GCCA+
THE GLOBAL CLIMATE CHANGE ALLIANCE PLUS INITIATIVE

Funded by the European Union

Case Study Nr. 18 – Belize

IMPACT AND SUSTAINABILITY STUDY

BELIZE

ENHANCING BELIZE'S RESILIENCE TO ADAPT TO THE EFFECTS OF CLIMATE CHANGE

CRIS CODE: DCI-ENV/2010/022-636

MARCH 2021

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List of Acronyms

AF	Action Fiche
BAM	Banana Accompanying Measures
BLPA	Belize Livestock Producers Association
BNCCC	Belize National Climate Change Committee
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CC	Climate Change
CCCCC	Caribbean Community Climate Change Center
CRIS	Common Relex Information System
DCI	Development Cooperation Instrument
DRR	Disaster Risk Reduction
ER	Expected Results
EUD	European Union Delegation
FA	Financing Agreement
FAO	Food and Agriculture Organisation
FAQs	Frequently Asked Questions
FNC	Fourth National Communication
GCCA+	Global Climate Change Alliance Plus
GEF	Global Environmental Facility
GIS	Geospatial Management Unit
GoB	Government of Belize
INDC	Intended Nationally Determined Contributions
MARFUND	Mesoamerican Reef Fund
MFED	Ministry of Finance and Economic Development
MFFSD	Ministry of Forestry, Fisheries and Sustainable Development
MIF	Multilateral Investment Fund
MLLGRD	Ministry of Labour, Local Government and Rural Development
MNRA	Ministry of Natural Resources and Agriculture
MoA	Ministry of Agriculture, Fisheries, Forestry, the Environment and Sustainable Development
MRV	Monitoring/Reporting/Verification
M&E	Monitoring & Evaluation
NAMA's	Nationally Appropriate Mitigation Actions
NAO	National Authorising Office
NCCO	National Climate Change Office
NCCPSAP	National CC Adaptation Policy, Strategy and Action Plan
NEMO	National Emergency Management Organisation
NGOs	Non-governmental organisations
NIWRMA	National Integrated Water Resources Management Authority
OO	Overall Objective
REA	Rapid Ecological Assessment
REDD+	Reducing Emissions from Deforestation and Forest Degradation
ROM	Result Oriented Monitoring
RWH	Rainwater harvesting
SEA	Southern Environmental Association
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SO	Specific Objective

Strat.O	Strategic Objective
TAPS	Technical and Administrative Provisions
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wide Fund

I. Project Details and Outputs Delivered

PROJECT TITLE:

Enhancing Belize's Resilience to Adapt to the Effects of Climate Change

CRIS CODE: DCI-ENV/2010/022-636

With the following 5 adaptation pilot projects included:

1. Building Resilient Communities: Preparing communities to effectively mitigate the impact of hazards associated with their changing climate.
   (National Emergency Management Organisation, 242,107 EUR)
2. Social Partnership in Adaptation as a means of Securing Community Wellbeing.
   (Southern Environmental Association, 184,380 EUR)
3. CC and Food Security: Building Resilience among Cattle Producers of Belize District.
4. (Centro Agronómico Tropical de Investigación y Enseñanza and the Ministry of Natural Resources and Agriculture, 231,073 EUR)
5. Accelerating Potable Water Coverage: Piloting Innovative Solutions in Securing Local Water Supply Sources. (the Department of Rural Development of the Ministry of Labour, Local Government and Rural Development and the National Emergency Management Organisation, 484,073 EUR)
6. Applied Forest Management: Building Capacities for the Restoration of Watersheds Impacted by Natural Disasters.
7. (Ministry of Forestry, Fisheries and Sustainable Development, 237,805 EUR)

AAP YEAR:	DURATION: 60 months[1] starting with the signature of the FA[2]	DATE OF COMPLETION:
2010		11/2014

TOTAL PROJECT COST: 3,200,000 EUR (total expenditure: 2,873,682 EUR) Distributed as: EU: 2,900,000 EUR Government of Belize (GoB): 300,000 EUR Budget breakdown: Component 1 (water sector and pilot projects): 2,550,000 EUR Component 2 (CC capacity building): 600,000 EUR Evaluation: 50,000 EUR	GCCA ALLOCATION: 2,900,000 EUR
AID MODALITY: Project approach	MANAGEMENT ARRANGEMENTS: ▪ Financing Agreement (FA) with GoB ▪ Joint management with UNDP, officialised through the Contribution Agreement DCI-ENV/2012/295-661 with UNDP

[1] With an operational implementation phase of 36 months and a closure phase of 24 months.
[2] The Financing Agreement was signed in November 2011.
[3] Effectively implemented from July 2012 to November 2014.

GEOGRAPHICAL COVERAGE:

The project operates across the entire country, with pilot projects (5) in the Belize and Stann Creek districts. Pilot 2 targets the areas in and around the Placencia Lagoon.

MAIN STAKEHOLDERS AND BENEFICIARIES:

- The Ministry of Finance and Economic Development (MFED) is in charge of the overall coordination.
- The main implementing agency is UNDP Belize.
- Other implementing partners, involved in the selected 5 adaptation pilot projects, include: the Ministry of Natural Resources and Agriculture (MNRA) (pilot 3); the National Emergency Management Organisation (NEMO) (pilots 1 and 4); the Department of Rural Development of the Ministry of Labour, Local Government and Rural Development (MLLGRD) (pilot 4); the Ministry of Forestry, Fisheries and Sustainable Development (MFFSD) (pilot 5); the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) (pilot 3); and the Southern Environmental Association (SEA) (pilot 2).
- Technical Assistance partners: GEOMEDIA (ground water assessment in Savannah Province); UNDP Oslo Governance Center (Institutional Context Analysis for the water sector)
- Direct beneficiaries: GoB planners, decision-makers and civil servants with responsibility for climate change management. Belize and Stann Creek district communities - buffering the Belize and North Stann Creek Rivers - as well as communities of the Placencia peninsula directly benefit from the adaptation pilot projects.

GCCA PRIORITY AREA(S):

Mainstreaming climate change, Adaptation, DRR

MAIN SECTOR(S):

Overall development, Water and sanitation (governance and management), Ecosystem-based adaptation, Coastal zone management and mangrove restoration, DRR and early warning systems, Forestry

OVERALL OBJECTIVE:

- To enhance adaptive capacity and resilience to climate change in national policies, including the water sector in Belize. (according to the logframes attached to the Action Fiche (AF) and the FA/Technical and Administrative Provisions (TAPS)[4])
- To enhance adaptive capacity and resilience to climate change in national policies and demonstrate action in support of effective governance of climate change and climate change related impacts in the water sector. (Strategic Objective according to the Project Results Framework developed by UNDP)

SPECIFIC OBJECTIVE(S)[5]:

- SO1: To improve the resilience to climate change by means of interventions in the water sector.
- SO2: To enhance the institutional capacity of the Government of Belize to deal with matters related to climate change[6].

[4] During the initial implementation phase, the logframes as attached to the AF and the FA/TAPS were revised by UNEP and reformatted in the "Project Results Framework" used by the UN. In terms of content, there are no major changes.

[5] The Project Results Framework (UNDP) has no intervention level corresponding to "specific objectives".

[6] Added to SO2 in the logframe attached to the TAPS: *"The aim is to provide support for the establishment of a permanent climate change office within the Ministry of Natural Resources that will provide economic, social and environmental expertise to meet the Government's objectives as required for the implementation of the UNFCCC, its Protocol and the Post Kyoto measures. This expert group could also be in charge of designing and coordinating awareness raising initiatives in Belize, in cooperation with specialised institutions such as the CCCCC"*.

The objectives of the 5 adaptation pilots, implemented under SO1, are:

- Pilot 1: To prepare communities for extreme weather events, storm water control and capture.
- Pilot 2: To create resilience to water quality degradation, to promote water conservation, and to combat soil erosion in the peninsula through mangrove restoration and conservation.
- Pilot 3: To reduce losses in the cattle sector due to CC impacts, to diversify water supply, to prepare for extreme weather events, and to promote water conservation.
- Pilot 4: To diversify water supply, to prepare for extreme weather events, to create resilience to water quality degradation, to improve storm water control and capture, and to promote water conservation.
- Pilot 5: To effectively restore damaged forest stands in hurricane sensitive and flood prone areas.

Expected Results:

Expected Results according to the logframes attached to AF and FA/TAPS[7]:

- ER1: Increased resilience in the water sector of Belize against potential climate change impacts
- ER2: Enhanced national capacities to plan for and to coordinate a national response to the threats of climate change

Outcomes according to the UNEP Project Results Framework[8]:

- Outcome 1: Increased climate change resilience in the water sector of Belize as demonstrated by the existence of an improved framework for planning and coordination
- Outcome 2: Practices for water resource and watershed management piloted and tested in selected project sites
- Outcome 3: Enhanced national capacities to plan for and to coordinate a national response to the threats of climate change

Outputs Delivered:

Component 1: Water Resource Management / Improved framework for planning and coordinating management of water resources

- Water Advisory Council established within the Ministry of Natural Resources and Agriculture (MNRA)
- Technical report “Institutional and Context Analysis on Water Governance in Belize”
- National Integrated Water Resources Management Authority (NIWRMA) established
- Organisational and operational charter for NIWRMA developed
- Decree on mandate[9], role and functions of NIWRMA developed
- Capacity development strategy for NIWRMA developed
- Ground water assessment, vulnerability profile and safety plan developed for the Savannah Province, by GEOMEDIA.

Pilot 1: Building Resilient Communities: Preparing communities to effectively mitigate the impact of hazards associated with their changing climate (NEMO)

- Community Climate Vulnerability Assessments conducted (nationwide)
- Community flood plans / contingency plans developed
- Community flood mitigation teams established for monitoring water levels in flood prone areas of the Belize and North Stann Creek river watersheds
- Community River Keeper and NEMO coordinators in all districts trained in flood detection and early warning systems

[7] The Expected Results are basically a repetition of the Specific Objectives; there is no hierarchical difference between the two levels.
[8] The Outcomes fully coincide with the Expected Results of the initial logframe; the difference lies in the creation of a separate outcome for the pilot projects in the water sector.
[9] Implementation of the National Integrated Water Resource Act (NIWRA), 2010

- Large earth-moving equipment supplied

Pilot 2: Social Partnership in Adaptation as a Means of Securing Community Wellbeing (SEA)

- Water quality and coral reef monitoring system (sampling points and protocol) established
- 75 teachers and community volunteers trained in mangrove protection and restoration
- 100 students trained in mangrove restoration and monitoring
- The *Belize Marvelous Mangrove Curriculum* developed for primary and secondary schools
- A Mangrove Restoration Guide (2013) developed and 500 copies disseminated
- Community restoration teams established and trained in mangrove restoration, water monitoring and data processing
- Mangroves replanted (800 trees)

Pilot 3: Climate Change and Food Security: Building Resilience among Cattle Producers of Belize District (MNRA & CATIE)

- 3 Farmer Field Schools established in Belize River Valley, with demonstration farms in each of the schools
- 150 small- and middle-scale cattle producers trained in sustainable land use management, in climate smart measures (e.g. alternative fodder, silage techniques, use of urea multi-nutritional blocks, water system management) and in farm planning
- 35 farm plans (reducing vulnerability) developed and 28 approved
- 27 three-acre improved pastures for forage production and 27 protein/energy banks (1 acre) established
- Barbed wire supplied to 18 additional farmers
- Grass seeds supplied to 18 additional farmers
- Cuttings of sugarcane, nacedero (*Trichanthera gigantea*) and mulberry supplied to 18 additional farmers
- 25 water sources (wells/ponds) constructed
- A communal livestock shelter constructed in Willows Bank to protect livestock in times of extreme weather conditions[10]

Pilot 4: Accelerating Potable Water Coverage: Piloting Innovative Solutions in Securing Local Water Supply Sources (MLLGRD & NEMO)

- 12 Community boreholes constructed and/or rehabilitated supplying more than 3,000 households
- Galleries for water capture and storage rehabilitated
- Action Plan for rain water harvesting systems and small-scale water purification plants (reverse osmosis) developed
- Community stakeholders trained in participatory management of water resources, sustainability of water supply systems, fee collection and record keeping (5 sessions)

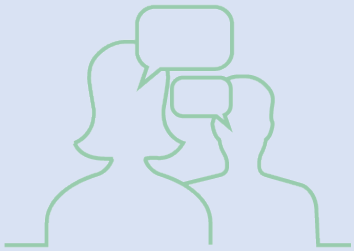
Pilot 5: Applied Forest Management: Building Capacities for the Restoration of Watersheds Impacted by Natural Disasters[11] (MFFSD/Forest Department)

- 1 Vehicle supplied
- GIS equipment supplied
- 8 Forest Officers trained in GIS for Rapid Ecological Assessment
- Nursery and best management practices guide developed
- 2 nurseries established with 2 NGOs (Ya´axche Conservation Trust and Corozal Sustainable Future Initiative)
- Permanent monitoring plots identified in impacted forest areas and baselines developed
- Draft Forest Management plan developed, including provisions for watershed restoration

[10] https://www.youtube.com/watch?v=XxsxHJ8x8T0
[11] According to the available reports, implementation of Pilot 5 was seriously delayed with most outputs still to be delivered at the date of reporting.

COMPONENT 2: CLIMATE CHANGE GOVERNANCE / ENHANCED NATIONAL CAPACITIES TO PLAN FOR AND TO COORDINATE A NATIONAL RESPONSE TO THE THREATS OF CLIMATE CHANGE (MFFSD)

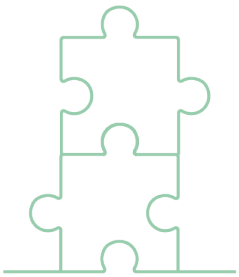
- A National Climate Change Office (NCCO) set up under the Ministry of Forestry, Fisheries and Sustainable Development (MFFSD) and operational
- A National CC Adaptation Policy, Strategy and Action Plan (NCCPSAP) developed[12]
- A National Vulnerability Profile developed, based on sector vulnerability assessments for six sectors: agriculture, tourism, fisheries, water resources, coastal development, and health.
- 15 scholarships granted to public servants and civil society staff for training in CC mainstreaming in their respective sectors.
- More than 100 public servants trained in climate change mitigation, vulnerability assessment, climate change modelling (in-house workshops)



[12] http://extwprlegs1.fao.org/docs/pdf/blz169290.pdf

II. Analysis of Impact

2.1. Impact expected as per logframe objectives and their indicators:



When comparing the different logframes developed at different stages of project development and implementation, we can conclude that (1) the OOs and SOs of the AF and FA/TAPS versions are basically identical but having different indicators, with the indicators of the FA/TAPS logframe version being of higher relevance and better specified; (2) the Strategic Objective of the UNDP's Results Framework actually combines the OOs and SOs of the AF and FA/TAPS logframe versions and adopts the indicators that were selected for the SOs in the logframe attached to the FA/TAPS; (3) the UNDP Results Framework has only 1 level of objectives, notably the Strategic Objective level, and that its lower level (= the outcome level) concerns project performance rather than impact.

Impact will therefore be assessed against the UNDPs Strategic Objective with the corresponding indicators, complemented by the OO level indicators that were included in the FA/TAPS logframe.

THE STRATEGIC OBJECTIVE HAS 4 INDICATORS[13]:

Strat.O: To enhance adaptive capacity and resilience to climate change in national policies and demonstrate action in support of effective governance of climate change and climate change related impacts in the water sector[14].

- Indicator Strat.O.1: Increased capacity of the government and civil society to take informed action on CC
- Indicator Strat.O.2: Level of National Adaptive Capacity determined by:
  - The number of administrative areas where CC capacity building results in more effective use of existing budgets for activities that reduce disaster risk and enhance adaptive capacity. (Strat.O.2a)
  - The extent to which government plans and budgets have been modified to reflect CC evidence generated. (Strat.O.2b)
  - The level of community and non-state stakeholder engagement. (Strat.O.2c)

Targets:

- Dedicated Government CC and Integrated Water Governance structures are in place and staffed and the positions are fully funded by the GoB by 2014.
- At least two types of resilience-enhancing measures effectively employed by the Government by the project's completion.
- Minimum 3 administrative areas have budgets for activities to reduce disaster risk and enhance adaptive capacity.

Baselines: not specified.

THE OVERALL OBJECTIVE HAS 3 INDICATORS (FA/TAPS LOGFRAME):

OO: To enhance adaptive capacity and resilience to climate change in national policies, including the water sector in Belize.

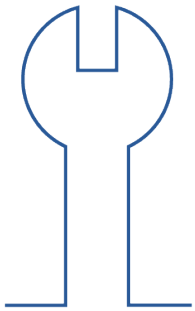
- Indicator OO.1: Level of understanding of government staff allows that appropriate linkages are being made between CC, national development, social protection, DRR and livelihood interventions (ability to cite examples of where this has had a positive impact on resilience to climate change).
- Indicator OO.2: Extent to which governmental plans and budgets have been modified to reflect CC evidence generated.

[13] Includes the sub-level
[14] Further specification of the project's final objective: "The baseline project consists of strengthening capacity at several levels to undertake integrated climate change adaptation/mitigation planning and integrated water resource management planning."

- Indicator OO.3: Level of resilience of vulnerable managed systems, such as flood/drought prone areas.

None of these indicators have baselines or targets.

2.2. Direct and indirect impact as reported in the available documents (desk phase):



- **From the EUD monitoring report (Oct 2014):**
  - The project certainly succeeded in strengthening awareness on CC through institutional support and through the implementation of adaptation measures relevant to challenges currently experienced in Belize.
  - Impact on institutional capacity: very high. Most of the pilot activities were implemented through local institutions.

- **From the GCCA Global Evaluation (June 2014):**
  - General conclusion on impact: The project found a highly receptive audience for its support in building capacity for better managing the impacts of climate change on the country's water resources. The GoB and other stakeholders were genuinely interested in seeing the project succeed. The project arrived at a time when Belize, from local communities to the highest political level, desired action and engagement to address the effects of climate change. Some very important elements have been introduced and necessary structures have been established. *However, to fully achieve the expected impact levels, continued effort and action will be needed.* The NIWRMA is not yet fully autonomous and operational; the capacities of the NCCO should be further enhanced and the impact generated by the 5 pilots is very incipient.
  - On NIWRMA's readiness: *becoming institutionalised is not the same as being operational*. NIWRMA will eventually have to assume full responsibility for implementation of the National Integrated Water Resource Act (NIWRA), enacted in 2011. To achieve this, an array of issues will still need to be addressed. To date (April 2014), NIWRMA is not seen as a leader within the government and this needs to change.
  - Support to the operationalisation of the NCCO contributed significantly to the establishment of a platform for climate change coordination, planning and dialogue. Increased visibility of the NCCO has been achieved largely through the project facilitating the NCCO's strategic positioning and their involvement in national development discussions and planning processes. With the NCCO, climate change has been put on the national agenda. Increased knowledge on CC by a wider range of professionals has resulted in a richer national dialogue with a greater diversity of opinions and perspectives. Also, the project helped the NCCO to articulate the Government's position on climate change which is very important given the evolving context both domestically and internationally where expectations are rising. The Minister of MFFSD, interviewed during the evaluation, was very positive on the impact of the programme in assisting the GoB and on the support she had received from the NCCO during recent international climate negotiations.

    In summary, expanded capacities of the NCCO have allowed for greater coordination of national climate change efforts, access to in-house expert advisory services, increased dialogue on the issues of climate change and development and improved national representation at regional and global fora. The expanded NCCO has spearheaded the development of the National Climate Change Adaptation Policy and has launched programmes to develop Nationally Appropriate Mitigation Actions (NAMA's), coordinated the elaboration of sector vulnerability assessments as well as informed national positions in regional and global discussions on sustainable development and climate change.
  - In terms of direct beneficiaries, the project has worked with a diverse set of beneficiaries including civil servants, farmers and rural community members. To date (April 2014), more than 150 public servants benefited directly through capacity development opportunities, while institutions benefited from enhanced human capacities, improved governance structures and the granting of essential equipment necessary for the execution of their mandates. At the pilot project level, farmers and communities benefited in several ways *but detailed information on (potential) impact was not available.*

- The results of the groundwater assessment in Savannah Province, carried out by GEOMEDIA, are expected to inform a local water management plan for the Savannah Region. At the same time, the consultancy was also intended to be a training/capacity building activity, enabling water sector professionals from Belize to replicate this in other areas and to develop a national water vulnerability profile, a national safety plan and a national Water Master Plan. This replication was not yet happening. To become a fully-fledged authority, NIWRMA needs to extend coverage of the Savannah surface and ground water studies to the entire country and finalise a Water Master Plan. Once this exercise will be completed, NIWRMA should be able to install meters, issue licenses and bills for different water users. Considering the transboundary nature of water basins in the country, its full implementation will also depend on good collaboration with neighbouring countries Mexico and Guatemala.
- Related to pilot 3: At community level, farmers were exposed to alternative and sustainable land use management practices and were taught through demonstration how to develop farm plans and to incorporate in these plans measures to reduce their vulnerability to the effects of climate change. Farmers also participated in exchanges with farmers from the Cayo district to show how effective farm planning can reduce farmers' vulnerabilities. Within the Belize River Valley three demonstration or teaching farms had been established. A fourth farmer, whose farm was visited during the evaluation, had allowed his plot to become a de-facto fourth demonstration site. This farmer actually implemented by himself many of the principles the pilot project was teaching.

2.3. Findings from the desk phase and specific issues that were explored further during the field phase

No final project or final evaluation reports were available[15]. The progress report, covering project implementation up to March 2014, reports against output indicators but not against the impact indicators at objective level. In other words, from the desk phase limited information is available on progress made towards the achievement of the indicators at objective level. The field mission will therefore focus on collecting data and evidence in this respect.

Apart from institutional support in the climate change (NCCO) and water (NIWRMA) sectors, the project financed a set of pilot activities. These activities focus on testing innovative technical solutions or methodological approaches and on assessing their effectiveness and potential for replication. UNDP committed to take care of such assessments. Getting information on the results of these assessments and on ongoing replication processes (including funding, further technical or methodological adjustments, institutional framework, geographical coverage) will be an important task during the field phase.

Examples:

- Pilot 1: Have the community flood plans / contingency plans that were developed during the project been used in case of floods; has their implementation resulted in less damage, quicker recovery?
- Pilot 2: For mangrove restoration, SEA would apply a "unique Red Mangrove Planting System tested in the Caribbean which combines a wrack protector with a Reef Ball Armored Cultivator pot". What were the results of applying this system? Was the system assessed as being adequate for scaling up? Is scaling-up ongoing?
- Pilot 3: Have the introduced climate smart livestock practices and adjusted farm planning effectively reduced previous losses and vulnerability? Are practices and planning methods adopted in neighbouring areas? Spontaneously or organised/steered?
- Pilot 4: Are the problems related to water shortage resolved in the target communities? Are the introduced systems for water purification and rainwater harvesting effective? And are they replicated?
- Pilot 5: In how many watersheds has the forest cover been restored by the time of visiting the country, and how effective has the restoration been in terms of reducing run-off and other types of erosion.

[15] The final evaluation of the Regional GCCA programme selected some countries for in-depth evaluation. Belize was part of this group. It was therefore decided to not carry out an additional evaluation for the specific contract.

The project has supported the development of a good number of Policies, Strategies, Action Plans and Management Plans. During the field phase, the extent to which these policies and plans are being implemented will be assessed.

Factors conducive to generating impact:

- UNDP having good relations with the Government partners and positive working relationships at the implementation level, already before the project had started.
- Project came in at the moment the negative effects of climate change had started to be noticed; there was a keen interest in the topic and in addressing the effects of CC.

Factors hampering generation of impact:

- A too short duration of the project's implementation period, particularly for the pilots whose starting date was delayed
- The absorptive capacities of some national counterpart ministries presented a challenge for fast implementation. The inception period of many pilots had to be extended creating early project lags.

2.4 Achievement of the logframe indicators at overall and specific objectives levels (direct impact)

INDICATOR	LEVEL OF ACHIEVEMENT	EXPLANATORY NOTES
Strat.O.1: Increased capacity of the government and civil society to take informed action on CC *Target:* Dedicated Government CC and Integrated Water Governance structure are in place and staffed and the positions are fully funded by the GoB by 2014. *No baseline*	40%	Of the two concerned national government structures, only the NCCO (National Climate Change Office housed in the MFFSD[16]) was officially in place and endorsed by the GoB in 2014. By that time, it was staffed by four professionals, one of which was paid by the GoB on contract basis while the other three persons were financed by projects. The main functions of the NCCO during the GCCA project were awareness raising & capacity building, mainstreaming CC in six targeted sectors (health, coastal development, tourism, water resources, agriculture and fisheries) and contributing to the development of the National Climate Change Policy, Strategy and Action Plan (NCCPSAP). Besides, the NCCO is acting as the secretariat of the Belize National Climate Change Committee (BNCCC)[17], which has been established as a broad-based multi-stakeholder committee comprising of non-state, public and private sector representatives. The BNCCC provides overarching leadership and policy guidance for CC issues, facilitates CC mainstreaming of relevant sectors and overlooks the implementation of the CC strategy and action plan. The BNCCC meets three times a year. The second structure, the NIWRMA (National Integrated Water Resource Authority under the Ministry of Natural Resources and Agriculture), is much less advanced than the NCCO. NIWRMA is mandated to implement the

[16] Ministry of Forestry, Fisheries and Sustainable Development
[17] Created in 2009, originally with a total membership of 23 representatives of mainly governmental institutions. In 2016, the size of the BNCCC has been reduced to a total of 16 members with three sub-committees (Vulnerability Assessment and Adaptation, Mitigation, and Public Education and Outreach).

		National Integrated Water Resources Act (NIWRA, 2011)[18] and has the responsibility to regulate the use of water, with domestic use being priority number one. The consultant who was hired for the institutional design of a functional Water Resource Management Entity[19], proposed a fairly heavy institutional structure, with three levels: 1. the Board of Directors (7 members) 2. the Belize Water Advisory Council (representatives of 6 core entities) 3. a technical/administrative team (23 persons) Such an institutional structure requires important investments (financial and human resources). According to the Principal Hydrologist in charge of getting the NIWRMA 13 institutionalised, it was estimated that only the start-up would cost at least one million Belizean dollars[20]. Besides, the water sector in Belize is complex and fragmented, and water consumers are not used to pay for the service. (see also Box 2.5)
Strat.O.2a: Level of National Adaptive Capacity determined by (a) the number of administrative areas where CC capacity building results in more effective use of existing budgets for activities that reduce disaster risk and enhance adaptive capacity. *Target:* At least two types of resilience-enhancing measures effectively employed by the Government by the project's completion. *No baseline*	150%	Four of the five pilot projects that were introducing and promoting resilience-increasing measures have been implemented by governmental institutions that benefited from the project's capacity building activities. At least for three of these projects, the promoted measures have been adopted. It concerns the following 3 projects: 1. Enhancing preparedness of communities for extreme weather conditions and early warning systems (NEMO) 2. Enhancing preparedness of cattle famers to extreme weather conditions (Ministry of Natural Resources Agriculture) 3. 3. Enabling restoration activities in sensitive and flood prone forest systems (Forest Department)
Strat.O.2b: Level of National Adaptive Capacity determined by (b) the extent to which government plans and budgets have been modified to reflect CC evidence generated. *Target:* Minimum 3 administrative areas have budgets which reflect activities	67%	No detailed data are available for this indicator, but it can be stated that at least two administrative areas (sectors) have included (or increased) budgets related to CC and DRR: 1. The Ministry of Labour, Local Government and Rural Development (MFFSD) assumed in 2014 the payment of one staff member of the NCCO. Later on, in 2017 and 2018, three additional NCCO staff members were paid

[18] https://www.belizejudiciary.org/download/LAWS%20of%20Belize%20rev2011/Law%20s%20Update%202011/Data/VOLUME%2010/Cap%20222.01%20National%20Integrated%20Water%20Resources%20Act.pdf

[19] Draft Organizational Review and Institutional Development Consultancy (National Integrated Water Resources Authority of Belize), DRAFT ORGANIZATIONAL AND OPERATIONAL CHARTER (R. Williams, October 2013) (https://info.undp.org/docs/pdc/Documents/BLZ/NIWRA%20D4%20OPERATIONAL%20AND%20ORGANIZATIONAL%20CHARTER.pdf)

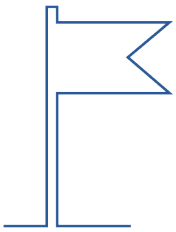
[20] Corresponding to approximately US$500,000

to reduce disaster risk and enhance adaptive capacity. *No baseline*		by the GoB, which makes that in 2020 four NCCO staff members are on the GoB's payroll. 2. The Forest Department has created a special GIS unit (Geospatial Management Unit) with its own national budget.
Strat.O.2c: Level of National Adaptive Capacity determined by (c) the level of community and non-state stakeholder engagement. *No target; no baseline*	100%	The indicator is not specific and not measurable (SMART[21]). The targeted "level of engagement" is not known. However, through the five pilot projects, community and non-state engagement has been achieved, such as: **Pilot 1:** Community river keepers/monitors **Pilot 2:** SEA (NGO), private tourism sector, community of Placencia **Pilot 3**: Cattle farmers **Pilot 4:** Communities benefitted by improved drinking water sources **Pilot 5:** The two NGO´s with nurseries (Corozal Sustainable Future Initiative in the North, and the Ya´axche Conservation Trust in the South)
OO.1: Level of understanding of government staff allows that appropriate linkages are being made between CC, national development, social protection, DRR and livelihood interventions (ability to cite examples of where this has had a positive impact on resilience to climate change). *No baseline, no target*	80%	Necessary guidance from baseline and target specifications is missing. However, it can be said that the kind of pilots chosen by the four government agencies (NEMO, Ministry of Natural Resources and Agriculture, Rural Development Department and Forest Department) reflect to some extent an understanding about the interrelationship between CC, national development, social protection, DRR and livelihood interventions (4 out of the 5 pilots).
OO.2: Extent to which governmental plans and budgets have been modified to reflect CC evidence generated. *No baseline, no target*	Idem Strat.O.2b	Idem Strat.O.2b
OO.3: Level of resilience of vulnerable managed systems, such as flood/drought prone areas. *No baseline, no target*	20%	The only pilot (out of five in total) that is directly related to increased resilience of vulnerable managed systems, such as flood/drought prone areas, is Pilot 3 (forage/protein and energy banks, silage production for resilience during prolonged drought periods; and a higher situated communal holding pen to protect cattle during periods of flooding).

[21] **S**pecific, **M**easurable, **A**chievable, **R**elevant and **T**ime-bound.

2.5. Achievement of the overall and specific objectives (direct impact, exceeding the scope of the indicators)

OVERALL OBJECTIVE (OO)/STRATEGIC OBJECTIVE (STRAT.O) [22]: To enhance adaptive capacity and resilience to climate change in national policies and demonstrate action in support of effective governance of climate change and climate change related impacts in the water sector.



Achievement: "2" (between 50% and 75%)

EXPLANATORY NOTE:

NATIONAL CC/WATER RESOURCES MANAGEMENT STRUCTURES (SEE ALSO INDICATOR STRAT.O.1 IN BOX 2.4)

In the period following the closure of the GCCA project, the NCCO became even more visible and recognised by the different governmental institutions. The scholarships, awareness raising & capacity building activities that had been offered by the project, had generated a critical mass of civil servants (and others) that succeeded in turning these governmental institutions into important allies for CC action. The NCCO staff increased from 4 persons (1 funded by the GoB and 3 persons by projects) at the end of the GCCA project, to currently a total of 7 persons of which four[23] are fully paid by the GoB and three[24] by international project funds. However, the majority of the NCCO activities are still funded under projects.

All in all, NCCO became better established within the national government of Belize. Future plans of the NCCO (under the MFFSD, also called Ministry of Environment) are *"to become independent from the Ministry and to convert the Office into a Department with a budget of its own and a clear mandate, which will give the NCCO more authority and stability"*[25]. *"CC is not seen any more as a mere environmental issue, but as a development issue"*[26].

On the other hand, the Integrated Water Governance structure (NIWRMA) has not progressed much after the GCCA project and is still not fully institutionalised. Although "*it was never abandoned as it was rooted enough, the complexity of water resource management was not clearly understood (different ministries involved, water management too fragmented within the system, a comprehensive inventory of water resources & monitoring system not existing, water regulations lacking, communities not used to pay for water consumption) and the GoB did not grasp the full amplitude of required action and initiative. It could have been better as a separate project"*[27]. The set-up and institutionalisation of an efficiently operating water management authority would need resources that are currently not available within the GoB.

As a next step, the GoB, with support of UNDP and GEF funds, will soon start to implement a project with the objective of drawing regulations for the Water Act (NIWRA) and with a focus on the Belize River watershed, being the biggest watershed of Belize.

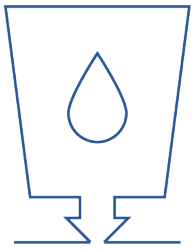
CC POLICIES, STRATEGIES AND ACTION PLANS

An important achievement of the NCCO under the GCCA project has been the development, in partnership with the Caribbean Community Climate Change Center (CCCCC), of the National Climate Change Policy, Strategy and Action Plan (NCCPSAP; 2015-2020). This document has served as basis and guideline for the elaboration of other policy, strategy and actions plans; for example:

[22] According to the Project Results Framework developed by UNDP
[23] (i) Head, (ii) Head deputy, (iii) CC Officer Adaptation, and (iv) Project Manager of the 4th National Communication (FNC)
[24] (i) CC Officer Mitigation & Greenhouse Inventory Coordinator, (ii) Monitoring/Reporting/Verification (MRV) Officer, and (iii) Procurement Officer.
[25] Idé Sosa, NCCO
[26] Diane Wade, UNDP
[27] Diane Wade, UNDP

- The National Adaptation Strategy to address climate change in the Agriculture Sector in Belize (CCCCC and NCCO, June 2015)[28]
- The National Forest Policy for Belize (May 2015)[29]
- The Belize Integrated Coastal Management Plan (MFFSD, 2016)[30]
- Belize's Intended Nationally Determined Contributions (INDC) under the United Nations Framework Convention on Climate Change, Belize[31]

Nevertheless, a National Water Resources Master Plan[32] to be implemented by the NIWRMA, does not yet exist. The groundwater assessment carried out in the Savannah Province by GEOMEDIA[33] during the GCCA project, was to be replicated in the rest of the country. This never happened.
It should be mentioned that the technicians of the Hydrology Department had not accompanied GEOMEDIA for data collection activities, nor had they received training to prepare them for such a replication in other parts of Belize: "*GEOMEDIA is just a database, but not information*"[34]. Besides, a water monitoring network with common monitoring and data-sharing protocols does not exist, its existence and operation being hampered by the high costs associated (estimated at US$9 million). In summary, the country is still very far from achieving a National Water Resources Master Plan.



SPECIFIC OBJECTIVE 1 (SO1): To improve the resilience to climate change by means of interventions in the water sector:

Achievement: "2" (between 50% and 75%)

EXPLANATORY NOTE:

The achievement level of SO1 has been determined by aggregating the achievement levels of the objectives of the 5 pilot adaptation projects. (explained below)

General observations on the impact generated by the 5 pilots:

- Most pilots were negatively affected by a late start and – as a consequence – a too short implementation period (nearly 2 years).
- The impact of the 5 pilots on the water sector as a whole was limited due to a lack of integration and coordination. The implementing partners were under time pressure and therefore focused on their respective projects without paying much attention to exchanges / synergies / integration. Also, the respective pilot projects all had different target groups.
- The impact generated by the 5 pilots is variable, and some elements were stronger than others.

OBJECTIVE PILOT 1 (SO1.1): To prepare communities for extreme weather events, storm water control and capture.

Achievement: "2" (between 50% and 75%)

[28] http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2018/03/1082.pdf
[29] http://extwprlegs1.fao.org/docs/pdf/blz149121.pdf
[30] https://www.coastalzonebelize.org/wp-content/uploads/2015/08/BELIZE-Integrated-Coastal-Zone-Management-Plan.pdf
[31] https://unfccc.int/files/focus/ndc_registry/application/pdf/belize_ndc.pdf
[32] For river basin, groundwater, and coastal zone management, including water quality control plans for all surface water and groundwater resources.
[33] Field work carried out between January 19, 2014 and February 14, 2014; and 167 sites documented.
[34] Tennielle Williams, Principal Hydrologist, Ministry of Natural Resources

EXPLANATORY NOTE:

Pilot 1 was fully integrated in the in NEMO's daily activities. NEMO proved to be an efficient institution (direct communications in cases of emergencies, close relationships with other ministries and well organised). NEMO[35], chaired by the Prime Minister, is mostly government funded and is, as one of the few governmental institutions, not project dependent.

The community river keeper (or river monitor) system was already used and well-functioning before the GCCA project. In this sense the GCCA has not generated much impact. However, it enabled NEMO to organise more training activities[36]. Importantly, through the supply of a backhoe for drainage work, NEMO is no longer dependent on the equipment of the Ministry of Works. This allows NEMO to react immediately in cases of emergency throughout the country, as for example happened in 2017 during the hurricane Earl.

OBJECTIVE PILOT 2 (SO1.2): To create resilience to water quality degradation, to promote water conservation, and to combat soil erosion in the peninsula through mangrove restoration and conservation.

Achievement: "1" (> 75%)

EXPLANATORY NOTE:

Pilot 2 is the only pilot project that was implemented by an NGO (while the other four pilots were implemented by governmental institutions).

Apart from its protected area programme[37] and educational & outreach programme, SEA focuses on water quality monitoring (for which SEA received equipment and training through the GCCA project) and mangrove restoration.

Since 2013, data on water quality[38] have been collected on a monthly basis at 4 main sites[39]. It should be mentioned that during this period SEA decided to include a tenth parameter on E. coli, considering the measurement of this parameter important for the densely populated and touristic Placencia Peninsula. Students participate in data collection activities as part of the awareness programme. Besides, the data are shared with the Environmental Department, the Belize Water Services, the Village Councils and the local communities, in order to be included into their databank and to take informed action when necessary.

The mangrove planting system that SEA originally would apply ("Red Mangrove Planting System which combines a wrack protector with a Reef Ball Armored Cultivator pot")[40] was after some discussions replaced by the encasement system (Riley Encased Methodology – REM)[41]. Unfortunately, the reasons for this modification could not be clearly explained by the current Executive Director of SEA, since by that time she was no longer employed by SEA.

Part of the mangrove trees that were planted during the GCCA project, were washed away or had been uprooted by children (the case in one of the most populated planting sites, Seine Bight). Although the sites had initially been monitored by SEA, during the visit no detailed information could be made available about the remaining mangrove stands. Besides, it should be mentioned that quite some mangrove areas are being cut

[35] Total number of employees 70 persons, of which 30 persons staff
[36] Normally organizes 3-4 times a month training activities country wise
[37] Co-management of two protected areas: (i) Gladden Spit and Silk Cayes Marine Reserve; and (ii) the Laughing Bird Caye National Park.
[38] Parameters: pH, Dissolved Oxygen, Temperature, Conductivity, Sea Level Pressure, Turbidity, Nitrate, Phosphate, Salinity, Ecoli.
[39] Laughing Bird Caye National Park, Gladden Spit Marine Reserve, Sapodilla Cayes Marine Reserve and the Placencia Lagoon.
[40] http://www.mangrovesolutions.com/product.php
[41] https://www.cbd.int/doc/case-studies/tttc/tttc-00159-en.pdf

as a result of the accelerating development of the tourism industry and real estate investments in the area. In order to mitigate those negative effects, SEA has selected new sites[42] for mangrove restoration, engaging schools in planting and maintenance and using the mangrove restoration guide that was developed under the GCCA project.

The "Curriculum-based teacher´s resource guide" with a section on mangroves (also developed under the GCCA project) forms part of the curricula of the Ministry of Education, and the teachers are receiving special credits by participating in those training activities.

In order to enhance impact, partnerships were established with the tourist sector. Under this partnership, about 250 licensed tourist guides participate in awareness raising (presentations) for on the importance of mangrove for coastal protection. Further, SEA has signed a Memorandum of Understanding and contract with the Norwegian Cruise Line Company – since 2015 an important tourism developer at the Harvest Caye – for the implementation of a conservation management plan which includes mangrove planting on the island (developer pays for conservation and protection).

Through the GCCA, SEA has become a member of the national and regional mangrove network, a platform for sharing experiences and information.

OBJECTIVE PILOT 3 (SO1.3): To reduce losses in the cattle sector due to CC impacts, to diversify water supply, to prepare for extreme weather events, and to promote water conservation.

Achievement: "1" (> 75%)

EXPLANATORY NOTE:

The implementation of pilot 3 follows the Farmer Field School approach (learning-by-doing), promoted by CATIE, with three Farmer Field Schools[43] involved:

1. The Belize River Valley Livestock Enterprise Farmer Field School, representing the villages of Flowers Bank, Scotland Half-Moon, Lemonal, Isabella Bank, St Paul's and Double Head Cabbage; with a core group of about 20 farmers.
2. The Belize United Farmer's Field School, representing the villages of Gardenia, Maypen, Biscayne and Crooked Tree; with a core group of about 10 farmers.
3. The Maskall Cattle Producers Field School, representing the communities of Corozalito, Rock Stone Pond, Nagu Bank, Bomba and Maskall; with a core group of about 5 farmers.

The Farmer Field School methodology has been adopted by the Ministry of Agriculture, since it turned out to be easier and more effective to the extension workers to reach the farmer population through these organised groups. The project, in partnership with CATIE, developed a Farmers Field School Curriculum and an ICA Practices Manual for the Department of Agriculture. These are now used as guidelines and training material for the extension workers. Similarly, the manual has been integrated in the curriculum of the technical agricultural schools[44].

It should be mentioned that the River Valley Field School is (as the only one of the three Field Schools) formalised into an association, and that a fourth Farmer Field School, supported by FAO, recently started in Orange Walk and Corrozal.[45]. Likewise, CATIE is providing technical support to the national Belize Livestock Producers Association (BLPA) under the project "Improving productivity and resilience to climate change in livestock systems" through the promotion of silvo-pastoral innovations. This project started in 2018 and is

[42] Laughing Bird Caye, Little Water Caye and Harvest Caye.
[43] Farmer Field Schools are organized groups of farmers
[44] Diane Wade, UNDP
[45] Ricardo Thompson and Manuel Matus, Ministry of Agriculture

financed by the Multilateral Investment Fund Program (MIF) and the Inter-American Development Bank (IDB)[46].

It has not been possible, however, to get information during the field visit on possible spontaneous dissemination and/or adoption of the introduced practices and planning methods, since the Ministry of Agriculture has not given follow-up to the Farmer Field Schools.

The establishment of protein/energy and forage banks and the preparation of silage has definitely contributed to a reduced vulnerability of the cattle farmers during periods of prolonged drought. Before, they relied on natural pasture which was poor in cattle digestibility and low in yield. Also the construction / improvement of water ponds was effective in reducing the farmers' vulnerability as ponds ran dry during droughts. The positive impact of the GCCA project became evident in 2019 when a drought period of 8-9 months hit the region. During this period, cattle got lean, but survived. The farmers were better prepared[47].

Only one (two were originally planned[48]) communal livestock shelter facility, owned by the Belize River Valley Association, had been constructed to protect the animals during periods of flooding. The facility is well equipped with holding corrals and feeding capacity for 250 heads of cattle. No information could be collected during the field mission about the impact of this investment.

OBJECTIVE PILOT 4 (SO1.4): To diversify water supply, to prepare for extreme weather events, to create resilience to water quality degradation, to improve storm water control and capture, and to promote water conservation

Achievement: "3" (between 25% and 50%)

EXPLANATORY NOTE:

Pilot 4 has been the only pilot project that did not spend its entire budget. Its focus was on water supply: "*This pilot is just seen as a project of digging wells*"[49], in line with the mandate of the Rural Development Department to make available improved water sources, based on a demand-driven approach. As an institutional deficiency, not addressed by the project, it should be mentioned that the Department does not have a national database for monitoring water supply, distribution and health.

It has not been possible to solve the drinking water problems in all 12 communities that were originally identified, mainly due to time constraints (late start and too short implementation period). None of the originally planned small-scale desalination plants were installed and only 8 of the 12 boreholes are currently supplying water in sufficient quantities and of good quality. Still, through the GCCA project, the life and health of more than 3,000 households have been improved by the improved water supply as described above.

The galleries for river water capture and the rainwater harvesting/storage systems have proven to be effective. In addition, they are relatively simple and easy to repair when necessary. Although being low-cost systems, the target communities are poor and many of them do not have the financial capacity to cover the costs themselves. The alternative of drilling boreholes is more expensive; the drilling of a shallow well of 140 ft has a cost of at least $7,000 (subsidized). So, an extension of the potable water coverage in Belize still depends on the availability of external financial resources.

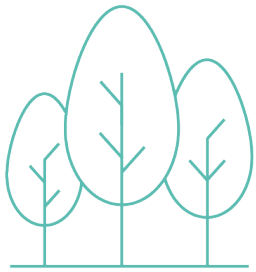
After the GCCA project, the Rural Development Department obtained funds through the EU-funded BAM Programme to improve the drinking water supply systems of two other communities (Hummingbird and Middlesex).

[46] https://www.catie.ac.cr/en/catie-news/3877-catie-provides-technical-support-to-livestock-producers-in-belize.html
[47] Ricardo Thompson and Manuel Matus, Ministry of Agriculture
[48] Limitations: available funds not sufficient, no proper places available in the area of the other two Farmer Field Schools.
[49] Diane Wade, UNDP

OBJECTIVE PILOT 5 (SO1.5): To effectively restore damaged forest stands in hurricane sensitive and flood prone areas.

Achievement: "1" (> 75%)

EXPLANATORY NOTE:



The main objective of pilot 5 was to develop a tool and to build capacity for effective management and restoration of damaged (mainly by hurricanes) forest stands.

Based on previous experience in 2010 with hurricane Richard, it was felt very important to be better prepared to respond to this kind of events and to count with an adequate methodology to mitigate the negative effects of hurricanes as CC impact.

Through the GCCA project, a tool (Rapid Ecological Assessment – REA) was developed, 10 foresters were trained in the application of the tool, the GIS-team was strengthened with equipment and training, and two nurseries were established. These support measures have proven to be very effective in 2017 when hurricane Earl passed by, following almost the same path as hurricane Richard. The demonstration / monitoring plots (8 plots), as part of the tool, served to investigate the damages caused in the forest stands. These were afterwards extrapolated to the wider regions and helped in the planning of restoration activities. With hurricane Earl, the tool had been expanded to include cost estimations.

It is worth mentioning that two years ago the Forest Department created a special GIS unit (the Geospatial Management Unit) with its proper budget, staff of 3 well-prepared experts and counting with all required equipment and software. The staff receives permanent training and the unit provides services to other government institutes, like the NCCO. In exchange, the GIS staff participates in training courses that are organized by the NCCO, as such creating a win-win situation.

SPECIFIC OBJECTIVE 2 (SO2): To enhance the institutional capacity of the Government of Belize to deal with matters related to climate change.

Achievement: "2" (between 50% and 75%)

EXPLANATORY NOTE:

The awareness and capacity building activities of civil servants as conducted by NEMO, have been – and still are – important and have contributed to the strengthening of the institutional capacity of the GoB. It should also be mentioned that the main objective of the five pilots was to enhance the capacity of the respective governmental implementing partners to deal with CC. However, some of these institutions have taken more advantage of it than others.

The main constraint of the GoB, however, remains its high dependence on external funding for dealing adequately and efficiently with matters related to CC.

2.6. Signs of indirect impact

No signs of positive indirect impact have been observed.

As a negative effect, the dissatisfaction of many cattle farmers (pilot 4) due to the fact that only 27 protein/energy banks and improved pasture plots were to be established, could be mentioned. The farmers found the limited number of beneficiary farms unfair as many of them had attended trainings, workshops and consultations without further benefiting from the project.

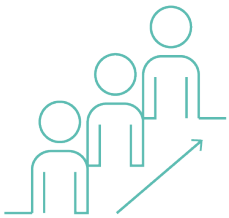
2.7. Conclusions on direct and indirect impact generated by the project and discussion on factors for success and failure

CONCLUSIONS ON GENERATED IMPACT:

Belize was always seen as a country rich in water. The discussions initiated under the GCCA project on the effects of CC in the water sector, gave insight in the complexity of the water resources system and its vulnerability.

The GCCA project mainly focused on institutional strengthening at national level through the establishment and operationalisation of two national government structures related to CC (NCCO) and water resources (NIWRMA), and through the implementation of pilot projects, under the responsibility of the National Emergency Management Organisation (NEMO), Ministry of Agriculture, Forest Department and the Department of Rural Development respectively.

Regarding the two planned government structures, only the National Climate Change Office (NCCO) is really operational and became even more visible and recognised after the GCCA. NCCO, in alliance with the CCCCC, has contributed to the development of the National Climate Change Policy, Strategy and Action Plan (NCCPSAP), which has served as the basis and guidelines for other sectoral policy and strategy papers. The NCCO staff employed/paid by the GoB increased from one person in 2014 to four persons in 2020. However, the operational budget is limited and the main activities of the NCCO (awareness raising and capacity building) are still project dependent.



The National Integrated Water Resources Management Authority (NIWRMA), in turn, is much less advanced and to date not even institutionalised. The water sector in Belize is complex and fragmented over many ministries. Important investments (financial/human resources and time) will still be needed to make NIWRMA operational.

The main impacts of the government-related pilot projects, are the following:

- Pilot 1 (NEMO): improved capacity of NEMO to react immediately and more efficiently in cases of flooding and other emergencies, by using its own backhoe (procured through the GCCA) and being independent from the Ministry of Works for equipment.
- Pilot 3 (Ministry of Agriculture): adoption and institutionalisation of the Farmer Field School methodology (included in training material for extension workers), which allows the extension workers to reach their farmer population more effectively. The methodology has been replicated in other regions of the country. Besides, the technical manual on CC adaptive agricultural measures has been integrated in the curriculum of the technical agricultural schools. The protein/energy and forage banks, together with the improved water supply, have reduced the vulnerability of cattle farmers during periods of prolonged drought.
- Pilot 4 (Department of Rural Development): this was the only pilot that did not spend its entire budget and that achieved less impact than expected. The pilot has not been used to build a national program and CC adaptation/mitigation strategy although it has improved the life and health through reliable supply of quality water of more than the approx. 3,500 households that directly benefited from the pilot.
- Pilot 5 (Forest Department): the Forest Department has used the pilot to develop a tool for effective management and restoration of forest stands damaged by, mainly, hurricanes (Rapid Ecological Assessment – REA). This tool, together with the foresters that were trained in the application of this tool and with the strengthened GIS-team, has proven to be very effective in 2017 after the passage of hurricane Earl.

FACTORS FOR SUCCESSFUL ACHIEVEMENT:

- Focus on one single objective (on institutional strengthening)
- High commitment of UNDP (main implementing partner) to CC-issues and to its role in supporting the GoB "putting the pieces together".
- Catalytic role in shifting from discussing CC issues to concrete actions and national plans.
- Establishment of relevant partnerships helps to ensure quality of deliverables: (1) with CATIE (technical and methodological expertise) and (2) with the Caribbean Community Climate Change Center (CCCCC)

(elaboration of the National Climate Change Policy, Strategy and Action Plan; potential replication throughout the Caribbean region)

FACTORS FOR FAILURE OF ACHIEVEMENT:

- Too many pilots in a too short timeframe resulted in poor interactions and synergies.
- Failure of the GoB to grasp the complexity of water resources management and the range of actions required to achieve adequate management; failure to share responsibility over the water sector with a wider range of actors and to effectively adopt an integrated and multidisciplinary approach to water resources management.
- High turnover of government civil servants.
- Lack of financial resources of the GoB.

III. Analysis of Sustainability Levels

3.1. List of services, systems and products that were established/delivered under the project and that should have been maintained (based on the outputs delivered):

COMPONENT 1: WATER RESOURCE MANAGEMENT / IMPROVED FRAMEWORK FOR PLANNING AND COORDINATING MANAGEMENT OF WATER RESOURCES

- Water Advisory Council within MNRA operational
- National Integrated Water Resources Management Authority (NIWRMA) operational

PILOT 1: BUILDING RESILIENT COMMUNITIES: PREPARING COMMUNITIES TO EFFECTIVELY MITIGATE THE IMPACT OF HAZARDS ASSOCIATED WITH THEIR CHANGING CLIMATE (NEMO)

- Continued monitoring of water levels by communities in flood prone areas of the Belize and North Stann Creek river watersheds
- Early warning system for flooding events still functional
- Large earth-moving equipment still available and operational

PILOT 2: SOCIAL PARTNERSHIP IN ADAPTATION AS A MEANS OF SECURING COMMUNITY WELLBEING (SEA)

- Continued monitoring of water quality and coral reef condition
- Continued community-based monitoring of mangrove areas
- Continued mangrove restoration, where needed
- Curricula of primary and secondary schools still include a programme on mangroves
- Replanted mangrove areas still standing (800 trees)

PILOT 3: CLIMATE CHANGE AND FOOD SECURITY: BUILDING RESILIENCE AMONG CATTLE PRODUCERS OF BELIZE DISTRICT (MNRA & CATIE)

- Farmer Field Schools (3) in Belize River Valley and demonstration farms still operational
- Improved pastures and protein/energy banks (27 farms) still productive
- Water resources (25 wells and/or ponds) still supplying water
- Communal livestock shelter in good condition and used to protect livestock in times of extreme weather conditions

PILOT 4: ACCELERATING POTABLE WATER COVERAGE: PILOTING INNOVATIVE SOLUTIONS IN SECURING LOCAL WATER SUPPLY SOURCES (MLLGRD & NEMO)

- 12 Community boreholes constructed and/or rehabilitated still supplying water
- Rainwater harvesting and storage systems still in use (RWH)
- Galleries for water capture and storage still functional

PILOT 5: APPLIED FOREST MANAGEMENT: BUILDING CAPACITIES FOR THE RESTORATION OF WATERSHEDS IMPACTED BY NATURAL DISASTERS (MFFSD/FOREST DEPARTMENT)

- Vehicle still available and operational
- GIS equipment still available and operational
- Continued monitoring of watershed restoration in established permanent plots
- Nurseries (2) still producing

COMPONENT 2: CLIMATE CHANGE GOVERNANCE / ENHANCED NATIONAL CAPACITIES TO PLAN FOR AND TO COORDINATE A NATIONAL RESPONSE TO THE THREATS OF CLIMATE CHANGE

- The National Climate Change Office (NCCO) under the Ministry of Forestry, Fisheries and Sustainable Development (MFFSD) still operational
- 15 scholarships granted to public servants successfully completed and skills effectively used by trainees in their current positions.

3.2. Information and comments on sustainability aspects from the available reports (desk phase):

♦ **From the EUD monitoring report (Oct 2014):**

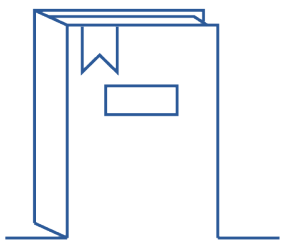
The project successfully integrated its main activities into existing institutions. Most of the institutional activities already received funds from the GoB budget, although they will need additional funding to ensure full functionality. Pilot 1: The pilot is well integrated into NEMO's early warning system for floods. However, most of the NEMO district coordinators lack the necessary means (transport, fuel) to ensure regular and full coverage within their districts.

♦ **From the GCCA Global Evaluation (April 2014):**

To what extent are the conditions met and mechanisms in place to sustain programme results and ensure a continued flow of benefits to beneficiaries?
"It is difficult to speak of sustainability when a project starts late and has a short implementation period. Nevertheless, key activities were closely linked to national processes and work programmes. Such "grounding" within ministerial work programmes allows for continuity of actions beyond project timelines and also facilitates the building on or expansion of efforts on established project foundations. There is still a need at some point for direct government financial investment in the seeds that the project has planted. The positions funded by the project with the NCCO, for example, may now be recognised as formal positions within the Belize public service but at some point, the GoB has to take financial responsibility for them. The plan is that through the next budget cycle that starts in November the positions will be funded by the GoB. …. Much attention was paid to selecting activities that truly respond to national needs. …. A lot of importance was given to the financial sustainability of the NIWRMA; this aspect had been the subject of previous studies on the future institution's mandates and operations."

3.3. Summary findings from the desk phase and specific issues to be further explored during the field phase:

The list of delivered outputs, presented in section 1, is based on information from the project's narrative report covering progress up to March 2014 and on the Aide Mémoire of the Global GCCA Evaluation mission of April 2014. As the project only ended in November 2014, this list may very well be incomplete and needs to be verified during the field mission. Together with later adjustments at the level of the outputs delivered, also the list (box 3.1) of "services and systems that were established under the project and that should have been maintained" must be adjusted so that the present assessment of sustainability levels covers all project deliveries.



Regarding Pilot 2, it was mentioned that partnerships with tourism operators were being sought and established to enhance the potential for sustainability. It should be further explored whether this has materialized and with what effects on sustainability.

3.4. Results of the sustainability analysis (as per table in Annex)

23 items were checked for their sustainability. Information could be collected for 19 of these.

The scores of these 19 items are as follows:
- 2 items (11%) scored 1, meaning that they were fully sustained and expanded/improved
- 11 items (58%) scored 2, meaning that they were fully sustained in a "status quo" situation
- 5 items (26%) scored 3, meaning that they still exist but with quality and/or coverage issues
- 1 items (5%) scored 4, meaning that they disappeared or lost their functionality

Evidence was found through direct observation for 1 item (5%); through reporting by reliable sources for 17 items (90%); and through information gained from uncertain sources for 1 item (5%).

3.5. Conclusions on the sustainability aspects and discussion on factors for success and failure

Sustainability levels are valued quite positive. Five years after completion of the GCCA project, 18 of the 19 systems/services about which information could be gathered during the field visit are still existing. 2 of them (11%) even scored "1" (fully sustained and expanded/improved). They concern (1) the functioning of the NCCO (its staff has doubled) and (2) the continued use of the GIS equipment for which a "Geospatial Management Unit" with a proper budget and well-trained GIS-staff was created within the Forest Department. On the other hand, 5 of the systems/services (26%) - though still existing - have lost coverage (planted mangrove area, drinking water supply, trained civil servants using their skills in current positions) or did not obtain the quality that was expected (NIWRMA). The only activity that was discontinued after the project's completion is the community-based monitoring of restored mangrove areas (pilot 2).

DRIVERS FOR SUCCESS:

- Raised awareness at government level
- NCCO became through the project well-organised and and gained national visibility and credibility.
- Institutionalisation and integration (e.g. in action plans) of tools/curricula/manuals developed during GCCA.
- Raised levels of awareness and capacity.
- Availability of funds from other projects.
- Response to concrete needs of local communities and their organisations; involvement of local communities and their organisations in project implementation.
- Introduction of systems/equipment that are low-cost and easy to maintain/repair.

DRIVERS FOR FAILURE:

- High turnover of public servants.
- GoB lacking resources.
- Water sector too fragmented within the system, with many ministries involved and lack of coordination.
- In order for the NIWRMA to become sustainable, it will require new taxes and viable water fees (unpopular measure).

IV. Additional elements

4.1 M&E Practice

M&E ACTIVITIES THAT HAVE TAKEN PLACE (INTERNAL AND EXTERNAL):

- **Internal:**
  - Regular follow-up meetings by UNDP with the implementing partners of the 5 pilot adaptation projects
  - Final reports of the 5 pilot adaptation projects received and reviewed by UNDP (Project Lessons Learned Reports)

- **External:**
  - A ROM mission was conducted in the early stages of the project, but the findings were never shared with the programme management team. "*It is understood that the evaluator responsible for the ROM fell ill and never completed the report*"[50].
  - No mid-term evaluation nor a final or ex-post evaluation was carried out.
  - External EU monitoring mission (Piero Nardi, Oct 2014)
  - There has been quite some discussion whether a final or ex-post evaluation would be conducted. Finally, it was decided that the task would be covered by the external evaluation of the Caribbean component of the 10th EDF Intra-ACP GCCA programme[51]. However, although Belize was chosen as one of the countries to be visited by the evaluators, the conclusions are very general with relatively little attention paid to impact and sustainability (in the report both were rated as "Unsatisfactory").

% OF BUDGET ALLOCATED TO M&E THAT HAS BEEN USED:

- Budget for evaluation: 50,000 EUR
- No information could be obtained on what % of this budget was actually spent for M&E.

ADDITIONAL M&E REPORTS THAT HAVE BEEN COLLECTED:

- Final evaluation of the "Support to the Climate Change Alliance under the 10th EDF Intra-ACP financial framework in the Caribbean Region" February 6, 2017 – May 6, 2017 (April 2017)
- Project Lessons-Learned Report GCCA Project, Component 2, NCCO (Jan 2015)
- Project Lessons-Learned Report GCCA Project, Pilot 3 (Jan 2015)
- Project Lessons-Learned Report GCCA Project, Pilot 4 (Jan 2015)
- Project Lessons-Learned Report GCCA Project, Pilot 5 (Jan 2015)

4.2. Contributions to GCCA+ knowledge management and communication

PROJECT-SUPPORTED RESEARCH AND RESEARCH FINDINGS: none

[50] Source: Aide Mémoire 2014
[51] Final evaluation of the "Support to the Climate Change Alliance under the 10th EDF INTRA-ACP financial framework in the Caribbean Region" February 6, 2017 – May 6, 2017 (April 2017).

COMMUNICATION MATERIALS:

Quotes, testimonies

- *"GCCA took Climate Change out of its discussion level and got CC uplifted to and maintained in national plans. In this way CC was not an environment issue any more, but became a development issue"* (Diana Wade, Program analyst/Environment Portfolio, UNDP)
- *"GCCA had a catalytic effect"* (Diana Wade, Program analyst/Environment Portfolio, UNDP)
- *"We could have done it quicker without consultation with the people, but how sustainable would it have been? In the end, they would not use it"* (Ernest Banner, Coordinator Rural Development)

Videos

- https://www.youtube.com/watch?v=F2przq8K5AQ&feature=youtu.be
- https://www.youtube.com/watch?v=UNktKsyXSqA&feature=youtu.be
- https://www.youtube.com/watch?v=XxsxHJ8x8T0

4.3. Opportunities for scaling up (future GCCA support activity)

- Capitalising on the established alliance with the Caribbean Community Climate Change Center (CCCCC) for multiplication and scaling up interventions to the Caribbean regional level.
- Further dissemination of the "Mangrove restoration guide" and the "Curriculum-based teacher´s resource guide" on mangrove (pilot 2).
- Farmer Field School methodology for CC training - and demonstration activities targeting organised farmer groups (Pilot 3).
- Rapid Ecological Assessment (REA) system for effective management and restoration of forest stands that suffered damage from hurricanes (Pilot 5).

4.4. Climate Finance – evidence of funding mobilised from public and/or private local sources

MOBILISATION OF PUBLIC RESOURCES:

- Payment by the GoB of salary of four staff members of the NCCO.

MOBILISATION OF PRIVATE RESOURCES:

- Financial support and human resources of SEA (NGO) for continued monitoring of water quality and coral reef condition, and for continued mangrove restoration.
- Financial support of the Norwegian Cruise Line Company for the implementation of a conservation management plan in Harvest Caye, which includes mangrove planting on the island (developer pays for conservation and protection).

V. Sources of Information

DOCUMENTS COLLECTED AND CONSULTED FOR THE DESK PHASE ANALYSIS:

- **Programming documents**
  - Action Fiche, with attached logframe, 2010
  - Financing Agreement with the Government of Belize (GoB), including TAPS and logframe, signed November 2011
  - Project Document with Results Framework, prepared by UNDP, March 2012. (Format: EU template for grant applications)

- **Progress reports**
  - Interim Narrative Report for the period July 2012 – March 2014, UNDP, 2014.
  - Financial Report First Tranche for the period June 2012-March 2014, UNDP, 2014.
  - Audit Report covering January – December 2014, Moore Stephens Magana LLP, June 2015

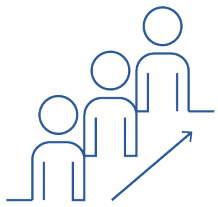
- **Monitoring and Evaluation reports**
  - Mission Aide Mémoire, Belize, GCCA Global Evaluation Report, June 2014
  - Monitoring Report of the EUD following a field visit, October 2014

- **Technical documents:**
  - Assessment of groundwater resources in the southern coastal water province of Belize referred to as Savannah Groundwater Province. Prepared by GEOMEDIA Ltd. Inception report, December 2013. Progress Reports, February and March 2014.

ADDITIONAL DOCUMENTS COLLECTED AND CONSULTED DURING THE FIELD PHASE:

- **Progress/Evaluation reports**
  - Final evaluation of the "Support to the Climate Change Alliance under the 10th EDF Intra-ACP financial framework in the Caribbean Region" February 6, 2017 – May 6, 2017 (April 2017)
  - Project Lessons-Learned Report GCCA Project, Component 2, NCCO (Jan 2015)
  - Project Lessons-Learned Report GCCA Project, Pilot 3 (Jan 2015)
  - Project Lessons-Learned Report GCCA Project, Pilot 4 (Jan 2015)
  - Project Lessons-Learned Report GCCA Project, Pilot 5 (Jan 2015)

- **Policy documents/Management plans**
  - National Integrated Water Resources Act (NIWRA) (https://www.belizejudiciary.org/download/LAWS%20of%20Belize%20rev2011/Law%20s%20Update%202011/Data/VOLUME%2010/Cap%20222.01%20National%20Integrated%20Water%20Resources%20Act.pdf)
  - National Climate Change Policy, Strategy and Action Plan – NCCPSAP (2015-2020) (CCCCC and MFFSD, 2014) http://extwprlegs1.fao.org/docs/pdf/blz169290.pdf
  - A national adaptation strategy to address climate change in the agriculture sector in Belize (CCCCC and NCCO, June 2015) (http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2018/03/1082.pdf)
  - National Forest Policy Belize (May 2015) (http://extwprlegs1.fao.org/docs/pdf/blz149121.pdf)
  - Intended Nationally Determined Contribution (INDC) under the United Nations Framework Convention on Climate Change, Belize (https://unfccc.int/files/focus/ndc_registry/application/pdf/belize_ndc.pdf)
  - Belize Integrated Coastal Management Plan (MFFSD, 2016) (https://www.coastalzonebelize.org/wp-content/uploads/2015/08/BELIZE-Integrated-Coastal-Zone-Management-Plan.pdf)



- **Technical documents**
  - Participatory Training of Cattle Producers of the Belize District in Preparation for Extreme Weather Events, Final Report (Catie, Oct 2014)
  - Enhancing Belize's Resilience to Adapt to the Effects of Climate Change, Project Number 00083646 Contract Number: GCCA/PS/2013/01 (Bhawan Singh, March 2014) (https://info.undp.org/docs/pdc/Documents/BLZ/Final%20Report%20Vulnerability%20and%20Adaptation%20Belize.pdf)
  - Draft Organisational Review and Institutional Development Consultancy (National Integrated Water Resources Authority of Belize), Draft Organizational And Operational Charter (R. Williams, October 2013) (https://info.undp.org/docs/pdc/Documents/BLZ/NIWRA%20D4%20OPERATIONAL%20AND%20ORGANIZATIONAL%20CHARTER.pdf)
  - Belize: National Integrated Water Resources Authority (NIWRA), Consultancy Report (Ydahlia Metzgen, May 2014)
  - (https://info.undp.org/docs/pdc/Documents/BLZ/Belize-%20NIWRA%20Consultancy%20Report.pdf
  - Frequently Asked Questions (FAQs), Consultancy National Integrated Water Resources Authority (NIWRA) of Belize, by Rudolph Williams Jr.
  - Mangrove Restoration Plan (Jan 2015) (http://fragmentsofhope.org/wp-content/uploads/2017/12/Mangrove-Reforestation-Plan.pdf)

- **Videos**
  - https://www.youtube.com/watch?v=F2przq8K5AQ&feature=youtu.be
  - https://www.youtube.com/watch?v=UNktKsyXSqA&feature=youtu.be
  - https://www.youtube.com/watch?v=XxsxHJ8x8T0
  - https://www.youtube.com/watch?v=kWLcX-lsFTo&feature=youtu.be

RELEVANT WEBSITES:

- https://open.undp.org/projects/00068453
- http://www.seabelize.org/research/
- https://www.facebook.com/belizeclimatechange/
- http://www.caribbeanclimate.bz/2017/page/4/
- https://fragmentsofhope.org/mangrovereforestation/
- https://www.catie.ac.cr/en/catie-news/3877-catie-provides-technical-support-to-livestock-producers-in-belize.html
- http://www.mangrovesolutions.com/product.php
- https://www.cbd.int/doc/case-studies/tttc/tttc-00159-en.pdf

CONTACTS OF STAKEHOLDERS COLLECTED DURING THE DESK PHASE:

- **EUD (to Jamaica):**
  - Nicolaus Hansmann, Project Manager (based in Belize). Nicolaus.HANSMANN@eeas.europa.eu
  - Ricard Bardia Divins, current Head of Cooperation, ricard.bardia-divins@eeas.europa.eu

- **Implementing partners and institutional beneficiaries:**
- **Ministry of Finance and Economic Development** (GoB/NAO):
  - Carlos Pol, focal person, Policy and Planning Unit.

- **UNDP Belize**:
  - Diane Wade-Moore, Program analyst/Environment Portfolio, diane.wade@undp.org
  - Ian King, Resident Representative, ian.king@undp.org

- Denise Antonio, Assistant Resident Representative, denise.antonio@undp.org
- Ismirla Tillett-Andrade, Programme Assistant, ismirla.andrade@undp.org

- **MFFSD/NCCO:**
  - Dr. Lennox Gladden, NCCO, Programme Director, coord.cc@ffsd.gov.bz
  - Ide Mckoy-Sosa, NCCO, Project Manager of the 4th National Communication Project (GEF), idesmckoy@gmail.com; passt.cc@environment.gov.bz

- **MNR/National Integrated Water Resources Management Authority (NIWRMA)**
  - Teniel Williams, GCCA Programme Focal Point, pflowers@mnra.gov.bz

- **MFFSD/Forest Department:**
  - Percival Cho, CEO Ministry of Agriculture, Fisheries, Forestry, the Environment and Sustainable Development (MoA)

- **NEMO:**
  - Col. Shelton Defour, NEMO National Coordinator

- **SEA**
  - Arreini Palacio Morgan, Executive Director, info@seabelize.org
  - Abigail Parham-Garbutt, coordinator GCCA component

- **Others:**

GEOMEDIA (Consultants). Michal Stibitz (project manager), Vaclav Frydrych (Head of Field Work), Zdenek Patzelt (Field Work) of GEOMEDIA Ltd. Czech Republic. Contracter for the groundwater assessment in the Savannah Groundwater Province. geomedia@login.cz

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- Col. Shelton Defour, NEMO, National Coordinator, defour-shelton@yahoo.com
- Wilber Sabido, MFFSD/Forest Department, Chief Forest Officer, cfo@forest.gov.bz
- Tennielle Williams-Hendy, NIWRMA, Principal Hydrologist, principal.hydrologist@naturalresources.gov.bz
- Areinni Palacio, Southern Environment Association (SEA), Executive Director, apmorgan@seabelize.org
- Ricardo Thompson, Ministry of Natural Resources and Agriculture, Station Manager Central Farm, ricardo.thompson@agriculture.gov.bz
- Manuel Matus, Ministry of Natural Resources and Agriculture, Procurement Officer, procurement.officer@agriculture.gov.bz
- Ernest Banner, MLLGRD, Director Rural Development, ernest.banner@gmail.com

Annex to the report: Sustainability Analysis

NR	DESCRIPTION OF SYSTEM/ SERVICE TO BE SUSTAINED	SCORE	EVIDENCE	EXPLANATORY NOTES
COMPONENT 1. WATER RESOURCE MANAGEMENT / IMPROVED FRAMEWORK FOR PLANNING AND COORDINATING MANAGEMENT OF WATER RESOURCES				
1	Water Advisory Council within MNRA operational	3	U	According to the organisational and operational charter as proposed by the project's consultant[52], the Belize Water Advisory Council should be officially composed of six technical officers drawn from the Water Sector (Public Health Bureau, Department of the Environment, Department of Agriculture, National Emergency Management Organisation, Forest Department). Its primary role is to overcome persistent inter-Ministerial/Departmental coordination challenges. The consultant for the present I&S Study has been told by the Coordinator of the Rural Development that "there exists a group" that organises once or twice per year a meeting to discuss issues related to water management problems. However, no formal water authority structure does exist as yet and the way how the Act (NIWRA) should be implemented through concrete actions has never been subject of discussion in this group.

[52] Source: Draft Organizational Review and Institutional Development Consultancy (National Integrated Water Resources Authority of Belize), DRAFT ORGANIZATIONAL AND OPERATIONAL CHARTER (R. Williams, October 2013)

NR	DESCRIPTION OF SYSTEM/ SERVICE TO BE SUSTAINED	SCORE	EVIDENCE	EXPLANATORY NOTES
2	National Integrated Water Resources Management Authority (NIWRMA) operational	3	R	To date the NIWRMA is not institutionalised nor operational, although the idea was never abandoned. The main reasons for failure are, amongst others: ▪ The complexity of the water sector and a too fragmented water management within the system ▪ Many ministries involved and lack of coordination ▪ Lack of appropriate water regulations, a comprehensive inventory of water resources, and a monitoring system ▪ Communities are not used/willing to pay for water consumption ▪ GoB lacking resources ▪ And, last but not least, the task to get the NIWRMA on the rails is still considered as a responsibility of the Hydrology Department of the Ministry of Environment, and not as a shared responsibility of all ministries concerned.
PILOT 1: BUILDING RESILIENT COMMUNITIES: PREPARING COMMUNITIES TO EFFECTIVELY MITIGATE THE IMPACT OF HAZARDS ASSOCIATED WITH THEIR CHANGING CLIMATE				
3	Continued monitoring of water levels by communities in flood prone areas of the Belize and North Stann Creek river watersheds	2	R	The river keepers, also called river monitors, are the community people who live right in front of the river. They receive training on a regular basis. Because of their location, monitoring river water levels is not a big effort. Also, they are aware that monitoring is for their own well-being. Therefore they are motivated to give continuity to the water level monitoring and, in case of emergencies and danger of flooding, they immediately warn their respective NEMO district coordinators (credit of their cell phone paid by NEMO).
4	Early warning system for flooding events still functional	5	-	No information could be collected on the functioning of the installed flood warning sirens.

NR	DESCRIPTION OF SYSTEM/ SERVICE TO BE SUSTAINED	SCORE	EVIDENCE	EXPLANATORY NOTES
5	Large earth-moving equipment still available and operational	2	R	The backhoe that NEMO acquired through the GCCA project is still operational and is currently working on drainage works all over the country according to a well-organised workplan. NEMO employs the operator and covers the costs of maintenance; NEMO is one of the few governmental institutions that is not project dependent. Reason for success: The backhoe is crucial for drainage work. Since NEMO has now its own backhoe, the department is not dependent anymore on the equipment of the Ministry of Works and is able to react more quickly and efficiently during periods of flooding and emergencies.
PILOT 2: SOCIAL PARTNERSHIP IN ADAPTATION AS A MEANS OF SECURING COMMUNITY WELLBEING				
6	Continued monitoring of water quality and coral reef condition	2	R	Water quality monitoring was an important component under the GCCA project that started in 2013. Since then, SEA continued data collection on a monthly basis until June 2019 when the equipment broke down. However, at the end of the year SEA was able to get it replaced using funds from another project. They will resume the water quality monitoring as from January 2020. Similarly, monitoring of the coral reef condition is continuing (bleaching and restoration), being part of SEA´s scientific programme, which is funded by the Mesoamerican Reef Fund (MARFUND). Reason for success: - Good water quality (for drinking water, as well as for marine biodiversity being one of the biggest attractions in the region) is crucial for the important tourism industry in Placencia - Access to funds from other projects.

NR	DESCRIPTION OF SYSTEM/ SERVICE TO BE SUSTAINED	SCORE	EVIDENCE	EXPLANATORY NOTES
7	Continued community-based monitoring of mangrove areas	4	R	Community-based monitoring of the planted mangrove areas has been discontinued. No particular reasons for this could be given by the Executive Director of SEA. It should be mentioned though that the NGO suffered a big reduction of its staff in 2015.
8	Continued mangrove restoration, where needed	2	R	SEA started planting mangroves in 3 new sites (Laughing Bird Caye, Little Water Caye and Harvest Caye), engaging schools in planting and maintenance, using the mangrove restoration guide that was developed during the GCCA project. Reason for success: ▪ Awareness about the importance of mangrove for the protection of the shoreline ▪ Need to counteract mangrove cutting by real estate companies in the area
9	Curricula of primary and secondary schools still include a programme on mangroves	2	R	Yes, officialised by the Ministry of Education.
10	Replanted mangrove areas still standing (800 trees)	3	R	Some parts are still standing, others are washed away because of currents or were uprooted by children in the most populated areas.
PILOT 3: CLIMATE CHANGE AND FOOD SECURITY: BUILDING RESILIENCE AMONG CATTLE PRODUCERS OF BELIZE DISTRICT				
11	Farmer Field Schools (3) in Belize River Valley and demonstration farms still operational	2	R	The three Farmer Field Schools are still operational as a group of organised cattle farmers, with the district extension officer in charge.

NR	DESCRIPTION OF SYSTEM/ SERVICE TO BE SUSTAINED	SCORE	EVIDENCE	EXPLANATORY NOTES
12	Improved pastures and protein / energy banks (27 farms) still productive	5		No information could be collected
13	Water resources (25 wells and/or ponds) still supplying water	5		No information could be collected
14	Communal livestock shelter in good condition and used to protect livestock in times of extreme weather conditions	5		One cattle pen in the Belize River Valley region has been constructed through the GCCA project, but no information could be collected about its condition and use.
PILOT 4: ACCELERATING POTABLE WATER COVERAGE: PILOTING INNOVATIVE SOLUTIONS IN SECURING LOCAL WATER SUPPLY SOURCES				
15	Community boreholes (12) constructed and/or rehabilitated still supplying water	3	R	Of the 12 boreholes where viable groundwater reserves were found, 8 are currently still supplying sufficient water of good quality, benefiting more than 3,000 households with a reliable water source. The other 4 wells were abandoned as they couldn't supply the quantities needed to respond to the demand; in addition, 1 of the wells presented water quality problems. In this regard, it should be mentioned that the groundwater level is decreasing in Belize; it becomes increasingly difficult to find aquifers with good water reserves. The mandate of the Rural Development Department is to give follow-up to the wells and to supervise the Water Boards. The Department is working closely with the Village Councils.

Nr	Description of System/ Service to be sustained	Score	Evidence	Explanatory notes
16	Rainwater harvesting and storage systems still in use (RWH)	2	R	The rainwater harvesting and storage systems that were installed for 65 households in the two villages Gracie Rock and Freetown Sibun are still functional. The systems are simple and easy to repair, if needed. Before the project, the river was the only water source for these households.
17	Galleries for water capture and storage still functional	2	R	The five galleries that were rehabilitated in three villages (San Vicente, Billy White and San Pablo) near the river are still functional, benefiting approximately 236 households.
Pilot 5: Applied Forest Management: Building Capacities for the Restoration of Watersheds Impacted by Natural Disasters				
18	Vehicle still available and operational	2	R	The Forest Department received through the GCCA project one vehicle that is still running. It is mainly used by the team in charge of monitoring the permanent sample plots.
19	GIS equipment still available and operational	1	R	The desktops, software, GPS, drones and satellite images supplied through the GCCA project are still operational and used by a recently created unit called “Geospatial Management Unit”, in charge of land use assessments. The unit has its own budget and its staff receives permanent training.
20	Continued monitoring of watershed restoration in established permanent sample plots	2	R	The sample plots, as an important element of the Rapid Ecological Assessment (REA) system, still exist and are still used for monitoring. The data on forest damages and restoration efforts that were described and monitored in the plots, have been extrapolated to other regions. With the Hurricane Earl in 2017, the REA system has proved to be very instrumental for efficient restoration. The REA system has been expanded with an estimated cost evaluation (based on future timber value).
21	Nurseries (2) still producing	2	R	The two nurseries are still there and producing (managed by the Corozal Sustainable Future Initiative in the North, and the Ya´axche Conservation Trust in the South). Reason for success: Both organisations already existed before the GCCA project, are well-known, and have their own infrastructure.

NR	DESCRIPTION OF SYSTEM/ SERVICE TO BE SUSTAINED	SCORE	EVIDENCE	EXPLANATORY NOTES
COMPONENT 2. CLIMATE CHANGE GOVERNANCE / ENHANCED NATIONAL CAPACITIES TO PLAN FOR AND TO COORDINATE A NATIONAL RESPONSE TO THE THREATS OF CLIMATE CHANGE				
22	The National Climate Change Office (NCCO) under the Ministry of Forestry, Fisheries, the Environment and Sustainable Development (MFFSD) still operational	1	D	The NCCO is still operational and, since the end of the GCCA project, its staff has almost doubled to 7 members, of which 4 are fully paid by the GoB (Head, Deputy Head, CC Adaptation Officer, and Project Manager). The other three members (CC Mitigation Officer & Green House Gas Inventory Coordinator, MRV Officer, and Procurement Officer) are being financed by other projects (GEF and REDD+). Main reasons for success: ▪ The project raised awareness at government level ▪ Through the project, NCCO became well-organised and gained national visibility and credibility.
23	15 scholarships granted to public servants successfully completed and skills effectively used by trainees in their current positions.	3	R	12 of the 15 scholarship beneficiaries completed the courses successfully; however, only about 25% of them are currently working in public service. Main reason for failure: High turnover of public servants. It is due to mention that, apart from the scholarships, also other capacity building activities for public servants were organised and conducted by the NCCO during the project. For example: ▪ WWF training workshop on CC Adaptation and Green Recovery Reconstruction with participation of more than 70 government representatives[53].

[53] http://envirodm.org/post/disaster-risk-and-recovery-and-climate-change-adaptation-training-held-for-belize-government

NR	DESCRIPTION OF SYSTEM/ SERVICE TO BE SUSTAINED	SCORE	EVIDENCE	EXPLANATORY NOTES
				▪ Training of 17 technical officers (agriculture department) on the effects of CC on the agricultural sector, in partnership with IICA. ▪ Training of more than 200 teachers countrywide to prepare them for teaching on CC under the science curriculum.

This **Impact and Sustainability Assessment of Enhancing Belize's resilience to adapt to the effects of climate change** (2010/022-636) is one of the 22 case studies that were conducted to feed into the overall **EU GCCA/EU GCCA+ Impact and Sustainability Study**.

This case study report provides a summary list of outputs delivered, a detailed analysis of ex-post impact and sustainability levels as well as additional information on the project's M&E practices, on the available knowledge and communication products, on scaling-up opportunities and on ex-post climate finance mobilised from local public and private sources.

All reports are available on www.gcca.eu/resources

THE ALLIANCE FOR A CHANGING WORLD

The Global Climate Change Alliance Plus (EU GCCA+) is a European Union flagship initiative helping most vulnerable countries respond to climate change. It started in 2007 and has become a major climate initiative with over 80 programmes in Africa, Asia, the Caribbean and Pacific region.

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