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Background document

Adapting to climate change: agriculture, land and water management – GCCA experience

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Adapting to climate change: agriculture, land and water management – GCCA experience

1. Background, scope and objective

The EU is taking decisive action on addressing climate change and making it an integral part of EU development aid. In 2007, it established the Global Climate Change Alliance (GCCA), its flagship initiative to strengthen dialogue, exchange of experiences and cooperation on climate change with developing countries most vulnerable to climate change, in particular the Least Developed Countries and the Small Island Developing States.

Since its inception, EU GCCA funding has been used to formulate and implement programmes aimed at addressing climate change in a range of different countries and contexts. As part of knowledge management efforts, the GCCA has prepared a series of five papers ("background documents") intended to inform the Global Learning Event to take place in Brussels in September 2012.

The objective of the background documents is primarily to identify key insights, emerging lessons and challenges arising from GCCA experience in the formulation and implementation of interventions. Observations are presented and discussed, with occasional references to international knowledge and experience, to support the collection of additional or more detailed insights and to inform better practice; they do not constitute and should not be interpreted as an evaluation.

The papers have been prepared using available information on GCCA-supported interventions. This includes documents prepared during project formulation, updates provided by EU Delegations, from a small number of visits to GCCA supported interventions undertaken by members of the GCCA Global Support Facility (GSF), and during specific side events held during the series of regional workshops on "Mainstreaming climate change into national development planning and budgeting" in the Pacific, Africa, Asia and the Caribbean. It is acknowledged that these approaches to information collection are not comprehensive, and that as such, the compiled descriptions and analysis of GCCA-supported interventions, on which these papers are based, may contain errors and/or omissions. As such, the papers are presented as a basis and framework to collect information, experience and knowledge from those most directly involved in GCCA-supported interventions across the initiative. The information, experience and knowledge collected at the Global Learning Event will then directly provide the material to prepare the forthcoming publication "GCCA achievements and lessons learned" that will be presented at the Qatar Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC) in November 2012.

This paper addresses adaptation to climate change, which involves adopting measures to protect people and natural systems against actual and expected harmful effects of climate change; to exploit any opportunities it may generate; and to ensure the sustainability of investment and development interventions in more difficult climatic conditions (Klein et al, 2005; IPCC, 2007; EC, 2009; World Bank, 2010). It focuses in particular on adaptation in agriculture, land and water management.

2. Overview of GCCA adaptation-related interventions

The GCCA promotes improvement in the knowledge base of the effects of climate change, the understanding of vulnerability, and the design and implementation of appropriate adaptation actions. In some cases, adaptation is the main focus of the intervention. In other cases, adaptation complements work on another priority area of the GCCA, typically climate change mainstreaming but also disaster risk reduction and, occasionally, reducing emissions from deforestation and forest

degradation (REDD). Some programmes focus on a single sector; many support adaptation measures across various sectors, which may include agriculture, land management, forestry, water and sanitation, ecosystem protection and rehabilitation, coastal zone management, fisheries, infrastructure, health, and waste management. Most adaptation interventions combine a 'soft' component (e.g. capacity building) with a 'hard' component (e.g. building of small infrastructure).

GCCA interventions frequently build on National Adaptation Programmes of Action (NAPAs) and other national plans – and in some case take them further, by building on what was initially a project approach to develop a strategic approach aimed at climate change mainstreaming.

The GCCA currently supports and/or is in the process of formulating programmes with a focus on climate change adaptation in nineteen countries and, at regional level, in all regions in which the GCCA operates. Twenty-one programmes with a specific focus on adaptation in general, on adaptation in agriculture, land and/or water management, as well as Maldives where adaptation measures are focused on coastal ecosystem protection and restoration, are described in this paper. For each of these, a summary of activities and expected results, as well as some key insights and emerging lessons, is provided in Table 1.[1]

Table 1 – Summary of GCCA adaptation-related programmes

Country or region Duration GCCA budget Sector(s) concerned	Main activities and/or expected results	Key insights and/or emerging lessons
Africa (ClimDev) 2012-2015 €8.0 million Overall development / poverty reduction; agriculture; energy; food security; health; water and sanitation	• Packaging and wide dissemination of climate information • Strengthening of data analysis capacities in support of climate policy and management • Contribution to policy dialogue and development policy-making processes at the continental, sub-regional, national and local levels	• Comprehensive climate- and environment-related data are required to underpin adaptation • Beyond data collection, research and strong knowledge management systems that consolidate available data are further needed to support the analysis of climate change adaption (and mitigation) options
Bangladesh 2011-2015 €8.5 million Overall development / poverty reduction; agriculture; coastal zone management; infrastructure; land management; natural resources	• Support for implementation of the Bangladesh Climate Change Strategy and Action Plan, aimed at improvements in food security, social protection and health; disaster risk management; the building of climate-resilient infrastructure; improved knowledge and understanding of CC and its impacts; less carbon-dependent development; and institutional strengthening and capacity building	• Targeting the most vulnerable people and areas, and engaging local communities, are important aspects of the response to CC • Research and modelling activities are needed to increase the knowledge base for successful adaptation
Belize 2012-2015 €2.9 million Overall development	• Technical assistance to the newly established National Integrated Water Resources Authority (NIWRA) • Development and enforcement of by-laws and	• Supporting adaptation at the level of a whole sector gives a strategic dimension to the intervention • Pilot, community-based projects

[1] The information presented in Table 1 is extracted from a more detailed Annex to the background documents, developed on the basis of documents prepared during project formulation, updates provided by EU Delegations, from a small number of visits to GCCA-supported interventions undertaken by members of the GCCA Global Support Facility (GSF), and during specific side events held during the series of regional workshops on "Mainstreaming climate change into national development planning and budgeting" in the Pacific, Africa, Asia and the Caribbean. The complete Annex for this paper will be available in hardcopy at the Global Learning Event, while each individual entry will be shared in advance of the Global Learning Event with the appropriate national / (sub) regional delegate(s) for their review and comment.

Country or region Duration GCCA budget Sector(s) concerned	Main activities and/or expected results	Key insights and/or emerging lessons
/ poverty reduction; water and sanitation	regulations necessary for enabling action by the NIWRA • Preparation of water resources vulnerability profiles and associated water safety plans • Water resources assessment • Implementation of pilot projects addressing issues such as droughts, floods, soil erosion and salinisation	complement this strategic approach and support the identification of effective adaptation options in the field • In the water sector, integrated approaches to resource management are essential for enhancing adaptive capacity
Bhutan 2012-2016 €4.4 million Overall development / poverty reduction; agriculture	• Preparation and endorsement of a Climate Change Adaptation Action Plan for the Renewable Natural Resources sector • Mainstreaming of the Action Plan into the 11th Five-Year Plan (11th FYP) • Implementation of actions reflected in the 11th FYP (focus on the agricultural sector) • Establishment of an institutional framework allowing a multi-sectoral approach to CC adaptation	• Supporting adaptation at the level of a whole sector gives a strategic dimension to the intervention • The improvement of sector performance monitoring systems is key for successful mainstreaming of CC adaptation
Caribbean 2011-2014 €8.0 million Agriculture; education and research; energy; fisheries; forests; health; tourism; water and sanitation	• Strengthening of climate monitoring systems • Climate modelling at downscaled resolutions • Vulnerability and risk assessment to inform future land use planning, zoning and development planning • Implementation of pilot adaptation projects • Strengthening of capacities to access carbon finance	• Strong climate monitoring systems, as well as downscaled climate modelling, are needed to underpin adaptation efforts • Vulnerability and risk assessment also supports these efforts
Eastern and Southern Africa 2010-2014 €4.0 million Overall development / poverty reduction; agriculture; energy; forests; land management	• Development of national 'climate smart' agriculture investment frameworks and related national financing strategies • Promotion of climate smart agriculture, conservation agriculture and other sustainable land use practices • Implementation of pilot adaptation (conservation agriculture) and mitigation projects • Research, knowledge exchange and training • Vulnerability assessment and analysis	• Vulnerability assessments, as well as pilot projects, are useful tools to support adaptation processes • Research and regional knowledge networks can also usefully support adaptation (and mitigation) efforts • Sustainable agricultural and land management practices are an essential aspect of adaptation, and simultaneously support mitigation
Eastern Caribbean 2013-2017 €10.0 million Land management	• Setting up of effective and sustainable land management frameworks and practices • Implementation of physical (i.e. infrastructure-oriented) adaptation pilot projects (coastal protection, ecosystem restoration and rehabilitation, soil conservation, reforestation, flood mitigation, land and river bank stabilisation, water conservation, etc.)	• Enhancing the resilience of the natural resource base through improved land management practices is an important aspect of CC adaptation • Investing in data collection and management is essential for achieving sustainable land management • Pilot adaptation projects complement activities aimed at strengthening land management systems at a more institutional level
Ethiopia 2012-2016	• Strengthening of the institutional capacity of the Environmental Protection Authority (EPA)	• A good knowledge management system, accessible by all key stakeholders, is

Country or region Duration GCCA budget Sector(s) concerned	Main activities and/or expected results	Key insights and/or emerging lessons
€13.7 million Overall development / poverty reduction; energy; land management	to coordinate and mainstream CC into development planning (focus on access to climate finance and renewable energy) • Development of climate modelling systems that operate at downscaled levels • Development of a database in support of building resilience to CC impacts • Field-testing of CC adaptation measures in the context of the Sustainable Land Management Programme	required to share experience and good practices in tackling climate change • Piloting adaptation options across various types of ecosystems helps ensure that lessons learned and best practices are identified for each type of ecosystem • In the field of land management, synergies between adaptation and mitigation can be exploited
Lao PDR 2012-2016 €5.0 million Overall development / poverty reduction; agriculture; land management	• Strengthening of the capacity of local, provincial and national institutions to design and implement plans addressing CC in the field of land use planning and rural development • Support for grassroots pilot activities to increase the resilience of rural livelihoods through improved agricultural practices and more sustainable natural resource management	• Learning and drawing lessons from grassroots activities can help create the body of evidence required to place CC adaptation higher on the government agenda • Sustainable natural resource management and the promotion of environment-sensitive livelihoods is needed to enhance resilience to CC
Lower Mekong Basin 2012-2016 €5.0 million Overall development / poverty reduction; agriculture; natural resources	Support for the Mekong River Commission's Climate Change Adaptation Initiative (CCAI), incl.: • Implementation of local demonstration activities and adaptation projects • Building of capacities to develop CC-related policies and to plan for CC adaptation • Building of capacities and development of a system for monitoring and reporting on the status of CC adaptation in the Mekong region • Development of policy frameworks, strategies and plans for CC adaptation, to be integrated with other development plans	• Pilot and demonstration projects can be used as a foundation for mainstreaming CC adaptation – especially if a regional network of such projects is set up to share and disseminate experience • Given the interconnectedness of countries sharing a river basin, the basin is an appropriate level for collecting climate-related evidence
Maldives 2009-2013 €3.8 million Overall development / poverty reduction; waste management	• Contribution to a multi-donor Climate Change Trust Fund set up to finance adaptation and low-carbon technology initiatives • Initially supported projects include one focused on wetlands conservation and coral reef monitoring; and one focused on solid waste management on Ari atoll	• Addressing human pressures on the environment is an important aspect of reducing vulnerability to CC • Creating a supportive environment for the development of public-private partnerships offers interesting perspectives for promoting adaptation and mitigation
Mozambique 2010-2015 €15.2 million Overall development / poverty reduction; agriculture	• Review of relevant sector development strategies to improve the mainstreaming of environmental and CC themes • Strengthening of the environmental monitoring system • Awareness raising and training • Setting up of information networks to promote CC awareness and knowledge sharing • Implementation of pilot adaptation projects, in the agricultural and agroforestry sector	• Strengthening the environmental monitoring system, and promoting the sharing of local knowledge, are important aspects for successful mainstreaming of CC adaptation • 'Locally appropriate' measures must be identified to adapt farming and livelihoods systems to changing climatic conditions
Nepal 2012-2015	• At national level: preparation and implementation of CC-related policies and	• NAPA adaptation priorities should be integrated into local development

Country or region Duration GCCA budget Sector(s) concerned	Main activities and/or expected results	Key insights and/or emerging lessons
€8.6 million Overall development / poverty reduction	strategies; undertaking of economic and social appraisal, governance and fiduciary risk assessment (paving the way for climate-related budget support); development of skills required to access and manage CC financing • At watershed level: data collection; strengthening of the capacity of local institutions to establish and monitor CC impacts • Financing of projects that pilot innovative mechanisms of adaptation/mitigation	processes, ensuring that the supported measures are appropriate for local conditions • Sustainably diversified livelihoods and private sector investment in clean development can support adaptation as well as mitigation • Integrated watershed approaches contribute to the realisation of synergies between adaptation and mitigation
Pacific 2011-2014 €8.0 million Education and research; technological development	• Capacity building on CC-related topics, through both formal and informal training • Formulation and implementation of replicable community-based CC adaptation activities • Applied research, with a focus on developing tools for assessing vulnerability and developing adaptation plans • Setting up of a CC Knowledge Centre at the University of the South Pacific	• Local communities need to be involved in capacity building, through training and pilot activities • Pilot projects based on a robust process of participatory community engagement must both draw on training and research initiatives, and provide inputs into them • A strong regional knowledge management system is required to support training, research and successful implementation of adaptation measures
Rwanda 2010-2012 €4.56 million Land management	• Support for the implementation of the national land registration programme • Establishment of a land tenure system that guarantees tenure security, gives guidance on land management and provides incentives for the rational use of land resources (including environmental protection aspects)	• Significant investment in data collection and management is required to implement a land registration system • Providing incentives for the rational use of land resources (including environmental protection aspects) is an important aspect of adaptation in the rural sector
Samoa 2012-2015 €3.0 million Water and sanitation	• Preparation of an updated *Water for Life* sector plan 2012-2016 that effectively integrates CC adaptation measures • Rehabilitation of the drainage infrastructure of the Greater Apia area • Rebuilding and upgrading of priority drainage infrastructure for stormwater flows in Apia • Setting up of an effective drainage infrastructure management system, and implementation of a maintenance plan	• Supporting adaptation at the level of a whole sector gives a strategic dimension to the intervention • Public-private partnerships can contribute to the sustainability of investments in adaptation infrastructure • Integrated water resources management is crucial to building resilience to CC
Tanzania 2010-2013 €2.21 million Overall development / poverty reduction; agriculture; coastal zone management; land management; natural resources; water and sanitation	• Support for 3 'eco-villages' where innovative adaptation measures are tested in the fields of agriculture, rangeland management, water management, sanitation and biomass energy • Activities include the establishment of participatory land use management plans; the use of improved agricultural techniques (e.g. micro-irrigation, soil conservation measures, agroforestry) and rangeland management techniques; and the use of integrated water management and conservation measures	• Engaging local communities using participatory techniques and a holistic approach to natural resource management supports the design of appropriate adaptation measures • Promoting sustainable natural resource management and more sustainable livelihoods is essential for CC adaptation • Testing adaptation responses in various ecosystems helps ensure that lessons learned and best practices are identified for each type of vulnerable ecosystem
Timor-Leste	• Enhancement of climate monitoring systems	• Strengthening climate data collection and monitoring systems is important for

Country or region Duration GCCA budget Sector(s) concerned	Main activities and/or expected results	Key insights and/or emerging lessons
2013-2017 €4.0 million Overall development / poverty reduction; forests; natural resources	• Mainstreaming of CC adaptation into national policies and plans and local development plans (with a focus on agriculture, forest and water management) • Implementation of environmental restoration and sustainable livelihood activities	successful adaptation • So is the promotion of sustainable natural resource management and more sustainable livelihoods • Using participatory diagnostic tools can help identify the most appropriate adaptation options for specific contexts
Uganda 2012-2015 €11.0 million Agriculture	• Strengthening of the institutional capacity of the Climate Change Unit of the Ministry of Water and Environment • CC awareness raising in selected government departments and a target district • Promotion and dissemination of adaptation good practices in agriculture, and their integration into relevant policies and plans • Implementation of concrete actions to strengthen the resilience of rural populations and agricultural production systems	• Involving the private sector and local communities is essential for the sustainability of investment in agriculture and water supply • Applied, multidisciplinary research is needed to achieve a more sustainable balance between pasture, livestock and water resources
Vanuatu 2012-2016 €3.2 million Overall development / poverty reduction; agriculture; natural resources; water and sanitation	• Mainstreaming of climate resilience and disaster risk reduction into key sectors • Provision of technical assistance to foster the integration of CC vulnerability into development plans and budgets • Implementation of concrete activities to increase resilience to climate risks (through improvement of farming practices, watershed management, ecosystem restoration, the development of early warning and monitoring systems for floods)	• Investing in data collection and knowledge management supports evidence-based adaptation • So does the implementation of adaptation activities in the field • More sustainable agricultural and water resources management practices, as well as ecosystem restoration, support adaptation objectives
Western Africa 2011-2015 €4.0 million Overall development / poverty reduction; agriculture; energy; forests; infrastructure; land management	• Strengthening of hydro-climatologic data management systems and related data analysis capacities • Improved mainstreaming of CC adaptation and mitigation into national and regional development strategies, and dissemination of good practices	• Strengthening data management systems and data analysis skills is essential for successful adaptation mainstreaming • Systems need to be set up and synergies developed (notably with the activities of NGOs and research organisations) to share good adaptation and mitigation practices at regional level • To be effectively implemented, NAPAs need to be mainstreamed into national policies and strategies

3. GCCA insights and emerging lessons

In this section, the individual country and regional experiences presented in Table 1 are clustered under broad themes and general findings.

3.1 Understanding and addressing vulnerability

GCCA adaptation interventions frequently build on already available vulnerability diagnoses and assessments, including those conducted as part of the NAPA process, or from the experience acquired through the implementation of other interventions (as in **Bhutan**, for example, where former and ongoing EU support to the livestock and agriculture sector helped understand its vulnerability and needs in terms of adaptation). Climate change vulnerability assessments may also be conducted in the context of GCCA-supported interventions, as in **Eastern and Southern Africa**, the **Caribbean**, and the **Lower Mekong Basin**, where regional-level assessments are planned with regard to food security, flood and drought impacts and sustainable hydropower and ecological systems, under the Mekong River Commission's Climate Change Adaptation Initiative.

As illustrated in Box 1, many GCCA-supported interventions explicitly target the poorest and most vulnerable people, and/or areas identified as among the most vulnerable in a country based on exposure to climate impacts or particular sensitivity of the environment.

Box 1: GCCA experience – Addressing human and environmental vulnerability

Some GCCA adaptation interventions target people identified as the poorest and most vulnerable. In the **Lao PDR**, for example, the four targeted provinces, in the Northern Uplands region, include many districts that are among the poorest in the country. In **Mozambique**, the GCCA programme, and in particular its pilot projects component has a special focus on helping the most vulnerable communities in the rural areas of the country.

Other interventions target geographical areas or ecosystems identified as particularly vulnerable. In **Uganda**, field projects and related investments will focus on the districts of the central part of Uganda's cattle corridor, identified as one of the most vulnerable to drought and climate variability. In **Maldives**, coral reefs and other coastal ecosystems are particularly sensitive to the effects of climate change, which compound other human pressures such as inappropriate design and construction of coastal infrastructure, the lack of proper waste and sewage management systems, and practices such as sand mining, dredging and reef entrance blasting. The economy of Maldives (in particular fisheries and tourism) is heavily reliant on the proper functioning and survival of coral reefs and other coastal ecosystems – which also provide a natural defence for the coastline. One of the projects financed by the multi-donor Climate Change Trust Fund to which the GCCA contributes addresses this specific area of vulnerability by promoting wetlands conservation and coral reef monitoring. Another one, focused on solid waste management on Ari atoll, will contribute to relieving human pressures on coastal systems.

Criteria of human and environmental vulnerability are sometimes combined to prioritise areas of interventions. The **Bangladesh** Climate Change Resilience Fund, financed by the GCCA and others, focuses on meeting the needs of the poorest and most vulnerable components of society, in the most vulnerable areas of the country, with regard to food security, housing, livelihoods, employment and access to basic services. In **Nepal**, field projects will be implemented in particularly vulnerable communities and areas, identified as 'climate vulnerable hotspots' in the NAPA due to a combination of particularly low human development index and location in the areas most vulnerable to climate change impacts. Selected projects will have to prioritise the poor and marginalised.

GCCA interventions address vulnerability in a wide variety of ways, typically through efforts to enhance adaptive capacity. This may involve creating jobs (e.g. green jobs in **Nepal**), diversifying livelihoods (e.g. **Bangladesh**, **Mozambique**, **Nepal**, **Vanuatu**) as well as improving housing conditions and enhancing access to public services (e.g. **Bangladesh**). Raising awareness (e.g. **Mozambique**,

Nepal), improving access to information (e.g. development of an adaptation database and knowledge management system in **Ethiopia**, of flood early warning and monitoring systems in **Vanuatu**, of hydro-climatic data management systems in **Western Africa**) and/or technology (e.g. development and promotion of improved agricultural techniques such as agroforestry, soil and water conservation, micro-irrigation, crop and variety diversification, improved livestock breeding techniques in **Eastern and Southern Africa**, **Ethiopia**, **Lao PDR**, **Mozambique**, **Tanzania**, **Timor-Leste**, **Uganda**, **Vanuatu**), and promoting education and enhancing specific skills (e.g. farmers' training in **Uganda**; training on sustainable land management, land use planning, the use of geographical information systems and cartographic tools in the **Eastern Caribbean**; formal and informal training on various climate change-related topics in the **Pacific**) are other areas.

Other programmes are focused on building or rehabilitating infrastructure such as drainage networks (e.g. **Bangladesh**, **Samoa**), flood protection systems (e.g. **Bangladesh**, **Eastern Caribbean**), water storage and irrigation systems (e.g. **Tanzania**, **Uganda**, **Vanuatu**), as well as protecting or reducing pressures on key ecosystems such as coral reefs (e.g. **Maldives**), coastal wetlands (e.g. **Vanuatu**) or forests (e.g. **Belize**, **Eastern Caribbean**, **Ethiopia**, **Nepal**, **Tanzania**, **Timor-Leste**) to maintain or restore important ecosystem services.

Fewer interventions address vulnerability by acting on exposure to climate change effects. However some do, in particular in the context of land use planning and disaster risk reduction. Here, decisions may be made not to develop in the most at-risk areas, e.g. in the **Eastern Caribbean**, or even to resettle some particularly exposed communities or infrastructure (e.g. in **Solomon Islands**, which is discussed in the paper on disaster risk reduction).

3.2 Investing in research, data collection and management

Reliable data, and a good understanding of ongoing processes, are required to support vulnerability assessments as well as the identification, implementation, monitoring and evaluation of adaptation policies, programmes and measures. Investment in regular monitoring, on the ground and through remote sensing, is required for example to track changes in land use, food production, climate, the environment and other variables (CGIAR, 2012). There is also a need for improved climate modelling and forecasting to inform choices about adaptation strategies and technologies.

More broadly, it is appropriate to ensure that data collection, management and research needs supporting adaptation in the targeted sector(s) of activity are systematically considered and addressed, and adequately budgeted, so that by the end of the intervention, the partner organisations' access to useful data and knowledge has improved. Data sharing agreements may be explored, and can assist in fostering collaborative work between different stakeholders.

To address these needs, several GCCA interventions support research projects, data collection, and/or the setting up of data management systems. Box 2 and Box 3 provide an illustration of initiatives in this regard, for country and regional programmes respectively.

Box 2: GCCA experience – Support for data collection and management in country interventions

GCCA national interventions support data collection and management in various fields.

In agriculture and environmental resource management: The GCCA programme in **Bhutan**, based on the identification of some weaknesses in monitoring the performance of the Renewable Natural Resources policy and strategy, has made improvement in sector monitoring and the quality of statistical data a criterion for sector progress and disbursement of the variable tranche of budget support. In **Mozambique**, the GCCA supports the strengthening of the environmental monitoring system and the setting up of information networks to promote the sharing of local knowledge. In **Timor-Leste**, the GCCA will help improve the capacity of ALGIS (the Agriculture and Land Use Geographic Information System) to collect and monitor climate data in all 13 districts, analyse them through agro-ecological perspectives, and disseminate their interpretation at both local and national level. In **Vanuatu**, support to early warning and monitoring systems will allow building the ability of farmers to cope with critical situations, such as flooding. Mapping of high-risk areas is also to be promoted as an input to evidence-based land use planning (e.g. to avoid expanding settlements into flood-prone areas).

In the field of land management: In **Rwanda**, by the end of March 2012, more than 8.9 million parcels had been registered, and more than 1.25 million of titles issued. Making such a system work required significant investment in data collection and management infrastructure, including the preparation and distribution of aerial ortho-photo base maps, and the development of a land administration information system and the underlying databases. One of the requirements was that data be available simultaneously at decentralised and centralised levels.

In the water sector: The GCCA programme in **Belize** supports the development of a water management system for monitoring the quality and quantity of national water resources.

Two adaptation-related, GCCA-supported country programmes also promote *research activities*. The **Bangladesh** Climate Change Resilience Fund supports research and modelling activities. The research window, launched in the first quarter of 2012, will initially cover three research topics of which the potential impact of adaptation options related to waterlogging in urban areas. Research and modelling activities will also help estimate the likely nature, scale and timing of climate change impacts and provide a foundation for identifying and prioritising suitable adaptation responses. In **Uganda**, an applied research programme will help achieve a more sustainable balance between pasture, livestock and water resources.

Box 3: GCCA experience – Support for data collection and management at regional level

Data and knowledge management in support of climate policy in general is a central feature of the **ClimDev Africa** programme. It supports the upgrading of observation networks and infrastructure to enhance the provision of essential data for climate services and early warning systems, including seasonal and long-term forecasting at continental and sub-regional levels and downscaling of climate projections and scenarios. It also promotes research into and the analysis of climate change adaption and mitigation options, for the purpose of contributing to policy dialogue, enhancing Africa's position in international climate negotiations, and supporting African climate change and development policy making.

(...)

Box 3 (continued) – Support for data collection and management at regional level

In **Eastern and Southern Africa**, two existing organisations are mandated to become regional knowledge centres on conservation agriculture. The African Climate Change Knowledge Network is also being strengthened and supported in its operations. Two research programmes are planned, of which one focused on generating scientific evidence in support of the African position on climate change. Vulnerability assessment and analysis is to be undertaken in at least eight countries.

In **Western Africa**, hydro-climatologic data management systems are upgraded through support for the Agrhymet Regional Centre (CRA). The CRA's existing database is being updated, and the production and dissemination of data is improved and extended. This is complemented with activities to strengthen the CRA's capacities to conduct detailed analysis of climate change in the Sahel (and other supported countries), and also to assess the potential impacts of climate change on agro-sylvo-pastoral production systems, on socio-economic systems and on ecosystems. The need for developing synergies with other organisations to share good adaptation and mitigation practices is recognised.

In the **Caribbean**, climate monitoring, climate modelling and climate vulnerability and risk assessment are key features of the GGCA programme. The existing regional climate monitoring system is being expanded and integrated in the Global Climate Observing System (GCOS). Over 100 hydro-meteorological stations, and 6 coral reef early warning stations, are to be installed; a system for collection, digitizing and storage of data is being set up; and a protocol for sharing information through the Information Clearing House Facility of the Caribbean Community Climate Change Centre (CCCCC) is being developed. The programme also supports the development of improved climate models based on data at smaller resolutions, and their use in studies on climate impacts, of which about ten should be conducted throughout the region; about ten vulnerability and risk assessments, based on improved methodologies, are also planned to inform future land use planning, zoning and development planning.

As for the GCCA intervention in the **Eastern Caribbean**, it will help build human and technical capacities to effectively operate and manage a number of technical tools (mapping and geographical information systems, GPS tools) required for the collection, storage, analysis and display of geo-spatial data necessary to support decision making in delivering sustainable land management policies and strategies.

In the **Pacific**, applied research will be undertaken with a focus on better understanding the degree and nature of the vulnerability of the communities of various sizes (cities, towns, villages) which occupy particularly vulnerable locations (e.g. atolls and river deltas), and on developing tools needed for assessing vulnerability and developing adaptation plans. The programme also supports the development of a Climate Change Knowledge Centre at the University of the South Pacific, to become a regional repository for data, reports and scientific documents on climate science, climate change impacts, lessons learned from community adaptation projects, traditional knowledge, and good climate change adaptation practices.

3.3 Building on NAPAs and other adaptation plans

The majority of countries receiving GCCA support have been through a process of reflection on climate change adaptation priorities in the context of NAPA preparation. Some have gone one or several steps further in adaptation planning, up to the point of having comprehensive adaptation strategies or plans (e.g. Bangladesh Climate Change Strategy and Action Plan, Climate Resilient Green Economy strategy and national Climate Change Adaptation programme of Ethiopia). In most cases, there is clear evidence, from programme preparatory documents, that GCCA intervention design has built on and been informed by existing adaptation plans and processes.

The approach for aligning with national priorities thus varies across programmes – from support for projects or priority intervention areas identified in the NAPA, as in **Maldives**, **Nepal**, **Uganda** and **Vanuatu**, to a contribution to the implementation of a comprehensive national adaptation plan spanning multiple sectors, as in **Bangladesh** and **Ethiopia**. Box 4 shows how these GCCA-supported interventions promote or build on national adaptation priorities.

Box 4: GCCA experience – Building on NAPAs and other adaptation plans

In **Maldives**, support for coral reef biodiversity and fisheries is among the priority adaptation strategies identified in the National Adaptation Programme of Action (NAPA) – and improving waste management practices is identified as one way of protecting the integrity and productivity of coral reefs and preventing pollution of the marine environment, as well as improving the health status of the population (through the prevention of vector-borne diseases). Two of the three projects so far selected for financing by the multi-donor Climate Change Trust Fund address these priorities, one by supporting wetlands conservation and coral reef monitoring, and one by supporting solid waste management on Ari atoll.

In **Nepal**, the GCCA is helping build resilience in vulnerable sectors identified during the NAPA process, which include water and energy; agriculture and food security; forestry and biodiversity; and health and disaster risk reduction. Specifically, it supports the mainstreaming of NAPA-prioritised activities through the national framework of Local Adaptation Plans for Action.

In **Uganda** and **Vanuatu**, the GCCA is contributing to the implementation of some components of the NAPA – in Uganda, with a focus on water for production, drought adaptation, tree planting and climate-compatible development planning.

In **Bangladesh**, the GCCA contributes to the multi-donor Climate Change Resilience Fund, which was set up to channel external climate change funding in support of the Bangladesh Climate Change Strategy and Action Plan.

In **Ethiopia**, the GCCA intervention is contributing to the implementation of specific activities under the government's comprehensive climate change adaptation programme, which comprising activities spanning twenty major sectors. Besides institutional support for climate change mainstreaming, it finances the field-testing of adaptation measures in the area of sustainable land management.

3.4 Supporting adaptation at a strategic, sector-wide level

While some GCCA interventions support activities in the context of a (more or less formally defined) sector strategy, others contribute directly to climate change adaptation at a more strategic, sector-wide level (or national level, in one case). Box 5 provides an overview of these interventions.

Support for adaptation at a sector-wide level can usefully complement support for specific activities (as in **Samoa**) or pilot projects (as in **Belize** and the **Eastern Caribbean**) within the sector. It adds a strategic dimension, however, and is likely to achieve greater impact over time than support for micro- or meso-level activities only.

Box 5: GCCA experience – Support to adaptation at a strategic, sector-wide level

In **Belize**, the government adopted a National Integrated Water Management Policy and a National Adaptation Strategy to Address Climate Change in the Water Sector in 2009. The GCCA supports the implementation of the adaptation strategy, including through the development of legal and regulatory framework aligned with the new policy and strategy. The GCCA programme also supports the implementation of pilot projects on drought resilience in the livestock sector, year-round sustainable water supply, flood risk management, and soil erosion prevention.

In **Bhutan**, the GCCA supports the mainstreaming of climate change-related aspects in agriculture and other aspects of the Renewable Natural Resource sector plan, through the preparation of a Climate Change Adaptation Action Plan for the sector to be further integrated into the sector's Five-Year Plan.

In the **Eastern Caribbean**, the GCCA will help establish or reinforce the regional and national land management systems by providing appropriate climate change-oriented institutional and regulatory frameworks. These frameworks are expected to include aspects such as regulations to protect and/or restore ecological buffers, regulations to phase out development in high-hazard areas, strict building codes, and the establishment of coastal construction baselines. Pilot projects in areas such as coastal protection, ecosystem restoration and rehabilitation, soil conservation, reforestation, flood mitigation, land and river bank stabilisation, and water conservation will usefully inform the development of the frameworks.

In **Samoa**, GCCA funding supports the preparation of an updated *Water for Life* sector plan that takes account of climate change impacts in all aspects of planning and infrastructure development, and effectively integrates adaptation measures. Works on drainage infrastructure and related maintenance complement this strategic orientation.

In **Western Africa**, support is provided for the mainstreaming of NAPAs into existing development policies and strategies, in recognition of the fact that lack of integration of these NAPAs into wider policy and planning processes may be a cause of limited implementation so far.

3.5 Involving local communities

Adaptation measures, in particular those related to agriculture, water resources management and sustainable land management, are usually implemented at the local level. Engaging local communities creates ownership and contributes to the overall success of initiatives. This is particularly important, for instance, where collective infrastructure such as water harvesting, water supply or irrigation systems are developed: without a strong feeling of ownership by users and a clear allocation of responsibilities for maintenance, this type of infrastructure tends to fall into disrepair very quickly. Stakeholder engagement is also important because traditional and indigenous knowledge, skills and practices can help identify and select appropriate adaptive and/or coping responses in a given environment (FAO, 2010).

Most adaptation-focused GCCA interventions involve local stakeholders, including local authorities and non-state actors, in the context of implementation of pilot or demonstration projects. Some make explicit references to the use of participatory, inclusive approaches. Box 6 provides examples of community engagement in GCCA adaptation interventions.

Box 6: GCCA experience – Community engagement for adaptation

In **Bangladesh**, 10% of the amount available for the Climate Change Resilience Fund is to be disbursed in the form of grants to community-based adaptation projects, on the basis of calls for proposals.

In the **Pacific**, a robust process of participatory community engagement governs the formulation and implementation of community-based adaptation activities.

In **Tanzania**, the programme has a strong focus on local communities and the use of bottom-up approaches. Participatory vulnerability assessments were used as a basis for designing the supported 'eco-village' projects. In the same spirit, participatory forest management and the establishment of participatory land use management plans are among the approaches advocated in these villages.

There is also a strong emphasis on local stakeholder engagement in the **Timor-Leste** programme. Participatory diagnostic tools will be used to develop environmental profiles in the five major watersheds, supporting the identification of the most appropriate adaptation options, and where they should be implemented by priority. The programme will also help communities draft local soil and water conservation plans, in coherence with watershed management principles (which by essence involve broad consultation and participation) – and environmental restoration and sustainable livelihood activities will be implemented in rural communities.

In **Uganda**, experience shows the need to work closely with farmer groups and the private sector. In the water sector, lack of community involvement can be a cause of failure due to lack of ownership of infrastructure, poor operation and maintenance, and lack of coordination between institutions in charge of water and agriculture. The GCCA is therefore promoting broad stakeholder participation, bottom-up planning and demand-driven approaches, which are seen as important for the success of investments in agriculture.

Adaptation activities involving local communities are also a feature of GCCA interventions in **Belize**, the **Lao PDR**, **Mozambique** and **Tanzania**.

3.6 Testing and demonstrating concrete, 'appropriate' measures, in view of replication

Physical demonstration of adaptation practices and technologies in the field is a powerful means of evaluating the 'appropriateness' of measures, i.e. their suitability from a technical and financial point of view, their acceptability from a social and cultural point of view, their sensitivity to gender issues, and their environmental sustainability in a given context. Identifying and testing adaptation practices and technologies should be done with a view to building and sharing knowledge, identifying best practices, learning from experience (including failures), and replicating successful approaches.

Many GCCA adaptation-related interventions include a component that supports pilot or demonstration projects.[2] Box 7 provides an overview of activities undertaken in this field.

[2] 'Learning by doing' through pilot or demonstration activities is also a topic addressed in Section 3.2 of the background paper on Mainstreaming.

Box 7: GCCA experience – Learning by doing through pilot adaptation projects

In **Belize**, support to the water sector is implemented to a large extent in the form of pilot, community-based projects. One of them aims to enhance resilience to droughts in the livestock sector. Another one will look at ways of guaranteeing a sustainable supply of water throughout the year, addressing water turbidity during the rainy season, salinisation and other aquifer contamination problems during the dry season. Other pilot projects will allow testing approaches to flood risk management, through the introduction of watershed management measures and small-scale infrastructure works; and to soil erosion prevention, through land use management and replanting of damaged forests in strategic locations.

In the **Caribbean** programme, at least two adaptation projects will be funded and implemented. In the **Eastern Caribbean**, infrastructure-oriented pilot adaptation projects will be implemented in areas such as coastal protection, ecosystem restoration and rehabilitation, soil conservation, reforestation, flood mitigation, land and river bank stabilisation, and water conservation. They will complement activities aimed at strengthening regional and national land management systems at the institutional level.

In **Ethiopia**, the programme will finance a variety of pilot adaptation projects that complement ongoing activities under the Sustainable Land Management (SLM) programme, which supports land registration and uses watershed-based approaches to rehabilitate degraded lands and improve farmer's livelihoods. They will be implemented across the range of areas covered by the SLM programme, in recognition of the fact that different agro-climatic conditions are likely to require different adaptation measures; in this way, lessons can be learned and good practices identified for all key types of ecosystems.

In **Maldives**, three projects have initially been selected for financing by the Climate Change Trust Fund, of which two adaptation projects. They were selected in part on the basis of their potential for replication.

In **Mozambique**, 'locally appropriate' adjustment and coping strategies on land use in the rural environment, supporting for instance the adoption of new agricultural techniques or diversification into complementary non-farming activities, will be identified to help local communities in vulnerable areas adapt traditional farming and livelihood systems to changing climatic conditions.

In **Nepal**, financial support is provided to civil society and local and national government, based on a call for proposals, to pilot innovative mechanisms of adaptation, and to test the convergence of mitigation and adaptation options. This will help ensure that the translation of NAPA priorities takes account of the significant variation in climatic and social conditions across the various regions of the country.

In the **Pacific**, low-input, replicable community climate change adaptation projects, accompanied by a robust process of best practice promotion, will be implemented. These projects are expected to draw on the programme's training and research components, but also to contribute inputs into them. Project sites are in the process of being chosen, and should represent different types of islands and problems common in the Pacific, building synergies with ongoing work carried out under major adaptation projects in the region. Projects sites are expected to be predominantly in outer (peripheral) and more vulnerable islands, where self-sufficiency issues are more acute.

In **Tanzania**, one pilot 'eco-village' project was selected in each of three types of ecosystems (coastal zones and islands, drylands, and highlands). This aims to ensure that successful practices can be identified and replicated across the most vulnerable areas of the country, taking account of the specific characteristics of each type of ecosystem. Selected projects generally promote low-technology, low-cost, culturally acceptable and gender-oriented solutions, that are deemed most appropriate for the environment in which they are to be implemented. This will encourage the sustainability of interventions and increase the potential for scaling-up and replication.

Pilot projects are or will also be implemented in the **Lao PDR** and in the context of the **Eastern and Southern Africa** and the **Lower Mekong Basin** programmes. They are presented in Box 13 of the background document on Mainstreaming.

Learning from experience and replicating successful approaches requires the setting up of a sound knowledge building, monitoring and evaluation system. The intention to use pilot projects as a body of evidence supporting learning and dissemination is more explicit in some GCCA programmes than in others. In the **Lao PDR** programme, for instance, there is a clear commitment to consolidating the experience and knowledge acquired through grassroots activities for use by decision makers in the relevant sectors, and disseminating results via, among other channels, the Sub-Sector Working Group on Environment. In **Nepal**, the intention of establishing a mechanism for sharing and learning from adaptation interventions among different stakeholders at the district and national levels is clearly stated. In **Ethiopia**, the knowledge management component of the programme, which includes the development of a database and the establishment of a national climate change forum and some networks including non-state actors, can support the dissemination of field project results, and thus contribute to replication and scaling-up. Such explicit learning and dissemination should become a standard GCCA practice, within and beyond each programme.

Detailed criteria for the prioritisation and selection of adaptation measures or projects are not usually provided in GCCA programme documents. Selection through a call for proposals, as in **Nepal** or **Tanzania** for example, supports transparency in the prioritisation and subsequent selection of projects. The engagement of a wide range of stakeholders in the development of guidelines, as was the case in **Tanzania** for the selection of 'eco-village' projects, contributes to transparency and the choice of relevant, balanced evaluation criteria.

3.7 Engaging the private sector

Private sector actors, whether operating in the informal or formal sector, have a role to play in adaptation to climate change. If provided with the right incentives, they can invest in activities that contribute to climate change adaptation, notably in agriculture and water management. They may also be contracted to play a role, for instance, in the maintenance of infrastructure, as in **Samoa**.

Explicit engagement of the private sector appears in a number of in GCCA-funded programmes, as illustrated in Box 8.

Box 8: GCCA experience – Engaging the private sector in adaptation programmes

In **Maldives**, the Climate Change Trust Fund co-financed by the GCCA aims to create a supportive environment for the development of public-private partnerships with a view to promoting adaptation and mitigation. Initial efforts focus in particular on engaging tourism sector operators in a project to improve waste management practices.

In **Nepal**, supported projects are expected to promote low-carbon livelihoods diversification and private sector investment in clean development and green jobs, especially through forest management, water resources management, and alternative energy development. Public-private partnerships will be encouraged.

In **Samoa**, public-private partnerships have been established for routine maintenance of the urban drainage network. This approach has already proved to greatly improve the performance of the network.

(...)

Box 8 (continued) – Engaging the private sector in adaptation programmes

In **Uganda**, actions aimed at strengthening the resilience of rural populations and agricultural production systems engage farmer groups and the private sector, which is the key driver of agriculture and forestry activities in the country.

More formal or systematic engagement of the private sector could be envisaged in future GCCA activities, considering the potential of private actors to leverage public investment by investing in adaptation (and mitigation) activities.

3.8 Fostering environmental sustainability and resource efficiency

Environmental sustainability and resource efficiency are key to the resilience of agriculture and the sustainability of water supply systems, and are (or should be) the essence of land use planning and management. Sustainable natural resource management is crucial, in particular, for ensuring adequate food and water supply for all, and for achieving sustainable rural development and livelihoods in the face of climate change (FAO, 2010).

Environmental sustainability is explicitly promoted by many GCCA adaptation-related interventions. Box 9 provides examples of programmes that involve this aspect, while Box 10 illustrates the use of integrated approaches to natural resource management, which emphasize the sustainable use of the water and other resources.

Box 9: GCCA experience – Fostering environmental sustainability and resource efficiency

In **Eastern and Southern Africa**, 'climate smart' agriculture, conservation agriculture and other sustainable land use practices are being promoted as adequate adaptation and mitigation measures. Research, training and demonstration projects are planned in these areas.

In the **Eastern Caribbean**, the GCCA programme aims to improve the region's natural resource base resilience to the impacts of climate change through support for the setting up of effective and sustainable land management frameworks and practices. Pilot projects will notably support ecosystem restoration and rehabilitation, soil conservation, reforestation and water conservation.

In the **Lao PDR**, grassroots activities will contribute to increased resilience to climate change through the promotion of sustainable natural resource management and environment-sensitive livelihoods. Food security, in particular, will be enhanced by the adoption of environmentally sustainable agricultural practices, including agroforestry and the sustainable management of livestock-related ecosystems.

In **Nepal**, supported projects are expected to promote low-carbon livelihoods diversification, investment in clean development and the creation of green jobs, in particular in the fields of forest management, water resources management, and alternative energy development.

(...)

Box 9 (continued) – Fostering environmental sustainability and resource efficiency

In **Rwanda**, a key objective of the land registration programme is to provide incentives for more sustainable management of land resources, notably in terms of erosion prevention. The certificate of title issued at registration is accompanied by land use conditions that landholders are obliged to comply with. These conditions mandate the application of a number of good practices (e.g. tree planting around farms to reduce soil erosion) that are critical to sustainable land management, particularly in fragile areas such as wetlands and high relief areas.

In **Tanzania**, the concept of 'eco-village' is focused on sustainable natural resource management and the promotion of more sustainable livelihoods. Based on the understanding that inappropriate land use planning and management often results in the degradation of land, forest and ecosystems (as well as conflicts among different land user groups), village communities are supported to develop land use plans and bylaws. These plans will identify areas suitable for crop and livestock production, settlements, woodlands, conservation, beekeeping and industry in accordance with land policy and land laws.

In **Timor-Leste**, the GCCA will support rural communities, particularly women, in implementing agricultural and soil/water conservation practices, such as terracing and water harvesting, that promote improved nutrition as well as more sustainable use of natural resources. The use of agroforestry techniques (such as intercropping, forest gardening for non-timber forest products, contour buffers and stabilizers, or fertility planting) will also be encouraged.

In **Uganda**, a programme of applied multidisciplinary research will be undertaken to help identify practices that ensure a sustainable balance between pasture, livestock and water resources.

In **Vanuatu**, priorities in the field of agriculture include the promotion of traditional and improved farming practices to conserve soil moisture and nutrients, to reduce run-off and control soil erosion; rainwater harvesting; and diversifying into agroforestry with due regard to wider catchment management issues, in particular to control flooding. In the water sector, the programme will support the scaling-up of successful practices such as roof water harvesting and storage. Wetland restoration, the replanting of coastal vegetation and forests, and the use of indigenous afforestation methods will also be promoted to reduce flooding, coastal erosion and the impact of storm surges.

(See also the **Ethiopia** example in Box 11)

Box 10: GCCA experience – Integrated approaches to natural resource management

Integrated approaches, which take a holistic view of resource management and bring together all the main stakeholders in a given issue in order to identify balanced approaches that take their various needs into account, can be particularly useful to address complex issues such as water resources management or climate change adaptation in rural development. Since they tend to be inclusive and based on participatory approaches, they also provide an opportunity to engage local communities and the private sector (see Sections 3.5 and 3.7).

In **Belize**, watershed and 'ridge-to-reef' approaches are promoted. For instance, trees, crops and mangroves will be replanted in strategic locations to prevent or limit soil erosion and coastal degradation, which are drivers of water resources degradation. A water resources assessment will also be conducted to inform a master plan for integrated water resources management.

(...)

Box 10 (continued) – Integrated approaches to natural resource management

In **Nepal**, field projects will be based on an integrated watershed approach, linking climate adaptation investments geographically so that the impact of specific actions on downstream areas is taken into account, and the cumulative impacts of various developments can be assessed.

In **Samoa**, the planned works to rehabilitate and upgrade drainage infrastructure will be undertaken in the context of an integrated watershed approach to flood reduction, complementing the regulation of development activities in the upper watersheds and the rehabilitation (replanting) of the Apia watershed.

In **Tanzania**, the GCCA supports the testing of holistic, integrated approaches to the sustainable use of natural resources, based on the understanding that agriculture and forestry are interlinked with a range of other sectors, such as energy, water management and sanitation.

All these approaches reflect the understanding that environmental sustainability is an essential condition to maintaining and enhancing adaptive capacity.
Another interesting feature of approaches that emphasize environmental sustainability is that they often contribute to the convergence of adaptation and mitigation. Box 11 provides examples of GCCA programmes that explicitly promote this.

Box 11: GCCA experience – Realising synergies between adaptation and mitigation

In **Eastern and Southern Africa**, conservation agriculture and other sustainable land use practices are promoted as measures that simultaneously support adaptation and mitigation.

In **Ethiopia**, pilot projects are likely to include watershed rehabilitation through natural regeneration, afforestation and reforestation, which enhance the carbon sequestration potential; tree management for sustainable fuelwood production; implementation of conservation agriculture practices that support increased carbon storage in agricultural soils as well as increased resilience to climate variation; and the integration of grasslands and pasture management into an agricultural technology package that combines carbon sequestration with improved livestock productivity.

In **Maldives**, the solid waste management project will contribute to greater resilience of the coral reef ecosystem while reducing emissions of greenhouse gases from inadequate waste disposal.

In **Nepal**, pilot adaptation projects are expected to promote low-carbon livelihoods. The watershed approach that will be promoted is also conducive to the realisation of synergies between adaptation and mitigation (e.g. between irrigation development and small hydropower, or between forest-based livelihoods and carbon sequestration).

4. Topics for further discussion at the GCCA Global Learning Event

How is climate change adaptation taking place in your GCCA programme? How are things being done? What are the challenges, and how are they being tackled? What are the lessons learned to date? Do you have practical examples (e.g. studies, policies or plans) or stories to share? More specifically:

1. To what extent does the GCCA programme in your country build on the NAPA or other national adaptation plans?
2. Besides the implementation of specific activities, does the GCCA programme in your country support adaptation at a more strategic, sector-wide or cross-sectoral level? How so? How do the two levels complement each other?
3. Does the GCCA programme in your country support applied research (e.g. climate change vulnerability assessments), data collection and management? If so, how does this aspect of the work complement other areas of work, and which ones?
4. Does the GCCA programme in your country include pilot or demonstration projects? Which issues do they address? What has been or will be put into place to support learning and dissemination? Can you already share some materials?
5. What approaches have been most effective at engaging stakeholders and in particular the most vulnerable? What about the private sector?
6. Does the GCCA programme in your country support approaches to adaptation that emphasize environmental sustainability and/or integrated approaches to natural resource management (e.g. ecosystem-based adaptation)? Can you explain?
7. How are you ensuring that the GCCA programme is supporting long-term institutional strengthening and capacity building? Which activities or approaches have proven most successful in strengthening capacities and institutions (e.g. in-country technical assistance, training, south-south exchange, etc.)? Can you explain?

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