

AFRICA'S CLIMATE CHANGE AND RESILIENT DEVELOPMENT STRATEGY AND ACTION PLAN (2022-2032)



TABLE OF CONTENTS

ACRONYMS	1		
EXECUTIVE SUMMARY	2		
01 INTRODUCTION AND RATIONALE	3		
02 STRATEGIC FRAMING	6		
2.1 Vision	6		
2.2 Goal	6		
2.3 Overall Objective	6		
2.4 Specific Objectives	7		
2.5 Strategic Intervention Axes	7		
2.6 Guiding Principles	8		
2.7 Beneficiaries/Stakeholders	9		
2.8 Methodology	9		
03 CONTEXT AND JUSTIFICATION	10		
3.1 Africa's Climatic Change Conditions and Vulnerability	10		
3.2 Africa's Socio-Economic and Development Context and Climate Change	12		
3.3 Key Sectoral Challenges and Opportunities Related to Climate Change	18		
04 STRATEGIC INTERVENTION AXES	29		
4.1 Strategic Intervention Axis 1: Strengthening Governance and Policy	29		
4.1.1 Enhanced climate policy, multi-scalar governance and institutional coordination	29		
4.1.2 Anticipatory governance and proactive, long-term planning	31		
4.1.3 Increase uptake of climate information services	32		
4.1.4 Improved climate literacy and awareness	34		
4.1.5 Governance solutions to address the climate-conflict nexus	35		
4.2 Strategic Intervention Axis 2: Pathways Towards Transformative Climate-Resilient Development	36		
4.2.1 Food systems under a changing climate	38		
4.2.2 Protecting land-based ecosystems and carbon sinks	40		
4.2.3 Enhancing climate-resilient and low-carbon energy and infrastructural systems	42		
4.2.4 Promoting low-carbon, resilient mobility and transport systems	45		
4.2.5 Building low-carbon, resilient urban areas	47		
4.2.6 Enhancing resilient water systems	49		
4.2.7 Building a climate-resilient African blue economy	51		
4.2.8 Digital transformation	53		
4.3 Strategic Intervention Axis 3: Enhancing Implementation towards Climate-Resilient Development	55		
4.3.1 Enhanced finance flows and resource mobilization	55		
4.3.2 Safety mechanisms to reduce loss and damage, including climate insurance	58		
4.3.3 Equitable technology transfer	60		
4.3.4 Inclusive participation, especially of gender and youth	61		
4.3.5 Capacity development	64		
05 MONITORING AND EVALUATION PLAN	65		
06 IMPLEMENTATION MATRIX	68		
07 REFERENCES	85		

ACRONYMS

AfDB	African Development Bank	M&E	Monitoring and Evaluation
AGN	African Group of Negotiators	MDG	Madagascar
AIP	Africa Investment Programme	MEL	Monitoring, Evaluation and Learning
AMCEN	African Ministerial Conference on the Environment	MRV	Measure, Report and Verify
AU	African Union	MW	Megawatt
AUC	African Union Commission	NAP	National Adaptation Plan
AUPSA	African Union Peace and Security Architecture	NbS	Nature-based Solution
CAADP	Comprehensive African Agricultural Development Programme	NDC	Nationally Determined Contribution
CAF	Central Africa	NEAF	North East Africa
CAHOSCC	Committee of African Heads of State on Climate Change	NGO	Non-Governmental Organization
CBD	Convention on Biological Diversity	NIS	National Innovation System
CDR	Carbon Dioxide Removal	NMHS	National Meteorological and Hydrological Services
CIS	Climate Information Services	PA	Protected Area
COP	Conference of the Parties	PIDA	Programme for Infrastructure Development
DRC	Democratic Republic of Congo	RCP	Representative Concentration Pathway
EbA	Ecosystem-based Adaptation	RECs	Regional Economic Communities
ESAF	East Southern Africa	SAH	Sahara
ESG	Environmental, Social and Governance	SCCF	Special Climate Change Fund
GCF	Green Climate Fund	SDG	Sustainable Development Goal
GDP	Gross Domestic Product	SEAF	South East Africa
GEF	Global Environment Facility	TNA	Technology Needs Assessment
GI	Green Infrastructure	UN	United Nations
GHG	Greenhouse Gas	UNCCD	United Nations Convention to Combat Desertification
GW	Gigawatt	UNECA	United Nations Economic Commission for Africa
GWL	Global Warming Level	UNEP	United Nations Environment Programme
ICLEI	Local Governments for Sustainability	UNFCCC	United Nations Framework Convention on Climate Change
ICT	Information and Communications Technology	WAF	Western Africa
IPCC	Intergovernmental Panel on Climate Change	WEF	Water, Energy, Food
IPP	Independent Power Producer	WMO	World Meteorological Organization
LDCF	Least Developed Countries Fund	WSAF	West Southern Africa



EXECUTIVE SUMMARY

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The Africa Union's Agenda 2063 makes it clear that climate-resilient communities and economies are an integral component of the continental vision for an integrated, prosperous and peaceful Africa, driven by its own citizens, representing a dynamic force in the international arena. This Africa's Climate Change and Resilient Development Strategy and Action Plan (2022-2032) supports the realization of this vision by setting out principles, priorities and action areas for enhanced climate cooperation and long term, climate-resilient development planning. The Strategy provides an outline for harmonized and coordinated actions to respond to the impacts of climate change, thereby supporting planning for the continent's low-carbon future. The Strategy defines the main parameters and priorities in building African resilient capacities for adaptation and exploiting the benefits of the mitigation potential of the continent. It seeks to ensure that institutions, strategies, and decisions for climate risk management and climate-resilient development are integrated and implemented as a central aspect of achieving sustainable development, as framed by Agenda 2063 and the United Nations' Agenda 2030.

Through a focus on strengthening adaptation and resilience building of Member States across the continent, the Strategy identifies key priority areas, interventions, and actions to reduce the vulnerability of affected communities and manage the risks related to climate change and climate-induced extreme events. These key priority areas include enhanced governance and institutional collaboration, policy coherence and enhanced climate knowledge systems, as well as anticipatory planning. The Strategy also seeks to enhance Africa's capacity to respond to climate impacts through the mobilisation of financial resources, access to technology and safety nets for loss and damage.

In order to pursue low-carbon, climate-resilient growth pathways across various sectors and systems, this Strategy highlights key principles of the green and circular economy, as well as innovation, sustainable development, poverty reduction and job creation.

These pathways are aligned with Africa's green recovery efforts and provide opportunities to catalyse socio-economic transformation on the continent towards a resource efficient, environmentally sustainable, climate-resilient, and more equitable society.

The Strategy supports the commitments made by African countries under the 2015 UNFCCC Paris Agreement and is guided by the existing national climate efforts and aspirations of its 55 Member States, as expressed through Nationally Determined Contributions and long-term, climate-resilient development and decarbonization visions contained in national Long-Term Strategies. It is recognized that each Member State will direct their climate response in a self-determined manner, based on their unique national circumstances and capacities. While recognising differences in national contexts and circumstances, this Strategy builds upon the shared challenges and opportunities for the continent, encouraging African-led and African owned innovation, social and cultural values, and leveraging of natural capital endowments.

The Strategy aims to enhance inclusion, alignment, cooperation, and ownership across all spheres of government and stakeholder groupings. The Strategy highlights the importance of supporting the most vulnerable communities and groups. It recognizes that women and the youth face particular challenges in responding to climate impacts, but also acknowledges and seeks to support the critical role that they play as change agents driving climate responses at local, national, sub-regional and continental levels.

To promote an inclusive climate approach, this Strategy seeks to enhance collective development, participation, implementation, and monitoring. In particular, the Strategy provides a consolidated platform around which partnerships can be built with non-governmental and civil society organizations, as well as the private sector.

01

INTRODUCTION AND RATIONALE

Climate change poses unprecedented challenges to the survival of humans, animals, plant life and ecosystems. It threatens social and economic systems, while putting development gains at risk. Relief programmes and other responses to disasters may require countries to redirect limited resources intended for other development priorities. Despite Africa having contributed less than 4% of global greenhouse gas (GHG) emissions, it is one of the regions that are most vulnerable to climate variability and change. This is due to the continent's biophysical makeup as well as numerous socio-economic vulnerabilities – including a high dependence on rain-fed agriculture (and natural resource-based sectors broadly), a lack of alternative livelihood support, widespread poverty and inequality, a weak adaptive capacity, low levels of education, and inequitable access to financial resources, credit, markets, and climate information services (CIS).

Even as Africa grapples with the impacts of climate change, agricultural production will need to increase by approximately 50% by 2050 to meet the needs of the region's growing population. Cities need to provide services to ever greater numbers of urban residents and massive investments are needed to address infrastructure backlogs. It is therefore urgent for the continent to adapt to the adverse impacts of climate change and mainstream climate action into its broader social and economic development activities.

The average growth of Africa's economy between 2002 and 2018 was 3.37% . This was largely driven by climate-sensitive sectors – including service sectors (such as tourism and hospitality, real estate, banking and transport), energy, industry and agriculture; as well as the ocean economy. It is therefore important for Africa to climate-proof these primary growth sectors and develop plans to ensure that the region's broader development objectives are attained.

The African Union's (AU's) 55 Member States collectively have an estimated population of over 1.2 billion people, making it the eleventh largest economy in the world, with a nominal gross domestic product (GDP) of about US\$2.263 trillion. The African population is the youngest in the world and the continent is set to be the most populous by 2023.

Since climatic and ecological regions cut across national political boundaries, a continental, trans-boundary response is important in the formulation and implementation of climate change responses. It's within this context that the region, through the African Union Commission (AUC), has developed a 10-year, Africa's

Climate Change and Resilient Development Strategy and Action Plan (2022-2032). This Strategy provides a broad outline for harmonised and coordinated actions to respond to the impacts of climate change, as well as to plan for the continent's low-carbon, climate-resilient future.

The Strategy defines the main parameters and priorities to build African-resilient capacities for adapting to and exploiting the benefits of the mitigation potential of the continent. It seeks to ensure that institutions, strategies and decisions for climate-risk management and climate-resilient development are identified, implemented and sustained as an integrated part of achieving sustainable development as framed by the AU's Agenda 2063 and the United Nations (UN) Agenda 2030 for Sustainable Development.

This Strategy supports the commitments made by African countries under the 2015 United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement and is guided by the existing national climate efforts and aspirations of its 55 Member States, as expressed through Nationally Determined Contributions (NDCs) and long-term, climate-resilient development and decarbonization visions contained in member countries' Long-Term Strategies (2050). The continent consists of diverse landscapes, ecosystems and weather systems, which are impacted differently by climate change. It is recognised that each Member State will respond in a self-determined manner to the impacts they experience, based on their unique national circumstances and capacities to respond. While recognising differences in national contexts and circumstances, this Strategy builds upon the shared challenges and opportunities for the continent. Agenda 2063 expresses a vision for the continent's future as an 'integrated, prosperous and peaceful Africa, driven by its citizens and representing a dynamic force in international fora'. Agenda 2063 emphasises that the achievement of climate-resilient economies and communities is an integral part of this vision and commits the region to play its part in supporting global climate action. The development visions and commitments expressed in Agenda 2063 therefore form the basis of the Strategy.

The Strategy is also aligned with several global frameworks, including the 2030 Agenda for Sustainable Development with the Sustainable Development Goals (SDGs), the UN Convention for Biological Diversity and the Sendai Framework for Disaster Risk Reduction. It's also aligned with existing regional protocols, policies and strategies that govern key sectoral and thematic

actions of relevance to the region's climate response. This includes continental frameworks such as the Comprehensive African Agricultural Development Programme (CAADP), the Programme for Infrastructure Development in Africa (PIDA), the Science, Technology and Innovation Strategy for Africa, the Accelerated Industrial Development for Africa initiative, as well as the AU's Green Recovery Action Plan, and many others. The Strategy further builds on existing work under various initiatives, including – but not limited to – the Africa Adaptation Initiative, the Africa Renewable Energy Initiative, the Africa Blue Economy Strategy, the Pan-African Action Agenda on Ecosystem Restoration for Increased Resilience, the Great Green Wall Initiative, the Climate for Development in Africa Programme, and the three regional Climate Commissions (the African Island States, the Congo Basin, and the Sahel). (See **Appendix 2** for a more comprehensive list of strategies and protocols). It also seeks to complement and support the climate strategies and green growth plans of Africa's Regional Economic Communities (RECs).

The Strategy provides a robust framework for ensuring climate justice for Africa and Africans through inclusive and equitable participation in climate action and future climate-resilient development pathways. There are disproportionate impacts of climate change on youth and women – and these are shortcomings that we address. Similarly, a consolidated platform is provided around which partnerships can be built with non-governmental and civil society organizations, as well as the private sector. These stakeholders are also needed to advocate for the continent's adaptation capacity, champion Africa's needs and priorities, and play an important support role for the implementation of actions and to monitor the Strategy's outcomes. Future planning for climate-resilient development will require strategic interventions and actions that consider multiple trends, drivers and uncertainties throughout the continent. It will necessitate the strengthening of governance systems and policy responses to enhance climate-resilient development. This includes planning tools that can help Member States to develop and implement policies to address both current and longer-term existential threats and assist governments to move away from reactive crisis-management approaches to dealing with climate risks. These anticipatory practices can help the region to manage and plan for future risks – and ultimately, to better protect vulnerable people and their livelihoods.

The Strategy can also assist Africa to take advantage of opportunities related to the transition to a low-carbon green economy and green recovery efforts.



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Opportunities that catalyse the socio-economic transformation in Africa towards a resource-efficient, environmentally sustainable, climate-change resilient, and more equitable society, can be exploited. Some of these opportunities within the SDG framework will result in improved human well-being and economic growth over the long-term, while mitigating the exposure of future generations to significant environmental risks and ecological scarcities, which are in line with international trends and sustainable development.

The African Development Bank (AfDB) estimates that Africa will need investment of over US\$3 trillion in mitigation and adaptation by 2030 to effectively implement its NDCs. While the Africa region has been consistent in its call for developed countries to support developing regions in addressing the financing, technology transfer and capacity building needs related to ambitious climate action, there is also a need for enhanced domestic resource mobilization and capacity development in support of African-led and African-owned climate responses.

The Strategy therefore seeks to build the continent's capacity to utilise new evidence and knowledge that influences global discussions and agreements. It also addresses the means needed to tackle the implementation of climate policies and plans – including finance, insurance mechanisms, technology and inclusive partnerships. Monitoring and evaluation will be an integral component of the Strategy to allow for it to be adequately tracked and implemented, recognising that the region has insisted that ambitious climate action relies upon adequate financial, technical and capacity building support.

The Committee of African Heads of State on Climate Change (CAHOSCC) was established in 2009 by the AU Assembly of Heads of State and Government to spearhead the African common position on climate change and ensure that Africa speaks with one voice in global climate-change negotiations. The African common position, which evolves in response to the progress of the negotiations and changing circumstances on the continent, is achieved through sustained consultations at the national, REC and the African Group of Negotiators (AGN)-levels. The outcome of these consultations is tabled for approval by the African Ministerial Conference on the Environment (AMCEN) and endorsed by the CAHOSCC. This is the position that guides the AGN members in their engagement at the UNFCCC, its mechanisms, bodies and panels. (For more information on the AU organs and decision-making structures, please see **Appendix 1.**)

A well-orchestrated and coordinated African agenda on climate change with common targets, indicators and milestones is key for a stronger climate change response and voice. This Strategy will help to determine Africa's common priorities, and it is key to guiding the AGN positions. It will also help to streamline approaches in implementing climate action – bringing about synergies, efficiencies and economies of scale.

This requires visionary leadership and partnership development that enables Africans to speak with one voice – which will strengthen its international presence, its negotiating power and the attainment of its climate change goals.

02

STRATEGIC FRAMING

This Strategy is a 10-year strategic planning document that defines the main priorities, intervention areas and action areas required to build resilient capacities for adaptation – and to unlock the benefits of mitigation-potential for the continent. It is designed as a living document to keep pace with the latest science, technological advancements and other global, continental, sub-regional and national developments. As such, the Strategy will be revised every five years.

In realization of a shared vision for a prosperous, secure, inclusive and innovative future for Africa, the Strategy outlines priority areas, sector-based adaptation interventions and actions for adaptation according to the level of associated vulnerability of the region to climate change. Strategic interventions and actions for mitigation are mainly aimed at responding to national and regional problems that are similar but under different responsibilities and capabilities. Responses can however be beneficial to all.

The overarching objective of this Strategy is to enhance the adaptive capacities and resilience of Member States with a view to minimising their vulnerability; pursue a low-carbon growth path dictated by the principles of the green and circular economy, sustainable development, and poverty reduction; and orient governance, knowledge systems, planning, and national/regional/international structures to addressing climate change as a development imperative. This includes policy development capacity; capacity building for policy engagement; and the capacity to engage new topics.

2.1 Vision

A sustainable, prosperous, equitable and climate-resilient African continent by 2063.

2.2 Goal

To provide a continental framework for collective action and enhanced cooperation in addressing climate change issues that improve local livelihoods and well-being, promote adaptation capacity, and achieve low-carbon, sustainable economic growth that contributes fairly towards preserving a global good.

2.3 Overall Objective

Building the resilience of Africa to withstand the impacts of climate change through promoting climate-resilient development.

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2.4 Specific Objectives

1. Reducing the vulnerability of affected communities and managing the risks related to climate change and climate-induced extreme events.
2. Pursuing equitable and transformative low, carbon climate-resilient development pathways.
3. Enhancing Africa's ability and capacity to mobilise resources and access technology to facilitate ambitious climate action, as well as to engage and develop policy making processes.
4. Enhancing inclusion, alignment, cooperation, and ownership of climate strategies and plans across all spheres of government and stakeholder groupings.

2.5 Strategic Intervention Axes

The Strategy's objectives will be achieved by concentrating on three main strategic intervention axes, namely:

- **Strategic Intervention Axis 1:** Strengthening Policy and Governance
- **Strategic Intervention Axis 2:** Pathways towards Transformative Climate-Resilient Development
- **Strategic Intervention Axis 3:** Enhancing Implementation towards Climate-Resilient Development

Under Strategic Intervention Axes 1 – 'Strengthening Policy and Governance', – the Strategy highlights five key policy and governance interventions areas and associated actions that are needed to pursue climate-resilient development. These include:

1. Enhanced climate policy, multi-scalar governance and institutional coordination
2. Anticipatory governance and long-term planning
3. Enhance climate information services
4. Improved climate literacy and awareness; and,
5. Governance solutions to address the climate-conflict nexus.

Strategic Intervention Area 2 – 'Pathways towards Transformative Climate-Resilient Development' – identifies key systems transitions that must be transformed to address climate change, achieve a resilient and low-carbon future, and support natural capital and biodiversity. These systems face significant

climate change impacts as well, making adaptation action critical across all eight areas. These systems are also critical to achieving a countries broader development goals. They require participation and collective action from the public and private sector to reduce the trajectory of emissions and limit climate vulnerabilities, but also to unlock major economic opportunities and create new markets and jobs. Interventions that support these key transitions will need to consider macroeconomic and fiscal impacts, in addition to managing social and labour impacts.

Aligned with the World Bank Outlook 2020, this Strategy identifies eight cross-sectoral opportunities that are essential for achieving climate-resilient development pathways and accomplishing the SDGs. It provides recommended interventions and actions for each priority area:

1. Transforming food systems
2. Protecting land-based ecosystems and carbon sinks
3. Transforming energy systems
4. Transforming mobility (reference to cities)
5. Building low-carbon, more resilient urban areas
6. Transforming water systems
7. Transforming the ocean economy
8. Digital transformation

The Strategy also requires strategic areas for intervention support. Strategic Intervention Axis 3 – 'Enhancing Implementation towards Climate-Resilient Development' – is centred on the following key priorities:

1. Climate finance and resource mobilization
2. Promoting safety mechanisms for loss and damage, including climate insurance
3. Technological development and transfer
4. Inclusive participation of marginalised and vulnerable groupings, especially women and youth
5. Capacity development

Monitoring and evaluation has also been incorporated to allow for tracking and measuring the successful implementation of the Strategy.



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2.6 Guiding Principles

The Africa Climate Change Strategy and Action Plan is guided by seven fundamental principles that drive the African Union and member countries' work across all sectors:

- 1. A People Centre Approach:** People must benefit from the transition to a low-carbon and resilient future. They are at the centre of climate action and need support to manage the transition and changes that accompany climate-focused policies. A people-centred approach is essential for the political feasibility of climate action – and to ensure that gains and losses from the transition to a low-carbon, resilient economy are shared equitably. This approach requires citizen engagement and participatory processes that consider diverse viewpoints – including gender and youth. The Strategy will mainstream gender- and youth-sensitive approaches to climate action on the ground, as well as increase support for social protection programmes. This includes job training, retraining and education initiatives that assist people to adapt to climate change. To promote a people-centred approach, the Strategy must be owned and driven by the inclusion of stakeholders and partners. This is best achieved through the collective development and implementation of the Strategy – guided by multilevel stakeholder participation and multi-sectoral engagement. To encourage stakeholder support, a public participation process of comment on this draft strategy within each Member State is strongly encouraged. This includes the important collaboration with development banks, international organizations, monetary and financial institutions – including central banks, institutional investors, the private sector, think tanks and civil society organizations to complement our work.
- 2. Conserving and restoring natural capital:** Natural capital is critical to address climate change in Africa. The conservation of natural capital – including biodiversity and ecosystem services – can contribute significantly to both mitigation and adaptation, while simultaneously producing multiple socio-economic co-benefits. Scaling up investments to strengthen and expand the waste value chain, including addressing marine plastics and land pollution, is critical to generating a sustainable circular economy.
- 3. Aligning plans and priorities:** The alignment of existing development plans alignment of existing national development priorities, Agenda 2063, SDGs and post-COVID recovery plans. Co-benefits with these agenda should be promoted.

4. **Leave no one behind/a just transition:** The Strategy must address issues related to equity and justice, given that climate change has the potential to exacerbate current inequality throughout the continent. This includes procedural, distributional and recognition justice, especially in relation to who is most vulnerable, where the burden of adaptation lies, and how to mobilise resources for adaptation.
5. **Evidence and practice:** The Strategy must continue to draw on the best available science, knowledge and practice within the international, regional and national context. This should be based on existing experiences, climate science and traditional knowledge and practices.
6. **African-led and African-owned:** Built on the foundations of Agenda 2063, the continent must generate its own dynamic scientific, technological and entrepreneurial capability, and innovate new, predictable and sustainable sources of funding for its response to climate change that includes Africa's social and cultural values and natural capital endowments.
7. **Whole of economy approach:** Integrated, cross-sectoral and holistic manner throughout national and regional economic planning. The Strategy considers and integrates a systems approach to climate change sectors.

2.7 Beneficiaries/Stakeholders

The success of this Strategy is highly dependent on the active commitment and involvement of the main beneficiaries and stakeholders in its development and implementation. These players involve government institutions, individuals, social international organizations, funding agencies, etc. It is important that the Strategy helps to clarify the mandate, role and responsibility of each organization, particularly as it relates to the Strategy.

They include, but are not limited to, the following:

- The AUC
- Regional institutions such as the AfDB, the African Union Development Agency-New Partnership for Africa's Development (AUDA-NEPAD), United Nations Economic Commission for Africa (UNECA)
- AU technical and negotiating structure such as AMCEN, AGN, CAHOSCC
- RECs
- Heads of State of the 55 AU member countries
- Technical institutions responsible for implementing actions
- National policy institutions
- National scientific and meteorological institutions
- Health institutions
- National and regional research centres
- Non-governmental organizations
- Public and private sector entities
- Women's organizations
- Youth groups
- Farmer groups
- Communities and citizens
- International organizations, including UN agencies
- Technical collaborators
- Development partners
- Financial institutions.

2.8 Methodology

Appendix 3 illustrates the regional stakeholder and outreach meetings hosted by the African Union Commission in collaboration with UNECA on the Strategy. Extensive feedback was received from key stakeholders from various RECs, academia, UN agencies and civil society organizations. These comments and recommendations have been incorporated to produce a more detailed draft of the Strategy. Multiple sectoral experts were also directly approached for their specific input. Please see a list of contributors in **Appendix 4** of this document.



03

CONTEXT AND JUSTIFICATION

3.1 Africa's Climatic Change Conditions and Vulnerability

The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (2021) indicates that it is unequivocal that human influence has warmed the atmosphere, ocean and land and that widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. The average global temperatures for the past five years were the highest on record.

The future annual global mean near-surface temperature is likely to be at least 1°C warmer than pre-industrial levels each year over 2021-2025. Global warming levels (GWLs) of 1.5°C and 2°C will be exceeded during the 21st century, unless there are rapid and large-scale reductions in CO₂ and other greenhouse emissions in the coming decades. Moreover, global surface temperatures will continue to increase until at least the mid-century – under all emissions scenarios considered. As the warming continues, an increase in the frequency and intensity of hot extremes, marine heatwaves and heavy precipitation is projected, as well as agricultural and ecological droughts in some regions, as well as reductions in Arctic sea ice.

Africa's particular aridity deserves special attention pertaining to climate change as it is the driest of the world's continents, with 45% of its land mass falling under dry lands and 50% of the population living in arid, semi-arid, dry, sub-humid and hyper-arid areas. It is forecasted that climate-change induced water stress could affect up to 700 million people in arid and semi-arid areas (UN Decade for Deserts and the Fight Against

Desertification, 2011). The impacts of climate change add to the already difficult water management challenges in arid and semi-arid regions.

Since 1797, the number of extreme hot days in Africa have increased sevenfold. The continent is projected to see an increase in average temperatures and hot extremes, and will likely experience drier conditions, with the exception of the Sahara and East Africa. Alarmingly, it is likely that surface temperatures in Africa will rise faster than the global average, particularly in more arid regions. Warming between 0.5°C and 2.5°C (relative to the 20th century mean) is projected by mid-century for Africa under all scenarios. Under medium scenarios, it is very likely that warming will stay below 2°C. Under high scenarios, all African regions will very likely experience warming greater than 3°C by the end of the century. Africa is likely to experience an increase in droughts in several regions. Heavy precipitation events and associated flooding are projected to increase in frequency and intensity almost everywhere in Africa.

The African continent is characterised by different climatic regimes, ranging from extremely arid to very humid conditions that remain highly variable and unpredictable. The IPCC divides the African continent into nine regions: Sahara (SAH), Mediterranean (North Africa), Western Africa (WAF), Central Africa (CAF), North East Africa (NEAF), South East Africa (SEAF), West Southern Africa (WSAF), East Southern Africa (ESAF) and Madagascar (MDG).

Temperature

A substantial increase in the magnitude of heat waves is projected for most of Africa, with potential effects for health and agriculture. For 2°C global warming (and under RCP8.5), mortality-related heat stress and deadly temperatures are projected to become more frequent in the future. This is particularly the case for equatorial regions where heat occurs with higher humidity levels. North Africa, the Sahel, and Southern Africa will experience the largest increase in heat stress. Cold spells and low temperatures will decrease in West, Central and East Africa.

Precipitation

Total precipitation is projected to decrease in the northern and southern regions of Africa, while West and East Africa have a west-to-east pattern of decreasing-to-increasing precipitation. Most African regions are going to experience an increase in heavy precipitation events that could lead to pluvial flooding. Under 1.5°C and 2°C global warming, West and Central Africa, in particular, are projected to experience an increase in the intensity of extreme precipitation, threatening widespread flood occurrences before, during and after the mature monsoon season. For 2°C GWL, extreme precipitation is also projected to increase in several other regions – including SAH, NEAF, SEAF, ESAF and MDG.

Projected declines in precipitation and soil moisture indicate an increase in aridity over the 21st century for NAF, WSAF, ESAF and MDG, with low confidence for other regions. A growing number of studies indicate expanding aridity in East and West Africa.

Under 1.5°C and 2°C GWL, regional models project a substantial increase in hydrological drought affecting the West African basin. Given that global models disagree, confidence in these projections is however low. An increase in agricultural and ecological drought at 2°C GWL is projected for North Africa, WSAF, ESAF and MDG, and generally rises for higher emission scenarios. Southern Africa has been identified as a drought 'hottest spot' in Africa. Weather conducive to wildfires is also projected to increase in North and Southern Africa before the middle of the century.

West African Monsoon

Monsoon precipitation is projected to increase over the central Sahel and decrease over the far western Sahel. The monsoon season is projected to have a delayed onset and delayed response.

Wind and storms

By mid-century, there is high confidence of a decrease in windspeed and wind energy potential for North Africa, and medium confidence in increases for South and West Africa. Tropical cyclones making landfall are projected to decrease in frequency in eastern parts of the continent, and overall there is medium confidence that there will be a general increase in their intensity.

Coastal and oceanic

Coastal- and ocean-related hazards will increase over the 21st century. Relative sea level rise will contribute to increased coastal flooding in low lying areas and shoreline retreat will occur along most sandy coasts. Median shoreline change projections relative to 2010, under RCP4.5, show that shorelines in Africa will retreat by between 30m (SAH, NEAF, WSAF, ESAF, MDG) and 55m by mid-century (WAF and CAF). By 2100, marine heatwaves will increase around Africa, with a hotspot of around 2°C (5°C) along the 24 coastlines of South Africa under RCP4.5 (RCP8.5).



Photo: ©TheHumanitarianCoalition.ca

3.2 Africa's Socio-Economic and Development Context and Climate Change

The IPCC defines climate vulnerability as the degree to which a system is susceptible to, and unable to cope with, adverse impacts. Africa is one of the most vulnerable continents due to its high exposure and low adaptive capacity. The continent's peculiar vulnerability is caused by the effects of multiple stressors – notably by low adaptation and mitigation capacities, fuelled by scant finance and investments. The UN State of the Climate in Africa (2019) report shows that there are increasing climate change threats for ecosystems, biodiversity, human health, food and water security and socio-economic development in Africa due to climate hazards such as increasing temperatures, rising sea levels, extended dry seasons, changing precipitation patterns and more extreme weather events. Improving the continent's climate resilience is key to unlocking its development potential. Climate change is estimated to cost the region US\$40 billion each year to 2030.

Globally, economic systems are growing in fragility, as increased sectoral co-dependence and the quest for increasing efficiencies lays them open to rapidly propagating shocks. The COVID-19 pandemic is an example of an unexpected and unprecedented event with impacts cascading across national borders. As is typically the case, the impacts have been felt most strongly by those with the lowest levels of wealth and resilience.

Africa's development context is defined by many factors in addition to a warming climate. With respect to **demographics**, the continent is expected to experience the highest rate of population growth globally in the coming decades, although there is considerable range in the level of projected increase, depending particularly on changes in total fertility rate. The population increase could be between 50-300%, depending on the assumptions used. All scenarios see a substantial **youth bulge** up to mid-century and beyond. Africa's **urban population** is projected to expand threefold from 360 million in 2015 to 1.137 billion by 2050, with 55% of the continent's population living in urban areas by mid-century. Increased urbanization, along with slowly rising incomes, will continue to drive **dietary transitions** to increased consumption of highly refined food high in calories and fat, while for rural and poor groups, high levels of food insecurity and nutritional deficits are likely to remain. Africa in general is squeezed by a **double burden of health risks**: on the one hand, undernutrition and stunting – as well as high vulnerability to communicable diseases such as HIV/AIDS and malaria; and on the other, inadequate diets leading to obesity and a surge in non-communicable

diseases. Although great strides have been made in reducing **food insecurity** in recent decades, there have been increases in the number of food insecure people in Africa since 2018.

Gender inequality, with women having less political, social and economic power than men, continues to be a major challenge in Africa, which is the least gender-equal of all regions of the globe, according to the 2019 SDG Gender Index – though some improvements have been achieved with participation in political representation and schooling for females. Africa has made some progress in achieving universal access to primary school **education**, with 70% of school-aged children enrolled, though drop-out rates are over 10% in most countries and secondary and tertiary school enrolment levels are low: typically 50% in lower secondary, 30% in upper secondary and under 15% in tertiary for most countries.

Africa continues to see high and persistent levels of **extreme poverty**, with significantly higher levels in rural areas. In general, low levels of **economic growth** and high levels of inequality in access to key productive assets inhibit successful and broad poverty reduction. The systems of **land tenure** are highly diverse across the continent, but customary systems are important for most. More transparent and equitable land tenure systems, that allow greater access and security of women to land, are needed. More than 90% of farms in Africa are less than five ha in size; although in some regions there is growth in medium-sized farms, the small farm sector and some of the pastoral lands are seeing increasing **fragmentation**. The contribution of the agricultural sector to GDP is highly variable across the continent, though it is often the most important sector for employment. Increasing **youth unemployment** is a major challenge, along with increasing **food prices**, despite increased food imports and some expansion of food production. **Land degradation** remains a major constraint to raising the continent's agricultural productivity, owing to poor soils, reduced fallows, and nutrient mining. Much of Africa is characterized by low levels of **energy access**, particularly in rural areas. Energy demand is projected to grow rapidly to mid-century due to growth of the industrial sector, which creates opportunities for the expansion of energy production from decentralized and renewable sources, particularly wind, hydro and solar.

These are serious challenges, but at the same time, opportunities abound – in two realms in particular: innovation and localization. Some argue we are in The Great Acceleration, an era of unprecedented and

increasingly rapid socio-economic and earth system changes, and this includes the rate of technological change. Transformation of energy and food systems offers a host of potential entry points for effective poverty reduction strategies based on innovation bundles and appropriate enabling conditions. There are already African examples in the domain of information and communications technology, for example. Innovation can be fostered and accelerated by broadening participation in innovation dialogues, novel financing of discovery for open-source innovation, and reforms of intellectual property regimes that can impede affordable access to and adaptation of new discoveries. For food systems, transformative change can be driven by behavioural and dietary changes that in many places are already underway, moving from calorie-rich but nutrient-poor diets with high costs to human health and the environment, to more environmentally sustainable food systems that could reduce the social burdens and economic costs of malnutrition and associated non-communicable diseases. At the same time, geopolitical shifts are discernible, and these give pause to notions of a global future characterised by ever more liberal trade, in part as a result of COVID-19 and other forms of disruption from climate change and frequent environmental disasters. This offers considerable opportunities for sustainable local and regional food systems to develop and meet the burgeoning demand of growing, increasingly youthful populations.

Business as usual is not an option; and the future is increasingly unlikely to be a predictable extrapolation of the past. By embracing the energy transition and green economy skills and technologies, Africa can position itself strategically within the global economy to support its vision of a prosperous, equitable continent that represents a dynamic force in the international arena.

Green recovery and COVID-19

Within this context, COVID-19 represents the biggest global economic shock since The Great Depression and will hit Africa particularly hard due to existing vulnerabilities. The World Bank estimates that an additional 23 million people will be pushed into extreme poverty and 20 million jobs could disappear, costing Africa up to US\$500 billion in revenue. Food insecurity and debt are rising, and hard-won development gains are being lost. Many countries entered the COVID-19 crisis with significantly greater debt vulnerabilities than they had at the start the global financial crisis. In the

years leading up to COVID-19, the composition of debt held by many African countries shifted away from traditional multilateral and concessional lending to both non-Paris Club official creditors – including China, Gulf States and India – and privately held, non-concessional loans. In addition, levels of debt held by African countries also increased over this time, averaging debt-to-GDP ratios of above 50%, with several outliers having ratios in excess of 100%.

Before the pandemic, the majority of African countries had fiscal deficits in excess of 3%. Post COVID-19, the debt situation has resulted in a lack of fiscal space for Africa to simultaneously respond to the pandemic, build resilience to climate change, and get back on track to achieve the SDGs in this Decade of Action.

The United Nations Secretary-General's policy brief on the impact of the pandemic in Africa recognises that, in addition to the health impact, indirect consequences such as food insecurity, a lack of medical supplies, loss of income and livelihoods, looming debt crisis, as well as related security and political risks will be significant. As the COVID-19 pandemic unfolds globally and in Africa, the situation remains fluid and rapidly evolving, and urgent responses, interventions, measures and responses are required. It calls for increased agility and heightened responsiveness from African states and other agencies to intervene and contribute positively in a timely and meaningful manner. There is a need to seize the opportunities in the recovery from the pandemic to support the transformation of the continent towards a more inclusive and sustainable future. As such, the recovery from COVID-19 is an important opportunity to deliver cleaner, healthier, more resilient and more inclusive economies and societies, accelerating progress towards the 2030 Agenda for Sustainable Development and the goals of the Paris Agreement.

Health

Human health will be negatively affected by climate change and its impacts, which can modify the transmission of diseases such as cholera, malaria meningitis, and zoonotic diseases such as Ebola and coronaviruses. The death rate from climate change is 60 to 80% higher in Africa than it is in the next most vulnerable region (Southeast Asia) due to pre-existing vulnerabilities and the weakened ability of Africa to adapt to the impacts of climate change. These results imply that there will be up to 70,000 additional

deaths in Africa by 2030 because of climate change, with malaria and diarrhoea responsible for the largest proportions of these deaths. Furthermore, climate change-induced floods and cyclones can lead to contamination of water supplies, increasing the prevalence of vector-borne diseases. The health of animals and other plants that humans depend on is not spared as they are also impacted by climate change in ways that are still yet to be fully understood.

The COVID-19 pandemic has also highlighted the inextricable link between human health and the health of the environment. Recent research suggests that the emergence of new human diseases is closely linked to loss and degradation of ecosystems and habitats, which in turn is driven by climate change, resource extraction, urban and agricultural expansion and pollution.

Finally, it should be recognised that transitioning to renewables have direct health benefits in terms of air quality. Combustion fuels like coal, oil and natural gas release pollutants that lead to widespread respiratory disorders, the exacerbation of asthma and other severe health implications. Replacing biomass (wood and charcoal) as a cooking and heating source with solar cookers and electric-powered appliances (which can be powered by renewable sources) will also have significant direct positive health impacts.

Climate, conflict, movement and human security

Changes in climate, demography and urbanization are rapidly changing Africa's security landscape. By 2050, parts of Africa will become hotter and more arid while others will become increasing more prone to flooding, rising sea levels, and related natural disasters. This may continue to increase international migration and see levels of internally displaced persons grow, while also creating competition for resources. Over the next decade, the continent's proportion of people of working age is projected to increase sharply and new entrants to the job market may find it increasingly difficult to gain employment. Increased urbanization and internal displacement will cause a rise in the number of urban dwellers living in slums. In this context, a lack of service delivery, unemployment and underemployment, and political and social marginalization will make vulnerable groups, and particularly youth, more susceptible to recruitment into various forms of violence.

Nevertheless, movement or migration is an adaptation strategy employed by hundreds of millions of people, both in response to negative stimuli and as a means of pursuing a worthwhile life. Migration decisions are highly context-specific and vary according to interactions



between economic, political, social, cultural, demographic, and other factors that operate across scales to create vulnerability and adaptive capacity. Migration outcomes reflect a continuum of agency, from voluntary movement to involuntary displacement, and a continuum of time scales, from temporary, seasonal to permanent, and spatial scales, from local to regional to international. Despite narratives that can portray international migrants as a threat to national security, the overwhelming majority of those who migrate are peaceful, productive, and bring many economic and social benefits to the places they settle as well as to the places they leave.

Climate change undermines human security and acts as a driver of conflict in Africa under certain circumstances and through different pathways. Defining a direct causal link between climate change and conflict can be challenging. For example, statistical studies have found no direct causal link between precipitation levels and violent conflict. Rather, climate change undermines human security and drives local conflicts and other types of violence by interacting with other intervening variables, such as social, political, and economic marginalization; water scarcity and resource competition; food insecurity; low



Urbanization and cities

It is anticipated that more than a quarter of the world's fastest-growing cities are in Africa and that by 2050, its urban population will have tripled. This exponential growth, coupled with weak governance structures, limited infrastructure and resources, high levels of poverty, a growing demand for resources, lack of reliable data and limited service delivery, puts immense pressure on local and regional governance, ecosystems and infrastructure, and increases the vulnerability of urban populations to climate change and other impacts.

It is estimated that 59% of sub-Saharan urban populations live in informal settlements, slums or peri-urban areas. Despite an increase in improved housing from 11% to 23% from 2000-2015, 53 million urban Africans were still living in unimproved housing in 2015, often in highly overcrowded conditions. Despite growing faster than other areas, large deficits in city infrastructure and public service provision exposes much of the population to high levels of risk.

Linear transport infrastructure, such as roads, railways, and pipelines, are expected to rapidly expand in the coming decades across Africa. In sub-Saharan Africa, dozens of development corridors have been proposed or are being created, involving large-scale expansion of infrastructure such as roads, railroads, pipelines, and port facilities and will open up extensive areas of land to new environmental pressures. There is a high likelihood that these new and existing investments in infrastructure risk exposure from extremes weather events (for example flooding could lead to destruction, water canal blockages, waterway diversions, and downstream sedimentation). These risks can be lowered through rigorous mitigation and protection measures, strategic foresight, and appropriate environmental regulations, licensing, contracting and enforcement of regulations, together with well monitored and deliberate investments, and inclusion in planning with the communities which are both impacted and dependent upon them.

Africa is known to be one of the most rapidly urbanising continents. In this way, Africa's urban transition is a key global game-changer: the way that African cities develop will determine whether or not we achieve our collective global climate mitigation and adaptation targets, SDGs, biodiversity, poverty and inequality targets, and resource sustainability. About 60% of the built environment that African cities will require has yet to be built, and if this is laid into place using business-as-usual and conventional approaches, we will not meet our development goals. Therefore, there is global interest in ensuring that Africa urbanises sustainably, and incentive to support this pathway.

economic development; weak institutions; population displacement and migration, among others.

It must be noted that conflict and human security threats are multi-layered and highly complex, even without climate change as a contributing factor. Climate-induced risks may only be one factor to exacerbate existing issues, which is why climate change is often described as a threat multiplier/ intensifier/ catalyst. However, the importance of climate change as a threat-multiplier should not be underestimated or trivialised.

Climate change may contribute to an increase in the frequency and intensity of conflict and human security issues on the continent, creating protracted and multifaceted humanitarian and security crises that will strain the capacity of the African Union Peace and Security Architecture (AUPSA) and other peace and security mechanisms to effectively respond. Recent framings in the research literature highlight the past and potential effectiveness of migration in all its forms as a means of adaptation, and there may be a considerable role for governments in normalizing and facilitating the movement of people in situations where climate variability or conflict pose an acute risk.

The growth of cities is also one of the primary drivers of the loss of urban natural assets, which undermines the quality and functioning of ecosystems, and thereby diminishes the ability of nature to provide the very services on which our growing urban communities - and in fact, all life on Earth - ultimately depend. This loss undermines the resilience of city-regions and ultimately impacts on social-economic systems, governance as well as human health and well-being. To sustainably accommodate urban growth, cities must 'think beyond the city limits' to develop mutually beneficial urban-rural linkages, and territorial scale development, to invest in regeneration and the renewability of their urban, peri-urban and hinterland natural environments, and embrace a planning approach that puts the ecological landscape first, before embedding urban development. This landscape approach can improve the circular economy at the city region scale, aid in disaster risk reduction, draw attention to ecosystem service synergies and promote agroecological food systems localization.

African cities, while currently responsible for a negligible amount of total global GHG emissions, are also under significant threat from climate change, which significantly exacerbates all the conditions mentioned above. Changes in precipitation levels likely increase in temperature extremes and rising sea levels will have a wide range of direct and indirect impacts on Africa. To adapt to these future climate challenges, it is important for decision-makers in to help reduce the negative consequences for society and, in particular, to protect vulnerable groups. Referring to sound research, it is necessary to understand what the future changes to the climate are likely to be (especially at a downscaled level), how impacts will be distributed across different regions, the direct and indirect impacts of these changes, and the appropriate adaptation responses to these impacts.

Furthermore, ensuring climate considerations are embedded in all city-planning policies – not just in standalone climate plans – is crucial to ensuring resilient and sustainable development. Climate change is a multi-sectoral issue. It will affect all of us, in multiple ways, and therefore integrated and systemic approaches are needed.

Harnessing the skills and opportunities within all municipal departments is therefore vital. And perhaps even more vital is proactively securing finance for climate change and sustainability actions – to ensure that they don't just remain in policies, but lead to tangible, on-the-ground change. Fortunately, African cities are not alone in this effort, and both regional and international networks for learning and exchange

between cities and territories have been rapidly evolving to bolster this urban transformation toward resilience (Local Governments for Sustainability (ICLEI), C40 cities, United Cities and Local Governments (UCLG) and others).

Inadequate human, financial and technological resources

While Africa has achieved significant development gains in recent decades, the continent still lags behind other world regions in terms of many social and economic development indicators. Financial resource constraints, inadequate skills development and governance challenges all contribute to this reality. Planning and implementing effective climate responses at local, national, sub-regional and continental levels, while at the same time addressing other developmental challenges, requires appropriate and effective institutional structures and coordination mechanisms.

A key challenge stems from insufficient data and capacity to generate accurate, site-specific forecasts regarding the changing climate. The regional and national climate information service centres are inadequately resourced to capture, analyse and effectively communicate climate data, undertake modelling, and make accurate, timely and user-friendly weather forecasts.

The competition for limited resources between responses to climate change and other pressing developmental needs undermines progress; when disasters occur, resources and capacities must be diverted from planned development actions to managing and recovering from the disasters. Yet, if a small proportion of the resources that are channelled into disaster relief and recovery is invested into effective early warning, preparedness and resilience-building, the negative impacts and reconstruction costs will be greatly reduced. Recovery would be faster and more resources would be invested to support development and prosperity.

Africa must continue to insist on appropriate, accessible and adequate support from partners in developed countries to address climate challenges. Such support includes financial, technological and capacity development components. At the same time, AU Member States should strengthen domestic resource mobilization, capacity development, and support domestic public and private investment in research and development, green technologies and climate information services.



Photo: © Felix Clay (Duckrabbitt)

Groupings particularly vulnerable to climate change

Gender

Gender norms and power structures play a critical role in determining how women and men of different backgrounds are impacted by, and respond to, climate change. Pre-existing inequalities, gender-related roles and expectations, and unequal access to resources can deepen inequality and leave some groups disproportionately vulnerable. Women are more exposed and vulnerable to climate change because they are often poorer, receive less education, and are not involved in political and household decision-making processes that affect their lives. Women are also more vulnerable to climate shocks due to their role in subsistence rain-fed agriculture and weaker access to resources and decision-making power. Research suggests that even after controlling for socio-economic characteristics, women still had about a 13% higher chance of experiencing moderate or severe food insecurity than men, and that their chance was close to 27% higher for being severely food insecure at the global level. As such, addressing inequalities is an essential part of building resilience and addressing climate and environmental challenges. Numerous studies indicate that if adaptation actions do not consider age and gender in their application, the loss of future livelihoods and educational opportunities will occur. This highlights the need to include gender and youth dimensions of climate adaptation at all levels.

Women and girls require support tailored to their specific needs to mitigate the changes that threaten their social and economic well-being. For example, women's participation at the political level has resulted in greater responsiveness to citizen's needs and increased cooperation. Conversely, if policies are implemented without meaningful participation of women, inequalities can increase and effectiveness decreases. Women, children and the elderly are the most frequent victims of natural and man-made disasters. Therefore, empowering women and building their resilience has a positive impact on the family and community. Access to education by women, young girls and adolescent females must be a priority in the fight against climate change, its impacts and poverty – which are interlinked.

Youth

Youth are among the key players identified in achieving the SDGs and Africa's developmental ambitions. Africa has the world's youngest population and future generations who are young today will experience significant climate change impacts over the course of their lifetimes if climate impacts are not efficiently and effectively managed. These include school disruptions, social and political disorders, food insecurity, diseases, and threats to water and sanitation services – to name a few. Today's young people will also enter the workforce in coming years as economies and industries are impacted by, and must respond to, climate change.

The 'Africa We Want' articulated in Agenda 2063 has a strong focus on children and the youth of today, as they are the elders and leaders of tomorrow and the key to the survival of mankind. African youth are projected to experience the worst impacts of climate change. As a result, their welfare and interests should not only be provided for, but their voices should also be heard – and they should play key roles in the development and implementation of solutions to the challenges they face – from today and going into the future.

3.3 Key Sectoral Challenges and Opportunities Related to Climate Change

While adaptation and resilience-building remain Africa's top priority, mitigation actions will also be required as part of the region's climate response. It is recognised that the continent has an immense mitigation potential due to its vast land mass, forests, agricultural systems and oceans. Africa also has unrivalled potential for renewable energy – especially solar – for its own development and export.

Africa's leadership has an opportunity to evolve and entrench a new ethos and establish pan-African networks for creating sustainable green jobs and livelihoods, based on enhancing the continent's natural capital, ecosystems and biodiversity. The continent's population demographics are an opportunity and latent strength, as most of the population is of school-

going age, and can therefore be equipped with the skills to become innovative and enterprising citizens supporting the realization of 'The Africa We Want.'

The continent possesses significant mitigation potential which, if fully unlocked, can attract substantial resource inflows to fund adaptation and resilience-building. The massive untapped source of clean renewable energy on the continent is an advantage for its own low-emission development, and potentially for powering and selling technology-driven carbon dioxide removal. Africa is well positioned to tap into the ever-rising global demand for clean energy, including green hydrogen, which is set to become the fuel of the future as the technology develops and costs are reduced. Climate-smart sustainable land and water use, agricultural practices and ecosystem management can transform Africa from a hungry continent into a net food exporter in a short period.

Climate actions are at times presented as a hindrance to growth or a diversion from more pressing development priorities. In truth, ambitious action in support of clean, low-carbon growth can position the continent strategically in terms of the skills, technologies and industries of tomorrow, thereby supporting job creation, global competitiveness and sustainable growth and industrialization.

As countries move from a focus on containing the COVID-19 virus to economic recovery, choices are being made that will shape trajectories on emissions, resilience, and biodiversity for decades to come. A clean and resilient recovery in Africa will lead to employment in the industries of the future, while ensuring that the region addresses the linked challenges of public health, prosperity and climate change. National or sectoral masterplans, climate change adaptation plans and the NDCs – as well as a host of other national plans – provide blueprints for action. Within this context, the AU's Green Recovery Action Plan (2021-2027) will tackle the combined challenges of the COVID-19 recovery and climate change, by focusing on critical areas of joint priority – including climate finance, renewable energy, resilient agriculture, resilient cities, land use and biodiversity.

Food systems, health and nutrition in a changing climate

A World Meteorological Organization (WMO) report on the State of the Climate in Africa 2019, indicates that recent years have witnessed some of the highest temperatures on record, with the latest decadal predictions, covering the five-year period from 2020-2024, showing continued warming and decreasing rainfall, especially over North and Southern Africa, and increased rain-fall over the Sahel. IPCC Assessment

Report 5 projects that extensive areas of Africa will exceed 2°C warming above pre-industrial levels by the last two decades of this century under medium GHG emission scenarios. IPCC projections suggest that warming scenarios risk having devastating effects on crop and livestock production and food security, with key risks to agriculture including “reduced [agricultural] productivity associated with heat and drought stress and increased pest damage, disease damage and flood impacts on food system infrastructure, resulting in serious adverse effects on food security and on livelihoods at the regional, national and individual household levels”.

Anticipated challenges

By the middle of this century, major cereal crops grown across Africa will be adversely impacted as they are at the edge of physical thresholds at which yields decline, albeit with regional variability and differences between crops. This includes primary sources of carbohydrates in African diets, such as maize, rice and millet, with each vulnerable to temperature increases, irregular rainfall and other deteriorating growing conditions. Other crops such as cassava may be more resilient to droughts and heat, but have far less support in terms of production-related research or infrastructure developed to provide sufficient substitute sources of nutrition.

The climate-related challenges to the livestock sector have also been evaluated in recent research, including the decline in quality and quantity of animal feeds and forage; a reduction in water availability; heat stress; biodiversity change; changes in the distribution and occurrence of livestock pests and diseases; and increased livelihood and income vulnerability affecting food security, purchasing power and resilience. Climate challenges to the livestock sector will need to be addressed at the same time as the sector responds to existing challenges. An assessment carried out in all regions of Africa determined that the livestock sector is not producing according to its potential due to multiple factors, including under-investment in more productive breeds, poor quality feed, poor disease control measures, low compliance with sanitary and phytosanitary standards, and poor planning or monitoring and a low commitment of resources devoted to improvements of rangelands and their management.

Climate change and increasing climate variability present a growing threat to food security and nutrition in Africa because of the region’s heavy dependence on climate-sensitive activities. The threat of these climatic uncertainties is linked to all determinants of malnutrition, ranging from underlying factors such as socio-economic status and environmental conditions to direct determinants such as droughts, floods, diseases and inadequate food and nutrient intake. It exacerbates malnutrition through three main

pathways: household food security, child feeding and care practices, and health. There is growing evidence that these effects are exacerbated by gender and social disparities between and within households and communities.

Africa (along with Southern Asia) is projected to be most exposed to an increased risk of hunger due to climate change. Malnutrition is a major cause of morbidity and mortality on the continent and statistics show that a quarter of a billion Africans suffered chronic undernutrition. 426 million experienced moderate food insecurity, 51% could not afford “nutrient-adequate” diets, and 11.3% could not afford “energy-sufficient” diets.

Health status affects how nutrients are absorbed and used by the body. Climate-change projections for Africa for the full range of emissions scenarios indicate that 350-600 million people will be at greater risk of water stress by the 2050s, and similar numbers at greater risk of heat stress and reduced labour productivity. In addition to the impacts on agricultural production, reduced health status affects food utilization and nutrition through increased incidence and prevalence of diseases such as diarrhoea, limiting nutrient uptake and further driving undernourishment.

Increasing frequency of very hot days is already having effects on the capacity of people to work in the fields, with major implications for livelihoods based on human labour, such as non-mechanized agriculture. Globally, rural labour capacity declined by more than 5% between 2000 and 2016. Further declines in labour capacity during the current century are very likely under all future climate scenarios.

By 2050, 54% of the projected increase in undernourishment globally will be in Africa, particularly sub-Saharan Africa. In sub-Saharan Africa, child malnutrition, measured by severe stunting, may increase by 23% by 2050, compared with a future without climate change. Climate change will continue to counteract the benefits of socio-economic development, exacerbated by rapid population growth.

Opportunities

The main challenge will be to establish the backbone infrastructure and services on the large scale needed to enable the majority of farmers in outlying areas to achieve a reasonably dignified life – as well as establishing mechanisms to ensure equity and fairness in sharing of risk and value along value chains. Digital technology offers significant opportunities for providing information, education, awareness and other climate risk management services at scale, speed and in a targeted and differentiated manner. It can also be used to enhance fairness and equity in the distribution

of risk and value. Policy innovations also have the potential to effect change at scale and at the lowest cost. Finally, the development of a new generation of data driven and ICT-enabled climate sensitive farmers, which is both environmentally and financially rewarding, is going to be a critical lever for the region's climate response. The development and selection of climate-resilient crops and breeds, using some of the new tools of genetics and genomics as well as traditional approaches, also represents significant adaptation opportunities for the agricultural sector.

Priorities for research and innovation needs to focus on addressing the fundamental challenges faced by farmers, which relates to policies, institutions, and society in general. The prevailing focus of research and innovation tends to concentrate largely on technical solutions and less upon the needs and opinions of farmers who are on the frontline of climate change and most exposed to the risks. Although entire agricultural chains are anchored on farmers as primary producers on the front-line of climate risk, the majority are uninsured and have no other adequate social safety nets. In addition, farmers' contribution to the management of various ecosystems is neither properly valued nor remunerated, yet they provide essential and valuable products and services.

Land-based ecosystems and carbon sinks

According to Swiss Re (2020), 55% of global GDP, equal to US\$41.7 trillion, is dependent on high-functioning biodiversity and ecosystem services. Regrettably, ecosystems and the services they provide, such as oxygen water and protection from flooding, are also affected by climate change and its impacts. Additionally, climate change is projected to decrease biodiversity and wetlands, leading to loss of soil and trees and the possible proliferation of zoonotic diseases. The poor and vulnerable communities mostly depend on ecosystem services and are therefore the most affected by the crisis.

If natural ecosystems continue to be degraded and habitat loss is left unchecked, human-wildlife conflict is inevitable and the experiences so far suggests that the odds are stacked against wildlife and ecosystems.

Africa is highly vulnerable to climate change, which is further exacerbated by the significant rates of land use change, population growth and industrial development.

Land-based ecosystems and the carbon sinks they comprise are concomitantly Africa's biggest risk and opportunity in the face of projected impacts of climate change. Terrestrial biodiversity conservation is dependent on the protection and restoration of key ecosystems such as forests, wetlands, grasslands,

highlands and coastal systems, which all serve as carbon sinks. Human-induced modification of the structure and function of many ecosystems through land use change and degradation (e.g., agricultural conversion, forest/grassland clearing and burning, urban expansion, mine and road expansion etc.) has significantly altered the relationships between natural carbon sources and sinks.

Africa's extensive tropical forests, mangroves and rangelands are critical land-based ecosystems in combating global climate change and provide valuable ecosystem services to its people. These ecosystems hold significant carbon stocks, 17.5 billion tons (Gt) of irrecoverable carbon, more than 12% of the world's total. Additionally, 62% of Africa comprises rangeland, mainly supporting extensive livestock production, wildlife conservation, and agro-pastoralism. Africa's rangelands contain 36% of the world's total carbon and, if fully restored, can sequester carbon in amounts equal to that of the Amazon rainforest. However, an estimated 700 million hectares of rangeland in Africa requires restoration.

Climate change poses a real threat to the African continent, with 85% of the people dependent on the natural environment to meet at least one of their basic human needs (shelter, energy for cooking, income, and clean water), and 65% dependent on subsistence agriculture for food production. This highlights the importance of the sustainable use and management of natural resources to maintain the livelihoods of people across the continent that are affected by climate change, while avoiding practices that contribute to environmental degradation.

Anticipated challenges

Globally, Africa had the highest net annual loss of forests (4.3 million ha) from 2010-2020, due to unsustainable agriculture, fuelwood harvesting and logging. Desertification affects approximately 45% of Africa's total land area, with 55% of this area at high or very high risk of further degradation. According to the IPCC, Africa will see increased droughts, which will continue to affect livelihoods, agriculture, water systems and ecosystems. Already, 18 of the world's 20 most food insecure countries are in Africa. Furthermore, two of the world's areas most vulnerable to ecosystem collapse within the next decade (due to resource scarcity and natural disasters) are in African rangelands.

Additionally, international interest in utilising African lands for NBS carbon dioxide removal activities may present unique governance challenges with regard to development trade-offs, land-use rights, safeguarding of biodiversity and food security, and water resources. Balancing potential financial benefits of these activities with risks may require new policy frameworks and collaboration.



Opportunities

Data indicates that nature offers more than 30% of the mitigation action needed by 2030 to limit the worst effects of climate change through natural climate solutions. In effect, Africa could reduce its greenhouse gas (GHG) emissions by 22% by implementing a multi-pronged approach to natural climate solutions that entails protecting key carbon ecosystems, avoiding further loss of nature and restoring important ecosystems. Therefore, many African countries could exceed their national climate targets through natural climate solutions alone. For example, innovative, regenerative farming approaches to livestock management that are community-driven, climate-smart and wildlife-friendly can support rangeland restoration at scale, making livestock farmers and pastoralists part of the solution, and enabling livelihood diversification and resilience. There is some experience in Africa of schemes that provide payments to land users for ecosystem services such as biodiversity conservation. Taking successful PES pilots to scale has considerable potential for helping to diversify livelihoods and increase resilience. Furthermore, modelling has shown that the protection of 30% of Africa's land area could reduce total species extinction risk by more than 60% under both 1.5°C (RCP2.6) and 4.5°C (RCP8.5) scenarios. This presents an opportunity for investment in protecting and restoring natural ecosystems to achieve not only climate benefits, but also biodiversity and social and economic development, thereby ensuring a green development pathway for Africa. Protecting and restoring Africa's ecosystems also has implications for the health of the population as land use change is increasingly linked to the occurrence and risk of zoonotic and vector-borne diseases.

Energy and infrastructure

Africa's energy systems face several climate risks. Extreme weather can lead to widespread damage to electricity generation, transmission, and distribution

networks. Higher temperatures reduce the operating efficiency of thermal generation, while simultaneously increasing energy demand for air conditioning. Reduced rainfall and associated streamflow can limit hydropower output and other water-dependent energy generation.

Several African countries are particularly vulnerable to reduced rainfall and runoff due to their heavy reliance on hydropower for generation. As of 2018, Africa had over 36 Gigawatt (GW) of installed hydroelectric capacity, roughly 20% of installed generation capacity, which was highly concentrated along the continent's major river basins. In East and Southern Africa (excluding South Africa), hydropower represents over half of electricity generation. In the Democratic Republic of Congo (DRC), Ethiopia, Malawi, Mozambique, Namibia and Zambia, hydropower accounts for over 90% of capacity.

Constrained hydropower generation due to reduced rainfall and runoff has already resulted in drought-induced electricity rationing in several African countries. The 2015-2016 El Niño drought led to severe reductions in electricity generation in Southern Africa due to low water levels at the Kariba and Cahora Bassa dams on the Zambezi River. Malawi, Tanzania, Zambia and Zimbabwe all experienced load shedding due to the drought. Zambia resorted to importing costly emergency power. The energy shortages resulted in a decline in the mining sector, along with overall economic growth.

Energy production is central to addressing developmental challenges, such as poverty, inequality, climate change, food security, health and education. Energy poverty can be defined as an absence of sufficient choice in accessing adequate, affordable, reliable, clean, high-quality, and safe energy services to support economic and human development. In Africa, climate change does not affect all members of the population in the same way. For example, women

¹ Energy justice refers to the need for social and economic equity in the energy system and the remediation of the social, economic, and health burdens of those historically affected by it.

and girls are the most at risk and require support tailored to their specific needs to adapt to the changes that threaten their social and economic well-being. This is most evident for women in rural areas who are particularly time-poor and the associated drudgery of their tasks is mainly fulfilled through their own physical labour, particularly fuelwood collection, fetching water and food processing. It is therefore critical that energy access programmes focus on women and promote energy justice¹ through better access to and control of energy resources, thereby contributing to the empowerment of women.

Anticipated challenges

Current actions to eradicate energy poverty and promote energy justice are falling short both in terms of scale and pace. Should this trajectory remain unchanged, more people will be without access to modern energy in 2030 than is presently the case. The climate risks that Africa's electricity systems will face in the future are heavily influenced by the infrastructure decisions that governments make in the near term. Hydropower plays a central role in African governments' plans to scale up generation. The African Union's (AU's) PIDA, along with other national energy plans (jointly referred to as PIDA+) aim to add 80 GW of hydroelectric capacity to the existing 36 GW, with an estimated cumulative cost of US\$75 billion over the period 2015-2050. The majority of these future additions would occur in the Congo (44.4 Megawatt (MW)), the Nile (21.4 MW), the Zambezi (8.2 MW) and the Niger (4.7 MW) river basins.

As African economies expand hydroelectric production, they risk becoming more sensitive to climate variability. The long lifespan of hydropower facilities means they are exposed to decades of climate variability. Current climate models disagree on whether Africa's major river basins will become wetter or drier. Regardless, future levels of rainfall, evaporation and run-off will have a substantial impact on hydropower production. The biggest risk to hydropower output is in the Zambezi River Basin, where the driest scenarios would see a 58% reduction in revenues relative to a scenario without climate change.

Opportunities

A global political commitment that goes beyond abstraction and sets out actions and associated benchmarks is required. Innovative and interdisciplinary approaches have been developed, notably, the operationalization of the energy justice framework has led to new energy justice indicators, such as affordability that includes opportunity cost (time and distance travelled). As research activities continue, it will be essential to integrate insights and lessons related to energy access and energy justice on an ongoing

basis. There are also opportunities related to off-grid and smart-grid solutions, designed around renewable energy technologies, to support rapid expansion of energy access. Investment opportunities can also arise from appropriate policy frameworks and programmes, such as South Africa's Renewable Energy Independent Power Producer Procurement Programme.

Climate change, transport and mobility

Transport systems in Africa are exposed to extreme climatic events and weather conditions, such as flooding (surface, fluvial and coastal), tropical cyclones, and high temperatures. The impacts of flooding on infrastructure can prove catastrophic for food security, communication, and the economy of affected regions. Simultaneously, transport systems can compound climate impacts, contributing to heat stress and air pollution. Increasing urbanization, motorization, and poor transport and urban planning exacerbates climate vulnerability and reduces the ability of cities to adapt. For example, in many African countries, the majority of poor urban residents commute by foot and are forced to walk through corridors of land unsuitable for development, such as swamps, floodplains, and hillsides, thereby increasing their exposure to extreme weather.

Anticipated challenges

Trade is crucial to food security, and transport infrastructure is the conveyance mechanism for trade. Food security in many African countries is exacerbated by a lack of resilient transport infrastructure. As critical trade routes face significant risk to disruption by climate impacts it is expected that food insecurity will worsen. Further, it is estimated that a direct liability of over US\$73.2 billion will be incurred to repair and maintain African roads damaged by projected climate change impacts, up to the year 2100.

Opportunities

Modelling suggests that proactive adaptation in the transport sector to account for temperature increases is a 'no regret' option in all cases, but precipitation increases should be considered on a case-by-case basis. By implementing adaptation measures, climate-related road maintenance could be reduced by 61% in Mozambique, 47% in Zambia and 43% in South Africa by 2050.

There is a dearth of literature on observed and projected climate impacts on the African transport sector. This presents an opportunity for research and innovation in the sector, to come up with timely solutions.

Water systems

Water is a key driver for development across the African continent and a critical enabler for productivity and sustainable economic growth. It contributes significantly to human development, poverty reduction, and the attainment of the African Union Agenda 2063 and the SDGs. Despite the critical role water plays towards economic and social prosperity, investments into Africa's water sector are not advancing at the rate needed to achieve SDG6. The AfDB estimates that investments totalling approximately US\$64 billion per year are required to meet the targets set out in the Africa Water Vision of 2025. The AfDB states that the current financial flows for water sector investment programmes are approximately US\$10.5 billion per year. Water systems across Africa are characterized by stark differences in both hydrological and climate dynamics that shape their risk and vulnerability to predicted climate futures. However, one constant across the continent is that livelihoods, ecosystems, and biodiversity are inextricably dependent on the sustainable functioning of water systems. Key examples include:

- Higher temperatures are projected to cause increases in water deficits of about 71% in agriculture, 27% in hydropower, and 1% in livestock production;
- RCP8.5 projections put 1.2 billion African people at significant risk of being negatively impacted by water pollution due to reduced water quality regulation by natural ecosystems;
- Climate change projections will reduce available habitat for aquatic species due to increases in water temperatures above optimal physiological limits; and,
- Minor climatic variations have been linked to significant impacts on ecosystem functioning in Africa's freshwater ecosystems.

The observed and projected increases in heavy precipitation and pluvial flooding, as well as observed and projected increases in aridity, agricultural and ecological droughts, will affect primary productivity (forests, grasslands, fodder). Also affected will be subsistence agricultural productivity, with repercussions for increased dependence on natural resources for sustenance, which are already under pressure from climate and other threats. These will increase water use and abstraction, causing further impacts for freshwater ecosystems while also increasing conflict between people and wildlife.



Many studies report the significant socio-economic consequences of climate variability and extreme weather events on water systems, increasingly in urban areas, often related to flooding. Notably, the El Niño event in 2015-2016 and associated drought in Southern Africa impacted, among other things, hydropower generation and electricity supply in Lusaka with serious implications for businesses. In 2017, the Day Zero water supply crisis in Cape Town had unequal impacts on communities and prompted intense debate over the role water resource management decisions, investment and drought prior to and during the crisis. An Indian Ocean Dipole event in 2019 produced high rainfall over East and the Horn of Africa triggering mud slides, destruction of crops and property, and loss of lives.

Marine heat waves have become more frequent since the 20th century and are projected to increase around Africa. Relative sea level has increased at a higher rate than global mean sea level around Africa over the last three decades. Relative sea-level rise is likely to virtually certain to continue around Africa, contributing to increases in the frequency and severity of coastal flooding in low-lying areas and coastal erosion along sandy coastlines.

Example of human and property losses due to climate events

- **1960s to present day:** Lake Chad (the vanishing lake), receded from 25,000 km² in the 1960s to between 2,000 km² and 15,000 km² (depending on the season) over the last 40 years, affecting the lives of about 30 million people.
- **2000:** Floods in Mozambique caused 800 deaths, affected about 2,000,000 people, 329 people were displaced and agricultural land was negatively impacted.
- **2001:** Floods in Northern Algeria resulted in approximately 800 deaths and caused an economic loss of about US\$400 million.
- **2011-2012:** Severe drought affected the entire East Africa region and was said to be “the worst drought in 60 years”. Within the same year floods affected the region and caused further damage.
- **2014-2019:** In Central and West Africa, a total of 700,000 people were displaced mainly due to flooding. This also resulted in localized crop and livestock losses.
- **2019:** Flooding due to Cyclone Idai destroyed about US\$1 billion of infrastructure, about 100,000 homes were damaged/ destroyed and at least 400,000 ha of crops were destroyed.
- **2019:** Heavy rainfall triggered widespread flooding, which resulted in a loss of life, displacement, damage to crops and livestock deaths, mainly in central and southern Somalia, south-eastern Ethiopia, northern and eastern Kenya and South Sudan. The heavy rains created conditions conducive to the severe desert locust outbreak, the worst in decades, affecting most parts of East Africa.

Anticipated challenges

Poverty is arguably the biggest challenge facing Africa, and more specifically in relation to changes in climate and the water sector, inequities in adaptive capacity for poorer populations. Adaptive capacity in Africa is often largely a function of access to natural and/or financial resources. Africa accounts for two-thirds of the world's extreme poor; combined with the

fact that Africa's population is projected to double by 2050 and the significant water stress that already exists across the continent (to be compounded further by climate change), water access and governance presents the most significant challenge for this decade. The increased drying of the continent will result in food shortages, conflicts over increasingly scarce resources and increasing dependence on natural resources.

There is a need to improve the efficiency and effectiveness of transboundary cooperation to ensure that decision-making and investment occur at appropriate timeframes to respond to the speed of changes in the climate and environment. In general, investment in water in Africa is low, contributing to inadequate capacity to minimise climate risks and enhance climate-resilient water systems. Although water is identified as one of the priority sectors affected by climate change, there is a lack of support and financing/resource mobilization required to facilitate climate-resilient water investment policy development.

Through potentially rapid and large changes in socially and economically critical aspects of the hydrological cycle, climate change represents a major cross-cutting challenge, in terms of availability, exposure to hazard, management capacity (both supply and demand), and individual well-being. Africa's size and diversity of climate conditions, often with high spatial and temporal variability, make it difficult to generalise about the current and future status of water resources. This is further compounded by limited availability and quality of climate data in Africa. Despite these challenges, it is evident that surface and subsurface water availability is being altered by changes in the timing, amount, intensity, and state of precipitation as well as atmospheric evaporative demand due to changes in temperature, humidity, radiation, and windspeed.

Increases in climate variability are likely in the future with possible long-term shifts in climate characteristics, including areas of wetting and drying. However, multiple atmospheric and oceanic processes, incompletely understood and represented in climate models, lead to uncertainty in the detail of future climate. Nevertheless, during the last 50-100 years observed warming over land in Africa has increased and is very likely to continue, including higher frequency and intensity of heat waves.

A comprehensive analysis of global and regional climate model rainfall projections shows both differences and similarities. There is limited consistency between ensembles in projections of seasonal mean rainfall (global models tending to be wetter than regional models) and large spread between model results, which often show opposite signs in the direction of projected change. Consistent patterns include higher maximum rainfall intensities in all regions during



Photo: © Cyclone Idai (World Vision)

the wet season and a decrease in frequency of daily rainfall events. The length of dry spells increases over Southern Africa and the Ethiopian Highlands in most models.

The latest IPCC review notes from global studies of fluvial impacts increases in river discharge in terms of the 30-year return period (of five-day average peak flows) by end of this century for most river basins in tropical Africa. This suggests higher frequency and intensity of floods and as a consequence more extensive impacts and greater need for action on flood mitigation.

Opportunities

There are numerous opportunities for enabling the most vulnerable populations to adapt to the impacts of climate change. For example, the adoption of water-efficient technologies, such as drip-irrigation or small-scale water harvesting, can both help to adapt to the impending impacts of climate change but also create significant private sector business opportunities across the continent.

Furthermore, the development of bankable/investable solutions for adaptation, particularly through nature-based solutions (NbS)² and ecosystem-based adaptation (EbA)³, that benefit the most vulnerable populations and ecosystems across Africa. This includes investing in water-efficient agricultural systems, rural/urban developments and using natural systems to ameliorate water pollution. For example, adaptation and disaster risk reduction could include reforesting hill slopes to prevent landslides from increased rains, re-vegetating riverine areas to prevent silt and flooding

or wetland restoration to act as carbon sinks and to absorb floodwaters. These adaptation solutions present significant opportunities for carbon storage and avoided emissions, as well as ecosystem protection and restoration. Ultimately, these types of solutions will capitalise on integrated revenue streams (e.g., water, carbon, ecosystems, biodiversity etc.) that are enabled at the landscape level through multi-sector and multi-stakeholder partnerships.

International climate change legislative frameworks such as the Paris Agreement of 2015, SDGs of 2015, Sendai Framework for Disaster Risk Reduction (2015-2030), climate finance mechanisms such as the Green Climate Fund (GCF), and continental, sub-regional and national water and climate policies provide strategic directions and commitments that governments, non-state actors, the private sector and communities can apply in designing, implementing and managing climate-resilient water investments.

Climate finance mechanisms and development funds provide an avenue for mobilising financial resources for practical climate-resilient water investments. Furthermore, the current Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) developed by respective Member States provide an opportunity for outlining integrated water-related climate change adaptation and mitigation programmes. For example, the continental Africa Water Investment Programme (AIP) has systematically incorporated water resources, SDG6 investments, climate resilience, gender transformative action and transboundary water cooperation and is ready for financing.

² Effectively using nature sustainably to assist in the mitigation of climate change, as well as to enable people to adapt to climate change.

³ Involves a variety of ecosystem management activities to increase the resilience and reduce the vulnerability of communities and the environment to climate change.

Climate-resilient cities

Inadequate city planning, inefficient land use, and poor regulatory systems have created an unsustainable model of urban growth that has resulted in unmanaged, fragmented and hyper-informal cities and all forms of pollution. Moreover, the potential consequences of climate change such as the rise in sea levels and erratic weather patterns are expected to increasingly strain the capacities of Africa's urban systems and heighten their vulnerability.

It is the cities' ability to mainstream climate goals into their activities is, to a large extent, influenced by the vertical divisions of responsibilities across different levels of government, that provides a key opportunity to overcome these challenges. Improved multi-level governance arrangements and processes, improved progress with implementing decentralization reforms, increased alignment of sectors that could influence those with significant emissions reduction potential and strengthened systemic capacity and resource mobilization all offer the potential to develop proactive climate governance.

Anticipated challenges

An estimated US\$20-25 billion per year needs to be invested in basic urban infrastructure, and an additional US\$20 billion per year in housing to respond to urban population growth—these investments need to be climate-proofed to ensure a sustainable pathway for urban development. This surge in population is paired with rapid urbanization and increased transportation. Consequently, harmful emissions from transportation and land-use change are growing significantly across Africa, further driven by urban sprawl and low levels of institutional capacity to manage growth and its impact.

Opportunities

Ecosystem-based solutions in the form of ecological (or green) infrastructure have emerged as spatial planning tools for ensuring functional networks of natural and semi-natural areas: demonstrating the importance of ecological systems as part of the infrastructural fabric that supports and sustains society and builds resilience. In various cases across Africa, well-functioning ecosystems provide diverse provisioning, regulating, supporting and cultural services that can buffer against risks, with benefits for physical/psychological health, social equity and well-being.

For example, hill forestation, terracing, green public open spaces, and clearing invasive alien plants can all help to reduce erosion, filter grey water, provide timber, fodder, windbreaks, and shade, promote the provision of downstream water, regulate flood shocks, reduce

sedimentation and run-off, complement drainage, and create opportunities for social interaction, community cohesion, foster inclusion and attachment to space. Green infrastructure (GI) can also help in recovering from hazards (e.g., poles for construction) or provide a safety net (e.g., wild foods in times of drought). Maintaining or restoring GI is considered to complement or substitute for more expensive infrastructure investments that are not available to meet local needs. Moreover, GI can lengthen the life of existing built infrastructure and make areas more attractive for investment, promoting multi-functionality, connectivity, and accessibility. Preferences and values differ by scale, proximity to natural areas, land prices, users' needs (e.g., design vs. use), and socio-economic classes.

The application of GI to enhance climate resilience in the African context is unique compared to other developing countries, considering the sociocultural context, and spatial challenges. Africa must therefore not necessarily emulate Western models of GI planning. Adaptation strategies should sensitize decision makers about the value and benefits of EbA and prioritize GI within broader land-use, valuation and spatial planning approaches. Integrated planning needs to prioritize capturing multiple functions, zones, ensure quality and accessibility in relation to function and form, and promote more even distribution in high- and low-income neighbourhoods (including backyard dwellings).

GI needs to be understood as part of the infrastructural fabric and economic good, rather than a "luxury and visual good, in comparison to more pressing needs". In small, secondary and even mega-cities, low-income and other marginalised urban residents are typically more dependent on ecosystem services than higher-income groups. However, these resources have not been included in previous assessments of informal economy to show economic benefits. For GI to be successful, sustainable landscapes and regions require both stewardship and management at multiple levels of governance and social scales to maintain the composition, structure and function of ecosystems. With changing precipitation, we need to maintain and restore degraded wetlands, riparian corridors, and rivers to enhance flood regulation, water purification functions, reduce contamination, and the spread of communicable and waterborne pathogens. Land use land cover change needs to be monitored, and urban ecosystem services incorporated in scenarios, and not managed intensively for one type of ecosystem service at the expense of others.



Climate change and Africa's blue economy

The challenges posed by climate change to the region's blue economy is highlighted in the Africa Blue Economy Strategy (2019), the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (2014) and other key thematic and sectoral frameworks and strategies. Addressing climate threats to Africa's blue economy will be central to realising the region's commitment to SDG14 'Life under Water' and Agenda 2063's vision for the region's oceans, coasts and inland water bodies to serve as major contributors to continental transformation and growth.

The oceans play a key role in regulating the earth's climate, having absorbed over 90% of the excess heat generated by greenhouse gases in the climate system, as well as 20-30% of anthro-pogenic carbon emissions. This regulating capacity is not unlimited, however, and there is a growing understanding of the diverse ways in which climate change is impacting oceans. The key climate impacts on oceans are changes in water temperature, ocean acidification and deoxy-genation. These drive a number of secondary impacts such as changes in ocean circulation and chemistry, rising sea levels, increased storm intensity, as well as changes in the diversity, distribution and abundance of marine species and phenomena such as coral bleaching. In turn, these changes impact society through physical risk to infrastructure and human life, as well as economic and food security risks. These risks are particularly acute for coastal and island communities who rely on marine resources for food security and a range of ecosystem services, and who are particularly vulnerable to climate impacts such as extreme weather events.

Anticipated challenges

Climate change is already impacting coastal and island communities in Africa through more frequent and intense extreme weather events, coastal erosion, sea level rise, saltwater intrusion, coral bleaching and other impacts. A critical factor in the ocean is the dynamism and movement of whole systems, such as current regimes, increasing unpredictability and the magnitude of fluctuations and biodiversity responses and loss resulting from climate change. These climate-induced changes impact on entire economic sectors – for example, the change in productivity and dynamics of upwelling currents affects fishery stocks (e.g., in the Canary Current); and the collapse of coral reefs impacts on small scale fishers and tourism industries (e.g., in east and southern Africa). These impacts will intensify over the medium term (to 2030), underscoring the need for effective climate responses to protect coastal and island infrastructure, livelihoods and industries.

Opportunities

While oceans and coastal zones are impacted by climate change in significant ways, they can also be an integral part of climate responses, for example through ecosystem-based adaptation approaches. Restoring mangrove ecosystems has both mitigation and adaptation advantages, while also providing important economic and biodiversity co-benefits. Efforts to increase the resilience of coastal economies and communities to sea level rise, and efforts to further enhance the ability of oceans to drawdown carbon dioxide, via expansion of mangroves, ocean alkalization, and other approaches, can create

livelihoods as well as financial flows for mitigation efforts. Mapping and analysis of ecosystems services, including economic production, carbon sinks and carbon dioxide removal potentials, can generate policy space for these activities.

It is important that climate responses are integrated into existing governance approaches and mechanisms, building on the significant investment in co-management, ecosystem-based governance approaches, integrated coastal zone management, and emerging practice around marine spatial planning. Regional- and adaptive governance approaches will be central to addressing climate challenges; it is therefore essential to leverage existing regional institutions and programmes to support joint research, sharing of data and good practice, and joint programme implementation in strengthening the climate resilience of Africa's blue economy.

Climate information services

The past several decades have witnessed phenomenal advances in the understanding of the laws that govern the characteristics and behaviour of the global climate system. This led to the development of Climate Information Services (CIS). CIS can be broadly defined as the generation, tailoring and provision of weather and climate information to inform all levels of decision. CIS are provided by a range of actors across the continent but are primarily the remit of National Meteorological and Hydrological Services (NMHSs). Types of CIS offered may include, observational data, daily to weekly forecasts, seasonal forecasts, impacts advisories and climate change projections. General packaging of climate data, information and related products find application in multiple climate-sensitive socio-economic sectors such as: agriculture; disasters risk management; water resources; health; and energy for societal benefits. CIS builds on continued improvements in climate forecasts and climate change scenarios to expand access to the best available climate data and information. Policy makers, planners, investors and vulnerable communities need climate information in user-friendly formats so that they can prepare for expected trends and changes.

Emerging Issues for Climate

While the primary strategy for reducing and eliminating climate change and limiting its impacts remains the rapid reduction in the burning of fossil fuels, as well as protecting and enhancing natural carbon sinks, atmospheric concentrations of CO₂ and other GHG continue to rise. Many governments, universities, and private institutions are now actively researching, developing and in some cases deploying new and novel approaches to fighting climate change.

Notable examples include: carbon dioxide removal (CDR), the process of capturing CO₂ from the atmosphere and sequestering it, which the IPCC says is necessary to prevent temperature rises above 1.5°C; synthetic biology and genetic engineering approaches to changing properties of plants and crops to enable enhanced carbon drawdown or to make leaves more reflective; solar radiation modification, which by various proposed approaches would reflect increased amounts of solar radiation back into space, cooling the lower atmosphere. Each of these carries potential benefits and risks, with physical impact, legal, ethical, and social aspects to consider, and will require the development of governance frameworks that are relevant and appropriate for African contexts.

Anticipated challenges

Over the next decade, emerging technologies for responding to climate change can present a number of challenges. Governance of these technologies at international, regional and national levels will require increased attention from policy makers. Governance considerations of these technologies in African contexts may include access to and control over technologies, access to finance, questions of liability and accountability, development of insurance mechanisms, questions of private versus public control or use, access to and control over data, and more. Further, some emerging climate response technologies carry significant risk in use, which will have to be weighed against the risks inherent in climate change impacts in the absence of the use of the same technologies.

Opportunities

Many new and proposed responses to climate change, either to enhance mitigation or adaptation capacity, are in early stages of development and research. Some are inherently global in nature, in their likely impacts, benefits and risks, and therefore will require input and shaping from African governments, research institutes, and civil society actors. Engaging in early-stage research, development, and regulation can ensure that African interests help to shape new technologies and their use.

Opportunities inherent in early engagement with emerging topics include: conducting, shaping and directing research to ensure consideration of African contexts and needs; shaping of technology transfer standards; engage and encourage innovation in African research institutions.



04

Photo: ©Olivier Girard (CIFOR)

STRATEGIC INTERVENTION AXES

4.1 Strategic Intervention Axis 1: Strengthening Policy and Governance

4.1.1 Enhanced Climate Policy, Multi-Scalar Governance and Institutional Coordination

Climate policy at a national level presents unique multi-scalar governance challenges by requiring the co-ordination between different spheres of government and non-state actors, across multiple sectors of society. It is also multi-dimensional, centring on different objectives, which can impact other developmental priorities. For this reason, the evolution of climate policy requires high levels of participation and coordination amongst ministries, spheres of government, non-state actors and citizens. Appropriate climate policy also requires relevant and up to date scientific knowledge, an understanding of anticipate climate risks and impacts, mitigation potentials and adaptation needs, the potential economic, social and biodiversity/ ecosystem co-benefits, as well as the identification, prioritization and costing of the requisite measures. Capacitated institutions with the requisite mandates to implement policy and facilitate well-coordinated climate action are also necessary drivers.

Countries are at different stages of addressing climate change, with NDCs having varying levels of detail and differing structures. Many have developed national

climate policies and/or strategies and in some cases have developed dedicated National Adaptation Programmes of Action and mitigation policies such as REDD+ strategies. The mainstreaming of climate change considerations across other sectoral policies is, however, ongoing and there are different levels of coherence on climate change issues within, for example, water and agricultural policies. Equally, governance structures and process for Africa climate policies need to be enhanced. Weak institutions, inadequate coordination and collaboration amongst sectoral line ministries have been identified by African governments as impediments to effective policy implementation. Research indicates that a lack of or limited authority by certain government ministries to implement national climate policy, as well as limited data, are presenting barriers to successful NDC implementation. Other challenges identified in the development and implementation of African climate policies, plans and strategies have included inadequate emphasis of gender dimensions, inclusion of local communities and engagement with district and local level governance actors.

Climate legislative frameworks are considered to play a determinative role in influencing the successful implementation of climate policy. Robust legislative frameworks, both climate change specific and non-specific, are likely to drive better adaptive responses. Research has indicated that outdated legislation can present a barrier to NDC implementation, an issue identified as a barrier by a number of African countries. A few African countries have developed or are in the process of developing dedicated framework climate change laws, whilst others have developed dedicated sector specific laws, for climate change trust funds, and forestry laws. A review of these laws indicates

evidence of cross-pollination in design across African jurisdictions, creating the potential for a unique and regionally appropriate body of law with a strong focus on adaptation. Whilst there is evidence of a regional influence, there remains a need for domestic analysis of the national legal landscape to craft suitable climate laws that adequately take into account national climate priorities, institutional requirements and the relevant legal culture.

Table 1. Priority interventions and suggested actions for enhanced climate policy, multi-scalar governance and institutional coordination.

Intervention area	Suggested actions
<p>1. Continued development, review and update of climate change policies and implementation plans at a national, sectoral and local level that give effect to NDC priorities.</p>	<p>1a. Review and revise existing policies and plans to ensure alignment with revised NDCs under the Paris Agreement, and update or develop NDC implementation plans as well as NDC investment plans.</p> <p>1b. Mainstream climate change considerations (including gender, youth and indigenous knowledge considerations) and updated NDC policy actions across sectoral policies, including national development plans, water, agriculture, health, energy, human settlements, environment, transport and infrastructure, utilizing an open and transparent engagement process with stakeholders.</p> <p>1c. Adopt a “whole-of-economy” approach to climate change, prioritizing the integration in long-term climate priorities in countries’ macro-economic frameworks, national budgets and expenditure frameworks, financial sector regulations and incentives; and in systems planning.</p> <p>1d. Develop/implement sound monitoring, review and reporting processes and systems, including MRV of GHG emissions, sinks and removals, and M&E of adaptation, climate finance and technical support outcomes to obtain the relevant data and information for policy development.</p>
<p>2. Strengthen institutional structures for policy implementation, through fostering good governance structures at the national and sub-national levels.</p>	<p>2a. Strengthen of mechanisms for co-ordination and collaboration between sectoral line ministries and spheres of government, as well as communication with citizens and stakeholders.</p> <p>2b. Identify line ministries and institutional bodies for the implementation of climate policy, development of legal mandates and delegations for these ministries/bodies, and capacitation of these bodies with qualified, well-equipped and motivated staff.</p> <p>2c. Develop systems for the monitoring and reporting of policy implementation, as well as open data and information sharing platforms to foster accountability and transparency.</p>

Intervention area	Suggested actions
<p>3. Cultivate robust climate change legislative frameworks.</p>	<p>3a. Review of the national legal barriers to successful climate change policy implementation through a legal landscape analysis, including existing provisions which hinder implementations as well as empowering provisions required for implementation, to determine the most appropriate legal instrument(s) to develop as well as their content.</p> <p>3b. Develop national, district and local level climate relevant laws to facilitate and enable effective policy implementation that give effect to the legal landscape analysis.</p>
<p>4. Improved multi-level governance arrangements, equitable partnerships and coordination platforms for dialogue and learning.</p>	<p>4a. Focus on the process, not just the output. Too often, the focus when developing strategies is on the “what” and not on the “how” or the “why”, and yet the process followed to design activities is at least as valuable as the end product.</p> <p>4b. Support the implementation of well-resourced decentralization reforms and local stewardship. Awareness raising and contextualising issues for citizens immediately improves local stewardship and participation in co-designing of solutions.</p> <p>4c. Promote equitable partnerships, local buy in and shared visioning. Shared visioning of future pathways, open dialogue, and a close analysis of assumptions underpinning worldviews, identities, beliefs, and stigmas based on social circumstances.</p> <p>4d. Mainstream climate-resilient development objectives and targets across all areas of governance and into all local development and sector plans.</p>

4.1.2 Anticipatory governance and long-term planning

Climate change policies are developed considering the current challenges we face and what we expect to change (based on a certain vision of the future), recognising that this idea of the future can change. To improve the effectiveness of long-term policies we need to consider what might change in our environment, speculate about how a range of possible futures might look, and use this knowledge to shape better decisions. This will not only make policies more effective but will also increase the confidence of countries in setting ambitious climate goals. Planning processes therefore need to be adaptive and flexible to avoid locking governments and other stakeholders into specific designs and operating procedures as the climate evolves or new information becomes available. In the face of uncertainty and variability,

many approaches to natural resource management, infrastructure development and investment may need to be strengthened to deal with the level of uncertainty associated with climate change. Foresight tools can bring citizens, designers, and planners together to reimagine social-ecological connections and overcome sectoral and institutional silos.

An example of an emerging issue for anticipatory governance is engaging the rapidly evolving field of CDR, which is inherent in many net-zero promises and increasingly in NDCs. African government officials, policy bodies and relevant stakeholders have not been fully engaged in the discussions on CDR as a concept, the approaches to CDR that are being researched, nor understand what role CDR could play in African or global climate policy.

There is broad agreement that African states should be shaping CDR research to understand better how nature-based and technology-driven CDR can support sustainable development and climate adaptation in Africa and globally. Research shows that almost all approaches to CDR would involve both risks and benefits to sustainable development, and African states and organizations should be working to identify the

specific approaches that would benefit their states or Africa more broadly.

Not engaging these processes poses a risk to African states related to climate and trade negotiations, the pursuit of finance, efforts to achieve the SDGs, adaptation planning and development planning, as well as access to relevant technologies.

Table 2. Priority interventions and suggested actions for anticipatory governance and proactive, long-term planning.

Intervention area	Suggested actions
1. Increase robustness of climate policy processes by testing and improving their effectiveness in possible future conditions.	1a. Identify the assumptions the climate policies are based on and the shaping and hedging of actions to assure climate goals will be reached.
	1b. Identify drivers of change in national, regional and global contexts, create scenarios to explore possible futures of Africa, and use these to test and enhance climate policies in a participatory manner, involving stakeholders from different groups, ages and backgrounds.
2. Test the assumptions that our climate change planning is based on.	2a. Consider alternative options and back up plans.
	2b. Use assumption-based planning methodologies.
3. Move to a more collective process when developing NDCs and long-term policy planning and development.	3a. Include a broad range of stakeholders throughout the climate policy cycle – from development and design, participatory scenarios development, to implementation and monitoring.

4.1.3 Increase Uptake of Climate Information Services

Despite significant international investment in African CIS, there is an incommensurate uptake of CIS into decision making. Reasons for this include: inaccessibility to and lack of understanding of CIS products; lack of trust in CIS products; a mismatch between the type of information supplied through CIS and the type of information required for decision making. While these represent challenges to the uptake and use of CIS, there are corresponding challenges in the supply/provision of CIS. Limited observational networks in many Africa countries, together with outdated technology, limited internet bandwidth and constrained financial and personnel resources, represent a barrier to provision of quality African-led CIS. These constraints perpetuate a reliance on the global North for provision of CIS for African decision making. However, within the

current CIS landscape there is scope to strengthen the supply of CIS from within Africa, as outlined in the table following.

These actions refer to enhanced collaboration, partnerships and/or co-production, which is a theme that runs through the suggested actions. Collaborative and co-productive processes require equitable partnerships between a variety of knowledge holders, ranging from producers of CIS to intermediaries and users of CIS. Substantial knowledge regarding collaborative processes has been gained in recent years and can be used to guide the processes needed to inform the development, tailoring and delivery of CIS.



Table 3. Priority interventions and suggested actions for the increased uptake of CIS.

Intervention area	Suggested actions
<p>1. Enhance weather and climate observational infrastructure and networks.</p>	<p>1a. Harness financial resources for maintaining observation networks, data rescue and data sharing. This could include proposals for funding to international (as well as national) funding agencies.</p> <p>1b. Motivate for central NMHS budgets from government.</p> <p>1c. Investigate and formalise public-private partnerships. This could be facilitated under the WMO Open Consultative Platform for public-private engagement.</p>
<p>2. Improve the uptake and effectiveness of CIS by increasing the coordinated delivery and sustainability of CIS interventions, including through User-Interface Platforms (UIPs).</p>	<p>2a. Enhance collaboration between the NMHS, sectoral experts, practitioners and policy makers to enable central delivery of decision-relevant CIS.</p> <p>2b. Develop CIS capacity, based on regional need and developed within African institutions in response to that need. Reduce reliance on international sources of CIS where possible.</p> <p>2c. Ensure regular and sustained monitoring and evaluation of CIS interventions.</p> <p>2d. Identify and prioritise initiatives that enable CIS interventions to be sustained after funding ceases.</p>
<p>3. Build capacity of users to trust and use CIS.</p>	<p>3a. Enhance user-informed co-production of CIS, based on good practice guidance.</p> <p>3b. Develop capacity to understand and use CIS through training courses, experiential learning (placements, internships etc) and inter-institutional partnerships.</p> <p>3c. Enhance methodologies for combining trusted indigenous and scientific knowledge to generate CIS products.</p>

4.1.4 Improved Climate Literacy and Awareness

Climate literacy can be defined as an understanding of one's influence on climate and the influence of climate on one and on society. Our response to climate change is affected by our perception of change and an understanding of its causes, impacts and future risks. In general, people with knowledge of the human causes of climate change and who have experienced its impacts are more likely to understand it as a serious threat. As a result, climate change literacy is recognized with "high confidence" by the IPCC as a key foundation for climate change adaptation and mitigation globally. The United Nations Environment Programme (UNEP) has also recognized the importance of climate change literacy for decision-making and governance, reflected in their development of a new curriculum on environmental law for judiciaries across Africa.

At a minimum, climate change literacy includes both having heard of climate change and understanding that it is, at least in part, caused by people. Advanced levels of climate change literacy include knowledge and skills enabling individuals to make informed decisions and actions. Understanding the human cause of climate change is a strong predictor of climate change risk perception and can enable responses to climate change that go beyond simply reacting to climate change or business as usual. This is important for Africa, as uninformed and inappropriate responses to climate change can lead to maladaptation and exacerbate vulnerability.

Although perception of climatic change is common across Africa, this alone cannot inform the depth and scope of transformative responses that climate change

requires. Furthermore, perception commonly houses misconceptions on the cause of climate change, highlighting the importance of climate change literacy. The average national climate change literacy rate in Africa is only 39%, with large variations within and between countries.

Education is the strongest predictor of climate change literacy in Africa, particularly those with post-secondary education. In every country, the average climate change literacy rate is higher among men than women (mean difference of country means for men and women was 12.8%). The gender difference varies between 5-25% across African countries; 60% of countries had gendered climate change literacy rates that differed between men and women by more than 10%, and 11 of the 15 countries with the largest gender gap are in West Africa. These are concerning findings given that women are often more vulnerable to climate impacts than men. Poverty undermines climate change literacy and perception that droughts and floods are getting worse by those in poverty highlights exposure to climate change impacts by those with least adaptive capacity.

These observed drivers of climate change literacy overlap with broader developmental challenges on the continent, affording opportunities for co-benefits between progress towards SDGs and climate action, particularly for education, gender equality and poverty reduction. Progress in climate change literacy would therefore afford a concrete opportunity to mainstream climate change within core national and sub-national developmental agendas in Africa, thereby supporting more climate-resilient development pathways.

Table 4. Priority interventions and suggested actions for improved climate literacy and awareness.

Intervention area	Suggested actions
1. Increase climate change literacy across all levels of formal and informal education curricula.	1a. Develop and include climate change literacy curricula for formal education (primary, secondary and tertiary levels), extending skills and knowledge for responses to climate change.
	1b. School girls need to be the focus of gender-sensitive approaches to education, emphasising attendance and completion of their schooling.
	1c. Develop climate change literacy programmes for informal education (e.g., civil society and other partnering actors), extending skills and knowledge for responses to climate change.

Intervention area	Suggested actions
<p>2. Mainstream climate change literacy into targeted sectors most vulnerable to climate change in Africa (across food systems, health, cities, infrastructure, economies, water, heritage, with an emphasis on gender).</p>	2a. Develop extension services that include climate change literacy in programmes for small holder farmers with concentration on skills and knowledge, particularly for adaptation to climate change.
	2b. Promote climate information services co-production and communication in ways that enhance climate change literacy and improved access to useable climate information, particularly for adaptation to climate change.
	2c. Address gendered vulnerability to climate change across all sectors, together with the implementation of equity-based approaches, including provision of skills and knowledge for adaptation to climate change for women.
<p>3. Mainstream climate change literacy across government policy and decision makers for greater climate action.</p>	3a. Enhance training of and support to high-level government officials with regards to skills and knowledge for climate action (both mitigation and adaptation), for example for the Minister of Finance, and with regards to new and rapidly evolving approaches to climate response, including carbon dioxide removal.
	3b. Advance climate change literacy across all implementing levels and departments of government extending skills and knowledge for responses to climate change.
	3c. Advance climate change literacy for key environmental decision makers, e.g., the Judiciary (UNEP has recognised the importance of climate change literacy for decision making and governance with a new curriculum on environmental law for judiciaries across the continent).

4.1.5 Governance Solutions to Address the Climate-Conflict Nexus

Over the next decade, climate change will have a significant impact on human security in Africa in a variety of ways, such as increasing the number of natural disasters and humanitarian crises, contributing to agricultural loss and food insecurity, and increasing water scarcity. To mitigate the impact of climate change on human security and its potential to induce conflict, it is crucial that steps are taken to improve our understanding of the links between climate change-induced conflict and insecurity, as well as to take pre-emptive action to improve resilience and adaptive capacity, particularly of the most vulnerable states and communities.

Key security institutions in the field of conflict prevention/ resolution/ management need to be trained in a climate sensitive approach, while the

adaptation to climate change also needs to happen in a conflict sensitive manner. An overly technical approach to climate change adaptation may not take other security-related issues (again, this includes development as a whole) into account and therefore even create more tension. Political and societal realities must be considered. Linking the two processes could, on the one hand, contribute to friction and tension, on the other hand, it can also lead to cooperation and understanding and therefore contribute to a more sustainable peace.

Furthermore, what causes conflict in one area does not necessarily cause the same outcome in another area. Thus, highly context-based and localized solutions are crucial (especially with regards to the respective country's history of violence/conflict).

Table 5. Priority interventions and suggested actions for governance solutions to address the climate-conflict nexus.

Intervention area	Suggested actions
1. Strengthen the capacity of AUPSA and institutions to analyse climate-related peace and security risks and develop appropriate detection, mediation, and resolution strategies.	1a. Provide intelligence and regional early warning centres with training on integrating climate risks into existing analytical tools and conducting in-depth climate-sensitive conflict analysis and climate-sensitive peacebuilding strategies.
	1b. Provide the AU Mediation Support Unit and RECs Mediation Support Units with training in climate-conflict dispute resolution.
	1c. Call on RECs to develop regional climate-conflict prevention frameworks that identify context, institution performance, and the role of key actors, and recognises the multifaceted and multidimensional nature of climate risks.
	1d. Advance post-conflict reconstruction and peacebuilding activities through climate development objectives and common activities.
2. Strengthen the capacity of Member States to develop more integrated responses to climate-related security risks.	2a. Support the development of national structures and processes that allow for integrated responses to climate-related security risks and coordination between policy areas and monitoring and evaluation systems.
	2b. Establish training for government members across departments and agencies on climate risks, development and peacebuilding strategies.
3. Strengthen the capacity of vulnerable communities to better engage in national climate policy process.	3a. Identify communities most vulnerable to climate-change human security risks, such as farmers, coastal fishing communities, internally displaced persons (IDPs) and provide them with training in national climate policy planning, agenda setting, monitoring and implementation.
	3b. Develop national mechanisms that allow vulnerable communities to engage with parliament on national climate adaptation and green industrialization initiatives.

4.2 Strategic Intervention Axis 2: Pathways Towards Transformative Climate Resilience Development

This section addresses the key cross-sectoral systems transitions required to address climate change, including systems related to food, ecosystems, energy, infrastructure, mobility, cities, water, the blue economy and the digital economy. In addition to their central role in achieving mitigation objectives, these systems themselves face significant climate change impacts, making adaptation action in these systems critical. These systems are key drivers for development across the African continent and are critical enablers for

productivity, sustainable economic growth, job creation and social inclusion. These cross-cutting systems also contribute significantly to human development, poverty reduction, and the attainment of the Agenda 2063 and the SDGs, and research shows that investing in these cross-sectoral opportunities, including as part of post COVID-19 stimulus packages, can aid in a sustainable green recovery. Transforming them is key for countries at all stages of development and requires action from the public and private sector to unlock major

economic opportunities and create new markets and jobs, and to reduce the trajectory of emissions and limit climate vulnerabilities. Interventions and actions that support these key transitions will need to take into account macroeconomic and fiscal impacts, in addition to managing social and labour impacts.

This Strategy identifies eight systems for transformation and recommends key intervention strategies and actions for each. Climate action includes both mitigation and adaptation across these key systems. Significant investment in education, training, and retraining to develop skills in these key systems is

essential for people to benefit from the jobs created in the green economy. The Strategy will thus prioritize climate action across these systems to advance development objectives through impactful country operations and programmes – including support for policy reforms, public and private sector investments, guarantees, and advisory services – and to support a just transition for African Union Member States, including through additional financing, technical and capacity support. In addition to these eight key systems, the Strategy will also support adaptation action in other priority areas such as disaster risk management.

The interventions and actions outlined below require a strong foundation of cross-cutting themes to be successful:

- **A strong, integrated and cohesive policy environment:** Governments should revise and strengthen policies to realign incentives across all land tenure and oceans systems, ensure integrated land-use and spatial planning, clarify tenure and rights, provide better management related to land use planning and protected areas, and develop carbon trading opportunities.
- **Economic development, financial opportunities and job creation:** Governments should prioritize green job creation and enterprise development to support economic development in all sectors of the economy.
- **Strengthening effective governance systems:** Governments should invest in technical and institutional capacity building, as well as supporting stakeholder-driven and responsive participation, transparency and accountability.
- **Effective and equitable application of safeguards towards high-quality outcomes:** Governments should develop frameworks and mechanisms for the effective inclusion of Indigenous Peoples and local communities, ensure to not only do no harm but also achieve positive social outcomes for communities, and promote gender-sensitive inclusion in decision-making.
- **Emphasis needs to be placed on regional and localised differences in climate change impacts and development contexts.** Regional strategies often apply broad approaches to challenges and opportunities. Institutional coordination at local, national, sub-regional and continental level is key. The AU, working with RECs and Member States, can play a key role in driving climate responses by integrating climate change into key development, trade, finance, environmental and economic policies, strategies and action plans.
- **Trade-offs between objectives need to be explicitly addressed to prevent significant disconnect between strategies and actions on the ground.** For example, attracting capital for climate mitigation activities may lead to conflict with food security, biodiversity, and local development initiatives. Although not easy, developing a hierarchy of priorities/objectives/goals goes a long way towards addressing national and local trade-offs.
- **Finance, investment and resource allocation** are key to support the implementation of NDCs, climate policies more broadly, as well as climate change projects.
- **Strengthening capacity building and development** so that all stakeholders can effectively engage in climate action.



4.2.1 Food Systems Under a Changing Climate

Africa's commitment to transform its food systems is articulated in Agenda 2063 and associated policy frameworks. CAADP and the African Union's Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods provide a coherent framework for tackling intrinsic challenges within Africa's many food systems. These frameworks spell out the continent's targets for food and agriculture by 2025, using 2013 as the baseline. The targets are to end hunger, halve poverty, triple intra-Africa trade and ensure that at least 30% of livelihoods dependent on agriculture are resilient to climate change. The challenge is to reconcile between these frameworks and provide a mechanism for tracking progress in multiple domains based on country reporting.

Deeper commitments to addressing climate change will need to take on board multiple linkages to food systems that have been identified through forums, processes, and institutions such as the 2021 UN Food Systems Summit, the UNFCCC Conference of the Parties (COP) processes and the work of the IPCC. Opportunities to intensify efforts on biodiversity and land health are also included in the Decade on Ecosystem Restoration; the UN Convention to Combat Desertification (UNCCD) and Convention on Biological Diversity (CBD).

Accelerating this progress requires a profound change in all facets of the food system, especially in the context of climate change, emerging pandemics, and threats to biological diversity. Food systems continent-wide are under increasing pressure and have yet to produce sufficient quantities of food of appropriate quality, or to

prioritise nutritional outcomes and needs in agricultural sector planning. National and regional organizations and governments will need to work hard to benefit populations equally and equitably, and to account for and address the negative impacts of food systems on the environment and natural resources. At the same time, large amounts of investment will need to be sought so that biophysical, social and ecological performance indicators can be monitored rapidly and efficiently to ensure progress towards the continent's food system targets.

The challenges of prioritising, financing and implementing the changes needed in Africa's food systems need to be urgently addressed, so that existing failings can be rectified and the threats from climate change addressed. Central to these challenges are dimensions of inclusion, equitable distribution of risks and benefits across food systems, and a focus on gender, youth empowerment, and rural employment

Priorities for research and innovation need to focus on addressing the fundamental challenges faced by farmers, which relate to policies, institutions, and society in general. In the past, the prevailing focus of research and innovation has tended to concentrate largely on technical solutions. For the future, technical innovation needs to be supported by appropriate enabling conditions so that the finance, markets, capacity development, policy and regulatory frameworks and social safety nets needed are all in place. Crucially, the needs and voices of farmers who are on the frontline of climate change and most exposed to the risk need to be at the centre of the transformation agenda.

Table 6. Priority interventions and suggested actions for food systems under a changing climate.

Intervention area	Suggested actions
<p>1. Promote the equitable sharing of climate risk and reward amongst all food system actors.</p>	<p>1a. Establish a climate-risk insurance facility to which every food systems player contributes, directly or indirectly.</p> <p>1b. Enhance availability of and access to appropriate climate-related insurance products to farmers, as well as novel risk-sharing mechanisms like risk pooling and other innovative models.</p> <p>1c. Develop mechanisms that ensure that the financial costs of climate disasters are not borne solely by farmers, but spread more equitably across the range of food systems actors, including consumers.</p>
<p>2. Enhance resilience of food systems against climate effects, while emphasising nutrition outcomes and integrated planning.</p>	<p>2a. Enhance capacity development, communication and social movements around blended local and international food systems.</p> <p>2b. Extend use of smart, innovative and climate-resilient technologies, renewable energy production, breed/variety development/switching and technologies that preserve and enhance nutritional qualities in food.</p> <p>2c. Implement appropriate valuation framework for the ecosystems management services provided by farmers to the general public and pay them fair value.</p>
<p>3. Emphasise production toward agro-ecological transition, to reduce carbon intensity and dependencies on external inputs.</p>	<p>3a. Support research, extension and implementation of public sector and market-based instruments toward agroecological, regenerative, nature-based and indigenous approaches for integrated farming and pastoral systems or resilient landscapes).</p> <p>3b. Provide resources to enable/facilitate the transition to more nature positive production systems by farmers.</p>
<p>4. Strengthen food system governance interventions.</p>	<p>4a. Conduct systematic review of existing policies, strategies and incentive mechanisms that support/inhibit transition to sustainable food systems.</p> <p>4b. Modify policies, processes and strategies to become more inclusive and participatory (farmers, women and youth) and support sub-national scales of food systems governance (territorial/landscape) while linking them with resources and authority to national level.</p> <p>4c. Enhance the role and influence of public procurement in food purchasing to support diverse and nutritious diets (for example, municipal support for local sourcing to public canteens, home-grown school feeding programmes).</p> <p>4d. Develop synergies across sectoral planning and investments in infrastructure and related investments (for example, how energy and transport dependencies can better cohere with resilience goals for food systems).</p> <p>4e. Align food system visions and targets with other national strategies and commitments (for example, NDCs, UNCCD net-zero land degradation targets, AFR100 and CBD biodiversity frameworks, SDGs and national development plans).</p>

Intervention area	Suggested actions
<p>5. Strengthen finance, investment and resource allocation interventions.</p>	<p>5a. Coordinate and augment investments by channelling flows toward sustainable food systems from philanthropy, private sector direct investment, and multi-lateral donors.</p>
	<p>5b. De-risk investment toward transition by distribution roles across philanthropic, public and private finance by avoiding single source funds; ensure better coverage across short- and long-term investing; maintain balance of risk to investors across spectrum of scales; ensure that ESG and social impact investment reporting by private sector is well monitored and promoted.</p>
	<p>5c. Analyse subsidy and investment programmes to ensure that direct payment schemes for food system actors are aimed toward sustainable food systems transformation.</p>
	<p>5d. Assess how financial and non-monetary incentives are applied to shift behaviours into more resilient, collaborative and integrated approaches.</p>
	<p>5e. Draw from cross-value chain initiative models that recognise and remunerate champions of transformation – highlighting successes (for examples, Beacons of Hope, Milan Urban Food Policy Pact and Rockefeller Food System Vision Prize).</p>
	<p>5f. Support development of market-based mechanisms to reward social and environmental outcomes (Ecosystem outcome verification, bundling of ecosystem services with carbon markets for agriculture sector, etc.).</p>
	<p>5g. Explore and establish innovative mechanisms that enhance availability and access to financial resources (both mitigation and adaptation) by farmers, such as soil carbon management carbon dioxide removal.</p>

4.2.2 Protecting Land-Based Ecosystems and Carbon Sinks

Ecosystem protection and restoration practices may be the best means in African contexts for removing atmospheric carbon in many different future scenarios. Such practices, if governed well, can also generate social, environmental, and economic benefits. For example, water and food security (and energy security, to a lesser extent) is highly dependent on functioning ecosystems.

Sustainable intensification and integration of agricultural systems into landscapes and ecosystems that improve soil carbon storage are a priority for the continent. This includes regenerative agricultural practices that disincentivise clearing of forests and natural vegetation, maintain/improve groundwater recharge, and improve biodiversity outcomes.

African governments need to prioritise investment in ecosystem protection and restoration practices, and

other NbSs, to build green economies, mitigate climate change and increase peoples' resilience to climate shocks. The 'Restoration Economy' refers to enhancing the environmental integrity of a landscape through a variety of place-appropriate interventions built on sustainable investment streams that deliver economic returns. In this context, ecosystem restoration, enterprise development and conservation finance methods can be utilised to support long-term climate security through accessing private sector finance for small, micro- and medium-sized enterprises. The interventions have co-benefits of enhancing community-level resilience to climate change and delivering EbA through livelihood and business activities. This can lead to the creation of social, and for-profit enterprises, which support both ecosystem restoration and economic development in remote, rural communities. Potential value chains in Africa include red meat, alien biomass, ecotourism and carbon.

Table 7. Priority interventions and suggested actions for protecting land-based ecosystems and carbon sinks.

Intervention area	Suggested actions
1. Develop bankable solutions for ecosystem protection/restoration, sustainable water resources management and regenerative agriculture.	1a. Study and implement a broad range of economic incentives for sustainable businesses that contribute to ecosystem protection/restoration, sustainable water resources management and regenerative agriculture.
	1b. Ensure incentives and bankable solutions align with continental, sub-regional, national and local policy directions and socio-political contexts.
2. Build technical capacity for implementing and investing in regenerative and biodiversity positive agricultural systems.	2a. Develop and support landscape scale multi-stakeholder partnerships for sustainable agricultural intensification and expansion.
	2b. Design regional agricultural intensification and expansion plans in line with projected changes in climate change.
	2c. Lobby for and develop intra-African agricultural trade, development and investment partnerships to aggregate performance and risk.
3. Finance EbA and NbS for climate adaptation and mitigation.	3a. Develop continental financing mechanisms for NbS/EbA that consider a wider range of costs and benefits in credit risk assessments.
	3b. Develop regional financing facilities (including nationally nested facilities) for supporting the development of NbS/EbA that have both social and environmental benefits.
4. Protect key carbon sinks in irrecoverable carbon ecosystems such as primary forests, mangroves and peatlands.	4a. Support the establishment and improve management of Protected Areas (PA) in irrecoverable carbon ecosystems through integrated land use planning for new PA siting, increased enforcement of PAs and capacity building for PA managers, and incentives for community monitoring of PAs.
	4b. Increase designation of community managed forest areas, capacity building for community forest management, and empower Indigenous Peoples and local communities through clarifying land rights, providing training and strengthening governance.
5. Avoid further deforestation and enhance sustainable management of forests.	5a. Encourage zero-deforestation commodity supply chains by leveraging climate-positive commitments/investments by private sector companies to support activities that strengthen landscape governance; facilitate alignment and action across stakeholders; support capacity building on land use planning; provide extension services and training; clarify land tenure, enhance governance and undertake policy revisions.
	5b. Remove perverse incentives that lead to destructive activities (fossil fuel subsidies) and encourage nature-positive activities/NbS (through tax incentives).
	5c. Leverage climate finance opportunities to encourage REDD+ implementation at site-scale and jurisdictional level in alignment with national GHG accounting, including by creating the appropriate policy and technical processes and infrastructure, attracting private sector investment, clarifying carbon rights and benefit-sharing arrangements, and providing capacity-building.

Intervention area	Suggested actions
<p>6. Restore and sustainably manage agricultural systems (including crop and livestock systems) to reduce and remove GHG emissions, reduce human-wildlife conflict, enhance food security and water regulation benefits.</p>	6a. Catalyse continent-wide actions on commitments (such as AFR100) to scale restoration, with a key focus on cost-effective and science-driven assisted natural regeneration through a mix of active planting and eliminating barriers and disturbances to native vegetation recovery.
	6b. Promote agroforestry systems with local and climate-resilient species that provide diversified livelihoods.
	6c. Prioritise novel, integrated livestock management approaches, such as the Herding 4 Health model, which is scalable and traditionally acceptable, enables wildlife-livestock coexistence, climate-change adaptation, carbon sequestration and water regulation.
	6d. Develop policy to allow livestock development strategies that support rural development and contribute to a restoration economy, including the development of national policies and mechanisms to allow for carbon credit trading and benefit sharing for communities that implement rangeland restorative practices.
<p>7. Integrate biodiversity conservation and sustainable management in climate change actions.</p>	7a. Promote and expand conservation of biodiverse areas, including sustainable use and community management.
<p>8. Ensure focus on food security, land-use rights and protection of biodiversity in projects for NbS approaches to carbon removal.</p>	8a. Integrate full community impact assessments into projects for afforestation, soil enhancement, coastal wetland expansion, and others which are driven by goals of carbon dioxide removal for either credits or payment.
	8b. Develop 'sustainable NbS' frameworks to ensure that carbon dioxide removal is not done at expense of development needs and local rights.

4.2.3 Enhancing Climate-Resilient and Low-Carbon Energy and Infrastructural Systems

Renewable energy generation and sustainable domestic energy consumption are key target areas for achieving a climate-resilient and low-carbon future in Africa.

Energy generation

Access to adequate and reliable electricity services is a necessary pre-condition for economic growth. Yet nearly half of Africans lack electricity access in their homes. Furthermore, around 80% of companies in Africa face regular disruptions to their electricity supply. Many African countries are failing to build the distribution networks required to connect poor households or add

sufficient generation supply to meet growing demand. The International Energy Agency projects that total generation in the region must more than double by 2030 to meet demand. Outside of South Africa, it must triple.

Renewable energy is central to addressing both these challenges. Africa is endowed with a wealth of renewable resources. Its river systems, bioenergy, sunshine and wind could meet the region's current and future electricity needs. Hydropower already generates 22% of sub-Saharan Africa's electricity. However, wind, solar, biomass and geothermal collectively contribute only 1%.

The cost of non-hydro renewable electricity has declined dramatically in recent years. Off-grid solar home systems are the cheapest option for providing electricity to nearly a quarter of unconnected homes, negating the need for extending distribution lines to rural areas. Renewable electricity generation from solar PV, wind, biomass, geothermal and hydropower is also increasingly the most cost-effective option for expanding grid-connected supply in many African countries. By 2030, solar is expected to be the cheapest or second-cheapest domestic energy source in most African countries.

In the International Renewable Energy Agency's Renewable Energy Roadmap 2030 scenario, renewable energy contributes 58% of sub-Saharan Africa's electricity mix by 2030, with non-hydro renewables contributing 23%. Underpinning this scenario is a dramatic increase in investment, with over US\$500 billion needed between 2015 and 2030 – 50% of which is needed for renewable energy. Both public and private finance will be required to close this spending gap.

Furthermore, given abundant renewable energy potential in different parts of the continent, there is also the possibility that some renewable energy could power technological carbon dioxide removal approaches, such as direct air capture and storage, potentially funded by developed countries. Also, some carbon dioxide removal approaches, such as Bioenergy with carbon capture and storage, if designed and governed sustainably, could both

generate energy and remove carbon from the atmosphere to meet obligations, or to generate financial flows and livelihoods, enabling development or further expansion of renewable energy infrastructure.

Domestic energy consumption

Most of the domestic energy consumed in rural Africa comes from biomass (wood energy and charcoal), the use of which not only causes deforestation and health problems, but also contributes to climate change. This has led to the development of technological solutions such as improved stoves for cooking, biogas and solar energy systems for pumping water. However, the uptake of these technologies remains insufficient for Africa to realise a low-carbon and climate-resilient future.

Africa needs to fully commit to overhauling its modes of energy production, transformation and consumption to strengthen a security of supply, preserve the competitiveness of its economy, and protect the environment. An analysis of African countries' energy systems and the challenges faced over the past decade highlights the need for system transformation via two priority areas:

- Use of renewable energies
- Strengthening energy use efficiency

Table 8. Priority interventions and suggested actions for enhancing climate-resilient and low-carbon energy and infrastructural systems.

Intervention area	Suggested actions
Energy generation	
1. Integrated water resource planning.	1a. Ensure that hydropower infrastructure is planned in coordination with other sectors that compete for the same water resources.
2. Promote power system planning for a climate-resilient, low-carbon electricity network.	2a. Set long-term targets for renewables to stimulate a pipeline of investible renewable projects.
	2b. Hydropower development must include projections of potential future patterns of hydrological variability, not just historical data.
3. Increase power trade across river basins to strengthen resilience to droughts and get renewable electricity to markets.	3a. To enable cross-basin trade, the transmission networks and market structures in the Southern Africa Power Pool (SAPP) and East Africa Power Pool (EAPP) should be interconnected, as is currently planned, not developed independently.

Intervention area	Suggested actions
4. Strengthen power sector reforms to enable renewable energy independent power producers (IPPs).	4a. Allow private participation in power supply to deliver financial needs and to harness the expertise of international renewable energy developers and investors.
5. Expand renewable capacity through competitive auctions.	5a. Increase competitive tenders can simulate a pipeline of bankable projects, if held regularly, through transparent and predictable planning processes.
6. Strengthen finance and risk mitigation for renewable energy IPPS.	6a. Governments and development finance institutions should crowd-in private investment by providing robust power purchase agreements, affordable loans and risk guarantee facilities to mitigate risks that the private sector is ill-equipped to handle.
Domestic energy consumption	
7. Enhance energy efficiency.	7a. Improve access to energy for more people by enhancing energy efficiency.
	7b. Focus efficiency interventions on electricity use and fuel types used for cooking.
	7c. Promote policies and organizational frameworks more conducive to enhanced energy efficiency and new market development.
	7d. Increase access to modern cooking fuels and promote nation-wide energy efficiency, in collaboration with implementing partners, local governments and communes.
8. Increase adoption of new cooking stove technology.	8a. Identify appropriate energy efficiency solutions/technologies that could be scaled up for larger development impact.
	8b. Promote improved cooking stoves.
	8c. Exchange knowledge and technology between rural and urban households to support rural households in the adoption and use of improved stoves.
	8d. Build knowledge on energy efficiency.
9. Build climate resilience with a focus on women and girls.	9a. Ensure that sensitization and awareness-raising campaigns target women, as they are almost exclusively in charge of collecting fuel for cooking.
	9b. Support households in reducing energy poverty and address the challenges of cooking with solid biomass.
	9c. Encourage the adoption of improved stoves and modern cooking fuels. This reduces cooking time (alleviating women's time-poverty), greenhouse gas emissions, and health risks.
	9d. Provide high quality training to those who play a key role in the dissemination and implementation of energy efficiency.



4.2.4 Promoting Low-Carbon, Resilient Mobility and Transport Systems

Discussions and priorities around climate change in the mobility sector can be grouped into three broad categories: mitigation, adaptation, and planning.

In terms of mitigation, there is a growing interest in the electrification of vehicles on the continent, with their work on electrifying 2- and 3-wheelers in East Africa and the uYilo programme in South Africa being leaders in the discussion. The conversation on the electrification of bus fleets has started among operators, often linked to Bus Rapid Transport and other public transport reform programmes, with Marrakesh and Cape Town leading the way.

The electrification of the paratransit industry in African cities is entangled in the complex relationship that it has with the state, but opportunities exist in programmes like the South African Taxi Recapitalization Scheme. Improving fuel standards and regulating the import of used vehicles has seen considerable progress across the continent in recent years, though the air quality in

many cities continues to decline and an acceleration of this progress would be welcomed by the environmental and public health sectors. Adaptation discussions in the African transport sector have primarily focused on the climate resilience of road infrastructure. For example, in response to anticipated climate change, the Ethiopian Roads Authority has proposed increasing the flood levels for road design by 10% up to 2030 and by 20% from 2030 to 2090.

While vehicle electrification, improvements to fuel standards and road infrastructure resilience are important climate change actions, arresting the rise in motorization across the continent and retaining the high public and non-motorised transport mode shares through low-carbon infrastructure investment has the potential for a significantly larger effect. Under the Nationally Appropriate Mitigation Action (NAMA) programme, some African states have identified investments in public transport and transit-oriented development as desired mitigation-adaptation

interventions within their cities. These interventions have been highlighted as examples of 'triple-wins', which simultaneously reduce the vulnerability of low-income residents to climate shocks, prevent lock-ins into carbon-intensive development pathways, and reduce poverty. African cities have the opportunity to build resilient, transit-oriented cities from the outset, but the higher upfront financial burden on the state may need support from the international community. The combined 'mitigation-adaptation' interventions in the land use-transport systems of African cities are also likely to have sufficient short-term co-benefits (reducing air pollution, congestion, and traffic fatalities) to be no-regret investments.

To facilitate these mitigation and adaptation interventions, the approaches to planning mobility systems in African countries need to become more

climate aware. It's a process that many countries themselves are leading, but it requires greater collaboration and discussion at the continental level. The coming transitions in transport planning, such as incrementalism, hybridity, digitalization, access-based planning and decision-making under deep uncertainty all need to be contextualised within African environments and cognisant of the associated climate risks. The traditional transport planning paradigm premised on travel time savings during the peak hour commute to formal employment nodes is being questioned heavily, and new paradigms – such as the Avoid-Shift-Improve framework – are gaining momentum. Homegrown frameworks for the design and planning of low-carbon mobility systems in African countries need to be explored to achieve specific goals and remain resilient to the unique risks the region will face in the years to come

Table 9. Priority interventions and suggested actions for promoting low-carbon, resilient mobility and transport systems.

Intervention area	Suggested actions
1. Build climate-aware transport planning capacity to better shape resilient mobility systems and infrastructure.	1a. Train transport planners and engineers in climate policy, planning under deep uncertainty, access-based planning, incrementalism, hybridity, adaptive project implementation and dynamic monitoring.
	1b. Collaborate in developing climate-aware, locally appropriate transport-planning masters and undergraduate courses at African universities.
	1c. Invest in research around the 'just transition' to low-carbon, resilient mobility in African cities through a continental knowledge platform.
2. Change the project financing and evaluation requirements for development banks to prioritise resilience, modal split, access equity, and emission mitigation, alongside travel time savings.	2a. Guide the use of development, concession and blended financing arrangements to include the complex climate and social risks – including risks that stem from the projects themselves.
	2b. De-prioritise the use of travel time savings as a metric for transport project benefit to acknowledge its effects on carbon intensity, as well as its weakening correlation with access, economic productivity, and social progress.
3. Support the adaptation of road standards and transport planning guidelines to include resilient designs, as well as prioritise the needs of the most popular and lowest carbon transport modes – walking and cycling.	3a. Compile African design standards for public transport systems and roads, including the infrastructure for non-motorised transport, which adheres to African resilience and universal accessibility principles.
	3b. Include the voices of vulnerable walking and cycling groups within local, national and regional planning processes.

4.2.5 Building Low-Carbon, Resilient Urban Areas

African cities, and current and future urban transitions, can contribute significantly to the continent's climate mitigation and adaptation targets, as well as SDG, biodiversity, poverty, resource sustainability and inequality targets. It can do this by developing mutually beneficial urban-rural linkages, and territorial scale development, in order to invest in regeneration and the renewability of urban, peri-urban and hinterland

natural environments – as well as embracing a planning approach that puts the ecological landscape first, before embedding urban development. This landscape approach can improve the circular economy at the city region scale, aid in disaster-risk reduction, draw attention to ecosystem service synergies and promote agroecological food systems localization.

Table 10. Priority interventions and suggested actions for building low-carbon, more resilient urban areas.

Intervention area	Suggested actions
1. Promote nature-based solutions and urban green infrastructure.	1a. Promote opportunities to realise the multiple co-benefits of incorporating NbS, including hybridised blue-green-grey infrastructure, to help regulate water flow, reduce the heat island effect, treat wastewater, reduce stormwater runoff, and improve water supplies.
	1b. Adopt an integrated landscape approach as a basic framework to balance competing demands, manage multiple land uses, and understand connections in a specific area.
	1c. Invest in long-term maintenance and security and surveillance measures in both in-dividual nodes (e.g., parks) and connections (e.g., pedestrian walkways) to support nature-based solutions in urban centres.
	1d. Scale monetary and non-monetary valuation of nature-based solutions, enhance appreciation of natural capital and complement this with cultural ecosystem assessments that consider production capacities, cultural practices, and access to markets.
	1e. Employ new metrics such as Biodiversity Net Gain, where infrastructure development leaves biodiversity in a measurably better state than beforehand.
	1f. Implement and enforce robust environmental impact assessments and strategic environmental impact assessments prior when expanding urban centres.
	1g. Promote soil biodiversity and soil organic carbon management as vital elements to ensure the land's ability to produce food, store water, control soil erosion and dust, maintain soil stability during extreme rainfall events, reduce carbon losses, among other benefits.
	1h. Plant indigenous trees for shade, reduces heat stress and buffer against storm surges (e.g., mangroves and sea grass) and prevent the loss of property and human lives.

Intervention area	Suggested actions
<p>2. Invest in the circular economy, smart mobility, decarbonization and net zero carbon buildings.</p>	<p>2a. Focus on resource efficient, compact, and mixed-use urbanization as well as net-zero carbon building designs.</p> <p>2b. Prioritise smart mobility, transit-oriented bicycle, and walking infrastructure in new or refurbished designs.</p> <p>2c. Integrate water resource use efficiency in the design of infrastructure as well as build-ing a circular economy for waste.</p> <p>2d. Decarbonise and detoxify energy systems by considering renewable energy in new or existing infrastructure designs.</p> <p>2e. Scale up district heating. In dense urban areas, district heating radically increases thermal efficiencies and decreases heat loss through heat recycling, combined heat and power systems, and economies of scale.</p>
<p>3. Build technical capacity in African cities to adapt to the impacts of climate change.</p>	<p>3a. Support cities access to climate finance by developing concept notes, investment cases and pre-feasibility studies for pilot projects to developers/funders.</p> <p>3b. Train local government officials in climate finance processes, language and opportunities.</p> <p>3c. Strengthen national education and outreach campaigns related to climate-resilient urban development.</p> <p>3d. Promote knowledge exchanges around best practices. These are particularly valuable in data poor regions where information sharing is challenging, ecological and social observations are scarce, institutional mandates for monitoring are ill-defined, and data access is often cost prohibitive.</p>
<p>4. Prioritise risk reduction and building adaptive capacity of residents living in informal, slum or peri urban settlements.</p>	<p>4a. Accelerate and simplify land tenure reforms to stimulate phased restoration of urban natural ecosystems to buffer against hydroclimatic risks and heat stress.</p> <p>4b. Upgrade informal settlements in cities to build urban climate resilience and therefore should be considered in policy making.</p> <p>4c. Develop extended and inclusive planning processes that rely on assessments to help prioritise specific needs of a city and its communities. Co-producing relevant inter-ventions is crucial to ensure social ownership of strategies.</p> <p>4d. Change the perceptions around how decision-makers see areas of informality to foster better engagement between informal sector representatives and municipalities. These are the ideal entry point to service these settlements with the potential to take implementation from the unplanned to the planned.</p>



4.2.6 Enhancing Resilient Water Systems

Building the resilience of water investments in Africa is a critical response to the projected severe and more frequent impacts of climate change. Climate-resilient water interventions need to consider gender inequalities since men and women are impacted by, and respond differently to, the impacts of climate change. Africa needs to move towards a gender equal and climate-resilient water system to ensure water security that will support sustainable socio-economic development.

Major decisions require careful planning; in cases involving large investments, long lifetimes and irreversibility, there is a strong argument for assessing resilience to future climate change. However, uncertainty is particularly high in relation to future rainfall patterns due to differences between climate model results. It is exacerbated by the fact that changes may not be unidirectional; it is possible

for rainfall to fluctuate over decadal timescales, inducing wet and dry periods in the same location. This uncertainty has important bearing on research directions and practical approaches to climate resilience in the water sector.

While many features of water-resources management have evolved measures to build resilience in the face of uncertainty and variability (such as forecasting, supply augmentation, storage, the use of groundwater and in some cases, demand management), many traditional approaches to infrastructure design for long-term assets and investments may be inadequate for the level of uncertainty associated with climate change. In such situations, Robust Decision-Making or Decision-Making Under Uncertainty approaches can help to identify adaptation strategies that work reasonably well under a range of conditions ('stress testing' system performance under a range of climate projections is recommended). This requires identifying what is at risk, for whom, under different policies. Flexible options that avoid locking into specific designs and operating procedures can be useful as the climate evolves or new information becomes available. Flexibility and robustness are generally desirable properties for resilient water systems.

Another important requirement for resilience is the recognition of interdependencies between water and other sectors. The water-energy-food (WEF) nexus is a good example, and its growing prominence is driven by concern about natural resource scarcities and the recognition that the WEF nexus sectors and other resources are strongly interdependent—such that development may imply significant trade-offs. In Africa, this is compounded by, among other things, the consequences of rapid development trajectories, including an upsurge in new dam construction, and high levels of physical and socio-economic exposure to climate in nexus sectors with crucial economic roles throughout the continent. However, few studies in Africa fully integrate all three nexus sectors, and they rarely include an explicit focus on climate change. This is a gap in our knowledge base.

While most climate impact assessments consider the physical components of nexus sectors and their interdependencies, understanding their management and governance structures is also important. Resilient systems require a cross-sectoral understanding of vulnerabilities and management decision points, and a cross-sectoral coordination for effective implementation. Barriers to coordination include institutional structures, limited resources, issues around cost recovery, free-riders and a need to protect roles and responsibilities to ensure future budgets. Political will and appropriate budget and human resource allocation can help to address such barriers

Table 11. Priority interventions and suggested actions for enhancing resilient water systems.

Intervention area	Suggested actions
1. Increase water investment.	1a. Increase political commitment for gender equal and climate-resilient water investment.
	1b. Mobilise financial and other resources for water investment.
	1c. Strengthen capacities (institutional and individual) for developing, implementing, operating and managing water investment programmes/projects.
2. Establish systems for developing and transferring technologies to support climate resilience building.	2a. Develop national innovation to produce water-efficient and climate-sensitive technologies.
	2b. Develop national systems for transferring, adapting and applying technologies.
3. Integrate the management of water resources as part of water development.	3a. Take actions to ensure that the natural resource base (water, land other natural resources) is maintained to support development in a changing climate.
	3b. Protect water-related ecological systems and build their climate resilience.
	3c. Establish systems for managing water resources, considering hydrological boundaries as units of management/development.
4. Strengthen transboundary water cooperation.	4a. Develop cooperative mechanisms for managing shared water resources.
	4b. Take actions for joint investment projects in shared water resources for benefit sharing.
	4c. Develop and implement a basin-wide development and management plans/programmes considering climate change.
5. Integrate water security issues into development plans/programmes.	5a. Integrate water security into national and sectoral development plans/programmes.
	5b. Integrate water security into climate response strategies such as NDCs and NAPs.
6. Strengthen the characterisation of climate risk in water systems.	6a. Include a focus on past and recent variability and extremes and their impacts.
	6b. Improve linkages between technical departments on weather/climate and water, build capacity in climate-risk assessment.
	6c. Agree on principles for risk-assessment approaches, share experiences on how future risks are assessed, and develop practical approaches suitable for operational implementation.
	6d. Consider the range of impacts – including who is affected and why/ how risk assessments need to consider local perspectives about who is vulnerable, and which risk mitigation steps are appropriate.

Intervention area	Suggested actions
7. Strengthen the mandate to undertake climate risk assessment of major investment decisions aiming for system resilience.	7a. Lobby donors to adopt risk assessment into planning and financing decisions.
	7b. Work through international adaptation mechanisms to support national government and relevant line ministries to design policy for climate risk assessment, consider policy to make it a requirement in some situations.
	7c. Work with technical departments to facilitate design and adoption of these approaches.
	7d. Raise awareness of decision-making under uncertainty approaches to planning and management. Where major decisions/investments are involved incorporate 'stress testing' of water resource systems under a range of climate (and other) conditions.
8. Improve coordination between multiple sectors, particularly water-energy-food, but also environment and land.	8a. Address governance and institutional barriers to coordinated planning and management.
	8b. Promote tools and decision-making approaches that incorporate multi-sector objectives and performance indicators.
	8c. Build the evidence base to demonstrate the value of greater coordination in planning.



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4.2.7 Building a Climate-Resilient African Blue Economy

There has been a growing interest in the role of oceans in supporting sustainable development and providing broader social and economic benefits, commensurate with a growing awareness of the pressures that marine ecosystems face through drivers such as pollution, habitat destruction, unsustainable and illegal harvesting of marine resources and climate change. The oceans

agenda, often framed in terms of the blue economy or oceans economy, has been included in the UN Sustainable Development Goals (SDGs) as SDG14 'Life Under Water', and has also been promoted through a range of international platforms and processes, such as the UN Ocean Conference and the High-Level Panel for a Sustainable Ocean Economy.

In the Africa region, too, the blue economy has become more prominent in national and regional policy arenas. African coastal and island states have combined ocean territories of 13 million km². Fisheries and aquaculture, marine and coastal tourism, offshore extractive industries and other ocean-based industries have been estimated to generate a value of US\$296 billion and support 49 million jobs. Investing in coastal/blue carbon infrastructure, mangrove expansion and shellfish fisheries can also draw down carbon and create jobs.

Several regional policy frameworks recognise the importance of Africa's blue economy, with the Africa Union's Agenda 2063 envisioning the region's blue economy as a major contributor to continental transformation and growth (it is important to note that in key policy frameworks, Africa's blue economy is defined as including both marine and freshwater ecosystems). Africa's Blue Economy Strategy (2019) and preceding regional frameworks have highlighted the risk posed by climate change to the region's

blue economy. Climate-related risks are impacting communities and ecosystems already threatened by pressures such as the overharvesting and illegal harvesting of fisheries and other marine resources, pollution, unsustainable coastal development, habitat destruction and governance challenges.

The foundations for climate resilience lie in ensuring the natural assets on which economic activity depends are secured and even enhanced, and that economic production and consumption processes do not degrade them. Healthier, more productive ecosystems are inherently more resilient to climate pressures, and therefore drivers undermining ecosystem health must be addressed as part of an integrated approach to ocean health. Integrated, adaptive and inclusive governance is therefore central to addressing climate change impacts and ensuring that Africa's maritime and freshwater ecosystems can effectively support a vibrant, prosperous, equitable, resilient and sustainable blue economy.

Table 12. Priority interventions and suggested actions for building a climate-resilient African blue economy.

Intervention area	Suggested actions
1. Promote climate-resilient coastal development .	1a. Invest in ecosystems and natural assets as multi-benefit providers, thereby enhancing natural capital that supports livelihoods and climate resilience.
	1b. Strengthen grey and green (ecosystem-based/nature-based) adaptation in coastal zones.
	1c. Enhance financing for adaptation in marine and coastal zones (blue carbon, 'blue finance', private sector partnerships, debt-for-nature swaps and other mechanisms).
	1d. Integrate climate risk in coastal development planning.
	1e. Strengthen disaster risk reduction and preparedness plans and strategies.
2. Support sectoral and integrative blue economy interventions .	2a. Strengthen co-governance and regional fisheries governance mechanisms for enhanced climate resilience.
	2b. Integrate climate in marine spatial planning, integrated coastal zone management and other planning frameworks.
	2c. Support sector-specific interventions for key blue economy sectors, including tourism, shipping, fisheries and aquaculture.
3. Strengthen research and policy .	3a. Strengthen the role of oceans and coasts in NDCs and other climate-related policies and strategies.
	3b. Support research to predict, monitor and respond to ocean-related climate impacts.
	3c. Ensure ocean-related climate policy interventions consider equity and the unique position of vulnerable groups.

4.2.8 Digital Transformation

Timely and accurate information is critical in building climate resilience across Africa. Digitalization within the context of the climate change agenda should be framed as a continent-wide capacity-building process that enables access to up-to-date climate data for informed decision-making and service-provision and ensures that the continent is ever-ready and able to rapidly adapt when required. To achieve this, a process of changing data from analogue to digital form (digital enablement) is needed. With the foundation of digitization, actors such as individuals, businesses and governments will be able to leverage digital innovations and business processes to transform climate responses and green economy development.

Within the agricultural sector, digitalization is seen as a game-changer for agricultural transformation across Africa as it has huge potential for product development, service delivery, and operationalization of services. However, for digitalization to work, especially in building resilience against climate variabilities, a holistic approach is needed. This means ensuring that the provision of climate advisory services for farmers would have to be consistent, sustainable, and scalable across the sector.

Digital innovations, consisting of digital solutions and services and digital technologies, are critical in data capture, processing and service delivery. The effective functioning of digital services and solutions such as production information services, access and use of climate sensitive inputs, and financial services – including index-based insurance services – depend on pioneering digital technologies such as drones or sensors, satellite technologies, artificial intelligence, cloud technologies and high-end devices for service delivery and access. However, access to accurate, customised, targeted and tailored advisory services, which is needed now more than ever before, depends on up-to-date user data and quality content data management. This requires complex data infrastructure to support the effective functioning of content data, derived from varied sources, and user data across diverse value chain actors.

A holistic approach also means understanding financing models for digital innovations, subsequent investments by private sector investors, the business models behind the delivery of the digital services, and the willingness of users to pay for the products and services to ensure continuous adoption, scale, and sustainability.

Furthermore, the rules of the game that define the enabling environment for digitalization, such as infrastructure and access, policies and strategies, knowledge and networking, and literacy and skills, are key to a holistic approach. Without the involvement of private sector investors, the holistic approach will fail, and for the private sector to invest in the innovations, an enabling environment is needed.

The following considerations are suggested at the intersection of digital transformation and climate change:

- Give environmental concerns prime importance in the development of digital technologies, services and interventions;
- Support multi-sectoral approaches to address digital transformation issues and involve all relation holders and stakeholders to ensure that digital technology is developed wisely and environmentally responsibly;
- Employ a holistic approach to the environmental impact of technologies;
- Incorporate energy efficiencies and account for the power consumption of digital health interventions (including, for instance, mobile base stations, server farms, and air conditioners) and the replacement of batteries;
- Control electronic waste, for example, by prioritising repair over replacement and aiming for circularity in digital apparatus;
- Avoid constant equipment upgrades and accelerating hardware-software cycles; challenge related unsustainable business models and practices;
- Limit the need for air travel by digital transformation projects; and,
- Assess the impacts of digital transformation on the environment (not only on climate) in relation to government action and international agreements.

It is important to note that digital transformation narratives have largely been framed by the Global North. Therefore, the first step to achieving meaningful African engagement is the decentring of digital transformation.

Promoting and implementing digital transformation in an interdependent, decentred and climate conscious way means:

- Building on African knowledge and capacities;
- Focusing on African people, communities and their demands, resources and agency;
- Respecting African authority;
- Aligning with African policies, standards and regulations;
- Being inclusive and leaving no one behind; and,
- Balancing human rights and human responsibilities.

Table 13. Priority interventions and suggested actions for digital transformation.

Intervention area	Suggested actions
1. Governments should coordinate their national digital climate data infrastructure.	<p>1a. Ensure governments take the lead in coordinating their national climate data infrastructure and connect them across the continent for policy and decision-making.</p> <p>1b. Involve private sector investors in the development of necessary facilities/ systems to support climate data for sustainability.</p>
2. Engage private sector digital innovators and service providers as business partners.	<p>2a. Involve young digital entrepreneurs across the continent to support local data ownership models and safeguard the continent's climate data.</p> <p>2b. Explore viable business models for scaling digital climate advisory services through big data and analytics.</p>
3. Strengthen community engagement.	<p>3a. Develop and implement digital transformation frameworks that glean common values from the African concepts like ubuntu (communal love), guiding interactions, research and development in the Africa.</p> <p>3b. Involve dynamic and integrative approaches, focus on local agency, seek reciprocity and the pragmatic inclusion of different ways of knowing, conceptualization, and meaning-making.</p>
4. Promote workforce enhancement.	<p>4a. Recognise and expand African capacity for climate-conscious digital transformation.</p>
5. Develop and promote thought leadership.	<p>5a. Develop communities of practice to contribute to conversations in international digital transformation.</p>
6. Strengthen system conciliation.	<p>6a. Acknowledge that digital transformation is a social action that requires empathy and the incorporation of all views.</p> <p>6b. Recognise that system experiences and standards in affluent settings are not necessarily useful to guide systems elsewhere.</p> <p>6d. Appreciate that solutions proposed by exogenous industries present technical, political, and climate challenges for African communities and governments.</p>

4.3 Strategic Intervention Axis 3: Enhancing Implementation Towards Climate-Resilient Development

The effective implementation of climate-resilient development plans and policies will require support in terms of climate finance and resource mobilization; technology transfer and enhanced capacity building; and awareness creation and outreach.

4.3.1 Enhanced Finance Flows and Resource Mobilization

Developed-country Parties to the UNFCCC have committed to mobilising US\$100 billion per year by 2020 to support climate action in developing countries. The UNFCCC defines climate finance as local, national or transnational financing, drawn from public, private and alternative sources, which seeks to support mitigation and adaptation actions to address climate change.

Climate change is a cross-cutting macro-economic issue, and climate finance is 'strategic' in the sense that it enables the delivery of multiple development outcomes such as food and water security, energy security, good health, employment, and other benefits. As such, climate finance can support countries to deliver not only on SDG13 (Climate Action), but also on several other related SDGs. Without financial support for action to reduce risks from climate change, most SDGs may not be achieved.

Climate finance can come from bilateral and multilateral sources. Bilateral climate finance comes directly from a country or an institution in that country, such as government development agencies. Multilateral sources are finance institutions that have multiple countries as contributors or shareholders, bringing together funding contributions from these different countries. Multilateral sources include Multilateral Development Banks, such as the World Bank, regional development banks, international public funds, and UN agencies. International public funds include those under the Convention such as the Global Environment Facility (GEF), the Special Climate Change Fund (SCCF), the Least Developed Countries Fund (LDCF), and the GCF. There exist also carbon markets, private equity and other alternative sources. Most OECD countries provide funding bilaterally and also channel some of their financial support to developing countries via multi-lateral institutions.

Most publications point to the fact that the amount of adaptation finance, although on an upward trend, falls far short of the scale of investments needed. Annual adaptation costs in developing countries alone

are estimated at US\$70 billion currently, according to the UNEP Adaptation Gap Report (2020). Although research costing climate-resilient development in Africa is limited, many African countries, particularly Least Developed Countries, express a stronger demand for adaptation compared to mitigation finance.

Africa is struggling to access climate finance and to deliver sustainable and transformative responses to climate-change impacts at scale. For example, the total financial commitments from bilateral and multilateral funders for adaptation between 2014 and 2018 remained well below US\$5.5 billion per year. This is far below the various estimates of adaptation costs in Africa, which range between US\$7-15 billion per year for 2020.

Moreover, the UNFCCC and its Paris Agreement are clear on the need for developed countries to provide financial support to developing countries in view of their constraints and the need to balance mitigation and adaptation finance. However, research on quantifying international public finance for climate change adaptation in Africa (2014-2018), found finance targeting mitigation (US\$30.6 billion) was almost double that for adaptation (US\$16.5 billion), with more adaptation-related finance provided as loans (57%), compared to grants (42%), and 50% of that amount targeting mainly two sectors: agriculture, and water supply and sanitation. Adaptation financing has not preferentially targeted the most vulnerable African countries. Furthermore, the disbursement ratio from 2014-2018, indicating whether approved projects are actually receiving funding and being implemented as planned, or whether they are encountering challenges on the ground, was found to be as low as 56% for mitigation and 46% for adaptation (compared to 96% for other development projects). This suggests constraints particular to climate-related projects.

Adaptation costs in Africa are expected to rise rapidly as global warming increases. Africa is highly vulnerable to climate change as many of the continent's key economic sectors, such as agriculture and hydropower, are climate-sensitive, making adaptation financing a key priority. Annual adaptation costs in developing countries are expected to reach US\$140-300 billion in 2030 and US\$280-500 billion in 2050. However, this could be a substantial underestimate. For example, the Coalition for Urban Transitions, which advises governments on economic development and climate change, estimates investments of about US\$280 billion will be needed to cope with the effects of climate change by 2050 in 35 cities in three African countries

alone (South Africa, Kenya and Ethiopia). The 2010 global goal of mobilizing US\$100 billion per year by 2020 is therefore outdated and it is hoped that by 2025, Parties will set a more realistic and collectively quantified goal.

Cumbersome procedures for gaining direct access accreditation to multilateral funds makes it difficult to access international climate finance for African countries. The capacity to develop fundable projects in Africa is also inadequate, including required upfront investments (e.g., for feasibility studies and co-financing) and lack of reliable data and evidence for a climate rationale. An analysis of proposals submitted to the GCF up to 2017 shows African countries had the lowest percentage of approvals (39%) compared to all other regions.

Not just the quantity, but also the quality of climate finance is important for climate-resilient development. For example, in contrast to finance for mitigation projects, such as renewable energy, many adaptation interventions for the most vulnerable countries and communities provide low or inadequate financial return on investments for private funders and can therefore only be funded with public finance. Yet public finance targeting adaptation in Africa has been provided mostly as loans rather than as concessional finance such as grants. This hinders adaptive capacity, because many African countries are at high risk of debt distress, especially due to the COVID-19 pandemic, and will need to decrease their debt levels for governments to have more fiscal space to invest domestically in climate resilience. The total external debt servicing payments across African countries currently far exceed commonly discussed or committed levels of near-term climate finance for adaptation.

Nonetheless, African governments already invest a substantial amount in national adaptation action, such as drought relief programmes, agricultural support programmes, and disaster management programmes. Research estimates public spending on adaptation from domestic budgets may average 3.4% of GDP, potentially diverting resources from other development priorities in cases where integrated project planning is not used to align multiple development goals. Work on

adaptation planning and mainstreaming of climate into budgeting and financing, such as climate public expenditure reviews, is still at nascent stages in Africa.

Public funds are very likely insufficient to meet rapidly growing adaptation needs. Public mechanisms should leverage private sector finance for climate-resilient development by reducing regulatory, cost and market barriers through blended finance approaches, public-private partnerships, or innovative financial instruments and structuring to support of private sector investment, such as green bonds. Subnational actors can be key agents to unlock domestic resources in the implementation of adaptation action, provided they are sufficiently resourced, and their participation and agency are supported.

Once finance is flowing, tracking of climate adaptation at a national level is challenging for many African countries, due to factors such as different tracking approaches and data gaps and limitations. Many countries lack the capacity to measure, report and verify (MRV) climate finance, thus putting Africa in a position where it is less able to demand accountability from funders because of the lack of transparency and challenges in how climate finance is defined by funders, as well as being less able to demonstrate transparency and effectiveness of financial support in climate-related projects.

Many climate funds continue to be programmed through multilateral entities. However, more recently direct access modality has enabled national and regional entities from African countries to manage their resources, promote national agency for climate action and to build in-country capacity for sustained climate action. Direct access also has an important role to play in strengthening the pathways for translating international climate finance disbursements into local action by building and reinforcing important connections between actors and structures on multiple domestic governance, decision-making and implementation levels. Many African institutions and agencies are still struggling to get accredited as a direct access entity (DAE) though, making them dependant on multilateral implementing entities.

Table 14. Priority interventions and suggested actions for enhanced finance flows and resource mobilization.

Intervention area	Suggested actions
1. Establish mechanisms to mobilise climate finance at scale in Africa.	1a. Assess current climate financial flows to Africa and develop a roadmap for achieving Africa's adaptation financial needs (as set out in NDCs).
	1b. Establish and maintain an MRV system for financial support for Africa as a means to enhance transparency.

Intervention area	Suggested actions
<p>1. Establish mechanisms to mobilise climate finance at scale in Africa. CONT.</p>	<p>1c. Implement policy, institutional and legal reforms for enhanced resource mobilization and scaled-up, transformative climate finance.</p> <p>1d. Integrate climate action in fiscal policy and public financial management systems.</p> <p>1e. Strengthen climate and disaster risk financing mechanisms in Africa.</p>
<p>2. Strengthen Africa's readiness and capacity to access international climate finance.</p>	<p>2a. Provide support for accreditation of African entities.</p> <p>2b. Build a cadre of African climate finance experts and establish a climate finance portal for Africa.</p> <p>2c. Strengthen Ministries of Finance/Planning leadership role in resource mobilization for climate action.</p>
<p>3. Promote private sector investment in climate action.</p>	<p>3a. Build capacity for private sector engagement and win-win contracting.</p> <p>3b. Identify barriers to private sector investment and promote use of policy and financial de-risking instruments.</p> <p>3c. Develop capacity for formulation of investment ready project pipelines and enhance matchmaking platforms.</p>
<p>4. Mobilise new financial instruments and accountability structures to support climate adaptation and mitigation.</p>	<p>4a. Mobilise financing from the private sector to reduce risk and enhance the quality and life of existing urban infrastructure.</p> <p>4b. Promote the uptake of nature positive infrastructure to reduce business risks, fewer stranded assets and new market opportunities.</p> <p>4c. Given the historical legacies across African cities (e.g., from colonialism and apartheid), investments should be targeted to address legacies of unequal development.</p> <p>4d. Local governments should re-examine the impact of cost recovery policies on low-income communities (e.g., for water, storm water drainage, waste services) - considering the need to achieve distributional and procedural equity in service delivery.</p> <p>4e. Increase public sector funding for adaptation in cities to mitigate and adapt climate change impacts and address infrastructure development needs.</p> <p>4f. Align local plans and policies with NDCs and NAPs to ensure climate finance flows to a local level and national targets and actions are achieved.</p>
<p>5. Strengthen climate finance effectiveness.</p>	<p>5a. Encourage cross-sectoral approaches to adaptation planning that emphasize reducing risk across interconnected sectors affected by climate change, such as the water-energy-food nexus and the biodiversity-health nexus.</p> <p>5b. Strengthen gender equality and the empowerment of women and girls in climate finance projects.</p>

4.3.2 Safety Mechanisms to Reduce Loss and Damage, Including Climate Insurance

Social protection mechanisms have significant potential to improve or support households' adaptation to climate change through social assistance (cash or in-kind transfers), social insurance (cover against designated contingencies), or labour market programmes (such as unemployment benefits). Evidence is emerging that demonstrates by alleviating credit, savings and liquidity constraints, such transfers can stimulate agricultural production through investment in technology and productive assets (farm, livestock, non-farm), and increased own-farm household labour allocation. There may also be positive impacts on savings and reduction of pressure on informal insurance mechanisms. Adaptive social protection emphasizes livelihood promotion in addition to protection, via mechanisms to increase benefits per participant and to reach more beneficiaries in the face of emerging shocks. Innovations in risk finance can increase the effectiveness and timeliness of adaptive social protection programmes.

Institutional risk management options can complement risk-reducing production technologies. They intervene in different aspects of the risk-poverty connection: technologies can reduce production or income losses when weather-related stresses occur, whereas institutional risk management can increase access to capital and uptake of improved production technologies and practices. For those living in chronic poverty in rural areas, adaptive social protection can provide a complementary safety net to reduce climate risk. They can also be complementary through bundling risk-reducing technologies to stabilize production in the face of moderate climate fluctuations, plus social protection to buffer the effects of extreme events such as drought.

Early Warning Systems can help to build resilience by responding to crises before they occur. If properly linked with national social protection systems, forecast based financing has the potential to not only help smooth climate-related shocks, avoiding set-backs in development, but also to enable poor and vulnerable people to manage climate risks more effectively and in a proactive manner.

Social Behavioural Change and Communication interventions can be linked to social protection programmes with the purpose of addressing some of the values, preferences and social norms that influence a behaviour, including maladaptation.

Social transfers should be predictable and flexible and the value and duration should be sufficient to protect and promote livelihood diversification.

Home-Grown School Feeding programmes can provide a platform for delivering other services and reaching schoolchildren, promoting knowledge and innovations, and strengthening relevant capacities of households and communities, and help to advance successful outcomes for climate change adaptation.

Asset-creation programmes can improve food security and boost income among the poorest people. However, in terms of climate change, there is a trade-off in some of these types of programmes, as there is a high carbon 'hoofprint' of livestock production, so improving livestock feeding is crucial.

Climate risk insurance could also play an important protection role to poor households exposed to climate risk. It can support sustainable development through transferring risk, incentivising risk prevention and management and mobilising capital to help manage climate risks, and mitigation activity risks, and improve Africa's resilience:

- Risk transfer: insurers protect households and businesses by absorbing financial shocks due to climate disasters.
- Risk managers: insurers help stakeholders understand, prevent and reduce risk through research and analytics, catastrophe risk models and loss prevention. Insurers also advocate proper land-use planning, zoning and building codes, and promote disaster preparedness. Furthermore, insurance pricing provides risk signals and rewards risk reduction efforts.
- Institutional investors. Insurance for, and investments, in renewable energy, green buildings, low-carbon transportation, sustainable agriculture, carbon dioxide removals and climate-resilient infrastructure promote sustainable development.

A large risk protection gap currently exists, with 91% (US\$1 billion) of losses from climate risks in Africa being uninsured. Furthermore, African countries are, in general, not well insured against climate risks. Fewer than 10% of people have cover in most countries and penetration is generally less than 2% of GDP. The African insurance sector has thus played a very limited role in climate risk reduction or transfer to date.

Table 15. Priority interventions and suggested actions for to enhance safety mechanisms for loss and damage.

Intervention area	Suggested actions
1. Strengthen integrated programming .	1a. Extend cash plus programmes to support adaptation through the promotion of income-generating activities, livelihood diversification and financial inclusion, promoting opportunities and strategies to deal with future risks.
2. Strengthen public works programmes.	2a. Establish robust public works programmes with regular scheduling and maintenance and not as a temporary safety-net.
	2b. Ensure community assets address key challenges to livelihoods, that they are relevant to local needs and support environmental rehabilitation and conservation in order to achieve longer-term impacts.
3. Promote asset creation .	3a. Develop asset-creation programmes to improve food security and boost income among the poorest people.
4. Improve understanding of risk exposure among the insurance sector and clients.	4a. Identify data and model requirements for underwriting needs and work to fill these gaps.
	4b. Support the Task Force on Climate-related Financial Disclosures (TCFD) and Environmental, Social and Governance (ESG) strategy development among insurers to enable them to better understand and manage impacts of climate change on their business.
	4c. Improve collaboration between stakeholders to improve data access, sharing and integration across use cases.
5. Develop innovative risk transfer and management solutions .	5a. Identify clients' key risks through conducting risk assessments.
	5b. Build capacity and trust among clients by training them on acquisition and use of data to better understand and manage their exposure to climate change.
	5c. Develop risk transfer products to meet the needs of key stakeholders, including support with prediction/ early warning and preparation activities.
6. Develop harmonised climate finance policies and regulation .	6a. Develop climate insurance policies that support national and continent-wide climate policies.
	6b. Identify priority regulatory constraints and address them to enable the provision of more innovative climate products.
	6c. Stimulate the market for climate risk insurance by building underwriting capacity in local markets, enabling access to global reinsurance and promote alternative risk transfer structures (i.e., insurance pools).
	6d. Promote innovation in product design and distribution through pilots, regulatory sandboxes, allowing development of index insurance products.
	6e. Improve collaboration between public and private sector stakeholders and champion climate risk insurance.



4.3.3 Equitable Technology Transfer

Implementing and reaching African NDC goals requires a sound and tailored development and technology transfer programme for key prioritised sectors. Alongside implementation of the Paris Agreement technology framework (Article 10, Paragraph 1), adopted during COP24, African national technology systems still encounter a range of constraints including political will, siloed approaches (weak multisectoral and multi-actor collaboration) and low promotion and support of in-country technology development processes.

Despite the numerous efforts undertaken by the Africa Group of Negotiators and Least Developed

Countries, African technology concerns and needs are not adequately addressed in climate negotiation processes. Furthermore, under the Poznan Strategic Programme (Decision 4/CP.13), many African countries have updated their Technology Needs Assessments (TNAs), but are waiting for financial support to implement their Technology Action Plans and Project Ideas.

There is great development potential for endogenous technologies that are relevant and appropriate to the local environment.



Table 16. Priority interventions and suggested actions for equitable technology transfer.

Intervention area	Suggested actions
1. Support the development of a sustained national technology innovation system.	1a. Update a technology gap and needs assessment at relevant levels (territorial, national and regional).
	1b. Support the design of an institutionalized national innovation system (NIS) including climate endogenous technologies. Technologies need to be at a higher level of use and understanding.
	1c. Develop and support the implementation of resource mobilization (national and international level) to implement the NIS.
	1d. Support the piloting and implementation of TNAs where needed and specifically in countries where the assessments have been successful.
	1e. Support private actors' (especially young entrepreneurs) access to climate finance to foster the deployment of mature technologies.
2. Promote regional south-south technology development and transfer/local dissemination.	2a. Design and implement a regional platform for climate technology knowledge management.
	2b. Identify, review and enhance the functioning of existing regional technology development and transfer centres.
	2c. Support in- and cross-country peer-to-peer learning and technical assistance.
3. Enhance the participation of African negotiators in technology-related agendas by improving their capacities in policy development and implementation and the compilation of technical documents that are needed by finance providers.	3a. Co-develop and implement a permanent and tailored capacity building programme for junior technology development negotiators that addresses negotiations, transfers and related agenda items.
	3b. Support technology negotiators (before, during and after climate negotiation events).

4.3.4 Inclusive Participation, Especially of Gender and Youth

The impacts of inequality and the socio-economic disadvantages of vulnerable people are not adequately addressed in climate change policy design and implementation, which ultimately undermines the continent's efforts towards inclusive resilience building. Despite their vulnerability to climate change, the mobilization of vulnerable communities in climate politics remains a challenge. Although a plethora of

climate change impact studies exist, there is a need to capture the responses of men, women and children to a series of climatic stressors and shocks over time and to carefully consider these needs in policy frameworks.

In addition, Agenda 2063 is designed around a people-centred approach, and intentionally developed to be driven by Africa's citizens. Likewise, a key determinant

of the Strategy's success is the capacity of government and non-government stakeholders, including citizens, to play a role in the domestication of this Strategy. In this regard, assessments and interventions are required to support the capacity needs of all continental players to adequately perform a role in the Strategy's roll-out and implementation. Also, a communications

plan for this Strategy needs to be developed so that its intentions are effectively disseminated and can guide stakeholders in their desired roles. Delays in the implementation of inclusive climate processes will negatively affect the future of Africans and their livelihoods.

Gender

Integrating gender issues in climate action will require coherence among the institutions responsible for climate change and gender policies in Africa. There is also a need to build the capacity of relevant institutions for mainstreaming gender into climate change policy formulation, planning, monitoring and evaluation. Climate change policy needs to equally address the interests of men and women and use disaggregated data to support policy initiatives. An understanding of gender inequalities is important to identify gender gaps and devise strategies to bridge them through policy.

The 16th session of the African Ministerial Conference on Environment focused on the development and strengthening of gender-responsive policies to empower women and men, as well as the enabling conditions and national policies needed to empower African youth. The Strategy acknowledges the existence of societal

challenges, including gender inequality, and the need for partnerships that embrace inclusive and sustainable approaches for socio-economic empowerment. Barriers to such an approach include inadequate platforms for meaningful engagement, restricted inclusion of women and youth in decision making, a lack of awareness of gender and youth dimensions of climate change, inadequate finance and missing inter-generational knowledge transfer. These challenges suggest the need for climate adaptation responses to be contextually embedded and to include resilience-building activities targeted at gender and youth.

Means for overcoming the identified barriers include establishing an enabling environment that institutionalizes gender participation in decision-making processes, dedicated climate change education and special funds for financing youth climate change action. Climate change vulnerability is multidimensional, the needs of the youth and women differ according to the geographic, cultural and social context.

Youth

Despite their vulnerability to climate change, the mobilization of youth in climate politics re-mains a challenge. Many attempts to involve young people often do so in a tokenistic way and do not provide youth with an opportunity to properly prepare content, understand procedures and substantively contribute. When discussing youth and climate change, there is often a framing that situates young people as only being impacted in the future, while failing to recognise the current impacts experienced by youth and how these impacts may differ from older generations. The same can be said for the for a growing area of climate-related work around creating a just transition in Africa. A new opportunity around the just transition serves as important way to en-gage youth to ensure that the benefits of a transition to a green, low-carbon economy are shared widely, while also supporting

those who stand to lose economically. This includes not only cre-ating decent work and quality jobs, but also dismantling systems of inequality that allow for the intersectionality of issues to be better understood. Youth are clearly central to this but are often only positioned as future participants or beneficiaries and not as current actors.

The important role that youth are already playing as active change agents should be recognized and supported. Young people across the continent have increasingly taken action in their own communities and at a national and regional level to put forward their own youth submissions, actions, plans and contributions to the policy space. The Youth Strategy of the UNEP, for exam-ple, speaks of harnessing Africa's youth to contribute towards the realization of Agenda 2063 as well as the global Agenda 2030.

Table 17. Priority interventions and suggested actions for equitable inclusive participation.

Intervention area	Suggested actions
Gender specific intervention and action areas	
1. Improve gender participation in policy development processes.	1a. Increase women's representation in major climate change policy making positions. 1b. Facilitate gender-sensitive dimensions in National Adaptation Planning processes and climate change development plans at all levels.
2. Empower and engage young people in climate adaptation planning and implementation through inclusive and participatory approaches.	2a. Involve young people in planning and implementation of climate change adaptation strategies using interactive methods. 2b. Build the capacity of the youth, prioritizing their development in national budgets, to ensure their contribution in climate change adaptation efforts.
3. Enhance education and sensitization on gender and youth responsive approaches.	3a. Conduct regular advocacy and awareness programmes on youth and gender equality and inclusivity in climate change policies, programmes and procedures. 3b. Increase information sharing for enhancing gender- and youth-sensitive climate change impacts.
Youth specific intervention and action areas	
4. Improve youth participation in policy development processes.	4a. Increase youth representation in major climate change policy making positions. 4b. Facilitate gender-sensitive dimensions in National Adaptation Planning processes and climate change development plans at all levels.
5. Empower and engage young people in climate adaptation, mitigation and just transition planning and implementation through inclusive and participatory approaches.	5a. Involve young people in planning and implementation of climate change adaptation, mitigation and just transition strategies using interactive methods. 5b. Build the capacity of the youth, prioritizing their development in national budgets, to ensure their contribution in climate change adaptation efforts.
6. Enhance education and sensitization on youth responsive approaches.	6a. Conduct regular advocacy and awareness programmes on youth and intergeneration equity and inclusivity in climate change policies, programmes and procedures. 6b. Increase information sharing for enhancing and youth-sensitive climate change impacts.

4.3.5 Capacity Development

It is essential that all climate stakeholders have the relevant capacities needed to deliver climate adaptation and low-carbon, climate-resilient development, together with the ability to apply skills, knowledge and tools and the willingness to deliver change. This includes:

- Institutional capacity for governance and coordination;
- Technical capacity to carry out modelling and evaluation, including sectoral expertise;
- Relational capacity to build partnerships and invest time in processes; and,

- Strategic capacity for systemic policy design and implementation.

Capacity-building is country-driven and involves learning by doing. It also requires the support from existing national institutions and civil society more broadly. Much capacity building work on climate action is taking place under the UNFCCC's Action for Climate Empowerment agenda, as well as in AGNES, which focuses on education, public awareness and access to data.

Table 18. Priority interventions and suggested actions for capacity development.

Intervention area	Suggested actions
1. Develop African-focused training courses on climate change that promote the Strategy's overall objectives.	1a. Plan stakeholder workshops to provide updates on global changes in legislation, policies and tools to ensure negotiators, member countries, advocacy groups and non-governmental stakeholders are informed and up to date.
	1b. Develop training intervention for the communication and dissemination of the Strategy specifically.
2. Develop capacity needs assessments to analyse country and stakeholder capacity-building requirements to develop actionable interventions and strategies.	2a. This capacity assessment should form the basis of discussions and priority intervention areas with technical partners, providers, and funders.
	2b. Develop a capacity assessment to address the capacity needs of all continental players to adequately perform a role in the Strategy's roll-out and implementation.
3. Support for policy makers in effective decision-making needs a bit more text here perhaps as per others to flesh out?	3a. Develop the skills and relationships needed to drive forward new strategies, policies and climate-change actions.
	3b. Plan stakeholder workshops to provide updates on global changes in legislation, policies and tools. For example, to ensure that government officials are kept abreast of the latest best practices, guidance and approaches.
	3c. Promote learning exchanges, shadowing or secondments to foster knowledge, and the exchange of skills. Also explore common challenges and questions on NDC implementation.

05

MONITORING AND EVALUATION PLAN

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The Strategy covers a period of 10 years, during which several actors at the local, national, and international levels will closely collaborate to attain the specified objectives. The implementation, under the overall supervision of the AU, will work alongside the Strategic Objectives, Overall and Specific Objectives, Expected Results, Key Strategic Interventions and Actions. The monitoring and evaluation (M&E) activity described in this section will ensure that all planned interventions, outputs, and outcomes are on track and will be verified periodically during the lifetime of the Strategy. A detailed M&E Plan will be developed before the start of the implementation of the Strategy, specifying actors, roles and responsibilities for various activities, and reviews. Their involvement will depend on their ability and capacity to deliver results and utilise knowledge in specific areas. The Plan will also include budgetary frameworks to support the implementation of the Strategy. The M&E Plan will be used to manage accountability and relationships.

Given the geographical extent, the diverse human resource involvement, and the range of factors that can influence the scope and pace of the work, the process will be one of Monitoring, Evaluation and Learning (MEL). To achieve this, the M&E Plan will be based on a Logical Framework of the Strategy, which will define the indicators needed to achieve the desired results. Provision will be made for flexibility in the face of unpredictable occurrences, such as health pandemics

and economic disruptions. The active players who will drive the implementation and the M&E of activities will belong to the AU and its partner organizations, national governments, RECs, civil society and the public and private sectors.

The M&E Plan that will be used to monitor progress during the implementation phase will allow the AU and other partners to track the:

- Schedules and timelines
- Level of success of the climate change programme across the continent
- Key indicators monitored
- Data sources, collection, management, and quality assurance
- How data will be analysed
- Feedback mechanisms for improving interventions
- Questions related to the relevance, effectiveness, efficiency, impact and sustainability of the proposed interventions and
- Contribution of stakeholders to achievements.

The Strategy is focused on supporting institutions to provide the enabling environment for effective mitigation, resilience, adaptation; improving capacities;

and information collection, use and dissemination. As a result, the successful implementation of this Strategy will depend on the ability of the M&E activity to provide accurate and useful responses for these areas, which include:

An enabling environment

- Institutions and mechanisms that are in place to enhance mitigation, resilience and adaptation on the continent;
- Policies adopted and/or implemented;
- The extent to which relevant and credible information are used in the conception and adoption of policies; and,
- The extent to which the participation and inclusion of all stakeholders are reflected in policies and mechanisms adopted.

Information Acquisition, Data Analysis and Dissemination

- The extent to which quality data has been available from various partners and sectors to assess the effectiveness of various actions carried out;
- The impact of the interventions in achieving the objectives of the strategy; and,
- The level of the dissemination of results and their effect in addressing mitigation, resilience and adaptation.

Supporting capacity building initiatives

- Avenues, approaches and finance identified for capacity development for policy engagement on all areas of climate policy;
- Development and strengthening of human resources and institutional capacity to achieve strategy objectives;
- Level of ownership of strategy and activities achieved by partners; and,
- Level of self-reliance as an index of effectiveness created among partners.

These M&E activities will be carried out by the AU Commission's competent experts that understand how to detect gaps in knowledge, as well as associated gaps in data, analytical tools and information and that have experience with working across multiple disciplines to interact with content experts in developing appropriate methodologies for collecting and analysing data. This collection of personnel will exist in various partner institutions so that a critical mass of M&E personnel in climate change assessment will exist. The main idea is to develop continent-wide capacity in

this area, as well as to obtain reliable information on the progress of implemented activities.

The range of activities covered by M&E will include aspects such as:

- assessing results (for example, the effects of activities, using indicators);
- assessing the implementation process (organizational, financial, organizational and physical);
- monitoring of objectives (assessment of impact);
- monitoring of change and attitudes; and,
- the overall monitoring and evaluation (using baseline information, internal evaluations, mid-term and final evaluations, indicators, etc).

The AU will ensure that high-quality data is gathered at pre-determined intervals, depending on the nature of the activity being carried out. M&E personnel in partner institutions will support these goals by delivering information in specified formats to the AU for compilation and analysis, as required. This process of data-gathering will ideally be well served during review meetings aimed at collecting information, data-quality control and the assessment of any difficulties.

Data-quality control will enjoy a very high priority. All data producers will ensure that they use high quality, robust and objective data in their reports; that they have a strengthened intellectual authority in their fields of competence; and that their brand and image in quality data and report preparation is strong. The following criteria should be respected to achieve the above conditions:

Validity, which assesses:

- the robustness of the design of the data-collection tools
- the existence of any reasons to suggest that respondents can give misleading information
- an understanding of indicators and data-collection definitions of concepts and terms
- profiles of the data collectors
- a level of training for data collectors and supervisors
- the transcription of data
- the existence of room for mistakes at any level

Reliability, which assesses:

- variability in the data-collection process year-on-year and place-to-place
- using the same data-collection tools
- a description of data-collection process
- what happens if a problem is found in the data, and how it is fixed
- discussions on issues related to data quality

Timeliness, which assesses:

- the frequency of data collection, and how current they are;
- a timetable for data collection
- an identification of data collected

Accuracy, which assesses:

- the margin of error of indicators
- the sufficiency of current data and the cost and worth of collecting additional precise data

Data integrity, which assesses:

- the mechanisms in place to prevent data manipulation
- the extent to which there is objectivity and independence in the procedures for collecting, managing and evaluating the data
- a review by an independent authority

An implementation plan will be included with this Strategy to indicate the main areas of intervention and the associated actions needed to achieve the desired objectives. A more detailed plan will be developed with areas of responsibility, costs and timeframes. The Strategy will be subjected to a five-year evaluation and review to ensure that the Strategy is up to date, relevant and making progress.

Evaluations carried out will be based on the use of clearly defined indicators, baseline data, deliverables and periodic internal monitoring produced by all partners. These M&E activities will contribute to improving the performance of the management of the programme, as well as help to determine the extent to

which the objectives of the programme are being met. In general, this will enhance the MEL process within the AU and its partners.

To aid the M&E process, a Results Framework and Logical Framework will be developed by the M&E team from the outset and before the activities start. The Results Framework that link the results to the activities and each of the specific objectives will show the causal linkages in the proposed interventions. The Logical Framework will help the AU to determine which indicators to follow to determine success. These frameworks should be useful in assisting the AU in the overall management of programmes related to this strategy.

Table 19. Priority interventions and suggested actions for Monitoring and Evaluation.

Intervention area	Suggested actions
1. Development an inclusive M&E Plan for the Strategy.	1a. Develop an inclusive plan that specifies different actors, their roles and responsibilities for various activities and reviews.
	1b. Develop a comprehensive results and logical framework which defines the indicators and baseline data needed to achieve the desired results.
2. Develop the capacity of the AUC and other partner organizations to carry out M&E services.	2a. Train AUC personnel to effectively carry out M&E reporting practices and collection of relevant data.
3. Development of a resource mobilization Strategy .	3a. implementation of the Strategy.
	3b. Develop strategies to explore new financing options, operationalise these financing strategies and expand partnerships for support.

06

IMPLEMENTATION MATRIX

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Strategic Intervention Axis 1: Strengthening Policy and Governance				
1. Enhanced climate policy, multi-sector governance and institutional coordination				
1. Continued development, review and update of climate change policies and implementation plans at a national, sectoral and local level that give effect to NDC priorities.	1a. Review and revise existing policies and plans to ensure alignment with revised NDCs under the Paris Agreement, and update or develop NDC implementation plans as well as NDC investment plans.			
	1b. Mainstream climate change considerations (including gender, youth and indigenous knowledge considerations) and updated NDC policy actions across sectoral policies, utilizing an open and transparent engagement process with stakeholders.			
	1c. Adopt a "whole-of-economy" approach to climate change, prioritizing the integration in long-term climate priorities in countries' macroeconomic frameworks, national budgets and expenditure frameworks, financial sector regulations and incentives; and in systems planning.			
	1d. Develop/implement sound monitoring, review and reporting processes and systems, including MRV of GHG emissions, sinks and removals, and M&E of adaptation, climate finance and technical support outcomes to obtain the relevant data and information for policy development.			
2. Strengthen institutional structures for policy implementation, through fostering good governance structures at the national and sub-national levels.	2a. Strengthen of mechanisms for co-ordination and collaboration between sectoral line ministries and spheres of government, as well as communication with citizens and stakeholders.			
2. Strengthen institutional structures for policy implementation, through fostering good governance structures at the national and sub-national levels.	2b. Identify line ministries and institutional bodies for the implementation of climate policy, development of legal mandates and delegations for these ministries/bodies, and capacitation of these bodies with qualified, well-equipped and motivated staff.			
	2c. Develop systems for the monitoring and reporting of policy implementation, as well as open data and information sharing platforms to foster accountability and transparency.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Strategic Intervention Axis 1: Strengthening Policy and Governance				
1. Enhanced climate policy, multi-sector governance and institutional coordination				
3. Cultivate robust climate change legislative frameworks	3a. Review of the national legal barriers to successful climate change policy implementation through a legal landscape analysis, including existing provisions which hinder implementations as well as empow-ering provisions required for implementation, to determine the most appropriate legal instrument(s) to develop as well as their content.			
	3b. Develop national, district and local level climate relevant laws to facilitate and enable effective policy implementation that give effect to the legal landscape analysis.			
4. Improved multi-level governance arrangements, equitable partnerships and coordination platforms for dialogue and learning.	4a. Focus on the process, not just the output. Too often, the focus when developing strategies is on the “what” and not on the “how” or the “why”, and yet the process followed to design activities is at least as valuable as the end product.			
	4b. Support the implementation of well-resourced decentralization reforms and local stewardship. Awareness raising and contextualising issues for citizens immediately improves local stewardship and partic-ipation in co-designing of solutions.			
	4c. Promote equitable partnerships, local buy in and shared visioning. Shared visioning of future pathways, open dialogue, and a close anal-ysis of assumptions underpinning worldviews, identities, beliefs, and stigmas based on social circumstance can help break path dependence.			
	4d. Mainstream climate-resilient development objectives and targets across all areas of governance and into all local development plans (LDP).			
2. Anticipatory governance and proactive, long-term planning				
1. Increase robustness of climate policy processes by testing and improving their effectiveness in possible future conditions.	1a. Identify the assumptions the climate policies are based on and the shaping and hedging of actions to assure climate goals will be reached.			
	1b. Identify drivers of change in national, regional and global contexts, create scenarios to explore possible futures of Africa, and use these to test and enhance climate policies in a participatory manner, involving stakeholders from different groups, ages and backgrounds.			
2. Test the assumptions that our climate change planning is based on.	2a. Consider alternative options and back up plans.			
	2b. Use assumption-based planning methodologies.			
3. Move to a more collective process when developing NDCs and long-term policy planning and development.	3a. Include a broad range of stakeholders throughout the climate policy cycle – from development and design, participatory scenarios development, to implementation and monitoring.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
3. Increase uptake of climate information services				
1. Enhance weather and climate observational infrastructure and networks.	1a. Harness financial resources for maintaining observation networks, data rescue and data sharing. This could include proposals for funding to international (as well as national) funding agencies.			
	1b. Motivate for central NMHS budgets from government.			
	1c. Investigate and formalise public-private partnerships. This could be facilitated under the WMO Open Consultative Platform for public-private engagement.			
2. Improve the uptake and effectiveness of CIS by increasing the coordinated delivery and sustainability of CIS interventions, including through User-Interface Platforms (UIPs).	2a. Enhance collaboration between the NMHS, sectoral experts, practitioners and policy makers to enable central delivery of decision-relevant CIS.			
	2b. Develop CIS capacity, based on regional need and developed within African institutions in response to that need. Reduce reliance on international sources of CIS where possible.			
	2c. Ensure regular and sustained monitoring and evaluation of CIS interventions.			
	2d. Identify and prioritise initiatives that enable CIS interventions to be sustained after funding ceases.			
3. Build capacity of users to trust and use CIS.	3a. Enhance user-informed co-production of CIS, based on good practice guidance.			
	3b. Develop capacity to understand and use CIS through training courses, experiential learning (placements, internships etc) and inter-institutional partnerships.			
	3c. Enhance methodologies for combining trusted indigenous and scientific knowledge to generate CIS products.			
4. Improved climate literacy and awareness				
1. Increase climate change literacy across all levels of formal and informal education curricula.	1a. Develop and include climate change literacy curricula for formal education (primary, secondary and tertiary levels), extending skills and knowledge for responses to climate change.			
	1b. School girls need to be the focus of gender-sensitive approaches to education, emphasising attendance and completion of their schooling.			
	1c. Develop climate change literacy programmes for informal education (e.g., civil society and other partnering actors), extending skills and knowledge for responses to climate change.			
2. Mainstream climate change literacy into targeted sectors most vulnerable to climate change in Africa (across food systems, health, cities, infrastructure, economies, water, heritage, with an emphasis on gender).	2a. Develop extension services that include climate change literacy in programmes for small holder farmers with concentration on skills and knowledge, particularly for adaptation to climate change.			
	2b. Promote climate information services co-production and communication in ways that enhance climate change literacy and improved access to useable climate information, particularly for adaptation to climate change.			
	2c. Address gendered vulnerability to climate change across all sectors, together with the implementation of equity-based approaches, including provision of skills and knowledge for adaptation to climate change for women.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
4. Improved climate literacy and awareness				
3. Mainstream climate change literacy across government policy and decision makers for greater climate action.	3a. Enhance training of and support to high-level government officials with regards to skills and knowledge for climate action (both mitigation and adaptation), for example for the Minister of Finance, and with regards to new and rapidly evolving approaches to climate response, including carbon dioxide removal.			
	3b. Advance climate change literacy across all implementing levels and departments of government extending skills and knowledge for responses to climate change.			
	3c. Advance climate change literacy for key environmental decision makers, e.g., the Judiciary (UNEP has recognised the importance of climate change literacy for decision making and governance with a new curriculum on environmental law for judiciaries across the continent).			
5. Governance solutions to address the climate-conflict nexus				
1. Strengthen the capacity of AUPSA and institutions to analyse climate-related peace and security risks and develop appropriate detection, mediation, and resolution strategies.	1a. Provide CISSA and regional early warning centres with training on integrating climate risks into existing analytical tools and conducting in-depth climate-sensitive conflict analysis and climate-sensitive peacebuilding strategies.			
	1b. Provide the AU Mediation Support Unit and RECs Mediation Support Units with training in climate-conflict dispute resolution.			
	1c. Call on RECs to develop regional climate-conflict prevention frameworks that identify context, institution performance, and the role of key actors, and recognises the multifaceted and multidimensional nature of climate risks.			
	1d. Advance post-conflict reconstruction and peacebuilding activities through climate development objectives and common activities.			
2. Strengthen the capacity of Member States to develop more integrated responses to climate-related security risks.	2a. Support the development of national structures and processes that allow for integrated responses to climate-related security risks and coordination between policy areas and monitoring and evaluation systems.			
	2b. Establish training for government members across departments and agencies on climate risks, development and peacebuilding strategies.			
3. Strengthen the capacity of vulnerable communities to better engage in national climate policy process.	3a. Identify communities most vulnerable to climate-change human security risks, such as farmers, coastal fishing communities, internally displaced persons (IDPs) and provide them with training in national climate policy planning, agenda setting, monitoring and implementation.			
	3b. Develop national mechanisms that allow vulnerable communities to engage with parliament on national climate adaptation and green industrialization initiatives.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Strategic Intervention Axis 2: Pathways Towards Transformative Climate-Resilient Development				
6. Food systems under a changing climate				
1. Promote the equitable sharing of climate risk and reward amongst all food system actors.	1a. Establish a climate-risk insurance facility to which every food systems player contributes, directly or indirectly.			
	1b. Enhance availability of and access to appropriate climate-related insurance products to farmers, as well as novel risk-sharing mechanisms like risk pooling and other innovative models.			
	1c. Develop mechanisms that ensure that the financial costs of climate disasters are not borne solely by farmers, but spread more equitably across the range of food systems actors, including consumers.			
2. Enhance resilience of food systems against climate effects, while emphasising nutrition outcomes and integrated planning.	2a. Enhance capacity development, communication and social movements around blended local and international food systems.			
	2b. Extend use of smart, innovative and climate-resilient technologies, renewable energy production, breed/variety development/switching and technologies that preserve and enhance nutritional qualities in food.			
	2c. Implement appropriate valuation framework for the ecosystems management services provided by farmers to the general public and pay them fair value.			
3. Emphasise production toward agro-ecological transition , to reduce carbon intensity and dependencies on external inputs.	3a. Support research, extension and implementation of public sector and market-based instruments toward agroecological, regenerative, nature-based and indigenous approaches for integrated farming and pastoral systems or resilient landscapes (practices to increase agrobiodiversity, conserve land and water, cycle nutrients, reduce waste and enhance productivity).			
	3b. Provide resources to enable/facilitate the transition to more nature positive production systems by farmers.			
4. Strengthen food system governance interventions.	4a. Conduct systematic review of existing policies, strategies and incentive mechanisms that support/inhibit transition to sustainable food systems.			
	4b. Modify policies, processes and strategies to become more inclusive and participatory (farmers, women and youth) and support sub-national scales of food systems governance (territorial/landscape) while linking them with resources and authority to national level.			
	4c. Enhance the role and influence of public procurement in food purchasing to support diverse and nutritious diets (for example, municipal support for local sourcing to public canteens, home-grown school feeding programmes).			
	4d. Develop synergies across sectoral planning and investments in infrastructure and related investments (for example, how energy and transport dependencies can better cohere with resilience goals for food systems).			
	4e. Align food system visions and targets with other national strategies and commitments (for example, NDCs, UNCCD net-zero land degradation targets, AFR100 and CBD biodiversity frameworks, SDGs and national development plans).			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Strategic Intervention Axis 2: Pathways Towards Transformative Climate-Resilient Development				
6. Food systems under a changing climate				
5. Strengthen finance, investment and resource allocation interventions.	5a. Coordinate and augment investments by channelling flows toward sustainable food systems from philanthropy, private sector direct investment, and multi-lateral donors.			
	5b. De-risk investment toward transition by distribution roles across philanthropic, public and private finance by avoiding single source funds; ensure better coverage across short- and long-term investing; maintain balance of risk to investors across spectrum of scales; ensure that ESG and social impact investment reporting by private sector is well monitored and promoted.			
	5c. Analyse subsidy and investment programmes to ensure that direct payment schemes for food system actors are aimed toward sustainable food systems transformation.			
	5d. Assess how financial and non-monetary incentives are applied to shift behaviours into more resilient, collaborative and integrated approaches.			
	5e. Draw from cross-value chain initiative models that recognise and remunerate champions of transformation – highlighting successes (for examples, Beacons of Hope, Milan Urban Food Policy Pact and Rockefeller Food System Vision Prize).			
	5f. Support development of market-based mechanisms to reward social and environmental outcomes (Ecosystem outcome verification, bundling of ecosystem services with carbon markets for agriculture sector, etc.).			
	5g. Explore and establish innovative mechanisms that enhance availability and access to financial resources (both mitigation and adaptation) by farmers, such as soil carbon management carbon dioxide removal.			
7. Protecting land-based ecosystems and carbon sinks				
1. Develop bankable solutions for ecosystem protection/restoration, sustainable water resources management and regenerative agriculture.	1a. Study and implement a broad range of economic incentives for sustainable businesses that contribute to ecosystem protection/restoration, sustainable water resources management and regenerative agriculture.			
	1b. Ensure incentives and bankable solutions align with continental, sub-regional, national and local policy directions and socio-political contexts.			
2. Build technical capacity for implementing and investing in regenerative and biodiversity positive agricultural systems.	2a. Develop and support landscape scale multi-stakeholder partnerships for sustainable agricultural intensification and expansion.			
	2b. Design regional agricultural intensification and expansion plans in line with projected changes in climate change.			
	2c. Lobby for and develop intra-African agricultural trade, development and investment partnerships to aggregate performance and risk.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
7. Protecting land-based ecosystems and carbon sinks				
3. Finance EbA and NbS for climate adaptation and mitigation.	3a. Develop continental financing mechanisms for NbS/EbA that consider a wider range of costs and benefits in credit risk assessments.			
	3b. Develop regional financing facilities (including nationally nested facilities) for supporting the development of NbS/EbA that have both social and environmental benefits.			
4. Protect key carbon sinks in irrecoverable carbon ecosystems such as primary forests, mangroves and peatlands.	4a. Support the establishment and improve management of Protected Areas (PA) in irrecoverable carbon ecosystems through integrated land use planning for new PA siting, increased enforcement of PAs and capacity building for PA managers, and incentives for community monitoring of PAs.			
	4b. Increase designation of community managed forest areas, capacity building for community forest management, and empower Indigenous Peoples and local communities through clarifying land rights, providing training and strengthening governance.			
5. Avoid further deforestation and enhance sustainable management of forests.	5a. Encourage zero-deforestation commodity supply chains by leveraging climate-positive commitments/investments by private sector companies to support activities that strengthen landscape governance; facilitate alignment and action across stakeholders; support capacity building on land use planning; provide extension services and training; clarify land tenure, enhance governance and undertake policy revisions.			
	5b. Remove perverse incentives that lead to destructive activities (fossil fuel subsidies) and encourage nature-positive activities/NbS (through tax incentives).			
	5c. Leverage climate finance opportunities to encourage REDD+ implementation at site-scale and jurisdictional level in alignment with national GHG accounting, including by creating the appropriate policy and technical processes and infrastructure, attracting private sector investment, clarifying carbon rights and benefit-sharing arrangements, and providing capacity-building.			
6. Restore and sustainably manage agricultural systems (including crop and livestock systems) to reduce and remove GHG emissions, reduce human-wildlife conflict, enhance food security and water regulation benefits.	6a. Catalyse continent-wide actions on commitments (such as AFR100) to scale restoration, with a key focus on cost-effective and science-driven assisted natural regeneration through a mix of active planting and eliminating barriers and disturbances to native vegetation recovery.			
	6b. Promote agroforestry systems with local and climate-resilient species that provide diversified livelihoods.			
	6c. Prioritise novel, integrated livestock management approaches, such as the Herding 4 Health model, which is scalable and traditionally acceptable, enables wildlife-livestock coexistence, climate-change adaptation, carbon sequestration and water regulation.			
	6d. Develop policy to allow livestock development strategies that support rural development and contribute to a restoration economy, including the development of national policies and mechanisms to allow for carbon credit trading and benefit sharing for communities that implement rangeland restorative practices.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
7. Protecting land-based ecosystems and carbon sinks				
7. Integrate biodiversity conservation and sustainable management in climate change actions.	7a. Promote and expand conservation of biodiverse areas, including sustainable use and community management.			
8. Ensure focus on food security, land-use rights and protection of biodiversity in projects for NbS approaches to carbon removal.	8a. Integrate full community impact assessments into projects for afforestation, soil enhancement, coastal wetland expansion, and others which are driven by goals of carbon dioxide removal for either credits or payment.			
	8b. Develop 'sustainable NbS' frameworks to ensure that carbon dioxide removal is not done at expense of development needs and local rights.			
8. Enhancing climate-resilient and low-carbon energy and infrastructural systems				
Energy generation				
1. Integrated water resource planning.	1a. Ensure that hydropower infrastructure is planned in coordination with other sectors that compete for the same water resources such as agriculture, industry and domestic households, because lack of integrated planning risks leading to inconsistent strategies and inefficient use of resources.			
2. Promote power system planning for a climate-resilient, low-carbon electricity network.	2a. Set long-term targets for renewables to stimulate a pipeline of investible renewable projects.			
	2b. Hydropower development must include projections of potential future patterns of hydrological variability, not just historical data.			
3. Increase power trade across river basins to strengthen resilience to droughts and get renewable electricity to markets.	3a. To enable cross-basin trade, the transmission networks and market structures in the Southern Africa Power Pool (SAPP) and East Africa Power Pool (EAPP) should be interconnected, as is currently planned, not developed independently.			
4. Strengthen power sector reforms to enable renewable energy independent power producers (IPPs).	4a. Allow private participation in power supply to deliver financial needs and to harness the expertise of international renewable energy developers and investors.			
5. Expand renewable capacity through competitive auctions.	5a. Increase competitive tenders can simulate a pipeline of bankable projects, if held regularly, through transparent and predictable planning processes.			
6. Strengthen finance and risk mitigation for renewable energy IPPS.	6a. Governments and development finance institutions should crowd-in private investment by providing robust power purchase agreements, affordable loans and risk guarantee facilities to mitigate risks that the private sector is ill-equipped to handle.			
Domestic energy consumption				
7. Enhance energy efficiency.	7a. Improve access to energy for more people by enhancing energy efficiency.			
	7b. Focus efficiency interventions on electricity use and fuel types used for cooking.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Domestic energy consumption				
7. Enhance energy efficiency.	7c. Promote policies and organizational frameworks more conducive to enhanced energy efficiency and new market development.			
	7d. Increase access to modern cooking fuels and promote nation-wide energy efficiency, in collaboration with implementing partners, local governments and communes.			
8. Increase adoption of new cooking stove technology.	8a. Identify appropriate energy efficiency solutions/technologies that could be scaled up for larger development impact.			
	8b. Promote improved cooking stoves.			
	8c. Exchange knowledge and technology between rural and urban households to support rural households in the adoption and use of improved stoves.			
	8d. Build knowledge on energy efficiency.			
9. Build climate resilience with a focus on women and girls.	9a. Ensure that sensitization and awareness-raising campaigns target women, as they are almost exclusively in charge of collecting fuel for cooking.			
	9b. Support households in reducing energy poverty and address the challenges of cooking with solid biomass.			
	9c. Encourage the adoption of improved stoves and modern cooking fuels. This reduces cooking time (alleviating women's time-poverty), greenhouse gas emissions, and health risks.			
	9d. Provide high quality training to those who play a key role in the dissemination and implementation of energy efficiency.			
9. Promoting low-carbon, resilient mobility and transport systems				
1. Build climate-aware transport planning capacity to better shape resilient mobility systems and infrastructure.	1a. Train transport planners and engineers in climate policy, planning under deep uncertainty, access-based planning, incrementalism, hybridity, adaptive project implementation and dynamic monitoring.			
	1b. Collaborate in developing climate-aware, locally appropriate transport-planning masters and undergraduate courses at African universities.			
	1c. Invest in research around the 'just transition' to low-carbon, resilient mobility in African cities through a continental knowledge platform.			
2. Change the project financing and evaluation requirements for development banks to prioritise resilience, modal split, access equity, and emission mitigation, alongside travel time savings.	2a. Guide the use of development, concession and blended financing arrangements to include the complex climate and social risks – including risks that stem from the projects themselves.			
	2b. De-prioritise the use of travel time savings as a metric for transport project benefit to acknowledge its effects on carbon intensity, as well as its weakening correlation with access, economic productivity, and social progress.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
9. Promoting low-carbon, resilient mobility and transport systems				
3. Support the adaptation of road standards and transport planning guidelines to include resilient designs, as well as prioritise the needs of the most popular and lowest carbon transport modes – walking and cycling.	3a. Compile African design standards for public transport systems and roads, including the infrastructure for non-motorised transport, which adheres to African resilience and universal accessibility principles.			
	3b. Include the voices of vulnerable walking and cycling groups within local, national and regional planning processes.			
10. Building low-carbon, resilient urban areas				
1. Promote nature-based solutions and urban green infrastructure.	1a. Promote opportunities to realise the multiple co-benefits of incorporating NbS, including hybridised blue-green-grey infrastructure, to help regulate water flow, reduce the heat island effect, treat wastewater, reduce stormwater runoff, and improve water supplies.			
	1b. Adopt an integrated landscape approach as a basic framework to balance competing demands, manage multiple land uses, and understand connections in a specific area. Working with natural processes involves actions across spatial and temporal scales to manage risk in urban areas.			
	1c. Invest in long-term maintenance and security and surveillance measures in both individual nodes (e.g., parks) and connections (e.g., pedestrian walkways) to support nature-based solutions in urban centres.			
	1d. Scale monetary and non-monetary valuation of nature-based solutions, enhance appreciation of natural capital and complement this with cultural ecosystem assessments that consider production capacities, cultural practices, and access to markets.			
	1e. Employ new metrics such as Biodiversity Net Gain, where infrastructure development leaves biodiversity in a measurably better state than beforehand.			
	1f. Implement and enforce robust environmental impact assessments and strategic environmental impact assessments prior when expanding urban centres.			
	1g. Promote soil biodiversity and soil organic carbon management as vital elements to ensure the land's ability to produce food, store water, control soil erosion and dust, maintain soil stability during extreme rainfall events, reduce carbon losses, among other benefits to people and ecosystems living in harsh and increasing warm dryland environments.			
	1h. Plant indigenous trees for shade, reduces heat stress and buffer against storm surges (e.g., mangroves and sea grass) and prevent the loss of property and human lives.			
2. Invest in the circular economy, smart mobility, decarbonization and net zero carbon buildings.	2a. Focus on resource efficient, compact, and mixed-use urbanization as well as net-zero carbon building designs.			
	2b. Prioritise smart mobility, transit-oriented bicycle, and walking infrastructure in new or refurbished designs.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
10. Building low-carbon, resilient urban areas				
2. Invest in the circular economy, smart mobility, decarbonization and net zero carbon buildings.	2c. Integrate water resource use efficiency in the design of infrastructure as well as building a circular economy for waste.			
	2d. Decarbonise and detoxify energy systems by considering renewable energy in new or existing infrastructure designs.			
	2e. Scale up district heating. In dense urban areas, district heating radically increases thermal efficiencies and decreases heat loss through heat recycling, combined heat and power systems, and economies of scale.			
3. Build technical capacity in African cities to adapt to the impacts of climate change.	3a. Support cities access to climate finance by developing concept notes, investment cases and pre-feasibility studies for pilot projects to developers/funders.			
	3b. Train local government officials in climate finance processes, language and opportunities.			
	3c. Strengthen national education and outreach campaigns related to climate-resilient urban development.			
	3d. Promote knowledge exchanges around best practices. These are particularly valuable in data poor regions where information sharing is challenging, ecological and social observations are scarce, institutional mandates for monitoring are ill-defined, and data access is often cost prohibitive.			
4. Prioritise risk reduction and build adaptive capacity of residents living in informal, slum or peri urban settlements.	4a. Accelerate and simplify land tenure reforms to stimulate phased restoration of urban natural ecosystems to buffer against hydroclimatic risks and heat stress.			
	4b. Upgrade informal settlements in cities to build urban climate resilience and therefore should be considered in policy making.			
	4c. Develop extended and inclusive planning processes that rely on assessments to help prioritise specific needs of a city and its communities. Co-producing relevant interventions is crucial to ensure social ownership of strategies.			
	4d. Change the perceptions around how decision-makers see areas of informality to foster better engagement between informal sector representatives and municipalities. These are ideal entry points to service these settlements with the potential to take implementation from the unplanned to the planned.			
11. Enhancing resilient water systems				
1. Increase water investment.	1a. Increase political commitment for gender equal and climate-resilient water investment.			
	1b. Mobilise financial and other resources for water investment.			
	1c. Strengthen capacities (institutional and individual) for developing, implementing, operating and managing water investment programmes/projects.			
2. Establish systems for developing and transferring technologies to support climate resilience building.	2a. Develop national innovation to produce water-efficient and climate-sensitive technologies.			
	2b. Develop national systems for transferring, adapting and applying technologies.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
11. Enhancing resilient water systems				
3. Integrate the management of water resources as part of water development.	3a. Take actions to ensure that the natural resource base (water, land other natural resources) is maintained to support development in a changing climate.			
	3b. Protect water-related ecological systems and build their climate resilience.			
	3c. Establish systems for managing water resources, considering hydrological boundaries as units of management/development.			
4. Strengthen transboundary water cooperation.	4a. Develop cooperative mechanisms for managing shared water resources.			
	4b. Take actions for joint investment projects in shared water resources for benefit sharing.			
	4c. Develop and implement a basin-wide development and management plans/programmes considering climate change.			
5. Integrate water security issues into development plans/programmes.	5a. Integrate water security into national and sectoral development plans/programmes.			
	5b. Integrate water security into climate response strategies such as NDCs and NAPs.			
6. Strengthen the characterisation of climate risk in water systems.	6a. Include a focus on past and recent variability and extremes and their impacts.			
	6b. Improve linkages between technical departments on weather/climate and water, build capacity in climate-risk assessment.			
	6c. Agree on principles for risk-assessment approaches, share experiences on how future risks are assessed, and develop practical approaches suitable for operational implementation.			
	6d. Consider the range of impacts – including who is affected and why/how risk assessments need to consider local perspectives about who is vulnerable, and which risk mitigation steps are appropriate.			
7. Strengthen the mandate to undertake climate risk assessment of major investment decisions aiming for system resilience.	7a. Lobby donors to adopt risk assessment into planning and financing decisions.			
	7b. Work through international adaptation mechanisms to support national government and relevant line ministries to design policy for climate risk assessment, consider policy to make it a requirement in some situations.			
	7c. Work with technical departments to facilitate design and adoption of these approaches.			
	7d. Raise awareness of decision-making under uncertainty approaches to planning and management. Where major decisions/investments are involved incorporate 'stress testing' of water resource systems under a range of climate (and other) conditions.			
8. Improve coordination between multiple sectors, particularly water-energy-food, but also environment and land.	8a. Address governance and institutional barriers to coordinated planning and management.			
	8b. Promote tools and decision-making approaches that incorporate multi-sector objectives and performance indicators.			
	8c. Build the evidence base to demonstrate the value of greater coordination in planning.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
12. Building a climate-resilient African blue economy				
1. Promote climate-resilient coastal development.	1a. Invest in ecosystems and natural assets as multi-benefit providers, thereby enhancing natural capital that supports livelihoods and climate resilience.			
	1b. Strengthen grey and green (ecosystem-based/nature-based) adaptation in coastal zones.			
	1c. Enhance financing for adaptation in marine and coastal zones (blue carbon, 'blue finance', private sector partnerships, debt-for-nature swaps and other mechanisms).			
	1d. Integrate climate risk in coastal development planning.			
	1e. Strengthen disaster risk reduction and preparedness plans and strategies.			
2. Support sectoral and integrative blue economy interventions.	2a. Strengthen co-governance and regional fisheries governance mechanisms for enhanced climate resilience.			
	2b. Integrate climate in marine spatial planning, integrated coastal zone management and other planning frameworks.			
	2c. Support sector-specific interventions for key blue economy sectors, including tourism, shipping, fisheries and aquaculture.			
3. Strengthen research and policy.	3a. Strengthen the role of oceans and coasts in NDCs and other climate-related policies and strategies.			
	3b. Support research to predict, monitor and respond to ocean-related climate impacts.			
	3c. Ensure ocean-related climate policy interventions consider equity and the unique position of vulnerable groups.			
13. Digital transformation				
1. Governments should coordinate their national digital climate data infrastructure.	1a. Ensure governments take the lead in coordinating their national climate data infrastructure and connect them across the continent for policy and decision-making.			
	1b. Involve private sector investors in the development of necessary facilities/systems to support climate data for sustainability.			
2. Engage private sector digital innovators and service providers as business partners.	2a. Involve young digital entrepreneurs across the continent to support local data ownership models and safeguard the continent's climate data.			
	2b. Explore viable business models for scaling digital climate advisory services through big data and analytics.			
3. Strengthen community engagement.	3a. Develop and implement digital transformation frameworks that glean common values from the African concepts like ubuntu (communal love), guiding interactions, research and development in the Africa.			
	3b. Involve dynamic and integrative approaches, focus on local agency, seek reciprocity and the pragmatic inclusion of different ways of knowing, conceptualization, and meaning-making.			
4. Promote workforce enhancement.	4a. Recognise and expand African capacity for climate-conscious digital transformation.			
5. Develop and promote thought leadership.	5a. Develop communities of practice to contribute to conversations in international digital transformation.			
6. Strengthen system conciliation.	6a. Acknowledge that digital transformation is a social action that requires empathy and the incorporation of all views.			
	6b. Recognise that system experiences and standards in affluent settings are not necessarily useful to guide systems elsewhere.			
	6c. Appreciate that solutions proposed by exogenous industries present technical, political, and climate challenges for African communities and governments.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Strategic Intervention Axis 3: Enhancing Implementation Towards Climate-Resilient Development				
14. Enhanced finance flows and resource mobilization				
1. Establish mechanisms to mobilise climate finance at scale in Africa.	1a. Assess current climate financial flows to Africa and develop a roadmap for achieving Africa's adaptation financial needs (as set out in NDCs).			
	1b. Establish and maintain an MRV system for financial support for Africa. Also promote enhanced transparency framework for climate finance in Africa.			
	1c. Implement policy, institutional and legal reforms for enhanced resource mobilization and scaled-up, transformative climate finance.			
	1d. Integrate climate action in fiscal policy and public financial management systems.			
	1e. Strengthen climate and disaster risk financing mechanisms in Africa.			
2. Strengthen Africa's readiness and capacity to access international climate finance.	2a. Provide support for accreditation of African entities.			
	2b. Build a cadre of African climate finance experts and establish a climate finance portal for Africa.			
	2c. Strengthen Ministries of Finance/Planning leadership role in resource mobilization for climate action.			
3. Promote private sector investment in climate action.	3a. Build capacity for private sector engagement and win-win contracting.			
	3b. Identify barriers to private sector investment and promote use of policy and financial de-risking instruments.			
	3c. Develop capacity for formulation of investment ready project pipelines and enhance matchmaking platforms.			
4. Mobilise new financial instruments and accountability structures to support climate adaptation and mitigation.	4a. Mobilise financing from the private sector to reduce risk and enhance the quality and life of existing urban infrastructure.			
	4b. Promote the uptake of nature positive infrastructure to reduce business risks, fewer stranded assets and new market opportunities.			
	4c. Given the historical legacies across African cities (e.g., from colonialism and apartheid), investments should be targeted to address legacies of unequal development.			
	4d. Local governments should re-examine the impact of cost recovery policies on low-income communities (e.g., for water, storm water drainage, waste services) - considering the need to achieve distributional and procedural equity in service delivery.			
	4e. Increase public sector funding for adaptation in cities to mitigate and adapt climate change impacts and address infrastructure development needs.			
	4f. Align local plans and policies with NDCs and NAPs to ensure climate finance flows to a local level and national targets and actions are achieved.			
5. Strengthen climate finance effectiveness.	5a. Encourage cross-sectoral approaches to adaptation planning that emphasize reducing risk across interconnected sectors affected by climate change, such as the water-energy-food nexus and the biodiversity-health nexus.			
	5b. Strengthen gender equality and the empowerment of women and girls in climate finance projects.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Strategic Intervention Axis 3: Enhancing Implementation Towards Climate-Resilient Development				
15. Safety mechanisms to reduce loss and damage, including climate insurance				
1. Strengthen integrated programming.	1a. Extend cash plus programmes to support adaptation through the promotion of income-generating activities, livelihood diversification and financial inclusion, promoting opportunities and strategies to deal with future risks.			
2. Strengthen public works programmes.	2a. Establish robust public works programmes with regular scheduling and maintenance and not as a temporary safety-net.			
	2b. Ensure community assets address key challenges to livelihoods, that they are relevant to local needs and support environmental rehabilitation and conservation in order to achieve longer-term impacts.			
3. Promote asset creation.	3a. Develop asset-creation programmes to improve food security and boost income among the poorest people.			
4. Improve understanding of risk exposure among the insurance sector and clients.	4a. Identify data and model requirements for underwriting needs and work to fill these gaps.			
	4b. Support the Task Force on Climate-related Financial Disclosures (TCFD) and Environmental, Social and Governance (ESG) strategy development among insurers to enable them to better understand and manage impacts of climate change on their business.			
	4c. Improve collaboration between stakeholders to improve data access, sharing and integration across use cases.			
5. Develop innovative risk transfer and management solutions.	5a. Identify clients' key risks through conducting risk assessments.			
	5b. Build capacity and trust among clients by training them on acquisition and use of data to better understand and manage their exposure to climate change.			
	5c. Develop risk transfer products to meet the needs of key stakeholders, including support with prediction/ early warning and preparation activities.			
6. Develop harmonised climate finance policies and regulation.	6a. Develop climate insurance policies that support national and continent-wide climate policies.			
	6b. Identify priority regulatory constraints and address them to enable the provision of more innovative climate products.			
	6c. Stimulate the market for climate risk insurance by building underwriting capacity in local markets, enabling access to global reinsurance and promote alternative risk transfer structures (i.e., insurance pools).			
	6d. Promote innovation in product design and distribution through pilots, regulatory sandboxes, allowing development of index insurance products.			
	6e. Improve collaboration between public and private sector stakeholders and champion climate risk insurance.			
16. Equitable technology transfer				
1. Support the development of a sustained national technology innovation system.	1a. Update a technology gap and needs assessment at relevant levels (territorial, national and regional).			
	1b. Support the design of an institutionalized national innovation system (NIS) including climate endogenous technologies. Technologies need to be at a higher level of use and understanding.			
	1c. Develop and support the implementation of resource mobilization (national and international level) to implement the NIS.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
16. Equitable technology transfer				
1. Support the development of a sustained national technology innovation system.	1d. Support the piloting and implementation of TNAs where needed and specifically in countries where the assessments have been successful.			
	1e. Support private actors' (especially young entrepreneurs) access to climate finance to foster the deployment of mature technologies.			
2. Promote regional south-south technology development and transfer/local dissemination	2a. Design and implement a regional platform for climate technology knowledge management.			
	2b. Identify, review and enhance the functioning of existing regional technology development and transfer centres.			
	2c. Support in- and cross-country peer-to-peer learning and technical assistance.			
3. Enhance the participation of African negotiators in technology-related agendas.	3a. Co-develop and implement a permanent and tailored capacity building programme for junior technology development negotiators that addresses negotiations, transfers and related agenda items.			
	3b. Support technology negotiators (before, during and after climate negotiation events).			
17. Inclusive participation, especially of gender and youth				
Gender specific intervention and action areas				
1. Improve gender participation in policy development processes.	1a. Increase women's representation in major climate change policy making positions.			
	1b. Facilitate gender-sensitive dimensions in National Adaptation Planning processes and climate change development plans at all levels.			
2. Empower and engage young people in climate adaptation planning and implementation through inclusive and participatory approaches.	2a. Involve young people in planning and implementation of climate change adaptation strategies using interactive methods.			
	2b. Build the capacity of the youth, prioritizing their development in national budgets, to ensure their contribution in climate change adaptation efforts.			
3. Enhance education and sensitization on gender and youth responsive approaches.	3a. Conduct regular advocacy and awareness programmes on youth and gender equality and inclusivity in climate change policies, programmes and procedures.			
	3b. Increase information sharing for enhancing gender- and youth-sensitive climate change impacts.			
Youth specific intervention and action areas				
4. Improve youth participation in policy development processes.	4a. Increase youth representation in major climate change policy making positions.			
	4b. Facilitate gender-sensitive dimensions in National Adaptation Planning processes and climate change development plans at all levels.			
5. Empower and engage young people in climate adaptation, mitigation and just transition planning and implementation through inclusive and participatory approaches.	5a. Involve young people in planning and implementation of climate change adaptation, mitigation and just transition strategies using interactive methods.			

Priority intervention area	Suggested actions	Responsibility	Timeframe	Cost
Youth specific intervention and action areas				
6. Empower and engage young people in climate adaptation, mitigation and just transition planning and implementation through inclusive and participatory approaches.	5b. Build the capacity of the youth, prioritizing their development in national budgets, to ensure their contribution in climate change adaptation efforts.			
7. Enhance education and sensitization on youth responsive approaches.	6a. Conduct regular advocacy and awareness programmes on youth and intergeneration equity and inclusivity in climate change policies, programmes and procedures.			
	6b. Increase information sharing for enhancing and youth-sensitive climate change impacts.			
18. Capacity development				
1. Develop African-focused training courses on climate change that promote the Strategy's overall objectives.	1a. Plan stakeholder workshops to provide updates on global changes in legislation, policies and tools to ensure negotiators, member countries, advocacy groups and non-governmental stakeholders are informed and up to date.			
	1b. Develop training intervention for the communication and dissemination of the Strategy specifically.			
2. Develop capacity needs assessments to analyse country and stakeholder capacity-building requirements to develop actionable interventions and strategies.	2a. This capacity assessment should form the basis of discussions and priority intervention areas with technical partners, providers, and funders.			
	2b. Develop a capacity assessment to address the capacity needs of all continental players to adequately perform a role in the Strategy's roll-out and implementation.			
3. Support for policy makers in effective decision-making.	3a. Develop the skills and relationships needed to drive forward new strategies, policies and climate-change actions.			
	3b. Plan stakeholder workshops to provide updates on global changes in legislation, policies and tools.			
	3c. Promote learning exchanges, shadowing or secondments to foster knowledge, and the exchange of skills. Also explore common challenges and questions on NDC implementation.			
19. Monitoring and Evaluation				
1. Develop an inclusive M&E Plan for the Strategy.	1a. Develop an inclusive plan that specifies different actors, their roles and responsibilities for various activities and reviews.			
	1b. Develop a comprehensive results and logical framework which defines the indicators and baseline data needed to achieve the desired results.			
2. Develop the capacity of the AUC and other partner organizations to carry out M&E services.	2a. Train AUC personnel to effectively carry out M&E reporting practices and collection of relevant data.			
3. Development of a resource mobilization Strategy.	3a. Agreement on a budgetary support framework to support the implementation of the Strategy.			
	3b. Develop strategies to explore new financing options, operationalise these financing strategies and expand partnerships for support.			

07

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APPENDICES

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