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LEARNING-ORIENTED REAL-TIME IMPACT ASSESSMENT (LORTA)

Inception report

December 2021

GREEN CLIMATE FUND
INDEPENDENT EVALUATION UNIT

Learning-Oriented Real-Time Impact Assessment (LORTA)

INCEPTION REPORT

December 2021

In collaboration with the Center for Evaluation and Development (C4ED)

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ABBREVIATIONS

AE	Accredited entities
ARA	Agriculture resilience and adaptation
CAT	Climate adaptation technologies
CCS	Clean cooking solutions
EARF	Energy Access Relief Facility
EE	Energy efficiency
EGIP	Embedded Generation Investment Programme
MGFC	Mongolia Green Finance Corporation
RCT	Randomized control trial
TA	Technical assistance
AEPC	Alternative Energy Promotion Centre
BOAD	<i>Banque Ouest Africaine de Développement</i>
CRDB	Cooperative and Rural Development Bank
CSA	Climate smart agriculture
DAEs	Direct access entities
DiD	Difference-in-difference
FSM	Federated States of Micronesia
GCF	Green Climate Fund
GHG	Greenhouse gas
GIS	Geographic information systems
IEU	Independent Evaluation Unit
LCTs	Local Community Trusts
LFI	Local Finance Institutions
LORTA	Learning-Oriented Real-Time Impact Assessment
M&E	Monitoring and evaluation
MSME	Micro-, small- and medium-sized enterprises
RED	Randomized encouragement design
RMG	Textile and Readymade Garment
ToC	Theories of change

I. INTRODUCTION TO THE LORTA PROGRAMME

The importance of impact evaluations for development projects and programmes has become widely accepted in recent years. The recent developments in this area include using impact evaluations in climate change interventions, as well as piloting impact evaluations in the humanitarian and peacebuilding domains. Impact evaluations allow for increased transparency by measuring outcomes, and they enable the more effective design and implementation of development projects. To contribute to this process, the Independent Evaluation Unit (IEU) of the Green Climate Fund (GCF) started the Learning-Oriented Real-Time Impact Assessment (LORTA) programme in 2018. The LORTA programme has the following aims:

- To embed real-time impact evaluations into funded projects/programmes so GCF programme managers can quickly access accurate data on the programme's quality of implementation and likelihood of impact.
- To build capacity within projects to design high-quality data sets for overall impact measurement.

The LORTA programme incorporates state-of-the-art approaches into impact evaluations, to measure results and provide information on the effectiveness and efficiency of GCF projects. The purpose of these impact evaluations is to measure the change in key result areas of the GCF that can be attributed to project activities.

The programme uses theory-based counterfactual impact assessment (experimental or quasi-experimental) designs, and employs mixed-methods approaches that involve both quantitative and qualitative assessment. The real-time measurement systems and qualitative data systems established for impact evaluation will help project teams measure progress in implementation and provide rapid lessons on the early progress of the projects.

LORTA is organized into three phases:

- Phase I – formative engagement and design: Once a year, the LORTA Design Workshop is held to select GCF-funded projects – suitable for impact evaluation out of the GCF portfolio of projects – to be part of LORTA. The IEU supports these projects to build high-quality, theory-based impact evaluation designs at inception. Formative work includes engagement with project teams, direct access entities (DAEs) and GCF staff, and designs for theory-based impact evaluations. So far, 17 projects (eight in 2018, five in 2019, and four in 2020) have gone through Phase I, and new projects will enter Phase I in 2022.
- Phase II – impact assessment: The second phase of LORTA will involve the main impact assessment stage (3–5 years) and include surveys implementing measurement and tracking systems, collecting baseline and endline data (both qualitative and quantitative), and continuous monitoring for real-time learning. Sixteen GCF-funded projects have already transitioned from Phase I to Phase II,¹ of which one project has already completed Phase II.
- Phase III – data analysis and feedback: The final stage will involve analysing baseline and endline data (both qualitative and quantitative), discussing results and engaging with a diverse range of stakeholders to share results and incorporate feedback as required. Currently, one project is in Phase III.

¹ Note that one of these 17 projects, the Mongolia one, is no longer part of the LORTA portfolio, and two further projects (FP096 of Congo and FP116 of Kyrgyzstan) entered LORTA in 2019 and 2020 respectively, but have not yet undergone LORTA Phase I.

As of December 2021, the LORTA portfolio consists of a total of 18 GCF-funded projects, of which 16 are active and 2 are on pause.

II. LORTA VIRTUAL DESIGN WORKSHOP

A. GENERAL REMARKS

The fourth LORTA Design Workshop was organized by the IEU and the Center for Evaluation and Development (C4ED) and took place from 30 August 2021 to 5 November 2021. Similar to the previous year, the COVID-19 pandemic prevented the design workshop from being held in person. The 2021 LORTA Design Workshop was therefore also held virtually over a video-conferencing platform, and consisted of different parts stretched over a period of about 10 weeks. Participants were representatives from different divisions within the GCF (including IEU), impact evaluation specialists from C4ED and other entities, as well as representatives of DAEs, implementing partners and project staff from 14 GCF-funded projects. With the aim of rebalancing the LORTA portfolio, the main target audience for this year's workshop were DAEs.

The workshop had the following objectives:

- 1) Increase understanding among project representatives of the importance of impact assessment and rigorous measurement systems.
- 2) Provide the opportunity for participants to gain basic knowledge or further increase their knowledge about impact evaluations, learn from case studies and be introduced to different impact evaluation methods (especially randomized and quasi-experimental designs).
- 3) Provide the opportunity for project representatives to critically discuss viable impact evaluation designs for their respective projects, under the guidance of experienced and qualified impact evaluation specialists.
- 4) Provide the opportunity for participants to consider how satellite data can complement their monitoring and evaluation (M&E) strategies.
- 5) Provide the opportunity for project representatives to apply lessons learned and share information received through online sessions about impact assessment to their own project.
- 6) Identify promising GCF-funded projects for which impact evaluation designs will be developed in the remaining 2021 inception and engagement phase of the LORTA programme.

The workshop incorporated capacity-building measures using various digital formats, such as a live webinar every week, a learning video for each topic of the webinar, additional reading material as well as online breakout group sessions (for the full workshop agenda, please refer to Appendix 1).

During the eight webinars, the following topics were discussed:

- Webinar 1: What is LORTA? Why is it important?
- Webinar 2: Theories of change (ToC)
- Webinar 3: Evaluation questions and indicators
- Webinar 4: Assumptions and mechanisms: evaluation questions and indicators for behavioural interventions
- Webinar 5: Experimental impact evaluation
- Webinar 6: Non-experimental impact evaluation
- Webinar 7: Scale, satellite and spatial data
- Webinar 8: Timeline and budget
- Webinar 9: Rapid-fire presentations and closing remarks

For all webinars, except webinar 9, a learning video and reading material were shared with participants in advance to increase understanding of the webinar's topics. All learning videos were

recorded by IEU and C4ED jointly and lasted between 20 and 40 minutes. The reading material consisted of papers, book chapters and guidelines, and aimed to deepen and add to the knowledge conveyed through the videos.

Three of the webinars were supported by external partners of the IEU based on their respective sets of expertise. Representatives from the Busara Center for Behavioral Economics supported one webinar, the King Climate Action Initiative of the Abdul Latif Jameel Poverty Action Lab (J-PAL) supported another, and representatives from the Food and Agriculture Organization of the United Nations (FAO) supported a third webinar.

The breakout group sessions were organized in parallel to the webinars, such that each week breakout sessions preceded the topic of the forthcoming webinar. Breakout groups were formed by team members from two different projects or DAEs, led by one or two impact evaluation specialists from C4ED and IEU. During the group work sessions, the corresponding topic for the week was discussed and applied to the respective project (summaries of the groupwork can be found in section BII.B as well as in Appendix 2).

During the webinars, the learning videos were briefly revisited and summarized. After that, the assigned reading material was critically reviewed by the specialists and participants through open discussion and questions. The discussion was followed by project presentations based on the group work from the preceding week. For each webinar, two projects were randomly selected for presentation. Following the project presentations, participation from other teams was encouraged. At the end of all webinars (except webinar 9), a short quiz was conducted to engage participants more actively and to test their knowledge and attention during the breakout sessions and webinar. A poll was also conducted during webinar 8 to encourage more active participation.

In the last webinar, participants were asked to present the outcomes from their 10-week group work and their plans for an impact evaluation, in the form of 3-minute presentations given to attendees from other projects, and IEU and GCF representatives.

Formative midline and endline surveys were conducted online with participants. Among all the webinars, there were between 70 and 73 respondents for the midline surveys, and between 19 and 27 respondents for the endline surveys. The results from these surveys show that many respondents were comfortable with statistical analysis and ToC, but a large share had limited experience in impact evaluations. Most respondents are engaged in GCF-approved projects.

The course modules shared via the GCF online learning website (<https://ilearn.greenclimate.fund/>) received very good feedback as all respondents watched them and found this approach to be very useful. Topics such as Evaluation Questions and Indicators, Behavioural Interventions, ToC, and Timeline & Budget were largely found to be extremely useful. Whereas the breakout sessions were appreciated in terms of received materials, information and structure, some respondents did not find the cross-learning structure with other entities particularly helpful as it ended up focusing on opinions rather than the actual evaluation. Additionally, the respondents suggested more practical cases could be integrated for better understanding.

Whilst the workshop could be restructured in some areas, and time zones may still be an issue, overall, the respondents perceived the workshop as a good and informative experience.

B. OUTCOMES OF THE GROUP WORK

The 9 groups worked on their tasks with the support of one or two impact evaluation specialists from C4ED or IEU. The outcomes of the group work for 14 GCF-funded projects and 4 pipeline projects are summarized below and described in more detail in Appendix 2.

GROUP 1

A) FP149: Green Climate Financing Facility for Local Financial Institutions in Latin-America

This project started in 2021 and will last until 2025. The goal is to reduce greenhouse gas (GHG) emissions in four Latin American countries – namely Chile, Ecuador, Panama, and Peru – through locally financed and developed climate change projects in the renewable energy, energy efficiency and land use sectors. The intervention most suitable for evaluation is the project component “Green finance credit lines for Local Finance Institutions (LFIs)”, through which loans will be made available to small- and medium-sized enterprises (SMEs) and technology services providers to improve or grow their businesses. Because of the nature of this project, a randomized design for this evaluation is not feasible. Based on the discussions with the project team, a matching design would be more suitable for the evaluation. The matched design would include a baseline of 250 treatment SMEs and 500 comparison SMEs where data collection is done on both treatment and comparison groups. This will allow for matching based on the characteristics of the SMEs and owners, and then for a follow-up with 250 treated and 250 comparison SMEs that are best matched. However, because this design would depend on the rollout of the project and on the interest of SMEs, the project team was not so eager to commit to this evaluation design. The team was most interested in conducting their normal M&E plans instead.

B) Transforming Finance to Unlock Climate Action in the Caribbean (Belize, Jamaica and St. Lucia) (Caribbean Development Bank)

While this project’s lifespan has not been determined yet, its overall aim is to establish climate action lines of credit to Development Finance Institutions (DFIs) in Belize, Jamaica and St. Lucia, to reduce the usage of pollutants. The project has the following two components: (i) “Component 1: Scaling up access to finance for DFIs to enable climate action investments in the productive sectors and energy systems”, and (ii) “Delivering technical assistance to facilitate programme lending and support the transformation toward climate-informed lending by Caribbean DFIs”. The intervention most suitable for evaluation is the project’s first component. Since the rollout of the programme is based on the interest of micro-, small- and medium-sized enterprises (MSMEs) and homeowners, a quasi-experimental design was suggested for an impact evaluation. Baseline data can be gathered for 150 treatment MSMEs and homeowners (T), which would be the PY1 cohort, as well as 300 comparison MSMEs and homeowners (C). The endline would be conducted on 150 T and 150 C that are best matched.

GROUP 2

A) FP148: Participation in Energy Access Relief Facility (EARF) in Sub-Saharan Africa

This project started in July 2021 and continues until 2026. The objective of this concessional debt fund is to provide energy access companies with vital liquidity during the ongoing COVID-19 pandemic, in the form of low-interest, unsecured junior loans. The aim of these loans is to help companies remain solvent, maintain staff and supply lines, be positioned to drive the post-COVID-19 recovery, and reduce 1.3 million tonnes of carbon dioxide equivalent (MtCO₂eq) in emissions. The intervention considered most appropriate for evaluation is its “Component 1: Disburse concessional loans to energy access companies who are helping to mitigate climate change and have a demonstrated need for liquidity support”. Due to the small number of observations and the heterogeneity of borrowers, no experimental or quasi experimental impact evaluation design was suggested. Therefore, two behavioural interventions in which two important bottlenecks from the implementation are aimed to be tackled were suggested: (a) collecting payments (2 x 2 design) – a randomized experiment in which there is (i) information provision with a social norms framework (repayment rates by others / percentage paid by others), and (ii) frequency of reminders for payment

(once vs. three times before payment due date); (b) compliance with loan terms regarding the gender action plans, in which certain companies will be randomly exposed to meetings with the gender consultant to analyse whether this increases compliance with the gender actions plans.

B) FP133: Resilience to hurricanes in the building sector in Antigua and Barbuda

This project started in July 2021 and lasts until 2027. The project addresses the resilience of building construction in the country, in addition to climate information systems and post-disaster responses. It will climate proof critical public service and community buildings to improve resilience to, and recovery from, extreme climate events. The intervention most suitable for evaluation is “Activity 2.4: Train local workforce on the installation, operation, and maintenance of climate-proofing measures for the targeted buildings”. For this intervention a randomized encouragement design (RED) could be applied to encourage the participation of the workforce in the training. Instead of randomizing units into treatment, RED randomizes units into encouragement, for example, financial incentives, nudges, promotion, intensified counselling on the benefits of a training, etc. The main objective of RED is to evaluate how effective an encouragement can be on the take-up rate. In this project, the encouragement would be in the form of personal advertisement. This means that all individuals would have access to the trainings but some would decide to take it because it was offered personally to them (treatment group), while another group might take the training without having received a personal advertisement (control group).

GROUP 3

A) FP023: Climate Resilient Agriculture in three of the Vulnerable Extreme northern crop-growing regions (CRAVE) (Namibia)

The project started in 2017 and will continue until 2022. The aim of the project is to reduce climate vulnerability and increase the adaptative capacity and resilience of vulnerable small-scale farming communities in vulnerable extreme northern crop production landscapes that are threatened by climate variables and change. The LORTA and project teams initially discussed the possibility of evaluating the additional impact of Component 3 activities (‘solar energy technologies and solar water pumping promoted and widely adopted’). However, the project team prefers to focus on the overall average impact of the project – a design that evaluates this was therefore discussed. As the project interventions have already started, the only possible design is an ex-post matching design that allows for the identification of non-beneficiaries sharing similar characteristics to those of the beneficiaries of this intervention.

B) FP138: ASER Solar Rural Electrification Project (Banque Ouest Africaine de Développement (BOAD)) (Senegal)

The project started in 2021 and will last until 2026. Its general objective is to foster the development of off-grid renewable energy mini-grids to reduce CO₂ emissions from the Senegal power sector, whilst contributing to electricity access objectives and promoting gender-balanced rural economic growth. Its main interventions are: (i) technical assistance to the solar rural electrification stakeholders, (ii) procurement and installation of solar powered mini-grids, and (iii) incentives for social and productive use of electricity. The proposed impact evaluation would evaluate the overall average impact of the project at the household level. The preferred design consists of a cluster randomized control trial (RCT), where groups of eligible villages will be used as clusters.

BOAD participated in this workshop as an institution, and FP138 was referred to for the purpose of illustrating the LORTA workshop activities.

GROUP 4

A) FP172: Mitigating GHG emission through modern, efficient and climate friendly clean cooking solutions (CCS) (Nepal) - Alternative Energy Promotion Centre (AEPC)

The project will start in July 2022 and have a lifespan of 5 years. Its goal is to reduce GHG emissions and improve health and well-being through increased use of CCS. The interventions most suitable for evaluation are the project's "Component 1: Scaling up the deployment of clean cooking technologies through accelerated investment and market development", and "Component 3: Empowering institutions' capacity for the supply chain and ensuring increased access to CCS through capacity building, awareness raising and trainings". The use of a RCT with a phase-in approach was recommended.

B) Climate smart villages (Pakistan) - National Rural Support Programme (NRSP)

The project starts in 2022 and will continue until 2026.² It aims to improve the resilience and food security situations of farmers through climate smart agriculture (CSA). The project's "Component 1: Climate smart agriculture - Installation of climate smart villages employing CSA" was chosen as the intervention most suitable for evaluation. Since the selection of around 100 treatment villages is already concluded and experimental methods are not feasible, difference-in-difference (DiD) technique with matching approach was suggested based on secondary data and 100 control villages to be selected outside the project area, incorporating a minimum distance to avoid spill-overs and taking into account the same selection criteria as those used for treatment. Geocoded data on climate variables, poverty profiles and production patterns are available for the treatment area and may be obtainable for potential control areas. However, these data are only available for the past 5 years, not for the past 30 years, as requested by GCF. In addition, the use of geocoded data needs special government permission in Pakistan, which may be a caveat.

GROUP 5

A) FP106: Embedded Generation Investment Programme (EGIP) (South Africa)

The programme started in 2019 and will last until 2024. Its main objective is to pioneer a new market mechanism to further implement renewable energy projects outside of sovereign support in South Africa. This should lead to more bankable and viable renewable energy projects to be incorporated into the renewable energy market. The project's main and most suitable intervention is "Component 2: Providing credits to Independent Power Producers (IPPs), Local Community Trusts (LCTs) and/or MSMEs". Due to a very small sample size, there is no opportunity for randomization. The best possible impact evaluation design would be a matching method. However, a robust evaluation design cannot be developed since it is unclear where the data base for matching a control group can come from. There will be no baseline data collection and the project team is not aware of any secondary data that can be used. To find a counterfactual group, the evaluation design will be dependent on having administration data and possibly business registers that could form the basis of a phone survey.

² Note this time span is not definite, as the project's GCF grant is yet to be approved.

B) Cooperative and Rural Development Bank (CRDB) Plc (Tanzania)

This programme is intended to start in January 2022 and end in December 2026. The CRDB plans to offer innovative financial products including a new dedicated line of credit for cropping sector adaptation and resilience, supported by a guarantee facility. The programme's two main components are: (i) Adaptation Credits, and (ii) Technical Assistance Package. The first component is the most suitable for evaluation, which includes credits to corporates, micro-enterprises, SMEs and microfinance institutions. The most suitable evaluation design is a DiD with a matching design, that estimates the effect of the project by comparing farmers who have access to credits, credits information and agriculture resilience and adaptation (ARA) training, to farmers who do not. The main caveat will be to identify a suitable control group. Since the interventions are rolled out at the same time on a nationwide basis, all farmers in the country will theoretically have access to the treatment. However, one could use distance to the closest partner branch as an instrumental variable for treatment while controlling for as many other characteristics as possible at the village level.

GROUP 6

A) FP150: Promoting private sector investment through large scale adoption of energy saving technologies and equipment for Textile and Readymade Garment (RMG) sectors of Bangladesh

This is a 21-year project which is to start in 2021/2022. The programme provides an integrated package of concessional financing for textile and RMG manufacturers, and technical assistance to create an enabling environment and ultimately to achieve a reduction of 14.5 million tonnes of MtCO₂eq emissions. The project's main and most suitable intervention is "Component 4: Develop enabling environment for EE [energy efficiency] investment in RMG sector". An RCT is recommended for the impact evaluation design for the beneficiaries that will receive capacity training on the new machinery (i.e. workers of the factories). A DiD approach is also suggested in case an RCT is not possible or not well executed (both groups are significantly different from each other).

B) FP153: Mongolia Green Finance Corporation

This is a 15-year project which is to start in 2021/2022. The programme aims to establish the Mongolia Green Finance Corporation (MGFC) for the provision of thermal insulation for housing, EE for businesses, and mortgages for green affordable housing to reduce 3.8 million tonnes of carbon dioxide equivalent (MtCO₂eq) in emissions. The programme's main components are: (i) Provision of wholesale financing to participating financial institutions (PFIs) for EE in industry, thermal insulation and green affordable housing; and (ii) Equity injection into the MGFC, technical assistance to strengthen MGFC's green business development function, reinforce the green finance policy environment, build the capacity of PFIs, project developers, households and policymakers, develop a sustainable and bankable green project pipeline and conduct community engagement and awareness-raising activities. Both components are suitable for evaluation. As a first evaluation strategy a non-experimental design was discussed: pre- and post-differences in outcome indicators of the beneficiaries (households and companies) combined with regular monitoring. A second evaluation strategy is a quasi-experimental design DiD combined with a propensity score matching design to test the effects of capacity building. In cases where it is difficult to collect data from the households that will not be successful in getting the green loans (i.e. control group), a non-experimental pre- and post-evaluation approach is suggested.

GROUP 7

A) SAP008: Extended Community Climate Change Project-Flood (ECCCP-Flood) (Bangladesh)

The AE for this project, Fiji Development Bank, did not attend enough breakout sessions during the workshop to flesh out an impact evaluation design and therefore it wasn't possible to develop and present an impact evaluation design.

B) SAP020: Climate resilient food security for farming households across the Federated States of Micronesia (FSM)

The project started in October 2021 and lasts until 2026. It aims to increase the resilience of FSM's most vulnerable communities to climate- change induced food insecurity. The project has three components: (i) Establishing an enabling environment for adaptive action and investment, (ii) Enhancing the food security of vulnerable households by introducing CSA practices, (iii) Strengthening climate-resilient value-chains and market linkages across the agriculture sector. The impact evaluation focuses on the third component. Previous interventions have been successful but scattered and not sustained – the uptake and use of farmer business plans aims to address this shortcoming. The project seeks to incentivize the completion of farmer business plans through a bundle of behavioural interventions aimed at producer organizations. For this, a phase-in clustered encouragement design was suggested.

GROUP 8

A) FP146: Bio-CLIMA: Integrated climate action to reduce deforestation and strengthen resilience in BOSAWÁS and Rio San Juan Biospheres (Nicaragua)

This project started in 2021 and will continue until 2027. It aims to establish sustainable land use intensification, landscape restoration and forest conservation to reduce deforestation. The intervention most suitable for evaluation is the project's main component "REDD+" (payment for reduction of deforestation). The proposed evaluation approach is a randomized phase-in design. It is a 7-year programme, with the first 2 years assigned to start up and years 3 to 7 to implementation in 485 communities.

B) SAP023 River Restoration for Climate Change Adaptation (RIOS) (Mexico)

This project started in 2021 and lasts until 2026. Its main goal is to perform watershed restoration to improve water quality and reduce soil erosion. The project's component "Design of a National River Restoration Strategy for Climate Change Adaptation" is the most suitable for evaluation. The unit of treatment is a sub-project within a sub-watershed. The team is hoping for 50+ applications and will fund 15 sub-projects. The small sample size makes an evaluation of the effects of watershed restoration on environmental outcomes not feasible. Instead, the team would prefer measuring the benefits to families and farmers. An evaluation design could be to compare households in the highly ranked groups (#s 1-15) with those ranked lower (#s 16-40). A DiD and/or matching design could then be used with these two groups. This will require a large sample size. For a working sample size, surveying 600 treatment and 1,200 comparison households was discussed for the baseline. The endline would be conducted on the 600 treatment households and on 600 comparison households that are best matched. The project has plans to use satellite and drone data to measure environmental watershed outcomes.

GROUP 9

A) FP060: Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)

This project started in 2018 and will last until 2023. It aims to increase awareness of the water cycle and climate change impacts threatening the island's drinking water supply, create resilience to severe weather impacts, reduce GHG emissions, reduce consumption, promote appropriate uses of diverse water sources, and implement legislation to support climate-smart development and water sector resilience. The intervention most suitable for evaluation is the project's component 3.4 "Potable Water Storage Systems", which includes the installation of potable water storage tank systems at the most vulnerable residences identified on a needs assessment. For this a DiD design was recommended. The needs assessment study will provide a list of potentially eligible households that meet the criteria. The treatment and control groups can be drawn from it to generate a panel dataset for the analysis. If the assessment does not identify eligible households, it could represent a threat for the impact evaluation design.

B) FP061: Integrated physical adaptation and community resilience through an enhanced direct access pilot in the public, private, and civil society sectors of three Eastern Caribbean small island developing states (Antigua and Barbuda, Dominica, Grenada)

The project started in 2019 and will last until 2023, with a lifespan of 4 years. Its main goal is to strengthen institutional capacities and increase the resilience of the population in the Eastern Caribbean pilot countries to climate variability and change. The intervention most suitable for evaluation is the project's Component ii, "Loans for private households and businesses to make their dwellings more resilient or climate friendly". Here a quasi-experimental evaluation design was suggested. Two evaluation strategies seemed suitable: Matching loan recipients to other applicants on covariates collected during the application process, and matching to a comparison group outside the programme area. However, the sample size is a concern for either approach as only 100 households and 30 businesses are supposed to receive loans.

C. PROJECT SELECTION

The 14 projects were assessed with the help of a scorecard to determine their eligibility for LORTA by considering the following strategic criteria and guiding principles:

- **Feasibility of impact evaluation design:** The project, or at least a sub-component of the project has to have the potential to be rigorously evaluated.
- **Commitment of project team:** Project selection takes the interest, commitment and engagement of the project team to conduct a theory-based, rigorous impact evaluation.
- **Budget:** The project needs to be aware of the budget implications of an impact evaluation and be willing to make sufficient budget available to conduct a data collection of a representative scope.
- **Level of innovation for LORTA:** The LORTA workshop seeks to add innovative projects to the overall LORTA portfolio.
- **Level of innovation for GCF and the climate change space:** The evidence gained from the impact evaluations of the selected projects should be innovative to enhance learning within GCF and inform global research on climate change.
- **Regional distribution:** The region of implementation of the project ensures an even, uniform-like geographical distribution within the LORTA portfolio.
- **Thematic area of the project:** Potential of the project to contribute to the achievement of the Fund's objectives and result areas in adaptation and mitigation.

Directly after the LORTA design workshop, staff members of the IEU and C4ED held a virtual meeting to discuss the evaluability and emerging impact evaluation designs of the 14 projects. Following the workshop, the IEU consulted with relevant divisions of the GCF Secretariat to build consensus regarding the most appropriate and eligible projects for the LORTA programme against the above criteria. Each division brought invaluable insight into the projects' details and the broader dynamics within the GCF. Staff members of the GCF echoed the keen interest expressed by workshop participants and conveyed their continued support for the LORTA programme moving forward. Discussions from these consultations were synthesized to inform the final deliberation of shortlisted projects. The first round of shortlisted projects includes:

- **FP060** – Barbados – Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)
- **FP138** – Senegal – ASER Solar Rural Electrification Project (BOAD)
- **FP146** – Bio-CLIMA – Integrated climate action to reduce deforestation and strengthen resilience in BOSAWÁS and Rio San Juan Biospheres (Nicaragua)
- **FP150** – Promoting private sector investment through large scale adoption of energy saving technologies and equipment for Textile and Readymade Garment (RMG) sectors of Bangladesh
- **FP153** – Mongolia Green Finance Corporation
- **FP172** – Nepal – Mitigating GHG emission through modern, efficient and climate friendly clean cooking solutions - Alternative Energy Promotion Centre (AEPC) (Nepal)
- **SAP020** – Climate resilient food security for farming households across the Federated States of Micronesia (FSM)
- **SAP023** – Mexico – River Restoration for Climate Change Adaptation (FMCN)

After a second round of discussions between C4ED and IEU, the following four projects were considered to be eligible for LORTA and to enter the next level/phase – that is, to be subject to formative work in preparation of impact evaluations:

- **FP060** – Barbados – Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)
- **FP138** – Senegal – ASER Solar Rural Electrification Project (BOAD)
- **FP172** – Nepal – Mitigating GHG emission through modern, efficient and climate friendly clean cooking solutions (AEPC)
- **SAP023** – Mexico – River Restoration for Climate Change Adaptation (FMCN)

The DAEs of these projects had already been informed that they had been invited to be part of the LORTA programme. If they accept, they will receive a memorandum of understanding, which they are requested to sign. The memorandum of understanding lays out the intention of the collaboration between the IEU and the AE, and sets forth its objectives, the scope and the terms. While the IEU commits to providing technical and advisory consultation and quality control for the impact evaluation, the AEs commit to actively engage, collaborate and work closely with the IEU throughout the evaluation, comply with timelines and quality standards, allocate the necessary budget for data collection and give the right to access and use all data collected during the impact evaluation.

The responses and signed MoUs from the projects are still in process at the time of writing, and the final project list for LORTA Phase I 2022 is yet to be confirmed.

III. WAY FORWARD

A. ENGAGEMENT WITH STAKEHOLDERS AND FORMATIVE WORK

For each of the selected projects, an evaluation team will be formed consisting of two impact evaluation specialists from C4ED and one IEU personnel member per project. The task of the evaluation teams will be to engage closely with key stakeholders of the projects – namely, national designated authorities (NDAs), DAEs, implementing agencies, project staff and potential end beneficiaries – to ensure their interest, understanding and sense of ownership for the planned theory-based impact evaluations.

Each evaluation team will conduct a (probably virtual) field mission, where it will hold meetings and capacity-building workshops with the key stakeholders. Meetings, in the form of expert interviews, will be used to acquire the maximum possible information about the GCF-funded project. These meetings will also aim to foster collaboration and trust between the evaluation team and the onsite parties involved. In addition, a capacity-building workshop on the rationale of impact evaluation as well as impact evaluation methods will be held with key stakeholders. A further aim of the field mission is to emphasize the benefit of theory-based counterfactual approaches and real-time learning and measurement.

Under the guidance of the evaluation teams, impact evaluation designs will be developed for each of the selected GCF-funded projects. The evaluation teams will conduct context analyses, examine the existence of appropriate counterfactuals (i.e. comparable treatment and control groups), elaborate a ToC, assess the availability of baseline administrative and secondary data sources, and acquire budget information. Some of this work will be conducted during the engagement phase (i.e. while the evaluation teams are in the field), although most of it will be done remotely. For all activities, close cooperation with the project teams, NDAs, DAEs and other stakeholders will be indispensable.

B. REPORTS

LORTA will produce a pre-analysis plan for each of the selected GCF-funded projects. These reports will include a justified, relevant empirical strategy on the measurement of causal change, including potential challenges and an implementation tracking and measurement framework, agreed upon by the evaluation team and key stakeholders. The pre-analysis plans will consist of a detailed ToC, feasibility considerations, evaluation design, an implementation tracking and real-time measurement system, calculated sample size, timeline and budget. The reports will be submitted approximately 3-4 weeks after (virtual) field missions take place (please refer to section **Error! Reference source not found.** below for a preliminary timeline, which will be updated once more information on timing is known).

C4ED will also write a synthesis report, which will provide information on the status quo of the field visits and formative work, as well as general lessons learned during LORTA Phase I 2021.

Appendix 1. LORTA DESIGN WORKSHOP AGENDA

Date of weekly webinars	Led by	Contents of webinar	Breakout session	Led by	Content of the breakout session
Monday, Aug 30	N/A	There is no webinar this week Project participants receive a video introducing LORTA, 2 readings and the link for Webinar 1.	N/A	N/A	N/A
Monday, Sep 6 9 – 10.30 pm KST	1. IEU – Andreas Reumann 2. C4ED – Viviana Uruena 3. IEU – Andreas Reumann 4 and 5. IEU / C4ED – Martin Prowse / Viviana Uruena	Webinar 1 – What is LORTA? Why is it important? 1. Short slide sequence summarizing LORTA (10 minutes) 2. Discussion of 2 readings (20 minutes) 3. Quiz (10 minutes) ---- 5-minute break ---- 4. Question and answer session (15 minutes) 5. Introduction of technical assistance team (30 minutes) Immediately after the seminar participants receive a video for Webinar 2, readings and relevant material.	Any time before Webinar 2 Time and duration agreed between project team, technical assistance teams (IEU / C4ED)	IEU and C4ED specialists	Technical assistance teams work with project teams to develop and refine the Theory of Change for relevant components of a project
Monday, Sep 13 9 – 10.30 pm KST	1. IEU – Deborah Kim 2. C4ED – Katharina Richert 3. Project participants with Deborah Kim 4. IEU / C4ED – Deborah Kim and Katharina Richert	Webinar 2 – Theories of Change 1. Short slide deck summarizing Theories of Change (10 mins) 2. Discussion of two readings (30 minutes) --- 5-minute break --- 3. Two projects randomly selected to present their Theory of Change (10-minute presentations, 5 minutes of questions) 4. Questions and answer session (15 minutes) Immediately after the seminar participants receive a video for Webinar 3, readings and relevant material	Any time before Webinar 3 Time and duration agreed between AE, technical assistance teams (IEU / C4ED)	IEU and C4ED specialists	Technical assistance teams work with project teams to develop and refine a project's evaluation questions and definitions of indicators
Monday, Sep 20 9 – 10.30 pm KST	1. IEU – Martin Prowse 2. C4ED – Clementine Sadania 3. Project participants with Martin Prowse 4. IEU / C4ED – Martin Prowse and Clementine Sadania	Webinar 3 - Evaluation questions and indicators 1. Slide deck on evaluation questions and indicators (10 mins) 2. Discussion of two readings (30 mins) --- 5-minute break --- 3. Two projects randomly selected to present evaluation questions and indicators (10-min presentations, 5 mins of questions) 4. Questions and answer session (15 mins) Immediately after the seminar participants receive a video for Webinar 4, readings and relevant material	Any time before Webinar 4 Time and duration agreed between AE, technical assistance teams (IEU / C4ED)	IEU and C4ED specialists	Technical assistance teams work with project teams to discuss evaluation questions and definitions of indicators based on behavioural interventions

Date of weekly webinars	Led by	Contents of webinar	Breakout session	Led by	Content of the breakout session
Monday, Sep 27 9 – 10.30 pm KST	1. IEU – Deborah Kim 2. Busara – Nathaniel Peterson 3. Project participants with Deborah Kim 4. IEU / Busara – Deborah Kim and Nathaniel Peterson	Webinar 4 – Assumptions and mechanisms: evaluation questions and indicators for behavioural interventions 1. Short slide deck on assumptions and mechanisms and behavioural interventions (10 mins) 2. Discussion of two readings (30 mins) --- 5-minute break --- 3. Two projects randomly selected to present on assumptions and mechanisms (10-min presentations, 5 mins of questions) 4. Questions and answer session (15 mins)	Any time before Webinar 5 Time and duration agreed between AE, technical assistance teams (IEU / C4ED)	IEU and C4ED specialists	Technical assistance teams work with project teams to discuss evaluation designs based on experimental impact evaluation methods
		Immediately after the seminar participants receive a video for Webinar 5, readings and relevant material			
Monday, Oct 4 9 – 10.30 pm KST	1. IEU – Christina Humtsoe 2. JPAL – Cristina Ruiz 3. Project participants with Christina Humtsoe 4. IEU / JPAL - Christina Humtsoe and Cristina Ruiz	Webinar 5 – Experimental impact evaluation 1. Short slide deck on experimental impact evaluation methods (10 mins) 2. Discussion of two readings (30 mins) --- 5-minute break --- 3. Two projects randomly selected to present experimental research designs (10-min presentations, 5 mins of questions) 4. Questions and answer session (15 mins)	Any time before Webinar 6 Time and duration agreed between project team and technical assistance team	IEU and C4ED specialists	Technical assistance teams work with project teams to discuss evaluation designs based on non-experimental impact evaluation methods
		Immediately after the seminar participants receive a video for Webinar 6, readings and relevant material			
Monday, Oct 11 9 – 10.30 pm KST	1. IEU – Martin Prowse 2. C4ED – Nick Barton 3. Project participants with Martin Prowse 4. IEU / C4ED – Martin Prowse and Nick Barton	Webinar 6 – Non-experimental impact evaluation 1. Short slide deck on non-experimental impact evaluation methods (10 mins) 2. Discussion of two readings (30 mins) --- 5-minute break --- 3. Two projects randomly selected to present non-experimental research designs (10-min presentations, 5 mins of questions) 4. Questions and answer session (15 mins)	Any time before Webinar 7 Time and duration agreed between project team and technical assistance team	IEU and C4ED specialists	Technical assistance teams work with project teams to discuss scale, satellite and spatial data
		Immediately after the seminar participants receive a video for Webinar 7, readings and relevant material			
Monday, Oct 18 9 – 10.30 pm KST	1. IEU – Anastasia Aladysheva 2. FAO – Carly Petracco 3. Project participants with Anastasia Aladysheva 4. IEU / FAO – Anastasia Aladysheva and Carly Petracco	Webinar 7 – Scale, satellite and spatial data 1. Slide deck on use of spatial data (10 mins) 2. Discussion of two readings (30 mins) --- 5-minute break --- 3. Two projects randomly selected to present on using spatial data (10-min presentations, 5 mins of questions) 4. Questions and answer session (15 mins)	Any time before Webinar 8 Time and duration agreed between project team and technical assistance team	IEU and C4ED specialists	Technical assistance teams work with project teams on timeline and budget
		Immediately after the seminar participants receive a video for Webinar 8, readings and relevant material			

Date of weekly webinars	Led by	Contents of webinar	Breakout session	Led by	Content of the breakout session
Monday, Oct 25 9 - 10 pm KST	1. IEU – Saesol Kang 2. C4ED – Asmus Zoch 3. Project participants with Saesol Kang 4. IEU / C4ED – Saesol Kang and Asmus Zoch	Webinar 8– Timeline and budget 1. Short slide deck on timeline and budget of an impact evaluation (10 mins) 2. Discussion of two readings (30 mins) --- 5-minute break --- 3. Two projects randomly selected to present on timeline and budget of an impact evaluation (10-min presentations, 5 mins of questions) 4. Questions and answer session (15 mins)	Any time before Webinar 9 Time and duration agreed between project team and technical assistance team	IEU and C4ED specialists	Technical assistance teams work with project teams on rapid-fire presentation
		Webinar 9 – Rapid-fire presentations and closing remarks 1. Opening remarks from IEU (3 minutes) 2. 3-minute rapid-fire presentations all project deliverables with 2-minutes of questions 3. Closing remarks from IEU (15 minutes) Participants who complete the entire course will receive a completion certificate.	N/A		
Monday, Nov 1 8 - 11 pm KST	IEU and project participants				

Appendix 2. OUTCOMES FROM GROUP WORK

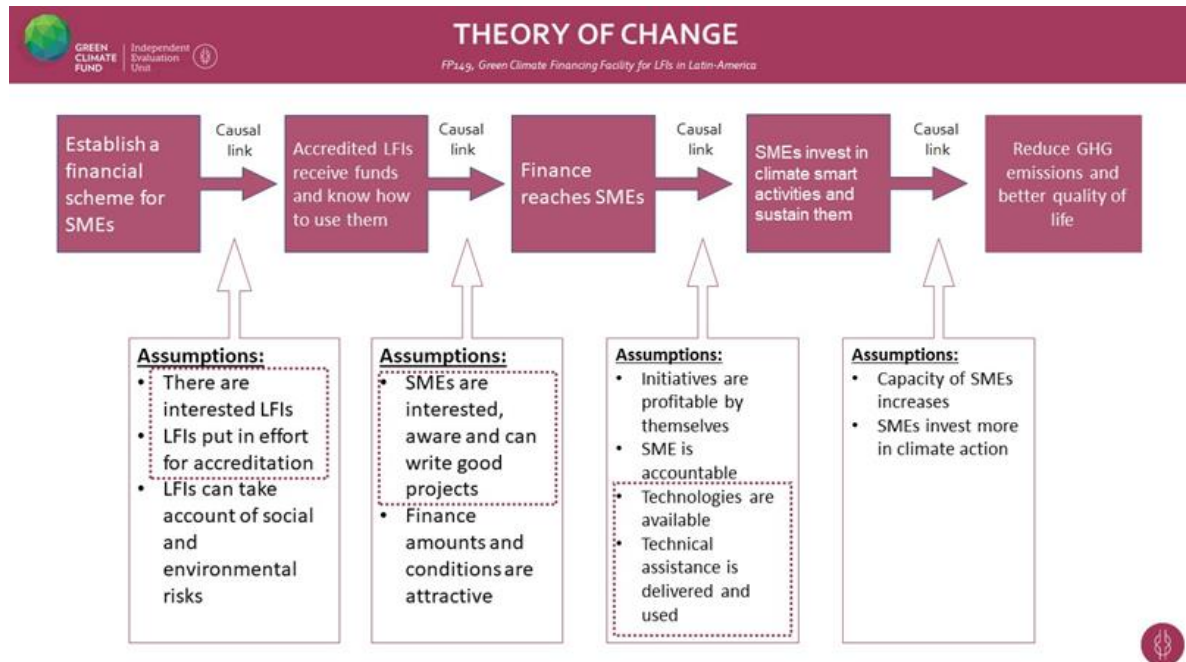
Group 1.A: Green Climate Financing Facility for Local Financial Institutions (LFIs) in Latin-America (Chile, Ecuador, Panamá and Peru) (FP149)

GCF grant: USD 100 million

Goal: Reduce emissions from energy, buildings, and land use

Overall timeline: 5 years, 2021 – 2025

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:
 - Project components
 - + Make available to LFIs a Green Finance Credit Line
 - + Implement 10 grant-funded activities with a focus on awareness-raising and technical support
 - Intervention most suitable for evaluation:
 - + Climate finance
- Targeted beneficiaries of intervention most suitable for evaluation:
 - SMEs
- Evaluation question(s) and related indicators:
 - Evaluation questions
 - + Is climate finance attractive for LFIs?
 - + Is climate finance attractive for SMEs?
 - + Do LFIs and SMEs have the capacity to apply gender policies, and environmental and social safeguards?
 - + How to assess indirect beneficiaries?
 - Indicators

- + GHG emissions
- + Income of SMEs
- + Subjective wellbeing of owners and employees
- + Longer-run adoption of climate smart technologies and practices of SMEs and others
- + Entities continue scheme on own

Task 3: Evaluation questions and indicators for behavioural interventions

The behavioural questions are focused on the attitudes of LFIs and SMEs toward climate smart finance and the attitudes of LFIs and SMEs toward awareness and capacity-building activities.

Tasks 4 and 5: Impact evaluation design

The programme team are very unsure about how to ascertain who the beneficiaries will be. It is highly unlikely that a randomized design could be used. If timing worked out perfectly, a prospective matched design could be possible, but will be based entirely on the rollout of partners and MSMEs interest.

A matched design that was discussed included a baseline of 250 treatment SMEs and 500 comparison SMEs where data collection is done on both treatment and comparison as close together as possible. It would then be possible to match on the characteristics of the SMEs and owners and then conduct a follow-up with 250 treated and 250 comparison SMEs that are best matched.

However, the team was not eager for this design either, and it seems most interested in conducting its normal M&E plans.

Task 6: Scale, satellite and spatial data

N/A

Task 7: Timeline and budget

There is no budget allocated for impact evaluation. They expect in year 1 to finalize the programme design, prepare to implement the programme, and advertise it to LFIs and SMEs. In years 2 to 5 they hope to roll it out with entities and SMEs.

Caveats/challenges:

It is possible the programme could collaborate with the statistical authorities to record pertinent data via conducting surveys with SMEs or censuses among economic units, but this seems unlikely.

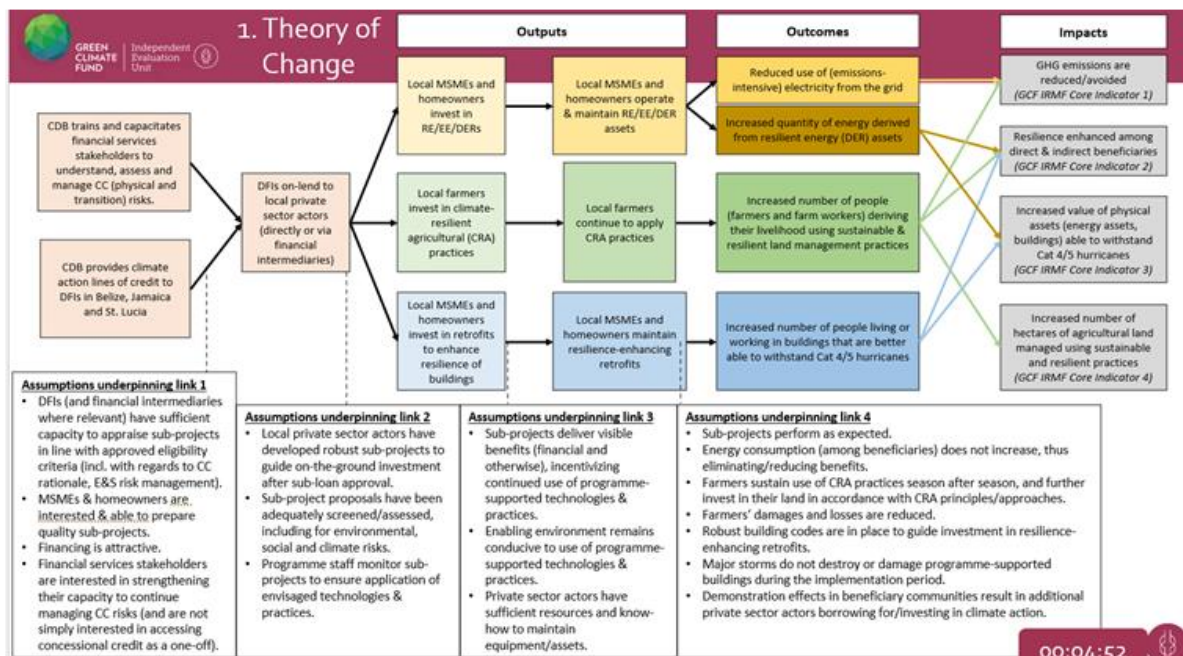
Group 1.B: Transforming Finance to Unlock Climate Action in the Caribbean (Belize, Jamaica and St. Lucia) (Caribbean Development Bank)

GCF grant: Unknown

Goal: Establish climate action lines of credit for Development Finance Institutions (DFIs) in Belize, Jamaica and St. Lucia to reduce usage of pollutants

Overall timeline: Unknown

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:
 - Lines of credit for SMEs
 - Intervention most suitable for evaluation:
 - Lines of credit for SMEs
- Targeted beneficiaries of intervention most suitable for evaluation:
 - SMEs
- Evaluation question(s) and related indicators:
 - Evaluation questions
 - + Does the programme reduce emissions?
 - + How do financial institutions' perceptions and understanding of climate risks (physical and transition) and opportunities affect their lending?
 - + How are the investment decisions and patterns of MSMEs and homeowners shaped by their access to financing and perceptions/understanding of climate risks and opportunities?
 - Indicators
 - + GHG emissions reduced/avoided
 - + Number of direct and indirect beneficiaries
 - + Value of physical assets (energy assets, buildings) equipped to withstand Category 4/5 storms
 - + Total land area being managed using resilient and sustainable practices

Task 3: Not completed

Tasks 4 and 5: Impact evaluation design

The rollout of the programme is based on the interest of MSMEs and homeowners ('opt-in'), so a quasi-experimental design is all that is feasible. Baseline data can be gathered for 150 treatment MSMEs and homeowners (T), which would be the PY1 cohort, as well as 300 comparison MSMEs and homeowners (C). The endline would be conducted on 150 T and 150 C that are best matched.

Task 6: Scale, satellite and spatial data

N/A

Task 7: Timeline and budget

Year 1 is to be used for planning and preparation.

During years 2–5, the programme would like to finance at least 100 sub-projects/-loans each year. The programme would also support additional cohorts of MSMEs and homeowners (of at least 150) to identify and develop proposals.

Expected costs for an impact evaluation could be around USD 300,000, including baseline, mid-term and endline surveys, which Caribbean Development Bank will try to embed in the core programme budget.

Caveats/challenges:

The programme is not yet approved by the GCF Board and so a lot of information is unclear.

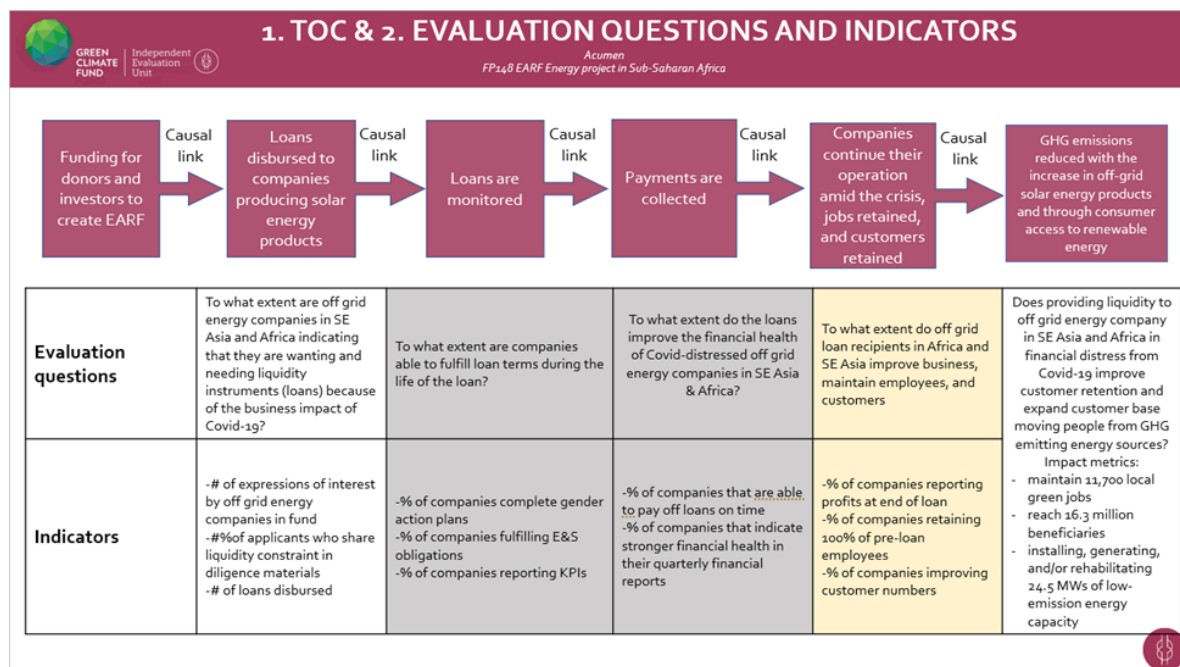
Group 2.A: Participation in Energy Access Relief Facility (EARF) (FP148)

GCF grant: USD 30 million

Goal: The Energy Access Relief Facility (EARF) is a concessional debt fund that is intended to provide energy access companies with vital liquidity during this crisis, in the form of low-interest, unsecured junior loans. The GCF will channel its investment into Climate CV, which, in turn, will participate in EARF loans to eligible companies operating in countries that have issued a no-objection letter. The aim of these loans is to help companies remain solvent, maintain staff and supply lines, be positioned to drive the post-COVID-19 recovery, and reduce 1.3 million tonnes of carbon dioxide equivalent (MtCO₂eq) in emissions.

Overall timeline: 5 years, July 2021 – July 2026

Task 1: Theory of change



Key assumptions:

- There is interest among companies to obtain these loans
- Loans are successfully received by selected companies
- Companies have the necessary revenues to repay the loans
- Customers keep buying clean energy solutions amid the COVID-19 crisis
- Companies have the liquidity to continue their operation

Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation: Loans disbursed to companies producing solar energy products
- Intervention most suitable for evaluation: The loans are disbursed to certain enterprises after a thorough screening process. Because of the small number of observations and the heterogeneity of borrowers, no experimental or quasi experimental evaluation design was suggested. Given that it is not possible to evaluate whether providing liquidity to Southeast Asian and African off-grid energy companies in financial distress from the COVID-19 pandemic improves customer retention, expands customer base and moves people away from GHG-emitting energy sources, we developed a behavioural intervention that aims to tackle the following two important implementation bottlenecks:
 - Payment collection
 - Compliance with loan terms regarding the gender action plans
- Targeted beneficiaries of intervention most suitable for evaluation: borrowers
- Evaluation question(s) and related indicators:
 - How to best persuade companies to pay on time?
 - Number of companies paying on time in each treatment arm
 - How intensity of exposure to the gender consultant increases compliance?
 - Number of companies complying with the gender action plans in each treatment arm

Task 3: Evaluation questions and indicators for behavioural interventions

As mentioned before, the evaluation will be centred around a behavioural component that focuses on the gender action plans and increasing compliance with payment.

Tasks 4 and 5: Impact evaluation design

The following are the two proposed behavioural interventions:

Collecting payments (2 x 2 design)

Randomized experiment in which we vary: (i) information provision with social norms framing (payment rates by others / percentage paid by others); and (ii) frequency of payment notifications. This intervention was highly welcomed by the project team, as repayment rates are one of the main challenges of this type of intervention.

	LETTER WITH PAYMENT REMINDER	LETTER WITH PAYMENT REMINDER + SOCIAL NORMS
One reminder letter before due date	Control	Treatment 1
(3 months before)	(at least 20 obs)	(at least 20 obs)
Three reminder letters before due date	Treatment 2	Treatment 3
(1 each month before)	(at least 20 obs)	(at least 20 obs)

Compliance with loan terms regarding the gender action plans

We expose companies at random to meetings with the gender consultant to analyze whether this increases compliance with the gender actions plans. Since the sample does not change, this adds an extra layer to the previous design (yet this will require the sample size to triple/quadruple).

	LETTER WITH PAYMENT REMINDER		LETTER WITH PAYMENT REMINDER + SOCIAL NORMS	
	NO EXPOSURE	X HOURS OF EXPOSURE	NO EXPOSURE	X HOURS OF EXPOSURE
One reminder letter before due date	Pure control	Treatment 1	Treatment 2	Treatment 3
(3 months before)	(60 obs)	(60 obs)	(60 obs)	(60 obs)
Three reminder letters before due date	Treatment 4	Treatment 5	Treatment 6	Treatment 7
(1 each month before)	(60 obs)	(60 obs)	(60 obs)	(60 obs)

Caveats: Lack of power due to low number of observations in each treatment arm. The second intervention is especially unlikely to be implemented as a limited number of borrowers can benefit.

Task 6: Scale, satellite and spatial data

Scale data will not be needed for this evaluation. The project team is interested in both night light and satellite data to identify who has solar panels (which requires high resolution data) or mini-grids (which requires data resolution of about 100 ft x 100 ft). These types of data will allow the team to monitor the potential effects of the loans, but any changes will not be attributable solely to the intervention.

Task 7: Timeline and budget

Timeline

ACTIVITIES	PROJECT LIFE									
	IV 2021	I 2022	II 2022	III 2022	IV 2022	I 2023	II 2023	III 2023	IV 2023	
Baseline data collection (phone surveys)										
Loan disbursement										
1 st monitoring										
2 nd monitoring										
3 rd monitoring										
4 th monitoring										
Experiment evaluation										

ACTIVITIES	I 2024	II 2024	III 2024	IV 2024	I 2025	II 2025	III 2025	IV 2025	I 2026
5 th monitoring									
6 th monitoring									
7 th monitoring									
8 th monitoring									
Endline data collection (phone surveys)									
Data cleaning and analysis									
Reporting of results									

Budget

The budget calculations take the following points into account:

- Time of the intervention: 1 month
- For the first behavioural intervention: 90 observations (companies)
- Number of data collection rounds: 8 (financial revisions), 1 experiment, 2 phone surveys

ITEM		QUANTITY	TIME (DAYS)	UNIT PRICE (USD)	TOTAL (USD)
Experiment implementation	Sending out letters to borrowers	90 letters		via email	0
Staff cost	Enumerators (phone surveys)	2	10	80	1,600
	Specialist (analysis and reporting surveys + experiment results)	1	30	200	6,000
Training cost	Enumerator training	2	1-2	80	160
Total					7,760

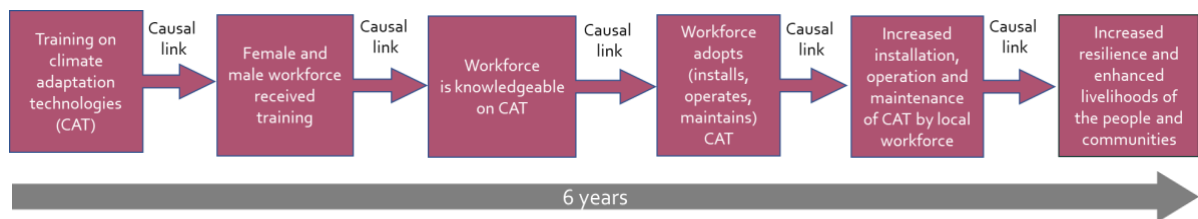
Group 2.B: Resilience to hurricanes in the building sector in Antigua and Barbuda (FP133)

GCF grant: USD 32.7 million

Goal: This project addresses the resilience of building construction in the country, in addition to climate information systems and post-disaster responses. It will climate-proof critical public service and community buildings to improve resilience to, and recovery from, extreme climate events. This timely initiative will also ensure that climate change adaptation is mainstreamed into the building sector and relevant financial mechanisms, as it will also strengthen climate information services to allow for early action in responding to extreme climate events.

Overall timeline: 6 years, May 2021 – May 2022

Task 1: Theory of change (Component 2 Activity 2.4: Train local workforce on the installation, operation, and maintenance of climate-proofing measures for the targeted buildings)



Key assumptions:

- Training is available in a format that is convenient for female and male workforce.
- Workforce have time to attend the trainings and have access to them.
- COVID restrictions allow practical trainings to take place and workforce will feel safe and willing to join the in-person trainings.
- Workforce is interested and willing to be trained in new technologies so that they internalize the content.
- Training and demonstration information is available after training.
- Workforce understands importance of climate adaptation technologies (CAT).
- Technologies are accessible (income perspective).
- New infrastructure is built according to CAT.

Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:
 - Strengthen adaptive capacity and reduced exposure to climate risks
 - Strengthen institutional and regulatory systems for climate-responsive planning and development
 - Increase generation and use of climate information in decision-making
- Intervention most suitable for evaluation:
 - Intervention Activity 2.4: Train local workforce on the installation, operation and maintenance of climate-proofing measures for the targeted buildings
- Targeted beneficiaries of intervention most suitable for evaluation:
 - General public but also local workforce working at the targeted buildings
- Evaluation question(s) and related indicators:
 - Overarching questions and indicators

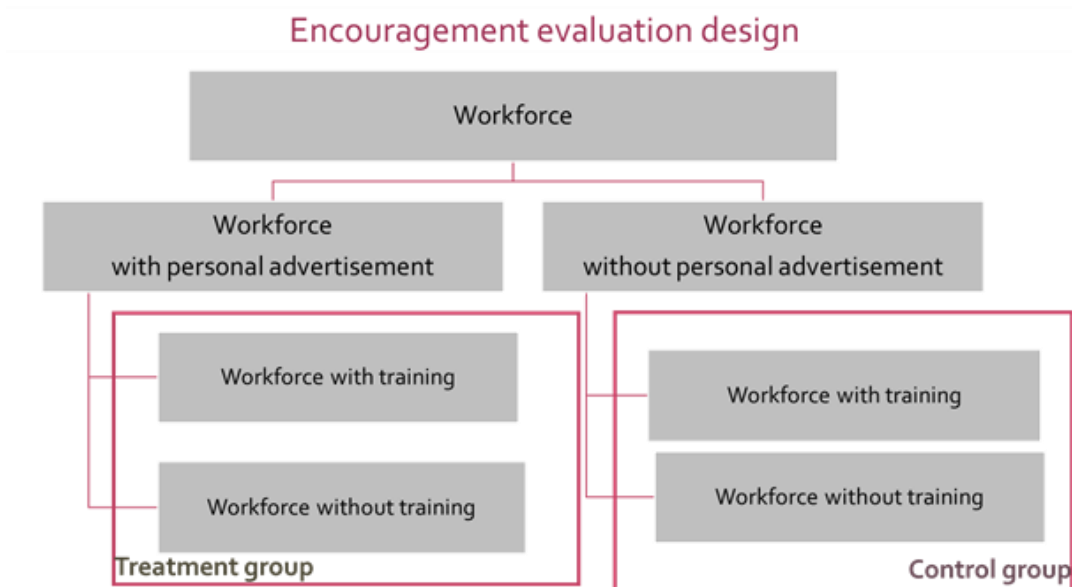
- + To what extent has training in CAT increased resilience and enhanced the livelihoods of people and communities?
 - ◆ Number of days of disruption to services provided by project facilities; number of men offering CAT services; number of women offering CAT services
- Secondary evaluation questions and indicators
 - + Have men and women receiving training in CAT?
 - ◆ Number of men who applied for CAT training; number of women who applied for CAT training; number of men certified as trained; number of women certified as trained
 - + Is the workforce skilled in CAT?
 - ◆ Number of buildings with CAT installed and/or operated and/or maintained by project beneficiaries; number of clients satisfied with the service provided by trained workforce; number of complaints about service provided by trained workforce
 - + Has the workforce adopted CAT?
 - ◆ Percentage of trained personnel engaged in installation, operation and maintenance of CAT; number of new businesses or expansions offering CAT installation, operation and maintenance services
 - + To what extent has the installation and maintenance of CAT by local workforce increased?
 - ◆ Percentage increase in the workforce installing CAT; percentage increase in the workforce operating CAT; percentage increase in the workforce operating/maintaining CAT

Task 3: Evaluation questions and indicators for behavioural interventions

Given that the trainings will be promoted through campaigns, it would be important to take into account whether these campaigns encourage training participation, especially for women. In addition, it would be important for the success of the intervention to investigate the labour force's perception of the technology's reliability, as this is a key determinant for adoption.

Tasks 4 and 5: Impact evaluation design

Randomized encouragement design: Instead of randomizing units into treatment, RED randomizes units into encouragement, through financial incentives, nudges, promotion, intensified counselling on the benefits of a training, etc. It is a useful design when nobody can be excluded from participation, for practical or moral reasons. We measure the impact of the training on adoption by members of the workforce who decided to take the training having been offered it, and compare this with the level of adoption among those who did not take the training because they had not been offered it. The figure below shows the evaluation design:



There are several risks and assumptions that underlie the above-presented evaluation design. For instance:

- We don't know how many people will be **willing to take the training**.
- Large contamination/**imperfect compliance** of treatment and control groups is a risk for the RED. This means people who were offered the training do not take it, and a large number of people who were not offered the training then take it.
- The main issue of this method is to have a proper **sampling frame**. A listing exercise can be useful.

Task 6: Scale, satellite and spatial data

This type of data will not be needed for this evaluation.

Task 7: Timeline and budget

Timeline

ACTIVITIES	PROJECT LIFE										
	IV 2024	I 2025	II 2025	III 2025	IV 2025	I 2026	II 2026	III 2026	IV 2026	I 2027	II 2027
Formation of core evaluation team											
Preparation of data collections: Collecting of sampling frame, design of instruments, recruitment of data collectors											
Ethical clearance											
Data collection (baseline)											
Encouragement campaigns											
Trainings											
Data collection (endline)											

ACTIVITIES	PROJECT LIFE											
	IV 2024	I 2025	II 2025	III 2025	IV 2025	I 2026	II 2026	III 2026	IV 2026	I 2027	II 2027	
Data cleaning, analysis and dissemination of results												

Budget

The budget calculations take the following points into account:

- Time of the intervention: 6 years, but training starts after year 3
- Sample size: 2,000
- Number of data collection rounds: 2 (baseline and endline)

ITEM		QUANTITY	TIME (IN DAYS)	UNIT PRICE (USD)	TOTAL (USD)
Staff cost*	Enumerators	12	72 (35 each round + 2 of training)	20	17,280
	Supervisors	3	72 (35 each round + 2 of training)	40	8,640
Training cost (USD 10 per person)	Venue, transport, snacks	2 (training in baseline and endline)		120	240
Ethical clearance		1		200	200
Transport (rides)		210		50	10,500
Printing		4,000		0,2	800
Total					37,660

Note: * This budget does not consider the time and resources required for data cleaning, analysis.
** Phone surveys can be conducted to reduce costs but depend on availability of phone numbers.

Group 3.A: Climate Resilient Agriculture in three of the Vulnerable Extreme northern crop growing regions (Namibia) (FP023)

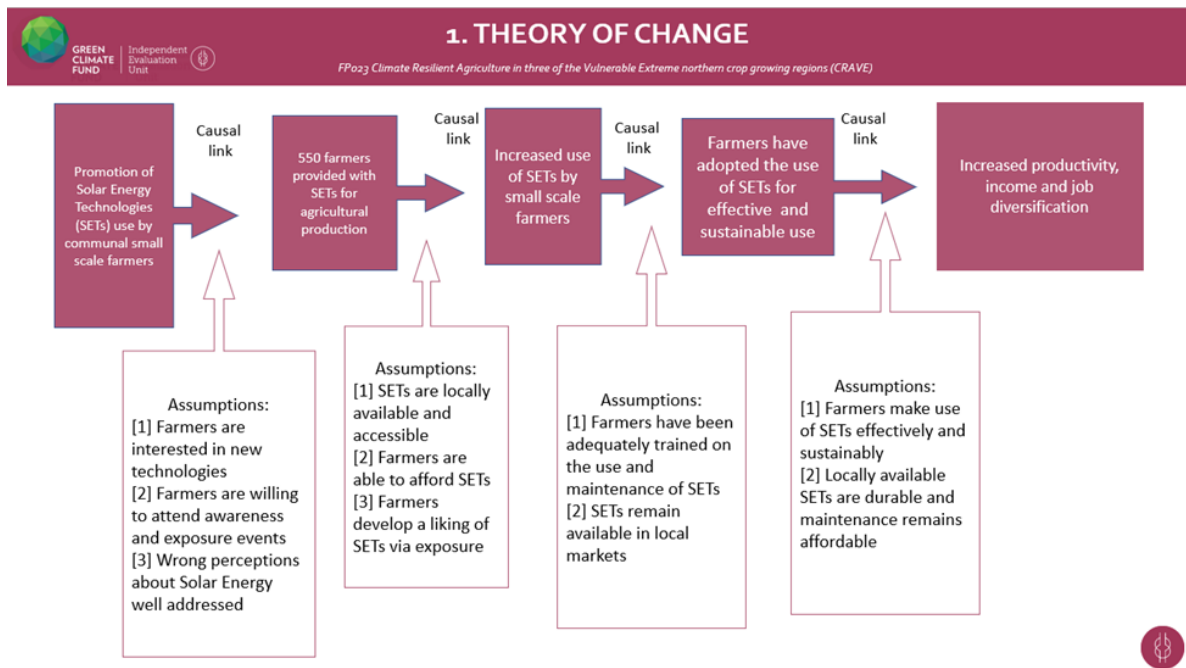
GCF grant: USD 10 million

Goal: Reduce climate vulnerability, increase the adaptative capacity and resilience of vulnerable small-scale farming communities in vulnerable extreme northern crop production landscapes that are threatened by climate variables and change

Overall timeline: 5 years, March 2017 – March 2022

Task 1: Theory of change

To expedite the process, the LORTA supported the project team in developing the ToC of one of the project components (Component 3: Solar energy technologies - Solar Energy Technologies (SETs) and solar water pumping). The following figure illustrates the outcome of this exercise:



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:

Project components:

- Increased adaptive capacity and enhanced climate change resilience

This first component essentially consists of setting up the Mashare Climate Resilient Agriculture Center of Excellence, conducting field research and trials, and setting up field demonstration sites.

- Reduced exposure to risks and strengthened adaptive capacity to climate change adaptation

This second component includes capacity-building of small-scale farmers on climate resilient rain-fed agriculture and horticulture, as well as a crop insurance scheme.

- SETs and solar water pumping promoted and widely adopted

- Intervention most suitable for evaluation:

- The LORTA and project teams initially discussed the possibility of evaluating the additional impact of Component 3 activities. However, the project team does not have the funds necessary to evaluate only one component of the project, and rather expressed interest in learning about the overall average project impact.

- Targeted beneficiaries of intervention most suitable for evaluation:

- All communal or small-scale farmers of the project intervention area are eligible for dry land and horticulture interventions, for which participation is voluntary. Though these activities have already started within the whole intervention area, the project has not yet reached its total target of beneficiaries. The SET component is only available to a subset of selected farmers, who were selected at inception based on their needs, the size of their land and their motivation.

- Evaluation question(s) and related indicators:

The following questions have been developed with the purpose of identifying impacts from Component 3 activities:

- To what extent are farmers (men and women) making use of SETs?

- Have yields increased? Have these farmers increased the size of their production areas and the number of employees used for production activities?
- Has the promotion of SET use in the communal farming community increased livelihood crop diversification?

Key indicators include the number of male and female farmers using SETs, the number of SETs and types of SETs used by farmers, crop yields, crop land area, number of employees, and number of cultivated crops.

Task 3: Evaluation questions and indicators for behavioural interventions

The key challenge of Component 3 is the adoption of SETs by farmers. For this, their opinions on SETs and cognitive barriers that may prevent the use of SETs in the short and in the long run need to be overcome by the project. The project also seeks to create positive externalities through experience-sharing between project beneficiaries and non-beneficiaries. As a result, the LORTA and project teams developed the following behavioural questions of interest:

- To what extent are farmers (men and women) preferring the use of SETs?
- To what extent are farmers (men and women) using SETs in the short-run?
- To what extent are farmers (men and women) using SETs in the middle- and long-run?
- Are more farmers adopting SETs over time as a result of the project activities?

Tasks 4 and 5: Impact evaluation design

The possibility of implementing a random promotion of the project activities for the future beneficiaries was discussed with the project team, which rejected this proposition in favour of a design that allows for an evaluation of the average overall impact of the project. As the project interventions have already started, the only possible design is an ex-post matching design.

Caveats: This design may suffer from the lack of baseline data and information, as well as from the threat of an unobservable selection bias in the project activities.

Task 6: Scale, satellite and spatial data

There was no plan to use geographic information systems (GIS) data, but based on discussions between the LORTA and project teams GIS data could be used to measure the impact on crop land area (using measures of vegetation cover during the dry season), on land use, and on resilience (looking for heterogeneous impacts depending on exposure to climate shocks). The GIS data could also be used to measure key matching or explanatory variables (e.g. distance to rivers and roads, soil characteristics).

Task 7: Timeline and budget

The project implementation is already on-going. The impact evaluation would take place at the time of the planned final evaluation of the project, in September 2022. The budget planned for this activity is USD 40,000.

Group 3.B: Banque Ouest Africaine de Développement (BOAD) “ASER Solar Rural Electrification Project (Senegal)” (FP138)

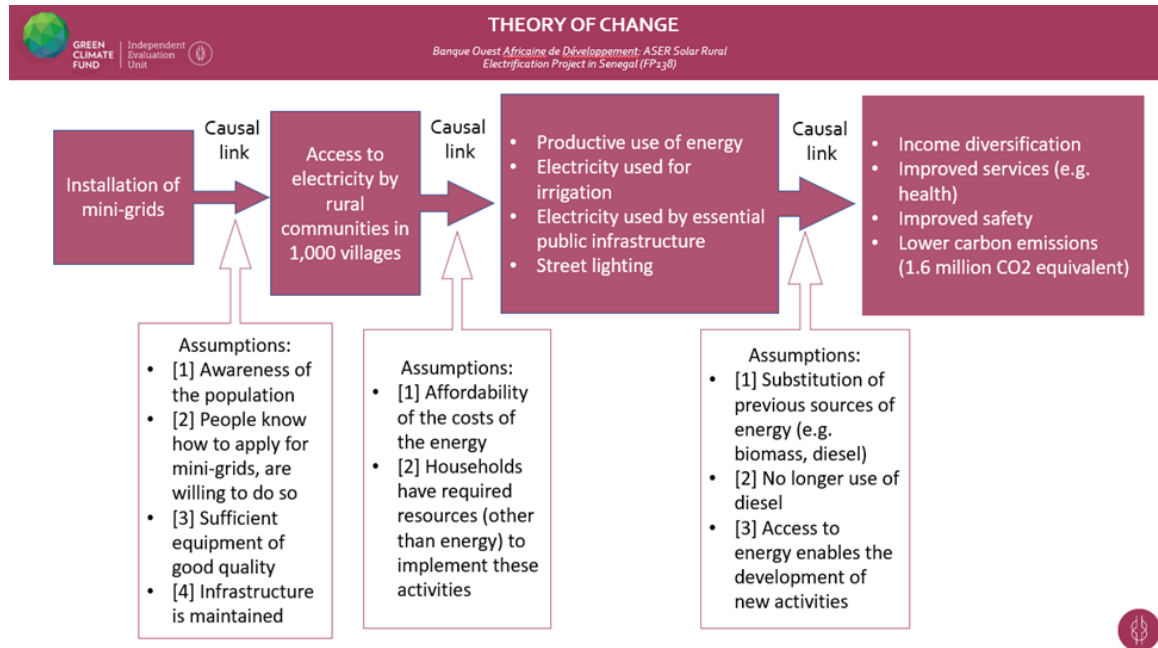
GCF grant: EUR 198.69 million

Goal: Foster the development of off-grid renewable energy mini-grids to reduce CO₂ emissions from the Senegal power sector whilst contributing to electricity access objectives and promoting gender-balanced rural economic growth.

Overall timeline: 5 years, 2021 – 2026

Task 1: Theory of change

The following figure illustrates a simplified theory of change for the project:



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:

Project components:

- Technical assistance to the solar rural electrification stakeholders

This first component aims to strengthen the capacities of the project's stakeholders (e.g. Senegalese Agency for Rural Electrification (ASER), local operators, rural beneficiaries) to implement a sustainable framework for the delivered services, including awareness campaigns and technical training.

- Procurement and installation of solar-powered mini-grids

This second component covers the bulk of the technology investment.

- Incentives for social and productive use of electricity

This third component comprises two levels of financial assistance: (i) coupons to cover part of the upfront connection costs of eligible social services and women- and youth-led enterprises; (ii) a productive equipment acquisition credit-access facility.

- Intervention most suitable for evaluation:

- The proposed impact evaluation would evaluate the overall average impact of the project at the household level.

- Targeted beneficiaries of intervention most suitable for evaluation:

- Target beneficiaries are households and public infrastructure. Beneficiary villages will be selected based on their electrification rate, density of population, level of social basic infrastructure and their distance to current energy sources.

- Evaluation question(s) and related indicators:

The following questions have been developed with the purpose of identifying the impacts of the project at the household level:

- Did the project lead to a greater access to electricity for rural communities?

- Does the change in access to electricity differ by population density?
- How much electricity from the mini-grids is used by households?
- Is energy from mini-grids affordable to all households?
- To what extent is mini-grid energy a reliable source of energy?
- To what extent did the project activities result in a greater awareness of the benefits of using energy from the mini-grids?
- Did a greater access to electricity lead to households' participation in new sources of livelihoods?
- How much electricity is used from sources other than mini-grids (e.g. diesel, firewood)?

Key indicators include the number of mini-grids installed; number of households reporting access to mini-grids, and its share by level of population density; self-reported expenditures on electricity (past month); barriers to adoption; willingness to pay; reported power-cuts and their frequency; self-reported health benefits; self-reported environmental benefits; number of sources of livelihood (past 12 months); reported use of other electricity sources and frequency; and estimated reduction in CO₂ based on energy consumption from the mini-grids.

Task 3: Evaluation questions and indicators for behavioural interventions

One key challenge of this project is to make households move away from the use of biomass to the use of solar energy. For this, the project needs to address possible wrong beliefs about solar energy and attitudes towards tree cutting. Another challenge is ensuring households keep using solar energy in the long run. As a result, the LORTA and project teams developed the following behavioural questions of interest:

- To what extent do households prefer the use of mini-grids?
- To what extent are households using mini-grids in the short-run?
- To what extent are households using mini-grids in the middle- and long-run?
- Is the promotion of mini-grids able to lead to households' sustainable use of cleaner energy?

Tasks 4 and 5: Impact evaluation design

The preferred design consists of a cluster-RCT, where groups of eligible villages will be used as clusters.

Caveats: BOAD participated in this workshop as an institution, and we referred to FP138 for the purpose of illustrating the LORTA workshop activities. ASER would need to be consulted to confirm their engagement in conducting an impact evaluation of this project, and their willingness to go for an experimental design.

Task 6: Scale, satellite and spatial data

GIS data could be used to measure impact on tree cutting (using indicators of vegetation cover) on crop land area (using indicators of vegetation cover during the dry season), on air pollution (would require high technical expertise), and on street lighting (using night lights). GIS data could also be used to measure key matching or explanatory variables (e.g. distance to rivers and road, soil characteristics, climate).

Task 7: Timeline and budget

This is a 5-year project and its effective starting date is still unknown. The impact evaluation could comprise up to three waves of data collection, possibly in March/April of the relevant years, to match the end of the dry season. The M&E budget of this project is EUR 181,938.

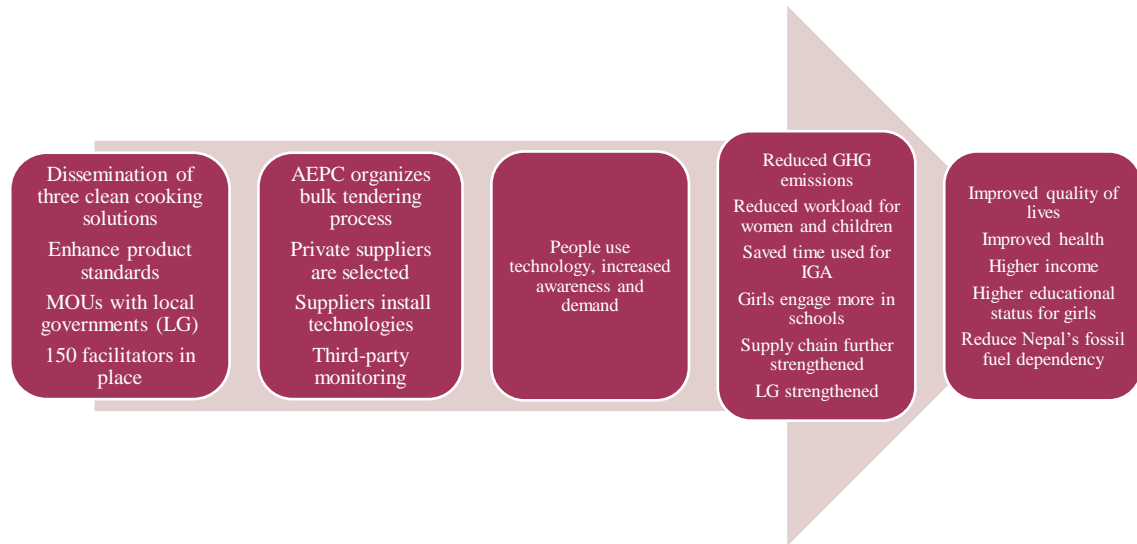
Group 4.A: Mitigating GHG emission through modern, efficient and climate-friendly clean cooking solutions (CCS) (Nepal) (FP172)

GCF grant: USD 21.1 million

Goal: Reduce GHG emissions, improve health and well-being through increased use of clean cooking solutions

Overall timeline: 5 years, July 2022 – November 2026 (tbd)

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:
Project components
 - Scaling up the deployment of clean cooking technologies through accelerated investment and market development.
 - Strengthening enabling environment through sector-based assessment and quality assurance of the technologies by creating partnership agreements with provincial and local governments and other implementing partners.
 - Empowering institutions' capacities for the supply chain and ensuring increased access to CCS through capacity building, awareness raising and trainings.
- Intervention most suitable for evaluation:
 - Intervention 1 and 3 – deployment of clean cooking solutions
 - + Under Component 1, the proposed project will support three different CCS adequate to the beneficiaries' needs and infrastructure conditions. The different CCS are Tier 3+ Improved Cooking Stoves, Biogas, and Electric Cook Stoves. Under Component 3, 150 local facilitators will be trained by the project, with a preference for female facilitators, in order to spread information about the improved cooking solutions and raise awareness. Working jointly with local governments the facilitators will gather lists of interested households to take part in the intervention. The project then facilitates the link to the relevant cooking stove suppliers.
- Targeted beneficiaries of the intervention most suitable for evaluation:
 - In total, 1 million poor and vulnerable households of the Terai region (southern plain region of Nepal) will be targeted by the intervention. It will be implemented in 22 districts and around 150 municipalities of the region and aims to switch 500,000 households from

liquefied petroleum gas and fuel-wood stoves to electric stoves; 490,000 households from loose biomass, dung cake and fuel wood to Tier 3+ improved cooking stoves; and to introduce a biogas system for 10,000 households that have sufficient livestock.

- Evaluation question(s) and related indicators:

The following evaluation questions are considered major in order to evaluate the main objectives of the project in terms of GHG emission reduction, improvement of health and living conditions as well as female empowerment:

- Have GHG emissions reduced? → Indicators: a) Amount of biomass used, b) Extent of CCS used, c) Number of households aware of CCS advantages
- Do households perceive a change in well-being and wealth? → a) Life satisfaction, b) Income
- Do girls' educational achievements change? → a) Girls' level of reading, writing and math skills
- Does the health status of households improve? → a) Respiratory health, b) Health costs (secondary data)

Task 3: Evaluation questions and indicators for behavioural interventions

The success of an intervention requires behavioural and mind-set change from beneficiaries: some “dirty” cooking solutions are associated with higher status – a change towards cleaner cooking solutions is incentivized through cost-savings. What is more, awareness campaigns will be implemented incentivizing women to take up technical occupations that provide the necessary maintenance services for the cook stoves.

Tasks 4 and 5: Impact evaluation design

The suggested impact evaluation design is a RCT with a phase-in approach. The intervention starts in year 1 with the selection of 150 participating municipalities selected via a public call. While the intervention needs to start in all 150 municipalities at the same time in year 1, the communities starting first can be randomized. Communities for treatment and control (likely 200 in total) will be randomly selected in year 1. Baseline and treatment will be conducted in year 2, and endline plus subsequent treatment on control communities will take place in year 4. All relevant outcomes are measurable after 2 years.

Potential treatment arms: 3 treatment arms, 1 for each clean cooking solution

Caveats: Communities selected for treatment in year 2 could be different (potentially better off) to communities selected for control, which will be treated in year 4.

Task 6: Scale, satellite and spatial data

Geocoded household data is available to the project team. In order to measure long-term outcomes for income, forestation or carbon emissions, geocoded night-time light intensity may be useful, as well as forest coverage measured through satellite imagery.

Caveats/challenges: Uncertain availability of data at required level

Task 7: Timeline and budget

Baseline in May 2023 (year 2), endline in May 2025 (year 4)

Available budget for IE (AE fee): USD 50,000 (mid-term review + project completion report)

Required budget (estimated): 2*1,500 households (tbc) per wave → USD 50,000 – USD 100,000

Caveats/challenges: The ongoing COVID-19 pandemic does not seem to pose a threat to the implementation or evaluation design from the current perspective. Secondary data can be used for the impact evaluation in addition to primary household data to measure health effects.

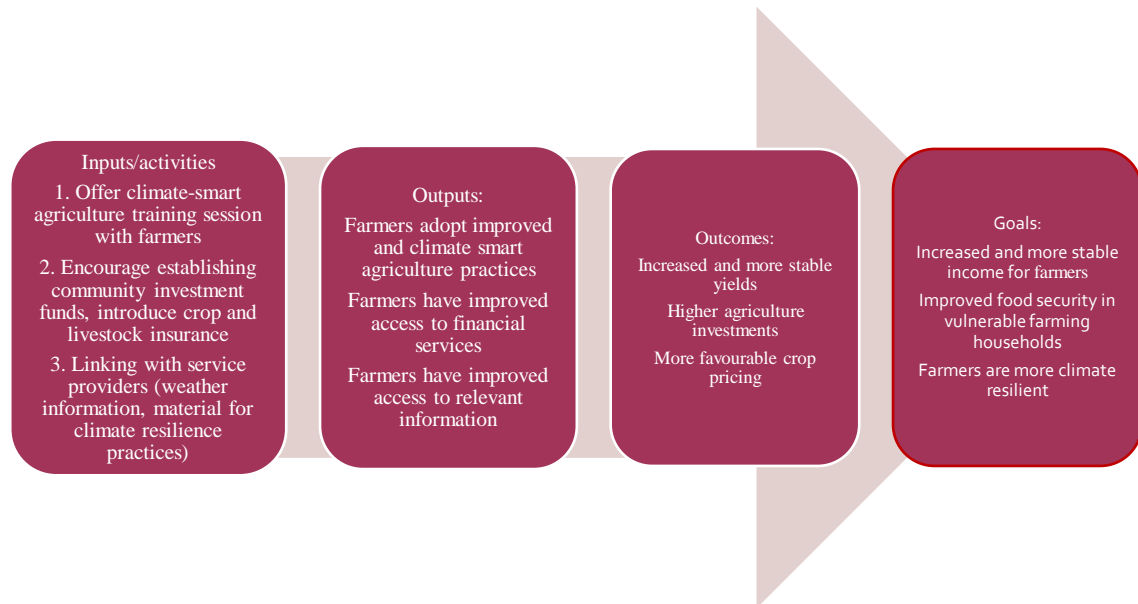
Group 4.B: Climate smart villages (Pakistan) (NRSP)

GCF grant: Not yet approved

Goal: Improve farmers' resilience and food security situation through climate smart agriculture (CSA)

Overall timeline: 5 years, 2022 – 2026 (tbc as project yet to be approved)

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:

Project components:

- Climate smart agriculture: Installation of climate smart villages employing CSA.
- Forestation: Focus on carbon sink through community forestation.
- Water: Line up channels of canals including renewable energies and efficient irrigation techniques.

- Intervention most suitable for evaluation:

Intervention component 1:

- Increase the cultivation areas of farmers by teaching and encouraging the use of climate smart agricultural practices. The major technique for transmission will be demonstration plots. In addition, farmers are supported by community investment funds, crop and livestock insurance and access to improved weather information.

- Targeted beneficiaries of intervention most suitable for evaluation:

- Vulnerable farmers selected based on their poverty profiles and production patterns

- Evaluation question(s) and related indicators:

The major overarching evaluation question is the following, which addresses the core objective of the intervention:

- Has the use of climate resilient agriculture practices by men and women contributed to stabilizing and increasing agricultural yields over 3–5 years and improved food security?

→ Indicators: a) Use of CSA practices by trained farmers, b) Yields of three main crops of CSA trained farmers

Task 3: Evaluation questions and indicators for behavioural interventions

Loan repayment is one important pre-condition for the project to sustainably succeed. The team takes lessons from its own previous projects and the microfinance institutions research into previous project accounts, which suggest the use of community-based loans that include follow-ups for compliance and which generally show recovery rates of 90 per cent. A second pre-condition for critical behavioural change is the adoption of climate resilient crop varieties. The changing of crops constitutes a high risk factor for vulnerable farmers, whose entire livelihoods depend on their harvests. Behavioural change can hence be facilitated through the use of demonstration plots outside the farmers' farmland. A third constraining factor is the necessity to lead to sustainable behavioural change. This requirement is addressed by repeated trainings for farmers, the identification and training of community resource persons as well as the creation of sustainable links to private and public service providers of CSA practices.

Tasks 4 and 5: Impact evaluation design

Evaluation strategy: The selection of around 100 treatment villages has already been concluded and experimental methods are hence not feasible. As an alternative, we suggest a DiD with matching approach. Based on secondary data, 100 control villages are to be selected outside the project area, incorporating a minimum distance to avoid spill-overs and taking the same selection criteria used for treatment into account.

Potential treatment arms: No

Caveats: Find adequately comparable control areas

Task 6: Scale, satellite and spatial data

Geocoded data on climate variables, poverty profiles and production patterns is available for the treatment area, and may be obtainable for potential control areas. In addition, satellite imagery of forest and cultivation areas may provide great opportunities for measuring the long-term effects of these outcomes.

Caveats/challenges: Geocoded climate data is only available for the past 5 years, not for the past 30 years, as requested by GCF. In addition, the use of geocoded data needs special government permission in Pakistan, which may be a caveat.

Task 7: Timeline and budget

Baseline: year 1 (2022); midline: year 3 (2024); endline: year 5 (2026)

Required budget (estimated): 3*1,500 households (tbc) per wave → USD 180,000 (requirement of midline tbc)

Available budget: Given the project is in the concept note stage, the required IE budget can be taken into account in budget planning.

Caveats/challenges: From the current perspective, the ongoing pandemic does not pose a particular threat to implementation and/or the evaluation.

Group 5.A: Embedded Generation Investment Programme (EGIP) (FP106)

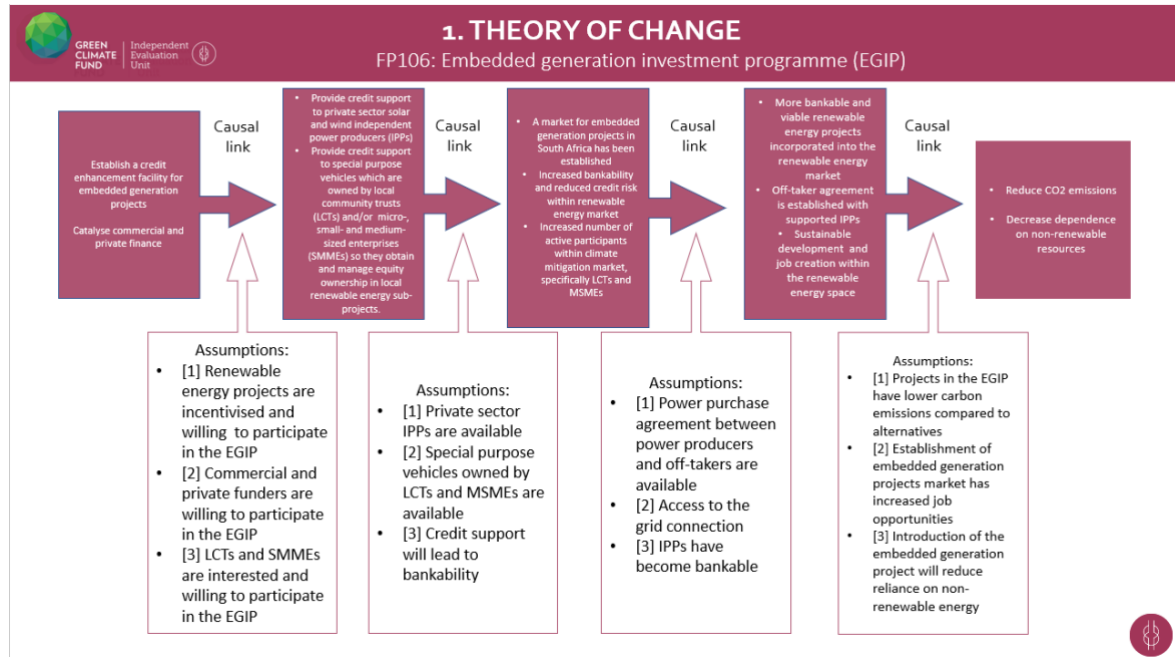
GCF grant: USD 100 million

Goal: The programme's main objective is to pioneer a new market mechanism to further implement renewable energy projects outside of sovereign support in South Africa. This should lead to more bankable and viable renewable energy projects to be incorporated into the renewable energy market. Furthermore, off-taker agreements should be established with supported Independent Power

Producers (IPPs). Finally, the goal is to achieve sustainable development and job creation within the renewable energy space.

Overall timeline: 2019 – 2024

Task 1: Theory of change



Task 2: Evaluation questions

- **Outputs:**
 - How many supported private-sector owned IPPs have received credit support?
 - How many supported special purpose vehicles owned by LCTs and MSMEs have received credit support?
- **Outcomes:**
 - Has a market for embedded generation projects been established in South Africa?
 - How many of the IPPs participating in the EGIP have reduced credit risk?
 - How many LCTs and MSMEs are participating in the climate mitigation market?
- **Goals/impacts:**
 - How many privately owned LCTs and MSME projects are embedded in the renewable energy sector?
 - Is there an off-take agreement established with supported IPPs?
 - How many jobs have been created from the EGIP?
- **Intervention most suitable for evaluation:** The main intervention of the project is providing credits to IPPs, LCTs and MSMEs. Other sub-components are about providing gender-specific training to increase the share of female-owned enterprises that apply for credits. However, this is not the main interest of the project.
- **Targeted beneficiaries of intervention most suitable for evaluation:** Any impact evaluation design would have to reach out to the targeted IPPs, LCTs and MSMEs.

Task 3: Not completed

Tasks 4 and 5: Impact evaluation design

- **Evaluation strategy:** Experimental methods

As with most projects providing large-scale credits, there is no opportunity for randomization in this case. The first problem is a very small sample size. Up to this point in time, only 12 credits have been provided. For this reason, all potential interested entities that fulfil the project requirements will receive a credit, and the roll-out cannot be randomized.

- **Evaluation strategy: Quasi-experimental methods**

The best possible evaluation design would be some matching method. However, there are many different obstacles for a robust evaluation design. First, it is not clear where the data base for matching a control group can come from. There will be no baseline data collection and the project team is not aware of any secondary data that can be used. To find a counterfactual group, the evaluation design will be dependent on having some administration data and maybe some business register that can form the base of some quick phone survey. However, given the small sample size (the above) it is questionable if the evaluation design will have enough power to detect any effects.

Task 6: Scale, satellite and spatial data

- Satellite and spatial data for a renewable energy project (CO2 reduction) is unavailable for evaluation purposes.
- A mapping exercise will be conducted to show where the projects will be implemented.

Task 7: Timeline and budget

- The project has already started some implementation. The project will end in 2024. The project evaluation is planned for 2024 – 2025.
- The total budget for the endline data collection is USD 88,000. While this seems to be sufficient for most data collection, it is unclear how a robust evaluation including a control group can be found.

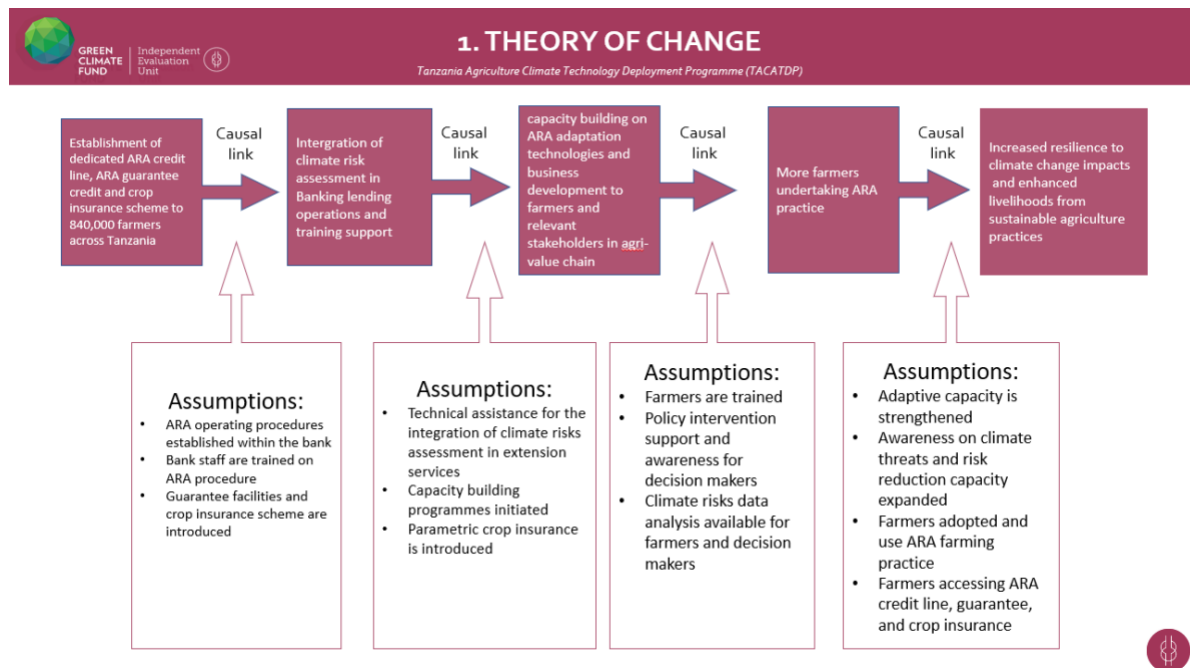
Group 5.B: Accredited entity: Cooperative and Rural Development Bank (CRDB) Plc, Tanzania

GCF grant: USD 100 million

Goal: CRDB plans to offer innovative financial products including a new dedicated line of credit for cropping sector adaptation and resilience, supported by a guarantee facility. The programme will also explore a dedicated insurance scheme focused on small-holder farmers.

Overall timeline: 5 years, January 2022 – December 2026

Task 1: Theory of change



Task 2: Evaluation questions

- **Main interventions:**
Project components:
 - Adaptation credits: Including bank credit for cropping-sector adaptation and resilience, and crop insurance
 - Technical assistance package:
 - + Build institutions' capacities to effectively implement adaptation measures and adopt climate-resilient agriculture finance
 - + Design and develop a climate risks assessment tool
 - + Train farmers on climate resilience and climate adaptation
- **Intervention most suitable for evaluation:**
The project component most suitable for evaluation comprises the credits to corporations, micro-enterprises, SMEs and microfinance institutions.
- **Targeted beneficiaries of intervention most suitable for evaluation:**
A possible evaluation might want to focus on small-holder farmers, who will not only receive the credit but also training and encouragement for sustainable organic farming. This will allow the team to measure the impact of different components on the goal of climate-resilient agriculture practices.
- **Evaluation question(s):**
 - To what extent have banking lending operations integrated climate risk assessment?
 - How many farmers (men and women) trained in the adoption of ARA practices?
 - Have crop production yields improved due to the adoption of ARA practices?
 - Overarching: To what extent does the establishment of ARA practices contribute to agriculture resilience, enhanced food security and improved livelihoods?

Task 3: Not completed

Task 4 and 5: Impact evaluation design

Evaluation strategy:

- **Experimental methods**

In terms of experimental methods, a random phased-in encouragement design has been discussed. This design would focus on those villages that will receive information and training on ARA practices. Combining some phased-in and control villages, such a design might be able to detangle the effect of the different components. However, the project team has little experience with evaluation methods, and randomization of implementation will be very difficult to achieve.

- **Quasi-experimental methods**

The most suitable evaluation design would be a DiD matching design. The goal would be to estimate the effect of the project by comparing the farmers who have access to credits and training, to those who do not. The control group would be farmers in villages where there are no branches of the implementation partner close by.

- **Caveats**

The main problem will be identifying a suitable control group. Since this is a national project that is rolled out at the same time everywhere, all farmers in the country will theoretically have access to the treatment. However, one could use distance to the closest partner branch as an instrumental variable for treatment while controlling for as many other characteristics as possible at village level.

Task 6: Scale, satellite and spatial data

- Use of satellite data to evaluate possible improvements in farms have used ARA technology practices, by checking colour densities in images
- Use of satellite data to evaluate forests that have been restored due to decreased deforestation by small holder farmers as a result of best farming practices
- Use of spatial data to see the number of water catchments starting to regenerate

Task 7: Timeline and budget

Project implementation is planned to start in 2022. The data collection and evaluation budget is around USD 287,000. While this sounds a lot, it is not clear how exactly the funds will be spent.

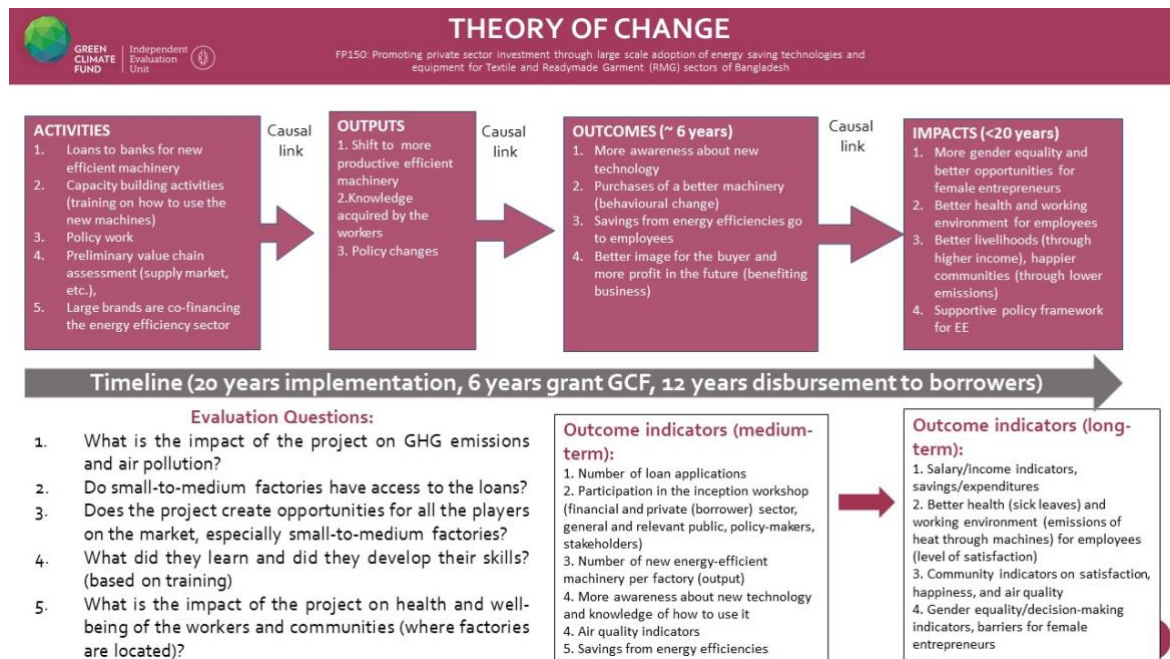
Group 6.A: Promoting private sector investment through large scale adoption of energy saving technologies and equipment for Textile and Readymade Garment (RMG) sectors of Bangladesh (FP150)

GCF grant: USD 256.48 million

Goal: Textile and RMG industries in Bangladesh will undergo a transformative shift to low-carbon pathways and increase the rate of GHG emission reduction through systemic identification, and financing of best available energy-efficient technologies. Infrastructure Development Company Limited will also aim to achieve uptake of targeted tools and knowledge to sustain and replicate the low-carbon transformation and seek to align policies for low-carbon industrial development.

Overall timeline: 21 years, starting from 2021/2022

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:

Project components:

- Component 1: USD 133 million financing for Energy Saving Equipment & Technology for Textile sector
- Component 2: USD 3.05 million GCF Technical Assistance (TA) to develop enabling environment for EE investment in textile sector
- Component 3: USD 200 million financing for Energy Saving Equipment & Technology for RMG sector
- Component 4: USD 2.3 million GCF TA to develop enabling environment for EE investment in RMG sector
- Component 5: USD 1.15 million GCF TA to strengthen regulatory & institutional framework at the national level to overcome the operational constraints related to implementing [energy efficiency and conservation] EE&C in the country

- Intervention most suitable for evaluation:

Components 1–4:

- Financing for Energy Saving Equipment & Technology and GCF TA to develop an enabling environment for EE investment in textile and RMG sectors. The idea for an impact evaluation is to measure the impact of capacity-building activities at the factory level, to assess how the new equipment is installed and used, whether it leads to a more efficient and safe work environment for the factory workers, if it has an impact on their incomes, an indirect impact on the families engaged in the manufacturing sectors in Bangladesh, and a positive impact on communities.

- Targeted beneficiaries of intervention most suitable for evaluation:

- Primary beneficiaries: factories, factory workers, their families, and communities.

- Evaluation question(s) and related indicators:

- Evaluation questions:

- + What is the impact of the project on GHG emissions and air pollution?
- + Do small-to-medium factories have access to the loans?
- + Does the project create opportunities for all the players on the market, especially small-to-medium factories?
- + What did they learn, and did they develop their skills (based on the capacity-building trainings)?
- + What is the impact of the project on the health and well-being of the workers and communities (where factories are located)?
- Outcome indicators:
 - + More awareness and knowledge about the programme
 - ◆ Number of loan applications
 - > More gender equality and better opportunities for female entrepreneurs
 - ◆ Participation in the inception workshop (financial and private (borrower) sector, general and relevant public, policymakers and stakeholders)
 - + Purchases of better machinery (behavioural change)
 - ◆ Number of new energy-efficient machinery per factory (output)
 - > Better health and working environment for employees
 - + More awareness about new technology
 - ◆ Awareness and knowledge about new machinery
 - + Better air quality, and savings from energy efficiencies go to community
 - ◆ Salary/income indicators, savings/expenditures
 - ◆ More gender equality and better opportunities for female entrepreneurs
 - ◆ Better health (sick leave) and working environment (emissions of heat through machines) for employees (level of satisfaction)
 - ◆ Better livelihoods (through higher income), happier communities (through lower emissions)

Task 3: Evaluation questions and indicators for behavioural interventions

The installation of new machinery is a behavioural intervention by itself as it may lead to behavioural change among factory workers, as well as management. The behavioural intervention has certain assumptions: the machinery is purchased and properly installed, all the technical and work environment pre-conditions are met for it to function properly, and the staff are trained and know how to use the machinery. The key outcome indicators are the changes in a work environment and safer practices among workers and management.

Tasks 4 and 5: Impact evaluation design

Evaluation strategy: RCT for the beneficiaries that will receive capacity training on the new machinery (i.e. workers of the factories)

DiD approach in case RCT is not possible or not done well (both groups are significantly different from each other)

Combined with project monitoring activities, community surveys, pre-, and post-evaluation.

Potential treatment arms:

- Round 1 training
- Round 2 training

Caveats: No possibility to measure long-term outcomes as the roll-out of an intervention is planned to happen within 1–2 months after the first round of capacity-building training.

Task 6: Scale, satellite and spatial data

There might be a possibility to use satellite data to measure outcome indicators, as well as for targeting. Examples include heat measurement from a factory, roof-top (solar) surface area, location of the factory, weather conditions or floods, affecting mini-grids.

Caveats/challenges: High resolution data can be expensive. Also, outcome indicators from capacity-building activities may not necessarily be measured through satellite data but rather by conventional individual/household surveys.

Task 7: Timeline and budget

MONITORING				
Data/source	Collection tool	Frequency	Indicator	Indicative budget
Reporting by the end-borrowers to LFIs	Survey/questionnaire	Annually	Submission of energy & emission savings/usage reports or information	Sub-project specific
Reporting by the LFIs to Infrastructure Development Company Limited	Document review	Annually	Submission of energy & emission savings/usage reports or information	Sub-project specific
EVALUATION				
Type	Timing	Independent/self-evaluation	Indicative budget	
Impact	After the end of half of the project lifespan, i.e. 10 years	Independent	To be determined	
Impact	After the end of programme evaluation, after programme life of 20 years	Independent	To be determined	

Caveats/challenges: Considering the current COVID-19 pandemic, it might be hard to collect data from individuals and households face-to-face. The M&E plan and data may inform an impact evaluation, as well as the potential use of satellite data.

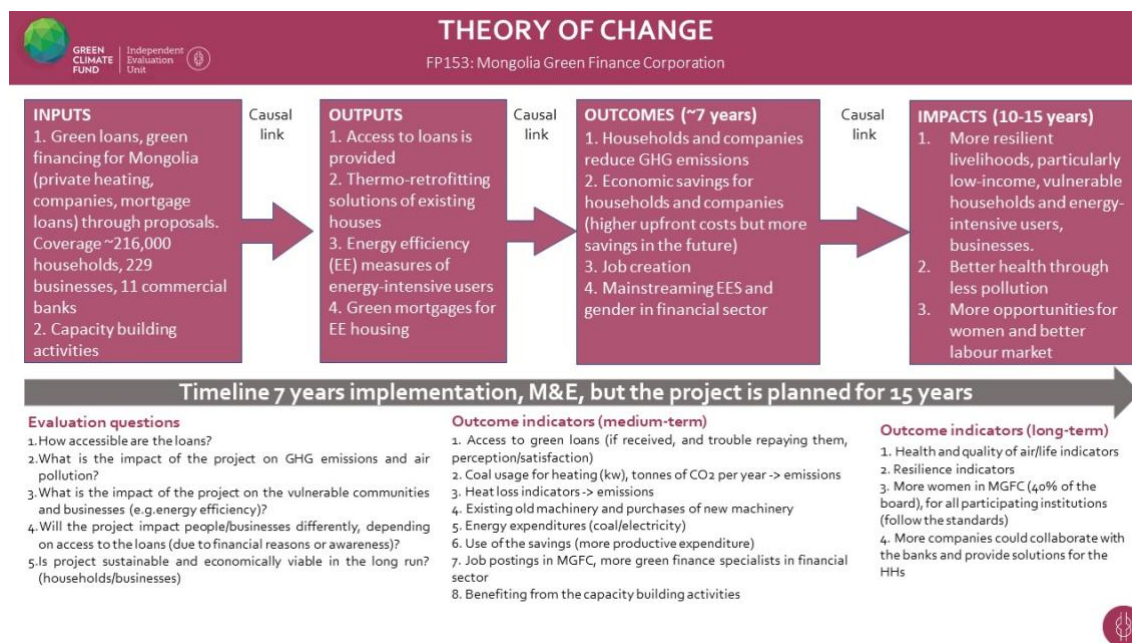
Group 6.B: Mongolia Green Finance Corporation (MGFC) (Mongolia) (FP153)

GCF grant: USD 26.654 million

Goal: MGFC will lead to reduced emissions from buildings, cities and appliances, and strengthen institutional and regulatory systems for low-emission planning and development.

Overall timeline: 15 years, starting from 2021/2022

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:
 - Project components:
 - Provision of wholesale financing to PFIs for EE in industry, thermal insulation, and green affordable housing; and
 - Equity injection into the MGFC; TA to strengthen MGFC’s green business development function; reinforce the green finance policy environment; build the capacity of PFIs, project developers, households, and policymakers; develop a sustainable and bankable green project pipeline; and conduct community engagement and awareness-raising activities.
 - Intervention most suitable for evaluation:
 - Components 1 and 2
 - The first component mainly focuses on providing green loans to project households and there is an opportunity to measure the impact of these loans on the households’ wellbeing and the use of the green loans. The second component focuses on the capacity-building activities for the companies that provide those green solutions. Therefore, there is an opportunity to measure impact on the management and staff of those companies by examining whether their knowledge of the green solutions increased, their decision-making is more efficient, etc.
 - Targeted beneficiaries of intervention most suitable for evaluation:
 - Households and company workers that provide green solutions.
 - Evaluation question(s) and related indicators:
 - Evaluation questions:
 - + How accessible are the loans?
 - + What is the impact of the project on GHG emissions and air pollution?
 - + What is the impact of the project on vulnerable communities and businesses (e.g. EE)?

- + Will the project impact people/businesses differently, depending on their access to the loans (due to financial reasons or awareness)?
- + Is the project sustainable and economically viable in the long run (households/businesses)?
- Outcome indicators:
 - + Households and companies reduce GHG emissions:
 - ◆ Access to green loans (if they received them; whether they had trouble repaying them; perception/satisfaction)
 - ◆ Coal usage for heating (kw), tonnes of CO2 per year → emissions
 - > Health and quality of air/life indicators
 - > More resilient households
 - ◆ Heat loss indicators → emissions
 - ◆ Existing old machinery and purchases of new machinery
 - + Economic savings for households and companies (higher upfront costs but more savings in the future)
 - ◆ Energy expenditures (coal/electricity)
 - ◆ Use of savings (more productive expenditure)
 - > More resilient households
 - + Job creation
 - ◆ Job postings in MGFC, more green finance specialists – financial sector
 - ◆ More companies could collaborate with the banks and provide solutions for the households
 - ◆ Benefiting from the capacity building activities
 - + Mainstreaming environmental and social safeguards and gender in the financial sector
 - ◆ More women in the MGFC (40 per cent of the board), for all participating institutions.

Task 3: Evaluation questions and indicators for behavioural interventions

The project may trigger behavioural changes in the following way:

Provide the opportunity, environment and policy to allow households to change their behaviour:

- By raising awareness:
 - Capacity building for government officials and financial sector, training of customers of the banks, events, targeting vulnerable groups (outskirts of capital).
 - Financial literacy training for the financial sector and households.
- By facilitation in terms of policy, easy access, understanding of the benefits, immediate and long-term goals:
 - Participation of the Government, bank sector and GCF; forms of policy – new policy catalysing green loans, Green Development Policy already in place; gathering more info; creating more green business pathways

Tasks 4 and 5: Impact evaluation design

- Evaluation strategy 1:
Non-experimental design: pre- and post-differences in outcome indicators of the beneficiaries (households and companies) combined with regular monitoring. There is a high probability that the project's outcomes can be attributed to the project itself and not any other external factors.
- Evaluation strategy 2:
Capacity building of the green solution sector: ensure client satisfaction and quality, 28 per cent EE requirement, expand business for other products, financial capacity (with respect to loans), a few days' workshop >100 firms, >1,000 participants. IE designs: propensity score matching, DiD
 - Step 1: Collect baseline data on all the beneficiaries (participants in waves 1 and 2)*
 - Step 2: Participants in wave 1 receive training
 - Step 3: Collect follow-up data for both groups (waves 1 and 2)
 - Step 4: Estimate impact on the participants using DiD
 - Step 5: Deliver training for wave 2 participants

*Ideally, we would need two baselines (to test parallel trend assumption).

Possible outcomes: acquired knowledge, stronger decision-making, better social cohesion with respect to decision-making and climate change domain, better leadership skills, and in the long run, better sales and customer satisfaction

Potential treatment arms:

- Households that receive loans and households that receive loans after 1 year
- Waves 1 and 2 of the capacity-building activities on the new machinery

Caveats: It would be difficult to collect data from the households that will not be successful in getting the green loans (i.e. control group). Therefore, a non-experimental pre- and post-evaluation approach is suggested. For the capacity-building activities, it would be difficult to measure long-term outcomes as the participants from Round 2 may be likely to receive training soon after Round 1 is finished.

Task 6: Scale, satellite, and spatial data

There might be a possibility to measure air pollution and GHG emissions at the household level if satellite data of a high resolution is available.

Caveats/challenges: High cost of high-resolution satellite data, and this data not being the main data source for measuring key outcome indicators.

Task 7: Timeline and budget

- MGFC – will have an M&E focal point who will report to the AE
- Supported by an external auditor, engineers, environment and gender specialist (funded for the first 5 years of implementation)
- Non-experimental design: pre-and-post differences in outcome indicators of the beneficiaries (households and companies) combined with regular monitoring
- Evaluation plan:
 - Baseline data of sub-sample of loan applicants
 - + Initial project targets: For thermal installation – 21,700 households; for green housing – 2,200 households; for large energy-users: 220 businesses

- Example with thermal insulation loans:
 - + Applicants: ~1,000 applicants yearly (those who will receive the loan)
 - + Sample 500 households (30 per cent women) for the baseline and endline
 - + Data collection (to external team), MGFC prepare the report based on the data
 - + Follow-up after 1 year, and 5 years after that (two follow-ups) to measure short-term and long-term outcomes
- In addition, interim and final independent evaluations (investment criteria – how well the project meets the targets)

Caveats/challenges: Considering the current COVID-19 pandemic, it might be hard to collect data from the individuals and households face-to-face. The M&E plan and data may inform an impact evaluation, as well as the potential use of satellite data to measure air pollution and reduction of GHG emissions.

Group 7.B: Climate resilient food security for farming households across the Federated States of Micronesia (FSM) (SAP020)

GCF grant: USD 8.6 million

Goal: The Federated States of Micronesia (FSM) is one of the most highly vulnerable small island developing states in the Pacific. The project is the first comprehensive national effort to focus on increasing the resilience of FSM’s most vulnerable communities to food insecurity in the face of climate change.

The project targets all households in the FSM high islands undertaking some form of farming and has approximately 68,250 direct beneficiaries (across the FSM with 63 per cent of households conducting some form of agriculture and forestry).

The project has three components:

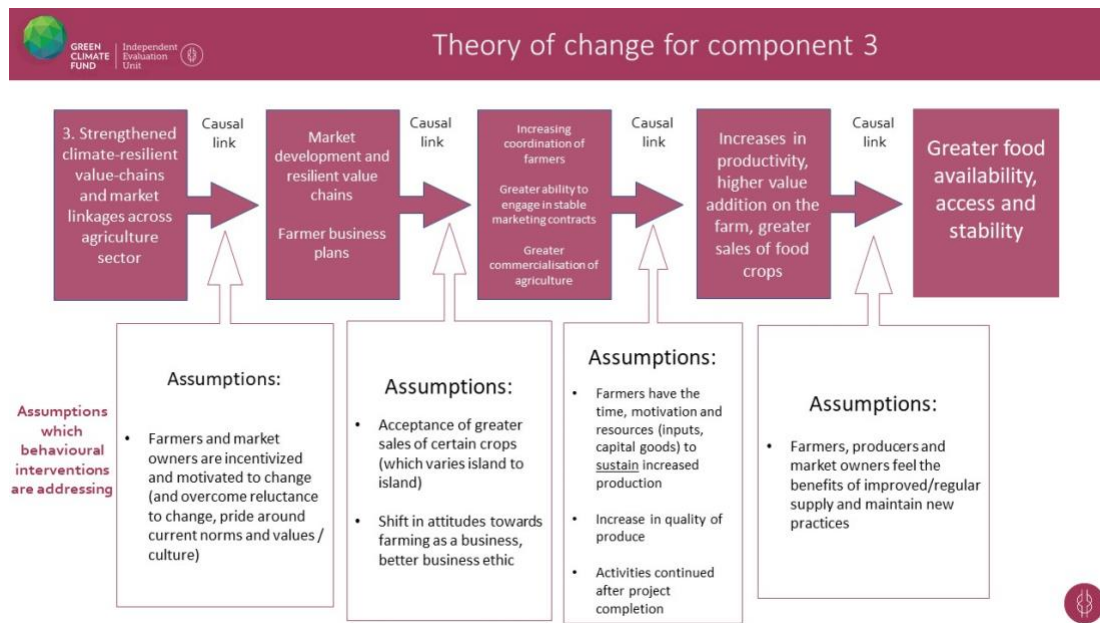
- Establishing an enabling environment for adaptive action and investment.
- Enhancing the food security of vulnerable households by introducing CSA practices.
- Strengthening climate-resilient value-chains and market linkages across the agriculture sector.

The impact evaluation focuses on Component 3. Previous interventions have been successful but scattered and not sustained – the uptake and use of farmer business plans aims to address this shortcoming. The project seeks to incentivise the completion of farmer business plans through the following bundle of behavioural interventions aimed at producer organizations:

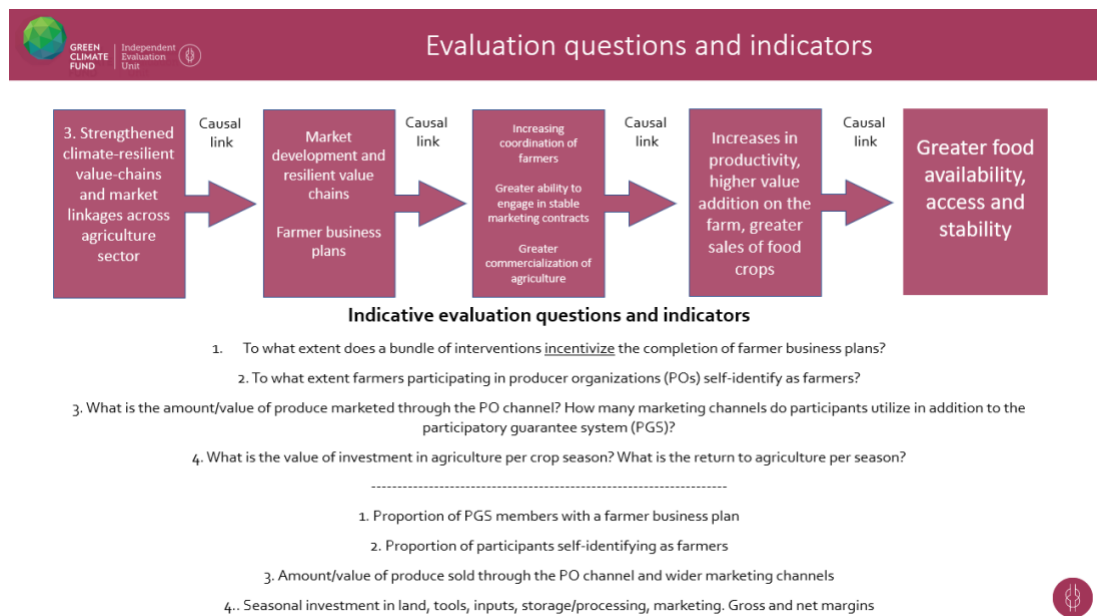
- Social visibility (events and social functions)
- Incentives via promotional material (stickers)
- Certification card for completion of farmer business plans (to be shown to traders)

Overall timeline: 5 years, October 2021 – September 2026

Task 1: Theory of change



Task 2 and 3: Evaluation questions



Task 4 and 5: Impact evaluation design

SAPo2o – Phase-in encouragement design – Farming groups				
Baseline	Group 1 existing POs – State A	Group 2 new POs 1 – States A, B, C, D	Group 3 new POs 2 – States A, B, C, D	Group 4 new POs 3 – States A, B, C, D
Year 1	Incentives for farmer business plans - stickers	Incentives for formalization	Nothing	Nothing
Year 2	Social visibility (events and social functions)	Incentives for farmer business plans - stickers	Incentives for formalization	Nothing
Year 3	Certification card	Social visibility (events and social functions)	Incentives for farmer business plans - stickers	Incentives for formalization
End-line				
Year 4	50+ PO groups already registered in one State 7-14 members per PO	Certification card	Social visibility (events and social functions)	Incentives for farmer business plans - stickers
Year 5		Baseline and endline	Certification card	Social visibility (events and social functions) and certification card

Task 6: Scale, satellite and spatial data

The project originally had a focus on deforestation, and GIS data was considered at that stage. One option here is using the Normalized Difference Vegetation Index, which can be used to look at the health of crops and farmlands (although its usefulness might be limited as the vegetation is so lush). A further indirect option would be to assess any improvement in the quality of houses (using high-resolution data). The collection of GPS coordinates is key.

Task 7: Timeline and budget

Q1 2022	Baseline data collection
Q2 - Q3 2022	Randomization and implementation starts – Phase-in begins
Q2 - Q3 2022, 2023	Phase-in continues
Q4 2024	Endline data collection

Staff costs (field coordinator, supervisor, enumerators) = USD 78,000

Training costs = USD 24,000

Transport = USD 6,320

Other = USD 26,400

International consultant = USD 31,367

Total = USD 166,287

Caveats/challenges: There are some concerns about the sample size and power calculations, including the size of producer organizations.

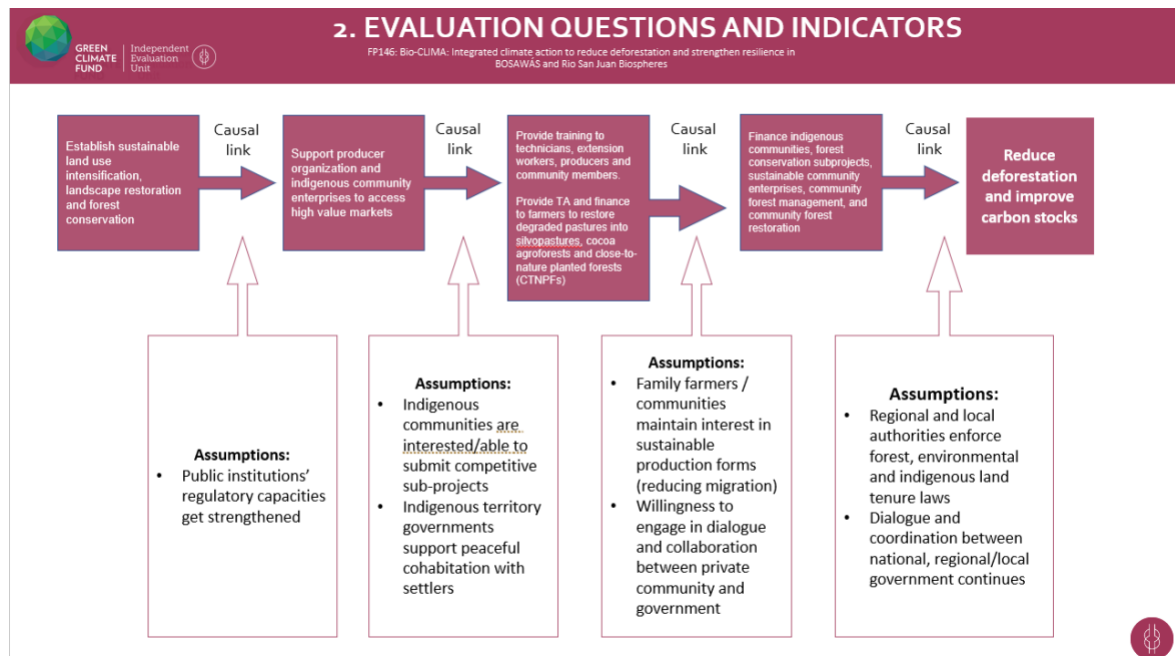
Group 8.A: Bio-CLIMA: Integrated climate action to reduce deforestation and strengthen resilience in BOSAWÁS and Rio San Juan Biospheres (Nicaragua) (FP146)

GCF grant: USD 64 million

Goal: Establish sustainable land use intensification, landscape restoration and forest conservation to reduce deforestation.

Overall timeline: 7 years, 2021 – 2027

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:
 - REDD+ (payment for reduction of deforestation)
- Intervention most suitable for evaluation:
 - REDD+
- Targeted beneficiaries of intervention most suitable for evaluation:
 - Indigenous communities in eastern Nicaragua
- Evaluation question(s) and related indicators:
 - Evaluation questions
 - + Does the programme reduce deforestation and improve carbon stocks?
 - Indicators
 - + Forest coverage
 - + Number of families and communities that continue to use sustainable production forms
 - + Incidence of forest, environmental and land tenure issues
 - + General satisfaction with forest, environmental and indigenous land tenure
 - + Number of meetings and coordination between national, regional/local government continues

Task 3: Evaluation questions and indicators for behavioural interventions

Behavioural questions:

- Will there be sustained interest in using sustainable production forms? What constrains that interest?
- Will they keep a good relationship with the technical team?

Indicators:

- Attitudes toward forest, environmental and indigenous land tenure

- Attitudes toward implementation team
- Attitudes towards water, rivers, and others' behaviours toward them

Tasks 4 and 5: Impact evaluation design

The discussed evaluation design is phase-in randomized. It is a 7-year programme, with the first 2 years to start the project and years 3 to 7 to implement it with 485 communities. It is possible that communities for later years of rollout could be selected randomly, according to the following schedule.

5 – Experimental methods				
	Year 3 enrolled villages randomized 97	Year 4 enrolled villages not randomized 97	Year 5 enrolled villages not randomized 97	Year 7 enrolled villages randomized 97
Baseline				
Year 3	TA and finance	Nothing	Nothing	Nothing
Year 4	TA and finance	TA and finance	Nothing	Nothing
Year 5	TA and finance	TA and finance	TA and finance	Nothing
Year 6	TA and finance	TA and finance	TA and finance	Nothing
End-line				
Year 7	TA and finance	TA and finance	TA and finance	TA and finance

Task 6: Scale, satellite and spatial data

The programme plans to GIS map the location of every project and use satellite data to monitor changes in forest coverage.

Task 7: Timeline and budget

The programme expects that years 1 and 2 will be used to prepare programme and evaluation design. In years 3 to 7, the team will run the programme. At around year 6, an endline survey can be conducted either through satellite data alone, or through an additional in-person survey if funding is available.

The project team can do the initial screening, baseline survey and mapping of areas. They have baseline imaging, but will need endline data (at a cost of around USD 30,000). If in-person data collection is desired, a budget of over USD 200,000 is expected for collecting from 97 treatment and 97 control villages that have between 10-15 households per village (2,000-3,000 households in total).

Caveats/challenges: This is a potentially very good quality design, but there is some concern about how well the Government can interact with indigenous communities.

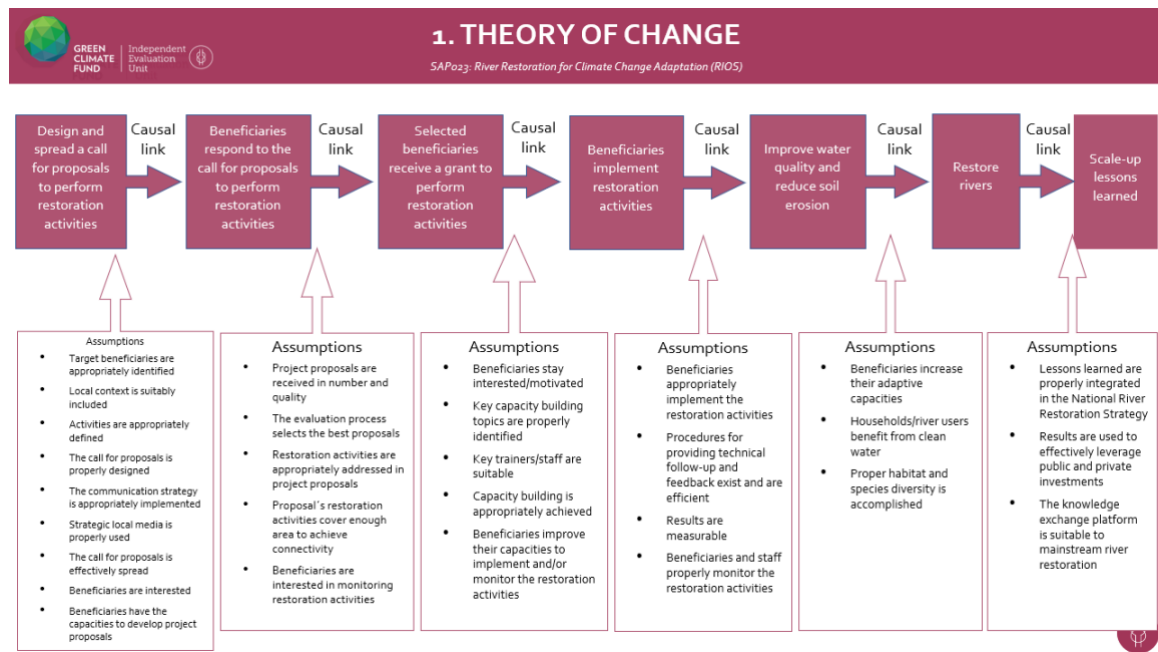
Group 8.B: River Restoration for Climate Change Adaptation (Mexico) (SAP023)

GCF grant: USD 9 million

Goal: Perform watershed restoration to improve water quality and reduce soil erosion

Overall timeline: 5 years, 2021 – 2025

Task 1: Theory of change



Task 2: Evaluation questions and indicators

- **Main intervention(s) of the evaluation:**
 - Project components:
 - Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices.
 - Alignment of public and private investments through natural capital accounting for scaling-up activities for the restoration of rivers for adaptation to climate change.
 - Design of a National River Restoration Strategy for climate change adaptation.
- **Intervention most suitable for evaluation:**
 - Watershed restoration
- **Targeted beneficiaries of intervention most suitable for evaluation:**
 - People living in and around the targeted watersheds.
- **Evaluation question(s) and related indicators:**
 - Evaluation questions
 - + Does the programme improve water quality and reduce soil erosion?
 - Indicators
 - + Measure of adaptive capacities of beneficiaries
 - + Amount of clean water used by households per river
 - + Measure of health issues in households
 - + Measure of species diversity
 - + Measure of perception of the programme and desire to continue it
 - + Measure of income
 - + Measure of productivity
 - + Amount of payment for ecosystem services distributed

Task 3: Evaluation questions and indicators for behavioural interventions

The team identified several questions related to behavioural outcomes:

- Will people change the way they use water?
- Will people change what they put in the rivers?
- Will people speak up more?
- Perceptions of the programme and desire to continue it?
- WhatsApp groups and sharing experiences
- Visits to experimental sites to show others effects
- Success of neighbours

Indicators include attitudes towards water, rivers, and others' behaviours toward them.

Tasks 4 and 5: Impact evaluation design

The unit of treatment is a sub-project within a sub-watershed. The team will advertise the programme and eventually work in two sub-watersheds. They are hoping for 50+ applications and will fund 15 sub-projects. The funding decision will be based on a ranking and funds available. There will be a cutoff based on funding available and it is possible that some of the unfunded applications could provide for a valid comparison. However, the small sample size makes an evaluation of the effects of watershed restoration on environmental outcomes infeasible.

Instead, the team is excited to measure the benefits for families and farmers. An evaluation design could be to compare households in the highly ranked groups (#s 1-15) to those in lower ranked groups (#s 16-40), while leaving out the worst applications. A DiD or matching design could then be used with these two groups, targeting households. This will likely produce a large sample size, depending on the number of households.

For a working sample size, surveying 600 treatment and 1,200 comparison households was discussed for the baseline. The endline would be conducted on the 600 treatment and 600 comparison households that are best matched.

Task 6: Scale, satellite and spatial data

The programme has plans to use satellite and drone data to measure environmental watershed outcomes.

Task 7: Timeline and budget

The programme has a budget for impact evaluation. Assuming 1,800 baseline and 1,200 endline households, with support coming from the programme for the baseline and the endline to be conducted independently, a budget of USD 100,000 to USD 150,000 may be needed.

Sub-project selection is expected in early 2022, with programming to start mid-2022. Baseline with both treatment and comparison households could be done in mid-2022.

Caveats/challenges: While not a randomized design, this is a very strong contender for a good quality prospective impact evaluation.

Group 9.A: Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados) (FP060)

GCF grant: USD 27 million

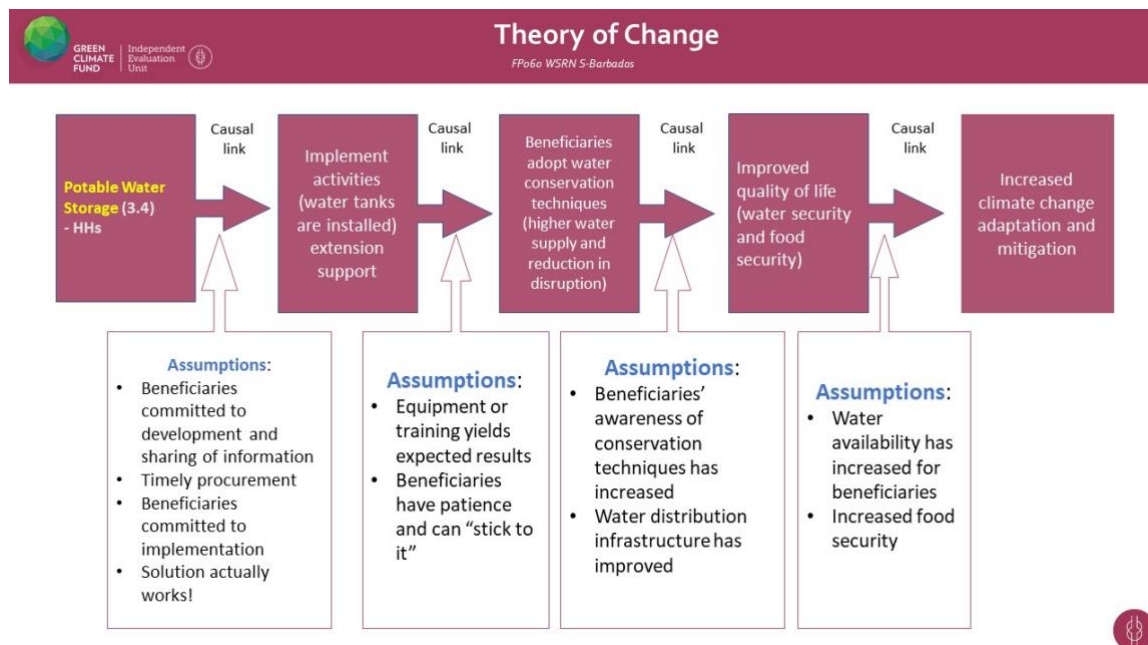
Goal: The Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados) project will result in a paradigm shift that makes the general public in Barbados aware of the water cycle and climate change impacts threatening the island's drinking water supply. It will also create

resilience to severe weather impacts, reduce GHG emissions, reduce consumption, promote appropriate uses of diverse water sources, and promote legislation to support climate-smart development and water sector resilience.

Overall timeline: 5 years, September 2018 – April 2023

Task 1: Theory of change

The intervention includes the installation of water tanks for vulnerable households and trainings to help the household familiarize itself with the technology. These activities aim to improve water supply and water storage practices, increase resilience to disruptive climate events affecting water supply, increase water and food security, and minimize the negative impact of water outages on time spent in other activities.



Task 2: Evaluation questions and indicators

- Main intervention(s) of the evaluation:
Project components:
 - Improving resilience to storm events and reducing Barbados Water Authority's carbon footprint
 - Expanding adaptation and mitigation initiatives through a revolving fund
 - Building resilience to climate change and disruption in water supply
 - Capacity building and public awareness
- Intervention most suitable for evaluation:
Component 3.4. Potable water storage:
 - Includes the installation of potable water storage tank systems at the most vulnerable residences identified on a needs assessment. Installation of potable water storage at the country's only public hospital, Queen Elizabeth Hospital, the nation's nine polyclinics, and 16 primary schools.
- Targeted beneficiaries of intervention most suitable for evaluation:
 - Households identified through a needs assessment and survey to determine the most vulnerable physically, financially and in terms of water shortages. The geo-coded survey will ascertain and record information such as existing service location, tank location,

access restrictions, type and size of installation, special conditions etc. It will also provide the opportunity to inform the customer of their responsibilities prior to installation.

Evaluation question(s) and related indicators:

- The project team is interested in the following questions:
- Have water tanks been installed? (Number of water tanks installed.)
- Are households using the water tanks?
- Are households changing their practices related to water conservation? (Which practices were adopted by the households?)
- Has water storage increased? (Volume of water storage per household.)
- Are there changes in water and food security (Households' water security and food security levels.)
- Is the water supply reliable? (Number of days lost in productive activities to provide/fetch water.)

Task 3: Evaluation questions and indicators for behavioural interventions

The team did not think it was necessary to add a behavioural approach to the ToC.

Tasks 4 and 5: Impact evaluation design

A DiD design was recommended for the evaluation of the potable water storage tank component of the project. The needs assessment study will provide a list of potentially eligible households – the treatment and control groups can be drawn from it to generate a panel dataset for the analysis.

Potential treatment arms:

- 500 households in the treatment group will receive the water tank
- 500 households in the control group will not receive the water tank

Caveats: In case the needs assessment does not identify eligible households, it could represent a threat for the impact evaluation design. In addition, it is essential the panel data structure and attrition should be reduced to be able to survey the highest possible number of households that took part to the project.

Task 6: Scale, satellite and spatial data

The team suggested several secondary sources of data collection that could be used to combine the household survey questionnaire. Some of this data refers to the water infrastructure on the island, the size of the roofs where the tanks will be installed, and the volume of water they can store. It will be useful to use these as control variables.

Caveats/challenges: The team did not identify challenges associated with gathering or accessing this data.

Task 7: Timeline and budget

ACTIVITIES	IMPLEMENTATION - ENDLINE									
	I 2022	II 2022	III 2022	IV 2022	I 2023	II 2023	III 2023	IV 2023	I 2024	
Implementation										
Monitoring										
Review of data collection tools										
Data collection endline (1-2 months)										
Data cleaning and analysis (2 months)										
Reporting of results (1 month)										
Dissemination of results (2 weeks)										

Budget:

- Sample size: 1,000 households
- Number of data collection rounds: 2 rounds
- Rule of thumb: ~30.000 USD/1000 observations

ITEM		QUANTITY	TIME	UNIT PRICE (USD)	TOTAL (USD)
Implementation					
Staff cost	Enumerators	5	60 days	50	15,000
	Supervisors	2	10 days	50	1,000
	Specialist	1	20 days	150	3,000
Training cost		5	2 days	200	2,000
Ethical clearance		1	10 days	200	200
Transport		5	40 days	7	1,400
Accommodation		n/a	n/a	n/a	n/a
Tablets/printing		1	n/a	5	5
Incentives		6	n/a	250	1,523

Caveats/challenges:

The COVID-19 pandemic represents a threat for in-person data collection; however, it does not affect the collection of spatial data that could be easily retrieved with low budget implications.

The tight timeline is the major threat for the implementation of the water tank component of the project. In addition, it was estimated by the team that six months would be enough time to detect an impact of the installation of the water tanks on the food and water security of the households. However, in the event that six months is not enough to affect outputs, the evaluation will not be able to detect an impact from the project.

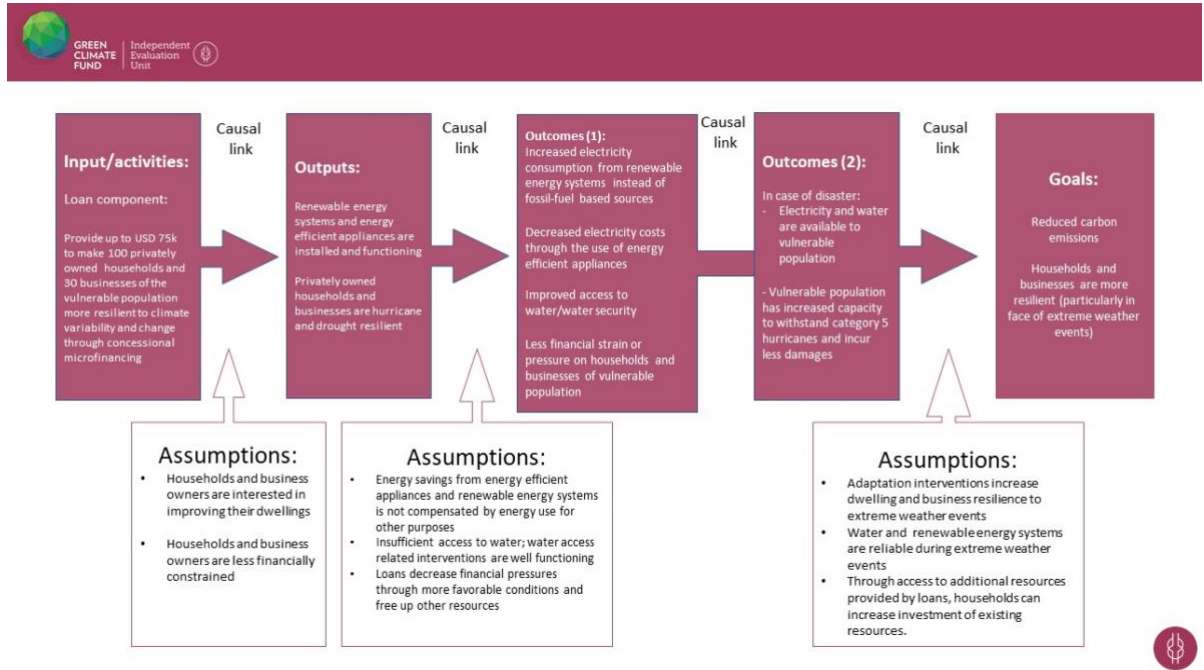
Group 9.B: Integrated Physical Adaptation and Community Resilience Through an Enhanced Direct Access Pilot in the Public, Private, and Civil Society Sectors of Three Eastern Caribbean Small Island Developing States (Antigua and Barbuda, Dominica, Grenada) (FP061)

GCF grant: USD 21.8 million

Goal: Strengthen the institutional capacities and increase the resilience of the population in the Eastern Caribbean pilot countries to climate variability and change

Overall timeline: 4 years, July 2019 – July 2023

Task 1: Theory of change



Task 2: Evaluation questions and indicators

There are two main evaluation questions directly related to climate change adaptation and mitigation. The loans are supposed to be used for improvements to dwellings that help make the dwellings more resilient to extreme weather events and/or make them climate friendly (e.g. by requiring less electricity (from fossil-fuel based sources)).

- Evaluation questions and indicators:

	EVALUATION QUESTIONS	INDICATORS
1	To what extent does the provision of micro-concessional loans contribute to (vulnerable) households' (and businesses') resilience?	
1a	To what extent are dwellings reinforced?	<ul style="list-style-type: none"> • # of dwellings reinforced • # of RE systems installed
1b	To what extent do the micro-concessional loans improve availability of electricity, water, shelter (in case of disaster)?	<ul style="list-style-type: none"> • Volume of water available • Value of damage after extreme weather event (insurance claims) • Reported water access/water security • Hours of renewable energy use during and after extreme weather event

	EVALUATION QUESTIONS	INDICATORS
1c	To what extent do the loans reduce financial strain?	<ul style="list-style-type: none"> Household/business debt Ratio debt payments to income
1d	To what extent do micro-concessional loans contribute to households' wellbeing and resilience?	<ul style="list-style-type: none"> Food security Reported wellbeing and psychological resilience Household/business assets
2	To what extent does the provision of loans contribute to reduced carbon emissions?	
2a	To what extent are dwellings made more energy efficient?	<ul style="list-style-type: none"> # of energy-efficient appliances installed # of renewable energy systems installed
2b	To what extent do the loans reduce electricity consumption from fossil-fuel based sources?	<ul style="list-style-type: none"> Electricity consumption from fossil-fuel sources and renewable energy sources

- Main intervention(s) of the evaluation: Stylized project Components: 1) Establish project procurement and monitoring mechanisms; 2) Select and provide grants to community adaptation projects; 3) Provide loans to households and businesses for adaptation in buildings.

- Intervention most suitable for evaluation:

Given that many activities (procurement and monitoring) are on the country level, we considered only two components for a potential design: (2) grants for reinforcing shelters, installing renewable energy systems, and providing shelter management training, and (3) loans for private households and businesses to make their dwellings more resilient or climate friendly. Due to the small number of grants in component 2 and the aggregate level on which these were provided, the loan component (3) seems to be more suitable for a (quasi-) experimental evaluation design.

Loans for private households and businesses: Provide up to USD 75,000 to make privately owned households (100) and businesses (30) of the vulnerable population more resilient to climate variability and change through concessional microfinancing.

- Targeted beneficiaries of intervention most suitable for evaluation:
 - Households and business owners in the larger programme area comprising five villages.

Task 3: Evaluation questions and indicators for behavioural interventions

At the time of the breakout session for the behavioural component, we focused on the training included in the grant component. The evaluation of the grant component was later abandoned due to sample size. Providing the shelter infrastructure will likely only yield the desired results in improved resilience and reduced carbon emissions if the enforced and improved shelters are managed properly. Thus, the following related evaluation questions were developed: (i) Does the training increase knowledge in best practices? (ii) Are community members willing to apply trained practices (during disaster)? (iii) Does the training increase the application of the best practices (during disaster)?

Tasks 4 and 5: Impact evaluation design

Two evaluation strategies seemed suitable: Matching loan recipients to other applicants on covariates collected during the application process and matching to a comparison group outside the programme area.

Caveats:

Overall sample size is a concern for either approach as only 100 households and 30 businesses are supposed to receive loans. Using unsuccessful applicants as a comparison group is limited by the number of unsuccessful applicants, which as of now is unclear. It is also questionable to what extent

a comparison group can be found among the unsuccessful applicants. Finding a comparison group outside the programme area can be challenging in terms of finding dwelling owners who are arguably similar to the applicants. Further, there will be no baseline data (e.g. from the application) available to match on, making it less plausible to argue for comparability.

Task 6: Scale, satellite and spatial data

Information on beneficiaries is available through the application forms, GIS data on exposure to hazards, and socioeconomic surveys in the programme area that provide context information. Additional data needs would include information on the outcomes measured at the level of analysis (household or business), e.g. through household surveys, but also information on electricity consumption.

Caveats/challenges:

GIS and satellite data was deemed unsuitable for measuring outcomes on the level of dwellings, and generally available secondary data could hardly be linked to households/businesses and thus used as outcomes. Measuring outcomes on the community level would again diminish the sample size.

Task 7: Timeline and budget

The following timeline was discussed and developed for an evaluation of shorter-term effects of the intervention based on a 6-month follow-up.

ACTIVITIES	TIMELINE EVALUATION OF LOAN COMPONENT					
	IV 2021	I 2022	II 2022	III 2022	IV 2022	I 2023
Distribution of loans						
Design of data collection tools						
Data collection at baseline (monitoring)						
Data cleaning and analysis						
Reporting of results						
Dissemination of results						
Data collection endline						
Data cleaning and analysis						
Reporting of results						
Dissemination of results						

Caveats/challenges:

The implementation is ongoing and while it was only slowly progressing all loans are assumed to be disbursed before summer 2022. The main challenges are budget availability and methodological issues. There is no time for a baseline – which is a methodological challenge – but assuming a matching design based on data collected at endline or through the application process, the timeline seems feasible.

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