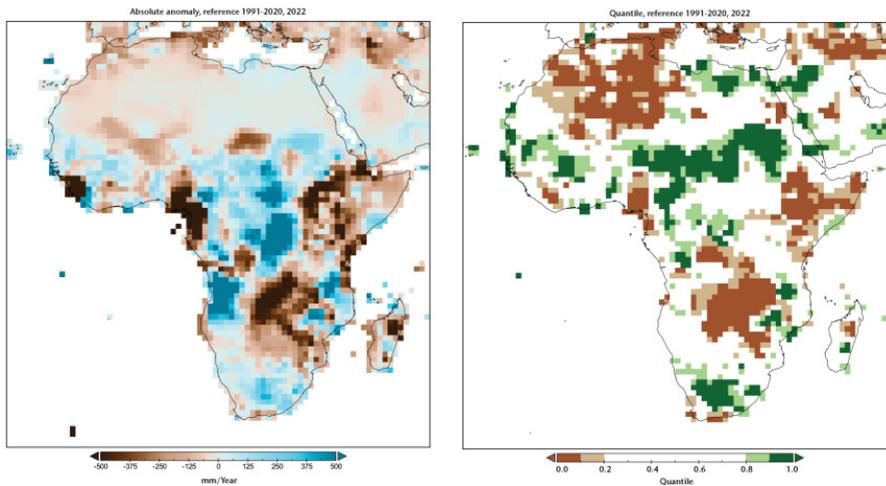
Source: World Metrological Organization (WMO)(https://library.wmo.int/idurl/4/67761)

Figure 2: Precipitation variances in mm for 2022 (left).

Source: World Metrological Organization (WMO) (https://library.wmo.int/idurl/4/67761)

Blue areas- above-average precipitation.
Brown areas- below-average precipitation. Precipitation quantiles for 2022 (right).
Green - unusually high precipitation totals (light green indicates the highest 20 per cent, and dark green indicates the highest 10 per cent of the observed totals).
Brown areas- abnormally low precipitation totals (light brown indicates the lowest 20 per cent, and dark brown indicates the lowest 10 per cent of the observed totals).
The data reference is between 1991–2020.

Moreover, suppressed precipitation patterns have significantly affected communities, particularly in rural areas where access to clean and sufficient water is already precarious. Securing adequate water for households, sanitation, and daily needs has become an ongoing struggle, undermining quality of life and public well-being. As scarcity intensifies, competition over resources is likely to increase, raising the potential for conflicts and further straining social cohesion (Jones et al., 2018).

The discernible shifts in precipitation and the subsequent decline in rainfall therefore presents a complex set of challenges. Their cumulative impacts on agriculture, food security, and water availability underscore the urgent need for strategic and coordinated measures to manage and adapt to this evolving climate reality in the COMESA region.

addition, effective nation branding requires sustained investment in building and promoting a positive national identity that appeals to both domestic and international audiences.

However, developing nations often face compounded obstacles, including political instability, underdeveloped public institutions, and insufficient bureaucratic expertise—all critical for government-led branding initiatives. These systemic challenges are further exacerbated by severe resource limitations and a lack of specialised marketing capabilities (Papadopoulos and Hamzaoui-Essoussi, 2015: 4). Without stable governance structures and professional expertise, even well-conceived branding strategies struggle to achieve meaningful impact.

Nation Branding is a Multi-Stakeholder Process

Nation branding is not solely the responsibility of the government. It involves collaboration among various stakeholders, including governmental bodies, private sector entities, civil society organisations, and citizens to effectively shape and communicate a country's identity domestically and internationally (Melissen 2005: 19 - 21). Governmental agencies play a crucial role in setting strategic objectives and coordinating branding efforts, but they must work in concert with other stakeholders to achieve success. Private sector organisations contribute expertise in marketing, communications, and branding techniques, while civil society groups offer insights into social and cultural dynamics that shape national identity. Additionally, citizens play a vital role as ambassadors and advocates for their country, influencing perceptions through their actions and interactions with others.

Table 1: A Summary of Nation Branding Characteristics

No.	Feature	Context
1.	Goal	Promoting (mostly) economic interest
2.	Context	De-politicised, general agreement among actors and political parties (but in some cases it is politicised)
		Image driven
		Driven by marketing and consumerism
3.	Targeted at	Consumers (of images, products, places)
		Both foreign and domestic audiences. Without the consent of domestic audiences, it is doomed to fail
		Applicable to any countries, more universal

No.	Feature	Context
4.	Government Role	Government could be the initiator but rarely the sender (danger of propaganda) leading to less or no government control
5.	Actors	National tourist boards, travel agencies; investment promotion and export agencies; trade boards, chambers of commerce, multinational organisations, which are all multipliers
6.	Strategies	Image management
		Emphasis on visual and symbolic elements
		Centralised approach, driven by the brand essence (one-size-fits all) tailored towards a global and homogenous audience
		Focus exclusively on positive and 'marketable' elements of a country's culture and people
7.	Tactics	Logo and slogan; country advertisements in leading international TV channels, sponsored pages in leading international magazines; emarketing, web portals; press tours, brochures, pseudo-events
8.	Media*	Relies heavily on mass media as the main channel. Media are passive, usually carrying paid advertisements.
9.	Time Frame	Ad hoc, campaign-driven
10.	Budget	Public and private partnership
11.	Evaluation	Mostly long-term

* Nation branding traditionally depended on mass media for broad messaging, but now increasingly leverages social media platforms like Twitter, Instagram, YouTube and Facebook to engage global audiences directly. Governments use these channels for real-time interaction, authentic storytelling, and cultural exchange, enhancing visibility and trust while tracking campaign impact efficiently.

Source: Adapted from Szondi (2008), p. 17-18.

Benefits of Nation Branding

Nation branding has three key benefits for countries. These are discussed in the following section.

Provides Commercial and Economic Advantages for Countries

In the current age of economic globalisation, the perceived identity of a nation is seen as a valuable asset for strategically marketing a specific region (Kotler and Gertner, 2002; Morgan, et al., 2011; Del Percio, 2016: 5). In this regard, nation branding

Table 1: Kenya Implementation Analysis - Green Analytical Framework for the NDC

	Principle	Implementation Analysis
i.	Environmental Sustainability	Agricultural Sector: leading GHG emitter Energy Sector: open-pit mining Environment: regulatory institution challenges Forestry: charcoal production, illegal logging, land-grabbing
ii.	Social Equity	Energy Sector: use of wood-fuel Agricultural Sector: livestock rustling Gender, Youth, and Other Vulnerable Groups: differentiated impact Water and Sanitation: water scarcity
iii.	Sustainable Economies	Agricultural Sector: use of banned agro-chemicals Energy Sector: possible oil, coal and nuclear production Infrastructure: climate-proofing
iv.	Long-Term Planning	The NDC is for the period 2020-2030: longer term required; diversion of resources to address climate-change crisis
v.	Transparency and Accountability	The updated NDC states the process was structured for transparent communication: information reported may be skewed towards positive reports
vi.	Cross-Sector Analysis	Energy Sector Agricultural Sector Health Sector

Note. Analysis based on the principles of the Green Theory

Table 1 above depicts the six components of the Green Analytical Framework, which is used to analyse Kenya's NDC.

Environmental Sustainability is the first component and includes the agricultural sector, energy sector, environment and forestry. As regards the agricultural sector, agriculture was the leading GHG emitter in Kenya in 2015, accounting for 40 per cent of national emissions (Ministry of Environment and Forestry, 2020). This was mostly due to livestock enteric fermentation, manure left on pastures and agricultural soils, and fertiliser application. The energy sector is, however, projected to be the country's leading GHG emitter by 2030. Currently, close to 90 per cent of electricity generated in Kenya comes from renewable energy, with geothermal power being the major contributor (ITA, 2024).

Several energy-related challenges, however, include the continuation of deforestation and possible open-pit mining planned in the Mui basin of Kitui county. This type of mining has high emissions of sulphur dioxide, heavy metals, and harmful GHGs. In June 2019, the National Environment Tribunal revoked a license for the construction of the Lamu Coal Plant. This was after finding that the National Environmental Management Authority (NEMA) had issued the construction license despite the Environmental and Social Impact Assessment (ESIA) being prepared without public consultation or participation (Namwaya, 2019).

Regarding the environment, a proposed activity in the updated NDC is the greening of 14,000 hectares of infrastructure. Forestry is considered a key mitigation measure, and the country aims to achieve a tree cover of at least 10 per cent of land area. This has faced several challenges, including ongoing and widespread trade in charcoal, land grabbing and illegal logging.

Social equity is the second component of the analytical framework, and the updated NDC states that the process was inclusive and stakeholders were consulted. The NDC notes that increased intensities and magnitudes of climate-related risks aggravate conflicts, mostly over natural resources. It further notes that climate impacts are not gender neutral, impacting men, women and children differently. For example, in the 2018 floods, out of the 230,000 people displaced, 150,000 were children, and 700 schools were closed.

In the energy sector, it is noted that half of Kenya's households use wood fuel for cooking, which poses a challenge to the stated forestry goal of at least 10 per cent of land area. In the agricultural sector, pastoral communities are mostly marginalised and heavily reliant on livestock for their livelihood.

Early marriage is particularly rampant during drought seasons, as families hard-hit by livestock loss marry off young girls to obtain a dowry in the form of livestock or other forms of wealth. Livestock rustling also continues to be a challenge despite various measures instituted by local communities, non-state and state institutions. Driving factors include the proliferation of illegal firearms, underfunded security agencies and insufficient collaboration between stakeholders (Muteti, 2024).

The updated NDC prioritised adaptation programmes to strengthen access of vulnerable groups, including youth and women, to enterprise funds, climate, and credit lines. Water and sanitation are also considered as a means of social equity, and water harvesting and storage should be promoted at county and household levels.

The third component is sustainable economies. The updated NDC states that resource requirements for mitigation activities in the 2020-2030 period are USD 17.725 million, with Kenya intending to bear 21 per cent of this cost. The agricultural sector is a key component of a sustainable economy in Kenya, as it is the major economic activity. Activities geared towards increased crop productivity may, however, counter environmental sustainability. This includes the wrong application of fertiliser in a bid towards increased yields. The widespread use of harmful agrochemicals has also been reported, with herbicides such as Glyphosate, which is banned in the EU, being approved for use in Kenya (Heinrich Böll Stiftung, 2023).

There has also been a focus on increased livestock production. For example, Kenya signed a deal to export 700,000 cows to Indonesia annually (Otieno, 2023). In the energy sector, mitigation efforts in the updated NDC include an increase of renewables in the electricity generation mix of the national grid, and the enhancement of energy and resource efficiency across the different sectors.

While Kenya has an abundant supply of renewable energy resources, including geothermal, solar, wind and hydro, it also has significant oil reserves and 400 million tonnes of coal reserves. Coal production has relatively low costs, and prospecting of coal production has occurred in Lamu, Kitui and Kilifi counties. Coal production has been contested due to its negative environmental impact and adverse effects on livelihoods. Additionally, the government's planned nuclear power generation has raised concerns, particularly around waste management. In infrastructure, the updated NDC prioritised adaptation programmes aim to green 14,000 hectares of infrastructure, enhance the climate-proofing of energy infrastructure along the renewable energy supply chain, and upscale the construction of roads to systematically harvest water and reduce flooding (Ministry of Environment and Forestry, 2020).

Long-term planning is the fourth component captured in the duration of the NDC, which covers a 10-year period from 2020 to 2030. A longer development time span is, however, necessary at a country, regional, and global levels as some activities, such as infrastructural projects, can take a longer duration. The diversion of resources from long-term planning can also occur due to climate change-related disasters, such as floods, and incidents like communal conflicts over resources, thereby detracting from the attainment of the NDC.

Transparency and accountability comprise the fifth component, and the updated NDC states that the process was structured for transparent communication. The use of an integrated Measurement, Reporting and Verification (MRV) system, which is

linked to existing monitoring and reporting systems, including the National Integrated Monitoring and Evaluation System (NIMES) and the County Integrated Monitoring and Evaluation System (CIMES), is an example of this. The Integrated MRV system is embedded in the Climate Change Act, which obligates all state and non-state actors to report activities on an annual basis.

The tracking of financial support required and received for climate action by all climate change actors, both state and non-state, is done by the National Treasury. While climate action may be reported using mechanisms that adhere to transparency and accountability requirements, activities that negatively impact climate change are not reported using similar mechanisms, and these can undermine climate change gains.

Cross-sector analysis is the sixth and final component. This is demonstrated in the implementation of the NDC, through the NCCAP. The NCCAP mainstreams climate change action in sectoral development plans and the CIDPs. At the sectoral level, state departments have a legal obligation to establish Climate Change Units (CCUs) to integrate NCCAP actions into their strategies and implementation plans.

A County Executive Committee member coordinates climate change at the county level through a CCU. Key sectors are climate-sensitive and include agriculture, water, energy, tourism, wildlife, and health. Climate action is implemented across various sectors at the national and county government levels. Counties and various sectors are to downscale and contextualise climate change action indicators in the county and sector planning documents.

Several implementation gaps in climate change adaptation are highlighted in the updated NDC, and proposed activities to bridge these gaps are articulated. These activities include: enhancing the adaptive capacity and climate resilience across all sectors of the economy and at both the national and county government levels; enhancing uptake of adaptation technology, especially of women, youth and other vulnerable groups, incorporating scientific and indigenous knowledge; and conducting a vulnerability and risk assessment of different climate risks on human health. The Green Analytical Framework, as presented in Table 1, allows for a comprehensive analysis of implementation gaps in policy and enables an identification of possible challenges in bridging these gaps.

In the energy sector, for example, climate-related challenges may include reduced hydroelectric power supply due to decreased water supply from melting Mt. Kenya glaciers and variable rainfall patterns. In the agricultural and livestock sector, climate-related challenges include land degradation and increased incidences of

pests and diseases, which may lead to the use of banned pesticides. Vulnerability of livelihoods is then reflected in practices such as early marriage in some pastoral communities.

In the health sector, climate-related health challenges include waterborne diseases due to floods, developmental challenges in children due to a lack of proper nutrition, and mental health challenges caused by climate-related conflict and displacement.

Sudan and the Climate Action Agenda

Sudan has a population of approximately 50 million people as of 2024. It occupies 1,886,068 square kilometres (728,215 square miles), making it Africa's third-largest country by area and the third-largest in the Arab League (World Population Review, 2023; Worldometer, 2025). Prior to the secession of South Sudan in 2011, the then-unified Sudan was the largest African country, with an area representing more than eight per cent of the African continent and almost two percent of the world's total land area (Sudan Population, 2021; CIA, 2023). Since Sudan's independence from joint British-Egyptian rule in 1956, a military junta supporting an Islamist-centric government has dominated the country's politics. President Omar Hassan Ahmad al-Bashir's 30-year rule ended after months of nationwide protests (The World Factbook,2018).

The country has varied climatic zones, with agriculture mostly dependent on rainfall. The northern and central parts experience a loss of vegetation, leaving them vulnerable to droughts (UNEP, 2007; FAO, 2005). In 2022, Sudan experienced economic growth driven by agriculture and mining (AfDB, 2022).

Sudan is severely exposed to climate change. As one of the world's least developed countries, extreme weather, recurrent floods and droughts, and changing precipitation interact with other vulnerabilities, such as ecosystem degradation, unsustainable agricultural practices, natural resource scarcities and resource-based conflicts, limiting societal capacities to cope and adapt.

Armed conflict in Sudan has had adverse effects on the population, which led to displacement, creating regional spillovers with devastating impact on the country's economic performance. In 2023, the GDP contracted by 37.5 per cent due to the destruction of production capacity, and the disruption of economic activities and rising debts. Poverty was extremely high in 2022 at 66.1 per cent and is projected to increase due to conflict (AfDB, 2024). Youth unemployment was at 40 per cent

in 2022, raising unemployment rates to 20.6 per cent. Due to the conflict, GDP is projected to contract by another 5.9 per cent in 2024. Between 2010 and 2022, the share of employment in agriculture declined from 49.7per cent to 40 per cent, while that of services increased from 41.8 per cent to 45 per cent, and that of industry remained stable at 15 per cent (AfDB, 2024).

Climate-Related Challenges

Sudan is endowed with natural resources such as oil, forests, and agricultural lands. Sudan's protracted history of conflict, combined with intensive utilisation of natural resources, has created a range of critical environmental challenges. These include widespread desertification, deforestation, loss of biodiversity, water scarcity, tribal and ethnic conflicts, and poverty. Other challenges include inadequate supplies of potable water, wildlife populations threatened by excessive hunting, soil erosion, and periodic drought (Mey and Tomlinson, 2013).

Together with environmental degradation and a growing population, climate change is contributing to the shrinking of the natural resource base, which underpins the livelihoods of farmers and pastoralists in the region, driving increased competition over land and water. Farmers, who depend on reliable and predictable weather patterns, are less productive than in previous years (UNEP-EU, 2022). National agricultural policies have favoured capital-intensive, large-scale farming, which has sidelined traditional farming techniques and focused on exporting raw materials, degrading land across agricultural areas of Sudan (Elnur, 2008).

Pastoralists have, in the recent past, experienced reliable water sources and fertile grazing areas drying up in some areas, while insecurity has made other areas inaccessible. To compensate for faltering livelihoods, fertile land and available water sources are highly sought after. Conflicts between farmers and herders tend to occur when animals encroach into fields and damage crops, or when crops are cultivated on migratory routes or animal grazing land (UNEP-EU, 2022).

National Climate Policy and Regulatory Framework

The Republic of Sudan submitted an update to its first NDC as required under the Paris Agreement in 2021, thereby meeting its obligation under Article 4.9, after ratifying the Paris Agreement in 2016 (Republic of Sudan, 2021). This ratification was particularly important, as Sudan has been significantly impacted by climate change, with rapid change and degradation of the natural environment.

The country's natural environment has rapidly changed and degraded. UNEP and other international actors are engaged in interventions to reduce the impacts

of climate change and increase the resilience of livelihoods in Sudan. Examples include the UK-funded 'Adapt for environment and climate resilience' (ADAPT!) project, and various government support engagements by UNEP (UNFCCC-NDC, 2022). Sudan's NDC outlines commitments and actions to reduce GHG emissions and adapt to the impacts of climate change. The country's NDC includes unconditional and conditional indicators, where unconditional targets are tasks that Sudan promises to fulfil regardless of external support. In contrast, conditional targets are contingent on receiving financial and technical support from developed countries.

The country's National Adaptation Plan (NAP) outlined the need for new partnerships ranging from governments to international donors, households to the private sector, and from one end of the national institutional spectrum to the other. The passing of the Miscellaneous Amendments Law (MAL) in 2020 is an important milestone for strengthening institutional coordination to meet climate change and other pressing environmental challenges (Sudan's Climate Change Strategy, 2019; Sudan's National Adaptation Plan, 2020; Sudan's National Climate Policy and Regulatory Framework, 2020).

Sudan has set a target in its NDC to reduce GHG emissions by seven per cent below BAU levels by 2030. These reduction target depends on adequate support from the international community. Sudan also aims to increase the share of renewable energy in power generation to 20 per cent by 2030. To achieve these goals, Sudan has established several mitigation measures in the NDC.

These include encouraging renewable energy sources such as solar and wind, improving energy efficiency across various sectors, enhancing sustainable land management practices, and reducing emissions from deforestation and forest degradation. In addition to mitigation efforts, Sudan›s NDC emphasises the importance of adapting to the impacts of climate change. These goals are unlikely to be realised due to ongoing conflict that has had serious ramifications not only on the humanitarian front but also the environment. The ongoing conflict is exacerbating the environmental challenges discussed above.

The country faces many challenges related to water scarcity, desertification, and the increasing frequency and intensity of extreme weather events. Sudan's NDC highlights the need to strengthen adaptive capacity, improve early warning systems, strengthen climate-resilient agriculture, and promote sustainable water management (Sudan's Climate Change Strategy, 2019; Sudan's National Adaptation Plan, 2020; Sudan's National Climate Policy and Regulatory Framework, 2020).

Sudan's Greenhouse Gas Emissions

Sudan's GHGs originate from different sources, including agriculture, energy, industry, and waste management. The country's emissions have been increasing over the past few decades, but there have been efforts to reduce them. Total GHG emissions in Kt of CO_2 equivalent ($KtCO_2eq$) is composed of CO_2 totals excluding short-cycle biomass burning (such as agricultural waste burning and Savannah burning) but including other biomass burning (such as forest fires, post-burn decay, peat fires and decay of drained peatlands). This total encompasses all anthropogenic sources of methane (CH_4), nitrous oxide (N_2O), and fluorinates gases (F-gases), including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Over the last several years, fluctuations in Sudan's GHG emissions have been influenced by a combination of economic, political, and environmental factors. A slight decline in emissions in 2017 (–0.3 per cent) may be linked to ongoing economic challenges following the 2011 secession of South Sudan, which significantly reduced Sudan's oil revenues and industrial output (World Bank, 2020; Elnaiem, 2020). Modest increases in 2018 (0.89 per cent) and 2019 (0.3 per cent) likely correspond to gradual economic recovery and rising energy consumption, especially in urban centres (International Energy Agency [IEA], 2021). Conversely, the minor decline in 2020 (–0.06 per cent) can be attributed to the global impact of the COVID-19 pandemic, which disrupted transportation, reduced industrial activity, and lowered overall energy demand (UNEP and UNEP-CCC, 2021).

Additionally, Sudan's dependence on biomass for household energy and its vulnerability to climate variability, such as droughts and changes in Nile River water levels, also affect emissions from the agriculture and energy sectors (FAO, 2020). Political instability and transitional governance during this period may have further influenced infrastructure development and energy policy implementation, indirectly contributing to emission variations. To address these issues, Sudan needs to continue implementing sustainable practices and technologies such as renewable energy and sustainable agriculture and promote education and awareness about the importance of climate change mitigation and adaptation.

Nationally Determined Contributions

Sudan made commitments to reduce GHG emissions and adapt to the impacts of climate change through its NDCs. This is a key component of the Paris Agreement, which aims to limit global warming to below 2 degrees Celsius above pre-industrial levels. These contributions are based on the circumstances, priorities, and capabilities of the country.

Sudan aims to reduce its GHG emissions by seven per cent by the year 2030, but the target can be increased to up to 35 per cent with international support (UNFCCC, 2021). To achieve this, Sudan plans to increase the share of renewable energy in its electricity generation mix. In this context, it plans to expand its solar and wind power capacity and promote the use of biomass for cooking and heating purposes. Since the country has significant solar and wind resources, these can be harnessed for clean energy production (UNFCCC, 2021).

As a country, it recognises the importance of improving its energy efficiency across various sectors. Its NDC emphasises the need for energy-efficient technologies and practices, especially in buildings, industry, transportation, and agriculture. Sudan can therefore significantly reduce its overall energy consumption associated with GHG emissions by adopting energy-efficient measures (Ministry of Environment, Natural Resources and Physical Development (Sudan), 2018).

For Sudan, forests play an important part in mitigating climate change. It recognises the role they play in absorbing carbon dioxide from the atmosphere. It, therefore, aims to encourage and enhance forest conservation efforts, promote sustainable forest management practices, and increase forest cover by encouraging afforestation. These measures will contribute to emission reduction and help preserve biodiversity.

The NDC also highlights the adaptation strategies that will help address the impacts of climate change. The adaptation efforts focus on water resource management, agriculture and food security, and ecosystem-based adaptation. The implementation of these contributions requires financial resources, technology transfers, capacity-building support, and international cooperation, which is already happening (UNFCCC, 2021; Ministry of Environment, Natural Resources and Physical Development (Sudan), 2018).

Table 2: Sudan Implementation Analysis-Green Theory Analytical Framework

	Principle	Implementation Analysis
i.	Environmental Sustainability	Agriculture: rain fed production Energy: oil, depended on South Sudan Forestry: available and mostly untouched
ii.	Social Equity	Agriculture: nomads Energy: wood, oil Gender, youth, and vulnerable groups: Riziegat – Mahadia, Maharia, and Mahami

	Principle	Implementation Analysis
iii.	Sustainable Economics	Agriculture: synthetic fertilizer and pesticides, desertification Energy: mining
iv.	Long-Term Planning	The NDC is for the period 2021-2030
v.	Transparency & Accountability	Transparency: reporting mechanisms Accountability: verified, ownership, responsibility
vi.	Cross-Sector Analysis	Case: forests, Blue and White Nile Sectors: energy, agriculture, education, health

Source: Analysis based on the principles of the Green Theory

From the table above, the green politics theory emphasises the interconnectedness of the ecological systems, the importance of sustainability, and the need for collective action to address the environmental challenges. The table above provides insight into the country's efforts to mitigate climate changes, promote sustainable development, and protect its natural resources. Sudan is keen on its ecosystem, biodiversity, and natural resources. It is focused on protecting its natural resources like wildlife, forestry, and water resources. It also promotes sustainable agriculture practices, enhances environmental governance, prioritises the well-being of the people from different backgrounds and vulnerable communities, youth and women and works on practices that reduce energy consumption and GHG emissions.

It also focuses on addressing potential social disparities from climate policies. Since agriculture is mostly rain-fed, the northern and central parts experience loss of vegetation, leaving them vulnerable to droughts (FAO, 2005; UNEP, 2007). A significant portion of its forests was lost to South Sudan, but it still has a range of forest land. It is also rich in oil, but most of it is in South Sudan. They, therefore, depend on each other economically for the petroleum revenue. Extensive petroleum exploration began in the mid-1970s, and exports in 1999. In 2011, Sudan and South Sudan collectively produced approximately 425,000 barrels per day. As of 2010, Sudan was Africa's fifth-largest oil producer and third-largest oil exporter. Its gas reserves are produced as a by-product of oil (Yager, 2012). However, by 2023, Sudan's oil production had decreased to around 68,000 barrels per day, reflecting a substantial reduction over the past decade (TheGlobalEconomy.com, 2023).

In Sudan, gender equity has been a significant issue because of the traditional gender roles and societal expectations. Women face discrimination in different

issues. However, there have been efforts to address these disparities. The Sudan government has implemented policies aimed at gender equality and empowering women. Non-governmental organisations together with international agencies, have initiated projects that focus on the Mahadia, Maharia, and Mahami communities, taking into account their cultural differences and practices. The youth have also been involved in these initiatives, with a focus on select communities.

The significant water resources, the Blue Nile, which flows into Sudan from Ethiopia, and the White Nile, which originates from Uganda through South Sudan, join in Khartoum to form the Nile River. Education and health both face significant infrastructure, resources, and political instability problems. Sudan is a multi-ethnic and multi-religious country, and most conflicts are caused by divisions along these lines, as well as the constant competition for resources. Sudan has a long history of ongoing conflicts. The change of leadership in 1993 contributed to political instability, civil wars, and various internal conflicts (Johnson 2021; Cohen 2019). Today, Sudan remains embroiled in a devastating civil war between the Sudanese Armed Forces (SAF) and the paramilitary Rapid Support Forces (RSF), which began in April 2023. The conflict has resulted in over 24,000 deaths, displaced nearly 13 million people, and precipitated a severe humanitarian crisis marked by famine, mass atrocities, and widespread destruction (Refugees International, 2025). An interplay of issues fuels violence in Sudan at different times, but ideally, the political instability issues fuel competition for resources because of the pressure on natural resources as a result of climate change and desertification. The history of conflict and poor governance has also led to competition among farmers and herders (Foong et al., 2020; Verhoeven, 2011).

Former UN Secretary-General Ban Ki-Moon, along with scholars such as Leroy (2009), acknowledges the contribution of the ecological crises to the Darfur conflict (Ki-Moon 2007). Yassin (2022) finds that droughts are a major challenge, leading to resource-based conflicts. The UNEP (2007) assessment also finds that conflicts in Sudan are driven by climate change and environmental degradation. This leads to the continual experience of conflicts in Sudan caused by climate change, which also has an adverse impact on infrastructure. This puts a strain on the policy implementation processes, despite funding and support.

Additionally, girls face gender disparities, often having less access to education compared to boys. The healthcare system suffers from underfunding and a shortage of medical professionals. While efforts have been made to improve healthcare and education in Sudan through sustained investments and reforms, numerous challenges exist due to conflict and ecological crises. Desertification is a major

problem in Sudan, and there are also concerns pertaining to soil erosion. Limited institutional capacity, access to finances, public awareness and a lack of political will further exacerbate these challenges.

The green politics theory emphasises the importance of sustainable policies that ensure social and economic equity. These include a transition to renewable energy sources, emphasis on conservation of biodiversity, transparency and accountability of environmental governance, international cooperation, and environmental justice. As analysed in Table 2, Sudan faces challenges in adherence to the six principles articulated in the green analytical framework.

Gaps in Implementation

Sudan faces several significant challenges in implementing the set of goals and targets geared toward reducing its GHG emissions. Sudan is highly vulnerable to the negative effects of climate change since its population primarily depends on climate-sensitive natural resources for their livelihoods. Lack of financial resources is a major challenge, as significant investments are required to develop its infrastructure and technology, to transition to a low-carbon economy. Institutional capacity is another challenge, as certain institutions need to be strengthened to ensure the effective implementation of the NDCs. Data on GHG emissions are also difficult to collect. This poses a challenge as data and information are key in assessing climate change impacts and other sustainable development indicators (United Nations Development Programme, 2018; Government of Sudan, 2016; World Bank, 2019).

Sudan's political and social instability in recent years has also hindered the country's ability to focus on long-term planning and the implementation of its NDCs. The ongoing conflict has affected livelihoods, making it difficult to adapt to the impacts of climate change. To address these challenges, Sudan needs to prioritise the development of a comprehensive national climate change strategy that will align with the NDCs. This will enable the development of a clear roadmap with milestones, timelines, planning and mobilising of financial resources (United Nations Development Programme, 2018; Government of Sudan, 2016; World Bank, 2019).

In the context of energy generation and use, Sudan has the potential to increase the use of clean and carbon-neutral energy, including increasing solar and wind energy, due to its favourable climatic conditions. This would also increase the supply of electricity and enhance production. In addition to reducing deforestation through alternative sources of energy, efforts geared towards reforestation and afforestation would include planting of trees, to leverage traditional knowledge, and

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