LDC University Leadership for Catalyzing Climate-Adaptation Finance (UNI-LEAD)

GUIDANCE MANUAL

Best practices for establishing effective university-government collaboration to catalyzing climate-adaptation finance

30 November 2022

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List of acronyms

AF	Adaptation Finance
CC	Climate Change
CCA	Climate Change Adaptation
GAN	Global Adaptation Network
GEF	Global Environment Facility
GESI	Gender Equality and Social Inclusion
IPCC	Intergovernmental Panel on Climate Change
ISS	Institutional Strengthening Specialist
LDC	Least Developed Countries
LUCCC	Least Developed Countries Universities Consortium on Climate Change
PoC	Point of Contact
PPP	Public-Private Partnership
R&D	Research and Development
SDG	Sustainable Development Goals
SPI	Science-Policy Interface
UNEP	United Nations Environment Programme
UNI-LEAD	LDC University Leadership for Catalyzing Climate-Adaptation Finance

1. Introduction

1.1. Contextual framework

Adapting to a complex challenge such as climate change is a multidimensional and dynamic process that requires informed decisions based on the potential impacts of climate change, public perceptions, knowledge, and experience (Lyalomhe et al. 2013). In this context, an appropriate "science-policy interface" (SPI) approach is required to translate climate change scenarios into adaptation policies including adaptation finance.

Indeed, most public policy measures require some level of funding, and climate change adaptation policy is no exception (Persson and Atteridge, 2019). Collaboration is essential to deliver the systemic change needed to increase finance and investment for climate adaptation and resilience.

This best-practice guidance manual is intended to strengthen university-government collaboration for climate finance and climate change adaptation within the LDCs. It is a product of the *University Leadership for Catalyzing Climate Adaptation Finance* project, which is funded by the Global Environment Facility (GEF), administered by the UN Environment Programme (UNEP) and implemented by START International in partnership with the 13 Least Developed Countries Universities Consortium on Climate Change (LUCCC).

The objective of the UNI-LEAD project is to strengthen capacities of LDCs to achieve scaled up and effective adaptation by fostering sustained endogenous technical services for project development, policy mainstreaming and creation of an enabling environment for adaptation to climate change. The development of this manual is linked with the first component of the project which focuses on enabling collaborative mechanisms for sustained endogenous capacity on climate change adaptation finance and to help LUCCC universities effectively facilitate access to climate finance in their respective countries.

1.2. Objective of the manual

The objective of this manual is to give best practices guidance on university-government collaborating for climate change adaptation in LDCs. The manual is designed to respond to the key challenge on *how university-government collaboration can be a source of knowledge generation and partnership for catalyzing climate-adaptation finance*.

1.3. Scope of the manual

This manual is primarily based on the review of cases where universities have worked effectively with governments, and it presents several models of collaboration between universities and governments that may be appropriate to LUCCC universities' contexts. To complete the desktop review, an in-country collection of case studies was undertaken within

13 LUCCC countries namely: *Bangladesh, Bhutan, Burkina Faso, Ethiopia, The Gambia, Liberia, Malawi, Mozambique, Nepal, Rwanda, Senegal, Tanzania, Uganda.*

The manual is intended to:

- build familiarisation with various concepts related to science-policy interface and collaboration for climate adaptation finance.
- identify areas where university-government collaborations can be established.
- deepen understanding of entry points, enabling conditions, and key steps for establishing and improving university-government coordination in support of access to climate finance for climate change adaptation.
- provide a foundational document for developing and implementing a roadmap/action plan for LDCs Universities in engaging with government agencies in the area of adaptation finance.

1.4. Definition of key concepts

To facilitate the understanding of the content of this guidance manual on university-government collaboration for access to climate-adaptation finance, the following key concepts have been identified and defined.

Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

- Incremental adaptation: Adaptation that maintains the essence and integrity of a system or process at a given scale. In some cases, incremental adaptation can result in transformational adaptation (Termeer et al., 2017; Tàbara et al., 2018).
- Transformational adaptation: Adaptation that changes the fundamental attributes of a socioecological system in anticipation of climate change and its impacts.
- Adaptation limits: The point at which an actor's objectives (or system needs) cannot be secured from intolerable risks through adaptive actions.
    - Hard adaptation limit: No adaptive actions are possible to avoid intolerable risks.
    - Soft adaptation limit: Options are currently not available to avoid intolerable risks through adaptive action.

Adaptive capacity: The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

Adaptation options: The array of strategies and measures that are available and appropriate for addressing adaptation. They include a wide range of actions that can be categorized as structural, institutional, ecological, or behavioral.

Adaptation pathways: A series of adaptation choices involving trade-offs between short-term and long-term goals and values. These are processes of deliberation to identify solutions that are meaningful to people in the context of their daily lives and to avoid potential maladaptation.

Adaptation Policy Framework: It Is a structural process for developing adaptation strategies, policies, and measures to enhance and ensure human development in the face of climate change, including

climate variability. The APF is designed to link climate change adaptation to sustainable development and other global environmental issues. It consists of five basic Components: scoping and designing an adaptation project, assessing current vulnerability, characterizing future climate risks, developing an adaptation strategy, and continuing the adaptation process (Lim et al, 2005).

Adaptation policies is used to refer globally to the group of instruments, strategies and plans that are designed and implemented to achieve climate change adaptation goals (Olazabal et al., 2019).

Adaptation strategy: It is a program, project or approach that has been developed to respond to anticipated climate change impacts in a specific area of potential concern (ERI, 2022).

Climate Change: A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2012). Note that the Framework Convention on Climate Change (UNFCCC), in its article 1, defines climate change as: 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.' The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to natural causes.

Climate Finance: The United Nations Framework Convention on Climate Change (UNFCCC) Standing Committee on Finance, which defines it as: "finance that aims at reducing emissions, and enhancing sinks of greenhouse gases and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts." It refers to local, national, or transnational financing, drawn from public, private, and alternative sources of financing, that seeks to support mitigation and adaptation actions that will address climate change. Climate finance is critical to addressing climate change because large-scale investments are required to significantly reduce emissions, notably in sectors that emit large quantities of greenhouse gases. Climate finance is equally important for adaptation, for which significant financial resources will be similarly required to allow societies and economies to adapt to the adverse effects and reduce the impacts of climate change (UNEP, 2022).

Co-benefits: The positive effects that a policy or measure aimed at one objective might have on other objectives, thereby increasing the total benefits for society or the environment. Co-benefits are often subject to uncertainty and depend on local circumstances and implementation practices, among other factors. Co-benefits are also referred to as ancillary benefits (IPCC, 2018).

Collaboration: It is the act of working together to achieve some common aim (Marinez-Moyano, 2006).

Collaborative partnership: Collaborative partnerships are agreements and actions made by consenting organizations to share resources to accomplish a mutual goal. The essence of collaborative partnership is for all parties to mutually benefit from working together. The relationships between collaborative partners can lead to long term partnerships that rely on one another (Saltiel, 1998).

Collaborative research: It can be defined as research that involves coordination among researchers, institutions, organizations, and/or communities. It can be through a voluntary

cooperation, consortium, association, merger, and fusion, and can occur at different levels including within a discipline, interdisciplinary, multidisciplinary, transdisciplinary, or national or international (Bansal et al., 2019).

Coping capacity: The ability of people, institutions, organizations, and systems, using available skills, values, beliefs, resources, and opportunities, to address, manage, and overcome adverse conditions in the short to medium term (Mach et al., 2014). According to the United Nations Office for Disaster Risk Reduction, it's "the ability of people, institutions, organizations, and systems, using available skills, values, beliefs, resources, and opportunities, to address, manage, and overcome adverse conditions in the short to medium term" (UNISDR, 2009).

Enabling conditions: Conditions that affect the feasibility of adaptation and mitigation options and can accelerate and scale-up systemic transitions that would limit temperature increase to 1.5°C and enhance capacities of systems and societies to adapt to the associated climate change, while achieving sustainable development, eradicating poverty, and reducing inequalities. Enabling conditions include finance, technological innovation, strengthening policy instruments, institutional capacity, multilevel governance, and changes in human behavior and lifestyles. They also include inclusive processes, attention to power asymmetries and unequal opportunities for development and reconsideration of values.

Governance: According to the IPCC, governance is a comprehensive and inclusive concept of the full range of means for deciding, managing, implementing, and monitoring policies and measures. Whereas government is defined strictly in terms of the nation-state, the more inclusive concept of governance recognizes the contributions of various levels of government (global, international, regional, sub-national and local) and the contributing roles of the private sector, of nongovernmental actors, and of civil society to addressing the many types of issues facing the global community.

- Adaptive governance: An emerging term in the literature for the evolution of formal and informal institutions of governance that prioritize social learning in planning, implementation, and evaluation of policy through iterative social learning to steer the use and protection of natural resources, ecosystem services and common pool natural resources, particularly in situations of complexity and uncertainty.
- Climate governance: Purposeful mechanisms and measures aimed at steering social systems towards preventing, mitigating, or adapting to the risks posed by climate change (Jagers and Stripple, 2003).
- Deliberative governance: It involves decision-making through inclusive public conversation, which allows opportunity for developing policy options through public discussion rather than collating individual preferences through voting or referenda (although the latter governance mechanisms can also be proceeded and legitimated by public deliberation processes).
- Flexible governance: Strategies of governance at various levels, which prioritize the use of social learning and rapid feedback mechanisms in planning and policy making, often through incremental, experimental, and iterative management processes.
- Governance capacity: The ability of governance institutions, leaders, and non-state and civil society to plan, co-ordinate, fund, implement, evaluate, and adjust policies and measures over the short, medium, and long term, adjusting for uncertainty, rapid change and wide-ranging impacts and multiple actors and demands.
- Multilevel governance: It refers to negotiated, non-hierarchical exchanges between institutions at the transnational, national, regional, and local levels. Multilevel governance identifies relationships among governance processes at these different levels. Multilevel governance does include negotiated relationships among institutions at different institutional levels and also a vertical ‘layering’ of governance processes at different levels. Institutional relationships

take place directly between transnational, regional and local levels, thus bypassing the state level (Peters and Pierre, 2001).

- Participatory governance: A governance system that enables direct public engagement in decision-making using a variety of techniques for example, referenda, community deliberation, citizen juries or participatory budgeting. The approach can be applied in formal and informal institutional contexts from national to local but is usually associated with devolved decision-making. This definition builds from Fung and Wright (2003) and Sarmiento and Tilly (2018).

Government: It is the system or group of people governing an organized community, generally a State.

Human behavior: The way in which a person acts in response to a particular situation or stimulus. Human actions are relevant at different levels, from international, national, and sub-national actors, to NGO, firm level actors, and communities, households, and individual actions.

- Adaptation behavior: Human actions that directly or indirectly affect the risks of climate change impacts.
- Mitigation behavior: Human actions that directly or indirectly influence mitigation.

Human behavioral change: A transformation or modification of human actions. Behavior change efforts can be planned in ways that mitigate climate change and/or reduce negative consequences of climate change impacts.

Indigenous knowledge Indigenous knowledge refers to the understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For many Indigenous peoples, Indigenous knowledge informs decision-making about fundamental aspects of life, from day-to-day activities to longer term actions. This knowledge is integral to cultural complexes, which also encompass language, systems of classification, resource use practices, social interactions, values, ritual, and spirituality.

Institution: Institutions are rules and norms held in common by social actors that guide, constrain and shape human interaction. Institutions can be formal, such as laws and policies, or informal, such as norms and conventions. Organizations – such as parliaments, regulatory agencies, private firms, and community bodies – develop and act in response to institutional frameworks and the incentives they frame. Institutions can guide, constrain, and shape human interaction through direct control, through incentives, and through processes of socialization.

Institutional capacity: Institutional capacity comprises building and strengthening individual organizations and providing technical and management training to support integrated planning and decision-making processes between organizations and people, as well as empowerment, social capital, and an enabling environment, including the culture, values, and power relations (Willems and Baumert, 2003).

Maladaptive actions (Maladaptation): Actions that may lead to increased risk of adverse climate-related outcomes, including via increased GHG emissions, increased vulnerability to climate change, or diminished welfare, now or in the future. Maladaptation is usually an unintended consequence.

Mainstreaming climate change adaptation can be defined as the process of integrating adaptation considerations into policy-making, budgeting, and implementation processes at the national, sector and subnational levels.

Nationally Determined Contributions (NDCs): A term used under the United Nations Framework Convention on Climate Change (UNFCCC) whereby a country that has joined the Paris Agreement outlines its plans for reducing its emissions. Some countries' NDCs also address how they will adapt to climate change impacts, and what support they need from, or will provide to, other countries to adopt low-carbon pathways and to build climate resilience. According to Article 4 paragraph 2 of the Paris

Agreement, each Party shall prepare, communicate, and maintain successive NDCs that it intends to achieve.

Policies (for climate change mitigation and adaptation): Policies are taken and/or mandated by a government – often in conjunction with business and industry within a single country, or collectively with other countries – to accelerate mitigation and adaptation measures. Examples of policies are support mechanisms for renewable energy supplies, carbon or energy taxes, fuel efficiency standards for automobiles, etc.

Public-Private Partnerships (PPPs): it involves collaboration between a government agency and a private-owned institution. They refer to a range of possible relationships between public and private actors for the delivery of a common goal. The PPP model is well-established for the construction of economic and social infrastructure in the countries and are commonly understood to incorporate three key elements:

- Formalized partnership defining the respective roles and responsibilities of public and private actors. There is a spectrum of possible contractual arrangements between public and private entities. These range from relatively short-term service contracts to long-term joint venture arrangements.
- Risk-sharing among public and private actors. PPPs offer a range of risk-sharing mechanisms. They recognize the differing characteristics of public and private actors and seek to optimize the effectiveness of public service delivery by allocating risks to parties most suited to address them.
- Financial reward for private parties, in line with contractual conditions and risk-sharing arrangements.

Research collaboration: It can be defined as the working together of researchers (with government or industry), to achieve the common goal of producing new scientific knowledge. There are different types of research collaboration including but not limited to:

- Collaboration within the institution (university).
- Collaboration with other academic institution.
- Collaboration with a private company.
- Collaboration with the government (government agencies).
- Collaboration with local communities (action-research).
- Collaboration based on task expertise.
- International research collaboration.

Resilience: The capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation. This definition builds from the definition used by Arctic Council (2013).

Science-Policy Interface: it has been defined as "*social processes which encompass relations between scientists and other actors in the policy process, and which allow for exchanges, co-evolution, and joint construction of knowledge with the aim of enriching decision-making*" (van den Hove, 2007, p. 807).

The European Commission Joint Research Centre (JRC) defined a set of essential skills for researchers and policymakers active in the science-policy interface (JRC, 2017), which are:

Figure 1: Skills Map for Evidence-Informed Policymaking[1]

Social inclusion: A process of improving the terms of participation in society, particularly for people who are disadvantaged, through enhancing opportunities, access to resources, and respect for rights (UN DESA, 2016).

Social Value of Mitigation Activities (SVMA): Social, economic, and environmental value of mitigation activities that include, in addition to their climate benefits, their co-benefits to adaptation and sustainable development objectives.

Societal (social) transformation: A profound and often deliberate shift initiated by communities toward sustainability, facilitated by changes in individual and collective values and behaviors, and a fairer balance of political, cultural, and institutional power in society.

Strategy: It refers to a broad plan of action that is implemented through policies and measures. A climate change adaptation strategy for a country refers to a general plan of action for addressing the impacts of climate change, including climate variability and extremes. It may include a mix of policies and measures, selected to meet the overarching objective of reducing the country's vulnerability (Lim et al, 2005).

Transformation: A change in the fundamental attributes of natural and human systems.

University: an institution of higher learning, providing facilities for teaching and research and authorized to grant academic degrees.

In the context of this manual, university refers to a framework to generate country-tailored knowledge and inform climate finance access and climate change adaptation policy-making processes.

The concept of "Academia" is also often used when talking about the scientific and academic communities, which represent part of society, especially universities, that is connected with the activities of thinking and studying.

University-Government Collaboration: It the university and government working together to produce new knowledge and tools in support of a specific policy-making and implementation processes; In the

[1] Adapted from: Framework for Skills for Evidence-Informed Policy-Making

context of this guidance manual, to support the access to climate finance and for climate change adaptation in LDCs.

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

1.5. Theoretical model and framework for university-government collaborations

1.5.1. Theoretical model

Knowledge-creation is a continuous process in which knowledge is generated and then used to generate competitive advantage (Lynch and Jin, 2016).

Existing literature shows that research collaboration has consistently played an important role in the advancement of knowledge through experimental research. Furthermore, research collaboration is rapidly increasing because of new public policies. These policies provide a platform for improved links between stakeholders (i.e., universities, governments, and industries) with regard to science and technology-based collaboration (Katz & Martin, 1997).

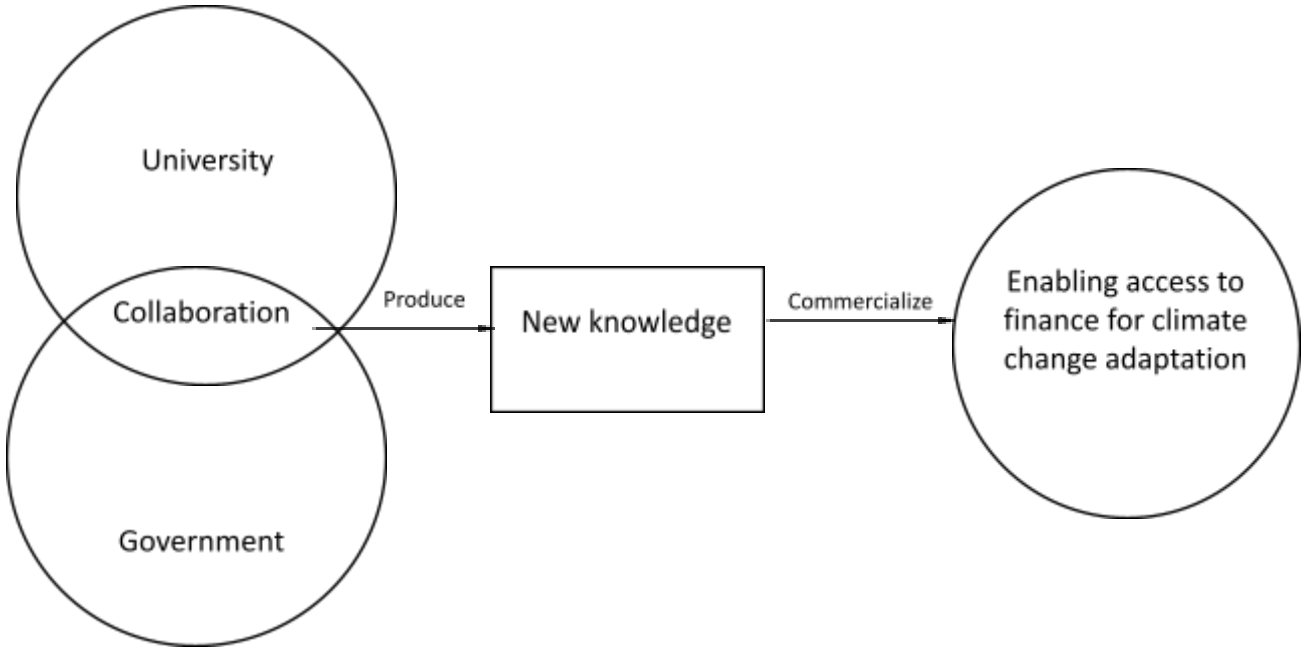


Figure 2: Theoretical model of university-government collaboration

Source: Author, adapted from Abbas et *al.*, 2019

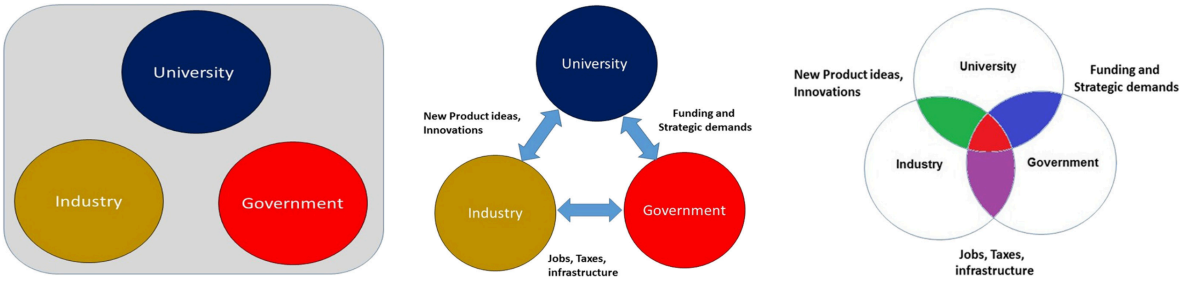
1.5.2. The university-government collaboration within the Triple helix model of innovation

The Triple helix model or system illustrates the necessary collaboration between academia, government, and industry. It refers to a set of interactions between the university, government, and industry, to foster economic and social development, as described in concepts such as the knowledge

economy and knowledge society (Leydesdorff, 2012; Galvao et al., 2019). The framework was first theorized by Henry Etzkowitz and Loet Leydesdorff in the 1990s, with the publication of "The Triple Helix, University-Industry-Government Relations: A laboratory for Knowledge-Based Economic Development" (Etzkowitz and Leydesdorff, 1995).

The triple helix model of innovation, as theorized by Etzkowitz and Leydesdorff, is based on the interactions between the three components of the model and their associated role: universities engaging in basic research, industries producing commercial goods and governments that are regulating markets (Leydesdorff, 2012).

Etzkowitz and Leydesdorff initially argued that the strength of the interactions between governments, industry and university depends on which component is the driving force in the framework. In a statist model, a strong state is driving interactions between the three components in a top-down implementation (Etzkowitz et al., 2002). The strength of interactions can also vary according to the development of a country, with a silo model predominating in an underdeveloped country, moderate interactions developing in a middle-income country due to the push for economic growth on the one hand and the pull for a competitive market-driven technological advancement on the other, and strong interactions developing in a developed country, for example in the form of a science park (Kimatu et al., 2016).



Triple Helix Interactions in a Developing Country (Silo Confinement)

Triple Helix Strategic Interactions in a Middle-Income Country (Push-Pull)

Triple Helix Strategic Interactions in a Developed Country (Red Indicates Science Park)

Figure 3: The triple helix interactions and the level of development

The bilateral interactions university-government within the triple helix model can be describe as follow:

> The strength of the interactions between the government and universities depends on the government's general relationship to and policy towards higher education. Etzkowitz and Leydesdorff's model uses a spectrum to define the extent of these interactions. On the one hand, when higher education is largely public, the government has a higher influence on universities and the research they conduct by being the main source of funding (Etzkowitz, 2008). On the other end of the spectrum, universities still receive some government funding but overall have a higher degree of independence from government influence. However, the two ends of this spectrum are used as ideal-types that are not necessarily reflective of the reality (Etzkowitz, 2011). The changing circumstances can push the government to create closer ties with academia (for example through funding of strategic disciplines.

Etzkowitz has also emphasized the fact that the shift towards a knowledge-based society has given a bigger role to universities, as innovation is increasingly based on scientific knowledge and that the role of universities as creators of knowledge is more valued (Etzkowitz, 2003).

2. Methodology

The main steps of the methodology used are as follows:

2.1. Document/literature review and analysis

Existing information relevant to science-policy interface for climate change adaptation as well as on collaboration between universities and governments to advance climate action has been reviewed. It helps to collect available source data relevant to the guidance manual. It also helps to identify gaps in existing data requiring primary survey in the LUCCC host countries.

2.2. In-country collection of cases studies

In addition to the collected case studies from the literature, primary data has been collected on university-government collaborations from the 13 LUCCC members countries under the leadership of the Points of Contact (PoCs) from the Focal Institutions (Table 1):

Table 1: List of targeted LUCCC members institutions

Nº	Country	Institution
1.	Bangladesh	International Centre for Climate Change and Development (ICCCAD), Independent University, Bangladesh (IUB)
2.	Bhutan	College of Natural Resources, Royal University of Bhutan
3.	Burkina Faso	Joseph Ki-Zerbo University
4.	Ethiopia	Climate Science Centre, Addis Ababa University
5.	The Gambia	University of The Gambia
6.	Liberia	University of Liberia
7.	Malawi	Lilongwe University of Agriculture and Natural Resources (LUANAR)

8.	Mozambique	Eduardo Mondlane University
9.	Nepal	School of Environmental Science and Management (SchEMS), Pokhara University
10.	Rwanda	Center of Excellence in Biodiversity and Natural Resource Management, University of Rwanda
11.	Senegal	University of Cheikh Anta Diop, Dakar
12.	Tanzania	University of Dar-es-Salaam
13.	Uganda	Makerere University Centre for Climate Change Research and Innovation (MUCCRI), Makerere University

2.3. Benchmarking: key challenges and best practices

This guidance manual uses an ***information-oriented selection approach***, in which case studies are carefully chosen for their significance. The four criteria for the selection of the case studies are:

1. The collaboration should involve the university (academia, scientific research, labs etc.) and the government (agencies, policy-makers, public sector practitioners etc.)
2. The collaboration should involve at least one LDC country (university and/or government agency).
3. A collaboration should be on climate change adaptation (project, programme, policy, strategy etc.) in general or more specifically on adaptation finance.
4. Collaboration must take place at the science-policy-practice interfaces.

The benchmarking and identification of the best practices was done through:

- Analyzing the relevance of the collaboration (Are the right institutions involved? Are the goals and objectives of the collaboration supporting climate change adaptation in the targeted country?)
- Analyzing the effectiveness (achieving pre-defined results/outputs/outcomes) and efficiency (resources committed for the results obtained) of the collaboration.
- Assessing the stakeholders (university and government) engagement and enabling conditions.
- Analyzing the impacts (and their sustainability) of the collaboration.

3. Science-policy interfaces

In the field of climate change governance, the search for going beyond a naive vision of the relations between science and policy as two independent monologues which intermittently exchange products takes place at all levels. At the local level, policy-makers and managers from both public and private institutions constantly innovate on new forms of interaction between science and decision-making (Van den Hove, 2007).

The aim of Science-Policy Interface (SPI) is to bridge the gap between the scientific community and policy makers to enhance the use of scientific knowledge in decision making (Sarkki et al. 2014). The SPI framework does not occur in a vacuum; institutions and their configurations play key roles in contributing towards its implementation (Koetz et al. 2012), and different actors hold different views around the complexity of climate change.

Considering these uncertainties, complexities, and the high stakes involved in climate adaptation, different arguments have been made in favor of a participatory approach in the production of knowledge to facilitate decision making on issues related to climate adaptation (Nkiaka and Lovett, 2018). Indeed, enhancing the link between science and policy is essential for adequate policy planning and formulation, especially in the prominent field of climate change adaptation (Theokritoff, 2018).

S. van den Hove (2007) has identified the theoretical problems at the science-policy intersection and normative requirements for the interfaces, summarized in Table below:

Table 2: Theoretical problems at the science-policy intersection and normative requirements for the interfaces

Theoretical problems	Normative requirements/challenges for science–policy interfaces
Outputs Complexity, uncertainty, indeterminacy	To bring about communication and debate about assumptions, choices, and uncertainties, and about the limits of scientific knowledge. To allow for articulation of different types of knowledge: scientific-, local-, indigenous-, political-, moral- and institutional knowledges. To provide room for a transparent negotiation among standpoints (participatory processes).
Issue-driven vs. curiosity-driven science	To allow for balancing issue- and curiosity-driven science and their articulation in knowledge for decision-making processes.
Roles of scientific explanations and predictions	To allow for a reemphasis of the role of scientific explanation for understanding the issue, exploring options for action, and building justifications.
Processes Fuzzy frontiers between science and policy	To allow for recognition of the existing dependencies between the scientific and the social systems and how they influence the knowledge that is exchanged in the interface. To allow for continuous creation and dynamic exchange of different knowledges across the frontiers of science and society (dynamic processes).
Prioritizing and organizing research	To include a reflection on research priorities and research organization.
Scientific quality	To allow for critical assessment of scientific outputs in light of users' needs and other knowledges.
Educating scientists	To allow for education and training of scientists in communication, translation, and mediation.
Role of scientific networks	To engage in a transparent manner with existing scientific networks.
Inputs and roles of social sciences in science-policy interfaces	To allow for genuine interdisciplinary interactions between social and natural sciences. To recognize the potential of social scientists as designers, implementers and evaluators of science-policy interfaces, and their potential role as translators, mediators, or facilitators.
Actors Non-neutrality of scientists and possibility of objective knowledge	To render explicit the values, ethics and interests of knowledge holders and allow for their articulation with (objective and subjective) knowledge.
Context Responsibility of knowledge holders and technology developers (scientists)	To allow for scientists to exercise their responsibility.

Source: Van den Hove, 2007

In practice, through the analyze of 34 case studies of science-policy engagement efforts, drawn from six years of agricultural research for development efforts around climate-smart agriculture, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), has come up with lessons derived from these case studies to improve theory for science-policy engagement for agriculture research for development under climate change (see figure below). The new proposed theory offers a pragmatic pathway to enhance credibility, salience, and legitimacy of research, which relies on engagement (participatory and demand-driven research processes), evidence (building scientific credibility while adopting an opportunistic and flexible approach) and outreach (effective communication and capacity building).

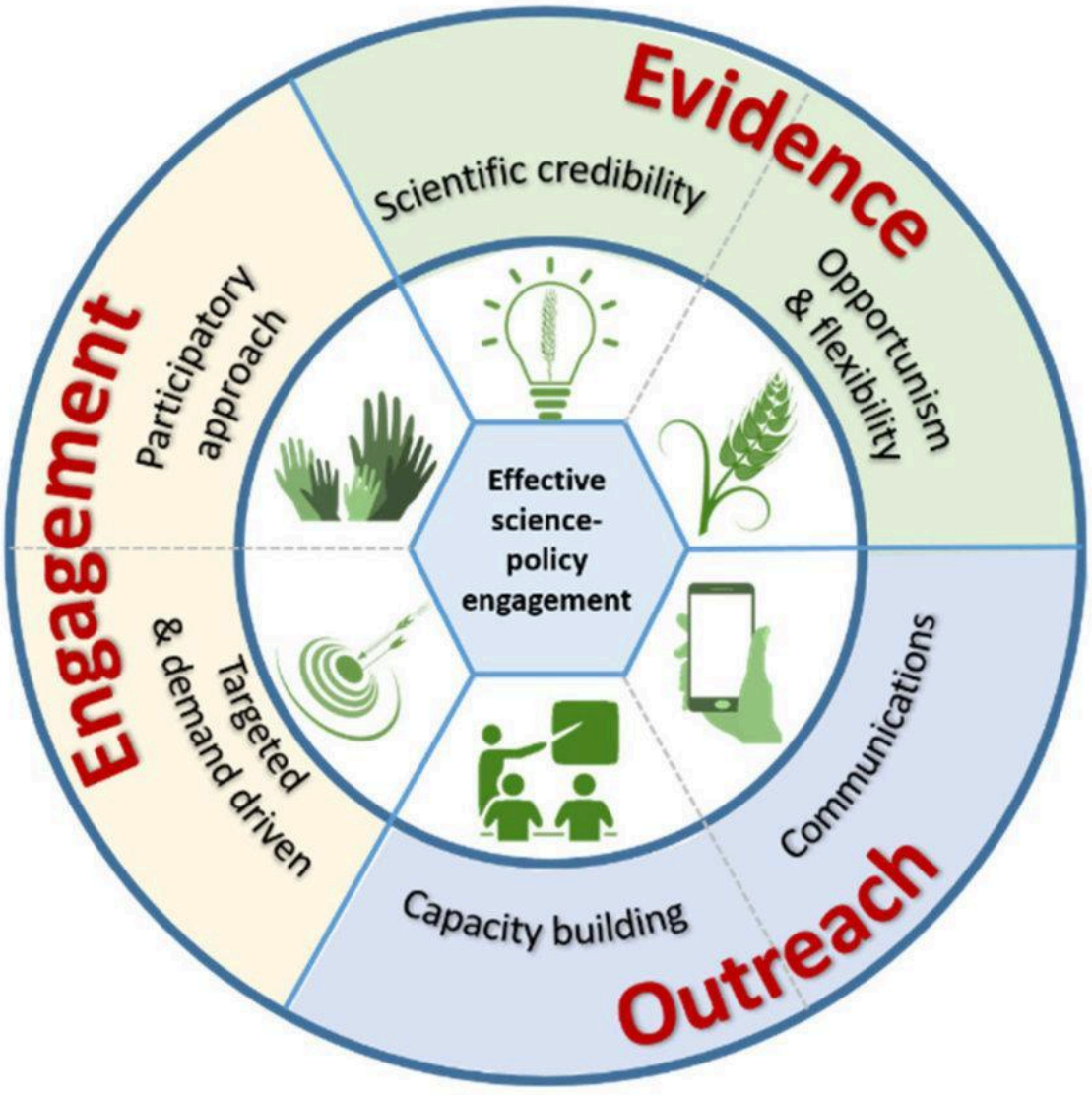


Figure 4: Facilitating Change for Climate-Smart Agriculture through Science-Policy Engagement
Source : Dhanush Dinesh et *al.*, (2018)[2]

[2] Dinesh, Dhanush, Robert B. Zougmore, Joost Vervoort, Edmond Totin, Philip K. Thornton, Dawit Solomon, Paresh B. Shirsath, Valerien O. Pede, Isabel Lopez Noriega, Peter Läderach, Jana Körner, Dries Hegger, Evan H. Girvetz, Anette E. Friis, Peter P. J. Driessen, and Bruce M. Campbell. 2018. "Facilitating Change for Climate-Smart

To help improve the adaptation planning, financing, and policy-making processes, Olazabal et *al.* (2019) has develop an Adaptation Policy Credibility (APC) conceptual and operational assessment framework for helping to allocate public funding and private investments, and for implementing and catalyzing climate policy (figure below).

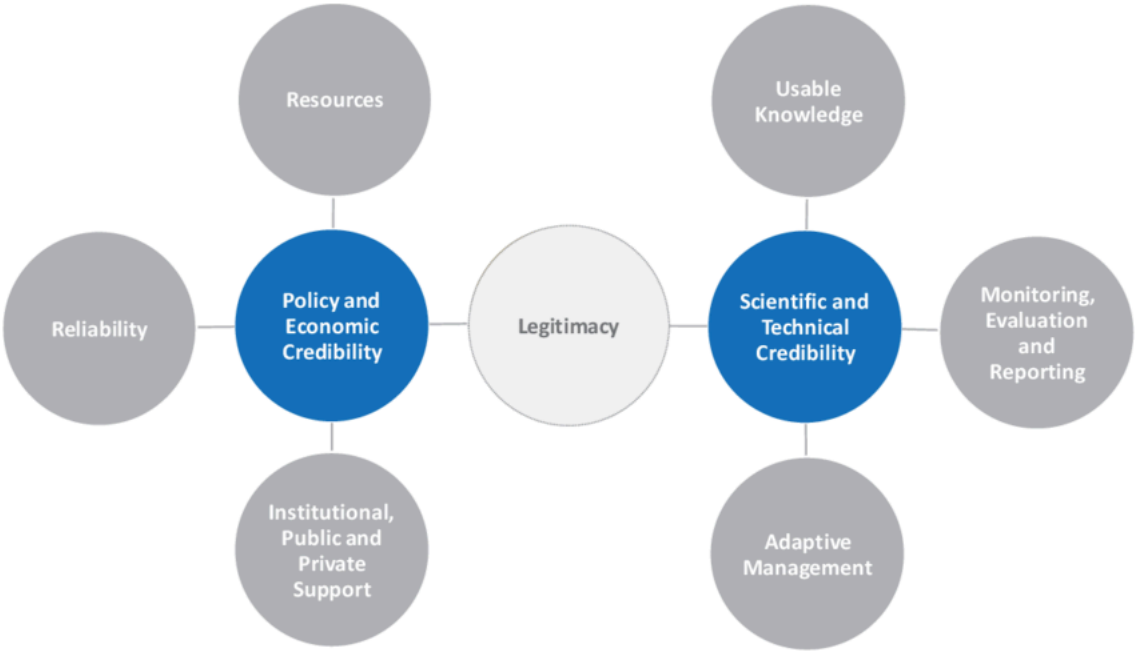


Figure 5: Climate change Adaptation Policy Credibility (APC) framework
Source: Olazabal et al., 2019

Box 1: In this framework, Credibility is divided into three components: Resources, Reliability, and Institutional, Public and Private Support. 'Resources' refer to the means required for the implementation of the plan and 'Reliability' to past performance and current assignment of human resources for plan definition, approval, and implementation, while 'Institutional, Public and Private Support' refers to the passive or active engagement of diverse public and private actors in the development of the plan. Scientific and Technical Credibility is divided into three components: Usable Knowledge; Monitoring, Evaluation & Reporting (MER); and Adaptive Management. **'Usable Knowledge' refers to the production and use of contextualized evidence (regarding climate impacts, risks, and vulnerability) according to local needs and 'MER' to the existence of systems that assess progress and outcomes according to a set of goals**, while 'Adaptive Management' refers to the process of learning through readjustment processes that allows revision, redefinition or change to alternative pathways. Overall, therefore, the APC comprises seven components, including 'Legitimacy'.

Agriculture through Science-Policy Engagement" Sustainability 10, no. 8: 2616. https://doi.org/10.3390/su10082616

4. Benchmarking best practices for university-government collaboration

It has been established that collaborative research between universities and governments can help funding leverage, access to new knowledge as well as their mainstreaming in policies. However, certain rules and principles must be followed in order to facilitate this collaboration and to achieve its determined objectives, particularly in the field of climate change adaptation policies.

Indeed, although the literature and the facts are clear on the needs of a strong science-policy-practice interface for climate change adaptation, collaborations between the universities and the governments can also lead to conflict when the roles of each party are unclear or when expectations are not met. So, laying clear ground rules and having an open discussion about each stakeholder's roles and expectations help the collaboration run smoothly. Building on Sharon Ann Holgate guidelines for a successful research collaboration (Holgate, 2012), as well as the university-government collaborations case studies presented in the previous chapter of this manual, please find below selected best practices for university-government collaborating successfully to accessing climate finance for climate change adaptation.

Figure 6: Best practices for university-government collaboration

1. Address mutual expectations: The university and the government may have different expectations about how each party will contribute to climate-adaptation finance and how they will be credited. By discussing these expectations openly, it's easier for each party to contribute to an effective access to climate finance for adaptation.

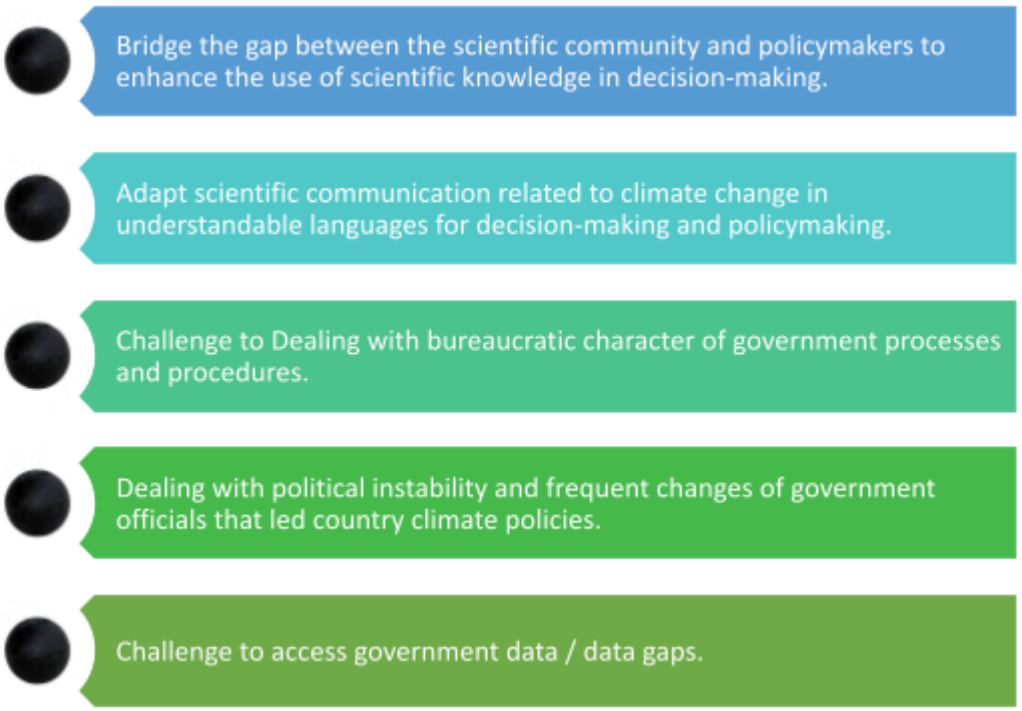
2. Clearly define and establish who is responsible for each task: Along the same lines as addressing expectations, a clear division of labor makes each party's role in the collaboration clear. This will also facilitate the conversations about authorship (which is something very important for the scientific communities).
3. Determine authorship: In a collaboration, it may appear that each party has a clear role. This assumption, however, can lead to confusion and disagreement over first authorship and it's very important to agree on authorship at the beginning of the project. If the project changes or takes a new direction, authorship may change too. As soon as this happens, all parties should renegotiate the authorship (with the consensus preferably in writing).
4. Communicate frequently: Keep open lines of communication with and between the university and the government teams. The lack of a clear timeline or clear collaboration goals can lead to the fall of the collaboration as party should not assume that no news is good news.
5. Take minutes of meetings and then distribute to everyone involved in the collaboration. For instance, send an email to every member of the team after phone conversations and face-to-face meetings. This provides documentation that can be referred to in later conversations. If you forget what was covered or if there's a disagreement about what was decided in the meeting, the minutes help resolve those issues.
6. Access to data: A clear conversation at the beginning of the project is necessary to establish who will have access to what information. If the project's direction changes or the project grows, revisit the question of who has access to which data. This is a very critical point as the government can facilitate access to some privileged information relevant for action-research and the development of good policy briefings to support adaptation decision-making.
7. Discuss the expectations for the data with all parties before the collaboration begins. For example, how will the research outputs be communicated (presentations, publications, policy briefings etc.) and how soon will it be shared after the research is conducted? When research collaborations span academia and government, there are different standards for sharing data, so this discussion is particularly important. An academic may be eager to publish findings for the tenure dossier, while the government wants a dissemination of the findings with key stakeholders first (in order to receive their feedback).
8. Shared responsibility for integrity in research integrity: Verification of data in the collaboration may not be feasible, especially when each party has the abilities to acquire part of the data that the other party cannot. In this case, when there's an error in the data or some portion of the data is compromised, it's vital that failure to comply with research regulations be shared with all parties involved including

researchers, government institutions and funding agencies. For this to be possible, all funding sources should be fully disclosed at the beginning of the collaboration. If new funding lines open up or another institution (industry or other country for example) becomes involved in the research, all parties involved in the research should be notified.

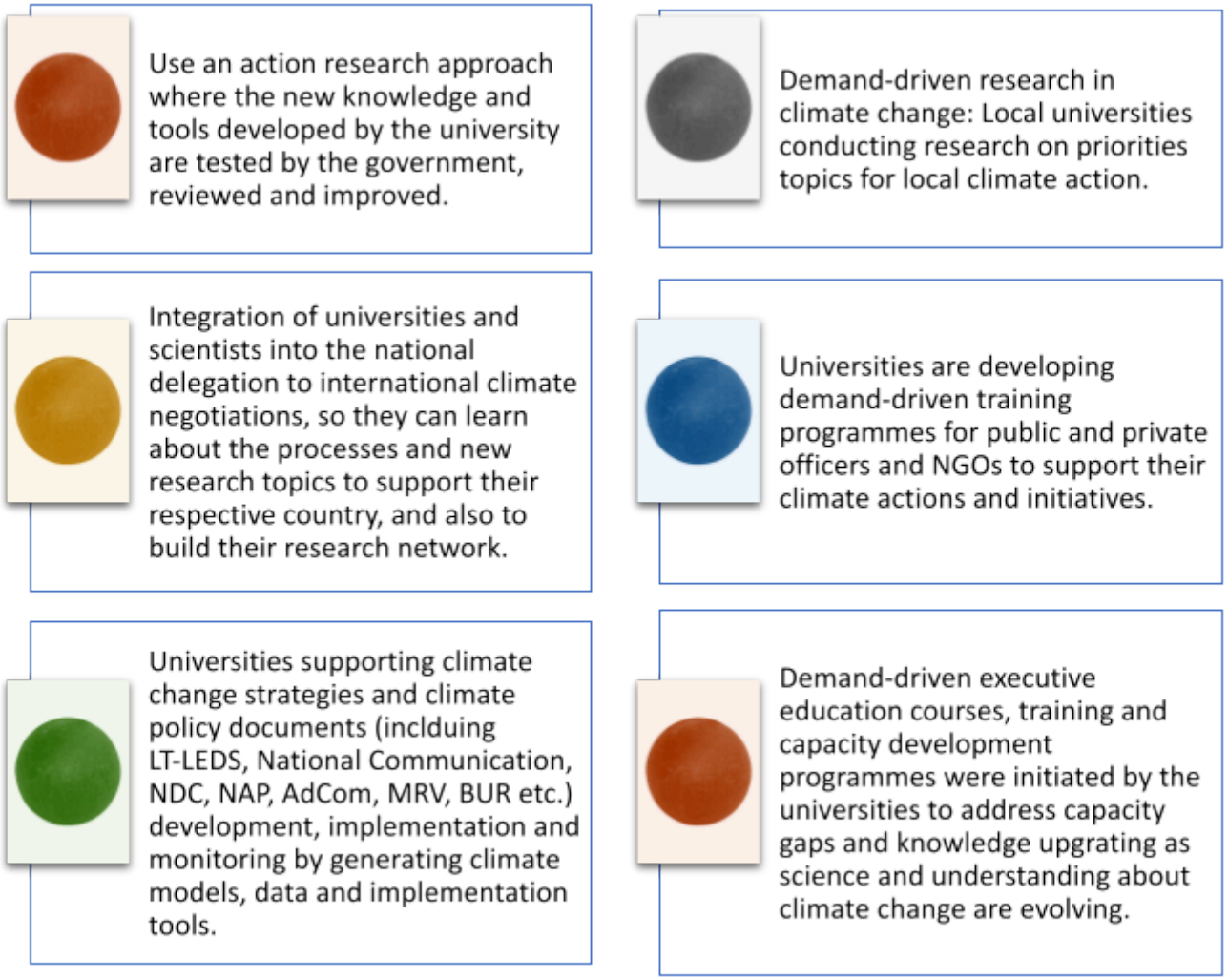
5. Lessons learnt from the cases studies in LUCCC countries

Between August-October 2022, and with the help of the PoCs of the LUCCC universities of the 13 target countries, around sixty (60) case studies of collaboration between universities and governments in the field of climate change have been collected (*see annex 1*). The review of all collected case studies makes it possible to benchmark the challenges, opportunities and best practices that can be replicated in similar contexts in general and particularly in building university-government collaboration for climate adaptation financing.

5.1. Key challenges



5.2. Best practices



6. Entry Points

The *International Network for the Availability of Scientific Publications* (INASP) and *Purpose & Ideas* in their joint knowledge systematization effort, combining a literature review with in-depth interviews with 48 experts and policymakers, mostly in developing countries, have identified that six main dimensions allow users to identify entry points to make strategic decisions in governmental institutions:

- macro-context: the overarching forces (structural and circumstantial) at the national level that establish the "bigger picture" in which policy is made.
- intra- and inter-relationships with state and non-state agents: although part of macro-context, these warrant special mention. They are the internal relationships between the public institution and other related government agencies and the interaction with relevant users and producers of knowledge who can affect or be affected by policy design and implementation.
- culture: the set of shared basic assumptions learned by a group.
- organizational capacity: the ability of an organization to use its resources (human and legal) to perform.
- management and processes: ongoing processes and policies, and how routine decisions are made.
- core resources: include budget, time, infrastructure, and technology.

Each dimension breaks down into several critical sub-dimensions, is shown in the figure below:

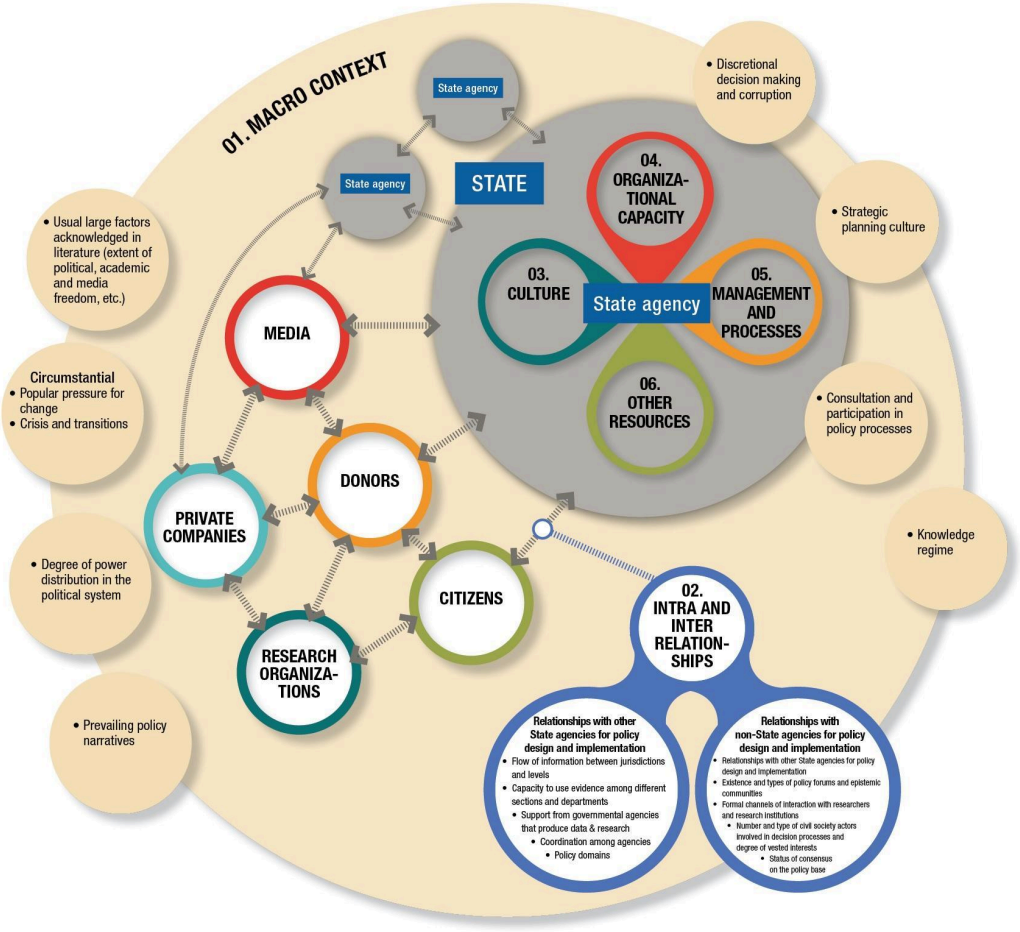


Figure 7: Going beyond 'context matters': A lens to bridge knowledge and policy - Integration and Implementation Insights
Source: Weyrauch, Echt and Suliman 2016a

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Annex 1: Examples of university-government collaboration

Table 3: Collected cases studies.

N	Country	Case studies – University-Government Collaboration (name of the project or initiative)	Collaborators		Period of collaboration	Brief description of the collaboration	Key results / Lessons learnt / Best practices
			Government(s)	University(ies)			
1	Liberia	Capacity Building Initiative for Transparency (CBIT), a GEF supported project	Environmental Protection Agency in Liberia	University of Liberia	2019-2021	The University of Liberia and the Environmental Protection Agency signed a COOPERATIVE Framework Agreement for Green House Gases (GHG) data sharing and management to support Liberia's Nationally Determined Contribution implementation. The project was to Strengthen GHG data sharing in the academic sector through the establishment of institutional arrangements for GHG data collection and sharing, quality control and assurance, analysis, and achieving. The University of Liberia has a sub-contractor agreement with Aether, the training institution base in the U.K. The role of the University of Liberia was to guide the process of GHG Inventory data collection from industries, government institutions, homes, etc. The UL process and store GHG data.	From the Aether training, UL hub members learn to collect data from a database, and various institutions, thus improving our quality control and assurance and analysis of GHG inventory data. The University of Liberia was part of team from various line ministries in Liberia to have participated in a south-south visit to Kampala, Uganda. The south-south visit was to strengthen institutional capacity on the Knowledge of how the Greenhouse Gas Inventory (GHGI) and the MRV system works and how can the Liberian team improved her activities.
2	Liberia	Climate Change program establishment at the University of Liberia	Environmental Protection Agency	College of Science and Technology, University of Liberia	2018	In 2008 Liberia developed its National Adaptation Program of Action (NAPA) with a focus on the urgent and immediate adaptation priorities of the country. At the policy level, the NAP called for capacity building to integrate climate change in development planning; raising awareness by disseminating climate change and adaptation information, particularly to vulnerable communities; and mainstreaming adaptation to climate change into policies through programs in agriculture, forestry, fisheries, energy, health, gender, and meteorology/hydrology. The National Adaptation Plan (NAP) epitomizes a means of identifying Liberia's medium-term adaptation needs. At the heart of many of the greatest challenges facing Liberia in its effort to combat climate change, is the lack of **trained experts and the absence of local training institutions** to prepare	Since its establishment in 2018, the University of Liberia through the Environmental Studies and Climate Change has engaged into climate data collection and research activities relating to climate change.

N	Country	Case studies – University-Government Collaboration (name of the project or initiative)	Collaborators		Period of collaboration	Brief description of the collaboration	Key results / Lessons learnt / Best practices
			Government(s)	University(ies)			
						professionals who can engage in environmental sustainability and climate change enabling activities across the critical sectors that are most vulnerable to climate change. The stocktaking exercise conducted in preparation for the NAPs project in 2015 noted the following: the relevant ministries do not have the experts and technicians needed, there is limited training on climate change issues, there is no integration of climate change in the development planning and implementation processes at the sector level and there is a lack of capacity of sectorial ministries to integrate adaptation into their strategies. To help meet this critical need, the project title: Advance the NAPs process for medium-term investment planning in climate-sensitive sectors (i.e., agriculture, energy, waste management, forestry, and health) and coastal areas in Liberia is implementing an activity: To provide support to the University of Liberia in setting up a graduate program in environmental studies. Through this activity, the NAPs project is providing funding to the University of Liberia to set up the groundwork for the establishment of an M.Sc. degree-granting program at the university.	
3	Rwanda	Msc programme in atmospheric and climate Science	REMA (Rwanda Environmental Authority) and Rwanda Meteorological Agency	University of Rwanda/College of Science and Technology, PHYSICS		Since 2016, a master's degree Programme in Atmospheric and Climate Science has been developed. This has come as a result of the need to improve Atmospheric and Climate skills to Rwandan and African scientists in order to meet environmental challenges faced by the country and the region due to atmospheric pollution, weather variability, weather extremes and climate change and its consequences. The designed MSc programme came in order to respond to the Rwanda needs as stressed in Rwanda Vision 2020 and the Economic Development and Poverty Reduction Strategy, 2014-2018 (EDPRS II)	Producing a critical mass of graduates who clearly understand changes in Atmospheric composition, weather and climate that help to address the environmental protection which is one of the key pillars for the sustainable development of the country.
4	Rwanda	Sizana-Environmentally Friendly transport systems in Rwanda	National Commission of Science and Technology	University of Rwanda/College of Science and Technology, BIOLOGY	2022-2025	It is a research project conducted under the College of Science and Technology and funded by NCST (The National Commission of Science and Technology)	In progress

N	Country	Case studies – University-Government Collaboration (name of the project or initiative)	Collaborators		Period of collaboration	Brief description of the collaboration	Key results / Lessons learnt / Best practices
			Government(s)	University(ies)			
5	Rwanda	Children's exposure to ambient air pollution at school in Rwanda	Ministry of Education	University of Rwanda/College of Science and Technology, BIOLOGY	2020-2022	It is a project funded by TWAS and Implemented under the College of Science and Technology. As the University is already under the Ministry of education, no formal collaboration is required to implement research projects	A publication to inform decision makers has been produced: Ambient Air Pollution and Respiratory Health in Sub-Saharan African Children: A Cross-Sectional Analysis
6	Rwanda	Retrofit of Fossil Motorcycles to Electric Motorcycles in Rwanda	FONERWA (RWANDA Green Fund)	University of Rwanda/College of Science and Technology, BIOLOGY	2022-2024	It is a project developed by academic staff from University of Rwanda/College of Science and Technology and funded by the government of Rwanda through the Green Fund FONERWA	In progress
7	Rwanda	Coordinating the Regional Network of Conservation Educators in the Albertine Rift (RNCEAR) which is composed of universities, research institutions and conservation NGOs in the Albertine Rift	REMA (Rwanda Environmental Authority) and RDB (Rwanda Development Board)	University of Rwanda/College of Science and Technology, BIOLOGY	2011-2014	It is about implementation of a collaborative project on building capacity for biodiversity conservation and climate change adaptation	Several trainings conducted; teaching materials produced
8	Rwanda	Establishment and operationalizing the "Rwanda Biodiversity Information System" (RBIS)	RDB, REMA, Rwanda water Board, Rwanda Forestry Authority, Ministry of Environment….	The Center of Excellence in Biodiversity and Natural Resource Management (University of Rwanda)	2019-2023	The RBIS is developed with several partners from governmental institutions as data providers and end users. The RIS gather information about biodiversity occurrences, distribution maps, climate layers, land use and land cover change, to build skills and provide knowledge for resilience and adapt to climate change.	The portal is already available and ready to be used
9	Rwanda	Climate Smart Agriculture Project, funded by African Climate Change Fund at AfDB	ICRAF and Rwanda Agriculture Board (RAB)	The Center of Excellence in Biodiversity and Natural Resource Management (University of Rwanda)	20022-2024	It is a project implemented in Eastern Province of Rwanda to help farmers to adapt to climate change. It is jointly implemented by CoEB, RAB and ICRAF	In progress
10	Rwanda	African Research University Alliance (ARUA) Unlocking	REMA, Rwanda Water Board	The Center of Excellence in Biodiversity	2019-2023	Water quality and water management, implication of local communities' management	Results not yet published (1 manuscript + raw data)

N	Country	Case studies – University-Government Collaboration (name of the project or initiative)	Collaborators		Period of collaboration	Brief description of the collaboration	Key results / Lessons learnt / Best practices
			Government(s)	University(ies)			
		resilient benefits from African water resources, Rhodes University, South Africa, and many other partner universities in the project.		and Natural Resource Management (University of Rwanda)			
11	Rwanda	Landscapes restoration (LAFREC)	REMA	The Center of Excellence in Biodiversity and Natural Resource Management (University of Rwanda)	2018-2022	The project was meant to support Msc students to carry out their respective thesis in the field of wetlands and forest restoration to build the capacity to climate change adaptation	24 Msc Students trained
12	Tanzania	National REDD Strategy and Action Plan for Tanzania	Vice President's Office-Division of Environment and the Ministry of Natural Resources and Tourism	University of Dar es Salaam-Institute of Resource Assessment (IRA)	2009 - 2013	Between 2009 and 2013 IRA collaborated with the government to develop readiness for REDD+ engagement. This included preparation of the National REDD Strategy and Action Plan for Tanzania. This involved the following activities. ● Awareness raising on climate change and importance of REDD+ initiative as one of the mitigation measures p particularly in the tropical regions. ● Designing of thematic areas for REDD+ pilots in various ecological units in the country ● Engagement of NGOs for REDD+ Piloting ● Stakeholders' consultations across scales for REDD+ strategy and action plan ● Drafting of REDD+ strategy and action plan by incorporating lessons from Pilots ● Development of Social and Environmental Safeguards ● Development of Climate change financing framework;	National REDD Strategy and Action Plan developed
13	Tanzania	Development of strategies for addressing negative effects of Climate Change in food	Ministry of Agriculture and Cooperatives	University of Dar es Salaam-Institute of Resource	June to December 2008	Between June to December 2008 IRA collaborated with the Ministry of agriculture to develop strategies for addressing negative effects of Climate Change in food insecure areas in Tanzania. Research Report to the Ministry of Agriculture. This involved the following activities.	

N	Country	Case studies – University-Government Collaboration (name of the project or initiative)	Collaborators		Period of collaboration	Brief description of the collaboration	Key results / Lessons learnt / Best practices
			Government(s)	University(ies)			
		insecure areas in Tanzania		Assessment (IRA)		• Field data collection through Participatory Rapid Appraisal • Collection of secondary data from various sources • Data analysis and report writing • Stakeholders' validation workshop • Final stakeholders' dissemination workshop	
14	Tanzania	Baseline for Development of Ecosystem-based Adaptation for Rural Resilience (EbARR) Project	Vice President's Office-Division of Environment	University of Dar es Salaam-Institute of Resource Assessment (IRA)	March to October 2019	The general objective of the project is to enhance resilience to climate change in rural communities of Tanzania by strengthening ecosystem resilience and diversifying livelihoods. This contributes to the overarching goal of reducing the vulnerability of rural populations. The baseline assessment was undertaken with the aim of updating indicators and targets, as well as collecting baseline data for these updated indicators.	Baseline and indicators developed
15	The Gambia	UTG/WASCAL Program	Ministry of Higher Education, Research, Science, and Technology (MoHERST)	University of The Gambia, School of Agriculture and Environmental Sciences	2014 to date	In 2010, The Gambia government under MoHERST, among ten other West African countries started a two-year (2010 to 2012) negotiations with German Federal Ministry of Education and Research (BMBF) to start a climate change capacity building program in West Africa. The negotiations went through, and the capacity building program started in ten West African countries, of which The Gambia was. The Gambia through UTG, started its program (M.Sc.) in 2014 and upgraded the program to a Ph.D. program in 2019. The specific goal is to enhance the capacities of Gambians in the area of climate change adaptation. The results are that up to date, over 20 Gambians have received either M.Sc. or Ph.D. in climate change education from the WASCAL program. The curriculum on this program at UTG consists of 26 Modules that are taught over a period of six months. After the six months class work, the students go out for field data collection for two years, during which they go to any German university for six months before they return to UTG for Dissertation writing and defense. The Lectures for the twenty-six Modules are recruited from The Gambia and outside The Gambia. Each Module is lectured for one week.	Key results are that over twenty Gambians have received either M.Sc. or Ph.D. in climate change education. Lessons learnt: Many of those Gambian graduates are now either Directors of government institutions like National Agricultural Research Institute, National Environment Agency, or Senior Lecturers at University of The Gambia. Best practices are that ONLY Ph.D. holders either as Associate Professors of Full Professors are recruited as Lectures and/or student Supervisors in the program.
16	The Gambia	Post Graduate Diploma in Meteorology and Hydrology	UNEP Early Warning System II Project under	UTG School of Agriculture and	2017 to 2019	The Ministry of Water Resources and National Assembly Matters negotiated with UNEP to offer a one-year Post Graduate Diploma in Meteorology and Hydrology at University	Key Results: Forty-eight students graduated.

N	Country	Case studies – University-Government Collaboration (name of the project or initiative)	Collaborators		Period of collaboration	Brief description of the collaboration	Key results / Lessons learnt / Best practices
			Government(s)	University(ies)			
			the Department of Water Resources	Environmental Sciences		of The Gambia. The specific goal is to enhance the capacities of Gambians in the area of Meteorology and Hydrology so that climate change adaptation through climate services can be greatly disseminated for the use by Gambian farmers. The expected results were to train sixty Gambians in two years at this level. Methodology: A one-year curriculum was developed and approved by UTG Senate. The first 9 months of the program was dedicated to lectures and the remaining 3 months was dedicated to student Research Report writing. Lectures were recruited from University of Nairobi, Department of Meteorology and Hydrology, who were present on the ground at UTG and lectured and supervised the students. Each student presented his/her Research Report before he/she could graduate.	Lessons learnt: The recruitment of the first Batch of students was not aggressively done to get the first thirty students trained. Instead, only Eighteen students were trained for the first Batch. Best Practices: Train more students but now at the BSc. level.
17	Nepal	Ministry of Forests and Environment and ADB supported this institution to upgrade the syllabus of MSc Environmental Science and Management "Mainstreaming Climate Chang Risk Management in Development."	Ministry of Forests and Environment, MOFE, Nepal. ADB	School of Environmental Science and Management, (SchEMS) Pokhara University, Nepal.	2014	The institution upgraded the syllabus of MSc Environmental Science and Management. The upgradation involved integration of 3 credit hour course on climate change into the syllabus. Such integration was first of its kind in any formal university syllabus in Nepal.	Upgradation involved integration of 3 credit hour course on climate change incorporated in the course syllabus.
18	Nepal	Ministry of Forests and Environment and Climate Analytics supported in the development of the syllabus of MSc Environmental Science and Climate Change	Ministry of Forests and Environment, MOFE, Nepal. Department of Hydrology and Meteorology (DHM), Nepal	School of Environmental Science and Management, Pokhara University, Tribhuwan University (TU),	2021	The development of curriculum on Master of Science and Climate Change which incorporated the engagement of 55 experts from every possible field of study. For the development of the course curriculum, School of Environment Science and Management (SchEMS) of Pokhara University with the assistance from Climate Analytics facilitated the MoFE in fulfilling its lead activity related to capacity building which evolved designing of the academic curricula at the university level. Through the Nationally Determined Contributions (NDC) Partnerships of MoFE, a Climate Action Enhancement Package (CAEP) was developed	The institution has developed a course on Master of Science in Environment and Climate Change. Syllabus for master's in environmental science and Climate Change has been developed and is ready to be incorporated in the University.

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				Kathmandu University (KU), Mid-West University, Nepal.		which could ensure long-term capacity building in the field of climate change science, policy, and implementation of climate action in the country. Environment and Geological Management Subject Committee of the Faculty of Science and Technology, PU has prepared the curriculum structure with extensive engagement from experts who represented academia, government, and non-governmental practitioners.	
19	Nepal, Norway	Co-creating Knowledge for Local Adaptation to Climate Change in LDCs under the NORWEGIAN PROGRAMME FOR CAPACITY DEVELOPMENT IN HIGHER EDUCATION AND RESEARCH FOR DEVELOPMENT (NORHED II)	Nepal	School of Environmental Science and Management, (SchEMS) Pokhara University, Nepal. NORWEGIAN UNIVERSITY OF LIFE SCIENCES /FACULTY OF LANDSCAPE AND SOCIETY/ DEPARTMENT OF URBAN AND REGIONAL PLANNING	2021-2026	Nepal presents an interesting case because of its remarkable Local Adaptation Plans (LAPAs) in the context of National Adaptation Programme of Action (NAPA). LAPAs present one of the few cases where locally driven adaptation Programme cascades across national, regional, and local levels covering institutional and financial planning, implementation, and monitoring aspects of adaptation process (Sharma et. al., 2017). LAPAs were developed to support operationalization of the policy objectives outlined in NAPA. The proposed project could focus on CBA co-learning from LAPA implementation and engagement of local governments. The project will benefit from communities' experiences on bottom-up planning approaches that were used to come up with LAPAs. The LAPA development process demonstrated inclusive and decentralized adaptation planning, as well as multi-stakeholder collaborative engagement to address adaptation needs. The project will be implemented in Bardiya District in Province 5 of Nepal. The district is located in a flood prone area that has continued to experience increasing frequency of floods. The flooding has had devastating impacts on the lives and livelihoods of the residents. The communities have a long history of practicing agriculture supported by fertile soils in the flood plains. However, the rising flood risk in the area, attributed to increasing amount and intensity of rainfall, poses a huge threat to the agriculture dependent communities. The communities are responding to flooding risk by working with government to set up early warning systems and disaster risk reduction committees, as well as establishing flood prevention infrastructure. **Objectives and target group**	In addition to the development of course syllabus, SchEMS has also been working on the development of course manual for the curriculum with the grant received from NORHED.

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						Pokhara University's School of Environmental Science and Management (SchEMS) has a research portfolio that covers a range of aspects relevant to environmental management, including climatic changes. The overarching aim of the project is to build capacity within targeted LDC universities for engaging in understanding and facilitating processes of knowledge co creation and community-based adaptation (CBA) education and research. The target groups for the project include university faculty, graduate level students, early-career researchers, local, regional, and national governments, community-based organizations as well as most vulnerable and marginalized communities in target areas. Objectives are: - Strengthen capacity of university faculty and students in undertaking research on CBA - Facilitate co-creation of knowledge on CBA among university faculty, students, local communities, grassroots organizations as well as local governments. - Develop an evidence base for effective processes for facilitating CBA in target countries. - Strengthen understanding and capacity of local governments and community-based organizations for learning with communities and implementing CBA related policies and action. - Promote vertical integration between the local and national level, and horizontal integration across sectors with natural resource-based livelihoods as the entry point.	
20	Senegal	PNA-FEM	Ministries of Environment and Sustainable Development (MEDD). Ministries of Agricultural and Rural	University Cheikh Anta Diop (UCAD). University Assane Seck de Ziguinchor (UASZ). University Gaston Berger	2020-2022	The project aims to strengthen the capacity of sectoral ministries and local governments to better evaluate the impacts of climate change and to adapt existing policies and budgets to integrate climate change risks and to integrate climate change risks and adaptation measures in the medium and long term. and long-term adaptation measures. Identify need in terms of climate products, dissemination channels.	Identification of needs in terms of climate services. identification of vulnerabilities of all concerning sectors (agriculture, health, flooding, infrastructure, risk, and catastrophe management). identification of adaptation options with policymakers and end-users. Prioritize adaptation options.

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			equipment (MAER). Ministries of health and (MSAS). Ministry of Infrastructure, Land Transport and Opening-up (MITTD)	(UGB) de Saint-Louis. (Physics, geography)		Use of CMIP6 models and impact models to access vulnerabilities of concerning sector to climate change. Identify and prioritize adaptation options.	strengthening collaboration between universities and government. strengthening collaboration between universities.
21	Senegal, Burkina Faso, Benin	PAS-PNA	Sénégal : DCC/MEDD DL/MEDD Agence Régionale de Développement de Développement (ARD) de Fatick ; Centre de suivi écologique (CSE) ; ISRA. ANACIM. Burkina Faso: Permanent Secretariat of the National Council for Sustainable Development (SP/CNDD), under the Ministry of Environment, Green Economy, and	Sénégal: UCAD; UASZ UGB, Université Iba Der THIAM de Thiès (UIDT) , université Alioune Diop de Bambey (UADB) (Physics, geology, geography, hydrology, agronomy) Burkina Faso: Climate Change Scientists, ecologists from Public Universities (University Joseph Ki-Zerbo of Ouagadougou , University	2018-2021	The project is funded by the Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in collaboration with Climate Analytics, from 2016 to 2021. This project supports francophone Sub-Sahara African LDCs in their National Adaptation Plan (NAP) process and was run in Benin, Senegal, and Burkina Faso, where its main partners are the national ministries in charge of climate change. In each country, the project accompanies government and scientific actors in the formulation, implementation, monitoring and evaluation of the NAP process, and engages with wider stakeholders from civil society and the private sector. The main aims of the project were to strengthen national science-policy interfaces and increase the capacity and efficiency of science-based NAP formulation in Benin, Senegal, Burkina Faso and another 12 Sub-Sahara African LDCs.	Clear definition of the role of each party in the implementation of the projects, the governments from the three countries (Benin, Senegal, Burkina Faso) represented by the ministries in charge of environment and climate change in one hand, and the universities labs / scientists from the public universities of the same countries. Mainstreaming climate change adaptation in national, sectoral, and local development plans and conducting stocktaking analysis together with policymakers. Creation of thematic groups mobilizing scientists, government representatives and civil society actors for the collective conduct of sectoral climate vulnerabilities studies (agriculture, coastal zones, health etc.) and the dentification of adaptation options to be prioritized in adaptation planning and policymaking.

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			Climate Change / Government of Burkina Faso	Nazi Boni of Bobo Dioulasso, and University of Dédougou).			Development by the scientists and experts from Climate Analytics, of a detailed guide for conducting vulnerability studies, used by sectoral managers and officers (from the sectoral ministries and directorates/departments of State) to conduct vulnerability studies themselves. Establishment of a works supervision committee composed of representatives from the governments and the universities (resource persons).
22	Senegal, Ghana, Nigeria, and Kenya	African SWIFT	ANACIM, Direction de la protection civile (DPC), Division du Changement climatique (DCC/MEDD). Ministère des Pêches et de l'Économie Maritime (MPEM)	UCAD. (Climate researchers)	2017-2012	Improved response to high-impact events (e.g., onset of rains, heatwaves, dry spells, strong winds). Rapid emergency response to extreme events, such as urban flooding and prolonged droughts. Increase resilience, through integration of weather prediction into strategies for response to climate change.	Increase of forecast method in ANCIM. integration of nowcast system in ANACIM;
23	Senegal	FAR (Femmes et agriculture resiliente)	ANACIM ; ISRA ; Centre de Suivi Écologique (CSE)	UASZ (Climate physics, geography)	2019-2024	The FAR project aims to improve the well-being and resilience of farming households in the face of climate change in the regions of Kolda, Sédhiou and Tambacounda, through the sustainable intensification of irrigated rice, banana, and vegetable crops.	
24	Senegal; Ghana; and Malawi	QWECI (Quantifying Weather and Climate Impacts on Health in developing countries)	CSE, PNLP/MSAS; ANACIM	UCAD	2010-2013	QWeCI aims to: • Assist in updating communications infrastructure at preidentified locations. • Collaborate with local climate- and climate-sensitive disease experts to redefine disease-climate relations in specific areas and tailor state-of-the-art models to user requirements.	Increase collaboration between university and health agency. Access by scientist to health data

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						• Learn from the disease experts in the community and centralized health care units what would be the best possible format in which to present climate and climate-sensitive disease risk information	
25	Burkina Faso	LDC Initiative for "Effective Adaptation and Long-term Resilience" to Climate Change (LIFE-AR) project.	Permanent Secretariat of the National Council for Sustainable Development (SP/CNDD), under the Ministry of Environment, Green Economy, and Climate Change / Government of Burkina Faso	Climate Change Scientists, ecologists from Public Universities in Burkina Faso (University Joseph Ki-Zerbo of Ouagadougou, University Nazi Boni of Bobo Dioulasso, and University of Dédougou)	2020-2023	The US and Norway fund the project. This project supports six countries worldwide, and Burkina Faso is the only French-speaking country. The leading partner in the country is the Permanent Secretariat of the National Council for Sustainable Development (SP/CNDD). The project supports governmental and scientific actors in formulating, implementing, monitoring, and evaluating project activities. LIFE-AR aims to address these challenges by developing interventions that reach the whole of society, ensuring at least 70% of climate finance supports local-level action, investing in the building of in country capabilities, and engaging women, youth, indigenous people, and other traditionally excluded groups in developing solutions and making decisions. The International Union for Conservation of Nature (IUCN) is supporting the project in Burkina Faso to ensure the success of activities. "This support is focused on the development of financing mechanisms in order to facilitate the collection of resources necessary for the actions to be carried out in the field.	This initiative aims to scale up long-term climate adaptation interventions and investments, strengthen national institutions, systems, and capacities, and further develop national adaptation plans (NAPs), nationally determined contributions (NDCs) and broader national efforts to build resilience and fight poverty by 2050.
26	Burkina Faso	Capacity Building for climate transparency project	SP/CNDD	Climate Change scientists, ecologists, chemists, and foresters' scientists from various public Universities in Burkina Faso (University Joseph Ki-Zerbo, University Nazi Boni of Bobo	2020 - 2023	Training on greenhouse gas (GHG) inventory. Training on the development of GHG emission factors. Establishment of emission factors on AFOLU sectors.	The capacity of national MRV stakeholders is strengthened, and they are able to monitor data on activities in their sector. The national GHG inventory is improved.

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				Dioulasso, University of Dédougou).			
27	Burkina Faso	Third National communication on climate change project	Ministry of environment SP/CNDD	Climate Change scientists, ecologists, foresters/botanists from various public Universities in Burkina Faso (University Joseph Ki-Zerbo of Ouagadougou, University Nazi Boni of Bobo Dioulasso, University of Dédougou)	2017-2022	GHG inventory Studies on the development of allometric equations for tree biomass estimation	National GHG inventory is improved
28	Burkina Faso	REDD+ project	Ministry of Environment through Forest Investment Program (PIF) - Climate Funds	University of Ouagadougou	2016-2021	Training of Master and PhD students. Studies on the development of allometric equations for tree biomass estimation. Studies on the influence of climate change on the spatial distribution of plant species. Determination of the land use emission factor	Some emission factors are developed for REDD+ implementation.
29	Burkina Faso	Consolidating Local Environmental Governance Project	SP-CNDD (Permanent Secretariat - National Council for Sustainable Development)	Agronomists of University of Joseph Ki-Zerbo of Ouagadougou /AGRINOVIA		Capacity building of local wetland governance actors. The training course leads to a university certificate	A hundred or so actors trained and certified

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30	Burkina Faso	Ecosystem-based Adaptation Project (EBA-FEM)	SP-CNDD	Agronomists and ecologists of the Institute for the Environment and Agronomic Research (INERA)	2015-2020	This project is based on the national action programme for **adaptation** to climate variability and change (PANA), and is based on the following priority actions: ● development and management of the Beari waterhole. ● fodder production. ● development and management of natural plant communities.	
31	Burkina Faso	Support Programme for the Sustainable Management of Forest Resources (AGREF)	General Directorate for Sectoral Studies and Statistics (DGESS)	Scholarships were granted to agents/officers from Burkina Faso for training in national public universities in collaboration with the Senghor University of Alexandria in the field of forests and wildlife.	2018-2022	This programme aims to contribute to the protection and sustainable development of forest and wildlife resources by ensuring a healthy environment for the population.	
32	Burkina Faso	National Adaptation Plan to Climate Change	SP-CNDD	University Joseph Ki-Zebo of Ouagadougou / Laboratory of Mathematical Analysis and Equations (LAME) University of Cape Town	2016-2021	Processing and analysis of climate data and scenarios	National Adaptation Plan developed.

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33	Ethiopia	Operationalizing Green Economy Transition in Ethiopia	Ministry of Environment Forest & Climate Change (MEFCC)	Hawassa University, Assossa University, Bahirdar University and Mekele University	December 2014-October 2017	The background of the Project is funded by the UNEF. Develop locally adapted step-by-step guide on green economy planning and implementation at sub national level and national replication strategy for promoting green economy planning at sub national can enhance implementation of national green economy strategy. Provision of the required technical back-up support for the planning and implementation of Green Economy Transition at the selected pilot locations could enhance the implementation capacity. Moreover, identification of the key lessons and best practices from the overall implementation of the project and the specific applications at the pilot areas of the respective region is critical for scaling up. The objective of the project is to translate the national green economy and climate resilience strategies to concrete development plans on the local level by means of a toolbox that has been tested in sub national regions.	• Training of Trainers for National Technical Institutions (NTIs) on the content and use of the Toolkit that was prepared by the International Technical Institutions meeting held in Nairobi from July 26-31, 2014. • Working session on roll out activities of the project held from August 18-19/2015 in Addis Ababa. Its objective was to have a common understanding of the key activities that have to be undertaken at the country's level and develop an agreement on the modality of their implementation. • Regional training of trainers was held from Nov.11-13/2015 in Addis Ababa aimed at bringing together experts from ministries and national technical institutions from five countries in Africa along with regional partners to gain an overview of how natural capital and green economy concepts are linked and work together. • National level ToT/workshops have been conducted from Nov. 16-20/2015 in Addis Ababa aimed at introducing IGEIP, Step-by-step guide for IGEIP, demonstration of the tool-kit and sectoral planning phases at national level.
34	Ethiopia	Capacity Gap Assessment and	Environment, Forest &	Addis Ababa University,	2020 to 2021	The background for this capacity gap assessment is that, following set of the aforementioned recommendations,	• The efforts and achievements made so far in addressing the

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		Capacity Building Action Plan for the Implementation of the Updated Ethiopia's NDCs	Climate Change Commission (EFCCC)	Climate Science Centre		updated NDCs across sectors was developed by large group of organizations. The NDCs updates provide a suite of immediate and long-term enabling measures that will result in strengthened action across all sectors and planning levels, with economy-wide benefits. Key areas of updated NDCs are in line with supporting and fostering the implementation of 10-Years Perspective Development Plan. The objectives of the assessment are to assess progress and to identify technical and capacity challenges at systemic, institutional, and individual levels that will affect the implementation of recently updated NDCs- of the agriculture and forest sectors; and ultimately to develop action plans to overcome identified capacity constraints for achieving the targets of Updated NDCs and PDP-10 set by the Ethiopian government and to make sure the current and future economic development is sustainably climate proofed and resilient. Methodology of the assessment uses tier level approaches consisting of four steps were used to collect relevant data sets for performing the tasks stated in the agriculture and forest sector (Task 1-4) following the assessment workflow shown as follows: ● **Step 1.** Literature review. ● **Step 2.** Conducting Gap assessment. ● **Step 3.** Primary data collection; and ● **Step 4.** Obtaining feedbacks/comments	capacity gaps had been evaluated, identified and prioritized; ● The existing capacity gaps and needs that may adversely affect the implementation of updated NDCs was assessed and identified; ● Actionable recommendations to bridge the gaps for meeting targets set for updated NDC and 10YPDP actions in the Agriculture and Forest sectors has identified; and ● Institutional Capacity Development Plan has prepared for implementing updated NDCs interventions and for supporting 10YPDP implementation in the each of the agriculture and forestry sectors.
35	Ethiopia	Develop MRV guideline	Ministry of Agriculture, Industry, Livestock, Transport of the Federal Republic of Ethiopia	Addis Ababa University (CSC), Wondogenet College of Forestry	Jan 2015-Oct 2017	Greenhouse gas emissions from deforestation and forest degradation have come to the forefront of the international discussions on climate change given their overall impacts. Existing Clean Development Mechanisms (CDM) activities, represent an existing opportunity for scaling up mitigation activities but they require in internationally recognized Monitoring Reporting and Verification (MRV) systems that can be used to track progress towards national mitigation targets. Thus, this project was set out to develop MRV systems and guidelines for the forestry, livestock, agriculture, and transport sectors.	MRV guideliens were prepared for agriculture, forestry, Industry, livestock and Transport sectors of the federal Democratic Republic of Ethiopia. The activity was financed by the Forest Carbon Partnership Facility (FCPF) grant to the REDD+ Readiness process.

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36	Ethiopia	Climate Financing	House of Peoples Representatives (House Speaker's office, Environment, forest, and climate change commission	Addis Ababa University Climate Science Centre,	2018	A total of 1,222 climate-related projects were committed to Ethiopia in the period 2013-2017, with the related total climate commitments summing to 2.87 billion USD, of which 1.1 billion USD was committed in 2017 over 326 projects. The four largest providers of climate finance were the World Bank (WB), African Development Bank (AfDB), United States and United Kingdom. As some of these funds come through loan, the members of parliament need to be well equipped with the national needs for adaptation to support the passing of bills in the house of parliament.	The Federal Members of Parliament were trained on climate financing; experts of MoA and environment, forest and climate change commission were trained in climate change adaptation, mitigation
37	Bangladesh	Multi Hazard Risk Atlas for 10 selected sub-districts in Bangladesh	Comprehensive Disaster Management Program (CDMP) of the Government of Bangladesh (GoB)	Centre for Climate Change and Environmental Research (C3ER), BRAC University	August 2013 -December 2013 (5 Months)	To attain the main objective of the study which is to facilitate the local government authority with easy, accessible, and credible information and reference for local level risk reduction and adaptation planning, the research has been executed by using the following steps: • Identification of current natural hazards in Bangladesh • Integrated risk and vulnerability analysis. Goals: 1. Conduct field survey to collect baseline data based on the selected vulnerability assessment indicators. 2. Analyze data and prepare multi-hazard risk atlas considering climate change scenario and draw the sub-district wise base profile for facilitating the community-based risk assessment process. Identification of current natural hazards in Bangladesh	By doing this project different districts (Barguna, Noakhali, Rangpur, Sirajganj, Rangamati, Madaripur, Chapai Nawabganj, Bagherhat, Satkhira, Sunamganj) natural hazards were identified and community-based risk assessment process were analyzed.
38	Bangladesh	Third National Communication Project	Department of Environment (DoE), Government of Bangladesh	Centre for Climate Change and Environmental Research (C3ER), BRAC University	June 2015-December 2016	Review and examine climate change related policies, strategies, plans and other national documents and suggest an appropriate framework; the national level situations on climate change governance and develop a comprehensive and effective climate change governance structure for the country; develop a Climate Finance Map; Mobilize a Core Inventory Team involving sector-specific experts. Develop a work programme for the GHG inventory preparation etc.	Preparation of inception report, quarterly progress report, mid-term report and final report were completed in this project.
39	Bangladesh	Promoting private sector investment through large scale adoption of energy saving technologies	Infrastructure Development Company Limited (IDCOL) and KPMG	Centre for Climate Change and Environmental Research	July 2019-December 2019	The project aims at promoting private sector investments in energy efficient technologies & equipment for garment sector in Bangladesh, through four selective Banks/FIs. The project team aims to help IDCOL to enhance the competitiveness of economies while also alleviating energy poverty with more	Prepare inception report, conduct feasibility study and data collection, Stakeholder consultation, and conduct environment, social and gender studies, risk assessment,

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		and equipment for garment sector of Bangladesh		(C3ER), BRAC University		available energy for the same levels of input. Lowering cost of the economy by improving Energy productivity gains, enhances the supply security, and reduces the need to develop new sources of energy supply to serve those without access to modern energy services for health and education enhancement. Accelerated energy efficiency and therefore create attractive green jobs and businesses. Prepare inception report, conduct feasibility study and data collection, Stakeholder consultation, and conduct environment, social and gender studies, risk assessment, Identification of programme/project-level indicators and Support for PPF preparation.	Identification of programme/project-level indicators and Support for PPF preparation.
40	Bangladesh	Strengthening Gender-Responsive Climate Actions in Bangladesh	Bangladesh Climate Change Trust	Centre for Climate Change and Environmental Research (C3ER), BRAC University	January 2022 September 2022	The main objective is to strengthen the National Capacity on Gender- Responsive Climate Change Investments and Actions. Specific Objectives: • To collect data and information for reviewing and updating the Climate Change and Gender Action Plan (CcGAP) from both local and national level • To conduct Baseline Survey for the women-led climate adaptive schemes implementing in the project working areas • To implement gender-sensitive climate scheme in the selected areas in Bangladesh, and • To provide skill development training to the selected community members in the project working districts.	Data collection for Updating Cc GAP: Bangladesh Organize 7 batches (total of 140 participants) of training of BCCT Officials and Planning Officials from Key Ministries and Departments on the Gender Guideline and Application Template of BCCT. Develop training module BCCT Officials focusing on the gender guideline and gender lens. Conduct a Baseline Survey Provide skill development trainings to the selected communities of climate vulnerabilities on the Adaptation Schemes.
41	Bangladesh	Capacity Building for Nature-Based Solutions to Climate Change Adaptation	General Economic Division (GED), Planning Commission of the Government of Bangladesh	International Centre for Climate Change and Development (ICCCAD), IUB	February 2020 – November 2020	This project is contributing to the on-going efforts of the 'NbS Initiative' of the University of Oxford to mainstream NbS as a crucial resilience building option through networking, evidence-base creation, capturing NbS knowledge, experiences, and processes, and disseminating the same through appropriate national and international platforms, channels, and processes. Establishing and operationalize a	To create and harness opportunities to integrate NbS within the 8th five-year plan of the Government of Bangladesh.

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			and supported by the University of Oxford			'NbS Bangladesh Portal' is a major activity that the project is trying to achieve. The project is also working on creating and harnessing opportunities to integrate NbS in the development planning of the country. At NbS Bangladesh, collecting scientific evidence and evidence from practice on the effectiveness of existing nature-based solutions projects from across Bangladesh, and identifying areas that could benefit from the implementation of NbS in future. Our current focus is building an evidence base for the role of nature-based solutions for economic development in Bangladesh. The project is being funded by the University of Oxford, and the part of supporting the development of NbS Bangladesh Portal is being carried out by ICCCAD.	To document and disseminate Bangladesh's NbS activities, experiences, and processes. Arranging workshop and learning hub are the best way to complete goals. The purpose of the workshop was to explore NbS to effectively enable sustainable development by bringing together the diverse range of government officials from the Planning Commission and the relevant line ministries. There are opportunities to consider the NbS in the forthcoming development planning process, including the 8th Five-Year Plan (2020−2025) and other development plans and strategies. The discussion during the meeting suggested to look beyond policy planning and focus more into the implementation of the policy.
42	Bangladesh	Universities as knowledge brokers in the governance of climate resilience		International Centre for Climate Change and Development (ICCCAD), IUB	01 February 2019 –31 January 2020	This project is concerned with the role of universities as knowledge brokers within climate resilience networks. It explores whether and how universities can serve to improve interactions by playing a role as knowledge broker in the production, use and translation of knowledge. It will collect data from academics in four universities (in Bangladesh, Uganda, Germany, and the UK) to analyze the range and extent of their networks. It aims to understand the architecture of existing networks between universities and public, private, and civil society sectors dealing with the governance of climate change resilience. Future needs, opportunities, and barriers for engaging universities as knowledge brokers will be assessed. The methodology of the research will combine quantitative and qualitative data. Detailed information on knowledge brokering	Strengthened role of universities as in 'real world' networks to build long term climate capacity. Improving universities range and quality of ongoing stakeholder interactions. Improved knowledge sharing between South-South, North-South and South-North based on more equal exchange

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						and knowledge translation activities of selected academics will be systematically collected for analyzing social relationships. The team will also engage with broader stakeholders for understanding and appreciation of how knowledge governance for climate resilience functions and can be improved.	
43	Bangladesh	Locally Led-Adaptation (LLA) Programme		International Centre for Climate Change and Development (ICCCAD), IUB	23-24th May 2022 (Workshop)	International Centre for Climate Change and Development (ICCCAD) is working to mainstream LLA by conducting research and capacity-building; promoting the inclusion of the most vulnerable individuals; facilitating knowledge sharing through a partnership with national and international networks in the Annual Gobeshona Global Conference; and investing in local institutions to leave institutional legacies. The current stream of work with IIED, WRI, and other LLA consortium partners on these components- governance of an active community of practice; peer-to-peer learning; co-designing the long-term strategy of LLA to generate knowledge and evidence on LLA. ICCCAD collectively alongside 9 other institutions are working globally to unfold the 8 principles of LLA in the context of local communities. ICCCAD has already undertaken and designed several projects, and case studies focusing on LLA. Besides, there are a number of publications authored by ICCCAD team. ICCCAD along with IIED, and WRI are in the process of developing a synthesis paper highlighting case studies from Bangladesh that aligns with the LLA core principles. Goals To increase the evidence-base of success stories and challenges of LLA from Global South. Lead advocacy, research, knowledge management, capacity building, co-production of knowledge, and implementation for LLA Identify the relevant stakeholder in Bangladesh and Global South to scale up activities on LLA funding and implementation and monitoring and evaluation	ICCCAD, with the support of IIED and FCDO organized a two-day consultation on Locally led Adaptation (LLA) in Bangladesh at Six Seasons Hotel, Dhaka. More than 60 participants in this consultation representing NGOs, INGOs, universities, private sector, think tanks took part. The consultation enabled to understand the importance of incorporating the 8 principles of LLA in planning, design and implementation of climate change adaptation projects and programmes. One of the major outcomes of the consultation was the launch of 'National Platform on Locally-Led Adaptation, Bangladesh (NPLLA, Bangladesh).'
44	Bangladesh	Climate Change and Gender		International Centre for Climate		The position of women in policy framework of Bangladesh is mixed. Bangladesh developed number of policies and sectoral strategies to ensure gender equality. Thus, the key objectives	Revision of Climate Change Gender Action Plan of Bangladesh (ccGAP Review):

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				Change and Development (ICCCAD), IUB		of ICCCAD Gender Programme are to mainstream gender equality and social inclusion approach in all its research initiatives, project, and programme intervention, while working with partners and communicating any research results as well as in policy advocacy of climate change in a gender responsive manner. With this in mind, ICCCAD values the human rights principles of fairness, respect, equality, dignity, and autonomy while conducting research, policy advocacy and programme implementation activities. ICCCAD believes that development process should consider the inclusion of the whole of society approach and the research should take into account gender and social inclusion, through participatory result. While in the climate change entity; women, children, elderly people, persons with disabilities, poor and hard-core poor fall under the category of vulnerable groups. Furthermore, ICCCAD also intends to promote women's participation in policy level processes shaping the climate change agenda, as well as advocates for a better understanding and acknowledgement of women's needs and roles in combating climate change. Major initiatives and projects under Gender Programme: 1. Revision of Climate Change Gender Action Plan of Bangladesh (ccGAP Review) 2. SAKTEE project (Scaling climate change adaptation knowledge and technologies for empowering women, and to enhance social equity and disaster resilience in Bangladesh) LUCCC Gender Group	The ccGAP was prepared in by the Ministry of Environment and Forests, with financial support from the Government of Finland and technical support from International Union for Conservation of Nature (IUCN). The document takes into account four key pillars of Bangladesh's Climate Change Strategy and Action Plan (BCCSAP) 2009, namely a) Food Security, Social Protection and Health; b) Comprehensive Disaster Management; c) Infrastructure; and d) Mitigation and Low Carbon Development. The other two pillars of the BCCSAP, Research and Knowledge Management and Capacity Building and Institutional Strengthening, have been considered as cross-cutting issues. This plan provides guidance on policy issues and initiatives that need to be taken into consideration by government and development practitioners, in collaboration with different institutions to address climate change in a gender responsive manner over a timeframe of five years, from 2013/14-2018/19. ICCCAD in collaboration with ActionAid Bangladesh and UNWomen planning to drive a process of stocktaking under ccGAP and review the current ccGAP to address the emerging climate change challenges particularly

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							gender issues in urban context in consistence with the Sustainable Development Goals, Paris Agreement and Sendai Framework. SAKTEE project: This is a gender focused 3 years duration action-research project with thematic areas on building climate change and disaster resilience of the marginalized population like women and young girls in Bangladesh. The project is funded by IDRC and being implemented by BCAS in partnership with ICCCAD, University of Manitoba and Department of Women Affairs (DoWA), Ministry of Women and Children Affairs, Bangladesh Government. The project aims to improve understanding of the dynamics of the complex set of factors that aggravate differentiated climate change and disaster impacts and in so doing to fill identified knowledge gaps. Feminist and Participatory Action Research approaches will be applied to all components of the project. The project intends to identify best practices in disaster and climate resilience and evaluate innovative climate change adaptation technologies in water and agriculture for scaling and implementation through multi-level institutional integration and adoption. Empowerment of women,

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							youth/students, and disadvantaged families through enhancing their knowledge, technical know-how and income-generation options and skills will be a consistent focus. LUCCC Gender Group: The Least Developed Countries (LDCs) Universities Consortium on Climate Change (LUCCC) is a South-South, long-term capacity-building programme. It is currently comprised of ten universities from the LDCs which form a network to exchange knowledge on climate change, collaborating through capacity building, training, and research. The LUCCC Consortium is managed by the International Centre for Climate Change and Development (ICCCAD. To advance the cause of the women in climate change arena and to build the capacity of the female practitioners within the LUCCC universities and national level, a LUCCC Gender group is formed where Bangladesh is playing the Moderator role. The key objectives of the formation of LUCCC Gender and Climate Change Group is to focus on how to engage them with climate change issues, the role of the group, scope of activities and how to strengthen the LUCCC platform with regards to gender and climate change.
45	Bangladesh	Capacity Building, Research	United Nations University –	International Centre for	01-01-2013	The aims of the Gibika (Research to Action) project are to advance a scientific understanding of livelihood resilience in	After two years of research, Gibika started its Action phase in January

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		Project on Livelihoods, Community-Based Adaptation, Resilience (Gibika)	Institute for Environment and Human Security (UNU-EHS) and Munich Re-Foundation (MRF	Climate Change and Development (ICCCAD), IUB	To 01-01-2018	Bangladesh, and to apply scientific conclusions towards community-led solutions (projects in the communities) that improve the living conditions of vulnerable people. When livelihood systems are not resilient, environmental shocks can have long-term impacts on human well-being and development goals. By implementing community-led solutions, this project can promote livelihood resilience, and protect progress toward development. The partnership is a five-year research-to-action partnership between International Centre for Climate Change and Development (ICCCAD), United Nations University – Institute for Environment and Human Security (UNU-EHS) and Munich Re-Foundation (MRF) with aim of improving the living conditions of people in our seven sites in Bangladesh through scientific research and community-led action. Key goals Rigorous scientific knowledge about resilience in livelihood systems. Community empowerment in decision-making and implementation. Livelihood transformation in the focus communities in Bangladesh. Disseminate findings, insights, and experiences to influence national policy and facilitate wider use. Research methods The research methods have been selected to achieve the project goals: Participatory Rural Appraisal (PRA) Household surveys Livelihood history interviews Focus group discussions Expert interviews Community consultation Implementation activities	2016. Based on the research findings, Gibika project started working on Disaster preparedness at Dalbanga South village in Barguna district, and it mainly focused on community capacity development. The project finds lack of knowledge on Early Warning System (EWS) and disaster preparedness as a key reason for rendering disaster reduction efforts unsuccessful. Recognizing the importance of continuity in learning the project has set up periodic courtyard learning sessions on EWS and disaster preparedness that are to be conducted annually prior to the two cyclone prone seasons and facilitated by people from the local community. Local people have been trained so that they are able to continue conducting these sessions among themselves beyond the project period. The project has employed other participatory methods such as mock drills, street dramas, risk mapping and evacuation to further facilitate mutual learning. The project has now expanded its study area and is currently carrying out the same activities in five new villages adjacent to Dalbanga South.

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						Project evaluation tools.	
46	Malawi	Capacity Building for Managing Climate Change (CABMACC) in Malawi	Norwegian Government and the Government of the Republic of Malawi: Ministry of Climate Change and Environment Management. National Commission for Science and Technology. Ministry of Agriculture, Irrigation and Water Development. Ministry of Finance.	Lilongwe university of agriculture and natural resources The main scientists involved were climate change experts, ecologists, and animal scientists and extensionists.	2013–2018	With support from the Government of Malawi through the Government of Norway, LUANAR was coordinating a national programme called "Capacity Building for Managing Climate Change in Malawi" (CABMACC). The overall goal of the programme was to “enhance innovative responses and capacity for adaptation to climate change in Malawi and specifically to (i) enhance capacity of the Lilongwe University of Agriculture and Natural Resources (LUANAR) in research and teaching for climate change mitigation and adaptation (ii) develop new knowledge, technologies and systems to enhance climate change adaptation and mitigation (iii)enhance capacity of the University and relevant key stakeholders in in climate change outreach and advocacy enhanced. CABMACC was a collaborative programme involving LUANAR, Government of Malawi and Norwegian University of Life Sciences. The collaboration implemented seven (7) sub research projects with five (5) Norwegian partners. Government partners and beneficiaries were those working in Extension Planning Areas (EPAs) of Rumphi, Mzimba, Nkhotakota, Balaka, Dedza and Phalombe districts. While capacity building was the central intervention of the programme, Research-Policy Dialogue was the main approach to the collaboration in the CABMACC programme. We describe only two of the seven subprojects. One of the seven projects was called ‘Techno-economic feasibility of decentralized Production of Bioethanol using waste from Cassava' is being coordinated by Industrial Research Centre (IRC) which promoted production of ethanol by communities in Nkhota-kota and assess the potential of ethanol processing effluents as stock feed and organic fertilizers. The policy implications of this project included reduction in dependence on fuel wood and utilization of waste for livestock and crop production. It was designed to increase the	Capacity of stakeholders increased in climate change response. Innovative research, best-bet practices and technologies developed on climate change adaptation and mitigation are undertaken. Collaboration between LUANAR and government and the Norwegian University of Life Sciences (UMB) enhanced. University staff participate effectively in outreach and dissemination programmes. Successful collaboration entails defined roles and responsibilities. Government played a role in facilitating working relationship based on capacity development needs on adaptation at national level. The government of Norway was a donor and the UMB worked with LUANAR in research and training.

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						adaptation capacity of communities through creation of employment and increased incomes. This project was a model partnership with large commercial firms such as ETHCO. It was meant to build the capacity of communities to operate community-based ethanol production plants and promote cassava production as a commercial crop. The CBMCC programme also supported a project hinging on gender and female farmer participation on conservation agriculture. This research project aimed to document the multiple factors that influence female farmers', adoption, or lack of, and spillover effects of Climate Smart Agriculture technologies and describe female smallholder farmers' perceptions and characteristics of effective CSA technologies. The project as relevant to the policy-practice dynamics in the extension services. One aspect of the CABMACC programme was the inclusive governance structure. CABMACC was managed by a nationally instituted Programme Advisory Committee (PAC). The Chairperson of the PAC was the Principal Secretary for Climate Change and Environmental Management. Members of the Programme Advisory Committee (PAC) included: (i) Ministry of Climate Change and Environment Management (Chair). (ii) National Commission for Science and Technology. (iii) Ministry of Agriculture, Irrigation and Water Development. (iv) Ministry of Finance. (v) Office of the Deputy Vice Chancellor – LUANAR (Deputy Chair). (vi) Dean of Postgraduate Studies (LUANAR). (vii) Directorate of Research and Outreach (LAUNAR). (viii) National Farmers' Association of Malawi (NASFAM). (ix) Co-ordination Unit for the Rehabilitation of the Environment (CURE). (x) Programme Coordinators (Malawi and Norway).	

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						(xi) The LUANAR Registrar shall be the secretary of PAC.	
47	Uganda	Economic assessment of the impacts of climate change in Uganda.	Climate and Development Knowledge Network (CDKN), and Uganda's Ministry of Water and Environment (MWE), Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), Ministry of Energy and Mineral Development (MEMD), Ministry of Works and Transport (MoWT), Ministry of Finance Planning and Economic Development (MoFPED) & Kampala Capital City Authority	Makerere University: Disciplines - agriculture, economics, environment, engineering, climate change	2014 - 2016	Conducted a study that used climate projections, economic modeling, and case studies to generate evidence of impacts of climate change and adaptation actions, and the cost of inaction across four sectors in Uganda i.e., agriculture, water, energy, and infrastructure (transport and buildings). In addition, the study conducted case studies at local level including: (i) Kampala urban area (flooding impact on housing and infrastructure, (ii) Karamoja (focus on drought impact on agriculture and livestock), Mt. Elgon region focusing on coffee production; Mpanga river catchment focusing on water and energy; a health case study in the districts of Kabale and Tororo, focusing on malaria prevalence.	The study produced a consolidated report, and four sectoral reports (agriculture, water, energy, and infrastructure) documenting the economic cost of climate change in Uganda. The study's main message was that the "cost of inaction" on climate change in Uganda was 20–24 times higher than the cost of action and/or adaptation, estimated at between US$ 273–427 billion Study also provided costings for not pursuing adaptation across different sectors. Study findings facilitated. the integration of climate change in national and sector. development plans The visible and relevant evidence generated. helped make the case for investment and strengthen. institutional structures.
48	Uganda	Migration, Environment and Climate Change (MECC) in Uganda	Climate Change Department, Ministry of Water and Environment	College of Agricultural and environmental Sciences &	October 2020 - March 2022	The primary objective of the collaboration was to inform and strengthen program responses and longer-term policy decisions on environmental migration and disaster displacement through the provision of evidence and verifiable data in Uganda.	Produced a publication: "Assessing the evidence: migration, environment and climate change nexus in Uganda".

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				Makerere University Centre for Climate Change Research Change and Environmental Research (C3ER), BRAC University		The collaboration was executed through: Conducting research on the migration, environment, and climate change nexus in Uganda Use of participatory mobility mapping (PMM) methodology to understand environment and climate induced migrations in Karamoja, Teso and Mt. Elgon sub-regions of Uganda. Training of district staff on managing environment and climate change induced migrations	Produced environmental / climate migration Displacement Tracking Matrix (*DTM*) Reports / dashboards on flow monitoring. District technical staff capacitated to handle environment and climate induced migration
49	Uganda	Universities as knowledge brokers in the governance of climate resilience	Ministry of Water and Environment	Makerere University	February 2019 –January 2020	This project analyzed the role of universities as knowledge brokers within climate resilience networks. It explored whether and how universities can serve to improve interactions by playing a role as knowledge broker in the production, use and translation of knowledge. Data was collected from academics in four universities in Bangladesh, Uganda (Makerere University), Germany, and the UK to analyze the range and extent of their networks. The study documented the architecture of existing networks between universities and public, private, and civil society sectors dealing with the governance of climate change resilience. It also documented the needs, opportunities, and barriers for engaging universities as knowledge brokers. The study methodology combined quantitative and qualitative data. Detailed information on knowledge brokering and knowledge translation activities of selected academics was systematically collected for purposes of analyzing social relationships. The study team engaged with broader stakeholders for understanding and appreciation of how knowledge governance for climate resilience functions and can be improved.	Produced an article publication titled: “University-based researchers as knowledge brokers for climate policies and action”. The study provided an in-depth understanding of how (and the opportunities and barriers) university researchers engage in knowledge brokering to inform climate policy and practice. The study findings provide avenues for strengthening the role of universities as in ‘real world’ networks to build long term climate capacity. Improved knowledge sharing between South-South, North-South and South-North based on more equal exchange
50	Uganda	1. LDC initiative for effective adaptation and resilience	Ministry of Water and Environment /	Makerere University Centre for Climate	June 2021 – ongoing.	The LIFE-AR initiative in Uganda focuses on strengthening in-country capacities and capabilities to mobilize and manage climate funds for locally led and prioritized adaptation action. MUCCRI and UMI are supporting the design of a	The following products are envisaged: A DCF guidelines – an operational manual detailing procedures and processes

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		(LIFE-AR) in Uganda	District Local Governments.	Change Innovators (MUCCRI) / Uganda Management Institute (UMI) (and IIED)		Decentralized Climate Finance (DCF) mechanism for Uganda under the LIFE-AR initiative.	associated with implementing the DCF approach. a Detailed Capacity Needs Assessment (CNA) report Training Curriculum and training materials Training of districts on the DCF
51	Uganda	Designing a Climate Change Knowledge Management System	Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Ministry of Water and Environment – Climate Change Department.	Makerere University – College of Agricultural and Environmental Sciences	April 2021 – ongoing to be completed March 2023	The FAO supported initiative is aimed at developing an integrated system to generate and disseminate knowledge on climate risks and emerging adaptation options/best practices at district and national level. The project will: (i) set up/strengthen district knowledge management and communication teams (KMCT) in target districts; (ii) (ii) equip the districts with the CCA Knowledge Base (CCAKB) software and necessary equipment (iii) train district staff in the use of the CCAKB and in knowledge management and communications; (iii) expand the CCAKB at the national level; (iv) provide training in the use of the CCAKB and knowledge management and communications tool at the national level.	Assessment and documentation of the climate change knowledge management (KM) needs, gaps, and challenges Developing a computer based CCAKB and national climate change KMS that addresses the KM needs and gaps. Developing KM toolkits and training manuals. Training of technical staff at district and national level in KM and using the developed CCAKB and national KMS.
52	Uganda	M.Sc. Climate Change and Sustainable Development	Ministry of Water and Environment	Makerere University, College of Agricultural and Environmental Sciences	2020 - ongoing	A master's degree Programme in Climate Change and Sustainable Development has been developed in partnership between the University and government ministry to produce graduates that will address the climate and environmental challenges faced by the country. The designed MSc programme came in order to respond to the Rwanda needs as stressed in the Uganda Vision 2040, National Development Plans, the National Climate Change Act, and the national medium to long-term climate change strategies.	Producing a critical mass of graduates / workforce that clearly understand the climate and environmental challenges and have capacity to help address them and promote sustainable development in Uganda and the region.
53	Mozambique	Institutional Capacity Strengthening project for NDC implementation	Ministry of Environment, Interministerial Group in CC,	University Eduardo Mondlane	2018-2024	The project aims at responding to the MTA and UEM institutional gaps for effective NDC implementation and tracking progress. Capacity building activities are defined to benefit MTA, line ministries, UEM	Capacity development for elaboration of UNFCCC documents such as: BUR, NDC

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			Swedish Agencies				Sectors are aware and clear on the role and responsibility
54	Mozambique	Development of capacity building programs for relevant actors in the irrigation sub-sector	Ministry of Agriculture, Institute of irrigation	University Eduardo Mondlane	2015-2016	Training packages develop to benefit sector technicians and extension services	Training packages developed and implemented
55	Mozambique	Review of the local adaptation plan development guide	World Vision	University Eduardo Mondlane	2016-2017	Technical assistance to National Directorate of Climate change in elaboration of guideline	Guideline for elaboration of Local adaptation plans developed - pioneer in included social protection
56	Mozambique	Priorizar	IIED, UEM, Save the Children, MTA, Mabote Administration	University Eduardo Mondlane	2017-2019	Implementation of decentralized district finance project to assist in capacity development, strengthening livelihoods and productive social protection schemes (investment in income generation activities).	Good example of investment in local capacity development under decentralization efforts; establishment of active participation scheme for project beneficiaries that last beyond project time
57	Mozambique	Identification, training, management and development of Agrarian Extension service providers and support to establish the Matching Grants concession system to beneficiaries in the Districts covered by the PRONEA Support	PSP	University Eduardo Mondlane	2016	Training in extension approaches and implementation of matching grants	capacity of extension services improved
58	Mozambique	Strengthening the capacities of key players in the timber market in Mozambique, especially the private sector, to implement the country FLEGT action plan.	FAO, Timber Association	University Eduardo Mondlane, Forestry, and legal enforcement	2015	Capacity-building services under the project: to strengthen the capacity of key actors in the forestry sector	

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59	Mozambique	The design and implementation of the training course in teaching methodologies based on professional skills for trainers of secondary level agricultural institutes (Certificate B) together with the Faculty of Education, and with funding from PRETEP (Italy Cooperation).	Ministry of Science and Technology	University Eduardo Mondlane (agronomy, forestry)	2014	Curriculum development	Curriculum
60	Mozambique	Elaboration of 1st Biennial report	Ministry of Land and Environment	University Eduardo Mondlane	2020-2022	UEM to support the development of the first Biennial report of Mozambique.	BUR report to be submitted to UNFCCC


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