

Cross-cutting lessons and strategies for prioritising climate action in Africa

*Synthesis report of projects under the Climate Resilient
Economies programme*

Published by
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Recommended citation:

Faith G.A, Onyango J., Kabasa M., Owuor B., Atieno E., Mwanzi L., Dikiny M., Nyanaroo V., Kopa A., Magale E.G., Simiyu B.M. (2024) Cross-cutting lessons and strategies for prioritizing climate action in Africa, African Centre for Technology Studies, Nairobi, Kenya

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Building climate-resilient economies is critical for addressing the impacts of climate change and promoting sustainable development in Africa. This paper explores Africa's priorities for building climate-resilient economies drawing on the experience of the Climate Resilient Economies (CRE) programme of the African Centre for Technology Studies (ACTS) in executing 10 climate-related projects over the last five years. These projects incorporate varying elements of research, capacity building and policy engagement. The paper presents critical lessons learned from executing these programmes; these include integrating sustainability principles, contextualised climate action, strategic capacity strengthening, gender and social inclusion, and sustainable governance. Further, the paper suggests strategies that can be deployed to develop climate resilient economies. These include integrating sustainability and climate considerations into policy and planning, investing in climate-smart infrastructure, enhancing financial mechanisms for climate action and fostering research and knowledge sharing, promoting locally-led adaptation and strengthening disaster risk management.

Keywords: *Sustainable development, climate change, resilience, mitigation action*

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Climate change presents substantial challenges with significant implications for economic development, employment, well-being, and sustenance. Uncontrolled climate impacts causes damage to infrastructure, disrupt business activity, and destroy jobs and livelihoods on an unprecedented scale. Taking measures to address climate change is a key focus of the 2030 Agenda for Sustainable Development.

It is within the scope of Sustainable Development Goal (SDG) 13 (ILO, 2017). Climate change is pertinent to nearly all other Sustainable Development Goals (SDGs), including Goal 8, which focuses on promoting decent work and economic prosperity. Uncontrolled climate change not only undermines countries' capacity to accomplish this objective but also has the potential to undo advancements in economic well-being, societal advancement, and alleviation of poverty (UN Environment Programme, 2023).

One of the largest employers is the agricultural sector, which is among the most vulnerable economic sectors. In addition, individuals and communities already facing vulnerability, such as those employed in the informal sector, indigenous and tribal populations, migratory workers, women, and young people, are more likely to encounter higher risk levels.

Climate resilient economies refer to the capacity of an economy to absorb, recover from, and successfully adapt to adverse effects of climate change, including climate variability and extremes (Levina and Tirpak 2006). This entails fundamental shifts in societal functions, incorporating changes in values, worldviews, social structures, and political and economic frameworks alongside power relationships to address climate impacts sustainably (Wakhungu 2010). In essence, fostering climate resilience in economic systems involves building the capability of these systems to withstand and adapt to the disruptive impacts of climate change, ensuring sustainable development, and protecting livelihoods against climate-related hazards and trends (Levina and Tirpak 2006).

The Climate Resilient Economies (CRE) programme at the African Centre for Technology Studies (ACTS) has in the recent past led projects focused on bolstering the resilience of communities and institutions within Africa against climate impacts through relevant and innovative research, evidence-based policy, demand-driven learning, and business frameworks. Building on the experience of ACTS over this time, the programme highlights in this paper key lessons

from these projects and provides insights as to the areas of priority for climate action in Africa and strategies that if employed could prove useful to this end. This synthesis paper emphasizes the significance of integrating these cross-cutting lessons in future policy-making and programming. As a programme, climate change remains relevant in our activities for several reasons.

Firstly, the Paris Agreement commits the international community to an ambitious collective goal to hold global warming well below 2 degrees with efforts to limit warming to 1.5 degrees, an aim for greenhouse gas emissions to peak as soon as possible and achieve a net zero emission in the second half of the century; and a requirement for mitigation measures of individual countries to be expressed in nationally determined contributions (NDCs). One of the previously concluded 26th Conference of Parties (COP 26) in Glasgow, UK, reinforced these commitments. Secondly, the Sustainable Development Goal (SDG) 13 commits the international community to take urgent action to combat climate change. Similarly, the African Union (AU) Agenda-2063 requires African governments to act with a sense of urgency on climate change and the environment.

The synthesis paper highlights the importance of climate change action in relation to sustainable development goals, specifically emphasising its impact on economic prosperity, social equity, and environmental viability. It also discusses key lessons learned from ten projects under the ACTS CRE programme. Furthermore, it highlights these projects, which are at different stages of implementation, ranging from mid-to near- completion as of March 2024. Lastly, it also includes a review of about 20 publications from these projects, including scholarly articles, blogs, policy and info briefs, reports, and technical papers.

2.0 CRE PROJECTS

In the last decade, the CRE programme has built on the achievements of ACTS by providing key guidance on matters related to Science, Technology, and Innovation (STI). In particular, the projects that have a time frame of 2022-2026 focus on supporting African countries and institutions to tap into global and regional opportunities in climate discourse, cognizant of different relevant disciplines, cultures, ages, and gender groups. Ten projects reviewed in this synthesis paper include Blue Empowerment, Decoloniality Pathways, Learning Lab (Virtual Academy), STREM, Transpath, CLARE Capacity Strengthening Hub, Youth Led Organisation (YLO) Support Project, Governing SDG interactions, Just Energy Transition project, African Food Fellowship Programme project, and RURARALITIES. This paper provides a detailed description of these projects, including their objectives, outcomes, and key lessons pertaining to building climate-resilient economies.

2.1 Capacity Assessment of 8 Youth-Led Organizations

The Mastercard Foundation has aligned with the youth employment challenge in Africa, recognising that by 2100, half of the world's youth will be Africans. It acknowledges the significant gap between the number of young people seeking meaningful work and the limited employment opportunities available, noting the mismatch between the skills mainly in governance structures, finance, gender, and safeguarding issues of young people entering the workforce and the needs of employers. In response, Mastercard Foundation has established the Young Africa Works initiative to improve youth unemployment in Africa by equipping young women and men with the skills and knowledge they need to strengthen their organizations, access jobs or grow businesses, access financial services, and scale the available economic opportunities.

The Youth-Led Organizations (YLO) support programme contributes to the overarching goal of Mastercard Foundation to enable 30 million young people in Africa, especially young women, to secure dignified and fulfilling employment. In Kenya, the YLOs in Kisumu, Kakuma, Kwale, and Nairobi spearhead projects to catalyse positive change within their communities and improve other young people's livelihoods. The Foundation has provided funding to support these YLOs, with 60 per cent of the allocated resources already disbursed. These funds are to be used to create a ripple effect for the youths, women, and people with disabilities that the YLOs will be supporting.

2.2 Blue Empowerment

Recognising the often overlooked or underrepresented role of women in the blue economy, it is evident that their significant contributions within the fisheries sector are increasingly recognized. Despite this acknowledgment, prevailing perceptions perpetuate that fishing is predominantly a man's domain largely due to inadequate disaggregated data on women fishers. Understanding gender dynamics in fisheries requires moving beyond a simple understanding of men's and women's roles to a deeper analysis of social and cultural norms that influence the experiences and challenges faced by both men and women in the sector, alongside other intersecting dimensions of social differentiation such as economic status, ethnicity, and disability.

In light of this context, the success of the fish and aquaculture industry in fostering inclusive and sustainable economic growth is intricately tied to the active involvement and engagement of women; their distinct identities and experiences underscore the importance of context-specific development strategies tailored to address their specific needs. Achieving gender equity and economic empowerment demands a concerted effort to build resilience against future environmental, cultural, and political challenges while preserving the ecological foundation for the local economy and promoting effective and equitable governance.

The Blue Empowerment Project, supported by the International Development Research Centre (IDRC) in Kwale and Kilifi counties, represents a groundbreaking initiative empowering women fisher folk along the coastal region. By harnessing the potential of climate-smart integrated multi-trophic aquaculture (IMTA) of seaweeds and fish, this project seeks to enhance livelihoods and build climate resilience while dismantling obstacles to women's empowerment in Kenya's coastal region.

Leveraging the existing seaweed and fish farming projects in Kwale County, Kenya, the project aims to integrate the IMTA system to catalyze positive change within the coastal communities.

The project employs a participatory approach, engaging coastal fisher communities, local government bodies, research institutions, and non-governmental organizations with the aim of enhancing livelihoods and resilience of coastal women through the adoption of IMTA by:

- Empowering fisherwomen through improved access to economic opportunities and participation in decision-making processes.
- Strengthening policy and institutional and government frameworks supportive of gender transformation approaches in aquaculture.
- Increasing awareness and knowledge dissemination of climate-smart aquaculture practices contributes to coastal regions' sustainable development.

This will offer social and economic solutions while promoting environmentally sustainable growth and enhancing resilience to climate change, socio-ecological impacts, and vulnerabilities related to the COVID-19 pandemic.

2.3 Decoloniality Pathways

Decoloniality encompasses the intellectual framework, philosophical underpinnings, and power dynamics that have emerged due to the extensive processes and consequences of colonization and settler colonialism. By relearning the lessons that modernity, settler-colonialism, and racial capitalism have taught us to disregard, forget, bury, or discredit, researchers, policymakers, and practitioners can engage in decoloniality. The goal of decolonisation is not to turn one's back on the "advances" made in the fields of research, healthcare, society, and ethics that have occurred in the modern age. Instead, it's a means of investigating how colonialism, modernism, and, more recently, neoliberalism and necro capitalism have displaced diverse ways of life, ideas, systems, and existence in the natural world.

The Decoloniality Pathways Book Project aims to explore methods that are inclusive within the knowledge and learning systems while shedding light on the negative aspects of coloniality, highlighting how it is constructed by exploiting and marginalizing certain groups of people who are discriminated against, erased, or objectified. Hence, decoloniality does not constitute a distinct entity.

The framework of restoration and repair relies on several factors, such as context, historical circumstances, and geographical considerations. Thus, as an approach, it aims to reinstate, elevate, rejuvenate, rediscover, and recognize the diverse range of existences, encounters, cultures, and knowledge of indigenous and colonial populations while also challenging the dominance of heterosexual and cisgender norms, gender-based hierarchies, power, and racial advantages. By drawing on theoretical insights and practical experiences from different disciplines, the project also aims to inform policy decisions, contribute to academic and political discourse, foster learning, expand knowledge, improve practices, including funding, promote more emancipatory outcomes in the Global South and enhance south-north, north-south, and south-south cooperation.

2.4 STREM

The development of key conceptual frameworks and environmental monitoring strongly relies on several streams: technical co-evolution of data processing techniques, the use of scientific principles in the design of monitoring systems at the local, regional, and global scales, and the use of data from human risk assessment and the environment. The scope of this project extends to the conceptualisation of the East African river ecosystems using cause-effect models (e.g., Social Simulation and DPSIR) to analyse effect relationships of biological indicators (macroinvertebrates), abiotic parameters, and social and governmental factors surrounding the river basins. Through this research, the development of a size-based model of the sensitivity of soft sediment benthic communities to river habitat disturbance and flooding regimes (climate change effect), identification of suitable water quality areas along selected rivers, and community user-friendly pictorial model for water quality monitoring will be made.

Management of Rivers requires a holistic approach for better framing, understanding, and developing solutions for improved river health. The different players within these ecosystems are independently important but stronger together. Activities that promote river health, including research, monitoring and evaluation, policy formulation, and regulation implementation, play an important role in ensuring that ecosystem services are utilised sustainably and in the co-development and co-implementation of solutions, which are key to achieving conservation objectives.

Globally, co-management has gained traction as a response

to the belief that centralized river management is ineffective in stopping the depletion of resources and that there are insufficient government resources for management. Therefore, this study emphasises these factors from the viewpoints of important players in Uganda and Kenya who stand to gain either directly or indirectly from the case studies of R. Mayanja and R. Njoro, respectively.

Understanding the river health social indicators and governance aspects of managing and conserving river ecosystems in the dry and wetlands is important to gaining a proper base for recommendations on the best practices to curb the river problems experienced over time.

A study was conducted through the Strengthening Community River Health Project with case examples of R. Njoro and R. Mayanja in Kenya and Uganda to bring these aspects into perspective. By engaging in community-based action, the project aimed to empower citizens as core beneficiaries and users to reflect upon the status of their rivers, identify issues and causes, and lobby for action from duty bearers, particularly policymakers.

2.5 TRANSPATH Plan

This project emphasizes the significant role of water in maintaining both human health and sustainable food production, particularly for subsistence, while maintaining the naturalness of ecosystems, with a focus on wetlands. Wetlands are often assumed to be wastelands and, as such, are misused and over-exploited through various human activities despite their vast social-ecological benefits. This project, within Kenya, uses two case studies, the Yala Wetland and the Kingwal Wetland. The project explores research through stakeholder workshops using participatory methods within transformational laboratories to gather the main challenges on the wetlands and identify how all actors can work together toward restoring these vital ecosystems.

The Transpath project aims to propagate change by educating the actors on the importance of the wetland ecosystem and proposing actions and strategies that can be undertaken to

curb the rapid degradation of these ecosystems. The project intends to propose policy recommendations that can be implemented by actors with influence in matters of authority over the ecosystems.

2.6 ACTS Pathway Academy (APA)/ Virtual Academy

Over the years, many initiatives on climate change have been implemented at the local and national levels in different countries, targeting different issues. While these efforts have increased awareness of climate change and its impacts locally, nationally, and globally, people are reluctant to take action to change their behaviour, as revealed in a recent study published in the journal *Energy and Environment* (Ellison et al. 2017) The minimal or lack of action is mostly due to limited capacity building regarding climate education.

One of the fundamental Climate Change discourses is anchored in the Paris Agreement. Implementation of the Paris Agreement requires economic and social transformation based on the best available science. The Paris Agreement has been a front-runner discourse calling for:

- Building technology frameworks: Establishing technology frameworks to provide overarching guidance to the well-functioning Technology Mechanism
- Enhancing financial commitment: Providing financial assistance to less endowed and more vulnerable countries while encouraging voluntary contributions by other Parties.
- Building capacity: Emphasis on climate-related capacity-building for developing countries and enhance support for capacity-building actions in developing countries.

The ACTS Pathways Academy is built on the premise that climate change-related capacity building, including climate change-relevant technologies and financing mechanisms, is important. However, there are capacity gaps in the Global South that can contribute to the achievement of the Paris Agreement and climate-compatible development.

To bridge this gap between climate change awareness and action and enhance demand-driven training, ACTS has developed a learning lab (ACTS Pathways Academy)

to strengthen knowledge and learning systems on climate change. The academy seeks to provide individuals with access to flexible, informative training that fosters skills, knowledge, and collaborations related to science, technology, and innovation (STI). The ACTS Pathways Academy currently offers short courses, summer school, Bespoke training, and self-paced learning. Some courses offered include Climate Change Modelling for Decision-making, Climate Finance, Climate Leadership and Policy, Fundraising Strategies and Grant-Writing, and Science Communication for Scientists and Non-Scientists.

The yearly summer school brings together a wide range of stakeholders to address current challenges, including researchers, policymakers, governments, think tanks, NGOs, civil society, indigenous people, and representatives of academic and research institutions.

Additionally, the ACTS Sustainability Fellowship programme is a new development under the learning lab aiming to translate research into impactful policy by fostering inclusivity and collaboration across geographical and career boundaries. By bringing together early-career researchers and established counterparts, it aims to create a diverse community of practitioners to advance progress on Sustainable Development Goals. Through support, mentorship, training, connecting, and celebrating, the fellowship program empowers thought leaders to transform research, policy, and action to help advance progress on sustainable development goals.

2.7 CLARE Capacity Strengthening Hub Project (Cs Hub)

Climate change poses one of our most pressing global challenges, with far-reaching environmental, social, and economic implications. Effective climate action requires policy changes and technological innovations, as well as a robust and coordinated effort to strengthen the capacity of individuals, organizations, and communities to respond to these challenges. Capacity strengthening for climate action is not only limited to traditional skill development but also encompasses a broader vision that centres on co-creating knowledge and the enrichment of the entire ecosystem supporting climate change mitigation and adaptation efforts. The CS HUB project is an ambitious 5-year initiative adopting an action-oriented research approach to enable socially inclusive and sustainable action to build resilience to weather, climate change, natural hazards, and related threat multipliers in the Global South. A core strategy for

achieving CLARE's long-term impact is to ensure knowledge and evidence are generated and used/actioned to increase the resilience of vulnerable communities that comprise heterogeneous groups.

2.8 Ruralities

Climate change adaptation in the rural scene in Europe and the rest of the world is essential. Climate action, especially climate change mitigation, has proven to be an efficient pathway to generate opportunities for rural communities to contribute substantially to more resilient, ecosystem-enhancing, and nature-based competitive development. A structured multi-actor significant contribution to the European Green Deal and connected agendas, e.g., the EU Biodiversity Strategy, the Farm to Fork Strategy, and the new Common Agricultural Policy: 2023-27.

The project 'Climate-smart, ecosystem-enhancing, and knowledge-based rural expertise and training centres' (Ruralities) is dedicated to delivering an innovative ecosystem-enhancing and climate action-driven expertise and learning framework. This framework revolves around hubs like 'Ruralities,' which integrate a variety of advanced methodologies with a focus on the learner. Supported by a strong network of living labs and a blockchain-based digital platform, these tools blend Internet and wireless technologies to engage, connect, and empower stakeholders in rural development.

Ruralities embrace a holistic approach involving diverse actors, disciplines, systems, scales, sectors, and levels. At its core, it recruits, trains, and coaches over 1,000 facilitators who serve as trainers, role models, and coordinators, shaping the learning framework's foundation for ongoing development.

The project aims to generate, implement, and validate expertise and learning centers through real-world practice. Ruralities collaborate with local and regional authorities to bolster rural innovation in areas where innovators lack network integration. By uniting efforts and leveraging SIMSES networks, Ruralities advances rural innovation

solutions and establishes innovative 'Ruralities Hubs' focused on expertise and training. This collaboration extends to engaging with managing authorities and regional bodies to influence policy instruments at regional and national levels, nurturing a supportive environment for rural development and innovation.

2.9 Governing SDG Interactions

The UN Sustainable Development Goals (SDGs) are restricted by an annual financing gap of about US\$ 4 trillion (UNCTAD 2023). The natural question of how to use the limited financial resources available, especially to the developing world, is at the core of SDG implementation. When implementing SDGs, development actors at different levels must identify synergies between SDGs as valuable opportunities to ensure the effective utilization of the finite resources available. It is equally important to address trade-offs that could arise during the implementation of SDGs, where one or more SDGs could supersede the implementation of others, in a sense "cherry-picking SDGs." Synergies (positive interactions) and trade-offs (negative interactions) are critical when considering the fragmented nature of SDG implementation and distributed policy and decision-making or polycentricity. All these ideas fundamentally speak to the governance and implementation of SDGs.

The overarching objective of this project is to explore how cross-level and cross-sector alignment enables development actors to address trade-offs and build synergies in the governance of SDG implementation.

This five-year multi-country project studies how public and private actors at different governance levels align their efforts in transforming the fragmented nature of SDG governance into a governance system that is more inclusive and effective. It is surmised that such a governance system will allow for trade-offs to be addressed and synergies to be realised between SDGs.

The project uses three case studies in Kenya, Uganda, and Ethiopia as anchor points for this understanding using a local-to-global and local-to-global approach. The project uses different SDGs for each case study as a starting point.

For Kenya, the study focuses on SDG 2 (Zero hunger); for Uganda, it focuses on SDG 6 (clean water and sanitation) and SDG 15 (life on land), all of which interact closely with SDG 13 on climate action, therefore central to the idea of building climate-resilient economies. The key learning from the Mid-term project review workshop in March 2024 was minimal alignment between these actors. Many of their actions remain fragmented, with multiple decision-making centres and polycentric governance, as coined by van Zeben (2019). This inhibits the effectiveness of the overall implementation of SDGs, given those synergies that could be realised when actors align their implementation mechanisms are left unexplored, and trade-offs that could be avoided during the implementation of SDGs are addressed.

This finding was particularly evident from preliminary findings from research and stakeholder engagements conducted in Ethiopia, which revealed poor awareness and coordination of action on SDGs by different actors. In Uganda, the results are a bit nuanced. There is some awareness of SDGs and a loose framework of alignment of mechanisms between actors at the national level. In Kenya, however, there seems to be some semblance of alignment between the national and the sub-national or county levels. For both Kenya, Uganda, and Ethiopia, there was a recognition by those involved in the project as well as stakeholders that there needs to be deeper engagement with actors at the community level whose day-to-day action on SDGs is either not recognized, measured, or overlooked.

As the project enters its second half, the questions it hopes to answer are why there is low alignment between actors at different levels and the effectiveness of the existing alignment mechanisms. The project will also explore other forms of alignment on SDG action. This understanding will hopefully lead the project to policy insights into how better alignment between different actors can lead to SDG financing, thereby leading to effective SDG implementation and moving away from 'cherry-picking' of SDGs.

2.10 Just Energy Transition project

The global trend towards sustainable energy is accelerating, driven by the declining renewable energy costs and a commitment by nations to promote sustainable development. Despite the urgent need to transition to a low-carbon development trajectory, developing countries like Kenya grapple with the dual challenge of addressing climate change while tackling poverty and income inequality.

A critical aspect of this transition is localization, which ensures a just transition by tailoring solutions to specific local contexts and considering regional vulnerabilities, resources, and socio-economic dynamics. Within the concept of the transition, it's important to recognize that this transition may lead to the loss of jobs and the need for reskilling, emphasizing the need to protect workers' rights, livelihoods, and well-being,

There are promising opportunities in Kenya to localise clean energy value chains and develop small, medium, and micro enterprises (SMMEs) in the clean energy sector. Kenya can drive economic growth while addressing social and environmental challenges by nurturing domestic clean energy industries and empowering local entrepreneurs. SMMEs can create jobs, generate income, and foster skills development within local communities.

However, inclusive policies that prioritize the needs of vulnerable groups such as women and youth are crucial to ensure a just energy transition in Kenya. Strengthening their representation and participation in decision-making positions along with providing targeted support programs and access to finance that can empower them to participate in the industry actively.

While Kenya has made significant strides in policies promoting clean energy and even deploying renewable energy technologies, it is essential to ensure that the transition is just and inclusive. By tailoring energy policies and supporting SMMEs, Kenya can fully harness the potential of clean energy adoption while ensuring that the benefits are distributed equitably across society.

In light of this context, the Just Energy Transition project aims to understand how public policy interventions in Kenya can leverage the localization of clean energy value chains, including SMMEs capability development, to enhance decent work and sustainable livelihoods, specifically for women and youth. The project also seeks advocacy support to cement decent work and sustainable livelihoods, particularly for workers and women.

2.11 African Food Fellowship Programme project

Food systems (FS) encompass the entire journey from production to consumption, including the processes, actors, and resources involved. Effective leadership - that guides and coordinates actions across various stages of the food journey, from production to consumption - within food systems is pivotal to ensuring the complex network of actors and processes operates cohesively and sustainably. Global-level FS leadership organizations, including the United Nations Food and Agriculture Organization (FAO) and the World Food Programme (WFP), set international standards, policies, and frameworks that address global food security, trade, and sustainability.

Continentially, the African Union (AU) and the European Union (EU) shape regional food policies, harmonize trade regulations, and address shared food security challenges in Africa and Europe, respectively, while at the country level, government leadership, in collaboration with civil society and the private sector, influences agricultural practices, food distribution, and nutrition programs. However, despite these leadership efforts, significant gaps in food system leadership must be addressed to ensure the effectiveness and inclusivity of food systems.

These gaps in Sub-Saharan FS leadership manifest as inadequate policies, insufficient resources allocated to agriculture and food programs, lack of coordination among government agencies, and limited representation of marginalized communities in decision-making processes.

Through research experience, ACTS aims to generate evidence-based insights and policy recommendations to inform the development of more effective and inclusive food policies and highlight the socio-economic and environmental impacts of inadequate policies and resource allocation. In this technical capacity, the African Center for Technology Studies acts as a vital catalyst for transformative leadership within African food systems, helping to bridge these critical gaps and foster sustainable change.

This synthesis emphasizes incorporating cross-cutting themes, such as sustainability, climate action, capacity strengthening, gender/youth empowerment, and governance, into climate resilience initiatives.

3.0 PRIORITIES FOR CLIMATE-RESILIENT ECONOMIES

3.1 Incorporating the principles of Sustainability

Sustainability, as defined by the Brundtland Commission in 1987, is a principle that prioritizes the satisfaction of current needs while safeguarding the capacity of future generations to fulfil their needs. This concept transcends environmental preservation and incorporates social equity and economic stability; thus, it constitutes the three pillars of sustainability, frequently delineated as environmental, economic, and social. The significance of sustainability lies in its capacity to tackle pressing issues such as diminishing environmental degradation, advancing resource efficiency, and ensuring equitable distribution of opportunities and resources (WCED 1987).

Within the context of Climate Resilience Economies, promoting economic systems that are resilient, adaptable, and able to endure the consequences of climate change is dependent upon the fundamental principle of sustainability.

By incorporating sustainable practices, societies can alleviate the detrimental consequences of climate change, protect biodiversity, and guarantee the enduring viability of ecosystems that are vital for economic and human activities (IPCC 2014). Consequently, sustainability has evolved from a mere environmental necessity to a holistic structure critical for safeguarding the well-being, economic growth, and adaptability of societies across the globe amidst intensifying climate-related challenges.

The Blue Empowerment Project effectively incorporates the principle of sustainability into its foundation by utilizing climate-smart Integrated Multi-Trophic Aquaculture (IMTA) of fish and seaweeds. The project aims to improve women's livelihoods in Kwale and Kilifi while enhancing their climate resilience. By establishing a symbiotic environment in which the by-products of one species provide nutrients for another, this innovative approach of aquaculture emulates natural ecosystems to improve environmental health and productivity. The project's emphasis on seaweeds and fish enables local women to empower themselves through a

sustainable source of income economically and contributes to the conservation of marine ecosystems by mitigating the depletion of natural resources and degradation of the environment caused by these practices.

Capacity building and the utilization of renewable resources are primary sustainability principles that the project prioritizes to reduce carbon footprints and the susceptibility of these communities to the effects of climate change. By prioritizing ecological equilibrium, equitable society, and economic feasibility, the Blue Empowerment Project exemplifies a comprehensive methodology toward sustainability. This ensures that the initiatives' advantages extend beyond the immediate and are long-lasting, strengthening the future resilience of the communities it supports.

Furthermore, the TRANSPATH project acknowledges wetlands' diverse and important functions, highlighting the importance of undertaking water transformations toward sustainable use. In the case of climate change, wetlands provide important ecological services, including climate moderation within surrounding areas, acting as carbon sinks, supporting biodiversity, and regulating water flow, thus preventing adverse weather conditions such as flooding. This project advocates for social-eco approaches, harmonizing ecological conservation through innovation with societal needs.

The project takes a comprehensive approach that harmonizes agricultural innovation with ecological conservation to achieve this. In addition to promoting and executing climate-smart agricultural methods, TRANSPATH attempts to preserve the ecological integrity of the Yala wetlands while enhancing sustainable food production. Yala Wetland plays a significant role in climate mitigation because it is the largest freshwater wetland in Kenya.

This entails advocating for methodologies that minimize water consumption, diminish chemical discharge, and improve soil quality, thus guaranteeing that agricultural operations augment the wetland's ecosystem services rather

than diminish them. Further, the project prioritizes community involvement and support for developing skills and abilities, enabling nearby producers to embrace environmentally conscious and nature-sustainable methods.

Similarly, the RURALITIES project embodies a deep commitment to sustainability through various strategic approaches. It strongly emphasizes ecosystem enhancement and climate action, aiming to foster long-term environmental health and resilience to climate change. By adopting a holistic, multi-actor approach (MAA), the project engages diverse stakeholders in rural development, promoting collaboration, knowledge sharing, and inclusive decision-making processes essential for sustainable development. Through extensive training and capacity-building efforts, Ruralities empowers local communities to implement sustainable practices, enhance resilience, and drive innovation.

The project focuses on real-world practice and collaboration, working closely with local and regional authorities to strengthen rural innovation and ensure that sustainability principles are applied in practical settings tailored to local needs.

By engaging with managing authorities and advocating for supportive policies at regional and national levels, Ruralities create an enabling environment for sustainable practices to flourish and expand across different regions. The 'Ruralities' project showcases a comprehensive and integrated approach to rural development and innovation that prioritizes sustainability at its core.

Governing SDG interactions project also base their approach on sustainability. The project aims to investigate how alignment across sectors and levels can effectively mitigate trade-offs and foster synergies in the governance of the Sustainable Development Goals (SDGs), thereby making a lasting contribution to the cause of sustainable development.

The Just Energy transition project endeavours to promote sustainability across environmental, economic, and social dimensions. By focusing on adopting clean energy, the

project contributes to climate mitigation and, hence, advances environmental sustainability. Economically, the project focuses on SMMEs' capabilities to create jobs and foster economic growth in clean energy within the local context.

Socially, the project prioritizes the inclusion of vulnerable groups such as women and youth, ensuring their representation in the clean energy sector, thereby promoting social equity and inclusivity; through these multifaceted efforts, the project seeks to influence policies that promote a just energy transition to safeguard the well-being of both the present and future generations.

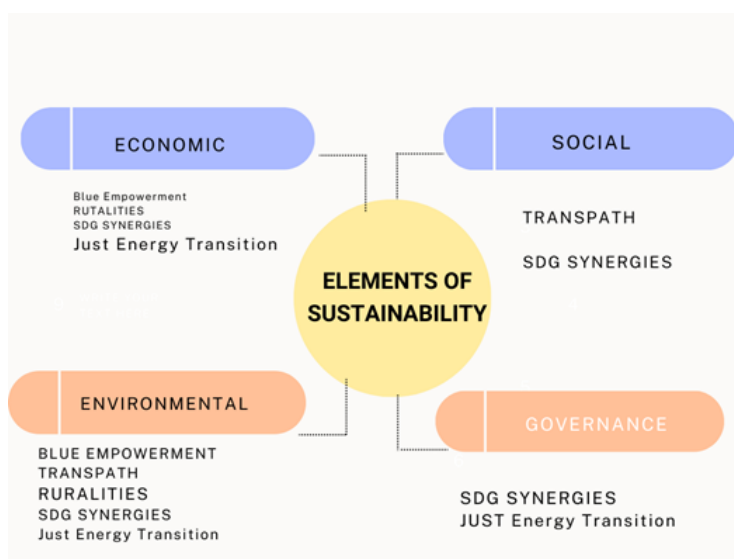


Figure 1: How projects contribute to different elements of sustainability

Table 1: How the projects contribute to the different elements of sustainability

	Economic	Social	Environmental	Governance
Blue Empowerment	It promotes economic resilience by empowering women to create sustainable revenue streams by providing resources and training.	None	The project mitigates the depletion of marine resources and minimizes environmental degradation by implementing climate-smart aquaculture practices.	None
TRANSPATH	None	Acknowledges the immense importance of wetlands, as they play a crucial role in sustaining livelihoods, regulating water cycles, and preserving biodiversity (Nyanaro and Ndege 2023). These social functions are essential to the health and cohesiveness of communities.	Seeks to improve the environmental integrity of wetlands and their surrounding ecosystems by promoting methods that minimise water consumption, reduce chemical discharge, and improve soil quality (Nyanaro and Ndege 2023).	None
RURALITIES	The project’s focus on sustainable agricultural practices and ecosystem management helps to foster economic stability in rural communities.	None	The project seeks to enhance ecosystem resilience and health by implementing climate-smart agriculture, conservation initiatives, and sustainable land management techniques.	None
SDG SYNERGIES	Explores the potential benefits of aligning different sectors and levels of governance to minimize trade-offs and promote synergies in achieving the SDGs. Improved resource allocation and policy coordination can result in economic advantages (Dikiny et al. 2023).	Aims to create a meaningful impact on sustainable development by promoting collaboration between various SDGs, leading to improved social well-being and fairness.	The project contributes to environmental sustainability by addressing the root causes of environmental degradation and promoting holistic solutions, which helps identify synergies between different SDGs (Dikiny et al. 2023).	SDG Synergies strongly emphasises governance mechanisms that can successfully coordinate actions across sectors and levels to accomplish the SDGs.
Just Energy Transition	The project emphasizes the importance of developing the capabilities of SMMEs to maximize the benefits of localizing clean energy value chains. It also focuses on supporting local clean energy industries, which creates economic opportunities, stimulates job creation, and enhances income generation for communities (Atieno et al. 2024).	None	By localizing sustainable energy value chains, the project reduces fossil fuel consumption and greenhouse gas emissions (Atieno et al. 2023). It also promotes clean energy legislation and renewable energy technology to reduce climate change and conserve ecosystems.	Upholds good governance principles by promoting inclusive policies, equitable practices, and participatory decision-making processes within the clean energy sector (Atieno et al. 2023).

3.2 Contextualized Climate Action

Climate action encompasses various initiatives and strategies to combat climate change and its impacts. Climate action is of great importance due to its capacity to mitigate the detrimental effects of climate change, including the depletion of biodiversity, increased sea levels, and severe weather events. Effective climate action can safeguard against these threats, ensuring a sustainable environment for future generations while also unlocking economic opportunities through the development of green technologies and industries (United Nations Framework Convention on Climate Change (Kabasa et al. 2022; Atieno et al. 2022; UNFCCC 2015).

Climate action is integrated into the Climate Resilience Economies (CRE) program’s diverse initiatives prioritising sustainable development and resilience. Illustrative examples of practical and impactful incorporation of climate action include the Governing SDG Interactions, STREM, and TRANSPATH projects. The primary objective of governing SDG interactions is strengthening governance mechanisms to synchronise economic activities more effectively with Sustainable Development Goals. This ensures that the pursuit of development does not compromise environmental sustainability. STREM emphasizes conceptual framing through the DPSIR framework, community participation in the governance and preservation of river health, acknowledging the pivotal significance of sound waterways in upholding ecosystems and providing sustenance. About a recent interview with one of the project leads:

The STREM project focuses on the biological and physical aspects of river health. The impact of project however goes beyond these scientific aspects as it also looks into strengthening community engagement on issues to do with river health as well as governance and policy issues concerning river health, which are all critical to the ecological conservation discourse.

This project emphasizes the significance of community engagement and education in attaining climate resilience. TRANSPATH focuses on transforming wetland ecosystems

in Kenya, with the dual goal of preserving their biodiversity and supporting the livelihoods that rely on them. These projects demonstrate the importance of focused, community-based climate action in the global fight against climate change. They emphasize the interdependence of ecological well-being, community health, and economic progress (United Nations 2015; IPCC 2014).

Lastly, the Just Energy Transition project considers climate action by using Kenyan public policy to localize clean energy value chains and improve decent work and sustainable livelihoods, especially for women and youth. The project reduces greenhouse gas emissions and mitigates climate change by promoting renewable energy and sustainable energy systems. The project also promotes economic empowerment and resilience-building in disadvantaged communities through advocacy support to secure decent work and sustainable lives, aligning with climate resilience goals.

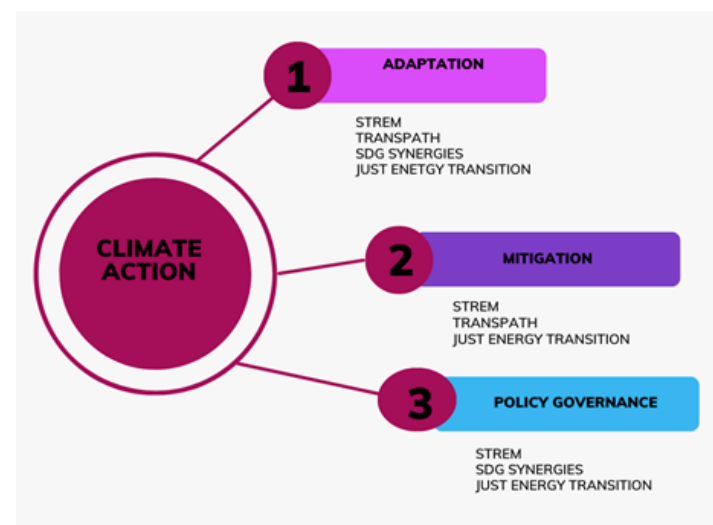


Figure 2: Climate action elements across different projects

Table 2: How the projects contribute to climate action elements

Projects	Mitigation	Adaptation	Policy Governance
STREM	STREM's efforts to involve communities in river health monitoring and promote policies to reduce pollution are crucial in addressing the impacts of climate change. By enhancing the ecological integrity of river ecosystems, STREM helps to minimize the carbon footprint linked to degraded ecosystems.	Gives communities the ability to react to the effects of climate change on river ecosystems and adapt to changing environmental circumstances by incorporating them in decision-making processes related to river health.	STREM's advocacy for pollution reduction and river health governance helps address climate change's impacts on river ecosystems.
TRANSPATH	TRANSPATH promotes sustainable practices that help conserve water, minimize chemical discharge, and enhance soil quality, thereby preserving wetlands and their carbon sinks.	With an emphasis on protecting wetlands and boosting ecosystem resilience, TRANSPATH supports communities in adapting to climate change by conserving wetlands' vital roles in sustaining biodiversity and controlling water cycles.	None
Governing SDG interactions	None	Helps communities adapt to climate change by recognizing synergies between sustainable development objectives and fostering collaboration across sectors and levels of governance.	he project focuses on enhancing governance structures to coordinate efforts across sectors and levels to accomplish sustainable development goals, especially those pertaining to climate action.
Just Energy Transitions	localizes clean energy value chains to reduce fossil fuel consumption and renewable energy uptake, lowering greenhouse gas emissions.	ust Energy Transition works to reduce fossil fuel use and adapt to climate change by supporting local clean energy enterprises and renewable energy technologies.	In the renewable energy industry, Just Energy Transition encourages equitable policies, inclusive practices, and democratic decision-making procedures. This strengthens policy governance throughout the shift to a low-carbon economy.

3.3 Strategic Capacity Strengthening

Capacity strengthening is improving the skills, resources, and structures of individuals, organizations, and systems to effectively perform their tasks and accomplish their objectives (USAID 2012). The process entails delivering training, technical guidance, resources, and institutional backing to enable stakeholders to carry out their responsibilities with greater efficiency and long-term viability (World Bank 2008). This concept is paramount in development efforts as it enables individuals and organizations to better respond to challenges and opportunities, ultimately leading to improved outcomes and sustainable development (OECD 2017).

Investing in capacity strengthening allows development practitioners to cultivate local ownership, promote institutional resilience, and improve the effectiveness and sustainability of programs (UNDP 2015). The authors underline the crucial importance of capacity strengthening in accomplishing development goals. Smith and Doe (2020) assert that enhancing capacity is crucial for developing the resilience of

communities in response to environmental issues. Similarly, Jones et al. (2018) emphasize the significance of enhancing capacity to enhance healthcare delivery and health outcomes in settings with limited resources.

Capacity strengthening has been a primary focus of the CRE programme, particularly through projects. The CLARE CS hub project's purpose of capacity strengthening in CLARE is to enable researchers, practitioners, users (including those disseminating research, such as journalists), and decision-makers to drive adaptation action and build a more resilient future for those most impacted by climate change.

As such, capacity-strengthening efforts are based on a commitment to recognize and, wherever possible, work with existing capacity and initiatives in the global South to leverage resources and synergies, promote gender equity and inclusion (both to do transformative research and advance gender equity and inclusion as an outcome); and address structural and organizational barriers to Southern leadership. As such, the target audience of the hub's

initiatives are researchers, knowledge brokers, and other climate action stakeholders covering individual CLARE project teams, stand-alone CS initiatives, and the overall CLARE programme.

The Blue Empowerment Project aims to improve the abilities of coastal communities to effectively and sustainably manage and preserve marine resources. The project enhances the capacity of local communities by providing business training and resources, enabling them to actively participate in conservation efforts, adopt sustainable livelihood practices, and advocate for marine protection. This not only enhances environmental sustainability but also these communities' economic resilience.

The ACTS Pathway Academy project aims to enhance the abilities of young scholars in green and blue economies by equipping them with the necessary tools and knowledge in the field of climate financing. On the other hand, the Decoloniality Pathways project seeks to promote disadvantaged viewpoints and amplify various voices by organizing yearly summer schools. Its primary goal is to challenge and dismantle current power structures. Observations from Kabasa (n.d), one of the Decoloniality Pathways project coordinators is that:

Embedded in the Summer School curriculum are lectures and discussions on decoloniality, which emphasizes a relooking into critical and indigenous knowledges and viewpoints. The summer school provides an opportunity for the Global South and North to have a unified perspective on achieving decoloniality in different areas such as research and praxis in education, health, and many other fields

The YLO support Project seeks to enhance the capabilities of youth-led groups by evaluating their requirements and offering specific assistance in areas such as organizational administration, project execution, and monitoring and assessment. Implementing this strategy guarantees that these organizations will enhance their efficiency, resulting in more significant outcomes in their endeavours to combat climate change and advance sustainable development.

The Governing SDGs Interactions project has within the project international level seven doctoral candidates and three post-doctoral research fellows working in cross-cutting areas of research on SDGs interactions and how the goals can be better governed and implemented in East Africa. The project, therefore, adds to the pipeline of researchers working in this area who, through their research, will inform policy, accelerate the achievement of the SDGs, and bring about climate-resilient economies.

The African Food Fellowship Programme (AFFP) project enhances capacity building by examining the effectiveness of current leadership programmes in providing practical training and guidance to agri-food leaders in Africa. The project highlights the importance of networking and collaboration among participants, fostering a community of professionals that promotes mutual learning and the sharing of successful approaches. This contributes to the growth of a competent and empowered workforce in the African agricultural industry, leading to improvements in the African

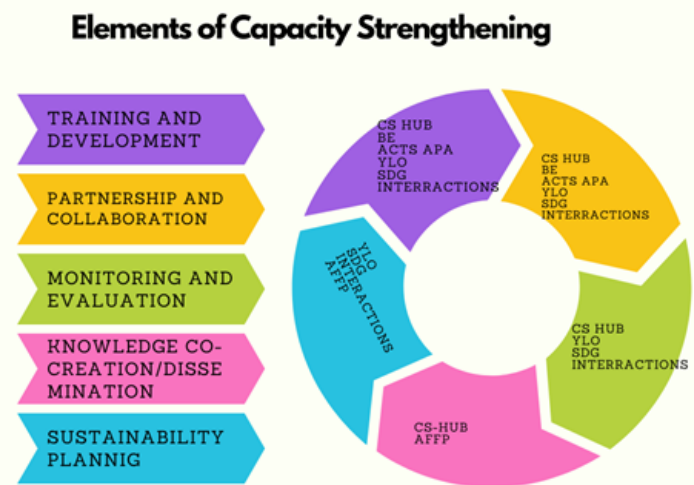


Figure 3: How different projects incorporate the elements of capacity strengthening.

Table 3: How different projects incorporate the elements of capacity strengthening

Projects	Training and Development	Partnership and collaboration	Monitoring and Evaluation	Knowledge co-creation/ dissemination	Sustainability Planning
CLARE CS HUB	The project funds training and development initiatives designed to improve the skills and expertise of individuals and organizations engaged in climate action.	CS HUB promotes partnerships and collaborations with a wide range of stakeholders, including local communities, governmental entities, non-profits organizations, and academic institutions.	The project employs comprehensive monitoring and evaluation systems to appraise the effectiveness of its activities and strengthen capacity. This entails monitoring the adoption of the project's knowledge and evidence and assessing its influence on bolstering the resilience of marginalized groups.	Through action-oriented research and collaborative research with communities, policymakers, and practitioners, CS HUB informs climate change initiatives with local knowledge and context-specific needs.	None
Blue Empowerment	The project comprises training courses to improve coastal women's proficiency with climate-smart IMTAs and business models.	The project engages many stakeholders, including coastal fisher communities, local government bodies, research institutions, and non-governmental organizations that aim to promote gender equality in aquaculture.	None	None	None
ACTS Pathway Academy	APA offers a variety of training opportunities with an emphasis on science, technology, innovation, and climate change, including short courses, custom training, and self-paced learning.	The APA engages researchers, policymakers, governments, NGOs, civil society, and academic institutions through its fellowship program. APA uses pooled skills and resources to boost capacity-building and encourage knowledge exchange across sectors and disciplines via partnerships (Dikiny et al. 2024).	None	None	None
YLO	The assessment includes a review of the YLOs' present capabilities in areas including gender, money, governance structures, and safeguarding problems. Based on the assessment findings, targeted training and development opportunities may be offered to strengthen their capabilities in crucial areas.	The project addresses young unemployment via cooperation between the Mastercard Foundation and Kenyan YLOs by improving organizational capacity for meaningful employment for young people.	The capacity assessment process involves monitoring and evaluation mechanisms to track progress and measure the effectiveness of capacity-building interventions. It identifies areas for development and makes modifications to guarantee continuous growth and impact by routinely analyzing YLOs' capability and progress.	None	The project's objective of enabling 30 million African youth to find dignified and fulfilling employment demonstrates sustainability. By investing in YLOs and enabling them to alter their communities, the project seeks to have a lasting impact.

Table 3: How different projects incorporate the elements of capacity strengthening

Projects	Training and Development	Partnership and collaboration	Monitoring and Evaluation	Knowledge co-creation/ dissemination	Sustainability Planning
SDG Interactions	None	Fosters partnership and collaboration between public and private players at multiple governance levels to examine SDG delivery across levels and sectors. This fosters collective action and knowledge sharing, enhancing the stakeholders' ability to collaborate effectively towards shared objectives.	Evaluates actor alignment at various levels and alignment strategies via research and stakeholder interactions. It identifies SDG governance weaknesses and challenges and delivers evidence-based suggestions for improvement via rigorous monitoring and evaluation, empowering stakeholders to make informed decisions and create positive change.	None	The project aims to provide policy insights and suggestions that might help diverse players coordinate more effectively in the SDG implementation process. Contributing to the long-term sustainability of SDG governance activities, the project identifies alignment challenges and proposes practical suggestions for improvement.
AFFP	None		None	Through research initiatives, the project seeks to produce evidence-based insights and suggestions for policy. The project broadens the knowledge base of stakeholders, including researchers, policymakers, and civil society organizations, through researching food systems and their impact on society.	Seeks to improve inclusive, effective, and economically sustainable food policies via research and policy suggestions. This involves supporting policies that boost smallholder farmers and other food system stakeholders' economic prospects and increase agricultural and food program funding.

3.4 Gender and Youth Empowerment

Women/youth empowerment involves enabling women or youth to exercise authority over their lives, make well-informed decisions, and actively pursue social, economic, and political advancements. Empowerment means offering individuals access to resources, opportunities, knowledge, and support systems that augment their skills and empower them to engage in society actively. Empowering women and youth is crucial for advancing social justice, alleviating poverty, and attaining gender equality and inclusive development. The active involvement of women and young people in the workforce, business ventures, and leadership positions plays a crucial role in driving economic development. This can be achieved through increased productivity and the fostering of creativity. Smith (2018) emphasizes the significance of tackling structural disparities and prejudice to attain substantial empowerment among women youth. Jones and Johnson (2020) argue that empowering women and youth is essential for sustainable development, as it promotes economic expansion, social cohesion, and enhanced welfare. In their study, Brown et al. (2019) emphasize the significance of education and skill enhancement in empowering disadvantaged populations, including women and adolescents, by improving their capacity to find employment and achieve economic autonomy.

Multiple projects within the CRE programme prioritise women and youth empowerment in the context of community and rural development. By providing leadership training, microfinance access, and skill-building workshops, the Blue Empowerment Project seeks to empower women in coastal communities. The CS Hub offers specialised support by mainstreaming gender and social inclusion matters to organisations and improving their efficiency and long-term viability. The YLO support project empowers young leaders in rural communities through mentorship, tools, and networking opportunities to enhance their voices and impact decision-making processes. The Just Energy Transition (JET) project aims to empower marginalised communities, particularly women and youth, by advocating for renewable energy solutions and sustainable livelihoods. It examines the impact of existing energy policies in Kenya on promoting decent work and local development within the clean energy sector. According to Atieno (n.d), the project implementor of the JET:

f It is critical to consider that in just transition projects, contextualization is key when defining terms such as localization. A number of African countries have made progress in promoting progressive policies in the energy sector such as the push for renewable energy and policy advocacy for the vulnerable population, in the whole effort of being 'just'.

3.5 Sustainable Governance

Governance encompasses the mechanisms and frameworks by which choices are determined, executed, and upheld within entities, collectives, or civilizations. It includes all the institutions, regulations, guidelines, and standards that direct the connections and exchanges between stakeholders, such as businesses, citizens, civil society organizations, and government agencies. Rhodes (1996) conceptualises governance as coordinating actions between various players to achieve shared objectives, highlighting the significance of interconnected relationships and cooperative agreements. Similarly, Kooiman (1993) highlights the transition from government to governance, promoting greater decentralization and participatory methods of decision-making that engage a wide range of stakeholders.

In addition, Stoker (1998) contends that governance encompasses formal institutions and informal practices and conventions that influence interactions and results within societies. Governance ensures transparency, accountability, and legitimacy in decision-making processes. Efficient governance systems guarantee that policies and actions are attentive to the needs and desires of stakeholders, hence increasing public trust and confidence in institutions. In addition, effective governance promotes societal unity, economic progress, and sustainable utilization of resources through establishing a structure for conflict resolution, collaboration promotion, and efficient resource allocation.

RURALITIES highlights the significance of a well-organized collaboration among several stakeholders to promote climate action and improve ecosystems, especially in relation to the European Green Deal and associated initiatives. The SDG interactions project aims to explore how public and private entities at various levels of governance presently could coordinate their actions in the future to manage trade-offs and enhance synergies in achieving the Sustainable Development Goals (SDGs). This entails examining governing systems that are inclusive, efficient, and able to accommodate a wide range of interests and agendas.

This research aims to improve the effectiveness and inclusivity of development initiatives by examining governance mechanisms that encourage collaboration and manage conflicts between several Sustainable Development Goals (SDGs). The YLO support project fosters governance by empowering young leaders in rural communities through mentorship, allocation of resources, and networking opportunities. The project empowers young local officials (YLOs) to actively participate in decision-making processes in their communities by equipping them with skills and support. YLOs play a role in influencing local policies and activities, promoting openness, accountability, and participatory governance.

Building climate-resilient economies in Africa requires a multifaceted approach that is cognisant of the five priority areas highlighted by the synthesis of the ACTS CRE

projects, including supporting innovative policy interventions, transformative community engagement, supporting infrastructure, and leveraging research for informed decision-making.

4.1 Integrating Climate Considerations into Policy and Planning

African countries can mainstream climate resilience into their development policies and frameworks to ensure that economic planning factors in climate risks and vulnerabilities. Stakeholders can incorporate climate change projections and risk assessments into their national development strategies and urban planning (Mwenje and Kumar 2024). This approach includes reviewing and revising building codes, land use plans, and environmental regulations to address projected climate impacts. Policymakers can also incentivize sustainable practices and investments in renewable energies. Collaboration with scientists and stakeholders is key for climate-responsive policies, ensuring they are evidence-based (Addaney et al. 2017). Mainstreaming climate goals into economic and sectoral policies encourages resilience across agriculture, water resources, public health, and infrastructure sectors, setting pathways for sustainable development in a changing climate environment.

4.2 Investing in Climate-Smart Infrastructure

The development of infrastructure that can withstand climate shocks and stressors is essential. This could include reinforcing existing structures and designing new projects with resilience as a central priority. Stakeholders can create regulatory environments that attract private investment, such as tax incentives for resilient buildings or renewable energy projects. Public funding can also be allocated to research and development of innovative, climate-resistant materials and technologies (OECD 2018). Infrastructure projects can be required to conduct climate risk assessments and integrate resilience measures into their design and operation. Public-private partnerships can be encouraged for large-scale infrastructure projects, sharing risks and benefits. International climate finance mechanisms, such as the Green Climate Fund, can also be tapped to secure resources for developing climate-smart infrastructure (Akomea-Frimpong et al. 2023).

4.3 Promoting Sustainable Agriculture

Implementing climate-smart agricultural practices can help safeguard food security and the livelihoods of rural communities, which are often the most affected by climate change (Ogisi and Begho 2023; World Bank 2021; Steenwerth et al. 2014). National and sub-national policies can provide subsidies for organic farming and sustainable irrigation systems while discouraging practices that lead to deforestation or soil degradation. Education and training programs can be established to equip farmers with the

knowledge and skills needed for climate-smart practices, such as precision farming, intercropping, and agroforestry (World Bank 2021). Financial incentives can also encourage farmers to adopt sustainable technologies. On a larger scale, funding for research can be increased to develop resistant crop varieties and improve weather prediction models, providing farming communities with more tools to cope with a changing climate (Ogisi and Begho 2023).

4.4 Strengthening Disaster Risk Management

Strengthening disaster risk management involves building robust early warning systems for extreme weather events and natural disasters. This infrastructure can be integrated with public awareness campaigns advising appropriate response measures. Additionally, governments can coordinate with local communities and aid organizations to establish and rehearse emergency response plans (Šakić Trogrlić et al. 2022; Ma et al. 2023). Capacity-building exercises can help equip these entities with skills to manage disaster situations effectively. Regular assessments of risk exposure and vulnerabilities and reviews of past disaster response performance are also crucial for improving preparedness (Šakić Trogrlić et al. 2022). At the policy level, legislation might be needed to define roles and allocate necessary resources.

4.5 Encouraging Climate-Resilient Business Practice

Promoting climate-resilient business practices can be approached in several ways. One effective step is creating awareness and offering educational programs about the importance of sustainable practices within and across businesses. Businesses should also consider integrating green skills into their workforce for long-term sustainability (Hariram et al. 2023). Furthermore, implementing a proactive risk management approach that adapts to climate change can ensure business continuity. Collaboration with diverse stakeholders at local and national levels is essential to achieve this.

The community plays a critical role in a sustainable business's supply and demand side. In this view, training and capacity building around sustainability should be cascaded to the community level to grow awareness and drive behavioural change. Lastly, a key element in building business climate resilience is transforming resilient business models via enterprise risk management due to the patent risk-return relationship. Risk management is essential in attracting new investment and preserving the value created by the businesses in question (Peláez et al. 2023). This is particularly important for Africa, which is often considered a risky business environment for multiple reasons.

4.6 Enhancing Financial Mechanisms for Climate

Adaptation

The financing gap for climate action is a growing concern that needs novel thinking around new financing mechanisms. This involves mainstreaming climate risks into investment decisions. It could include issuing green bonds for climate-resilient projects and diversifying insurance products to cover climate risks (Lopez et al., n.d.).

National adaptation funds can finance domestic projects, while public-private partnerships can fund large-scale infrastructure projects for climate adaptation. International mechanisms, like the Green Climate Fund, can assist developing nations with resources even though it is well-accepted that African countries have not been able to tap into these funds for several reasons (Migun 2021). Microfinance could support individual climate resilience efforts. Innovative financial instruments like resilience bonds or catastrophe bonds can be introduced.

Finally, capacity-building within the financial sector to manage climate risks appropriately is crucial. It is also critical to consider the place of financial prudence in using finite resources available for climate Action and development more broadly in Africa. Leveraging synergies between climate change priorities to avoid unnecessary duplication of efforts and exploring trade-offs that may lead to re-ordering of. implementation priorities to fit changing contexts.

4.7 Fostering Research and Knowledge Sharing

Fostering research and knowledge sharing can be achieved through creating platforms for collaboration between academic institutions, industry, and government (Thibault et al. 2023). The promotion of open-access publishing can ensure that cutting-edge research is widely accessible. Workshops and conferences bring together experts to share insights and spark innovative ideas.

Encouraging multidisciplinary research can lead to holistic solutions. Moreover, providing funding for research projects is crucial to produce new knowledge. Also, integrating traditional and local knowledge with scientific research can lead to effective, locally tailored solutions. Lastly, fostering a culture of learning and curiosity within organizations and institutions can promote continuous knowledge generation and sharing (Thibault et al. 2023).

4.8 Community Empowerment and Locally-led Led

Adaptation

Foster community empowerment and locally-led adaptation involves nurturing a community of practice for locally-led adaptation to support peer learning, accountability, and collaboration. This can be done by working with partners to empower communities through knowledge sharing and practical support in implementing adaptation principles (Soanes et al. 2021). Additionally, empowering communities can help implement adaptive responses and give them a transformative capacity to create novelty and align solutions with local contexts.

Moreover, endorsing principles for locally-led adaptation, with over 100 organizations committing to make changes, strengthens efforts to meet the urgent adaptation agenda by emphasizing the importance of devolving decision-making to appropriate local levels (John Theodore Houghton et al. 2001). This approach ensures that local institutions and communities have more direct access to finance and decision-making, empowering them to lead their adaptation strategies effectively.

4.9 Fostering Partnerships and Collaboration

Fostering partnerships and collaboration among stakeholders is crucial for addressing climate resilience. By bringing together various sectors and actors, diverse expertise and resources can be leveraged to develop effective strategies (Onyango 2023; Mariani et al. 2022). This collaborative approach enables knowledge sharing, innovation, and sustainable outcomes. It enhances trust, communication, and inclusivity in decision-making, leading to equitable solutions for vulnerable communities and ecosystems (Peláez et al. 2023). Overall, partnership and collaboration are essential for collective action and shared responsibility in tackling the urgent global challenge of climate change.

Table 4: Project against the climate resilience focus areas

	Metrics of Priority								
Projects	Integrating Climate Considerations into Policy and Planning	Investing in Climate Smart Infrastructure	Promoting Sustainable Agriculture	Strengthening Disaster Risk Management	Encouraging Climate-Resilient Business Practice	Enhancing Financial Mechanisms for Climate Adaptation	Fostering Research and Knowledge sharing	Community Empowerment and Locally-led Led Adaptation	Fostering Partnerships and Collaboration
Blue Empowerment			✓						
CLARE CS HUB	✓						✓		
ACTS Pathway Academy					✓		✓		
Decoloniality Pathways							✓		✓
RURALI-TIES			✓				✓		✓
Capacity Assessment of YLOs					✓			✓	✓
SDG INTER-ACTIONS	✓					✓	✓		✓
Just Energy Transition		✓			✓	✓			✓
AFFP									
STREM				✓				✓	
TRANS-PATH				✓			✓		✓

The table above illustrates how each project aligns with various aspects of climate resilience. Each project is categorized based on its focus area. The ticks indicate which elements of climate resilience each project addresses, providing a comprehensive overview of their collective contributions to addressing climate change and promoting sustainability.

5.0 Conclusion

The projects detailed within this synthesis have shown that equipping communities with the knowledge and tools to monitor and advocate for their environmental interests leads to more sustainable and effective management of natural resources. The participatory pictorial models for water quality monitoring, in particular, exemplify how scientific research and community action can be harmoniously aligned to foster environmental stewardship at the grassroots level. The synthesis also highlights the importance of transdisciplinary collaboration, bringing together scientists, policymakers, and local communities to co-create knowledge and solutions. This collaborative approach has not only enriched

the research outcomes. Still, it has also ensured that the findings are grounded in local realities and, therefore, more likely to be implemented and impact. As we move forward, it is clear that the challenges posed by climate change require concerted efforts and integrated solutions. The synthesis serves as both a reflection of the progress made thus far and a blueprint for future action. It advocates for continuous engagement with and empowerment of local communities, adopting evidence-based policy interventions, and fostering innovative scientific research. Ultimately, this synthesis reaffirms the indispensable role of inclusive, locally-led, and scientifically informed initiatives in navigating the complexities of climate resilience and sustainable development in East Africa and beyond.

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