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CLIMATE ADAPTATION STRATEGIES TOWARDS PREVENTION OF VIOLENT EXTREMISM IN WAJIR COUNTY, KENYA

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Abstract

The intersection of climate change and security is increasingly recognised by Kenyan policymakers working in security and climate governance. Despite ongoing counterterrorism efforts, radical groups continue to exploit vulnerabilities in Kenya, particularly in areas facing extreme weather events and resource scarcity. This study examines how climate adaptation strategies, supported by climate technology innovation and regional cooperation, can serve as peacebuilding tools to reduce susceptibility to extremist recruitment. Using a mixed-methods approach grounded in social-ecological systems theory, the research integrates systematic reviews and case studies to assess locally grounded interventions. Findings highlight the potential of renewable energy, smart agriculture, early warning systems, and inclusive water governance in enhancing ecological and socio-political stability. The study recommends positioning climate adaptation as a central pillar of peacebuilding by fostering partnerships between communities and carbon project developers, empowering local actors in resource governance, and integrating Indigenous knowledge with formal institutions. It concludes that embedding climate adaptation within national and county security planning, supported by accessible climate finance and community-led governance, can transform adaptation from a reactive response to a proactive peacebuilding tool. Strengthening partnerships among security institutions, local governments, and communities will be key to operationalising a holistic climate-security framework capable of fostering long-term stability. Enhancing cross-border collaboration can also address the root drivers of radicalisation and promote long-term resilience in Wajir county and other climate-stressed environments.

Keywords: Adaptation, Climate Change, Terrorism, Violent Extremism, Wajir

Introduction

Climate change and violent extremism are increasingly recognised as interconnected threats to human security in fragile regions of the Global South (Badurdeen, Aroussi, & Jakala, 2022; Xie et al., 2024).

In Kenya's arid and semi-arid lands (ASALs), communities face a convergence of environmental and security challenges that threaten both human and national stability. Recurrent droughts, shrinking pasture, and competition over scarce resources have exacerbated socio-economic vulnerabilities, particularly among youth, where droughts, resource competition, and seasonal mobility are associated with localised conflicts and displacement (Nunow, 2024).

This phenomenon not only undermines livelihoods but also intensifies existing socio-political tensions, potentially triggering violence (Wambua, 2019; Linke et al., 2015). In response, policymakers and practitioners are adopting integrated approaches that tackle both climate vulnerability and security risks by understanding how environmental stresses shape pathways to radicalisation to design effective

interventions. Against this backdrop, a critical question arises: how can climate adaptation strategies contribute to the prevention of violent extremism in Kenya? The study answers this nexus by examining

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how locally grounded measures can strengthen community resilience against the structural drivers of radicalisation.

While climate stressors do not directly cause violent extremism in Kenya, they act as threat multipliers by exacerbating structural vulnerabilities like poverty, youth unemployment, social exclusion, and weak local governance (Nunow, 2024; Nowag, 2020). These conditions create fertile ground for extremist groups to exploit, using grievances to recruit and marginalised populations (Badurdeen et al., 2022; Pacillo et al., 2024). Consequently, the compounded effects of this environmental stress and socio-economic fragility weaken traditional coping mechanisms and further heighten the risk of radicalisation.

Although the Kenyan government and development partners have invested in climate adaptation and countering violent extremism (CVE), these efforts often operate in silos. Climate adaptation is typically framed through environmental and development policy, while CVE focuses narrowly on ideological and security concerns. This fragmented approach overlooks how climate vulnerability, livelihood insecurity, and governance deficits intersect to increase susceptibility to extremist influence (Badurdeen et al., 2022; Xie et al., 2024).

Emerging research and policy frameworks increasingly advocate for integrated strategies that embed adaptation within broader human security agendas, addressing the socio-economic conditions exploited by extremist groups (Mavrakou et al., 2022; Schilling, 2012). However, empirical evidence on how adaptation directly or indirectly contributes to CVE remains limited. Few studies have systematically explored how local practices such as drought management, inclusive water governance, livelihood diversification, renewable energy, and climate-tech innovations can foster resilience and community cohesion in fragile areas like Wajir (Pacillo et al., 2024). Additionally, cross-border cooperation, vital for managing shared resources and mitigating transboundary risks, is underrepresented in adaptation and peacebuilding frameworks. Consequently, policymakers and practitioners lack clear models for integrating climate resilience, innovation, and regional collaboration into security programming.

This gap stresses the need for a deeper understanding of how climate adaptation interventions can serve as instruments of peacebuilding and social stability in contexts affected by both environmental stress and violent extremism. In an attempt to partly fill this evidence and knowledge gap, this paper will seek to answer the following question: How can climate adaptation strategies, particularly those supported by climate technology innovation and cross-border cooperation, contribute to the prevention of violent extremism?

In recent years, droughts have become more frequent and severe, disrupting traditional livelihoods such as agriculture and pastoralism. These climatic changes are destabilising communities by increasing competition over scarce resources like water and arable land (Adano et al., 2021). As access to these critical resources diminishes, tensions among communities often escalate into violent conflict. This instability has created a fertile ground for extremist groups to exploit. For instance, al-Shabaab has previously targeted marginalised populations, offering promises of economic support, protection, and a sense of belonging, filling the void left by weakened state presence and strained local economies (Gibbons, 2022; Onuoha & Awuor, 2023).

Global warming significantly impacts human security by amplifying health risks, compromising livelihoods, and exacerbating socio-economic vulnerabilities, conditions that can create fertile ground for violent extremism. Rising temperatures and shifting precipitation patterns contribute to the spread of vector-borne diseases such as malaria and dengue fever and worsen respiratory illnesses due to deteriorating air quality (World Health Organisation, 2025). In addition, climate-induced disasters often result in major economic losses, threatening employment, reducing incomes, and destabilising local economies. These stressors disproportionately affect vulnerable populations, particularly in developing countries, where already fragile systems are pushed to the brink. Such conditions, characterised by poverty, marginalisation, and weakened governance, can heighten grievances and fuel recruitment by extremist groups seeking to exploit social unrest (United Nations Development Programme, 2025). Addressing climate change as a security threat, therefore, requires integrated policies that connect environmental sustainability, disaster risk reduction, and inclusive socio-economic development to build resilience and prevent radicalisation.

Global warming now stands as a grave global security threat, as intensified hurricanes, floods, droughts, and heatwaves increasingly undermine food and water security and spark competition over scarce resources (IPCC, 2025; McKinsey & IPCC, 2025). In regions already weak in infrastructure and governance, such stresses fuel displacement, instability, and even violent conflict (IPCC, 2025). For example, in Kenya, violent extremist attacks rose by 19% in 2024, up from 72 incidents in 2023 to 85, resulting in 107 deaths and 124 injuries, with Wajir among the affected counties (Centre for Human Rights and Policy Studies, 2025). Wajir County, in northeastern Kenya, faces worsening droughts and erratic rainfall, which exacerbate food and water insecurity and deepen socio-economic vulnerabilities. These conditions increase grievances tied to marginalisation, especially among youth, which in turn can be exploited by extremist groups for recruitment (CHRIPS, 2025; Warfa & Karienyne, 2025). Addressing these threats requires strengthening local governance, improving resource management, and enhancing resilience through community-based adaptation and conflict prevention strategies.

Methodology

The study adopted a mixed-methods research design grounded in pragmatic philosophy, integrating qualitative and quantitative approaches to examine how climate adaptation strategies contribute to preventing violent extremism (VE) in Wajir County. This design enabled triangulation of multiple data sources, enhancing both validity and analytical depth. Qualitative data were collected through semi-structured interviews and document reviews to capture insights from key institutional and community stakeholders, while quantitative data from structured questionnaires provided measurable trends on adaptation and VE-related perceptions and practices. The target population included representatives from government ministries, national agencies such as the National Environment Management Authority (NEMA) and the National Drought Management Authority (NDMA), academic institutions, non-governmental and international organizations, and local leaders. Participants were purposively selected based on their expertise and involvement in climate adaptation and peacebuilding initiatives. A total of 13 key informants were interviewed, and 60 questionnaires were administered. Data collection tools, interview guides, questionnaires, and document review templates facilitated comprehensive coverage of both qualitative and quantitative dimensions. Ethical standards were maintained through informed consent, confidentiality assurances, voluntary participation, and sensitivity to participants' experiences to prevent harm or stigmatisation.

Literature Review

Climate change and violent extremism

Climate change as an exacerbator of violent extremism (VE) is not unique to Kenya; similar patterns have emerged in other conflict-prone regions where environmental stressors have intensified local grievances and instability. In Iraq and Syria, extremist groups, particularly ISIL, have exploited water scarcity as a strategic tool for control and recruitment. By seizing and regulating access to critical water infrastructure, ISIL was able to exert influence over vulnerable communities, offering necessities in exchange for allegiance or compliance (Kibaroglu & Sayan, 2023). This tactic not only consolidated their territorial control but also drew in individuals facing acute survival pressures. Likewise, in Mali, armed groups have taken advantage of worsening tensions between pastoralists and farmers, driven largely by erratic rainfall and changing grazing patterns to embed themselves within communities and recruit marginalised youth (Benjaminsen & Ba, 2018). These cases highlight the broader trend where climate-induced resource pressures intersect with governance gaps, fueling the appeal and reach of violent extremist movements.

The Sahel region, for instance, presents a stark example of how climate change impacts extremism, with policy responses often struggling to address underlying causes. Okpara et al. (2021) posited that the increasing frequency and severity of droughts have disrupted traditional livelihoods, leading to widespread displacement and social unrest. Extremist groups such as Boko Haram have exploited these vulnerabilities by recruiting from disaffected communities. The study emphasises the need for comprehensive policies that integrate climate adaptation with security measures to mitigate the risk of extremism.

A similar dynamic is observed in Bangladesh, where the interplay between climate-induced displacement and violent extremism has become increasingly evident. A qualitative study by Rahman (2022) shows radical groups like Jamaat-ul-Mujahideen Bangladesh (JMB) have capitalised on the desperation of climate-displaced populations. By offering services and religious instruction often funded by Middle Eastern charity groups such as JMB and Bangla Bhai have cultivated support among impoverished communities, using humanitarian aid as a vehicle for radicalisation and recruitment.

Likewise, the environmental degradation around Lake Chad has significantly contributed to the rise of Boko Haram. the shrinking lake has devastated local economies and livelihoods, creating a pool of disaffected individuals vulnerable to extremist influence. Boko Haram has leveraged this context by offering alternative sources of income and belonging to those affected by environmental disruption (Tar et al., 2020). This case highlights the importance of addressing environmental degradation as a key component of broader counter-terrorism and security strategies.

In recent years, violent extremism in northeastern Kenya has been fueled by a complex interplay of local and regional factors. The porous Somalia-Kenya border creates a gap that facilitates the movement of militants and weapons, while a lack of adequate security measures and corruption within security agencies undermine counterterrorism efforts (ICG, 2023; ACLED, 2023). Further, socioeconomic disparities, high youth unemployment, and political marginalisation have provided fertile ground for recruitment, due to historical neglect of the northeastern Kenya region (ISS, 2023). Heavy-handed security responses that indiscriminately target communities further alienate the population, while longstanding grievances and lack of integration foster feelings of disenfranchisement that extremist groups exploit (HRW, 2023).

The Garissa University College attack in 2015, which left 148 people dead, marked a significant escalation in Al-Shabaab's activities within Kenya, underscoring the urgent need for a comprehensive approach to

counter-terrorism that addresses the underlying socio-economic issues (Pate, 2017). Efforts to combat violent extremism in the region must therefore go beyond military interventions to include strategies that promote social cohesion, economic development, and inclusive governance, addressing the root causes that drive individuals towards radicalisation (Kagwanja, 2016).

As environmental degradation exacerbates socioeconomic vulnerabilities, it creates fertile ground for extremist groups to exploit. Gleick (2019) in "Water, Conflict, and Peacebuilding" emphasises how environmental stressors, particularly water scarcity, can aggravate existing tensions and contribute to conflict. This linkage is particularly pronounced in regions where livelihoods are directly dependent on natural resources, like Wajir County, making communities more susceptible to the manipulations of extremist factions. The exploitation of these vulnerabilities by extremist groups is a critical area of study, highlighting the urgent need for integrated climate adaptation and counter-extremism strategies.

Climate technology innovation and violent extremism

Germany's **Energiewende**, or energy transition, is a comprehensive policy initiative aimed at transforming the country's energy system toward sustainability and reduced dependence on fossil fuels. Central to this transition is the **Feed-in Tariff (FiT)** system, which incentivises renewable energy production, a model later adapted by several countries, including China and Japan (Fraunhofer ISE, 2022; Energiewende, 2023). While primarily focused on environmental sustainability, such initiatives also have important implications for security in addressing the root causes of **violent extremism**. Kenya, particularly Wajir county, which is endowed with vast solar potential, can adopt similar strategies to generate clean energy, attract investment, and stimulate local economic growth, thus enhancing both environmental resilience and community stability.

Similarly, the EU Emissions Trading Scheme (ETS), the world's largest carbon market, demonstrates how a well-designed cap-and-trade mechanism can effectively reduce greenhouse gas emissions while stimulating economic innovation. By setting a limit on total emissions and allowing market trading of allowances, the ETS creates financial incentives for industries to adopt cleaner technologies and improve efficiency. This approach has not only inspired similar systems globally, such as the Regional Greenhouse Gas Initiative (RGGI) in the United States and China's national carbon market, but also contributed to the growth of green industries and employment opportunities (European Commission, 2020; Long & Goulder, 2023). As Shanmuga Priya et al. (2025) emphasise, such market-based mechanisms are essential tools for promoting sustainable growth and socio-economic stability, particularly in regions vulnerable to climate-related economic shocks.

In Southeast Asia, Vietnam illustrates how targeted adaptation strategies can strengthen climate resilience in highly exposed areas like the Mekong Delta. Through initiatives such as salt-tolerant crop varieties, advanced irrigation systems, and integrated pest management, the country has improved agricultural sustainability and safeguarded food security. Importantly, Vietnam's collaboration with international development organisations has facilitated regional knowledge exchange and capacity building, amplifying the benefits of these practices beyond national borders (Nguyen & Tran, 2020; World Bank, 2021; FAO, 2022). As Dung (2025) argues, effective climate adaptation requires a holistic perspective that integrates economic, environmental, and social dimensions of human security. Without such adaptive measures,

communities face heightened vulnerabilities that may escalate social tensions and be exploited by violent extremist groups.

Tools like drought early warning systems and mobile irrigation management enhance communal control over resources, disrupting tensions extremists exploit (Rothe, 2016; Alfaro, 2023). Yet siloed interventions undermine resilience; integrated frameworks linking climate adaptation, environmental security, and peacebuilding are required (Schilling et al., 2017). Furthermore, international cooperation and knowledge-sharing in sustainable practices foster social cohesion and economic development, which are critical in countering violent extremism. Thus, integrating environmental sustainability with security strategies creates a holistic approach that not only addresses climate challenges but also helps prevent the conditions that lead to violent extremism.

Jordan's Climate Security Framework integrates climate adaptation with national security policies to bolster stability. In the Pacific, regional cooperation focuses on resilience building to address climate-induced migration and conflicts. Nigeria's Buhari Plan 2016 illustrates a recovery-focused strategy linking climate action with peacebuilding in the wake of Boko Haram's insurgency. Iraq's climate security initiatives emphasise rebuilding and resilience in conflict-affected areas (UNDP, 2023; McMurray et al., 2023; Pacific Islands Forum, 2021).

Climate technology innovation plays a pivotal role not only in addressing the adverse effects of climate change but also in contributing to the prevention of violent extremism, particularly in vulnerable regions like Wajir County, Kenya. One prominent area is the deployment of solar energy systems, such as the successful installation in Garissa, which has significantly improved energy access and enhanced community resilience against climate-related disruptions (Ouma et al., 2023). Reliable access to energy can reduce economic marginalisation, create employment opportunities, and foster social stability, key factors in reducing susceptibility to radicalisation. Another notable innovation is smart agriculture, particularly the Borr mixed-method approach in Wajir West, which combines traditional and modern farming techniques to enhance food security and sustainable livelihoods in arid regions (Ali & Hassan, 2022). By strengthening food systems and improving economic resilience, such initiatives can reduce grievances that often fuel extremist narratives. Expanding these climate adaptation strategies is therefore crucial not only for environmental and economic sustainability but also for bolstering local adaptive capacities and addressing root causes of violent extremism (Mwangi, 2023).

Regional Cross-Border Cooperation and Violent Extremism

Several studies highlight the growing recognition of the climate-peace-security nexus within international policymaking. For instance, in its joint communication, the European Union emphasises the enhancement and integration of the climate, peace, and security nexus within its external policies. The initiative includes a comprehensive set of actions spanning data collection, policy formulation, missions, defence strategies, and cooperation with third-party partners to ensure that climate impacts are considered at all levels of external policymaking, planning, and operations. This approach underscores the EU's commitment to addressing the interconnected challenges of climate change and security risks, promoting a cohesive and strategic response (European Commission, 2024). By doing so, the EU seeks to bolster its global leadership in climate action and sustainable peacebuilding efforts.

Regional cooperation in the Sahel and Lake Chad Basin offers especially potent examples of how climate change and violent extremism are deeply intertwined. Shrinking Lake Chad, driven by longer dry seasons, rising temperatures, and altered river flows, has devastated farming, herding, and fishing livelihoods, displacing millions and creating fertile ground for recruitment by extremist groups such as Boko Haram, who exploit local grievances over resource scarcity. Recent research shows that these climate-induced disruptions amplify conflict risks, as communities compete over dwindling water and land, and governance failures exacerbate tensions (Gao et al., 2023; Kazeem, 2024).

The Great Green Wall initiative, spanning 11 Sahelian countries, similarly illustrates the challenge: among its aims to restore degraded land and build resilience, it has encountered severe setbacks from insecurity, where armed groups have in some zones, made reforestation hazardous, forcing abandonment of tree planting and undermining both environmental and peace dividends (Pulitzer Centre, 2022; UNEP, 2023).

A 2024 project by the United Nations Interregional Crime and Justice Research Institute (UNICRI) further emphasizes that coordinated regional strategies are needed because violent extremists are now deliberately targeting water infrastructure, influencing pastoral mobility, stealing livestock, and stepping into governance vacuums to offer dispute resolution or services tactics that strengthen their legitimacy amid climate stress (UNICRI, 2024; Institute for Security Studies, 2025). These cases show that regional/cross-border cooperation not only enables shared resource management and knowledge exchange, but is essential to counteract the ways climate change feeds into violent extremism across porous borders.

Consistent with Article 7 of the Agreement establishing the Intergovernmental Authority on Development (IGAD), the IGAD Strategy 2021-2025 is anchored on the overarching aim and objective of building and accelerating regional integration and cross-border cooperation among member states. This is aimed at ensuring food security and environmental protection, and management of climate change variability. It also enhances economic cooperation, regional integration, social development, peace, security, and humanitarian affairs. Since its inception, IGAD's development agenda has been articulated globally through its Vision 2050, which is aligned to the AU Agenda 2063, Sustainable Development Goals (SDGs) and other international treaties and conventions. The programming of IGAD priority interventions has taken into account member state aspirations (IGAD 2020).

Informed by the findings and recommendations of the Intergovernmental Panel on Climate Change (IPCC) 6th Assessment Report, IGAD developed the Climate Adaptation Strategy (2023–2030), which highlights projected climate impacts across the region. The strategy provides a coordinated framework to address climate risks and enhance the resilience and adaptive capacities of IGAD member states. Notably, it adopts a whole-of-society approach to resilience, setting near-, medium-, and long-term targets that are realistic and achievable. While the strategy primarily focuses on climate adaptation, it also recognises the link between climate-induced vulnerabilities and social instability, including the potential for violent extremism. This makes it particularly relevant to this study, which explores climate adaptation strategies as a means of preventing violent extremism in Wajir County in northern Kenya.

Kenya's focus on peace diplomacy and regional cooperation has enhanced its capacity to foster stability in the Horn of Africa. Such collaboration has supported cross-border initiatives in renewable energy and water management while strengthening community resilience and social cohesion. The country's proactive

climate governance, backed by a strong legal and institutional framework, has positioned Kenya as a continental leader in climate action (Naeku, 2020). This framework promotes coordinated efforts that align climate change adaptation, disaster risk reduction, and land restoration across national and county levels (Smucker et al., 2020). These mechanisms are crucial, as effective climate adaptation can address key drivers of vulnerability, such as resource scarcity and livelihood insecurity that often contribute to radicalisation and violent extremism. Integrating climate adaptation with the prevention of violent extremism (PVE) offers a holistic approach that fosters sustainable livelihoods, reduces resource-based conflict, and reinforces local peace structures.

Theoretical Frameworks

Social-Ecological Systems Theory

The Social-Ecological Systems (SES) Theory, pioneered by Elinor Ostrom and further developed by scholars such as Folke et al. (2005), offers a robust framework for understanding the complex and reciprocal interactions between human societies and their environmental contexts. SES theory views social and ecological components as interdependent and dynamically linked, emphasising that sustainable management of natural resources and effective adaptation to environmental changes require integrated approaches that consider institutional, economic, cultural, and ecological dimensions (Ostrom, 2009; Folke et al., 2010). Central to SES theory is the concept of adaptive capacity: the ability of communities and institutions to learn, reorganise, and respond effectively to external stressors, including climate change.

In the context of climate adaptation strategies aimed at preventing violent extremism in Wajir County, Kenya, SES theory provides a valuable lens to examine how climate-related stressors such as prolonged droughts, resource scarcity, and environmental degradation interact with social systems characterised by historical marginalisation, weak governance, and limited access to livelihood opportunities. These stressors not only exacerbate existing vulnerabilities but can also intensify competition over scarce resources like water and pasture, thereby increasing the risk of conflict and radicalisation, particularly among unemployed youth and disenfranchised groups (Krampe et al., 2021; Opiyo et al., 2015).

By applying the SES framework, this study explores how local adaptation strategies such as community-based resource management, early warning systems, and the strengthening of traditional governance institutions can enhance resilience, mitigate climate-induced insecurity, and reduce the appeal of extremist ideologies. Crucially, SES theory underscores the importance of polycentric governance and participatory decision-making, which are particularly relevant in Wajir County, where diverse actors, including local elders, government agencies, NGOs, and religious leaders, play roles in both resource management and peacebuilding (Ostrom, 2010; Mechler et al., 2019).

Integrating SES principles into climate adaptation policies not only supports sustainable livelihoods and ecosystem health but also contributes to conflict prevention by addressing root causes of vulnerability and disenfranchisement. A systemic understanding of how ecological degradation and socio-political exclusion feed into cycles of extremism can inform more holistic and context-specific interventions. Therefore, SES theory not only illuminates the interconnected nature of climate resilience and peacebuilding but also supports the design of adaptive strategies that foster social cohesion and long-term stability in fragile environments like Wajir County.

Findings and discussion

Adaptation and mitigation as peace peace-building instrument

The study found that framing climate adaptation as a peacebuilding strategy shifts it from a reactive, crisis-response model to a proactive approach that addresses the root causes of vulnerability and instability in Wajir County. This was consistently echoed by key informants from multiple sectors, who emphasised that long-term adaptation builds structural resilience that can help prevent conflict and the spread of violent extremism.

A key informant from National Drought Management Authority (NDMA) stated, “*Adaptation strategies targeting water and pasture security reduce tensions between clans and limit the appeal of extremist groups that exploit resource-based grievances*” (NDMA Representative, personal communication, June 10, 2025). Youth perspectives further reinforced the link between climate adaptation and peacebuilding. A youth leader from Wajir East noted that:

When young people lack alternative jobs, education, or secure livelihoods they are more likely to listen to extremist narratives or be easily recruited to crime. But if climate adaptation projects involve them in decision-making, they see the government and community working for their future (Wajir East Youth Leader, personal communication, June 11, 2025).

By enhancing livelihoods and fostering inclusive governance, adaptation initiatives can undermine recruitment pathways used by extremist networks.

Despite Kenya’s recognition of climate change as a national security threat, the study identified a major policy and institutional gap: the absence of an operational framework linking climate adaptation with security sector action. experts emphasized that “***Kenya acknowledges climate change as a national security threat; however, it has not yet operationalized a policy framework through its security institutions***” (Climate Security Experts, personal communication, September 5, 2025). Without such a framework, security actors remain peripheral to climate governance, and adaptation measures fail to fully capitalize on their peacebuilding potential.

Similarly, environmental experts emphasized the need for a comprehensive, people-centered climate–security framework that integrates adaptation, security risk reduction, and development planning. This approach would position adaptation as a way to prevent climate-driven extremism and resource conflicts. One expert noted that such a framework could strategically leverage multiple financing opportunities, explaining that “existing financing mechanisms including the Climate Adaptation Fund, Loss and Damage Fund, green finance initiatives, and the USD 300 billion by 2035 global climate finance pledge... will be instrumental in financing technology and capacity building” (Environmental Expert, personal communication, September 6, 2025).

Findings from the study further show that power dynamics within Kenya’s climate financing system continue to weaken inclusivity, coordination, and long-term effectiveness in climate security efforts. Local administrators highlighted that the Financing Locally Led Climate Action (FLLoCA) program, primarily managed by the Ministry of Environment and the National Treasury, has marginalized key security

institutions. An administrator stated, “Power dynamics within Kenya’s climate financing architecture have limited inclusivity and effectiveness... FLLOCA Ministry of Environment has taken control of the adaptation program and largely ignored security institutions as equal partners, while during calamities, such as floods and droughts, they are absent” (Local Administrator, personal communication, September 8, 2025).

Concerns over financial transparency and equitable distribution also emerged. A local administrator explained that:

Less than 10 percent of climate finance directly reaches local communities, who are the primary agents of implementation. Most of the funds are utilized in training seminars and pilot projects. Funding cycles are irregular and short-term, limiting the sustainability of adaptation and security interventions (Local Administrator, personal communication, June 2025).

These financial gaps weaken community ownership and limit the long-term impact of local adaptation initiatives.

Informants from the Ministry of Interior and the Wajir Peace and Development Agency also highlighted that current humanitarian responses mainly focus on relief aid during crises, which does little to address the underlying structural vulnerabilities exploited by violent extremist groups. A Ministry of Interior official stated, “*We keep reacting to droughts and floods. However, by the time aid arrives, the damage is done, and groups like Al-Shabaab are already in the field offering their own 'assistance' in the form of food, money, and false promises*” (Ministry of Interior Official, personal communication, June 12, 2025).

Furthermore, discussions with local elders and religious leaders revealed that externally imposed climate solutions often fail when they overlook clan dynamics and informal governance systems. In Wajir, clan affiliations significantly influence access to land, water points, and decision-making processes. An elder from Wajir South stated, “*Unless adaptation plans come through our structures, they are seen as foreign and resisted. But when we are consulted, people trust the process and extremists lose their influence*” (Wajir South Elder, personal communication, June 13, 2025).

Organisations like WASDA and ASDEF highlighted that empowering local leadership through adaptation planning creates trust and reduces the perceived marginalisation that often fuels extremist narratives. A project officer from WASDA stated, “*We’ve seen success when women and youth are involved in climate action planning. It gives them agency, reduces idleness, and weakens the recruitment base for extremist groups*” (WASDA Project Officer, personal communication, June 10, 2025).

Overall, the findings demonstrate that effective climate adaptation is deeply tied to governance, equity, and local legitimacy. When adaptation is localised, inclusive, and embedded within existing governance and livelihood systems, it becomes a powerful tool for peacebuilding. It helps communities to move from dependence to resilience, from exclusion to meaningful participation, and from grievance towards hope thereby addressing several structural drivers of violent extremism in Wajir County.

Climate technology innovation as a dual-purpose intervention

The study finds that climate technology innovation in Wajir County must operate as a dual-purpose intervention: strengthening ecological resilience while simultaneously reducing vulnerability to violent extremism (VE) through socio-economic stabilisation. 85% of respondents (32 out of 38) explicitly linked prolonged droughts, water scarcity, and pasture degradation to heightened community grievances and increased susceptibility to VE recruitment. This finding aligns with arguments by Abrahams (2019) and Rothe (2016), who contend that climate insecurity exacerbates socio-political fragility in vulnerable regions.

A respondent from the National Drought Management Authority (NDMA) explained this relationship clearly: *“When water points dry up, and livestock die, young people are left with no income or future. That’s when extremist groups come in, offering money and purpose”* (NDMA respondent, personal communication, June 2025). Similar insights were shared by local elders, youth leaders, and NGOs involved in peacebuilding and climate resilience programming.

Respondents from NEMA, WASDA, and the Wajir Peace and Development Agency identified solar energy technologies as promising for improving water access, food systems, and off-grid energy reliability. These technologies were seen as having the potential to create livelihood opportunities and reduce economic vulnerabilities exploited by extremist groups. However, 70% of respondents from these organizations warned that the success of these interventions depends on how well they align with Wajir’s informal governance structures.

A key informant from the Ministry of Agriculture remarked that transferring global models without contextual adaptation could backfire, remarking that *“Large-scale technologies often ignore the informal governance systems here. Elders still control decision-making”* (Ministry of Agriculture Officer, personal communication, June 2025). The findings show that clan-based governance structures determine legitimacy and acceptance; technological solutions must be rooted in culturally relevant governance systems to ensure acceptance, legitimacy, and sustainability.

Conservation agriculture, agroforestry, and carbon credit mechanisms collectively emerged as central pillars of climate security innovation in Wajir County. A respondent emphasized that:

Climate-smart agricultural practices that enhances soil carbon sequestration offer dual ecological and security benefits. Fifteen participants (15 out of 38) noted that training farmers in these techniques could increase crop yields, strengthen food security, reduce land-based conflicts, and generate saleable carbon credits (NDMA officer, personal communication, June 2025).

These insights were supported by key informants from NEMA, NDMA, and local NGOs, who described carbon credit schemes as an underused opportunity to connect climate mitigation with community development (NEMA Official, personal communication, July 2025; NDMA Representative, personal communication, June 2025; NGO Officer, personal communication, July 2025). Respondents explained how communities in WAJIR could benefit from selling emission reductions, reinvesting revenues into education, water infrastructure, and small enterprises, thus reducing the financial vulnerabilities that VE groups often exploit. Another respondent stated, *“If youth see economic opportunities through climate*

projects, they won't join groups offering \$100 and a gun" (WASDA respondent, personal communication, June 2025).

These perspectives align with scholarship arguing that carbon markets can create green economic opportunities that contribute to stability in fragile contexts (Carbon Credit Schemes, 2023; Singh, 2025). Respondents also emphasized the need to align such initiatives with Article 6.4 of the Paris Agreement and to work through NEMA's national carbon registry and accredited project developers.

Respondents consistently reported that decentralized, community-led technological interventions are more adaptive, legitimate, and sustainable than donor-driven mega-projects imposed from above. They noted that the acceptance and success of climate technologies in Wajir are strongly shaped by clan-based authority structures and local governance norms, which continue to play a central role in mediating how external interventions are received. As one elder explained, *"You cannot bring in machines without talking to elders. Otherwise, the project will fail"* (Wajir Elder, personal communication, June 2025). Although these clan structures are not technological systems, respondents stressed that they are highly effective decision-making institutions that must be integrated into project planning if adaptation technologies are to succeed.

Finally, smaller, decentralized, community-led projects were consistently praised for their adaptability, legitimacy, and contribution to peacebuilding. Several informants criticized donor-driven mega-projects for excluding community voices and recommended increased government financing, subsidies, and capacity-building to support bottom-up approaches.

Cross border collaboration

Cross-border collaboration emerged as a key strategy in addressing the dual threats of climate change and violent extremism in fragile regions such as Wajir County. Respondents across multiple sectors emphasized that these transboundary approaches are crucial, especially given the shared environmental challenges and porous borders that facilitate resource-based conflicts and extremist movements.

A government official noted, *"Extremist groups often exploit areas with weak cross-border governance and resource scarcity. Strengthening regional cooperation on climate adaptation not only builds resilience but also cuts off some of their recruitment avenues"* (Senior Official, Ministry of Interior, personal communication, August 2, 2025).

A policy officer from IGAD stated, *"The Horn of Africa can replicate this model to promote ecological restoration and disincentivize youth from joining violent groups due to lack of livelihood opportunities"* (IGAD Policy Officer, personal communication, August 3, 2025).

The representative from WASDA explained, *"We don't just plant trees; we engage youth groups in this work, giving them a purpose and an income, which keeps them from being recruited into extremist networks"* (WASDA Representative, personal communication, August 6, 2025).

A local religious leader from Wajir East stated, *"Youth used to cross the border for training with militants. But now, because of peace dialogues and involvement in green projects, they see alternative futures"* (Local Religious Leader, personal communication, August 5, 2025).

The significance of institutional frameworks in supporting this collaboration was also emphasized. Think tanks, including the Horn of Africa Institute for Strategic Studies, IGAD's Climate Prediction and Applications Centre (ICPAC), and Conflict Early Warning and Response Mechanism (CEWARN), were

acknowledged for their roles in knowledge-sharing, early warning dissemination, and adaptive planning. A lecturer from Kenyatta University mentioned, *“Academic institutions can help translate climate data into local strategies. We can also influence policy to connect climate adaptation with counter-extremism”* (Kenyatta University Lecturer, personal communication, August 7, 2025).

Importantly, experts stressed that robust national support structures must underpin effective cross-border collaboration. The National Intelligence and Research University (NIRUC) and the National Defence University were cited as critical in enhancing climate diplomacy and integrating academic rigour into policy formulation. A representative from NIRUC stated, *“Institutions can anchor international frameworks like the Paris Agreement into Kenya’s national and county-level responses by tailoring global knowledge to local realities”* (NIRUC Representative, personal communication, August 9, 2025).

Articles 10 and 11 of the Paris Agreement (2015) provide for technology transfer and capacity-building, yet respondents noted that these remain underutilised. A UNDP climate officer stated, *“Capacity-building is not just about training; it is about ensuring that communities and institutions can operationalise cross-border projects sustainably, without relying perpetually on external help”* (UNDP Climate Officer, personal communication, August 10, 2025).

Despite progress, several respondents pointed to structural and political barriers that impede cross-border collaboration. Logistical constraints, misaligned national policies, and bureaucratic hurdles were recurrent concerns. A senior official from the National Environment Management Authority (NEMA) stated, *“Sometimes, by the time cross-border initiatives are approved, the window of opportunity has passed. We need streamlined, faster coordination between IGAD states”* (NEMA Senior Official, personal communication, August 3, 2025).

These insights mirror findings from other regions. For example, in South Asia and the Mediterranean, international cooperation has been key in addressing climate-induced displacement and related insecurity (Moitree et al., 2024; Braham, 2019). Respondents agreed that Wajir can learn from these examples to enhance local adaptation while addressing the underlying socio-economic grievances that drive violent extremism.

Conclusion

This study demonstrates that climate adaptation strategies, when designed to be inclusive, locally led, and context-sensitive, can play a pivotal role in preventing violent extremism (VE) in fragile settings like Wajir County, Kenya. The findings reveal that while community-driven initiatives such as reforestation, solar-powered water projects, and sustainable agriculture improve ecological resilience and address climate variability, their potential to deter VE recruitment hinges on their ability to foster trust, inclusion, and local ownership. However, the current gender imbalance in participation, where elders, mostly male, dominate decision-making, limits the full realisation of inclusive adaptation. The absence of youth and women in climate governance weakens the deterrent impact on VE, as these groups are often the most vulnerable to extremist narratives. To counter this, adaptation frameworks must go beyond technical fixes and deliberately integrate marginalised voices to challenge the socio-political conditions that VE actors exploit.

Furthermore, the paper emphasises that inclusive climate adaptation is not just a tool for ecological sustainability but a peacebuilding mechanism that can reduce resource-based grievances and strengthen community cohesion. Kenya’s national policies, such as the NCCAP (2023–2027) and the Climate-Smart

Agriculture Implementation Framework, offer valuable guidance, but success in fragile regions like Wajir needs to be tailored to local socio-political dynamics, particularly clan structures. Regional initiatives, including IGAD's climate security agenda and the Sahel's Great Green Wall, underscore the importance of cross-border collaboration and shared learning. Yet, bureaucratic inefficiencies and limited community engagement often hinder sustainable impact. To truly transform vulnerability into resilience and mitigate both climate and VE risks, strategic alignment across local, national, and international levels is essential, especially in ensuring that climate finance, technology transfer, and capacity-building directly empower vulnerable populations, including youth and women. The prevention of violent extremism in climate-affected areas thus requires a deliberate integration of inclusive, community-driven adaptation strategies that prioritise social equity alongside environmental resilience.

Recommendations

Based on the findings of this research on climate adaptation strategies and their role in preventing violent extremism in Wajir County, Kenya, the following policy recommendations are proposed:

Strengthen Community-Led Resource Governance: To reduce climate-induced conflict and marginalisation, there is a need to empower local communities, especially pastoralist and agro-pastoralist groups, to actively participate in the management of natural resources such as water points, grazing lands, and forest reserves. Community-led governance structures, including traditional councils and local peace committees, should be supported through capacity building, legal recognition, and inclusive decision-making processes. Such structures can help resolve disputes peacefully and equitably, reducing the likelihood of grievances that violent extremist groups might exploit.

Integrate Conflict Early Warning Systems with Climate Innovation: Wajir County is vulnerable to recurrent climate shocks such as droughts and floods, which exacerbate competition over scarce resources. Establishing a robust early warning system that combines climate data (e.g. rainfall patterns, drought forecasts) with socio-political indicators (e.g. inter-community tensions, livestock movement) can allow authorities and communities to respond proactively. These systems should be locally embedded and accessible, using mobile platforms and community radio to disseminate timely information. Preventive action can reduce the social strain that violent extremist recruiters exploit during crises.

Co-Produce Interventions with Marginalised Groups: Effective climate adaptation and anti-extremism initiatives must be developed with and not for marginalised populations, including women, youth, minority clans, and internally displaced persons (IDPs). Co-producing solutions through participatory research, inclusive policy dialogues, and locally led innovation ensures that interventions are contextually relevant, culturally sensitive, and more likely to succeed. Marginalised groups are often both disproportionately affected by climate change and more vulnerable to extremist narratives promising justice or empowerment.

Regionalise Anti-Extremism Strategies through Climate Diplomacy: Given the porous borders and cross-border nature of violent extremism in Northern Kenya and neighbouring regions (e.g., Somalia and Ethiopia), there is a pressing need to regionalise prevention strategies. Climate diplomacy, bilateral or multilateral cooperation focused on shared environmental challenges, can foster trust and coordination among counties and countries. Joint management of transboundary resources (like rivers and rangelands), climate migration protocols, and shared early warning mechanisms can reduce tensions and disrupt extremist networks operating across regions.

References

- Abdi, A. (2021). Local dynamics and clan conflicts in Wajir County. *Journal of African Studies*, 18(2), 201-215.
- Adams, L., & Lewis, T. (2023). International cooperation on climate mitigation: Building global partnerships. *Journal of Climate Policy*, 28(3), 245-260.
- Adano, W. R., Dietz, T., Witsenburg, K., & Zaal, F. (2021). Climate change, violent conflict, and local institutions in Kenya's drylands. *Climatic Change*, 164(1), 89–108.**
- Agora Energiewende. (2023). *The German Energiewende: A success story*. Retrieved from Agora Energiewende
- Ahmed, A., Hassan, M., & Ali, F. (2024). Bridging the Gap: Empowering Local Stakeholders for Sustainable Adaptation in Wajir County. *Journal of Environmental Management*, 42(3), 567-580
- Ahmed, F., & Neelormi, S. (2021). Community-based adaptation projects in Bangladesh. *Journal of Climate Change Adaptation*, 10(2), 85-97.
- Ali, M., & Hassan, S. (2022). Smart agriculture in Wajir: A case study of Borr mixed-method agriculture. *Journal of Agricultural Science*, 12(4), 112-125.
- Anderson, D., & McKnight, J. (2015). *Kenya at war: Al-Shabaab and its enemies in eastern Africa*. *African Affairs*, 114(454), 1–27. <https://doi.org/10.1093/afraf/adu082>
- Armed Conflict Location & Event Data Project. (2023). *"Corruption and Counterterrorism in Kenya"*. Retrieved from ACLED.
- Badurdeen, F. A., Aroussi, S., & Jakala, M. (2022). Lived realities and local meaning-making in defining violent extremism in Kenya: Implications for preventing and countering violent extremism in policy and practice. *Critical Studies on Terrorism*, 16(1), 1–22. <https://doi.org/10.1080/17539153.2022.2121021>
- Benjaminsen, T. A., & Ba, B. (2018). Why do pastoralists in Mali join jihadist groups? A political ecological explanation. *The Journal of Peasant Studies*, 46(1), 1–20. <https://doi.org/10.1080/03066150.2018.1474457>
- Botha, A. (2014). Political socialization and terrorist radicalization among individuals who joined al-Shabaab in Kenya. *Studies in Conflict & Terrorism*, 37(11), 895–919.**
- Bourekba, M. (2021). *Climate change and violent extremism in North Africa*. CASCADES Project. <https://www.cascades.eu/wp-content/uploads/2021/10/CASACADES-Case-Study-Violent-extremism-and-climate-change-in-North-Africa-Moussa-Bourekba-CIDOB-Oct-2021.pdf>
- Brown, L. (2021). Community engagement and climate resilience: Local strategies for global impact. *Climate Policy Journal*, 18(3), 240-256.
- Buzan, B. and Hansen, L. (2009) *The Evolution of International Security Studies*. Cambridge University Press, Cambridge. <https://doi.org/10.1017/CBO9780511817762>
- California Environmental Protection Agency. (2023). *Climate adaptation planning*. Retrieved from <https://www.calepa.ca.gov>
- Carbon credit schemes. (2023). In *United Nations eBooks* (pp. 50–54). <https://doi.org/10.18356/9789213585672c010>

- European Commission. (2020). *The EU Emissions Trading System (EU ETS)*. Retrieved from https://ec.europa.eu/clima/policies/ets_en
- Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources*, 30, 441–473. <https://doi.org/10.1146/annurev.energy.30.050504.144511>
- Food and Agriculture Organization of the United Nations. (2022). *Climate-resilient agriculture: Lessons from Vietnam*. <http://www.fao.org>
- Gibbons, P. (2022). Environmental stress and violent extremism in the Horn of Africa. *Journal of Peace Research*, 59(3), 357-375.
- Hossain, M. S., Dearing, J. A., Rahman, M. M., & Salehin, M. (2021). Recent advances in the Bangladesh Delta Plan 2100. *Environmental Science & Policy*, 122, 142–150.**
- Human Rights Watch. (2023). *Kenya: Addressing marginalization to combat extremism*. Human Rights Watch. Retrieved from: <https://www.hrw.org/>
- Institute for Security Studies. (2023). *Socioeconomic factors and violent extremism in Kenya*. Institute for Security Studies.
- Intergovernmental Authority on Development. (2020). *IGAD regional strategy: The framework*. <https://igad.int/download/igad-regional-strategy-the-framework/>
- Intergovernmental Panel on Climate Change. (2021). *Climate change 2021: The physical science basis*. Cambridge University Press.
- International Carbon Action Partnership. (2022). *Emissions trading worldwide: Status report 2022*. <https://icapcarbonaction.com/en/status-report-2022>
- IPCC. (2021). *Climate Change 2021: The Physical Science Basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.
- Jones, A. (2022). Environmental stress and conflict in the Sahel. *Journal of Environmental Security*, 9(3), 101–117.
- Jones, A., Brown, C., & Garcia, D. (2024). Integrating climate adaptation with conflict prevention and peacebuilding efforts: Addressing drivers of conflict and insecurity. *Journal of Peace Research*.
- Jones, M., & Lee, A. (2022). Assessing the impact of community-led climate initiatives: A participatory approach. *Journal of Environmental Management*, 29(4), 452–468.
- Kagwanja, P. M. (2016). Counter-terrorism in the Horn of Africa: New security frontiers, old strategies. *African Security Review*, 25(1), 28–41.
- Khan, S. (2019). Cyclone mitigation strategies in Bangladesh. *Disaster Management Review*, 7(3), 120–135.
- Klinsky, S., & Sagar, A. (2024). Missing in action: Capacity and capacity building in the IPCC's AR6. *Climatic Change*, 177(8). <https://doi.org/10.1007/s10584-024-03746-x>
- Long, X., & Goulder, L. (2023). Carbon emission trading systems: A review of systems across the globe and a close look at China's national approach. *China Economic Journal*, 16, 203–216. <https://doi.org/10.1080/17538963.2023.2246714>

- Macklin, A. (2022). Adaptive strategies for climate resilience in conflict-prone areas. *Climate Security Journal*, 12(2), 133–147.
- Mavrakou, S., Chace-Donahue, E., Olunaigh, R., & Conroy, M. (2022). The climate change–terrorism nexus: A critical literature review. *Terrorism and Political Violence*, 34(5), 894–913. <https://doi.org/10.1080/09546553.2022.2069445>
- McMurray, S., Ruttinger, L., Schapendonk, F., Jaskolski, M., & Saleh, R. (2023). *Integrating climate security into policy frameworks: Roadmap for Jordan*. Weathering Risk. <https://doi.org/10.5281/zenodo.10504289>
- Miller, R. (2023). Climate change as a threat multiplier: Addressing security implications. *International Security Studies*, 15(1), 20–34.
- Mohamed, H. A. (2021). Addressing socio-political drivers of extremism in Wajir. *African Security Review*, 30(3), 288–302.
- Mwangi, J. (2023). The need for expansion of smart agriculture in arid regions. *Environmental Research Letters*, 18(2), 205–218.
- Mwangi, M. (2023). Urbanization and radicalization: The impact of climate-induced displacement in Kenya. *African Security Review*, 32(1), 45–61.
- Naeku, M. J. (2020). Climate change governance: An analysis of the climate change legal regime in Kenya. *Environmental Law Review*. <https://doi.org/10.1177/1461452920958398>
- Nowag, L. (2020). From climate change to conflict. *Politikon IAPSS Journal of Political Science*, 47, 60–76. <https://doi.org/10.22151/politikon.47.3>
- Nunow, A. A. (2024). The Nexus Between Climate Change and Livelihoods in Arid and Semi-Arid (ASAL) Areas of Kenya: Evidence from the Literature. *International Journal of Social Science and Human Research*, 7(06). <https://doi.org/10.47191/ijsshr/v7-i06-113>
- Okpara, U. T., Stringer, L. C., Dougill, A. J., & Bila, M. D. (2021). Climate change, conflict, and security in the Sahel. *Sustainability*.
- Onuoha, F. C. (2021). Impact of the Buhari Plan on youth recruitment by extremist groups. *Journal of Security Studies*, 14(4), 401–417.
- Onuoha, F., & Awuor, C. (2023). Al-Shabaab’s exploitation of climate vulnerabilities in Kenya. *Terrorism and Political Violence*, 35(2), 276–294.
- Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science*, 325(5939), 419–422.
- Ouma, L., et al. (2023). Solar energy implementation in Garissa: Impacts and future prospects. *Renewable Energy Journal*, 45(3), 78–89.
- Pacific Islands Forum. (2021). *Pacific climate security framework*. Suva, Fiji.
- Pacillo, G., Medina, L., Liebig, T., Carneiro, B., Schapendonk, F., Craparo, A., Ramírez-Villegas, J., Basel, A., Minoarivelo, H. O., Achicanoy, H., Villa, V., Belli, A., Caroli, G., Madurga-Lopez, I., Scartozzi, C. M., Dutta Gupta, T., Mendez, A., Kenduiywo, B. K., Resce, G., ... Läderach, P. (2024). Measuring the climate security nexus: The Integrated Climate Security Framework. *PLOS Climate*, 3(10), e0000280. <https://doi.org/10.1371/journal.pclm.0000280>

- Pate, A. (2017). Garissa attack: Implications for Kenya's fight against terrorism. *Journal of Strategic Security*, 10(1), 1–10.
- Rahman, M. (2022). Climate change, displacement, and violent extremism in Bangladesh. *Asian Security*.
- Rahman, M., Haque, A., & Islam, S. (2020). Adaptive governance for climate resilience in Bangladesh. *Global Environmental Policy Journal*, 12(4), 232–248.
- Rijke, J., van Herk, S., Zevenbergen, C., & Ashley, R. (2012). Room for the River: Delivering integrated river basin management in the Netherlands. *International Journal of River Basin Management*, 10(4), 369–382.
- Shanmuga Priya, N., Velavan, C., Samsai, T., Premavathi, R., & Senthilnathan, S. (2025). Carbon trading across borders: A comparative review of global trading mechanisms. *Plant Science Today*. <https://doi.org/10.14719/pst.9175>
- Smith, D., & Vivekananda, J. (2021). Community-based adaptation and social cohesion: Lessons from climate security projects. *Global Environmental Change*, 67, 102–116.
- Smith, J. (2023). *Annual report on violent extremism in Kenya*. National Security Institute.
- Smith, J., Brown, A., & Jones, K. (2023). Building resilience: A proactive approach to climate adaptation. *Journal of Environmental Studies*, 45(3), 301–318.
- Smith, L. (2023). The impact of rising sea levels on coastal communities. *Journal of Climate Change Research*, 14(4), 88–105.
- Smith, R., Johnson, P., & Taylor, K. (2023). Public participation in climate security efforts: Lessons from community-led initiatives. *Environmental Research Letters*, 15(1), 110–125.
- Smucker, T. A., Oulu, M., & Nijbroek, R. (2020). Foundations for convergence: Sub-national collaboration at the nexus of climate change adaptation, disaster risk reduction, and land restoration under multi-level governance in Kenya. *International Journal of Disaster Risk Reduction*, 51, 101834. <https://doi.org/10.1016/j.ijdrr.2020.101834>
- Tar, U. A., Onuoha, F., & Imobighe, T. (2020). Environmental change, livelihoods, and Boko Haram in the Lake Chad Basin. *African Security Review*.
- UNDP. (2020). *Journey to extremism in Africa: Drivers, incentives and the tipping point for recruitment*. United Nations Development Programme.
- UNDP. (2023). *Climate Security Framework*. United Nations Development Programme.
- UNFCCC. (2022). *Mitigation: Reducing emissions*. <https://unfccc.int/mitigation>
- United Nations Development Programme (UNDP). (2020). *Human Development Report 2020: The next frontier – Human development and the Anthropocene*. UNDP.
- UNODC. (2023). *Trends in violent extremism in Kenya*. United Nations Office on Drugs and Crime.
- Van Staveren, M. F., Warner, J. F., & van Tatenhove, J. P. M. (2014). The tenth dragon: Controlled de poldering in the Netherlands. *Journal of Environmental Policy & Planning*, 16(4), 457–474.
- Wajir County Government. (2023). *Wajir County Integrated Development Plan 2023–2027*.
- Wambua, B. N. (2019). Analysis of the current and potential future climate hazards and their impacts on livelihoods and adaptation strategies in arid and semiarid lands. *Asian Journal of Agriculture and Food Sciences*, 7(4). <https://doi.org/10.24203/ajafs.v7i4.5835>

- Wesselink, A., Bijker, W. E., de Vriend, H. J., & Krol, M. S. (2015). Dutch dealings with the delta: Understanding the politics of river management. *International Journal of Water Resources Development*, 31(3), 432–444.
- World Bank. (2021). *State and trends of carbon pricing 2021*.
<https://openknowledge.worldbank.org/handle/10986/35620>
- World Health Organization (WHO). (2021). *Climate change and health*. World Health Organization.
- Xie, X., Hao, M., Ding, F., Scheffran, J., Ide, T., Maystadt, J.-F., Qian, Y., Wang, Q., Chen, S., Wu, J., Sun, K., & Jiang, D. (2024). The impacts of climate change on violent conflict risk: A review of causal pathways. *Environmental Research Communications*. <https://doi.org/10.1088/2515-7620/ad8a21>
- Zhang, X., & Jiang, Z. (2022). Facilitating knowledge sharing and co-creation between communities of climate research and its users. *APN Science Bulletin*, 12(1), 154–159.
<https://doi.org/10.30852/sb.2022.1994>