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CLARE scoping study

Understanding African decision-makers' needs for research and evidence

A report by SouthSouthNorth (SSN) and the International Institute for Sustainable Development (IISD)

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IISD
International Institute for Sustainable Development

TABLE OF CONTENTS

TABLES

FIGURES

ACRONYMS

Acronym	Meaning
AU	African Union
AUC	African Union Commission
AF	Adaptation Fund
AfDB	African Development Bank
AGN	African Group of Negotiators
BRACED	Building Resilience and Adaptation to Climate Extremes and Disasters
CARIAA	Collaborative Adaptation Research Initiative in Africa and Asia
CCMD	Climate Change Management Department (Government of Zimbabwe)
COMESA	Common Market for Eastern and Southern Africa
CLARE	Climate and Resilience Framework
CR4D	Climate Research for Development in Africa
CRIDF	Climate Resilient Infrastructure Development Facility
EAC	East African Community
ECOWAS	Economic Community of West African States
GCF	Green Climate Fund
HDI	Human Development Index
IDBZ	Infrastructure Development Bank of Zimbabwe
IGAD	Intergovernmental Authority on Development
IISD	International Institute for Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
GHG	Greenhouse gas
GWP	Global Water Partnership
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organisation
REC	Regional Economic Community
SADC	Southern African Development Community

SSN	SouthSouthNorth
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Programme
WASH	Water, Sanitation and Hygiene

1 Executive summary

This scoping study focused on two areas:

1. Identifying African decision-makers' current and future demand for research and evidence that will increase climate action on the continent; and
2. Identifying research uptake approaches that will be the most promising for the CLARE framework and programme.

Approximately 80% of effort was put into the first area of inquiry, and the balance into the second.

The scoping study used a combination of desktop reviews and stakeholder interviews to identify current and future demand for research. This study identified policy-makers as central to the decision-making process, given the role they play in designing and influencing national, regional and global climate policies. Given the time available for the study, the desktop review focused on climate change policies, plans and strategies across three different spatial scales: continental; sub-continental (defined by the boundaries established by a Regional Economic Community); and national level. Structured interviews with stakeholders were used to confirm or challenge the validity of priority areas outlined in policy documents (considering typical shifts in political landscape and the time lag between policy development and implementation) to draw out specific examples of user demand and research-uptake experiences, and to understand which research-uptake approaches have been successful in the past, and therefore provide options for the design of CLARE.

Understanding demand for research and evidence

The nature of demand for research and evidence varies across the continent, due to distinct political, economic and institutional contexts, and the prioritisation of climate action in each country. Agriculture, biodiversity and ecosystems, energy, infrastructure, and water emerged as key sectors across all spatial scales. This is not surprising given that these sectors are the engines of growth in most African countries and are aligned with the continent's 50-year development plan - *Agenda 2063: The Africa We Want*, the Regional Economic Communities' strategies, and national-level development policies. Other sectors that are important, but were not common across sub-regions or countries, include health, tourism and transport. Our study suggests that the driving force of adaptation action lies primarily at the country level. By comparison, regional and sub-regional levels seem to play a less influential role than we originally assumed. Overall, policy-makers are looking to better understand:

1. How to assess climate risks and, subsequently, how to identify and prioritise climate action, as well as the trade-offs that need to be made in this context (budgetary, social and environmental);
2. What information enables investment decisions that enhance climate resilience, while contributing to social and economic development within their specific political context; and
3. How to access, manage, translate and use available climate-related information in decision-making.

More specifically, there is cross-scale demand for research and evidence in the following areas:

- **Policy design:** Understanding the impacts of climate risks across different scales to inform future design and implementation of climate change into sectoral plans. There was substantial demand for context-specific tools or advice for decision-makers, such as the Government of Botswana's request for recommendations on managing drought

risk, including coordination across different departments, diversification of crops and livestock, and understanding ecosystem changes. Ethiopia expressed a need for evidence / research on approaches to integrate local-level adaptation priorities into the national planning process.

- **Capacity building and process:** Understanding current capacities of different actors to respond to climate-related risks, and identifying gaps in capacities, taking into account the development pathways of countries.
- **Filling data gaps:** There is insufficient primary data related to hydrology, weather and downscaled climate models to drive adaptation planning, especially at local levels. Other gaps identified included climate finance data (including climate flows into the country and how much the national government is allocating and spending towards climate action), limited documentation on indigenous knowledge systems and mapping of vulnerability hotspots. Perhaps surprisingly, there is still demand for vulnerability and risk assessments. Even though many have been undertaken, there remain important gaps and / or the data available is not accessible to decision-makers. The limited availability and accessibility of information makes it difficult to take appropriate climate action. Furthermore, lack of appropriate knowledge management systems can make research efforts ineffective and hinder the prospects of evidence-based policy-making.
- **Implementation of interventions:** This includes what does and does not work for implementation, taking into account different scales (local, sub-national and national levels). Policy documents also emphasised the need for feasibility studies of large-scale interventions, but also of viable technologies that, for example, reduce reliance on wood as a source of fuel.

Continent-wide demand

Politically, climate change is seen as a development challenge at the continental level, as it is eroding the developmental benefits attained over the last decades (African Union, 2014). *Agenda 2063: The Africa We Want* is the 50-year development plan for socioeconomic transformation, and is a key document that all Member States to the African Union have begun implementing. Specific research areas related to climate action include:

- Disaster risk and preparedness – understanding vulnerability (particularly at the local level), levels of preparedness, including mechanisms in place to deal with disasters, and policy harmonisation, including finance, infrastructure, human settlements;
- Attribution of extreme weather events, which will contribute to climate resilience and disaster preparedness;
- Identifying appropriate indigenous knowledge systems that can be integrated into climate adaptation strategies;
- Finance, including measuring current climate finance flows and understanding trade-offs;
- Biodiversity, conservation and sustainable natural resources, including diversifying livelihoods of populations that depend on threatened natural resources and developing appropriate governance systems at the community, sub-national, national and continental levels;
- Mainstreaming climate change into planning, budgeting and monitoring (including methods and tools); and
- Understanding incentives for taking climate action in different sectors.

However, the influence of the continental level in terms of leading the identification and prioritisation of climate action is low. The continental level is important for maintaining one voice within the United Nations Framework Convention on Climate Change (UNFCCC) negotiations

and for providing the mandate for large-scale, multi-country initiatives. However, this work will still need to be agreed at the country level.

Demand at the sub-continental level

The main purpose of the Regional Economic Communities (RECs) is to promote development, peace and collaboration amongst their Member States. The work of the RECs is informed by their Member States' priorities and, therefore, there is an emphasis on raising awareness and collaborating on the design and implementation of climate action. A number of climate change-related dialogues have been convened by RECs over the last few years on key issues such as disaster-risk management, climate finance and climate policy development. Only the following RECs have developed climate policy frameworks for their region: the East Africa Community (EAC), the Intergovernmental Authority on Development (IGAD) and the Southern African Development Community (SADC), and these are at various stages of implementation. Other RECs, such as the Arab Maghreb Union, are not in operation due to a number of political factors. Across the three RECs with existing climate change policies, there were fairly similar research needs. These are summarised in the table below.

Table 1: Research demands identified across the RECs

Sector	Expressed research demands
Agriculture	• Support to develop a regional framework for agricultural research and development • Research on crop varieties, cultivars, and mixtures of crops that are capable of adapting to anticipated climate scenarios and different agro-ecological zones • Generation, transfer and dissemination of information on technological and institutional processes for adaptation in agriculture • Best practices for building resilience in agriculture sector • Identification of vulnerability hotspots to decrease regional vulnerability and increase resilience • Agricultural technologies or practices that enhance carbon and nitrogen sequestration • Research on indigenous knowledge systems and adaptation in the sector that could be integrated with modern knowledge.
Biodiversity and ecosystems	• Regional biodiversity inventory systems (measurements, assessments and mapping) • Sustainable management and utilisation of biodiversity • Diversification of alternative livelihoods to reduce pressure on biodiversity • Policies and legal framework development • Research and active management of protected and marginal areas to determine the carrying capacity and inform the infrastructure needs to support wildlife • Assessment of environmental consequences of shore protection
Energy	• Relevant research inputs to support the review of regulatory frameworks • Energy efficiency regulations and plans • Mapping of renewable energy potential • Energy integration within Regional Economic Communities • Alternative energy sources that include low-income and marginalised populations • Review of electricity tariffs to meet the demands of the poor

Water	• Sea-level rise projections to inform regional planning processes, including coastal zone management • Integrated catchment management • Efficient water management practices • Capacity development for water data analysis and water balance • Data on groundwater to inform management • Incorporating indigenous knowledge • Diversify and improve water supply sources to reduce climate vulnerability • Vulnerability assessments • Meteorological, hydrological, morphological and water quality data to inform decision-making • Social equity and water use efficiency in the region

The RECs and associated institutions such as river basin organisations play a critical role in supporting the implementation of climate action. They do this largely through convening Member States, sharing data and information, and mobilising resources. The research needs of RECs are informed by country-level priorities. However, they also have their own research needs particularly on equitable use of resources, such as water, across their Member States.

Demand at the country level

When it comes to climate action, adaptation is the core focus of many African countries, given the high levels of vulnerability coupled with low levels of adaptive capacity. This focus has been emphasised in several documents including Nationally Determined Contributions (NDCs) and national-level climate change policies and programmes. For this scoping study, six countries were selected as case studies: Botswana, Ethiopia, Ghana, Kenya, South Africa and Zimbabwe. The case studies outline key aspects of each country's institutional governance, climate change adaptation priorities, and demand for research to inform and support the implementation of adaptation action.

Country-level adaptation research needs are partly a reflection of each country's stage of advancement in designing and implementing climate change policies, as well as of political priorities and governance approaches. This study identified three stages of policy advancement, each of which have different adaptation research needs, as summarised in the table below.

Table 2: Policy advancement and adaptation research needs

Stage of climate change policy advancement	Examples	Types of adaptation research most beneficial to the country
Early stage	Botswana	• Approaches to identify and integrate adaptation needs into local- and national-level planning • Identification and development of appropriate and sustainable capacities within research and governmental organisations mandated to design adaptation processes • Opportunities to learn from more advanced countries through bilateral exchanges
Mid stage	Ethiopia, Zimbabwe Ghana	• Identification of the strengths and weaknesses of existing institutional arrangements and policy processes • Capacity building of decision-makers and researchers to facilitate effective research engagement and uptake

Advanced stage	Kenya, South Africa	• Specialised engagement based on identified gaps in knowledge, capacity and capability • Sharing knowledge with less advanced countries through bilateral exchanges, including spearheading an increasingly partner-like relationship between government and researchers

It is fundamental to note that each country is unique and the differences in adaptation research demand between African countries is vast and multidimensional. In assessing the research needs across the country case studies, policy documents reviewed were not always explicit about the research needs. However, there were common sectoral needs, which include:

- **Agriculture, forestry and fisheries:** This includes enhancing resilience within these sectors, identifying vulnerabilities and promoting sustainability;
- **Health:** This includes understanding the links between climate change and human health and changes in the distribution of diseases.

Key cross-cutting issues include:

- Establishing and maintaining **early warning systems**
- **Gender and social equity**: There is a need to understand the effects of climate change, especially in marginalised rural communities, the informal economy, and informal settlements. There is also a need for increased awareness by decision-makers (and possibly increased evidence) of the advantages of an intersectional approach that includes gender and social equity in understanding the differential impacts of climate change on social groups.

As illustrated by the case studies, specific research needs vary widely depending on country contexts and their governance systems and evolve in response to the impacts of climate change. The country case studies also highlight the need to frame adaptation as a broader developmental challenge that needs to address poverty and inequality. Immersive co-production could be a practical approach to deal with this dynamic context. Each study carried out under CLARE should involve a unique research-needs assessment for its countries of focus and explore the potential of country-specific research uptake.

Recommendations

Understanding climate change research needs, specifically adaptation requires a clear identification of the structural challenges, such as the existing capacity within institutions and the barriers to implementation. Policy documents do provide some research priorities, however, often these are unclear and vague. Research priorities also vary by context. Thus, to better understand demand, the CLARE programme should start by assessing specific needs at national and sub-national levels to ensure the programme meets the needs of recipients. Nonetheless, the following recommendations can be made based on this scoping study:

Priority sectors

1. Policy development is a crucial part of the adaptation response. CLARE must consider how best to influence policy and build relationships accordingly. However, this also means that research agendas must fit within and build on existing structures of governance and power to ensure alignment with policy and allow for greater uptake and impact. This would include working with decision-makers to understand their research needs, which may take significant time.

2. Regardless of the scale of the programme (country, sub-continental and continental), it must target and prioritise the agriculture, biodiversity and ecosystems, energy, health and water sectors as these are common priority sectors for national governments. There are other emerging sectors such as transport and infrastructure (from an adaptation lens) that are increasingly becoming a priority due to reasons such as rapid urbanisation.
3. Policy documents are useful as a guide for needs assessment. However, they should not be the sole focus for scoping research demand as intersectional issues could be missed. Stakeholder engagement to develop a wider understanding of the needs and challenges is thus critical when scoping user demand at the outset of specific projects.
4. Additional scoping studies should be commissioned to define research needs, either prior to, or as the first activity in a research call. This scoping should include a component on mapping the political and decision-making landscape or partnering with a local institution with in-depth knowledge. In some contexts where a sufficient adaptation knowledge base already exists, the impacts of the research may be aimed at achieving strategic and efficient outcomes for countries, and not at generating new findings. It is therefore important to engage and work with decision-makers and other stakeholders to identify concrete needs.
5. A mapping of the priorities and ongoing / planned work by other development partners and research stakeholders in the identified sectors will be important to refine where CLARE can add value and avoid duplication of efforts.

Scale of work

1. Climate change priorities are defined at the country level, which then inform sub-continental and continental priorities. For maximum policy impact, the CLARE programme should primarily target the country-level ensuring relevance and buy-in from decision-makers. However, there are specific issues that would need to be defined at the sub-continental level such as the transboundary management of water.
2. The sub-continental level will be key for knowledge sharing and convening of key stakeholders and should not be ignored entirely.
3. Including a learning component that is global in nature should be considered (e.g. in the spirit of CARIAA's Annual Learning Review event), where country/regional consortia would be exposed to work and learning from consortia working in other parts of the world.

Structural

1. Broaden the number of disciplines to identify solutions to climate change adaptation. Climate change research programmes tend to focus on the scientific and technical elements. However, engaging other disciplines such as gender studies, anthropology or psychology could be beneficial, particularly when looking for transformative solutions.
2. Invest in governments' vertical and horizontal integration systems as there are gaps in the way information and research findings flow up / downwards and across sectors, resulting in inefficient and insufficient use of these findings in decision-making processes. Research into improving vertical (national ←→ sub-national) and horizontal (cross-sectoral) alignment is recommended.
3. Prior to the research calls, provide as much policy background in the framing of the research themes as well as in the documents that are sent to applicants. This would

help applicants better match their responses to the project needs, and would promote the formation of consortia with national/ local expertise.

4. Seek opportunities to work at cross-country and cross-regional (Pan-African) levels to enhance knowledge brokering, learning and sharing amongst African countries.
5. The programme should consider partnering with local institutions that understand the decision-making context of policy-makers in the targeted countries or regions. These institutions include think tanks and Non-Governmental Organisations (NGOs) that have experience working with government institutions.

During the commissioning process

1. Additional scoping studies should be commissioned to define research needs, either prior to, or as the first activity in a research call. This scoping should include a component on mapping the political and decision-making landscape or partnering with a local institution with in-depth knowledge.
2. It is important to have very clear demand-related criteria for the projects that will be funded or for the research windows. For example, in the call for proposals, be clear about the need for projects to:
    a. Demonstrate policy demand for the research (e.g. identifying specific policies that will be targeted, what the challenges are and how the research idea addresses these, including who they would engage with over the duration of the project).
    b. Outline the anticipated policy impact, noting that policy work is complex and can be an evolving landscape.
3. Be clear on criteria related to African research institutions' participation in the research programme. Research proposals should include leadership roles for local research institutions and their role should be clearly articulated. Local research institutions should not be merely 'local partners' but have a clear role in leading the consortia and design and delivery of the research.
4. Research projects funded through CLARE should show an understanding of the decision context they intend to influence and the institutional, political and social interactions at play that might affect how their research will be used and implemented. Understanding decision-making systems, power dynamics (of institutions and individuals within a country) and how change happens in these systems, as well as where new (or existing) research could facilitate change, would enhance research uptake.
5. Research proposals must clearly state how and at what phase they will engage with policy-makers. This scoping study has highlighted that policy-makers want to be involved in defining the problem and in the research process. This, therefore, creates a space for ownership of research findings and recommendations, even if the research outcomes are not complimentary to policy-makers' systems or processes. Suggestions include establishing committees (established through a Memorandum of Understanding) that includes representatives who would meet throughout the research project. These structures could operate as a vehicle for promoting research uptake at the end of the project(s).
6. Research proposals should actively seek to align the possible impacts of the research to the adaptation objectives of the country, as expressed in relevant documents - whether it is by providing evidence of the positive / negative implications of these strategies or to effectively counter the country's direction of travel. In other words, alignment does not and should not entail endorsement, but should still take into account the considerations of decision-makers in relation to adaptation.
7. Top-down encouragement of inter- and trans-disciplinary approaches is needed to promote the use of these strategies. Beyond diversity in consortium formation, it is

equally relevant for donors to support, even at the research-design stage, opportunities for genuine collaboration among consortium partners.

8. Include local in-country experts on the research call review panels. This will allow for further interrogation of proposals to ensure that funded projects meet country needs and are realistic about the country context.

Invest in research uptake

1. Although CLARE will be a research programme, it should have specific funding for knowledge brokering and convening at different scales as not all applicants will have the necessary relationships with policy-makers, nor have knowledge-brokering expertise. It is, therefore, important to have other institutions (such as NGOs, Civil Society Organisations, think tanks or journalists) to assist in these areas as this may contribute to increased research uptake. Furthermore, this effort needs to embedded from the beginning, and not be introduced as an add-on towards the end of the research project.
2. Enable learning between researchers and policy-makers and identify the interaction as a desirable outcome in itself. This will require skilful facilitation to create authentic learning spaces. Shift away from traditional roles (e.g. researchers gather data, government agencies create a space for influence and action, and NGOs support participatory work and lobby), towards a co-production research process as successful research-uptake outcomes are more likely to result from collaboration among individuals and institutions and their diverse perspectives and areas of expertise.
3. Enhance the capacity of researchers to engage in research-uptake activities and in understanding the decision-making context; both of which remain low. Furthermore, the (career development) incentives for them to develop these capacities are lacking. Addressing both the capacity-related gap and the structural shortcomings could boost research-uptake objectives.
4. Enhance the capacities of government officials to understand, use and communicate research findings. Likewise, the capacities of decision-makers to access, interpret and use research findings are insufficient. Establishing or improving systems that enable decision-makers' ease of engagement with existing research is equally necessary.

2 Introduction

Between now and 2030, there are a number of key issues that are of importance to policy-makers across Africa. These include implementing the African Union's *Agenda 2063 - the Africa We Want*[1], achieving the 2030 Agenda for Sustainable Development with its associated 17 goals, and meeting the ambitions of the United Nations Framework Convention on Climate Change (UNFCCC). These objectives need to be met within a context of lower-than-projected regional economic growth, rising debt, population growth and a changing climate (Brookings, 2019). Climate change will erode the continent's developmental gains, thus mainstreaming adaptation into development actions is central to the continent's response (AUC, 2013).

The recent Intergovernmental Panel on Climate Change (IPCC) *Special Report on the impacts of global warming of 1.5°C above pre-industrial levels* highlighted the urgent need to respond to the effects of climate change. The consequences of a 1°C warming are being observed through more extreme weather and rising sea levels. In order to limit global warming and adapt to the impacts of climate change, African decision-makers will require robust, appropriate research, that also feeds into critical decision-making for medium- to long-term sustainable development planning, while ensuring inclusive economic development and growth.

At the country level, decision-makers are developing and, in the majority of cases, starting to implement national and sub-national level plans that integrate climate change. Across the continent, several governments have progressed in developing policy frameworks specific to climate change, with some going further by developing specific climate change laws[2]. However, the implementation of these policies has been slow, due to challenges such as limited awareness of climate change, limited institutional capacity to respond to the challenges, a siloed approach to addressing the impacts, insufficient data and limited financial resources to deal with the scale of the problem (UNEP, 2012). In addition, there are inevitable trade-offs between development priorities and timeframes for emissions reductions and poverty alleviation (Bickersteth et al., 2017). Research therefore needs to be responsive to the needs of decision-makers on the continent and advance further understanding on how to address the triple challenge of mitigation, adaptation and development, based on social equity.

Further work is needed to integrate climate risks into long-term development planning while fostering a just, transparent and representative climate governance system that involves cooperation across all segments of society as well as across multiple sectors and governance levels. Moreover, climate change will impact certain key sectors in Africa, such as agriculture, energy and water security, infrastructure and health. Vulnerable populations will disproportionately feel the impacts on these sectors, with factors such as gender, age, disability, marital status, ethnicity or caste influencing resilience (Rao et al., forthcoming). This means that increasingly research needs to engage with this complex governance and social reality, bringing in multi-stakeholder and intersectoral perspectives for understanding climate resilience and vulnerability (ASSAR, 2018).

[1] *Agenda 2063*: the Africa We want is the continents 50 year development plan for socioeconomic transformation on the continent.
[2] Kenya enacted the Climate Change Law in 2016. Other countries that are currently drafting laws include South Africa, Zimbabwe and Lesotho.

2.1 Methodology

The scoping study sought to meet the following objectives[3]:

- Identify African decision-makers' current and future demand for research and evidence that will increase climate action on the continent; and
- Identify research uptake approaches that will be the most promising for the proposed framework.

A combination of desktop reviews and structured interviews were used to better understand the decision-makers' current and future demand for research and evidence. Given that the CLARE Framework, to the best of the authors' knowledge, does not currently have a set scale at which it will operate, the consortium focused its analysis across three spatial scales: continental, sub-continental (as defined by the boundaries established by RECs) and the national level, shown in Figure 1. The scoping study defined the decision-maker as a national policy-maker. This is because they have a mandate to design and oversee the implementation of climate change policies and engage in UNFCCC processes.

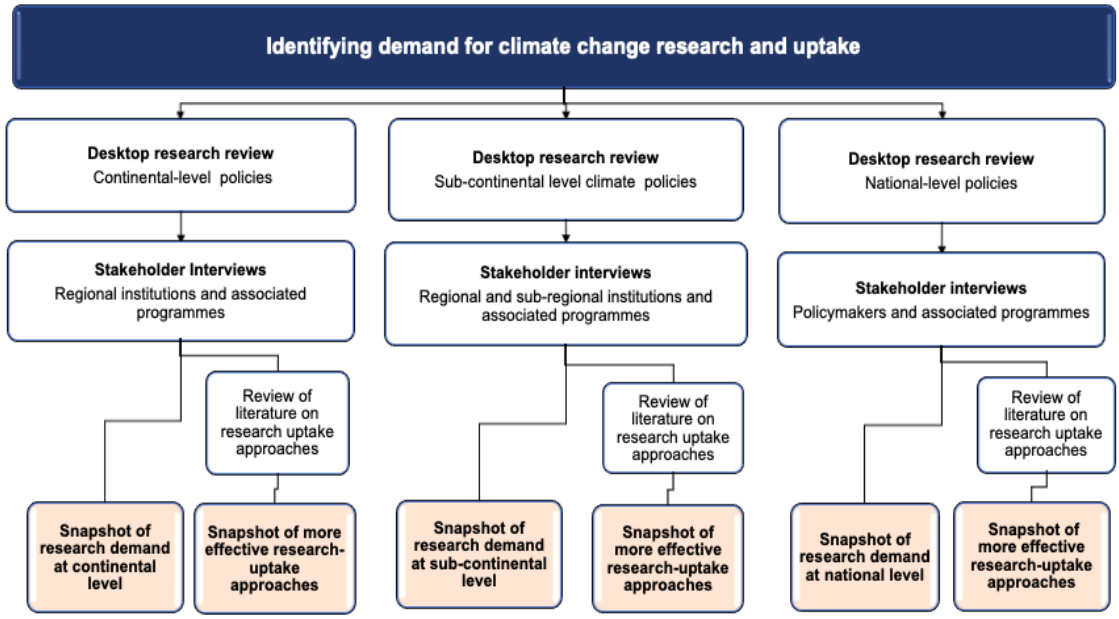

Figure 1: Methodology for Identifying demand for climate change research and uptake at continental, sub-continental and national levels

2.1.1 Desktop review

The desktop review focused on key regional development policies, and sub-regional and national climate change policies to understand policy priorities, research needs and the environment within which implementation of climate action would occur. The review of the different scales allowed for an assessment of priorities across the spatial scales, understanding where there are commonalities and where there are differences. The following policy documents, plans and international commitments[4] were reviewed, among others:

- Continental level: *Agenda 2063: the Africa We Want* (2013 - 2063) and its *shared Strategic Framework for inclusive growth and sustainable development: First ten-year implementation plan (2014 - 2023)* and the *Algiers Declaration on Climate Change* (2008)

[3] As agreed, the focus of the scoping study would be on the first objective (approximately 80% of effort).
[4] Only the Nationally Determined Contributions

- Sub-continental level:
    - Common Market for Eastern and Southern Africa (COMESA) *Medium-Term Strategy (2016 - 2020)*
    - East African Community (EAC) *Climate Change Policy, Climate Change Master Plan and Climate Change Strategy*
    - Intergovernmental Authority on Development (IGAD) *Regional Climate Change Strategy*
    - *Southern Africa Development Community (SADC) Climate Change Strategy and Action Plan (2014)* and the *Climate Change Adaptation in SADC: A strategy for the water sector*
- National level
    - **Botswana's** *Botswana Climate Change Response Policy* (Draft) and the *Nationally Determined Contribution to the UNFCCC* (NDC);
    - **Ethiopia's** *Climate Resilient Green Economy Strategy* (2011) a 20-year Strategy*, Climate Resilient Green Economy: National Adaptation Plan* (2017), and the *NDC*;
    - **Ghana's** *National Climate Change Policy* (2013)*, National Climate Change Master Plan Action programmes for implementation (2015 – 2020)* (2015), *National Climate Change Adaptation Strategy* (2012**)** and the *NDC*;
    - **Kenya's** Climate Change Act (Number 11 of 2016), *National Climate Change Action Plan: Towards low carbon climate resilient development (2018 - 2022*) (2018), *National Adaptation Plan (2015 – 2030): Enhanced climate resilience towards the attainment of Vision 2030 and beyond* (2016), and the *NDC;*
    - **South Africa's** draft *National Climate Change Bill (2018)*, draft *National Climate Change Adaptation Strategy (2019)*, and the *NDC*; and
    - **Zimbabwe's** *National Climate Policy* (2018), *National Climate Change Response Strategy* (2014) and the *NDC*.

To meet the second objective of identifying research-uptake approaches that would be most promising for the CLARE Framework, a limited desktop review of literature and research programmes such as the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) and Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED) was undertaken.

2.1.2 Stakeholder consultation

In addition to the desktop review, the scoping study aimed to interview the following types of stakeholders:

- Policy-makers at the national level, specifically those responsible for leading climate change issues including the design and implementation of climate policy as well as leading engagements with the UNFCCC;
- The African Group of Negotiators (AGN) leadership (Chair and Lead Coordinators), as they represent the interests of the African continent in the climate change negotiations. The AGN also offers inputs to the African Ministerial Conference on the Environment that provides political guidance to the negotiations; and
- Programmes working with policy-makers at the national level, such as the NDC Partnership; at the sub-regional level, such as the Climate Resilient Infrastructure Development Facility (CRIDF); and at the continental level, such as Global Water Partnership (GWP) and the Africa Climate Change Fund.

A total of 33 stakeholders were identified, 17 of whom were interviewed (Annex 7). These interviews were important to further understand:

- Priority climate actions for implementation that might be supported with evidence and research, given the time lag between policy development and implementation;
- Timelines for the implementation of actions where possible, outlining windows of opportunity for the CLARE programme given its potential start date of 2021/22; and
- Research-uptake approaches that have been successful and could be considered by the CLARE design team.

2.1.3 Country case study selection

The two main criteria used to select countries for case studies were:

- Strength of the consortium's in-country relationships, which would help with accessing stakeholders within a short timeframe. Fifteen countries were identified and assessed further; and
- Diversity in spread of countries in terms of their stage of advancement in designing and implementing climate change policies, as shown in Figure 2.

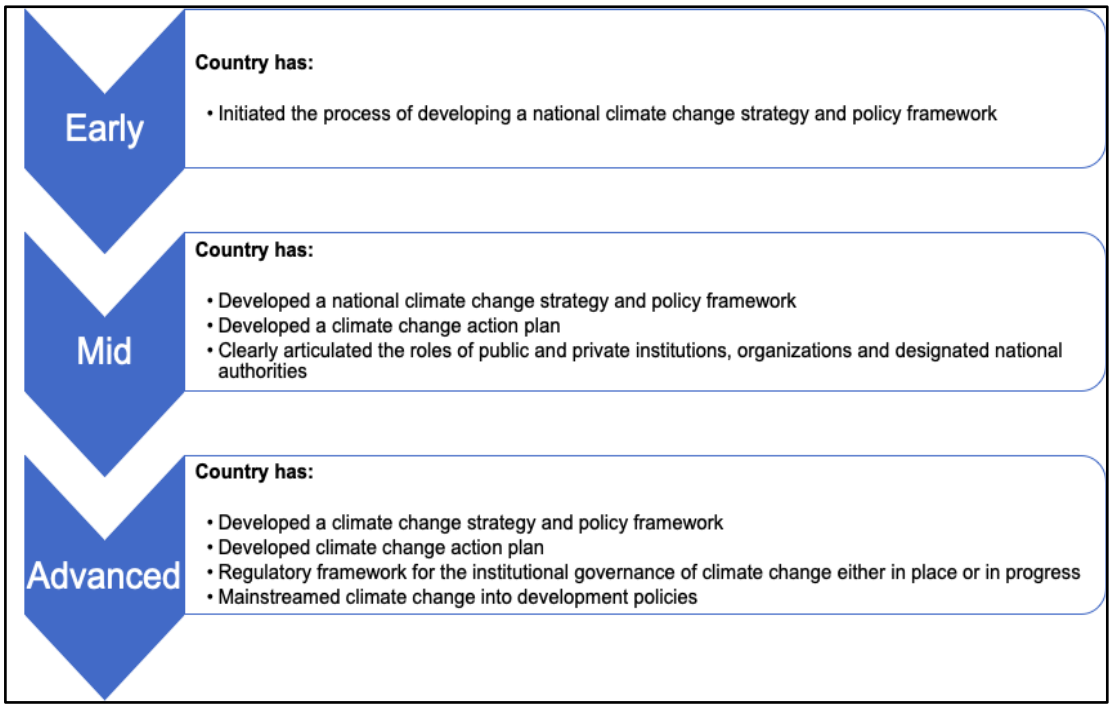

Figure 2: Categorisation of policy advancement by country

This simple categorisation informed country selection for the case studies. Further considerations were:

- Diversity of economic classification to include Least Developed Countries (LDCs), and ranking on the Human Development Index; and
- Geographical representation (east, west, central, southern and northern).

As a result, six countries were selected: Botswana, Ethiopia, Ghana, Kenya, South Africa and Zimbabwe. The table below shows that the study included a spread of countries across different stages of policy development. There is only one country in the early stages due to the

consortium having relatively fewer networks in countries that had not yet initiated policy development work. The selected countries also included a spread of economic classifications (low income, lower middle income and upper middle income), although only one low-income country was selected.

Table 3: Results of country selection

Country	Policy development stage	Economic classification	Human Development Index
Botswana	**Early stage** × Climate change law × Climate change policy (this is currently being drafted) × Climate change strategy × Climate change action plan × NAP (in the process of being developed) ✓ NDC	Upper middle income	0.717 (high)
Ethiopia	**Mid stage** × Climate change law × Climate change policy ✓ Climate change strategy × Climate change action plan ✓NAP ✓ NDC	Low income [5] (also classified as an LDC)	0.463 (low)
Ghana	**Mid stage** × Climate change law ✓Climate change policy × Climate change strategy × Climate change action plan × NAP ✓ NDC	Lower middle income	0.592 (medium)
Zimbabwe	**Mid stage** × Climate change law (this is currently being drafted) ✓ Climate change policy (this is currently being drafted) ✓ Climate change strategy × Climate change action plan × NAP (in the process of being developed) ✓ NDC	Lower middle income	0.535 (low)

[5]As per 2018/2019 World Bank classification

Kenya	**Late stage** ✓ Climate change law ✓ Climate change policy ✓ Climate change strategy ✓ Climate change action plan ✓ NAP ✓ NDC	Lower middle income	0.59 (medium)
South Africa	**Late stage** × Climate change law (this is currently being drafted) ✓Climate change policy ✓ Climate change strategy × Climate change action plan ✓NAP ✓ NDC	Upper middle income	0.699 (medium)

2.2 Limitations of the scoping study

Given the timeline for delivery (four months), slower than anticipated responses from identified stakeholders and the broad nature of the terms of reference, the following limitations apply:

1. The scoping study is not a comprehensive assessment of demand from national-level policy-makers, but seeks to give an overview of demand drawn at a particular point in time (August - October 2019) from a review of policy documents and interviews with stakeholders. More detailed in-country assessments focusing on specific sector needs, for example, would yield more specific demands.
2. At the national level, interviews focused on policy-makers who have the mandate to drive climate change policies and oversee the implementation of climate activities (UNFCCC, NAP, NDC focal points). Thus, the study does not give indications of demand from other actors such as the private sector, sub-national level policy-makers or civil society organisations that would have their own needs.
3. The country case studies are illustrative and not representative of the continent as a whole, as contexts differ in each country, and across sub-regions. A comparative analysis across the six countries therefore only provides a limited understanding. In addition, the case studies did not draw on sectoral policies, plans or strategies.
4. The study does not include Francophone and Lusophone countries, due to the limited availability of staff who are fluent in French and Portuguese and who work in these countries. The study also does not include Small Island Developing States as the consortium did not have any networks there.

2.3 Lessons learnt in developing this scoping study report

In developing the scoping study, there are a number of reflections from the consortium that are useful for the CLARE design team as the scoping phase continues.

1. Determining demand for current and future research and evidence across the continent is challenging, particularly when the impact the programme seeks to make is not yet defined and sectors have not been identified. Attempting to do this too early in programme design has severe limitations, and we therefore strongly recommend that

scoping of demand is incorporated into CLARE's commissioning phase by requiring project proposal teams to conduct scoping studies as part of their research design.

2. Policy-makers' demands are not always clearly stated in policy documents. It is therefore important to consult country-level policy-makers as widely as possible to ascertain the extent of the demand. To do this would require significantly more time.
3. The climate change governance landscape is continuously evolving and responding to political dynamics. When the programme starts in 2021/22, there may be political and institutional changes that could influence the current priorities. For example, of the six country case studies, all of them will hold national elections between 2020 and 2023, which may solidify or change governance arrangements.
4. There was hesitancy by some policy-makers to state their current and future research demands, as they felt they were speaking on behalf of their governments and sector stakeholders. The questions should, therefore, have focused more on understanding the relationships and mandates between research institutions and policy-makers, what makes research useful and understanding the specific barriers to implementation that could be alleviated by further research.
5. Focusing only on user demand can lead to research programmes re-enforcing the status quo instead of challenging it. For example, decision-makers largely continue to view poverty alleviation and climate change as separate topics. The same is often true for the relationship between gender equality and climate change adaptation. While the link between these is well established in academic and grey literature, exploring questions around how to promote an integrated approach from a government decision-making perspective and truly operationalise it, as well as to understand why it remains disconnected, is important, even if decision-makers are not (yet) asking for this from the research community.

3 Understanding decision-makers' current and future demand for research and evidence

This section provides snapshots of policy-makers' research demands drawn from a review of policy documents specific to climate change and interviews with a limited number of stakeholders. In reviewing the documents, very few research demands were explicitly stated. The majority of documents expressed research as an overarching need within specific sectors, without articulating sufficient levels of detail on the exact nature of this research. Documents emphasised the need for further information in certain areas, implying an opportunity for research. The views presented are therefore only a snapshot of policy research needs. Further engagements would be necessary to determine demand based on the target countries and themes of the CLARE programme. The section is divided into four and covers the following:

- Continental level demand;
- Sub-continental level demand (defined by the boundaries established by the Regional Economic Communities); and
- Country level demand.

3.1 Continental level demand

Currently there is no continental-level policy on climate change. Adaptation, however, is recognised as an overriding priority for the continent by the *Common African Position on Climate Change*, given the high levels of vulnerability and low adaptive capacity to climate change. *The Common Position* was established by the *Algiers Declaration on Climate Change* (2008) and spearheaded by the Committee of African Heads of State and Government on Climate Change (CAHOSCC) founded in 2009 by the African Union Assembly of Heads of State and Government.

Within the context of a changing climate, Africa also faces significant development challenges that have been noted by various continental institutions, such as the African Development Bank, the African Union Commission and Regional Economic Communities:

- **Population growth:** Africa is estimated to undergo the largest relative increase globally in its population size between 2015 and 2030, with a median projection of 1.68 billion people by 2030 (AUC, 2018). This growth has resulted and will continue to result in rapid urbanisation, as well as an increasing need for services and resilient infrastructure.
- **Poverty levels:** the estimated average poverty rate across sub-Saharan Africa is 41%, with 27 of the 28 poorest countries located on the continent (World Bank Group, 2018). Across many countries, the inequality gap is also rising.
- **Limited financial resources:** 40% of African countries are at a high risk of debt stress, impacting the ability of the public sector to drive the development agenda and achieve the majority of the SDGs, for example (SDG Centre for Africa, 2019).
- **Infrastructure:** this is key to driving economic growth. Africa requires between an estimated investment of USD130 and USD170 billion per year in infrastructure. There is also an annual spending gap of approximately USD68 - USD108 billion (AfDB, 2018). This infrastructure deficit hampers regional integration and industrialisation, with natural hazards magnifying the challenges of under-funded and poorly maintained infrastructure.

These challenges have amplified calls for transformative and inclusive growth, social development, industrialisation, trade, and job creation. However, this needs to happen within

the context of a changing climate with growing associated risks. In response, a number of continental and sub-continental plans have been created to promote development. At the continental level, Agenda 2063 was developed by the African Union Commission to provide a 50-year development vision for Africa that is centred on transformation and provides a roadmap for sequencing sectoral, national, regional and continental plans into a coherent whole. Agenda 2063 outlines seven aspirations for the continent, each with their own specific goals and targets:

1. A prosperous Africa based on inclusive growth and sustainable development;
2. An integrated continent which is politically united and based on the ideals of Pan-Africanism and the vision of Africa's Renaissance;
3. An Africa of good governance, democracy, respect for human rights, justice and the rule of law;
4. A peaceful and secure Africa;
5. An Africa with a strong cultural identity, common heritage, shared values and ethics;
6. An Africa whose development is people-driven, relies on the potential of African people, especially its women and youth, and cares for children;
7. Africa as a strong, united and influential global player and partner.

Agenda 2063 recognises that climate risks will impact on the ability of countries to meet their development goals and outlines several priority areas that will need to be addressed between 2013 and 2023. These include:

- Biodiversity, conservation and sustainable natural resource management;
- Climate resilience and natural disaster preparedness, which includes the implementation of the *Africa Strategy on Disaster Risk Reduction and Plan of Action*, strengthening the capacity of RECs on disaster risk reduction and researching climate change attribution;
- Integrating indigenous knowledge systems into climate adaptation strategies;
- Strengthen capacities to collect, analyse and evaluate climate-related data; and
- Resource mobilisation, which includes the establishment of an African Climate Fund by 2025. This will be funded through an AU levy on Member States' carbon credits (attained through the implementation of climate change mitigation projects, levies on African private sector firms or equivalent Member States contribution, or through public-private partnerships with local private sector participation). This is not to be confused with the existing African Climate Change Fund that was established in 2014 and is currently housed within the African Development Bank.

Research needs articulated in the Agenda 2063 ten-year implementation plan are highlighted in the table below. Interviewed senior-level stakeholders from the African Development Bank (AFDB), the Climate Resilient Infrastructure Development Facility (CRIDF) and the NDC Partnership highlighted additional research demands that complement those identified in Agenda 2063, indicating the large-scale nature of the knowledge gaps. The research demands articulated by these stakeholders are highlighted in bold in Table 4.

Table 4: Continental-level research demands

Agenda 2063 aspiration	Agenda 2063 Goal	Implied Research Demand[6]
A prosperous Africa, based on inclusive growth and sustainable development	Goal 3: Health and well-nourished citizens	• Develop and implement programmes for health research and surveillance (through the African Centre for Disease Control and Surveillance).
	Goal 6: Blue/ ocean economy for accelerated economic growth	• Research focused on supporting the sustainable growth of marine businesses
	Goal 7: Environmentally sustainable climate resilient economies and communities	• Better understand the relationship between weather events and climate change • Adapt indigenous knowledge for climate adaptation strategies • Climate-smart agriculture options • Strengthening the capacities to collect, analyse, and evaluate climate-related data and meteo-information • **Early warning systems and disaster risk reduction strategies[7]** • **Identifying appropriate indicators for resilience in different contexts** • **Transitions to low carbon and climate resilience which include realistic development pathways** • **Data on climate finance flows to the continent but also between national and subnational levels**
An integrated continent, politically united on the ideals of Pan-Africanism and the vision of Africa's Renaissance	Goal 10: World class infrastructure criss-crosses Africa	• Sustainable energy production and distribution options

The success and sustainability of the various continental plans, such as the *Comprehensive African Agricultural Development Programme*, the *Programme for Infrastructural Development in Africa* and the *Accelerated Industrial Development for Africa*, will be impacted by climate change to varying degrees. Although some of these plans mention climate change as a risk, they do not consider what this means for the plans' feasibility. They also do not consider if specific interventions are needed to mitigate the various threats to ensure the plans remain

[6] Agenda 2063 provides very few explicit research demands specific to climate action. However throughout the ten-year implementation plan, research is mentioned in a number of goals, particularly in terms of developing policies that support research in a number of areas, promoting African research institutions and better funding research on the continent.
[7] This includes how to ensure that users and decision-makers take appropriate action, and research to inform how to design early warning systems better.

viable in a changing climate. CLARE could position itself to assess and integrate climate risks, making these plans more climate resilient.

Climate knowledge gaps on the continent remain large, particularly on climate science research, applications and policy development and implementation (Climate Research for Development in Africa, CR4D, 2018). Thus research initiatives need to incorporate practitioners and development actors (both state and non-state actors) to deliver on priority end-user needs at different scales (continental, sub-continental and national). A more demand-driven and user-oriented approach to research has been called for at several key continental climate conferences, such as the Climate Change and Development in Africa conference convened under the Climate for Development in Africa (Clim-Dev Africa) programme, while also responding to the continental and global agendas such as the 2030 Agenda for Sustainable development, Agenda 2063 and the Paris Agreement (ClimDev-Africa, 2018).

Implications for the CLARE programme

1. Climate change cannot be separated from development issues; thus the programme should include a developmental lens.
2. Agenda 2063 focuses on the broad issues related to economic growth, such as trade, industrialisation and migration, which often do not include a climate change lens. Generating relevant research targeting technocrats could initiate work in these non-typical areas.
3. To achieve impact at the continental level, CLARE would need to make significant investments into building key relationships both politically, for example with the African Ministerial Conference on the Environment (AMCEN) and African Ministers' Council On Water (AMCOW), and with institutions such as the African Climate Policy Centre, the United Nations Economic Commission on Africa, the African Union Commission or programmes (CR4D, Clim-Dev) working at that scale.
4. The continental level could be a useful platform to elevate key research. However, the efficacy of this would need to be informed by a clear stakeholder engagement strategy that identifies the main policy demands and the change the CLARE programme seeks to implement at that level, and which research and knowledge brokering institutions should be engaged.

3.2 Sub-regional level demand

RECs are critical to enabling both regional integration and supporting Member States' development. In relation to adaptation, they play a key role, particularly on transboundary issues, as they offer a platform for sharing information, for example (Denton *et al.*, 2016). This is particularly important for sectors such as water, energy and infrastructure, which require agreement on the design and implementation of projects that are in multiple countries, or those which are impacted by a project happening in another country.

At the sub-regional level, strategies and plans related to key infrastructure, such as transport corridors that seek to unlock economic potential and support regional trade focusing on upgrading infrastructure, are already in place. These include emerging agricultural corridors such as the Beira Agricultural corridor and Tanzania's Southern Agricultural Growth corridor, and large-scale infrastructure programmes, such as the *Programme for Infrastructure Development in Africa Priority Action Plan 2* (2019 - 2024).

The table below provides an overview of the policy development status of the RECs and

identifies the units that have been established or that have the mandate to oversee the implementation of the relevant climate change strategy or policy, within the RECs. A snapshot of research demands emerging from the common priority sectors is provided in Table 5.

Table 5: Overview of REC climate change policies

REC	Existing climate change policy/ strategy/ plan	Key priority sector(s) articulated in policies	Unit responsible for implementation
Arab Maghreb Union[8]	No policies, strategies or plans in place. However, the Maghreban Charter for Environment Protection and Sustainable Development was adopted by Member States	Land use, land use change, forestry, water	No information available
Community of Sahel-Saharan States	No policies, strategies or plans in place	Reforestation, agriculture, biodiversity, water (identified through the Green Wall for the Sahara and Sahel Initiative)	No information available
Common Market for Eastern & Southern Africa	No policies, strategies or plans. However, climate change is mentioned in the Medium-Term Strategy (2016 - 2020)	Agriculture, energy, water, climate finance, information and communications technology	Climate Change Unit
East African Community	• EAC Climate Change Policy • EAC Climate Change Master Plan • EAC Climate Change Strategy	Water, agriculture and food security, wildlife, coastal and marine ecosystems, land-use and soil protection, forestry and wetlands, human health, tourism, infrastructure, wildlife, energy, transport, waste	• EAC Secretariat • Lake Victoria Basin Commission • Lake Victoria Fisheries Organisation • Inter-University Council of East Africa Sectoral • Council of Ministers for Environment and Natural Resources

[8] Currently the REC is not fully operational.

Economic Community of Central African States	● Environment and Natural Resources Policy ● Disaster Risk Reduction Strategy ● Central Africa Regional Strategy for Risk Prevention, Disaster Management and Climate Change Adaptation (2012)	Disaster risk reduction, environment	Le Secrétariat général
Economic Community of West African States	No climate change policy, plan or strategy in place. However, there are many relevant initiatives focused on impacts and adaptation costs in agriculture, water resources and the coastal zone.	Agriculture, water, coastal zones	● Climate Change Project Steering Committee ● Scientific and Technical Consultative Group on Climate Change ● ECOWAS Water Resources Coordination Centre ● ECOWAS Regional Centre for Renewable Energy and Energy Efficiency
Intergovernmental Authority on Development	IGAD Regional Climate Change Strategy	Agriculture, environment, health, water.	IGAD Climate Prediction and Application Centre
Southern African Development Community	● Climate Change Adaptation in SADC: A strategy for the water sector ● SADC Climate Change Strategy and Action Plan	Agriculture, energy, biodiversity, fisheries, human health, human security, industrial processes, settlements and infrastructure, tourism, mining and other extractive industries, waste, transport	● SADC Secretariat (there are plans to establish a climate change coordinating structure at the secretariat level) ● SADC Cross-Sectoral Technical Working Group on Climate Change

Based on the review, climate change is recognised as a cross-cutting issue with implications for different sectors across the RECs[9]. Common priority sectors in REC climate change policies or strategies are agriculture, energy, biodiversity and ecosystems, and water. This is not surprising given that these are the engines of economic growth in the majority of African countries. If CLARE is considering large-scale programmes, working in these sectors would be critical. Specific research needs within these sectors are noted in Table 6 below.

Table 6: Research demands identified across the RECs

Sector	Implied research demands
Agriculture	• Support to develop a regional framework for agricultural research and development • Research on crop varieties, cultivars, and mixtures of crops that are capable of adapting to anticipated climate scenarios and different agro-ecological zones • Generation, transfer and dissemination of information on technological and institutional processes for adaptation in agriculture • Best practices for building resilience in agriculture sector • Identification of vulnerability hotspots to decrease regional vulnerability and increase resilience • Agricultural technologies or practices that enhance carbon and nitrogen sequestration • Research on indigenous knowledge systems on adaptation in the sector that could be integrated with modern knowledge.
Biodiversity and ecosystems	• Regional biodiversity inventory system (measurements, assessments and mapping) • Sustainable management and utilisation of biodiversity • Diversification of alternative livelihoods to reduce pressure on biodiversity • Policies and legal framework development • Research and active management of protected and marginal areas to determine the carrying capacity and inform the infrastructure needs to support wildlife • Assessment of environmental consequences of shore protection
Energy	• Relevant research inputs to support the review of regulatory frameworks • Energy efficiency (including regulations) • Energy planning • Alternative energy sources that are pro-poor • Review of electricity tariffs to meet the demands of the poor
Water	• Sea-level rise projections to inform regional planning processes including coastal zone management • Integrated catchment management • Efficient water management practices • Capacity development for water data analysis and water balance • Data to inform groundwater management • Incorporating indigenous knowledge • Diversify and improve water supply sources to reduce climate vulnerability • Vulnerability assessments

[9] Two of the eight RECs (Arab Maghreb Union and Community of Sahel-Saharan States) are currently not fully operational due to political reasons.

	• Meteorological, hydrological, morphological and water quality data to inform decision making • Social equity and water use efficiency in the region.

There are cross-cutting issues that some RECs have considered, such as resource mobilisation, which raise additional research needs related to undertaking feasibility studies of different interventions and understanding the climate rationale to inform the development of proposals to climate finance institutions such as the Green Climate Fund (GCF).

Increasingly to attract finance for projects, countries are working together on common areas such as conservation and infrastructure. A key lesson from the CRIDF programme is that working across multiple countries connected by an overarching policy framework, in this case the SADC Regional Infrastructure Development Master Plan, provides the opportunity to use economies of scale. This is helpful, as looking at a single intervention in one country reduces the pool of financiers; in particular climate financiers who are increasingly looking for large-scale impacts. (Ringwood, 2017)

3.2.1 Engaging with RECs

RECs have been increasingly holding climate change related dialogues for their Member States on key issues, such as disaster risk reduction and management, climate finance and policy development. These dialogues have been driven by the climate change units identified in Table 5 above. These units are entry points for the CLARE programme to engage more directly at the regional level, providing relevant, targeted research that supports the implementation of regional-level activities. RECs that have clearer structures, and hence an enhanced ability to coordinate and convene Member States, could be engaged to share research findings and enhance learning across countries. In addition to the internal structures of RECs there are a number of regional-level institutions that have been designed to coordinate and implement specific actions at a regional level. These institutions are typically established through REC protocols. The table below provides some examples of these institutions. Other relevant programmes could be mapped out depending on the sector(s) the CLARE programme will focus on.

Table 7: Examples of other institutions linked to RECs

Sector	Institution examples	Rationale
Energy	• Southern Africa Power Pool • West Africa Power Pool	Power Pools bring together national energy utilities to promote and develop power generation and transmission in the RECs. They facilitate the development of a competitive electricity market. If CLARE includes work on affordable and sustainable energy access at a regional level. These institutions can be an entry point.
Water	Transboundary River Basin Organisations (RBO) such as the: • Permanent Okavango River	RBOs manage a single shared resource - a specific river basin that is transboundary in nature. The majority of these have adopted models of shared water governance and the principles of Integrated Water Resource Management.

	Basin Water Commission; ● Zambezi Watercourse Commission ● Limpopo Watercourse Commission	If CLARE is working on water sector issues at the national level these would, in some cases, be linked to transboundary issues. RBOs would thus be a suitable entry point.
Disaster risk reduction and management	● Parliamentary Network for Disaster Resilience in Central Africa ● IGAD Climate Prediction and Application Centre ● SADC Climate Services Centre	A number of institutions have been established to provide early warning to countries, providing timely information and support and conduct research. It is important for the CLARE programme to include a focus on early warning systems, to understand the research needs, and to engage with these institutions to promote research uptake.

The work done by CRIDF provides a rationale for including research at the sub-continental level. Over 70% of SADC's freshwater resources are shared between two or more member states (SADC, 2005). These member states have different social, environmental, economic and political contexts with the result being that water resources serve a variety of different needs in different degrees. Collaboration to manage the transboundary resources is thus critical to building resilience in the region. This was further emphasised during the interview with CRIDF, where the team lead stated, "Climate change does not respect borders and it is one of these things that joint action becomes much more critical... So we see, for example, in many of the major river basins in Southern Africa, there are places where it is going to get wetter, and places where it is going to get drier...because of that, you have got increasing options through cooperation between the countries to try to adapt to the impacts of climate change" (2 October 2019, pers. comm.).

Based on all the stakeholder interviews undertaken, key roles identified for RECs with regards to engaging with research programmes were:

- Enabling joint action, particularly on the major transboundary issues;
- Being a convenor and knowledge broker amongst Member States, sharing relevant information and facilitating peer-to-peer learning;
- Providing data to Member States; and
- Supporting capacity building of Member States.

There was support from interviewed senior policy-makers from Zimbabwe and Kenya to have RECs play a more substantial role in promoting collaboration on climate action between Member States, particularly as climate change will impact natural resource management, which could result in community and political tensions. "We would like to see them do more to support the countries, and help us connect our work" (Senior official, Climate Change Management Department, 25 September 2019, pers. comm.).

Implications for the CLARE programme

1. Depending on the sector, transboundary issues may emerge that would require the engagement of RECs and countries. Common sectors are water, energy, infrastructure and agriculture. In the water sector relevant institutions include the transboundary RBOs most commonly found in southern Africa. These can be the initial entry point for CLARE engagement.
2. RECs have their own research needs focused on supporting the needs of the collective (as opposed to a single-country focus). Early engagement could identify research demands that are applicable to countries in the RECs, thereby creating a link between national and regional interests.
3. RECs can be an important convenor and disseminator of research information as they also hold some power within the governance landscape of their region. CLARE should, therefore, seek to build relationships with units tasked with advancing climate action within the RECs and co-convene events to disseminate research findings.
4. Commence engagements with the Secretariats of the RECs that currently have clear and established roles (IGAD, EAC, ECOWAS and SADC). For those geographic areas that do not have this institutional structure, it would be more time consuming to understand the different units' roles with regard to climate change.

3.3 Country-level demand

Increasingly, countries are developing policy and regulatory frameworks that respond to the impacts of climate change in a systematic manner. Many national development plans now mention the risks of climate change to the countries' economic development pathway, indicating an increasing awareness of the climate risks and the need to address these. Despite the progress that has been made, some countries lag behind in terms of developing the governance framework.

Drawing on case studies[10] developed and interviews with policy-makers from Ethiopia, Ghana, Kenya and Zimbabwe, a significant finding of this study is that countries classified as 'late stage' articulate clearer research demands, having gone further in developing climate change policies and regulations. This is in contrast to countries that are still in the process of establishing their governance frameworks, or that have just started implementing their first policies or strategies. Countries at this earlier stage tend to express more general than targeted adaptation research demands. This indicates a requirement for orientation and general understanding of key issues.

The following section is divided into two parts:

- Understanding commonalities in research demand across countries; and
- Understanding differences in demand across countries.

3.3.1 Understanding commonalities in research demand across countries

Based on a desktop review of the climate change policy frameworks, the six countries were categorised as the following:

- **Early stage:** Botswana
- **Mid-stage:** Ethiopia, Ghana and Zimbabwe
- **Late stage:** Kenya and South Africa

Across the six countries, regardless of the policy advancement, the common priority sectors were agriculture, disaster-risk reduction and management, forestry and fisheries, health and water. The table below provides a summary of identified research demands from policy documents and interviews with national level policy-makers.

Table 8: Summary of research demands emerging from the country case studies and interviews

Sector	Research demands	Countries with an adaptation research focus for this sector
Agriculture	• Identifying effective and appropriate climate-smart agriculture techniques for crops and livestock • Analysis on how crops (both for subsistence and commercial purposes) are affected by a changing climate and how to manage crops within this context • Breeding and promotion of stress-tolerant varieties	Botswana, Ghana, Kenya, Zimbabwe

[10] See Annexures 1-6

	● Understanding climate risks in the sector and how to mitigate them in different contexts ● Research to support the diversification of livelihoods from agriculture ● Pest management and soil conservation	
Disaster-risk reduction and management	● Development of insurance systems to assist in rebuilding after disasters ● Updated (and in some cases developing) vulnerability, risk, and capacity assessments ● Development of early warning system; this includes capacity building within institutions to use these systems and context-appropriate technologies ● Developing appropriate policies, plans and strategies	Ethiopia, Ghana, South Africa, Zimbabwe
Forestry and fisheries	● Research to understand forest ecosystem resilience and climate risks to forests ● Research to strengthen the frameworks for reducing emissions from deforestation and forest degradation (REDD+), and other financing mechanisms applicable to forests ● Research to support agroforestry and non-timber forest products ● Research to identify approaches to forest conservation, afforestation, restoration of ecosystems, and the use of modern technologies for controlling veld fires ● Land rehabilitation ● Research to determine the economic and social impacts of ocean acidification on coastal communities and fisheries ● Research on coral bleaching ● Research to understand impacts on the inland fisheries sector and develop appropriate management responses	Botswana, Ethiopia, Kenya, Zimbabwe
Health	● Understanding the impacts of extreme weather events on human populations and their health to inform and catalyse health sector reforms ● Research on the human health implications of climate change ● Understanding the potential changes to the distribution of diseases ● Mainstreaming climate change into health policies ● Strengthening disease surveillance including after extreme weather events	Botswana, Kenya, South Africa, Zimbabwe
Water	● Understanding how coordination could be improved across different governance scales to support an integrated approach to drought management that builds climate resilience ● Identifying appropriate technologies for irrigation and approaches to rolling out rainwater harvesting strategies	Botswana, Ethiopia, Kenya, South Africa, Zimbabwe

	● Understanding risks associated with reduced and variable precipitation coupled with increasing water demand, particularly from a growing urban population and increasing industrialisation ● Groundwater management ● Transboundary water management ● Improving the management of hydropower stations and managing reservoirs ● Management of water resources including identifying policy gaps, and enhancing resilience in the water sector ● Coastal zone management	

In addition, cross-cutting issues facing countries became evident from the case studies and interviews. Some countries express specific research needs that apply to **overarching institutional and governance issues** rather than sectoral issues, for example:

- **Cross-sectoral adaptation options and costs:** One of Ethiopia's primary demands are for analysis of adaptation options across sectors, including vulnerability and risk assessments, and to undertake a cost-benefit analysis of adaptation options across sectors. The CRGE Facility also expressed demand for more research and evaluation of the implementation progress of the CRGE Strategy so far.
- **Mainstreaming and alignment across scales and sectors:** In Ethiopia at the ministry level there is a demand for climate-relevant data and guidance on how to mainstream it. "In general, there is limited understanding and capacity on how to incorporate climate change results into overall sector-development targets" (Director of the Environment, Forest and Climate Change Commission, 18 October 2019, pers. comm.). Ghana and Zimbabwe expressed demand to improve alignment between sectors and between research institutions and government agencies; and links across scales of governance.
- **Bottom-up planning:** A number of countries expressed needs for enhanced understanding and integration of local-level adaptation priorities. In Ghana there is a need to better understand the challenges faced by people at local levels, communication, and alignment of priorities. In addition, in Ethiopia the Coordinator of the CRGE facility highlighted that there is a need for research on local-level adaptation priorities that engage with, and integrate, all 270 woredas into adaptation planning and implementation (17 October 2019, pers. comm.).
- **Effective institutional frameworks:** In Kenya, as the Government is in the process of implementing its National Adaptation Plan, they expressed the need for **r**esearch on how institutional frameworks can address climate change, and support better communication and coordination amongst relevant ministries. In Ethiopia the CRGE Facility expressed the need for better Monitoring, Reporting and Verification of climate actions (mitigation and adaptation) and improved systems for climate finance tracking (17 October 2019, pers. comm).
- **Gender and vulnerable groups:** Botswana, Kenya and Zimbabwe expressed demand for research on the differential gender impacts of climate change. Botswana (GoB, draft) and Zimbabwe (GoZ, 2018) going a little further expanding this to children and people living with disabilities and including a focus on gender-responsive mechanisms that continually enhance adaptation measures at the community level. It is worthwhile to note that whilst gender was mentioned in the policies, stakeholders interviewed did not mention it explicitly as a priority. Observations made by SSN in its Southern Africa Climate Finance Partnership programme is that often ministries mandated to lead on

gender issues very rarely are involved in the climate change discussions. Ensuring that they are engages in the research programme would raise awareness of the relevance of climate change to their work, further informing policies.

- **Knowledge management and enhanced soft skills:** Both Kenya and Ghana expressed the need for enhanced knowledge management systems and communications. Ghana has also identified the need for skills to achieve research uptake, and strengthened soft skills for increased cooperation between researchers and decision-makers.

Table 9 below indicates the extent to which each case study country prioritises adaptation research in the key sectors. To develop this table, the team analysed a selection of relevant documents (e.g. NDCs, climate change policies, adaptation strategies), and identified a short list of the priority adaptation research needs for each country. A nominal scale was used to categorise the priority level of adaptation research for each sector within each country as LOW, MEDIUM, or HIGH.[11] Table 9 is an illustrative exercise and it should be noted that the classification of sectors in each country vary widely, in addition to how recent and complete the underlying source documentation on adaptation planning is - the latter correlates with the level of advancement in national climate change policy.

Table 9: Level of demand for adaptation research by sector

Sector / cross-cutting	Botswana	Ethiopia	Ghana	Kenya	South Africa	Zimbabwe
Policy development, governance, and finance	MEDIUM	HIGH	MEDIUM	MEDIUM	LOW	MEDIUM
Agriculture, forestry, fisheries, ecosystem management, biodiversity, and sustainable land management	MEDIUM	MEDIUM	HIGH	MEDIUM	HIGH	MEDIUM
Disaster risk reduction and management, and climate services	MEDIUM	MEDIUM	HIGH	LOW	HIGH	MEDIUM
Human settlements, labour, and employment	MEDIUM	MEDIUM	MEDIUM	HIGH	MEDIUM	LOW
Energy and infrastructure	MEDIUM	MEDIUM	MEDIUM	MEDIUM	LOW	HIGH
Water management	MEDIUM	LOW	LOW	LOW	HIGH	MEDIUM

3.3.1.1 Responding to international climate policy processes

African countries have a range of common research needs, as indicated by their Nationally Determined Contributions (NDCs) to the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC's Paris Agreement - which all African countries are Parties to, and most have ratified, ratified the Paris Agreement. The Paris Agreement makes provisions for Parties to show progression of ambition over time, for example, the Global Stocktakes will assess progress and long-term goals. An understanding of demand for climate change

[11] Based on the review of each country's adaptation research priorities: if a sector is not mentioned, it is listed as LOW demand; if a sector is mentioned 1-2 times, it is listed as MEDIUM demand; if a sector is mentioned 3 or more times, it is listed as HIGH demand.

research thus would not be complete without considering the work that countries are doing to meet the UNFCCC goals.

The Paris Agreement recognises that adaptation actions should be country-driven, gender-responsive, participatory and fully transparent and should take vulnerable groups, communities and ecosystems into consideration (UNFCCC, 2015). Adaptation action should also be based on and guided by the best available science and appropriate traditional knowledge (knowledge of indigenous people and local knowledge systems), to integrate adaptation into relevant socioeconomic and environmental policies and actions where appropriate.

This provides a key opportunity for the CLARE programme to provide relevant research to Parties to enable them to meet these requirements, contributing to countries' understanding of these issues. The table below provides a summary of opportunities for the CLARE programme in light of the provisions of the Paris Agreement highlighted above drawn from decisions made at the UNFCCC 24th Conference of the Parties (COP24).

Table 10: Summary of opportunities for the CLARE programme in light of the provisions of the Paris Agreement (UNFCCC, 2018)

UNFCCC process	Opportunities for the CLARE programme	Timeline
Global Stocktake (There is an emphasis on equity and using the best available science).	Through country level work provide research inputs that inform African countries' technical inputs, for example, on adaptation efforts and priorities. These inputs should target the UNFCCC Focal points of targeted countries.	The first stocktake will take place in 2023 and every five years thereafter. Information collection and preparation for the Global Stocktake will end no later than six months before the consideration of outputs.
NDCs	Providing research and evidence on: ● Better understanding how the private sector can invest in adaptation across the continent for long-term climate resilience ● Clear costing of adaptation measures and current spend (international and domestic) on adaptation as well as financing gaps and opportunities, this will inform the ratcheting up of ambition. ● **Policy options that better integrate adaptation, mitigation and sustainable development goals**[12] ● **Better understanding the capacity constraints of key institutions responsible for the design and implementation of**	Ongoing

[12] Areas highlighted in bold were further emphasised in interviews with the CRGE Facility in Ethiopia and Ethiopia's Environment, Forest and Climate Change Commission.

	climate policies and interventions.	
Global goal on adaptation	Providing research and evidence on: ● What effective adaptation practices look like within different contexts and the robustness of the adaptation actions. ● **Financial flows and costing of adaptation actions in priority sectors such as agriculture, water, biodiversity and ecosystems including forestry, health.** ● **Allocation and monitoring expenditure on adaptation at different scales (national and sub-national).** This can include establishing methodologies, and research on the impact of expenditure. ● **Indicators, metrics and frameworks that** could be used to assess progress on adaptation in African countries.	Ongoing, with developing countries required to submit their communications starting in 2025. In addition to research, there is a critical need to share knowledge across different scales (sub-national, national, regional and global); thus knowledge brokering plays a role in supporting the attainment of the goal.

In learning from the development of the first NDCs, the African Development Bank (2019) noted the following challenges, that would be important for the CLARE programme to take note of, if the programme intends to support African countries in their response to specific provisions within the UNFCCC such as the NDCs:

- The NDCs contained limited quantitative data, particularly in terms of costing adaptation actions in the priority sectors identified; and
- Given the high-level nature of the NDCs there was a limited understanding of the beneficiaries, as well as the specific interventions that are required to reduce vulnerability and increase adaptive capacity.

It is anticipated that some of these challenges would be addressed through a number of other processes such as the National Adaptation Plan process, with some countries such as Zimbabwe looking to develop a costed plan, with clear interventions based on an understanding of vulnerability in different regions of the country (Adaptation Focal Point, Climate Change Management Department, 25 September 2019, pers. comm).

Implications for the CLARE programme:

- The majority of countries will require support to respond to the goals of the UNFCCC and the Paris Agreement. This is in addition to ongoing work on the development and implementation of country level policies and strategies.
- There are still a number of gaps in terms of identifying and prioritising adaptation actions as well as understanding what effective adaptation looks like at different scales. Including these focus areas into the CLARE programme will be beneficial to the majority of countries and support their negotiation positions within the UNFCCC processes.

3.3.2 Understanding differences in demand across countries

Across the case study countries, there were differences in research demands given the differing social, political, environmental and economic contexts of these countries. As the circumstances of each country are unique, each study carried out under CLARE should involve a unique needs assessment for its countries of focus. The research needs of countries are also dynamic - liable to change under new climatic, social, and political circumstances - and evolving as countries further clarify their priorities and advance on their adaptation journey.

The most comprehensible criterion by which countries differ in their approach to adaptation research is their level of advancement in developing climate change adaptation policies and related institutional infrastructure as shown in the table below.

Table 11: Understanding policy advancement differences

	Early stage (e.g. Botswana)	Mid stage (e.g. Ethiopia, Ghana, Zimbabwe)	Advanced stage (e.g. Kenya, South Africa)
Policy advancement	These countries have not developed national climate change adaptation policy frameworks - although all countries generally would have initiated some form of strategic and policy framework that addresses adaptation issues.	These countries have developed policy related to climate change adaptation, but still require substantial improvement with regards to stakeholder engagement, policy cohesion, or implementation.	These countries have clear policies and regulatory frameworks covering mitigation and adaptation. Often climate change policies have also been developed at the subnational level in response to national level guidance.
Stakeholder engagement	There's much to be done in terms of engaging stakeholders on their needs, but still some limited focus on priority areas, and limited understanding or consensus on what the key adaptation research needs and demands are.	There has been substantive work done on engaging a variety of stakeholders to understand key needs that should be addressed by policy.	The highly developed and focused policy context of such countries means a very clear steer on which areas to prioritise for further adaptation research. There is consensus on the key priorities and needs at different scales.
Institutional infrastructure	Institutional roles may not be very clear impacting the ability to design a coordinated approach. Such countries may require some guidance in the most effective way to structure their national bodies engaging with adaptation, but it is also important to consult extensively within the country, and to ensure that strong demand and a	The roles of governmental and decision-making institutions in such countries are generally clear, but there may be a need to develop capacities and capabilities further. While such countries may have government and related institutions with a strong mandate and structure focused on	Those African countries with the most developed institutional infrastructure to address climate change often have a clear idea of where they need to improve, and what skills and services are required for these improvements.

	strong mandate exists for such work - for example, through a memorandum of understanding and the development of trust through ongoing relationships with key institutions in the country.	adaptation, these institutions may be fairly new. During these formative stages, institutions can often benefit from bilateral exchange with similar organisations on the continent - to learn from how the more experienced institutions are structured institutionally, how they engage with the global context international research, climate diplomacy, and climate finance, and with the local context of government, private sector, and civil society.	Such countries can also work effectively as regional leaders - to share their learning with other countries at an earlier stage, to act as hosts for regional coordination programmes, and to engage with international climate diplomacy and climate finance bodies.
Political prioritisation	Climate change issues may not be a political priority, so programmes operating in the country must engage at a more fundamental level with decision-making bodies, to understand the needs of in-country stakeholders.	Although climate change policies have been developed, the policy goals may not have been mainstreamed into other sectoral policies and plans or at the subnational level. Adaptation may need to be addressed more effectively, through integration into documents like sectoral policies and action plans.	In the most advanced cases, climate change adaptation issues have already been mainstreamed into development policies across various geographical scales, time horizons, and sectors.
Types of adaptation research most beneficial to the country	High-level engagement on appropriate channels and methods to incorporate adaptation needs into local and national planning. Development of appropriate and sustainable capacity and capability within the organisations required to develop and execute adaptation planning processes. Opportunity to learn from more advanced countries, through bilateral exchanges.	Identification of the strengths and weaknesses of existing institutional infrastructure, policy, and adaptation. Research needs should arise through the development of relationships with in-country stakeholders.	Specialised engagement based on identified gaps in knowledge, capacity, and capability. Research that is less general, and more targeted towards particular needs identified by in-country stakeholders, as identified through consultation. Opportunity to share learnings with less advanced countries, through bilateral exchanges.

It became clear, from stakeholder interviews as well as case studies, that a clear articulation of who to engage in each country is crucial at the outset of any engagement. The roles of key stakeholders are not as clear and established in early-stage countries, adding an extra dimension to the planning and research required in such countries. For example, in the two

interviews conducted with Ethiopian stakeholders, the CRGE Facility and the Environment, Forest and Climate Change Commission (EFCCC) both mentioned the same research project undertaken by EDRI. One institution thought it had been a great success, while the other thought it had been an example of poorly conducted research because they had not been consulted. The insight from this example is that national level climate-related research in Ethiopia often has to ensure all relevant units and ministries are consulted right from the beginning, and selective engagement with a narrower set of stakeholders is unlikely to have as much uptake. Understanding who to engage with in the relevant country context is a crucial first step for any research project.

From the interviews and case studies, it is clear that a more immersive co-production is necessary, due to the nature of research and decision-making in the context of a rapidly changing climate and political context.

Implications for the CLARE programme:

- Countries that have established a climate change governance system are more likely to have well articulated research demands. Where a governance system isn't in place, more time would be required to engage with relevant stakeholders to establish demand.
- As the circumstances of each country are unique and are evolving, each study carried out under CLARE should involve a unique needs assessment for its countries of focus.
- The country-level is the best starting point for the research programme overall as countries priorities are the building blocks for regional and continental action. This is also seen Green Climate Fund's country ownership principles whereby each country included in a proposal has to agree to that project by submitting a no-objection letter.
- National policies are important to clarify a country's needs, and generate support for adaptation initiatives, depending on the stage of a country's stage of climate change policy advancement:
    - For early stage countries, CLARE's adaptation research can begin the process of generating robust adaptation policy, driven by relevant government ministries and legitimised through wide consultation with key local stakeholders. Such countries may offer the greatest challenge for CLARE, as adaptation research needs and mandates may be unclear.
    - Mid-stage countries may have some adaptation policy in place, but it may not be well-implemented. Alternatively, such countries may have limited or dated policies or documentation which is no longer relevant due to changing climatic, social, or political circumstances. Research institutions are engaged, but may require additional capacities.
    - For advanced stage countries, where implementation of policies is more advanced, research institutions are typically engaged with policy-makers. Research needs and entry points for engagement tend to be very clear. There may be a lot more development partners working in different spaces, thus requiring a broader stakeholder engagement strategy that takes into account different partners work.

4 Integrating policy demand into research commissioning

The preceding sections have provided an overview of policy demand across three spatial scales (continental, sub-continental and country levels). This next section will briefly consider how the CLARE programme can ensure that research applicants consider policy-makers' demand as they design their projects. Although the research commissioning process was not a focus of the study, some high-level lessons can be gleaned from the user study and from particular programmes that the consortium is involved with directly, such as the Climate and Development Knowledge Network (CDKN) and the Future Climate for Africa (FCFA) projects.

There are two main aspects to consider, the role of the internal CLARE team and the roles of the research applicants for a research call that includes policy impact as an objective. Each of these roles is largely dependent on the structure of the calls for proposals, and if the calls are open or restricted to predetermined focus countries. There are strengths and weaknesses to each approach. A preliminary recommendation from this report is that scoping needs to take place at the country level, and therefore this should be conducted either prior to an open call for research proposals or during the first phase of establishing research consortia. Outlined below are recommendations for both the CLARE team and the research consortia, applicable to a variety of modalities CLARE may consider when commissioning research to ensure demand is integrated.

Internal CLARE team

1. The CLARE calls for proposals should present an updated and reasonably detailed picture of ongoing government efforts on adaptation (strategies, policies and planning) and encourage consortia to link to these. This would ensure alignment and avoid duplication as well as identify gaps in the existing policies, strategies and plans. As an illustration, in Botswana the NAP Global Network, the Department of Meteorological Services and the Ministry of Environment, Natural Resource Conservation and Tourism organised a stakeholder inception workshop to inform the NAP Framework and to encourage interaction between official processes and adaptation research.
2. If focus countries for the programme have been identified prior to the call for proposals, the team should engage with relevant national stakeholders to further scope demand and design the research commissioning process prior to finalising the scope of the research call. Carter *et al.* (2019) identify six building blocks for an effective co-production process, starting with identifying key actors and building partnerships, creating common ground, co-exploring need, co-developing and co-delivering solutions and finally, evaluation of the process.
3. Where there are no focus countries, researchers should be required to carry out additional scoping studies as the first activity in a research call and include these in their project budgets, as a means of encouraging them to co-explore research needs and demands. This scoping should include a component on mapping the political and decision-making landscape or partnering with a local institution with in-depth knowledge. A mapping of the priorities and ongoing/ planned work by other development partners and research stakeholders in the identified sectors is crucial to ensure that research responds to demand. As described in Box 2, the FRACTAL research consortia spent at least the first two years of the five-year programme scoping demand and working with embedded researchers to understand needs before deciding on the research to conduct. It is anticipated that this approach would lead to greater research uptake, but produce fewer research outputs than other FCFA consortia.
4. It is important to have very clear demand-related criteria for the projects that will be funded or for the research windows. For example, in the call for proposals, be clear about the need for projects to:

- Demonstrate policy demand for the research (e.g. identifying specific policies that will be targeted, what the challenges are and how the research idea addresses these, including who they would engage with over the duration of the project).
- Outline the anticipated policy impact, noting that policy work is complex and can be an evolving landscape.

5. Be clear on criteria related to African research institutions' participation in the research programme. Research proposals should include leadership roles for local research institutions and their role should be clearly articulated. Local research institutions should not be merely 'local partners' but have a clear role in leading the consortia and design and delivery of the research. The importance of local research institutions was emphasised by the majority of those interviewed including CRIDF, the Climate Change Management Department and the Coordinator of the CRGE Facility who noted "much adaptation support is delivered through projects implemented by Northern-based technical assistance institutions, which have limited understanding of the Ethiopian context.. the result is often systems, frameworks and research outputs that are difficult to use and mainstream across government. Adaptation support is poorly coordinated by donors and tends to result in gaps and overlaps or duplication of effort" (17 October, pers. comm.)
6. Beyond diversity and inclusion in consortium formation, it is equally relevant for donors to promote opportunities for genuine collaboration among consortium partners across disciplines right from the research-design stage. At the commissioning phase, CLARE should actively promote the involvement of different disciplines as part of any co-production process.
7. Novel partnerships should be encouraged beyond academia, including with key local influencers (such as think tanks, NGOs, the private sector, and government agencies), as well as organisations representing a range of skills, including knowledge brokering competences such as the ability to act as a bridge between research producers and users, strong communication, interpersonal and networking skills, and the ability to facilitate social learning and translate research for different contexts and audiences, amongst others.
8. CLARE should ensure the inclusion of local in-country experts on the review panel of the research calls. This will allow for further interrogation of proposals to ensure that funded projects meet country needs and are realistic about the country context. This will be more onerous to do if there is no predetermined country focus of the calls, in which case the timeline for review of submissions should allow sufficient time to source such experts.
9. The CLARE programme should facilitate capacity building for local research institutions within each consortium who hold key relationships with policy-makers to ensure they are able to take on a leading role in the research consortia. Capacity building on research uptake and knowledge brokering approaches should also be integrated through all phases of the research process. The CDKN process in Box 1 also provided a capacity building opportunity through the development of project impact pathways. This process included the involvement of an expert facilitator who demonstrated a number of tools to use when developing an impact pathway and supported each team as they worked on their own. This process also ensured that thinking about research uptake was a priority from the commissioning phase and team members were provided with tools to support them in doing this.
10. CLARE should not commission all of its research at the same time. A lesson from the FRACTAL project and from CDKN Phase 1, is that having the flexibility to respond to demands that emerge as the research process unfolds is crucial to being responsive and ensuring that the programme can capitalise on any "policy windows" that might

arise. Having funds set aside for this purpose that are accessible in response to emerging demand, can help CLARE research consortia be flexible in the face of demand they may not have planned for.

Research applicants

Research proposals need to demonstrate how they respond to the demand-related criteria set by the CLARE team. These criteria should include the following considerations:

1. Research proposals must clearly state how they will engage with policy-makers and at what phases of the research. This scoping study has highlighted that policy-makers want to be involved in defining the problem and in the research process. “We value consultation throughout the life-span of the research project,” (Coordinator of the CRGE Facility, 17 October 2019). This, therefore, creates a space for ownership of research findings and recommendations, even if the research outcomes are not complementary to policy-makers’ systems or processes. In Zimbabwe, the UNFCCC focal point suggested co-authoring some research outputs with technocrats and not merely using technocrats as data providers (17 October 2019, pers. comm), whilst in Ethiopia the Director of the EFCCC recommended establishing committees (through a memorandum of understanding) that have different stakeholder representatives who would meet throughout the research project. These structures could then be used as a vehicle for promoting research uptake at the end of the project(s). Examples of different approaches are articulated in Box 2 (FRACTAL’s use of embedded researchers and the City Learning Labs) and Box 3 (CDKN’s use of the CEL model for integrating demand).
2. Research proposals should include an initial stakeholder mapping and engagement plan and provide an overview of where the research they intend to conduct could facilitate change. The proposals should show an understanding of the decision-making context and where their research will feed into. Research proposals should indicate some understanding of this context, even if further scoping is still needed. While it may not be possible for researchers to conduct scoping activities prior to submitting a proposal, this criterion will ensure that consortia include a critical role for researchers who are already familiar with the institutional, political and social landscape and can already articulate this at the proposal stage. It will be important to have local reviewers of proposals in order to evaluate this component.
3. Research proposals should align the possible impacts of the research to the adaptation objectives of the country, as expressed in relevant policies and plans. This recommendation came through in the interviews, for example, the Director of the EFCCC in Ethiopia said a key factor, “determining the translation of research into practice is whether the research agenda is aligned with the country’s policy framework. These include development plans, CRGE strategies, [and] roadmaps.” (18 October 2019)
4. Applicants must submit their research uptake plan and/ or approach, demonstrating what the approach is, why it has been chosen for this specific context, how it will be implemented for the duration of the programme and what impact is expected. This should just be the start of the process and researchers should be supported to deliver a strong approach to research uptake throughout the process.

An important aspect of co-production is building common ground and co-developing solutions. Box 1 below provides an example of a CDKN process to encourage collaborative project design. Following a call for concept notes, initial project ideas were shortlisted and then researchers participated in a facilitated co-production process with knowledge users and local

stakeholders (including local knowledge brokers such as NGOs) to develop high-level project visions and design projects.

Box 1: An example of project co-development in practice in CDKN Phase 2

In CDKN's second phase, the programme has been experimenting with approaches for knowledge users, brokers and producers co-creating research-uptake initiatives using existing research from programmes like CARIAA as the knowledge basis. The figure below outlines one process used by CDKN to select and develop projects in Africa and Asia:

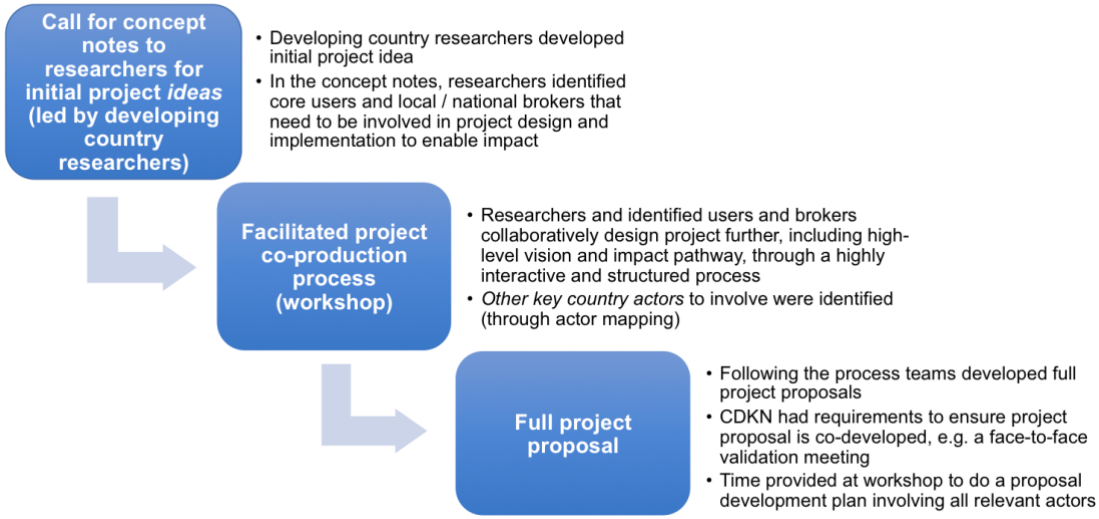

Figure 3: CDKN co-production process for developing project proposals

The advantages and disadvantages of this approach included:

Advantages

More effective and rapid stakeholder identification: Local researchers identifying users and brokers that needed to be involved in the project development workshop proved to be effective, as they are more embedded in the decision context and therefore more likely to identify the right actors for co-developing and enabling impact for the *specific* idea proposed. At the workshop, it was evident that relevant stakeholders had been included. However, researchers are still likely to overlook certain actors. The workshop then provided another opportunity for users, brokers and researchers to identify other potential key actors together through impact pathway and actor mapping exercises.

Co-production at the project design stage. The engagement process highlighted the potential impact of bringing in key stakeholders at the project *design* stage (as opposed to stakeholder engagement at project initiation stage after the project activities and budgets are finalised) to co-create impact pathways, build relationships and plan their continued engagement in project implementation and beyond.

Legitimacy: Leadership by local researchers in the project as well as the collaborative design helped to build legitimacy and buy-in for the different initiatives scoped. However, this approach will still need to be maintained during implementation despite this being a good first step.

Capacity building: The process also provided an opportunity to build the capacity of researchers on effective research-uptake approaches. They were exposed to a number of tools

and had an opportunity to work with these through the impact pathway development process. All the factors above mean that there is a greater chance of knowledge being used and applied and achieving impact.

Disadvantages

Robust methodology and strong facilitation is required to guide a co-development process. All workshop processes in Asia and Africa needed careful design, and used a highly interactive and structured approach for developing a shared vision, longer-term goals and outcomes for the project beyond project activities and outputs (and progress markers in the case of Asia). In Africa a social learning expert with experience in impact pathway development and working with mulit-disciplinary and multi-stakeholder teams was needed to hold what was sometimes a messy and complex process, and which required helping groups work through conceptual confusion and balance competing ideas and interests in the project outcomes.

Resource-intensive: A significant time investment was required to design and facilitate a robust process.

Box 2: Co-exploration and co-production approaches in the Future Resilience for African CiTies and Lands (FRACTAL) research consortia

FRACTAL aimed to support decision-makers to better integrate relevant climate knowledge into their urban planning and action. It used transdisciplinary co-exploration and co-production processes to create and share new climate knowledge in southern African cities. FRACTAL used the concept of City Learning Labs, based on the principles of social learning labs as processes that engage a variety of stakeholders in finding solutions for a specific question or problem that they all perceive as relevant and urgent.

Several research consortia commissioned through NERC and DFID as part of the FCFA programme tended to prioritise research excellence over intensive stakeholder engagement. FRACTAL is a notable example of how consortia can actively pursue the integration of demand into the research process. The five-year research consortia chose to delay some of their core research and climate modelling activities in order to prioritise engagement first. The consortia spent the first two or so years on co-exploration to understand the research needs and the decision space while building capacity (of both the researcher and the decision-maker), and then co-produced its research outputs. As the programme progressed, research outputs were ramped up but the engagement process continued to ensure a bottom-up approach to their research outputs.

All participants were encouraged to share views, needs, insights and research on a specific problem or burning question. While sharing these insights, all participants were asked to listen and possibly revisit their own perspectives. The City Learning Labs were an important platform for researchers to facilitate dialogue on pressing issues. Together with FRACTAL team members, these discussions were useful for analysing complex problems and exploring potential solutions.

In addition to the City Learning Labs, FRACTAL embedded researchers from a local university into a local government institution. Embedded Researchers (ERs) operate within a set space between the local university, local government, and the FRACTAL project lead

partner (i.e. Climate Systems Analysis Group (CSAG) at the University of Cape Town (UCT)). This set space is governed by an MOU agreed upon between the three institutions. Acting as a bridge between the local university and local government, the ERs' aim is predominantly trust and relationship building and they play a central role in facilitating the co-exploration and co-production of knowledge between all three institutions.

The partnership between the local university, local government and FRACTAL project lead is key to the success of the FRACTAL ER approach because the city-based partners ensure the contextual and conceptual relevance of the ERs work, while the project lead partner provides structure, guidance, support and learning opportunities relating to the ER approach and the broader themes of the FRACTAL project. Experience from both the FRACTAL project and the preceding Mistra Urban Future project, which informed the FRACTAL project design and approach in numerous ways, suggests that having a cohort of ERs to support and learn from each other is beneficial.

The specific roles, responsibilities and organisational positioning of the FRACTAL ERs vary according to the contextual conditions in each city and are negotiated on a case by case basis between the university and city government in each city, together with the FRACTAL lead partner.

Advantages:

- Capacity building for the ER themselves, including increased knowledge of the policies, plans and programmes operating in the city, improved knowledge on how climate science can be used in decision-making, and skills in how to effectively communicate climate science to decision-makers;
- Increased access to government data, information for researchers, research results and scientific knowledge for government and other actors. Greater access to spaces and people of influence to shape policy and research agendas to increase the relevance and usefulness of both. Interactions with senior academics and high-level key decision-makers through the Learning Labs which otherwise would not have happened;
- Having an intermediary mediate expectations and differences can avoid dissatisfaction in project expectations, work approaches, definitions and outcomes. An ER who is familiar with the processes and limitations at both organisations can help to mediate the expectations, and find ways to facilitate the working relationships between researchers and municipal staff;
- Build relationships of trust, understanding and value for further collaboration.

Disadvantages

While the benefits of undertaking an ER approach are many, the approach also presents some challenges that are important to acknowledge and actively address.

- Universities and governments are both large hierarchical bureaucracies, which makes operating across them particularly challenging because they are constrained by many rules and protocols that are not always compatible with one another. A lot of time is required to become familiar with new people, terms, concepts, documents, procedures and protocols.
- Establishing formal engagements and partnerships can be a long process that requires constant follow-up. A related challenge is the high turnover rate in city governments, which require of the ER to re-establish relationships and trust each time key positions are replaced.
- Research priorities and government priorities are often pursued at different paces. Problems are framed differently and different kinds of knowledge are valued by

researchers versus government. For ERs trying to straddle the two spaces and being held accountable for delivering products for each these differences prove challenging.

- The chronic capacity and resource constraints facing both city governments and local universities in many southern African cities meant that people prioritise their core tasks and can be reticent to participate in activities that are outside of their mandate, making the kind of transdisciplinary co-production work that ERs are tasked with facilitating very difficult. But despite these constraints, most of the staff that the ERs engaged with were as supportive as possible.

For more information see Pretorius *et al*. 2019 (http://www.fractal.org.za/wp-content/uploads/2019/07/Pretorius-L-et-al-Embedded-Researcher-approach.pdf)

Box 3: CDKN's CEL model for integrating demand and ensuring uptake

In its first phase, CDKN established a model of using Country Engagement Leads (CELs), having at least one in each of its focus countries across all three regions. The CEL's role is to build relationships with decision-makers and scope demand for CDKN interventions. This position requires an individual with a unique set of skills including the political acumen to navigate the political landscape, the technical knowledge to scope and advise on technical projects and enough seniority in their career to be well-respected by decision-makers.

CDKN's independent external review found this model to be successful (CDKN Year 7 Review, IOD PARC, 2017), which has led to CDKN establishing strategic relationships with senior officials including Ministers and Mayors in the focus countries who are often unlikely to seek out information stored in a knowledge portal, for example. When the model works, the CEL fills a crucial gap, strengthening internal capacity and provides connections to others for learning.

For a research programme such as CLARE there are advantages and disadvantages to consider.

Advantages identified in the CDKN Year 7 Review

- The review found that the greatest successes came when a CEL was able to combine political and technical knowledge and develop a reputation as a trusted advisor (and sometimes a critical friend) who had demonstrable continuity. A number of CELs have held this role for eight years or more. CELs with this combination were able to gain significant traction in spaces that would otherwise have been difficult to access and even provide critical feedback to decision-makers, moving beyond a linear 'demand-led only' approach to one in which CELs were able to respond to demand with honest feedback in good faith.
- The CELs were able to identify the right stakeholders to be engaged at different phases of project implementation as they had their ear to the ground and had built strong relationships in-country.
- A long-term programme gave the opportunity for CELs to build an informal network of trusted national consultants, and as such were able to procure the expertise of more experts with a better understanding of the national context and less "fly in/fly out" Northern consultants. In the words of a regional stakeholder who was quoted in the independent review "it's more useful if it's embedded in people's minds, and you get this based on local relationships… even if the quality of work is lesser on an

international standard, because we hired local people the outcome is still vastly better".

Disadvantages

- Finding the right person, the right method, the right entry point and the right time for each specific context is a coordination challenge. Each individual CEL has different strengths and finding one person with all the required characteristics can be challenging, and requires a degree of good timing and a small amount of luck. Each CEL also has to be able to identify relevant 'windows of opportunity' for CDKN interventions, and ones that align with what CDKN can do with the available time and resources. To make the most of the windows, the programme team has to be quick to respond and flexible in its planning.
- Implementing the CEL model takes time to establish. While the evidence from the Year 7 Review of CDKN suggests that CDKN's long-term in-country combination of TA and political acumen is now its most impactful asset, which has been a maturing of approach and process over time. Stakeholders are also wary of programmes who previously operated, as CDKN initially did, on a fly-in-fly-out model.
- Unexpected changes to staff can create setbacks. Having one person crucial to the operation of the country-level activities, means that if that person moves on this can stagnate the programme whilst a new CEL is appointed. Similarly, high turnover rates within key institutions can seriously hamper the efforts of the CEL to build momentum.

5 Reflections on research-uptake approaches and strategies

Research uptake has become a core focus area for research programmes seeking to influence change, both with respect to policy and implementation at different scales. There is increasing recognition that the availability of climate change information and the ability of decision-makers to understand and apply it meaningfully remains a challenge. This challenge is not only a result of lack of data and low capacity of data users but also of researchers failing to produce evidence that is readily understandable to or actionable by decision-makers. The focus within this scoping study is to understand what research-uptake approaches have worked for policy-makers and what strategies the CLARE programme can use as a result.

5.1 Starting the research process

When research seeks to influence climate policy or implementation, or development more broadly, then the research process should begin even before defining a research question and end much later than when the question has been addressed. While unsurprising, this statement remains a largely theoretical one, and this approach to research is not overly common in practice.

Conducting research on climate change is complex and encounters structural challenges, such as: who defines and funds research agendas, how involved should non-research actors be throughout the process, or how aligned should research questions be to official strategies and policies. Furthermore, the meaning of research uptake may vary among different stakeholders, which presents a challenge beyond semantics. A linear approach process to research uptake, whereby research is produced first and later disseminated, hoping it gets used by decision-makers, will be constructed differently than an iterative and consultative approach, where stakeholders are engaged in defining the question and where the communications strategy is an integral element of the research process, for instance. The Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) programme is an example of research uptake / impact being included as a relevant element (30% weight in terms of overall budget and focus) of climate change adaptation research programmes.

Different views about approaches to research uptake should be welcomed, as the team involved in the research project (ideally including non-research stakeholders) define what will work best in their particular circumstances, in the context they are operating and with their specific set of skills. There is no single way to approach a research-uptake objective. Institutions funding research initiatives could encourage a constructive conceptualisation and actioning of research-uptake ideas by embedding incentives in their funding schemes and by providing capacity building opportunities for researchers (Prakash et al. 2019). Capacity building should be regarded as an integral part of research-uptake efforts and, in line with Article 11 of the Paris Agreement, it should be “country-driven, based on and responsive to national needs” (UNFCCC, 2015 p. 9), pay special attention to sub-national needs and support the development of Global South institutions.

Stakeholders interviewed working at various scales, indicated that the most successful research projects that led to policy influence were research projects that involved all the key stakeholders right from the inception phase. For example, Dr. Roger Kanton, Deputy Director and Chief Research Scientist at the Savannah Agricultural Research Institute (SARI) in Northern Ghana praises the working relationship that his research institute has developed with adaptation decision making bodies and claims that a constructive engagement between researchers and policy makers has regularly contributed to inform policy decisions. Furthermore, Dr. Kanton sees a direct role and responsibility of researchers working in adaptation to turn findings into applicable results, which often requires building capacity of

stakeholders. “We also train the staff of the Department of Agriculture at the district levels who in turn will train farmers,” Kanton said. This blurring of the boundaries between the roles of researcher-decision maker-user allowed for the development of a common and fuller understanding in terms of what the problem was. It also led to a collective shift in thinking about the possible solutions. Less successful research projects, some stakeholders conceded, have adopted more traditional approaches to engage policy-makers - both when generating data and when presenting their findings.

5.2 Framing adaptation

Beyond stakeholder engagement approaches and capacity building, the language used to define adaptation and its interpretation by the relevant agencies or ministries can make a considerable difference in what gets prioritised and de-prioritised when translating this concept into action. For example, in Ghana, a water resource management approach followed in the National Climate Change Adaptation Strategy, was poorly mirrored as a WASH approach in the National Climate Change Policy; similarly an understanding of improved land use management in the former, was framed as climate-resilient agriculture, carbon sinks and improving the management of ecosystems in the latter. Promoting an open process of defining adaptation across sectors can help avoid narrow understandings of it, which in themselves lead to ‘doing more of the same’ sectoral work, rather than incorporating new thinking into what a sector needs to do to adapt to climate change impacts.

The importance of linking adaptation work and research is made very explicit in Ethiopia’s National Adaptation Plan (NAP), which lists “Advancing adaptation research and development in the area of climate change adaptation” (p. v) as one of its five strategic priorities, while also including “Reinforcing adaptation research and development” (p. iv) as one of its 18 adaptation options.

A holistic and dual (research-implementation) framing of adaptation is important because it informs governments’ research needs and prompts the disciplines from which they expect to harvest (research) findings and insights feeding adaptation strategies. In doing so, the choices around framing and the language used to determine what is excluded from the discussion become apparent. Gender and governance, for example, are terms that rarely appear in a prominent, substantive way in the documents consulted.

5.3 Understanding the governance of research institutions in-country

The case studies conducted as part of this paper offer an insight into the different ways’ governments engage with research institutions. This has implications for how researchers may effectively engage with both. Countries like Ethiopia, Ghana and Kenya have established fairly robust structures, whereas Botswana and Zimbabwe still require building up a system that can better coordinate interactions between (external) researchers or research projects, local/ national research institutions, and how both of these can shape and/or align with a government’s strategic priorities. In the case of Botswana, efforts to improve the coordination would increase the ownership of the governments’ agendas and provide a stronger counter-weight to external (international) players, where national priorities are inexistent or vague.

Notwithstanding the above characterisation of the situation in Zimbabwe, there, too, efforts are ongoing to promote research uptake. Stakeholders indicated that academia is active in the design of policy frameworks both as direct contributors (consultants) and as stakeholders engaged in consultations. This helps bring research outcomes into the process. In addition, to further country ownership, it was suggested that technocrats need to be actively engaged in the research process, and some examples were given such as technocrats being co-authors

on specific policy-relevant outputs as well as putting in place a Memorandum of Understanding between the research and the public sector institutions in question.

Most countries have research institutions that are linked to government such as the Council for Scientific and Industrial Research in Ghana. These institutions are well-positioned to address climate change strategically, however, the capacities and influence that institutes have, nevertheless, vary largely country by country and are often insufficient to enable research uptake to function smoothly. Well-resourced national research centres, however, can strongly enhance the ability of a country to define its own, strategic vision for addressing adaptation (Harvey *et al*., 2019) and, by extension, have stronger control in determining its own research priorities and agenda.

Returning to the example of Ghana, the Research Extension Farmer Linkage Committees, a multi-stakeholder consultative group that seeks to inform agriculture-related policy and practice, as well as environment and climate change agendas, is a fundamental part of stakeholder engagement in research uptake efforts. This institutional arrangement facilitates open dialogue across governmental sectors and with non-government stakeholders and subsequently enables authorities to make informed decisions in developing strategies and plans.

Recognising the differences in institutional arrangements in individual countries, and identifying influential (leverage) points within these systems are likely to increase the possibility that research efforts are both relevant to and used by decision-makers.

5.4 Engaging with policy-makers and funding research in-country

As mentioned in section 4 above on integrating demand into the research commissioning process, stakeholders interviewed emphasised the need for sustained engagement processes with policymakers and the use of local research institutions. Box 4 blow provides a short case study, further illustrating this point and linking it to the success of research uptake.

Box 4: Importance of local institutions to enhancing research uptake

The Environment and Climate Research Centre (ECRC), within the Ethiopian Development Research Institute (EDRI), had the mandate to support climate-resilient development in Ethiopia in its role as a knowledge broker. ECRC's core function was policy-oriented research on the economics of climate change and conducting a real-time impact evaluation of the implementation of Ethiopia's climate strategy. The centre served as an 'interaction hub' for actors involved in research and policy while developing a knowledge repository of Ethiopia's green growth experience. EDRI itself has often played an intermediary role between local institutions and international researchers, forming partnerships with many international consultancies and universities who wish to conduct research in Ethiopia but relied on EDRI to navigate the local context and facilitate interactions with local actors. This central coordinating role made it an effective knowledge broker and was partly born of a desire from the Ethiopian government to avoid dealing with volumes of researchers who all require similar information or induction and avoiding research fatigue while aligning new research with existing policy priorities. Its mandate came from the national government, with whom EDRI had a close and trusting relationship. The think tank was established by the Ethiopian government in 1999 to provide responsive, needs-based research that would provide inputs to policy-making and policy implementation, and EDRI worked in close collaboration with stakeholders at national and regional levels in identifying research areas and disseminating research results. EDRI has since merged with the Policy Study and Research Centre to become the Policy Studies Institute in November 2018 but aims to provide a similar role to the previous EDRI.

Local research institutions face multiple challenges that include underfunding, resulting in them relying heavily on external, donor funding to undertake research. To illustrate the above, a high-level representative from a research institute in Ghana explained that the national government funds staff salaries, but it is only with international donor funding that actual research and new initiatives can be undertaken. “All our research activities are project-driven”, he explained.

Funding provided by international agencies does have an impact, not only on the opportunity for African countries to undertake research but also in steering what is researched. While our case studies revealed that donors’ agendas have a considerable impact in shaping research areas at the country level, they also suggested that collaboration with African institutions working in the specific contexts is essential for the research to be used. For instance, in the interviews conducted with Ethiopia and CRIDF stakeholders, they both highlighted that while international research was relevant, policy-makers tend to first seek out national research institutions as they understand the context better.

Box 5 below provides explores some of the key factors that contribute to enhancing research uptake, drawn from literature and stakeholder interviews.

Box 5: Factors determining the success of research uptake

1. **Common language:** Explore the various understandings of adaptation and establish a common, inclusive language that encompasses this diversity of views
2. **Levels of engagement:** Ensure that there are sustained engagements with key policy-makers (and other stakeholders) at different stages of the research and not just when the research is completed.
3. **Understand decision-making context:** As the policy space is always evolving, there may be key moments in which research outputs or approaches would be useful to policy-makers, understanding when these moments are likely to happen and being ready to act is important. Local institutions play a key role here.
4. **Understand the needs for new research and for knowledge management:** While research needs in Africa are significant, it is important to promote the use of existing knowledge and research findings, where applicable.
5. **Multi-stakeholder partnerships:** Create partnerships with non-academic institutions that are knowledge brokers, these could be NGOs and think tanks, and where non-academic, non-research partners are treated as equally valuable to those undertaking research
6. **Relevance and appropriateness:** Ensure that research findings and recommendations are in a format and language that targeted policy-makers can understand and use. Ensure messages are targeted (and concise) to the issues of relevance to the policy-maker.
7. **Accessibility of research:** This is a common challenge cited by many countries. Ensuring that research findings are accessible to policymakers for example using a repository that targeted policymakers use, can extend the shelf-life of research.
8. **Capacity-building:** both researchers and policy-makers require their capacities to be enhanced for working together with one another. Additionally, for researchers the focus is on stakeholder engagement and communication and for policy-makers on accessing and interpreting research findings.

With regards, to accessibility, the South Africa case study highlights the Climate Change Response Database that makes research findings accessible to, and usable by, decision-makers in tasks that define the shape of adaptation: building budgets and undertaking planning activities. At the sub-regional level, for example, some stakeholders interviewed pointed to limited engagement between research institutions and decision-makers within RECs. In some

cases, this has been as a result of the information not being in a form that takes into account the decision-making landscape in which the RECs operate, and therefore not easily usable. Zardo (2018) shows that two key elements needed to ensure research uptake are:

i) Facilitating access to research findings such as through the repository in South Africa or communication channels; and
ii) Building the capacity of decision-makers to be able to make use of the information available.

This latter point is almost a common denominator, whatever country you look into in the region. Furthermore, the soft skills of researchers on engaging with decision-makers are often low, yet much needed to engage and communicate with stakeholders. This important skill is needed because the premise of a natural leap between research published and research generating impact is not true. As mentioned before, the journey to research uptake does not necessarily start at the interface between researchers and decision-makers, though. It is in the process of undertaking research and, importantly, how those engaged in the research interact with one another, that the work's 'uptake-ability' starts to be determined.

5.5 Multi-stakeholder alliances

While it is true that there is a growing willingness of researchers to partner with stakeholders beyond their discipline, and even beyond the academic and scientific communities to enhance the expected use of findings (Prakash et al. 2019), genuine multi-disciplinary climate change adaptation research remains largely an illusion. For example, skills to collaborate inter- or trans-disciplinarily to produce solutions-oriented proposals are lacking in researchers (Middleton, 2011). Furthermore, the UK Research and Innovation body (2018) acknowledge a number of shortcomings in the way research is being conceived, namely: an excessive focus on problems and an insufficient focus on solutions; too little attention to understanding people's behaviours and responses to climate change impacts; and researchers' incentives for career progression lacking alignment with the challenges mentioned above, as well as hindering the government's ambition to frame resilience research in broader terms of sustainability (including more on exposure and vulnerability).

Another fundamental issue to consider with research uptake is the role that NGOs and other non-state actors should and do play. Harvey *et al*. (2019) recognise that international NGOs are increasingly involved in research work related to resilience, creating opportunities, and addressing challenges like insufficient alignment with national priorities and the introduction of unsustainable, 'projectised' models of funding. Aniekwe *et al*. (2012) stress two important points necessary to ensure multi-stakeholder collaboration is productive and constructive: (i) encourage innovative and long-term collaborations, or projects, that seriously explore non-traditional outputs, and (ii) enable sufficient time for NGOs and researchers/ academia to explore the objectives of their collaboration and design strategies to overcome (potential) obstacles resulting from their different worldviews and institutional objectives. The country case studies included in this report suggest that it could be especially advantageous to combine local NGO efforts with the development of research priorities by national government bodies.

Cemented collaborations between researchers/ academia, NGOs, other civil society actors, and the private sector could be highly beneficial for research uptake. Upwards, it could result in national agendas being better informed of local needs and conditions, as well as, downwards, in NGO efforts being more effective, e.g. by translating, contextualising findings and fostering co-production. It may also lead to government officials and NGOs working more closely in defining the scope and regional scope of their research 'areas'. This is particularly relevant considering that one shortcoming of NGO-led research is, according to some decision-makers,

an excessive focus at local levels impeding the scaling up of its findings to inform provincial or national information gaps.

The above suggests that CLARE should encourage the formation of multi-stakeholder consortia that challenge the traditional idea of research being conducted exclusively by academic researchers. Diverse research consortia that expand the norm to include NGOs, CSOs (including e.g. women's rights organisations), private sector and government entities (including those without a mandate of research), will, by the very nature of their diversity contribute to redefinining the notion of what knowledge contributes to adaptation knowledge creation and expand the types of voices.

The CARIAA programme produced key lessons for facilitating research uptake, which aligns with the findings of this report. The CARIAA report stresses the need for "prioritising long-term relationships and trust-building, being flexible and willing to change course, investing in building researchers' buy-in and capacity for [research uptake] activities, and budgeting for the dedicated staff required to achieve all the above" (Prakash *et al*., p. 23). From a policy-maker's perspective, the same would hold true for promoting research uptake - investing in mapping out and building relationships, understanding the context in which decisions are made, assessing the capacities of institutions that researchers are seeking to influence and co-producing research where feasible. CLARE should encourage its consortia, through the allocation of resources and time in the project's budget, to assess at the beginning of the project both the *de facto* and *de jure* governance and aspects indicated above, and use these findings to refine the research project.

In some contexts, the wealth of existing knowledge and information about climate change, however, has ironically translated into a knowledge management nightmare - with a myriad of institutions producing findings on climate change adaptation, but no solid repository or structure to make this readily available to potential users, including decision-makers. This can lead to ineffective use of resources and under-utilisation of existing research to inform government policy. It also suggests that research uptake efforts should not necessarily start with the premise 'do more research', but rather with an understanding of existing gaps and, if needed, a reassessment of the research questions under consideration based on the likelihood of their usefulness. (Nonetheless, it is important to acknowledge the existence of major adaptation research gaps right across the African continent). Specifically, the resulting recommendation for CLARE is to identify, whether prior to project implementation or as a first phase of it, existing research and institutions in-country hold relevant knowledge - even if some of these work largely outside the peer-reviewed literature radar - and work with them to narrow down the relevant adaptation research needs, as well as how these needs may align with or contribute to expand the understanding and framing of adaptation strategies and policies.

Implications for the CLARE programme

- Work with local institutions to drive research uptake.
- Frame adaptation research in the broadest sense in CLARE calls for proposal, so that a wide range of knowledge sources contribute to framing and undertaking the research.
- Involve research users (both government decision-makers and other stakeholders) in CLARE-funded consortia; from the identification of the research need to the development and sharing of its findings.
- Promote a central role for national research institutions and aim for the CLARE initiative to enhance their research and influencing capacity.
- Develop - whether as part of the CLARE-funded research project or a priori - a good understanding of institutional arrangements in-country and use this as a basis for designing research impact pathways.

6 Recommendations

Adaptation research needs cannot be fully understood without understanding the structural challenges within a context, such as the existing capacity within institutions and understanding the barriers to implementation. Policy documents do provide some research priorities, however, often these are unclear and vague. Research priorities also vary between and within countries thus, to better understand demand, the CLARE programme should start by assessing specific needs at national and sub-national levels, once the geographical location of the programme has been set, to ensure the programme meets the needs of recipients. Nonetheless, the following recommendations can be made based on this scoping study:

6.1 Priority sectors

1. Policy development is a crucial part of the adaptation response. CLARE must consider how best to influence policy and build relationships accordingly. However, this also means that research agendas must fit within and build on existing structures of governance and power to ensure alignment with policy and allow for greater uptake and impact. This would include working with decision-makers to understand their research needs, which may take significant time.
2. Regardless of the scale of the programme (country, sub-continental and continental), it must target and prioritise the agriculture, biodiversity and ecosystems, energy, health and water sectors as these are common priority sectors for national governments. There are other emerging sectors such as transport and infrastructure (from an adaptation lens) that are increasingly becoming a priority due to reasons such as rapid urbanisation.
3. Policy documents are useful as a guide for needs assessment. However, they should not be the sole focus for scoping research demand as intersectional issues could be missed. Stakeholder engagement to develop a wider understanding of the needs and challenges is thus critical when scoping user demand at the outset of specific projects.
4. Additional scoping studies should be commissioned to define research needs, either prior to, or as the first activity in a research call. This scoping should include a component on mapping the political and decision-making landscape or partnering with a local institution with in-depth knowledge. In some contexts where a sufficient adaptation knowledge base already exists, the impacts of the research may be aimed at achieving strategic and efficient outcomes for countries, and not at generating new findings. It is therefore important to engage and work with decision-makers and other stakeholders to identify concrete needs.
5. A mapping of the priorities and ongoing / planned work by other development partners and research stakeholders in the identified sectors will be important to refine where CLARE can add value and avoid duplication of efforts

6.2 Scale of work

1. Climate change priorities are defined at the country level, which then inform sub-continental and continental priorities. For maximum policy impact, the CLARE programme should primarily target the country-level ensuring relevance and buy-in from decision-makers. However, there are specific issues that would need to be defined at the sub-continental level such as the transboundary management of water.
2. The sub-continental level will be key for knowledge sharing and convening of key stakeholders and should not be ignored entirely.
3. Including a learning component that is global in nature should be considered (e.g. in the spirit of CARIAA's Annual Learning Review event), where country/regional

consortia would be exposed to work and learning from consortia working in other parts of the world.

6.3 Structural

1. Broaden the number of disciplines to identify solutions to climate change adaptation. Climate change research programmes tend to focus on the scientific and technical elements, however, engaging other disciplines such as gender studies, anthropology or psychology could be beneficial, particularly when looking for transformative solutions.
2. Invest in governments' vertical and horizontal integration systems as there are gaps in the way information and research findings flow up/ downwards and across sectors, resulting in inefficient and insufficient use of these findings in decision-making processes. Research into improving vertical (national ←→ sub-national) and horizontal (cross-sectoral) alignment is recommended.
3. Prior to the research calls, provide as much policy background in the framing of the research themes as well as in the documents that are sent to applicants. This would help applicants better match their responses to the project needs, and would promote the formation of consortia with national/ local expertise.
4. Seek opportunities to work at cross-country and cross-regional (Pan-African) levels as there are expressed needs for knowledge brokering, learning and sharing amongst African countries.
5. The programme should consider partnering with local institutions that understand the decision-making context of policy-makers in the targeted countries or regions. These institutions include think tanks and Non-Governmental Organisations (NGOs) that have experience working with government institutions.

6.4 During the commissioning process

1. Additional scoping studies should be commissioned to define research needs, either prior to, or as the first activity in a research call. This scoping should include a component on mapping the political and decision-making landscape or partnering with a local institution with in-depth knowledge.
2. It is important to have very clear demand-related criteria for the projects that will be funded or for the research windows. For example, in the call for proposals, be clear about the need for projects to:
    a. Demonstrate policy demand for the research (e.g. identifying specific policies that will be targeted, what the challenges are and how the research idea addresses these, including who they would engage with over the duration of the project).
    b. Outline the anticipated policy impact, noting that policy work is complex and can be an evolving landscape.
3. Be clear on criteria related to African research institutions' participation in the research programme. Research proposals should include leadership roles for local research institutions and their role should be clearly articulated. Local research institutions should not be merely 'local partners' but have a clear role in leading the consortia and design and delivery of the research.
4. Research projects funded through CLARE should show an understanding of the decision context they intend to influence and the institutional, political and social interactions at play that might affect how their research will be used and implemented. Understanding decision-making systems, power dynamics (of institutions and individuals within a country) and how change happens in these systems, as well as

where new (or existing) research could facilitate change, would enhance research uptake.

5. Research proposals must clearly state how and at what phase they will engage with policy-makers. This scoping study has highlighted that policy-makers want to be involved in defining the problem and in the research process. This, therefore, creates a space for ownership of research findings and recommendations, even if the research outcomes are not complimentary to policy-makers' systems or processes. Suggestions include establishing committees (established through a Memorandum of Understanding) that includes representatives who would meet throughout the research project. These structures could operate as a vehicle for promoting research uptake at the end of the project(s).
6. Research proposals should actively seek to align the possible impacts of the research to the adaptation objectives of the country, as expressed in relevant documents - whether it is by providing evidence of the positive / negative implications of these strategies or to effectively counter the country's direction of travel. In other words, alignment does not and should not entail endorsement, but should still take into account the considerations of decision-makers in relation to adaptation.
7. Top-down encouragement of inter- and trans-disciplinary approaches is needed to promote the use of these strategies. Beyond diversity in consortium formation, it is equally relevant for donors to support, even at the research-design stage, opportunities for genuine collaboration among consortium partners.
8. Include local in-country experts on the research call review panels. This will allow for further interrogation of proposals to ensure that funded projects meet country needs and are realistic about the country context.

6.5 Invest in research uptake

1. Although CLARE will be a research programme, it should have specific funding for knowledge brokering and convening at different scales as not all applicants will have the necessary relationships with policy-makers, nor have knowledge-brokering expertise. It is, therefore, important to have other institutions (such as NGOs, Civil Society Organisations, think tanks or journalists) to assist in these areas as this may contribute to increased research uptake. Furthermore, this effort needs to embedded from the beginning, and not be introduced as an add-on towards the end of the research project.
2. Enable learning between researchers and policy-makers and identify the interaction as a desirable outcome in itself. This will require skilful facilitation to create authentic learning spaces. Shift away from traditional roles (e.g. researchers gather data, government agencies create a space for influence and action, and NGOs support participatory work and lobby), towards a co-production research process as successful research-uptake outcomes are more likely to result from collaboration among individuals and institutions and their diverse perspectives and areas of expertise.
3. Enhance the capacity of researchers to engage in research-uptake activities and in understanding the decision-making context; both of which remain low. Furthermore, the (career development) incentives for them to develop these capacities are lacking. Addressing both the capacity-related gap and the structural shortcomings could boost research-uptake objectives.
4. Enhance the capacities of government officials to understand, use and communicate research findings. Likewise, the capacities of decision-makers to access, interpret and use research findings are insufficient. Establishing or improving systems that enable decision-makers' ease of engagement with existing research is equally necessary.

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8 Annexures

The following annexes inform the body of the report:

1. Botswana case study
2. Ethiopia case study
3. Ghana case study
4. Kenya case study
5. South Africa case study
6. Zimbabwe case study
7. List of stakeholders interviewed

8.1 Botswana case study

Despite having one of the world's fastest growing economies over the past 50 years, Botswana remains reliant on diamonds and the public sector, making it vulnerable to short term shocks and structural changes (Matambo, 2016). Although poverty has been declining rapidly, it remains high in rural areas, and low job creation means inequality levels are still some of the world's highest. Urban-rural gaps are significant in basic services, especially sanitation and electricity. Botswana is projected to experience some of the most extreme changes in temperature and precipitation under global warming scenarios of 1.5°C-3°C above pre-industrial levels (ASSAR, 2018).

8.1.1 Overview of Botswana's institutional governance

Botswana has established a National Climate Change Committee as an advisory body to the government. The Committee is made up of members with technical expertise on climate change that advise government decisions and champion climate change considerations. The development of a National Adaptation Plan (NAP) for Botswana will be coordinated by the Ministry of Environment, Natural Resources Conservation and Tourism, with support from the National Committee on Climate Change. The Ministry of Environment, Natural Resources Conservation and Tourism is also responsible for developing and implementing Botswana's National Climate Change Response Policy (NCCRP) and Strategic Action Plan. The draft NCCRP, if approved by parliament, stipulates that national government establish a legal framework for a National Climate Change Unit responsible for implementation, monitoring and compliance with climate change response measures as defined by the policy.

The ASSAR research findings concluded that, institutionally, drought and climate change have been managed separately in Botswana. The resulting lack of coordination among the relevant national departments responsible for drought management has meant that responses have been reactive and crisis-driven rather than proactive. The research argues that an integrated approach is needed to build the longer-term resilience of vulnerable people, ecosystems and the economy (ASSAR, 2018).

The Ministry of Finance and Economic Development is Botswana's Nationally Designated Authority (NDA) to the Green Climate Fund (GCF). This represents a shift of Botswana's GCF Focal Point, which was initially within the Ministry of Environment, Natural Resources Conservation and Tourism. Botswana is still in the process of developing its NDA office, exploring how best to set up its unit, and positioning itself to access GCF funding. The NDA continues to engage with, and receive support from, the GCF Regional Advisor to this end. Several GCF AEs have engaged with Botswana including UNDP, and Conservation International (CI). Botswana's GCF NDA has submitted a Readiness Proposal to the GCF, with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) identified as the delivery partner.

8.1.2 Overview of Botswana's climate change adaptation priorities

Botswana submitted its NDC to the UNFCCC in 2015. Botswana's NDC states its intention to develop a National Adaptation Plan (NAP) and Action Plan and mentions that priority areas will include Climate Smart Agriculture techniques such as low to zero tillage, multi-cropping to increase mulching and reducing evapotranspiration and soil erosion. Botswana's NDC is relatively short and, while not particularly detailed, it lists various adaptation actions to be implemented, which are summarised in Table 12.

Table 12: Adaptation actions listed in Botswana's NDC

Policy document	Adaptation Sector	Adaptation priorities
NDC	Water	Transmit water to demand centres, by constructing pipelines and connecting existing pipelines
		Reduce water loss during transmission by investing in telemetric monitoring systems
		Enhance conjunctive groundwater / surface water use
	Agriculture	Improve genetic characteristics of livestock breed
		Improve livestock diet through supplementary feeding
		Switch to crops with drought resistance, high temperature tolerance, and short growing times
	Health	Malaria strategy, public education, and malaria campaigns
		Control diarrhoeal diseases

Botswana's 11th National Development Plan (NDP11), published in 2016, acknowledges that climate change has become a topical issue, noting periodic severe droughts and their effect on Botswana's wildlife and livestock assets, landscape, and biodiversity. Both NDP11 and the NDP10 midterm review that closely preceded it included a sustainable environment thematic area. Botswana is in the process of developing its National Climate Change Response Policy and Strategic Action Plan (NCCRP), to be implemented through the Ministry of Environment, Natural Resources Conservation and Tourism in cooperation with the United Nations Development Programme (UNDP). This was intended to be completed and approved by parliament by 2016 but has been delayed. The reasons for this delay are unclear. At present, there is a draft Climate Change Response Policy (draft NCCRP) publicly available which was tabled before parliament earlier this year. The draft highlights the key concerns for Botswana such as increased energy and water stress as a consequence of rising temperatures and changing rainfall patterns, losses in rangeland productivity and reduced agricultural yields which threaten food security (draft NCCRP, 2019).

The draft also outlines the following ten key priority areas for adaptation:

1. agriculture and food security;
2. water;
3. human health;
4. human settlements;
5. forest management;
6. land use and land use allocation;
7. disaster risk reduction;
8. biodiversity and ecosystems;
9. infrastructure development; and
10. gender.

Noteworthy inclusions in the draft include the prioritisation of climate change-related conflicts as a result of competing interests on the use of land and land allocation, migration of human settlements, livestock and wildlife. There is also an emphasis on the importance of biodiversity

and the implementation of natural capital accounting measures and mainstreaming gender with reference to youth and disabled persons. The tourism, transport and beef production sectors are highlighted as some of the major economic sectors that are vulnerable to climate change.

Botswana's Second National Communication to the UNFCCC was submitted by the Ministry of Environment, Wildlife, and Tourism in 2011. The SNC lists a range of potential adaptation actions – dealing with crops, health, water, grasslands and livestock, and forestry. Botswana also has Sustainable Land Management initiatives in Ngamiland and Central Districts, which are ongoing national initiatives designed to enhance resilience and reduce the vulnerability of communities to climate change.

8.1.3 Needs and demand for research to inform and support the implementation of adaptation action in Botswana

The draft NCCRP documents a number of research needs which mainly relate to health, water and ecosystem restoration, as well as early warning systems to inform disaster risk reduction plans and resource allocation. These needs are detailed in full in Table 13.

The ASSAR research findings highlight the need for research on heat stress and, "its impact on people and economically-important sectors, as well as the appropriate responses that are required" (ASSAR, 2018: p. 11).

Table 13: Research needs that support implementation (Botswana)

Sector / cross-sector	Research demand	Source of demand	Nature of demand
Drought management	Research interventions to improve coordination among the relevant national departments responsible for drought management to support an integrated approach to building longer-term resilience of vulnerable people, ecosystems, and the economy	The ASSAR research programme	Implied demand that was identified by the research team, not necessarily expressed explicitly by country actors
Policy development	Inputs to develop a National Adaptation Plan (NAP) and Action Plan, including research on Climate Smart Agriculture techniques such as low to zero tillage, multi-cropping to increase mulching, and reducing evapotranspiration and soil erosion	Botswana NDC	Demand was not explicitly articulated for research, but it is assumed that some research will be required for the development of the policy
Biodiversity	Development of natural capital accounting measures designed to preserve biodiversity	Draft NCCRP	Explicit demand
Health	Understanding the impacts of extreme weather events on human health so that necessary health sector reforms are made	Draft NCCRP	Explicit demand
Water management	Research into the development and use of relevant technologies for irrigation systems and roll-out of rainwater harvesting strategies	Draft NCCRP	Explicit demand
Forest and ecosystem management	Feasibility studies on forest conservation, restoration of ecosystems, and the use of modern technologies for controlling veld fires	Draft NCCRP	Explicit demand
Disaster risk reduction	Research on early warning systems for extreme weather to inform disaster risk reduction plans and allocation of resources	Draft NCCRP	Explicit demand
Heat stress	Research on heat stress and its impact on people and economically important sectors, as well as the appropriate responses that are required	ASSAR research findings	Demand from a research programme, not explicitly from country actors

8.2 Ethiopia case study

Ethiopia has recorded a high level of growth in the past decade, at around 10% GDP growth per annum, which is one of the highest globally for a non-oil economy. However, following recent unrest in the country, the level of economic growth is anticipated to stagnate. There is strong interest in industrialising the country, underpinned by the drive to become a middle-income economy by 2025. However, low-carbon and climate resilient development in the industrial sector has not been given due consideration to date. Despite its industrialisation ambitions, Ethiopia remains a largely agrarian economy affected by recurrent droughts and food insecurity. Approximately 80% of the population is dependent on agriculture for their livelihoods (ENDC, 2018: p.8). The rehabilitation of land and natural resource management remains the top priority for Ethiopia in the context of environmental management. More than 97% of Ethiopia's energy supply is renewable energy sources. However, due to low coverage of the grid and high electricity costs, rural households are dependent on fuel wood for domestic use.

8.2.1 Overview of Ethiopia's institutional governance

The next general election in Ethiopia is in May 2020. However, following the appointment of the new Prime Minister Abiy Ahmed on 2 April 2018, there followed a significant restructuring of government. This included a reshuffling of ministers in the relevant sector ministries including the ministries responsible for climate change coordination. One of the major implications of this restructuring was the reorganisation of the Ministry of Environment, Forest and Climate Change to an Environment, Forest and Climate Change Commission under the Prime Minister's Office. It is anticipated that this will result in a higher profile for the climate change agenda, as it is under the Prime Minister's Office, but implementation capacity, particularly at the provincial level, will be compromised. In addition, most ministries have climate change units and/or focal persons that are responsible for ensuring their ministry considers climate change in the context of its work.

Despite being a Least Developed Country, Ethiopia has demonstrated a high level of ambition to climate change adaptation and mitigation, as described in its NDC, the foundation of which is the 2011 Climate Resilient Green Economy (CRGE) Strategy.

The CRGE Strategy requires the conversion of the inter-ministerial approach into a permanent setup for horizontal coordination of sector ministries and relevant agencies at the Federal level. Although adaptation policy measures and actions are first to be adopted at the Federal level; their implementation involves regions, cities and local administrations. Therefore, capacity for vertical coordination is needed to engage regions, cities and local administrations.

Led by the Prime Minister's Office, the Environmental Protection Authority (EPA), the Ethiopian Development Research Institute (EDRI), six ministries, and several other government agencies, the government dedicated significant resources to implementing the CRGE Strategy. An Inter-Ministerial Steering Committee was established comprised of State Ministers and senior officials and was the most senior body in charge of developing and implementing the CRGE Strategy. The governance structure for the implementation of Ethiopia's National Adaptation Plan (NAP-ETH, 2019) is intended to align with that of the CRGE Strategy rather than create a new structure.

Implementation of NAP-ETH falls under the mandate of the various sectoral institutions, such as the Ministry of Environment, Forest and Climate Change (MEFCC - now the Climate Change Commission), Ministry of Agriculture and Natural Resource, Ministry of Livestock and Fishery Development, Ministry of Industry, Ministry of Water, Irrigation and Electricity, Ministry of Transport, Ministry of Housing and Urban Development and 70 other sectors, commissions,

agencies, research and academic institutions, NGOs, CSO, and private sector actors. The MEFCC, now the Climate Change Commission, holds responsibility for coordination of the implementation of the NAP-ETH.

In Ethiopia, the 1995 Constitution also allows each regional state to decide on its own local government structure, so that the local governance system of each region could be rooted in its socioeconomic circumstances. Accordingly, regional states have established rural and urban local governments: woredas (districts) in rural areas and city administrations in urban areas. In cities, there is an executive council, which is chaired by a mayor. However, in many cases, regional governments still need to clearly define the functional roles of city administrations within their jurisdictions. This fact was observed in relation to a project CDKN undertook with the Kombolcha and Mekelle city administrations, where the mandate and responsibility of the Federal and Regional government on the one hand, and the city administrations on the other, was not clearly defined with regards to industrial park development, solid waste management, and housing.

Urban development is a key issue noted Ethiopia's climate change response. Institutions such as C40 are supporting the City of Addis Ababa in undertaking a GHG inventory for the city and identifying city level strategic priorities for climate action. However, outside of Addis Ababa and several secondary cities, there is less of a focus on integrating climate change issues in city level strategic priorities.

The Ministry of Finance and Economic Cooperation (MOFEC) is the national accredited entity to the Green Climate Fund and the Adaptation Fund. MOFEC has had the following projects approved:

- Green Climate Fund approved $50m project - Responding to the Increasing Risk of Drought: Building Gender-responsive Resilience of the Most Vulnerable Communities. This project was submitted through the National Implementing Entity (MOFEC) and focuses on three main activities, namely introducing solar-powered water pumping and small-scale irrigation, the rehabilitation and management of degraded lands around the water sources, and creating an enabling environment by raising awareness and improving local capacity.
- Adaptation Fund approved $10m project - Climate Smart Integrated Rural Development Project - the overall objective of which is to increase resilience to recurrent droughts in seven agro-ecological landscapes in Ethiopia. The project will take an integrated water, agriculture and natural resource management approach to achieve its objectives.

To implement the green economy initiatives, the GoE has expressed its commitment to allocate its own finances, but it also expects the support of international private and public partners. For this to happen, the GoE established a financial mechanism for receiving and distributing funds, the Climate Resilient Green Economy (CRGE) Facility within the Ministry of Finance and Economic Cooperation (MOFEC). The CRGE Facility is expected to mobilise finance from the government, private sector, development partners, carbon trading schemes and multilateral sources, and channel to investors in a net-zero emitting climate resilient economic growth.

The CRGE Facility has so far mobilised over USD 200 million from various sources for the implementation of climate resilience and low carbon development projects. However, Ethiopia has ambitious climate change targets, which require an estimated expenditure of more than USD 150 billion by 2030 (ENDC, 2018: p.9). Therefore, there is a huge gap between the climate finance flowing into the country, and the amount needed.

8.2.2 Overview of Ethiopia's climate change adaptation priorities

Ethiopia's NDC sets out the objective of achieving middle income status by 2025 while reducing the sharp increase in GHG emissions and vulnerability to extreme weather events. GHG abatement opportunities are identified to ensure that GHG emission levels in 2030 do not exceed 150 megatons of CO_{2e}. Co-benefits include improved public health through better air and water quality and strengthened rural economic development.

The economic sectors covered under the ENDC for mitigation are: agriculture, forestry, transport, electric power, industry and buildings (including waste and green cities). The sector definition adopted under the ENDC is consistent with the definition of sectors under the Country's First and Second Five Year Growth and Transformation Plans (GTPI and GTPII).

Table 14: Adaptation priorities outlined in Ethiopia's NDC

Policy document	Adaptation Sector	Adaptation priorities	Timeline
Ethiopia's Nationally Determined Contribution	Agriculture, water, energy	• improved crop varieties; • enhancing water harvesting techniques; • agroforestry and sustainable afforestation; • rainwater harvesting for irrigation; • construction of dams or deep wells, • deployment of water saving technologies and wastewater treatment infrastructure for reliable urban water services; • improve traditional methods for storage of food; • create biodiversity movement corridors; • ecological farming to reduce soil degradation; • expanding electric power generation from geothermal, wind and solar sources to minimise the adverse effects of droughts on predominantly hydroelectric energy sector. • building additional dams and power stations; • breeding and distributing disease resistant crop and fodder varieties	2015-2030
Ethiopia's Nationally Determined Contribution	Health	• increasing capacity to deal with expansion and emergence of human, animal, crop and plant diseases;	2015-2030
Ethiopia's Nationally Determined Contribution	Infrastructure	• ecosystem rehabilitation approach to the rehabilitation of degraded lands/forests; • building/ construction codes for buildings, roads, airports, airfields, dry ports, railways, bridges, dams and irrigation canals to limit flood damage.	2015-2030
Ethiopia's Nationally	Cross-cutting	• developing insurance systems to assist in rebuilding after disasters;	2015-2030

Determined Contribution		• reducing the impact of fire and pests by integrated pest management, • improved early warning systems and DRM for extreme weather events;	

The Climate Resilient Green Economy (CRGE) Strategy was launched during COP17 in Durban in 2011. The CRGE Strategy also stipulates Ethiopia's overarching goals of becoming a net carbon neutral, climate resilient, middle-income economy by 2025. Similar to the ENDC, it identifies the priority sectors for adaptation and regional adaptation plans as: agriculture, health, water and energy, buildings, and transport.

Ethiopia is currently pursuing large-scale afforestation and reforestation and is developing further adaptation initiatives to increase climate resilience through support for natural ecosystems and a "green cities" approach to urbanisation. Improving crop and livestock production practices to increase food yields is also a high priority. By adopting green economy practices on a large scale, Ethiopia hopes to unlock economic growth, create jobs for the growing population, and deliver wider socioeconomic benefits.

The second Growth and Transformation Plan of Ethiopia (GTP-II: 2016-2020) emphasises the importance of industrialisation and urbanisation, with the planned development of a number of industrial parks. It also prioritises increasing energy access through the development of off-grid renewable energy sources in rural communities.

Ethiopia has undertaken several adaptation strategies and plans, including:

1. The National Adaptation Programme of Action (NAPA, 2007)
2. The Ethiopian Programme of Adaptation to Climate Change (EPACC, 2011)
3. Nine National Regional States and two City Administrations adaptation plans
4. Five sectoral adaptation plans
5. Agriculture sector adaptation strategy

Ethiopia's National Adaptation Plan (NAP-ETH) was submitted in March 2019 and builds on ongoing efforts to address climate change in the country's development policy framework, including the CRGE strategy and the Second Growth and Transformation Plan (GTP II), as well as sectoral climate resilience strategies and regional and municipal adaptation plans. NAP-ETH focuses on the sectors that have been identified as most vulnerable, namely: agriculture, forestry, health, transport, power, industry, water and urban. Within these sectors, 18 adaptation options have been identified for implementation at all levels and across different development sectors, recognising the considerable diversity in context and vulnerability across Ethiopia's regions and social groups (NAP-ETH, 2019: p.i).

The NAP-ETH identifies five strategic priorities for achieving further integration of climate change adaptation in development policies and strategies:

1. Mainstreaming climate change adaptation into development policies, plans and strategies
2. Building long-term capacities of institutional structures involved in NAP-ETH
3. Implementing effective and sustainable funding mechanisms
4. Advancing adaptation research and development in the area of climate change adaptation
5. Improving the knowledge management system for NAP-ETH

There is currently no climate change law, but there are several environmental pollution control and environmental impact assessment regulations, which have not been implemented consistently due to capacity issues, especially in regulation enforcement.

8.2.3 Needs and demand for research to inform and support the implementation of adaptation action in Ethiopia

Mensur Dessie, Director of the Environment, Forest and Climate Change Commission, remarked that a process was recently completed with the NDC Partnership to identify the research needs of the commission as well as the CRGE-relevant ministries. The report identified the need for a country level climate risk assessment and vulnerability assessment; a cost-benefit assessment of various adaptation and mitigation options which could make the case for higher public investment; and research into private sector investment barriers and possible business models for climate resilience.

Within Ethiopia's NDC, a number of high level future research needs for adaptation implementation are outlined as follows:

1. "Quantify the required international financial, technological and capacity building support for the implementation of vulnerability abatement measures up to and beyond 2030;
2. Identify and quantify the technical support needed for the adequate integration of climate change adaptation considerations into existing and planned policies, strategies, plans, programmes and projects;
3. Identify the required technical support to quantify the cost of countering social, environmental and economic vulnerabilities that are likely to result from the adverse impacts of climate change." (ENDC, 2018: p. 10)

8.2.4 Reflections on research institutions and research uptake approaches

In reference to the role of research institutions, the Ethiopian Development Research Institute (EDRI) was a semi-autonomous national think tank focused on economic research. EDRI established an Environment and Climate Research Centre (ECRC), which aspired to be a national knowledge centre on climate change and environmental sustainability. EDRI and the Centre participated in a number of research undertakings, including the IDRC funded research project: 'Adaptation to Increase Resilience to Climate Change in Ethiopian Agriculture'. The Environment and Climate Research Centre (ECRC) was considered to have the mandate of a knowledge broker in Ethiopia, given the semi-autonomy of the Centre, the Government's trust in the Centre and its outputs, and its independent perspective that was based on research and analytical findings. Zerihun Getu, the Coordinator of the CRGE Facility, said that it is unfortunate that EDRI was restructured in 2018, resulting in many researchers moving on from EDRI and a number of research projects and outputs are delayed as a result. In November 2018 EDRI merged with the Policy Study and Research Center to become to Policy Studies Institute but aims to provide a similar role to the previous EDRI and also includes the Environment & Climate Change Policy Study Centre.

The newly restructured institution will not be able to enter into agreements with donors directly, which may constrain its ability to mobilise resources. The role of the EDRI in providing demand-led research was celebrated by Zerihun Getu and is acknowledged to have been instrumental in the implementation of the CRGE Strategy. However Mesur Dessir, Director of the Environment, Forest and Climate Change Commission, highlighted an example in which EDRI could have been more consultative. The contrasting examples from the different institutions

illustrate that consultation must be inclusive of all the relevant ministries and institutions involved in climate change adaptation in order to be effective.

Other relevant research institutes include: The Ethiopian Environment and Forest Research Institute (EEFRI); the Ethiopian Institute of Agricultural Research (EIAR); and the Ethiopian Biodiversity Institute (EBI). The city of Addis Ababa works closely with the Horn of Africa Regional Environmental Centre/Network, which is hosted by the Addis Ababa University and affiliated to a number of universities in East Africa. Similarly, the city of Hawassa works closely with Hawassa University. It is likely that this is the case for other secondary cities in Ethiopia as well.

In terms of challenges to research uptake, Mensur Dessie highlighted that new research is often poorly aligned with existing policy frameworks. Various MRV exercises are on-going in the country but are poorly coordinated and do not adequately align with the policy frameworks either. One specific example is MRV research conducted by EDRI, demonstrating that there is still progress to be made in improving alignment, even between EDRI and national government.

The manner in which researchers engage with the EFCCC commission can also be a challenge for research uptake. Researchers often contact employees and directors personally to collect data through interviews. However, these contacts are not institutionalised and the commission is often unable to follow up on the findings of the research. On the other hand, the institutional memory of the commission and other ministries themselves can also prove a challenge to research uptake. Some kind of steering committee or advisory group with the mandate to follow up on research outcomes would improve the usability of research outputs. The interviews further highlighted demand by government decision-makers to co-develop the research agenda jointly with the commission and relevant ministers.

Zerihun Getu highlighted that much adaptation support is delivered through projects and implemented by Northern-based technical assistance institutions, which have limited understanding of the Ethiopian context, particularly the capacity constraints at the woreda (district or local) level. The result is often systems, frameworks and research outputs that are difficult to use and mainstream across government. Adaptation support is poorly coordinated by donors and tends to result in gaps and overlaps or duplication of efforts.

Mr Getu highlighted that Oxfam's Africa Climate Change Resilience Alliance (ACCRA) project in Ethiopia was one of the few that tried to engage with woreda level communities and incorporate their needs in the CRGE Strategy. The CRGE Strategy was central government led and the participation of provincial government and districts in the design of the strategy was limited. Moreover, the capacity at these levels of government to implement the strategy were not given due attention. The ACCRA project looked at 4 or 5 pilot woredas in order to identify livelihoods and climate challenges these communities faced; and prioritise which were relevant in relation to the climate change interventions areas that were articulated in the CRGE.

This was later packaged into a woreda level integrated development and climate change plan. While this exercise was very useful, it was also difficult to replicate in over 270 woredas in the country due to its technical capacity and financial requirements.

This poses a challenge to the national government, who do not wish to be seen as favouring one region over another but rather being equitable in the split of resources across different ethnic regions in the country. More research is needed on how to engage at the woreda level in less technical or expensive ways, that could realistically be applied to all local governments in an equitable manner and help design systems that are more applicable and take into consideration the woreda level.

He concluded that research uptake requires research that is participatory, inclusive and based on the needs of the recipient. Most important is that all stakeholders are involved from the initial stages of the research, and the Ethiopia Participatory Forest Management (PFM) programme is one such successful example of this. PFM involved all stakeholders in forestry management from the inception stages onwards. This resulted in a shift in thinking from the prevailing approach to forest governance in Ethiopia, which was 'fence and patrol' at the time, to enable the community to use forest resources in a regulated manner and as a common pool resource. In contrast, many research projects only approach the government to obtain data and then to extend an invite to their validation workshops at the end of the project. This engagement does not adequately ensure that research results in usable outputs.

Table 15: Summary of research demands in Ethiopia

Sector / cross-sectoral	Research demand	Source of demand	Nature of demand
Cross-cutting	Improving understanding and capacity on how to incorporate climate change results into overall sector development targets	Interview with CRGE Facility	Explicit demand
Finance	Developing a climate finance tracking system	Interview with CRGE Facility	Explicit demand
Cross-cutting	Feasibility studies to demonstrate the adaptation contribution of sector level projects, in order to complete funding proposals for donors and funds that require this data	Interview with CRGE Facility	Explicit demand
Governance	Research on how to engage with and integrate all 270 woredas into adaptation planning and implementation	Interview with CRGE Facility	Explicit demand
Cross-cutting	Quantify the required international financial, technological and capacity building support for the implementation of vulnerability abatement measures up to and beyond 2030	Ethiopia's NDC	Explicit demand
Cross-cutting	A cost-benefit assessment of various adaptation and mitigation options which could make the case for higher public investment	Interview with EFCC Commission	Explicit demand
Cross-cutting	Country level climate risk assessment and vulnerability assessment	Interview with EFCC Commission	Explicit demand

Finance	Research into private sector investment barriers and possible business models for climate resilience	Interview with EFCC Commission	Explicit demand
Cross-cutting	Identify and quantify the technical support needed for the adequate integration of climate change adaptation considerations into existing and planned policies, strategies, plans, programmes and projects	Ethiopia's NDC	Explicit demand
Cross-cutting	Identify the required technical support to quantify the cost of countering social, environmental and economic vulnerabilities to climate change	Ethiopia's NDC	Explicit demand
Sustainable Land Management	Rehabilitation and management of degraded lands around the water sources	Ethiopia's NDC	Explicit demand
Drought management	Integrated drought management across seven agro-ecological landscapes in Ethiopia	Ethiopia's NDC	Explicit demand
Agriculture	Improving crop and livestock production practices to increase food yields	Ethiopia's NDC	Explicit demand
Disaster Risk Reduction	Development of insurance systems to assist in rebuilding after disasters	Ethiopia's NDC	Explicit demand
Forestry	Large-scale afforestation and reforestation projects	Ethiopia's NDC	Explicit demand
Urban Industrialisation	Green approaches to urbanisation and sustainable management practices for urban natural assets	Ethiopia's NDC	Explicit demand
Urban Industrialisation	Climate resilient industrial development practices which address environmental degradation, pollution and resource management across state boundaries. Including feasibility studies for new climate technology in housing, water and sanitation for industrial parks	CDKN Kombochal-Mekelle study	Implied demand that emerged during the study and a key gap both in policy and practice. Environmental protection policies exist but implementation is low
Urban Industrialisation	Research into the impact of industrial parks on secondary cities and the implications of this for revising Ethiopia's CRGE to	Interview with CRGE Facility	Explicit demand

	integrate the urbanisation-industrialisation nexus		
Governance	Improved coordination from federal level to the local level that clearly articulates the roles and functions of each level for adaptation implementation	CDKN Kombolcha-Mekelle study	Implied demand
Forestry	Quantification of forestry mitigation potential, including higher resolution satellite images and improved methods for forest cover change detection	NDC Partnership study on user-needs for NDC implementation	Explicit demand
Water	Water resource assessment and support for the preparation of climate resilient water resource management plans	NDC Partnership study on user-needs for NDC implementation	Explicit demand

8.3 Ghana case study

8.3.1 Overview of Ghana's institutional governance

Throughout the 2010s, Ghana has built a solid policy and strategy architecture to address climate change adaptation. The Ministry of Environment, Science, Technology and Innovation (MESTI) leads the country's environmental and climate related work, providing strategic steer and policy direction, and is assisted in its function by the National Climate Change Committee. Within MESTI sits the Environment Protection Agency (EPA) - which plays the role of UNFCCC national focal point - and is in charge of environmental regulation and technically coordinating climate change related issues in Ghana.

The National Climate Change Adaptation Strategy (NCCAS), supervised by MESTI and implemented at sub-national (especially district) level, was completed in 2012 and covers the period 2010-2020. It aims to strengthen "Ghana's current and future development to climate change impacts by strengthening its adaptive capacity and building resilience of society and ecosystems" (MESTI, p. 17). It contains a number of sub-strategies addressing climate change impacts on sectors and people, focusing on the following areas: Livelihoods, Energy, Agriculture, Health, Early Warning, Fisheries Management, Land Use, Water, and Awareness & Research. The strategy led to the identification of 75 sector-specific adaptation actions. In doing so, it also surfaced a common challenge of adaptation: the difficulty of building connections and synergies between sectors (MESTI).

The year after the publication of the NCCAS, the National Climate Change Policy (NCCP) was approved to provide coherence to climate action and to set a pathway towards sustainable development. It addressed both adaptation and low-carbon growth priorities. In 2015, the country's Nationally Determined Contribution (NDC) as well as the National Climate Change Master Plan Action Programmes for Implementation: 2015-2020 were finalised.

Furthermore, 2017 saw three additional important milestones:

1. Ghana's submission of its proposal to the GCF's NAP Readiness;
2. The formalisation of climate change units in the agriculture, energy and forestry sectors; and
3. The setting up of the National Climate Change Committee, hosted by MESTI, with representation from other governmental bodies.

The country's National Adaptation Plan (NAP) Framework was established in 2018 (NAP Global Network). The NAP Framework, importantly, was developed through a multi-stakeholder consultative undertaking that provides a strategic steer for Ghana's NAP process, and is coordinated by the country's EPA. It identifies adaptation priorities for key sectors (Antwi-Agyei and Amoah, 2018).

These key sectors are agriculture, energy, forestry, gender, health, infrastructure and water. One of the key aspects that Ghana has identified as crucial to the effectiveness of the country's work on adaptation is enabling institutional collaboration among sectors, as well as through inclusive engagement with stakeholders. This requires addressing the insufficient capacities of stakeholders at the sub-national level and across sectors (Antwi-Agyei and Amoah, 2018). Similarly, attracting sufficient funding from both the international donor community, and internally through public and private channels, is and will remain an important determinant of the success of the country's efforts on climate action.

Another element highlighted by several interviewees of this case study was that the national government recognises with high importance the impacts of climate change on the country's development. This recognition is manifested, partly, through high-level politicians engaging in

adaptation research projects. As an example, Ms. Vincent, Director of Kulima Integrated Development Solutions, recalled that a Member of Parliament sat on the Advisory Board of a climate change research project called Deltas, Vulnerability & Climate Change: Migration & Adaptation (DECCMA); the Queen Mother of the Fievie Traditional Area engaged in some of the project's stakeholder events; and the Minister of MESTI attended one of the project's events. This shows that the highest levels of government are championing adaptation research, facilitating the ownership of its mandate by other stakeholders in government and beyond.

Notwithstanding this, even the most carefully crafted policy and institutional arrangement is put to the test at the moment of implementation and of assessing its impacts. Some of the structural challenges identified in the implementation of the NCCAS, for example, were: "poor and inadequate infrastructure, limited human resources capacity, weak sub-[national] networks, inadequate financial resources and low budgetary allocation" (MESTI, p.15). Furthermore, Mr. Kanton, Deputy Director and Chief Research Scientist at the Savannah Agricultural Research Institute (SARI) in Northern Ghana, pointed to an insufficient link between the policy architecture and climate change adaptation research, by suggesting that more effort is needed to ensure that all adaptation related policies connect to the research arm of government, ideally through the umbrella Council for Scientific and Industrial Research (CSIR).

Furthermore, a recent study focusing on the Ghanaian city of Kumasi evidenced poor coordination among state actors, insufficient focus on climate change in urban planning, and lack of clarity of policies. This complicated the management of climate risks and led to little success in achieving adaptation policy objectives (Cobbinah et al. 2019). The authors add that there has been limited implementation of local adaptation plans and national policies; with climate action efforts remaining reactionary and lacking a forward-looking vision.

To sustain the positive impact of adaptation efforts, it is necessary to properly address structural shortcomings, as described here, whether they be related to poor governance and coordination, failures in regulation, or challenges in implementation. Furthermore, research shows that it is through long-term efforts that promote behavioural change and collaboration between stakeholders that structural deficiencies can be properly repaired (Few et al, 2018).

8.3.2 Overview of Ghana's climate change adaptation priorities

The main documents setting climate related policy in Ghana are the NCCAS and the NCCP (Dazé & Echeverría, 2016). Interestingly, although both documents have several common areas of concern, and in some cases the language and specific entry points mirror each other (for example the acknowledgement of the need to engage with vulnerable populations; human health; or agriculture), more frequently these entry points differ in their approach. For example, a water resource management approach followed in the NCCAS, versus a WASH approach in the NCCP; or a mention of improved land use management in the NCCAS, versus an approach focused on climate-resilient agriculture, carbon sinks and improving the management of ecosystems in the NCCP (see Table below).

Table 16: Adaptation priorities outlined in the National Climate Change Adaptation Strategy and National Climate Change Policy

NCCAS 10 priority adaptation programmes	NCCP 10 programme areas
1. Increasing resilience to climate change impacts by identifying and enhancing early warning systems 2. Developing alternative livelihoods to minimise the impacts of climate change for the poor and vulnerable 3. Enhancing national capacity to adapt to climate change through improved land use management 4. Adapting to climate change through enhanced research and awareness creation 5. Developing and implementing environmental sanitation strategies to adapt to climate change 6. Managing water resources as climate change adaption to enhance productivity and livelihoods 7. Minimising climate change impacts on socioeconomic development through agricultural diversification 8. Minimising climate change impacts on human health through improved access to healthcare 9. Determine demand- and supply-side measures for adapting the national energy system to impacts of climate change 10. Develop sustainable livelihoods through enhanced fisheries resource management Source: USAID	1. Developing climate-resilient agriculture and food security systems 2. Building climate-resilient infrastructure 3. Increasing resilience of vulnerable communities to climate-related risks 4. Increasing carbon sinks 5. Improving management and resilience of terrestrial, aquatic, and marine ecosystems 6. Addressing the impacts of climate change on human health 7. Minimising impacts of climate change on access to water and sanitation 8. Addressing gender issues in climate change 9. Addressing climate change and migration 10. Minimising greenhouse gas emissions Source: Dazé & Echeverría, 2016.

Perhaps even more remarkably, some key elements of adaptation are not explicitly mentioned in one document, while they are in the other. For example, the NCCAS prioritises research and awareness creation, while the NCCP does not do so explicitly, and the NCCP prioritises gender and migration, while the NCCAS does not mention these areas explicitly.

Moving forward chronologically, following the NCCAS and the NCCP, Ghana's NDC contributions identify the following 14 sectors where adaptation action is planned (NDC Partnership):

1. Agriculture
2. Energy
3. Tourism
4. Coastal zone
5. Environment
6. Transport

7. Cross-cutting area
8. Health
9. Urban
10. Disaster risk management
11. LULUCF / Forestry
12. Water
13. Education
14. Social development

The NAP Framework, in parallel, contributes to unifying the various strategies, policies and plans into a common vision leading to the implementation of adaptation actions. The NAP Framework, coordinated by the EPA, pays considerable attention to gender, social norms, inequalities and poverty reduction; and recognises the importance of community- and ecosystem-based adaptation practices (Antwi-Agyei & Amoah, 2019).

Mr. Amoah, Principal Programme Officer, Climate Vulnerabilities and Adaptation, at Ghana's EPA, offered two examples linking strategy planning and action:

1. The National Disaster Management Organisation (NADMO) implementing community resilience projects proposed in the frame of the NCCAS; and
2. UNDP undertaking work described in the strategy, funded by the GEF.

Mr. Ansah, a former Technical Officer at the University of Ghana's Institute for Environment and Sanitation Studies and a PhD candidate at the University of Cape Town, however, questioned the strength of this link, suggesting these "nicely drafted policies" have a limited link to implementation. Furthermore, capacity development at sub-national levels to carry forward policy and action is not prioritised, he said, reducing the possibility that policies will have a lasting impact at sub-national (regional) or local levels.

The large influence of international donors and international NGOs in driving adaptation action is well recognised. However, Mr. Ansah claimed this influence extends to adaptation-related research, too. He offered an example: the agenda pursued by the Adaptation at Scale in Semi-Arid Regions (ASSAR) project was more aligned with that of the donors' and the project consortium members' than directly related to the country's official agendas. Indeed, external funding for research is a considerable factor shaping adaptation research in Ghana, agreed Ms. Vincent, as is widely the case across large parts of the global South.

Ms. Mensah, Senior Research Fellow, Institute for Environment and Sanitation Studies at the University of Ghana, agreed that adaptation action, research and political decision-making is, at times, out of sync in Ghana. However, she believes the gap is bigger in relation to implementation than to research prioritisation, meaning adaptation action is more influenced by external forces (donors and international NGOs), in comparison to the influence exerted by the international donor community on setting the adaptation research agenda. Ms. Mensah explained that most university departments or institutes do make efforts to establish a working relationship with the corresponding government agency or ministry; and furthermore, the CSIR provides a level of structure in order for research to be aligned with government policies and strategies, at least in theory. She further claimed that important efforts are being made to attract private sector funding to adaptation research, for example through the University of Ghana's fundraising arm, the Office of Research, Innovation and Development.

It is undeniable, nevertheless, that external funding plays a key part in shaping adaptation research in Ghana today. Mr. Kanton illustrated it well. He explained that the national government funds staff salaries, but it is only with international donor funding that actual research and new initiatives can be undertaken: "All our research activities are project-driven."

Just as it can be easy to miss the forest for the trees, the existing complex architecture of strategies, policies and plans can lead stakeholders to lose sight of the essence of the problem at hand, which is that the implementation of adaptation ultimately depends on people undertaking the adaptation action. People's decisions whether or not to engage in adaptation processes, especially those external to their own fabrication, will depend on many intangible factors, such as household structures and how they evolve, whether the proposed measures address a person's aspirations, their visions of the future, time horizons, or their personal view about well-being (Rao et al, 2019). Missing this link can make or break an otherwise solid proposition on advancing adaptation efforts.

8.3.3 Reflections on research institutions and research uptake

One of the areas of common understanding between the researchers and government decision-makers interviewed was that the research capacity of Ghanaian institutions is high. The wealth of existing knowledge and information, however, has ironically translated into a knowledge management nightmare - there are a myriad of institutions producing findings on climate change adaptation, but no solid repository or structure to make this readily available to potential users, including decision-makers. This can, and Mr. Ansah claimed it does, lead to an ineffective use of resources and an under-utilisation of existing research to inform government policy. Ms. Mensah agreed that a critical challenge is dealing with the existing knowledge, which at present is done far from systematically, rather than systematically responding by generating new data.

While technical capacity of research in Ghana may be considered high, several interviewees suggested that soft skills around engaging with decision-makers are much lower. Without these skills, including how to engage and communicate with stakeholders, a natural leap or transition between research published to research generating impact is simply wishful thinking. As Mr. Winfred Nelson, Chief Analyst at the National Development Planning Commission, mentioned, "It's not just about showing up in a meeting, sharing findings and leaving."

Interestingly, this reality exists side by side with what some interviewees, like Mr. Ansah and Ms. Vincent, acknowledged, that personal relationships in Ghana are highly relevant when it comes to getting a seat at an influential table. Ms. Mensah, too, agreed that influential academics are utilised by government as vehicles to summarise masses of research findings on a specific topic, usually with only hours to prepare. Not many researchers have the capacity and willingness, or possibility, to get into this political space, she added. But some do, which presents opportunities for research impact, but it also comes with challenges, such as losing the richness of a large body of research (but not in a single person's mind) for the sake of soundbites linked to the influential academics' interests or expertise.

Indeed, these dynamics may in some cases fast forward adaptation action, but they also carry in themselves the risk of overlooking the fundamental importance and the very ethos of effective adaptation: working collaboratively with and enhancing the capacities of marginalised and most affected groups in addressing the impacts of climate change. Indeed, "Recognising the ways that gender and other social differences affect access and control over vital adaptation options for different groups is a central first step for successful adaptation planning" (ASSAR, p.9) as well.

Mr. Amoah indicated that the development of the NCCAS was informed by vulnerability assessments conducted in 2010 by researchers in Ghana. He valued this as one of the research community's main contributions to adaptation efforts. Other relevant research findings, in his view, included climate information/weather data, data on land degradation and WASH. On the other hand, Mr. Amoah was also critical of research priorities, arguing that despite the limited resources available, a considerable amount of research undertaken on

adaptation in the country is not relevant to decision-makers, nor is it driven by (or aligned with) government needs. Part of the problem is about scale, with much research focusing on local/community levels and not always being translatable to a national scale. The other, perhaps more structural, part of the problem concerns a lack of alignment of interests and priorities between government and research/academic institutions, he said, added to the fact that government agencies lack financial resources to engage directly with researchers.

Coming back to the point about adaptation research focusing largely at the local/community level, Mr. Ansah indicated that sub-national levels are attractive for researchers because researchers have a higher possibility of impacting people's lives - and maybe even policy. Still, Mr. Ansah admitted that the prospect of upwards policy influencing, based on research conducted at the local level, is unrealistic, or at least very difficult, especially if the researcher in question does not have personal connections with influential researchers or decision-makers.

Mr. Kanton, on the other hand, considered that the existing structures that should enable research findings to inform policy are working well. He praised, for example, the Research Extension Farmer Linkage Committees (RELCS), a multi-stakeholder consultative group that seeks to inform agriculture-related policy and practice, as well as environment and climate change agendas.

Mr. Kanton proudly refers to the constructive working relationship that his institute, which sits under the CSIR, has with key government stakeholders. He claims that their research findings have regularly informed policy decisions by the national government, such as through the shift in government subsidies from acidic fertilisers to urea, as recommended by Mr. Kanton's institute, SARI; or through the increased support for conservation agriculture and for crop varieties and hybrids, resulting from research findings.

Ensuring that research can be internalised and digested by decision-makers is a fundamental aspect of the researcher/decision-maker relationship, said Mr. Amoah, lamenting that this remains a problem area. The challenge is not just the proper packaging of information, the choice of language and communication of research findings - though this, too, needs to be improved significantly - but, importantly, the need to collaboratively design research based on the government's priorities.

Asked what questions key decision-makers, like the EPA, would like answered, Mr. Amoah proposed three:

1. An update on the vulnerability status of communities (i.e. an update of the 2010 vulnerability assessments that informed the NCCAS);
2. An assessment of the capacities of vulnerable communities to address climate change impacts and their awareness and understanding about the problem (e.g. to what extent do cultural and religious beliefs prevent people's willingness to undertake adaptation?); and
3. Understanding what capacities and knowledge gaps exist at the sub-national level, especially at local assemblies with regards to adaptation, in order to identify training requirements to cover these gaps.

While these questions are, quite possibly, sensible, a lesson from Ghana is that people working as or with researchers should be aware of simply wanting to produce more information, even if the research would cover an existing knowledge gap. There is a strong need in Ghana, as elsewhere, for appropriate packaging of research findings. A commendable project currently being undertaken by Ms. Mensah, funded by the International Network for Government Science Advice (INGSA), explores the question of how data - in this case related to flood risk management in two slums in Accra – can be packaged so that it is useful and helpful to

decision-makers (and other stakeholders), by asking what is it really that decision-makers need? Both adaptation researchers and government officials should try, early on, to answer that question, too.

8.4 Kenya case study

8.4.1 Overview of Kenya's institutional governance

In Africa, Kenya has emerged as one of the first countries to directly enact a comprehensive law and policy to guide climate change (Johara et al., 2018). In May 2016, the Climate Change Act (2016) of Kenya was enacted, which is the fundamental legal framework for the institutional governance of climate change. It is the basis on which coordination mechanisms have come to be established. Principally, the Climate Change Act (2016) articulates and shapes the framework for coordinating adaptation priorities, and Figure 4 details the country's climate change institutional governance.

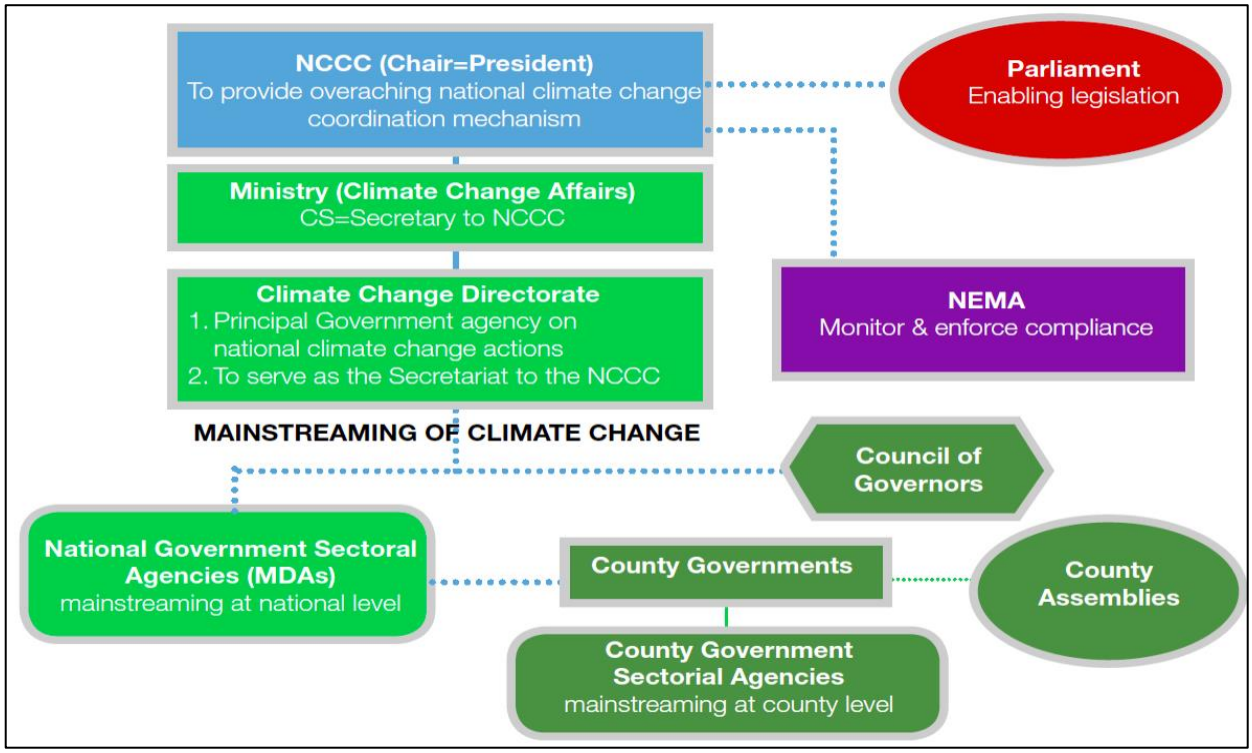

Figure 4: Kenya's climate change institutional governance structure (Source: Kenya National Adaptation Plan 2015 – 2030)

As stipulated in the Climate Change Act (2016), the National Climate Change Council (NCCC) is chaired by the President, and is responsible for guaranteeing the mainstreaming of climate change functions by national and sub-national governments. The NCCC also has the mandate to oversee and implement the National Climate Change Action Plan (2018-2022), which is revised every five years. The Cabinet Secretary (CS) holds the responsibility of managing climate change affairs, and submits NCCAPs for approval, following NCCAP (2013-2017), and reports to NCCC and Parliament on their implementation. At the ministerial level, several ministries, including designated national authorities, play key roles in the institutional governance of climate change, as detailed in the Table below.

Table 17: The role of national ministries and authorities in climate change governance

National Ministry or Designated National Authorities	Role in Climate Change Governance
Ministry of Environment and Forestry	Exercises control over and provides guidance for climate change governance, and develops and reviews climate change policies, strategies, and action plans
Ministry of Devolution and Planning	National development planning and leading the process of mainstreaming climate change into national plans, including the Vision 2030 five-year mid-term plans and Big Four agenda
Ministry of Energy	Facilitates the delivery of clean, sustainable, affordable, and secure energy sources and services for national development
Ministry of Agriculture, Livestock and Fisheries	Coordinates climate-related matters across the agriculture sector and implements several climate change programmes and projects
Ministry of Finance	Develops financial and economic policies and allocates funds, including those for climate actions
Ministry of Water and Irrigation	Facilitates sustainable management and development of water resources for national development, especially in the face of climate change
National Drought Management Authority	Supervises and coordinates all matters relating to drought management, and is the principal instrument of the government delivering all policies and strategies that relate to drought management and climate change adaptation
National Environment Management Authority	Monitors and enforces compliance of climate change interventions

Source: Author, derived from Johara et al. (2018)

8.4.2 Overview of Kenya's climate change adaptation priorities

The National Climate Change Response Strategy (NCCRS) of 2010 was the first national planning document to recognise climate change as a threat to national development (GOK, 2010). The NCCRS also recognised that to achieve Kenya's Vision 2030, the country's long-term development plan, which was launched in 2008, had to consider leading the country on a low-emissions path (GOK, 2010). Principally, the NCCRS focused on ensuring that adaptation and mitigation measures were integrated in all national planning, budgeting and development objectives through a climate change mainstreaming approach (GOK, 2018). Specifically, NCCRS focused on improving the understanding of the global climate change negotiations; evaluating the impacts of climate change nationally and sub-nationally; developing legal and institutional structures to combat climate change; and recommending avenues for transferring existing technologies, including research and technological needs (GOK, 2010; GOK, 2018).

After 2010, climate change policy was anchored on the foundation of the NCCRS, Vision 2030 and the constitution[13], and led to the architecture of the National Climate Change Action Plan (NCCAP, 2013-2017) (GOK, 2013; Johara et al., 2018). The NCCAP clearly articulated that adaptation was the main priority for the country, given the adverse socioeconomic impacts related to climate change being experienced and the ever-increasing vulnerabilities of the different sectors. Therefore, the National Adaptation Plan, NAP (2015-2030) was established

[13] The Constitution of Kenya (2010) requires that all citizens have the right to a clean and healthy environment

to consolidate the country's vision on adaptation supported by macro-level adaptation actions that relate to the economic sectors and county level vulnerabilities to enhance long term resilience and adaptive capacity Kenya (National Adaptation Plan 2015-2030, 2016). As outlined in the NAP (2015-2030), the adaptation priorities are as follows:

- Emphasise the importance of adaptation and resilience building actions in development
- Integrate climate change adaptation into national and county level development planning and budgeting processes
- Improve the resilience of public and private sector investment in the national transformation, economic and social pillars of Vision 2030 to climate shocks
- Enhance synergies between adaptation and mitigation actions in order to attain a low carbon climate resilient economy
- Enhance resilience of vulnerable populations to climate shocks through adaptation and disaster risk reduction strategies

Following the revision of the NCCAP (2013-2017), the NCCAP (2018-2022) was developed. During the 2018-2022 medium-term planning period, the NCCAP will primarily focus on increasing forest cover to at least 10% of land area, as outlined in the Kenyan Constitution (GOK, 2018). It is expected that this action will contribute to the protection of water towers and the managing of flooding, which will improve livelihoods (GOK, 2018). In addition, the NCCAP (2018-2022) will also guide Kenya's development path through the Big Four agenda, which recognises employment creation through manufacturing, universal health coverage, affordable housing, and food and nutritional security, as key to the country's sustainable development. More importantly, the NCCAP (2018-2022) will contribute to the realisation of Kenya's Nationally Determined Contribution (NDC) under the Paris Agreement to reduce GHG emissions by 30% by 2030. The NDC priority sectors are agriculture and forestry, while significant emissions emanating from energy, transport, industrial processes and waste sectors.

Table 18: Kenya adaptation priorities

Policy Document	Sector	Adaptation Priorities
NAP (2015-2030) NDC NCCAP (2018-2022)	Water	● Prioritising climate change into all water management plans and actions ● Rehabilitating and restoring all water catchments ● Expanding irrigation systems and improving drainage
	Agriculture	● Prioritising adaptation needs into agricultural extension ● Establishing and maintaining climate change-related information for agriculture ● Increasing focus on specific adaptation actions such as water harvesting, agroforestry, and seed bulking of drought-tolerant traditional high value crops
	Livestock	● Implementing grazing management systems and fodder banks ● Diversifying livelihood strategies (e.g. bees, ostriches) ● Implementing livestock insurance schemes and disease control
	Forestry	Increasing tree cover by 10% per year
	Energy	● Expanding solar power provision, notably in ASALs ● Increasing small hydropower, geothermal, and wind power generation Improving energy efficiency at household and industrial levels
	Health	● Improving urban sewage services to reduce disease ● Increasing water and sanitation strategies in rural areas

	Coastal Zones	• Increasing climate resiliency of coastal infrastructure
	Environment	• Strengthen capacity of national and county institutions, including improving access to climate-related data
	Tourism	• Promote sustainable and climate-resilient tourism and increase resource efficiency

8.4.3 Needs and demand for research to inform and support the implementation of adaptation action in Kenya

The NCCAP outlines that the role of researchers and research institutions in Kenya is to provide technical support, and offer grounded evidence and science for knowledge-based decision-making at both National and County levels of Governments. The level and type of research demand will vary depending on different aspects of the climate change spectrum, as outlined in the Table below. Similarly, the NAP has identified research needs embedded in Kenya adaptation priorities. Through the Collaborative Adaptation Research Initiative in Africa and Asia (CARRIAA) programme, Parry (2016) articulates Kenya's adaptation research needs by analysing the NCCAP (2013-2017).

Table 19: Summary of research demand from Kenya

Sector / Cross-Cutting Area	Research Demand	Source of Demand	Nature of demand
Social Development	• Research on determining the economic and social impacts of ocean acidification on coastal communities and fisheries in Kenya • Research on migration as an adaptation strategy	NCCAP (2018-2022)	Explicit demand
Fisheries	• Research on coral bleaching • Research on understanding of impacts on Lake Victoria's fisheries sector, how productivity of important subsistence and export crops could be affected, and the human health implications of climate change	NCCAP (2018-2022)	Explicit demand
Energy	• Research on enhancing implementation of an energy generation mix plan that increases the resilience of the current and future energy systems to the impacts of future climate variability and change.	NAP (2015-2030)	Explicit demand
Human Resource Development, Labour and Employment	• Research on enhancing adaptive capacity and resilience of the informal sector	NAP (2015-2030)	Explicit demand

Education and Training	• Mainstream climate change adaptation in education (formal, non-formal and informal) and training	NAP (2015-2030)	Explicit demand
Agriculture / Policy Development	• Research on how institutional frameworks can support climate change and better communication and coordination between the relevant Ministries in implementing the NAP	NAP (2015-2030)	Explicit demand
Social development	• Research on differential gender impacts of climate change and strengthening the capacity of women to adapt	CARIAA	Implied demand based on analysis of NCCAP (2013-2017) by CARIAA
Urban planning	• Research on improving resilience in Kenya's growing urban areas	CARIAA	Implied demand from analysing the NCCAP

8.5 South Africa case study

The South Africa case study was carried out through the analysis of existing documents and the knowledge of the research team in working with the South African context. Documents analysed included: documentation dealing with national climate change strategies, policies, and plans, and research to inform climate change adaptation research in South Africa.

In many regards, South Africa has an advanced adaptation response, and a well-coordinated network to execute this. It has played a key role in various climate change diplomacy and climate finance - notably hosting the UNFCCC COP in 2011, and playing a formative role in developing the Green Climate Fund (GCF), and before that the Adaptation Fund (AF). South Africa is unusual among countries with high levels of GHG emissions per capita, to have widespread poverty. The high GHG emissions result largely from the coal dependent energy sector. There is thus a need to mitigate carbon emissions through a just transition to renewable energy, along with a great need for adaptation to climate change - a need that has already become clear through natural disasters and droughts, with related effects on agriculture and food security. Although the national income of South Africa - as measured by GDP per capita - is higher than many other African countries, inequality is among the highest in the world, and the majority of South Africans still need to benefit from development - through infrastructure that is both low carbon and resilient to climate change risks.

South Africa presents an example of an African country that is relatively advanced in its engagement with climate change information and infrastructure - with institutions that are well established and defined, but may be improved upon and enhanced with focused demand-driven interventions. Through existing research and documentation, South Africa has also identified some key areas of further research and potential improvement, but in an ever-changing landscape any research will need to be dynamic and reactive to the changing needs of decision-makers and end users.

8.5.1 Overview of South Africa's institutional governance

South Africa introduced a draft National Climate Change Bill in 2018, which includes a chapter addressing national adaptation to climate change impacts, which specifically:

- Allows the Minister to set out national adaptation objectives, publish indicators towards such objectives, and determines dates for incorporating such objectives into national planning;
- Allows the Minister to develop adaptation scenarios over the short, medium, and long term to inform the development of national adaptation objectives and the National Adaptation Strategy, and inform decision making;
- Ensures that adaptation is managed in accordance with the National Adaptation Strategy;
- Mandates the Minister to develop and publish a National Adaptation Strategy, to be reviewed every five years;
- Lists the aims and components to be included in the National Adaptation Strategy; and
- Mandates a Minister responsible for a sector department to develop and implement a climate change response implementation plan, to be updated, and coordinated into a Synthesis Adaptation Report.

A precedent was set for South African policy and planning around climate change, through the lengthy process leading up to the publication of the *National Climate Change Response White Paper* by the Department of Environmental Affairs (DEA) in 2011, which was supported by documentation including:

- *Financing Climate Change* (2011), which includes the following policy recommendations:
    - Aim to build an enabling climate finance environment to support local and regional climate resilience interventions
    - Promote and mainstream climate change into fiscal budgetary and planning processes
    - Support integration and development of climate change considerations into existing financial practices, to enable domestic financing institutions to invest in climate interventions and to promote green growth in South Africa and the SADC region
    - Promote a climate resilient SADC region and support the development of sustainable technologies and green infrastructure
    - Create capacity for local government to develop and implement climate resilient development and response strategies
- *Long-term mitigation scenarios: Strategic options for South Africa* (2007)

8.5.2 Overview of South Africa's climate change adaptation priorities

South Africa's Department of Environmental Affairs (DEA) published a *Draft National Climate Change Adaptation Strategy* (NCCAS) in May 2019. It is intended to be the cornerstone for adaptation in South Africa and to reflect a unified, coherent, cross-sectoral, economy-wide approach to adaptation. It outlines priority areas for adaptation, both to guide adaptation efforts and inform resource allocation. The NCCAS has four strategic objectives:

1. Build climate resilience and adaptive capacity to respond to climate change risk and vulnerability;
2. Promote the integration of climate change adaptation response into development objectives, policy, planning, and implementation;
3. Improve understanding of climate change impacts and capacity to respond to these impacts; and
4. Ensure resources and systems are in place to enable implementation of climate change responses.

South Africa's NDC to the UNFCCC was submitted in September 2015. The NDC was supported by various existing documents, including *Technical background information to support the development of the mitigation component of South Africa's INDC, including support required for mitigation* (2015). The NDC emphasises South Africa's challenge in dealing with the impacts of climate change as a developing country, with overriding priorities to eliminate poverty and inequality, while recognising South Africa's heavy dependence on coal. The NDC considers equitable access to sustainable development and uncertainties, and seeks recognition of South Africa's national investments in adaptation as part of its fair global effort – especially important because analysis of future scenarios indicates a significant increase in financial requirements. South Africa's NDC has 6 core adaptation goals, as summarised in the table below, along with potential opportunities for further information, as supported by a programme like CLARE:

Table 20: Adaptation research opportunities drawn from the NDC

Adaptation goal	Opportunities for further information
Develop a NAP and begin operationalisation as part of implementing the NCCRP for the period from 2020 to 2025 and for the period 2025 to 2030.	Consultation and research to inform the development of South Africa's NAP.
Take into account climate considerations in national development, sub-national and sector policy frameworks for the period 2020 to 2030.	Adaptation research specific to the local regional and sectoral scale required for sub-national and sector policy frameworks.
Build the necessary institutional capacity for climate change response planning and implementation for the period 2020 to 2030.	Learning from existing institutions in other countries, to inform capacity building of South African institutions for climate change response.
Develop an early warning, vulnerability, and adaptation monitoring system for key climate vulnerable sectors and geographic areas for the period 2020 to 2030, and reporting in terms of the NAP with rolling 5-year implementation periods.	Research for improved understanding of South Africa's vulnerability to climate change, and the information and coordination required for early warning systems, specific to particular sectors and local geographical scales. Learning from existing early warning systems in other countries. Data gathering and interpretation for reporting on rolling implementation periods.
Development of a vulnerability assessment and adaptation needs framework by 2020 to support a continuous presentation of adaptation needs.	Consultation and study to develop a model for future assessments on vulnerability and adaptation needs, along with capacity building and communication channels for the institutions carrying out such assessments in the future.
Communication of past investments for adaptation for education and awareness as well as for international recognition.	Data collection and interpretation from past investments.

South Africa's *National Climate Change Response White Paper* (NCCRP) (2011) identifies a set of key adaptation related sectors - including water, health, human settlements, agriculture and commercial forestry, biodiversity and ecosystems, and disaster risk reduction and management - and advocates the inclusion of climate change into plans for these sectors. However, since the development of the NCCRP, considerable progress has been made in developing adaptation policies, plans, and strategies in various sectors and spheres of government, including the development of climate adaptation plans in local and provincial government. Of particular relevance is the *Disaster Management Amendment Act* (2015).

8.5.3 Needs and demand for research to inform and support the implementation of adaptation action in South Africa

South Africa's adaptation and mitigation priorities have been informed by research in a number of ways. For example, the *Long-Term Adaptation Scenarios (LTAS) Flagship Research Programme* (2012 - 2014), a multi-sectoral research programme that was mandated by the NCCRP, is an important example of a scenario-based planning approach used to inform decision making. The LTAS aimed to develop national and sub-national adaptation scenarios for South Africa under plausible future climate conditions and development pathways. The LTAS informed the development of the *Draft National Climate Change Adaptation Strategy*

(NCCAS). The table below highlights adaptation research needs identified in the NCCAS that may present opportunities for the CLARE programme.

Table 21: Summary of research demands

Sector / cross-cutting area	Research demand	Source of demand	Opportunities for Relevance to the CLARE programme
Water	Current stresses to water resources: ● High water demand - current water usage already exceeds reliable yield ● High levels of variability in rainfall, resulting in frequent floods and droughts ● Deteriorating water quality in river systems, water storage reservoirs, and groundwater	NCCAS	Implied demand: Adapting to these climate change stresses will require further research, coordination, communication, and informed decision-making
Health	Current stresses: ● Quadruple burden of disease ● Poor housing, infrastructure, and service delivery ● Change in distribution of diseases ● Catastrophic events may affect the health of the population	NCCAS	Implied demand: Adapting to these climate change stresses will require further research, coordination, communication, and informed decision-making
	There is a lack of understanding of the linkages between climate and health in South Africa (e.g. quantitative link between high temperatures and mortality)	NCCAS	Explicit demand
Human settlements	Current stresses to urban and rural settlements: ● Deficit in infrastructure and provision of services	NCCAS	Implied demand: Adapting to these climate change stresses will require further research, coordination, communication, and informed decision-making
Agriculture and commercial forestry	Investigate the potential effects of an expanded forestry sector on water availability	NCCAS	Explicit demand
	Current stresses: ● Land use and change ● Water stress ● Invasive alien plants	NCCAS	Implied demand: Adapting to these climate change stresses will require further research, coordination, communication, and informed decision-making

Biodiversity and ecosystems	Monitor and control the spread of alien invasive species that benefit from climate change	NCCAS	Explicit demand
	Current stresses to coastal zone: ● Direct wave impacts ● Coastal flooding / inundation ● Erosion and under-scouring ● Land use change	NCCAS	Implied demand: Adapting to these climate change stresses will require further research, coordination, communication, and informed decision-making
	Current stresses to terrestrial ecosystems: ● Habitual fragmentation ● Land use change ● Invasive alien plants	NCCAS	Implied demand: Adapting to these climate change stresses will require further research, coordination, communication, and informed decision-making
Disaster risk reduction and management	Develop and support a climate change early warning and vulnerability network with the involvement of relevant stakeholders	NCCAS	Explicit demand
	Research and investigate alternative technologies that can be used in developing effective and efficient early warning systems	NCCAS	Explicit demand

South Africa's NCCAS lists potential activities for increased research output and technology uptake (Strategic Outcome 5.1), to support planning and implementation, which are indicative of the country's advanced stage of climate change policy development:

- Set up a National Climate Change Centre in an existing institution;
- Establish an Interactive Online Climate Service Platform;
- Establish a Climate Change Science Advisory Technical Council;
- Develop a research roadmap for climate change adaptation;
- Continue and enhance climate observation and monitoring;
- Continue to invest in climate change prediction and modelling data;
- Continue to invest in research that aims to understand the different impacts of climate change on the environment and society;
- Invest in research on the most effective adaptation responses to different climate change impacts; and
- Establish a programme to encourage research uptake.

The NCCAS notes the importance of accurate and current data and research on which to base decisions made in planning for the physical and socioeconomic effects of climate change in South Africa. It notes that many institutions are currently involved in climate observation, modelling, and research in South Africa, including:

- South African Weather Services (SAWS);
- Government departments (e.g. Department of Science and Technology);
- Academic and research institutions (e.g. Climate System Analysis Group (CSAG), and Africa Climate and Development Initiative (ACDI), based at the University of Cape Town (UCT)); and

- Various NGOs and community organisations.

However, there is a lack of coordination between the different institutions, and no central database or platform where climate related data is shared.

8.6 Zimbabwe case study

Zimbabwe is vulnerable to the impacts of climate change. According to the World Bank (2019), the number of people in extreme poverty in Zimbabwe has risen from 4.7 to 5.7 million. This increase has been driven by a number of factors including a decrease in agricultural production following an El Nino induced drought as well as Cyclone Idai which impacted three provinces that account for 30% of agricultural output. The impacts of Cyclone Idai are still being felt in the eastern part of the country, where infrastructure including 4,000 homes were destroyed, and an estimated 270,000 people's livelihoods were affected (OCHA, 2019). The impacts of the drought have also been far-reaching, impacting the energy and water sectors. For example, Kariba dam, which produces electricity for both Zambia and Zimbabwe, is currently only 10% full[14] which has resulted in severe power shortages for both countries (Reuters, 2019). Thus, the Government of Zimbabwe has emphasised adaptation and building climate resilience as being key.

The Zimbabwe case study was carried out through the analysis of existing climate change policy documents and interviews with representatives from the Climate Change Management Department.

8.6.1 Overview of Zimbabwe's institutional governance

The Ministry of Environment, Water, and Climate has a mandate to guide Zimbabwe's compliance in all multilateral environmental agreements, and acts as the country's UNFCCC Focal Point. The Climate Change Management Department (CCMD) was established in 2013 when the Ministry of Environment and Natural Resources Management and Ministry of Water Resources Planning and Development were merged to form the Ministry of Environment, Water and Climate. In 2018 after the general elections, the CCMD was moved to the Ministry of Lands, Agriculture, Water, Climate, and Rural Resettlement, somewhat complicating the governance arrangements. The CCMD is responsible for National Communications to the UNFCCC, and is supported by the multisectoral National Climate Change Committee (NCCC).

The CCMD's objectives are to:

- Develop climate related policies and strategies;
- Coordinate climate change research, carrying out education, awareness and training on climate change;
- Promote the greening of the economy (through energy efficiency, green jobs);
- Carrying out climate change negotiations; and
- Develop and coordinate climate change mitigation and adaptation projects.

The table below provides the institutional framework (GoZ, 2018).

Table 22: National Climate Policy institutional framework

Lead institution	Institutions engaged
Department of Climate Change Management	**Cabinet Committee on Climate Change**
	Ministry of Environment, Tourism and Hospitality Industry • National Climate Change Platform (multi-stakeholder) • Technical sub-committee on Climate Change

[14] As of 12 December 2019. Daily updates can be found here - http://www.zambezira.org/hydrology/lake-levels

	● Sub-committees on capacity building, resource mobilisation, advocacy and awareness
	Provincial Climate Change Platform ● Technical Sub-Committee ● Sub-committees on capacity building, resource mobilisation, advocacy and awareness

	Local urban and Rural Authority Climate Change Platform
	
	● Technical Sub-Committee
	● Sub-committees on capacity building, resource mobilisation, advocacy and awareness
	● Community based committees (existing structures)
	  ○ Disaster Risk Management Committee
	  ○ Water Point Committee
	  ○ Fire Committee
	  ○ Home-based care Committee
	  ○ Environmental Committee
	  ○ Neighbourhood Watch

Other national level institutions that also have specific mandates related to climate change include:

- The Office of the President and Cabinet has overall responsibility for National Climate Policy decisions.
- The Meteorological Services Department (MSD) situated in the Ministry of Environment, Tourism and Hospitality Industry has a mandate to provide meteorology, climate and seismology data, and disseminate forecasts and warnings on imminent meteorological hazards. However, data availability is hampered by old equipment.
- The Zimbabwe National Water Authority (ZINWA) carries out hydrological monitoring, and the Water Resources System is the main system used for data management. Seasonal forecasts on crop yields and rangeland conditions are coordinated under the Drought Mitigation Strategy Framework.
- The Civil Protection Unit is a national government unit that coordinates climate-related disaster risk reduction programmes, and includes key agencies for disaster early warning, response, and recovery.

Outside of the governance structure outlined above, institutions that are also involved in the implementation of climate action include:

- Environmental Management Agency of Zimbabwe has recently been accredited to the Adaptation Fund (AF) - this presents key opportunities for informing Zimbabwe's climate finance project pipeline.
- Infrastructure Development Bank of Zimbabwe (IDBZ) is one of the institutions seeking accreditation to the Green Climate Fund (GCF), as a Direct Access Accredited Entity (AE) - this presents an opportunity to inform Zimbabwe's climate finance project pipeline from a different angle.
- United Nations Development Programme (UNDP) has been engaged in discussions focused on providing comprehensive data to inform the design and implementation of adaptation projects in Zimbabwe.

- United Nations Industrial Development Organisation (UNIDO) has been developing a large-scale programme to support the Zimbabwean private sector in understanding their climate risk, as well as technologies and activities to address climate risk.
- Zimbabwe's Ministry of Agriculture, Mechanisation, and Irrigation Development is mandated to produce crop yield assessments to contribute to reporting requirements on adaptation programmes.
- Zimbabwe Vulnerability Assessment Committee (ZIMVAC) facilitates the Zimbabwe Vulnerability Assessments, which Cabinet is mandated to continue producing up to 2030.
- Zimbabwe's Cabinet is mandated to produce internal food and nutrition security reports under the National Early Warning Unit.

8.6.2 Overview of Zimbabwe's climate change adaptation priorities

Zimbabwe has well-coordinated adaptation and mitigation priorities, and has been successful in accessing climate finance from the Clean Development Mechanism, the Global Environmental Facility, the GCF and through bilateral sources such as UNDP. Zimbabwe presents a good example of an African country with institutions that are existing but still developing further, and frameworks to address climate adaptation and resilience, but which can benefit significantly from support to its adaptation research inputs and coordination. Zimbabwe's context is complex and frequently changing, forcing stakeholders to be innovative and responsive to opportunities as they arise, which can yield great rewards if addressed effectively.

Zimbabwe's adaptation priorities have been identified through a number of processes and policy documents including:

- Development of the country's baseline report on economic development and climate change which, amongst other actions, prioritised the development of a National Climate Change Strategy and a National Adaptation Programme of Action. In addition, the baseline report also clarified the roles of different actors (government, academia, development partners and civil society).
- Development of the National Climate Change Response Strategy
- The National Climate Policy (2018)
- NDC

Zimbabwe is also in the process of developing its NAP, having received resources from the GCF. The NAP will outline interventions at both the national and sub-national level, the cost of implementation as well as a strategy on engaging the private sector in adaptation. The table below provides a summary of the adaptation priorities listed in the NDC.

Table 23: Adaptation research priorities outlined in relevant policy documents

Policy document	Adaptation Sector	Adaptation priorities
NDC, National Climate Policy	Agriculture	• Promote adapted crop and livestock development and climate smart agriculture (CSA) practices • Promote practices that reduce the risk of losing crops, livestock, and agricultural incomes • Strengthen relevant early warning systems • Undertake regular comprehensive sectoral analysis of climate risks
NDC, National Climate Policy	Water	• Strengthen management of water resources and irrigation in the face of climate change including the development of relevant policies • Increase support to transboundary water management
NDC	DRM	• Build resilience in managing climate-related disaster risks, such as droughts
NDC	Cross-cutting	• Build human capacity • Mainstream gender and support vulnerable groups • Promote non-timber forest products and sustainable agroforestry • Improve management of hydro power stations • Increase water-holding capacity of reservoirs • Support diversification of livelihoods from agriculture
National Climate Policy	Health	• Strengthen surveillance programmes for monitoring human health under a changing climate • Understand the impacts of climate change on women, children, youth and people living with disabilities
National Climate Policy	Forestry and biodiversity	• Strengthen research capacity in forest ecosystem resilience and in reducing existing knowledge gaps on climate risks to forests • Strengthen framework for Reducing Emissions from Deforestation and Forest Degradation and other financing mechanisms • Support research to enhance understanding of climate change impacts on wildlife and adaptive management planning for key wildlife species.
National Climate Policy	Gender	• Gender responsive mechanisms that continually enhance mitigation and adaptation measures at community level • Research on gender dimensions of climate change

8.6.3 Needs and demand for research to inform and support the implementation of adaptation action in Zimbabwe

The National Climate Policy emphasises that research on climate change provides the supporting evidence that supports the development of vulnerability assessments, and informs adaptation and mitigation strategies. There is thus provision to develop specific policies that focus on strengthening the capacity in weather, climate research and modelling. The Policy thus commits the Government to:

- Capacitate the National Meteorological Services and CCD to set up robust dense observing systems, data management systems with clear collection, quality control, assessment processes;

- Conduct in-depth climate research including climate modelling and impact studies to inform climate actions; and
- Integrate research outputs into sustainable development planning and programming.

Interviews conducted with staff of the CCMD indicated that the priorities in the Climate Policy would remain relevant over the next 5 - 10 years with further nuances emerging as resources are mobilised for implementation at different scales. In addition, there was an emphasis on research that supports the Department and other key stakeholders. The table below indicates the research demand articulated in the National Climate Policy that may be of relevance to the CLARE programme.

Table 24: Summary of research demands in Zimbabwe

Sector / cross-cutting area	Research demand	Source of demand	Opportunities for the CLARE programme
Policy	• Policy planning, including climate proofing of existing and future policies	National Climate Policy	Implicit demand: This may be achieved through research, or by other solutions, including institutional restructuring and capacity building
Climate services	• Early warning and climate services - this includes training and capacity building for modelling	National Climate Policy	Implicit demand: This may be achieved through research, or by other solutions, including institutional restructuring and capacity building
Finance	• Development of a sustainable climate finance framework	National Climate Policy	Implicit demand: This may be achieved through research, or by other solutions, including institutional restructuring and capacity building
Water	• Establishment of a centre of excellence in water and climate change to undertake research on the impacts of climate change on water resources and transboundary water management	National Climate Policy	Implicit demand: This may be achieved through research, or by other solutions, including institutional restructuring and capacity building
Forestry and biodiversity	• Better understanding of the impacts of climate change on forest ecosystems • Better understanding of climate change impacts on wildlife and adaptive management planning for key wildlife species • Conservation and restoration of forests	National Climate Policy	Explicit demand
Infrastructure	• Assessments on the impacts of climate change on hydropower	National Climate Policy	Explicit demand

Energy	• Research on the development and adoption of gender sensitive green technologies	National Climate Policy	Explicit demand
Industrial processes	• Cleaner technologies and practice	National Climate Policy	Implicit demand
Indigenous knowledge systems	• Documentation of indigenous knowledge systems to complement scientific knowledge • Protection and rights of children, communities, and vulnerable groups, and their indigenous knowledge systems as a prerequisite for sustainable development • Strengthen the Civil Protection Department and other institutions to integrate local knowledge in the development of early warning systems • Co-production of climate information by the Meteorological Services Department and indigenous communities to up-scale provision and use of location specific climate information products	National Climate Policy	Explicit demand: Integration and communication of indigenous knowledge systems may require external research support, but it may be better realised through other internally driven methods, including institutional restructuring and capacity building

8.7 List of stakeholders interviewed

The table below lists the stakeholders who the consortium reached out to for an interview.

Table 25: List of stakeholders interviewed

Name	Geographical focus	Institution	Role
Margaret Barihaihi	Africa (regional)	NDC Partnership	Country Engagement Regional Specialist, Anglophone Africa
Omar Zemrag	Africa (regional)	NDC Partnership	Country Engagement Regional Specialist for Francophone Africa
Charles Reeve	Africa (regional)	Climate Resilient Infrastructure Development Facility (CRIDF)	Team Leader
Emily Matingo	Zimbabwe	Climate Change Management Department, Zimbabwe	Leads adaptation activities including the development of the NAP.
Elisha Moyo	Zimbabwe	Climate Change Management Department	Research focal point, also responsible for CTCN activities and GCF focal point
Washington Zhakata	Zimbabwe	Climate Change Management Department, Zimbabwe	Director
Louise Brown	Africa (regional)	Africa Climate Change Fund (ACCF), African Development Bank	Coordinator
Kidanemariam Jembere	Africa (regional)	Global Water Partnership - Africa Coordination Unit	Technical Advisor for Water, Climate, and Development Programme (WACDEP)
Davinah Uwella	Africa (regional)	Africa NDC Hub, African Development Bank	Coordinator
Antwi-Bosiako Amoah	Ghana	Ghana Environmental Protection Agency	Principal Programme Officer (Climate Vulnerabilities and Adaptation)
Prince Ansah	Ghana	University of Ghana	Former Technical Officer (Institute for Environment and Sanitation Studies)
Roger Kanton	Ghana	Savannah Agricultural Research Institute	Deputy Director and Chief Research Scientist

Adelina Mensah	Ghana	University of Ghana	Senior Research Fellow (Institute for Environment and Sanitation Studies)
Winfred Nelson	Ghana	Ghana National Development Planning Commission	Chief Analyst
Katharine Vincent	Based in South Africa; interviewed in the context of the Ghana case study	Kulima Integrated Solutions	Director
Zerihun Getu	Ethiopia	Environment, Forest and Climate Change Commission	Director
Mensur Dessie	Ethiopia	CRGE Facility, Ministry of Finance	Coordinator of the CRGE Facility