

GREEN CLIMATE FUND
INDEPENDENT EVALUATION UNIT

Learning-Oriented Real-Time Impact Assessment Programme (LORTA)

SYNTHESIS REPORT (PHASE I AND PHASE II)

12/2021

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ABBREVIATIONS

AE	Accredited entity
AEPC	Alternative Energy Promotion Centre
ASER	<i>Agence Sénégalaise d'Électrification Rurale</i> (Senegalese Rural Electrification Agency)
BOAD	<i>Banque Ouest Africaine de Développement</i> (West African Development Bank)
BYG	Backyard garden
C4ED	Center for Evaluation and Development
CABEI	Central American Bank of Economic Integration
CAMBio II	Productive Investment Initiative for Adaptation to Climate Change
CBCRM	Community-based climate risk management
CBEWS	Community-based early warning schemes
CCCCC	Caribbean Community Climate Change Center
CCS	Clean cooking solutions
CFF	Climate Finance Facility
COBA	Communauté de base
CRA	Climate-resilient agriculture
CSA	Climate-smart agriculture
DAE	Direct access entity
DAP	Data analysis plan
DBSA	Development Bank of Southern Africa
DiD	Difference-in-differences
DOST-PAGASA	Department of Science and Technology- Philippines Atmospheric Geophysical Astronomical Services Administration
FAA	Funded activity agreement
FAO	Food and Agriculture Organization of the United Nations
FbF	Forecast-based financing
FFS	Farmer field schools
FMCN	<i>Fondo Mexicano para la Conservación de la Naturaleza A.C.</i> (Mexican Fund for the Conservation of Nature)
GCF	Green Climate Fund
GHG	Greenhouse gas
GIS	Geographic information systems
IE	Impact evaluation
IEU	Independent Evaluation Unit
IFAD	International Fund for Agricultural Development
IFI	Intermediary financial institution
IUCN	International Union for Conservation of Nature
LORTA	Learning-Oriented Real-Time Impact Assessment

M&E	Monitoring and evaluation
MGF	Matching Grant Fund
MHEWS	Multi-hazard early warning system
MH-IBF-EWS	Multi-hazard impact-based forecasting and early warning system
MIS	Management and information system
MSMEs	Micro, small and medium-sized enterprises
PAPI	Pen-and-Paper Personal Interview
PICSA	Participatory Integrated Climate Services for Agriculture
PMU	Project Management Unit
POs	Producers' organization
PROEZA	Poverty, Reforestation, Energy and Climate Change Project
PSM	Propensity score matching
RCT	Randomized control trial
RIOS	River Restoration for Climate Change Adaptation
RRB	Resilient Rural Belize
SIB	Statistical Institute of Belize
SLEM	Sustainable Landscapes in Eastern Madagascar
ToC	Theory of change
TUHF	Trust for Urban Housing Finance
UNDP	United Nations Development Programme
WSRN S- Barbados	Water Sector Resilience Nexus for Sustainability in Barbados project

Chapter I. THE LORTA PROGRAMME

A. IMPORTANT ELEMENTS OF THE IEU'S LORTA PROGRAMME

In 2018, the Independent Evaluation Unit (IEU) of the Green Climate Fund (GCF) started the multi-year Learning-Oriented Real-Time Impact Assessment (LORTA) Programme to keep track of the impact of GCF investments. The goal of the programme is to measure if GCF projects lead to lower greenhouse gas (GHG) emissions and enhanced resilience to climate change, and if so, by how much. This can be measured with the help of rigorous impact assessments. Empirical evidence on impacts of climate-related projects is rather scarce, which adds to the importance of this programme. The LORTA programme has two particular aims:

- Embedding real-time impact evaluations (IEs) into approved projects so that GCF project managers can quickly access accurate data on the quality of implementation and likelihood of impact
- Building capacity within projects to design high-quality data sets, which aid the measurement of causal change and impact

The LORTA programme not only informs on the returns of GCF investments, it also helps GCF projects to track implementation fidelity. To do so, LORTA incorporates state-of-the-art approaches for measuring results and informing effectiveness and efficiency into funded projects. It employs mixed-methods approaches that involve quantitative and qualitative data-collection methods and analysis. Theory-based counterfactual impact assessments are based on experimental or quasi-experimental research designs; real-time measurement systems and qualitative data help project teams measure progress in implementation and provide rapid lessons even during the early stages of projects.

It is envisioned that GCF-funded projects will increasingly use theory-based IEs. The purpose of these evaluations is to measure the change in key result areas of the GCF that can be attributed to project activities. In sum, LORTA has the following objectives:

- Measuring the overall change (outcome or impact) of GCF-funded projects and enhancing learning
- Understanding and measuring results at different parts of theories of change (ToCs)
- Measuring the GCF's overall contribution to catalysing a paradigm shift and achieving impacts at scale

The IEU contracted the Center for Evaluation and Development (C4ED) for consultancy services to develop IE designs for selected GCF projects and to provide relevant technical advice and quality assurance throughout the IE phases. This is always carried out as a collaborative effort between the IEU, C4ED, accredited entities (AEs), project teams and other stakeholders. Therefore, an important pillar of LORTA is the buy-in of AE and project staff into the overall idea of incorporating causal designs and theory-based IEs.

B. PHASES OF LORTA

LORTA is organized into three phases.

- Phase I – formative engagement and design: The LORTA programme supports GCF-funded projects to build high-quality, theory-based IE designs. Formative work is conducted, which includes engagement with AEs and project teams, with the final output of this phase being a design for a theory-based IE for each project.
- Phase II – impact assessment: The second phase of LORTA involves the main impact assessment stage (2–5 years) and includes support to the project teams in collecting high-quality data to be used for the IE in the form of surveys, qualitative interviews, project monitoring tools and secondary data. The support from the LORTA programme specifically includes technical advice in setting up real-time implementation tracking and measurement systems, quality checks for data collection and data analysis conducted by others, and data analysis of baseline, midline and endline data.
- Phase III – final data analysis and feedback: The final stage involves the final IE analysis (both qualitative and quantitative), discussing results and engaging with diverse stakeholders to share results and incorporate feedback as required.

The first Phase I period was completed in 2018, with eight projects from the 2018 cohort undergoing formative research and the result being an IE design for each project.¹ Of these eight initial projects, seven moved on to Phase II in 2019. In this phase, necessary data for the IE are collected or compiled, project activities are implemented and the project teams are supported to ensure the highest quality of data, both in terms of measuring outcomes to be achieved and tracking the implementation of project activities. In 2019, the LORTA team added six new projects to the LORTA portfolio from the 2019 cohort, of which five transitioned to Phase II in 2020.²

In 2020, a third cohort of four³ projects entered LORTA and went through Phase I.

At the time of writing this report, the status of the 16 active projects in the LORTA portfolio is as follows: one project from the 2018 cohort is in Phase III, and six projects from the 2018 cohort, five projects from the 2019 cohort and four projects from the 2020 cohort are in Phase II. In addition to these 16 active GCF-funded projects, there are currently two further projects that are paused (one from the Democratic Republic of the Congo and one from Kyrgyzstan). Thus, the LORTA portfolio contains a total of 18 projects.

C. LESSONS LEARNED AND RECOMMENDATIONS

LORTA design workshop

As in 2020, the LORTA design workshop was conducted in an online format in 2021. The workshop included a set of different topics related to IE and stretched over a period of about 10 weeks. The workshop consisted of different elements and 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 and online breakout group sessions. An indicator of the acceptance of this format is that participation was relatively high and remained constant over the whole period of the workshop. Although the attendance during the webinar and breakout sessions varied, as did the

¹ One project (from Mongolia) is no longer part of the LORTA portfolio.

² One project (FP096: Democratic Republic of the Congo) entered LORTA in 2019 but has not yet undergone Phase I of LORTA.

³ One further project (FP116: Kyrgyzstan) entered LORTA in 2020 but has not yet undergone Phase I.

viewing rates of the learning videos, all projects except four handed in a final presentation for the rapid-fire session.⁴ The workshop organization ran smoothly, and small technical problems were quickly resolved. Thanks to the feedback rounds during the LORTA weekly meetings, small improvements were implemented at the time of the workshop. For instance, the time of the quiz was switched from the end to the middle part of the webinar and polls were implemented to encourage participation and to have more knowledge of participants' experience with IE. The fact that the workshop was stretched over several weeks was beneficial because it allowed for more intensive group work on different IE topics. Furthermore, project representatives could use the extra time between sessions to look up certain information or documents. The webinars also got better over time in terms of encouraging the active participation of participants by asking questions that were more related to the projects' perspectives.

In 2021, two new sessions were included in the agenda that increased the quality of the workshop and aligned it with recent standards for IE methods. The projects had the opportunity to explore and potentially include behavioural components in their evaluation as well as to assess the feasibility of incorporating spatial data in their evaluations. Both sessions were well received by participants and had a positive impact on the quality of the IE designs.

Also, formative, midline and endline online surveys were conducted with participants, which provided very useful insights and were therefore helpful in designing the workshop. The number of participants in the workshop and respondents to the surveys fluctuated between 70 and 73 and 19 and 27, respectively. The results from these surveys show that many participants were comfortable with statistical analysis and ToCs, but a large share had limited experience of IEs. Based on the mid- and endline surveys most respondents were engaged in GCF-approved projects.

Furthermore, the iLearn modules received very good feedback: all respondents watched the modules and found them useful. Topics such as Evaluation Questions and Indicators, Behavioural Interventions, ToC, and Timeline & Budget were found to be extremely helpful. 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 actual evaluation practices. Additionally, respondents suggested that more practical cases could be integrated.

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

The material developed in 2021 was well structured and clearly focused on learning. However, a limited number of participants watched the videos and even fewer read the reading material. This is a downside of the online format as participants cannot take time off to prepare themselves because they have to do their current work tasks and activities in parallel with the workshop. This is different from an in-person format where participants block out a full week to receive the information and have more time to go over the material.

In 2021, the length of the breakout sessions was increased from 1 to 1.5 hours, which improved capacity-building and gave sufficient time to discuss each topic in depth. However, the duration of the breakout sessions could be extended to two hours. Potentially, to increase interest in the videos and to exploit the benefit of this material, the recommended 30 minutes extra time could be allocated during the breakout sessions to watch or review the video and/or reading material.

⁴ Two of the groups did not participate in the rapid-fire session due to national holidays and travels related to the COP 26 conference in Glasgow.

The virtual form of the breakout sessions gave the participants time to ask specific questions and revisit topics that were not yet clear to them and allowed for a more tailored discussion of potential for an IE. In addition, all groups could choose the time slot for their breakout session, ensuring that as many participants were available as possible. However, motivation, preparation and attention among the groups differed considerably. Here, the online format might offer a better indicator of interest and engagement than an in-person workshop. Requiring each project to present in the webinars is a good strategy to encourage project teams to engage with the material.

Since the same topic was watched in the learning video first, then covered again in the breakout sessions and afterwards repeated in the webinar, there was a degree of repetition. However, given the difficulty of some of the material, and the potential for greater learning, participants may appreciate some repetition. In particular, quasi-experimental IE design was reportedly hard to understand for some of the participants.

For the next workshop, the team suggests inviting representatives from one or two projects from the current LORTA portfolio as keynote speakers. They could provide a first-hand account of what it means to be part of LORTA and encourage participants to have a higher engagement during the workshop.

Regarding the rapid-fire presentations on the last day of the workshop, it was clear that the time allocated to each project was too short because many presenters had difficulties keeping to time. Going through all projects in one day was also too ambitious given how dense the presented information was. Allocating the rapid-fire presentations over several days and giving each more time should be considered for future workshops.

Formative work (Phase I)

Phase I has not yet been conducted with the shortlisted countries from the 2021 Design Workshop. It is expected to be conducted during the first half of 2022.

Impact evaluation stage (Phase II)

The ongoing COVID-19 pandemic continues to affect LORTA activities, since it keeps causing delays in project implementation and data collections. Also, communication with some project teams has been difficult to maintain as many have low capacity at the moment. For this reason, some of the activities that were initially planned for 2021 were postponed (mainly the start of data collections).

In 2021, it became evident that some countries do not have the funding to conduct an IE or that no design is feasible for the nature of the project. In addition, some projects are still facing some administrative challenges with their own funding. As a result, some projects from the LORTA portfolio are currently on hold (Paraguay and Vanuatu). The Philippines project has just executed its funded activity agreement (FAA) and the Democratic Republic of the Congo and Kyrgyzstan projects are waiting for the execution of their FAAs.

Not all countries face the same challenges, however, and some projects showed good progress in their IE activities, including two primary data collections (baseline in Guatemala and Bangladesh), three baseline reports (Guatemala, Zambia and Bangladesh), and seven data analysis plans (Uganda, Madagascar, Guatemala, Rwanda, Bangladesh, Belize and Ecuador). Moreover, in 2021, the volume of the technical advice on implementation tracking and monitoring activities increased.

Since March 2020, no international travel has occurred under the LORTA programme. Instead, the LORTA teams switched to virtual solutions – for example, by conducting workshops and meetings over videoconference software (Microsoft Teams, Zoom or Skype). It became evident that this kind

of communication works fairly well, and its use has meant that IEU members could participate, which has enriched the technical advice provided and increased the visibility of the LORTA team. While the categorization of activities into work packages has been beneficial, these work packages still need to be defined with more realistic workloads. This current work organization will be optimized during the next contract phase.

Another point the LORTA team needs to work on is communication. Virtual communication decreases distance and eases dialogue, but time differences remain a real challenge. Ensuring all relevant colleagues are copied into email communication also remains an area for all to improve upon.

Another challenge in 2021 was the data sharing process. While a data sharing strategy was developed by the LORTA team in 2020, some countries are facing difficulties with this process, and it requires a further clarification from all parties.

Despite the aforementioned challenges, 2021 ended with very positive achievements for the LORTA team:

- The LORTA design workshop was a success, and it will bring four new countries with innovative designs into the LORTA portfolio. This will result in a more equal regional distribution of LORTA projects.
- Malawi completed its endline report for FP002 M-Climes and became the first country to complete the three phases of the LORTA programme.

Despite the pandemic, many countries continued with their operations and engagement. As a result, the LORTA team was able to deliver most of the activities planned at the beginning of 2021.

Chapter II. PHASE I - FORMATIVE WORK

A. SELECTION PROCESS OF PROJECTS FOR LORTA IN 2021

1. THE VIRTUAL LORTA DESIGN WORKSHOP

The fourth LORTA design workshop was again organized by the IEU and C4ED. As in 2020, the 2021 LORTA design workshop could not be held in person due to the COVID-19 pandemic. The 2021 workshop was therefore held virtually and consisted of different components stretched over a period of about 10 weeks. It took place from 30 August to 5 November 2021 over a video conferencing platform. Participants were representatives from different Divisions/Units within the GCF, including the IEU; IE specialists from C4ED and other entities; representatives from four direct access entities (DAEs) and from implementing partners; and project staff from 14 GCF-funded projects. In order to rebalance the LORTA portfolio, which had become weighted toward international AEs, only DAEs were invited to attend the 2021 workshop. The workshop consisted of different elements and capacity-building measures using various digital formats, such as a live webinar every week, a learning video for each topic covered in the webinar, additional reading material and weekly online breakout group sessions.

The workshop produced several results:

- 1) Project representatives were introduced to the concept of IE and why it is important.
- 2) Workshop participants were able to increase their knowledge about IEs while being introduced to different IE research designs (especially randomized and quasi-experimental designs) and learning about their implementation in practice.
- 3) Project representatives were given the opportunity to critically discuss viable IE design for their respective projects, under the guidance of experienced and qualified IE specialists.
- 4) Participants were given the opportunity to consider satellite data to complement the monitoring and evaluation (M&E) strategies.
- 5) Workshop participants were equipped with the knowledge to be able to apply the lessons learned to their own projects, beyond the scope of the project.
- 6) A shortlist of four GCF-funded projects was identified for which IE designs will be developed in the remaining 2021/2022 inception and engagement phase of the LORTA programme.

2. DECISION-MAKING PROCESS

The 14 GCF-funded projects were assessed with the help of a scorecard to determine their eligibility for LORTA support by taking into account the following strategic criteria and guiding principles:

- Feasibility of IE design: The project, or at least a subcomponent of the project, had to have the potential to be rigorously evaluated.
- Commitment of project team: Project selection considered the interest, commitment and engagement of the project team to conduct a theory-based, rigorous IE.
- Budget: The project needed to be aware of the budget implications of an IE and be willing to make sufficient budget available to conduct a data collection of a representative scope.
- Level of innovation for LORTA: The LORTA Phase I for 2021 sought to add innovative projects to the overall LORTA portfolio that would complement the existing project selection.

- Level of innovation for GCF and other climate change intervention research: The evidence gained from the IEs of the selected projects had to be innovative, to enlarge the learning within GCF and global research on climate change interventions.
- Regional distribution: The region of implementation of the project had to ensure an even more equal geographical distribution within the LORTA portfolio.
- Thematic area: The had to be a more equal proportion of adaptation, mitigation and cross-cutting projects within the LORTA portfolio.

Directly after the LORTA design workshop, IEU and C4ED held a virtual meeting to discuss the evaluability and emerging IE designs of the 14 projects. Following the meeting, the IEU consulted with relevant Divisions/Units of the GCF Secretariat to build consensus regarding the most appropriate and eligible projects for the LORTA programme against the criteria above. Each Division/Unit brought invaluable insight into the projects 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 following four projects were considered to be eligible for LORTA and to enter the next phase - that is, to be subject to formative work in preparation for an IE:

- 1) FP060: Barbados – Water Sector Resilience Nexus for Sustainability in Barbados
- 2) FP138: Senegal – ASER Solar Rural Electrification Project
- 3) FP172: Nepal – Mitigating GHG emission through modern, efficient and climate friendly clean cooking solutions
- 4) SAP023: Mexico – River Restoration for Climate Change Adaptation

B. ENGAGEMENT WITH PROJECT TEAMS AND KEY STAKEHOLDERS

For each of the selected projects, an evaluation team will be formed consisting of two IE specialists from C4ED and one IEU member per project. The overarching task of these teams, referred to as “LORTA teams” in this report, is to further develop the IE design discussed during the workshop for each project. The timing for the field mission depends on the status of the project. For all four selected projects, it is yet to be determined whether country visits will take place in-person or virtually, but it is most likely that they will be virtual missions given the circumstances arising due to the COVID-19 pandemic.

The task of the LORTA teams will be to engage closely with key stakeholders of the selected GCF-funded projects before, during and after the (virtual) field missions of Phase I. The principal stakeholders are the national designated authorities, AEs, implementing agencies, GCF task managers and potential project end beneficiaries. Ensuring their interest, understanding and ownership for the planned theory-based impact assessments is one of the objectives of this close engagement. The strong cooperation of stakeholders, initiated and constantly supported by the IEU, will be crucial for the following steps of the LORTA programme.

Benefiting from the close engagement between the LORTA teams and the key stakeholders / project teams, the LORTA teams will conduct context analyses, investigate the existence of appropriate counterfactuals, assess administrative and secondary data sources, and discuss the ToCs.

Overall, this first phase focuses on the choice of an appropriate evaluation method for the design and implementation schedule of the selected GCF-funded projects. For example, outcome variables have to correspond to the project timing and mirror the time-horizon (e.g. short-term outcomes can be measured quickly after implementation of a project, whereas long-term outcomes can only be

measured a certain time after project finalization). Again, the importance of commitment and ownership on the part of implementation partners has to be taken into account, as does the need to respectfully strive for a balance between strong evaluation designs and requirements for implementation.

C. SUMMARIES OF EVALUATION QUESTIONS, DESIGNS AND TIMELINES

FP060: Barbados

The “Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)” project aims to make society aware 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; and promote appropriate uses of diverse water sources and legislation to support climate-smart development and water sector resilience.

The AE for this project is the Caribbean Community Climate Change Center (CCCCC), which will provide overall management for the project and facilitate information-sharing and marketing via its online portal. CCCCC also has the overall responsibility and oversight for the project, which involves project implementation and supervision, financial management, and project monitoring and reporting.

The main questions to be answered for the evaluation of the project’s effectiveness and impact are as follows:

- 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? (What practices are adopted by 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 status)
- Is the water supply reliable? (Number of days lost in productive activities to provide/fetch water)

Adding a behavioural approach to the ToC was not considered necessary by the project team.

The evaluation design developed for the project’s component 3.4, “Potable Water Storage”, is a difference-in-differences (DiD) design. Component 3.4 includes the installation of potable water storage tank systems at the most vulnerable locations identified on a needs assessment – for example, installation of potable water storage at the country’s only public hospital (the Queen Elizabeth Hospital), the nation’s nine polyclinics and 16 primary schools.

The targeted beneficiaries will be households identified through a needs assessment and survey to determine those most vulnerable physically, financially and in terms of water shortages. A geocoded survey will ascertain and record information such as existing service location, tank location, access restrictions, and type and size of installation. It will also provide the opportunity to inform the customer of their responsibilities prior to installation.

The needs assessment study will provide a list of potentially eligible households. The treatment and control groups can be drawn from this list to generate a panel data set for the analysis. In all, 500 households in the treatment group will receive a water tank and 500 households in the control group will not. The IE design could be compromised if the needs assessment does not identify eligible

households. In addition, attrition must be minimized in order to maintain the panel data structure, so that the highest possible number of households that take part in the project can be surveyed. The estimated sample size is likely to produce an IE that is underpowered.

The team suggested several secondary sources of data that could be used in combination with the household survey questionnaire. Some of the data refer to the size of the roofs on which the tanks will be installed, as it can be used to determine how much rainwater can be collected and thereby the overall water infrastructure on the island. These data will be useful control variables.

Baseline data collection is planned for Q1 2022 and endline data collection for Q3 and Q4 2022.

The M&E budget for this project is modest and amounts to USD 31,400.

FP138: Senegal

The goal of the project “ASER Solar Rural Electrification Project” is to foster the development of off-grid renewable energy mini-grids to reduce CO2 emissions from the Senegal energy sector while contributing to electricity access objectives and promoting gender-balanced rural economic growth.

There are three main components to the project:

- 1) Technical assistance to the solar rural electrification stakeholders
- 2) Procurement and installation of solar powered mini-grids
- 3) Incentives for social and productive use of electricity

The AE for this project is the West African Development Bank (BOAD), which will be responsible for the overall management, including project appraisal and administrative, financial and technical oversight and supervision throughout project implementation. The implementing partner and co-financier of the ASER project is the Senegalese Rural Electrification Agency (ASER).

The following evaluation questions are to be answered:

- Does the project lead to a greater access to electricity by rural communities?
- Does the change in access to electricity differ by population density?
- How much electricity is used by households from the mini-grids?
- Is energy from mini-grids affordable to all households?
- To what extent is energy from mini-grids a reliable source of energy?
- To what extent do the project activities result in a greater awareness of the benefits of using energy from the mini-grids?
- Does 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)?

One key challenge for 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 beliefs about solar energy and attitudes towards deforestation. Another challenge is that households should keep using solar energy in the long run. Based on this, the LORTA and project teams developed the following behavioural questions of interest:

- To what extent are households preferring the use of mini-grids?
- To what extent do households use mini-grids in the short, medium or long term?
- Is the promotion of mini-grids able to lead to households’ sustainable use of cleaner energy?

The preferred evaluation design consists of a cluster randomized control trial (RCT), where groups of eligible villages will be used as clusters. The proposed IE would evaluate the average impact of the project at the household level. 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.

Geographic information system (GIS) and satellite data could be used to measure impacts on deforestation (using indicators of vegetation cover), on cropland area (using indicators of vegetation cover during the dry season), on air pollution (which would require high technical expertise), and on street lighting (using night lights). GIS and satellite data could also be used to measure key matching or explanatory variables (e.g. distance to rivers and roads, soil characteristics, climate).

This is a five-year project with an effective starting date that is still unknown. The IE 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.

FP172: Nepal

The project “Mitigating GHG emission through modern, efficient and climate-friendly clean cooking solutions (CCS)” aims to reduce GHG emissions and improve health and well-being through the increased use of CCS. The project has three components:

- 1) Scaling up the deployment of clean cooking technologies through accelerated investment and market development
- 2) Strengthening the 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
- 3) Empowering institutions’ capacity for the supply chain and ensuring increased access to CCS through capacity-building, awareness-raising and trainings

The AE for this project is the Alternative Energy Promotion Centre (AEPC).

The following evaluation questions were formulated during the LORTA workshop:

- Do GHG emissions reduce?
 - 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?
 - Indicators: (a) life satisfaction, (b) income
- Do girls’ educational achievements change?
 - Indicators: (a) girls’ level of reading, writing and math skills
- Does the health status of households improve?
 - Indicators: (a) respiratory health, (b) health costs (secondary data)

The success of the intervention requires forms of behaviour change from beneficiaries: some “dirty” cooking solutions (such as LPG cooking techniques) are associated with higher social status, since the technologies used are seen as luxury goods. The project aims to incentivize cleaner cooking solutions through cost savings. Awareness campaigns will also be implemented to incentivize women to take up technical occupations and provide the necessary maintenance services for cookstoves.

The interventions most suitable for evaluation are components 1 and 3. Under component 1, three different CCS suited to the beneficiaries’ needs and infrastructure conditions will be provided. Under component 3, 150 local facilitators will be trained by the project, with a preference for facilitators who are women, in order to spread information about the improved cooking solutions and raise awareness. In total, 1,000,000 poor and vulnerable households of the Terai region (in the southern plain region of Nepal) will be targeted with the intervention. It will be implemented in 22

districts and around 150 municipalities. It aims to switch 500,000 households from LPG and fuelwood stoves to electric stoves; to switch 490,000 households from loose biomass, dung cake and fuelwood to Tier 3+⁵ improved cooking stoves; and to introduce a biogas system for 10,000 households that have sufficient livestock.

The suggested IE design is 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 data collection will occur in year 2, followed by the treatment; and endline plus subsequent treatment on control communities will occur in year 4. All relevant outcomes are measurable after 2 years.

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

The available budget for the IE is around USD 50,000. The estimated required budget for each wave of the evaluation is greater than this, and additional external sources of funding will be investigated.

SAP023: Mexico

The project “River Restoration for Climate Change Adaptation (RIOS)” aims to perform watershed restoration to improve water quality and reduce soil erosion. The project’s activities aim to increase vegetation cover in riparian systems and slopes, as well as in areas to protect springs. Through a number of activities, RIOS aims to reduce vulnerability to the impacts of climate change, mainly by decreasing exposure to landslides, floods and drought. The AE is the Mexican Fund for the Conservation of Nature (FMCN).

The project is based on three components:

- 1) Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices
- 2) Alignment of public and private investments through natural capital accounting for scaling up activities for the restoration for rivers for adaptation to climate change
- 3) Design of a National River Restoration Strategy for climate change adaptation

The IE tries to answer the following main evaluation question:

- Does the project improve water quality and reduce soil erosion?

Furthermore, the team identified the following questions related to behavioural outcomes, and indicators include attitudes and other behaviours towards water and rivers:

- Do people change the way they use water?
- Do people change what they put in the rivers?
- Do people speak up more?
- Do perceptions of the programme and the desire to continue it change?
- Do the use of WhatsApp chat groups and sharing experiences change people’s attitudes and behaviours?
- Do visits to experimental sites to show other effects change people’s attitudes and behaviours?
- Does the success of neighbours change people’s attitudes and behaviours?

⁵ This is a shorthand term for national vehicle emissions and fuel standards, which are designed to reduce soot, smog and other types of pollution that come from the tailpipes of cars and trucks.

The team plans to measure the possible 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 and on 600 comparison households that are best matched. The project has plans to use satellite and drone data to measure environmental watershed outcomes.

The programme has a budget for IE. 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.

Table 1. Summary of IE designs of projects that are likely to start in 2022

PROJECT N°	PROJECT NAME	COUNTRY	AE	EVALUATION DESIGN	EVALUATION QUESTIONS
FP060	Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados)	Barbados	CCCCC	DiD	<ul style="list-style-type: none"> • 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)
FP138	ASER Solar Rural Electrification Project	Senegal	BOAD	Cluster RCT	<ul style="list-style-type: none"> • Did the project lead to a greater access to electricity by rural communities? • Does the change in access to electricity differ by population density? • How much electricity is used by households from the mini-grids? • Is energy from mini-grids affordable to all households? • To what extent is energy from mini-grid 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 other sources than mini-grids (e.g. diesel, firewood)?
FP172	Mitigating GHG emission through modern, efficient and climate-friendly clean cooking solutions (CCS)	Nepal	AEPC	RCT with phase-in	<ul style="list-style-type: none"> • Do GHG emissions reduce? • Do households perceive a change in well-being and wealth? • Do girls' educational achievements change? • Does the health status of households improve?
SAP023	River Restoration for Climate Change Adaptation (RIOS)	Mexico	FMCN	DiD or matching design	<ul style="list-style-type: none"> • Does the project improve water quality and reduce soil erosion? • Indicators: <ul style="list-style-type: none"> – Measure of adaptive capacities of beneficiaries – Amount of clean water used by households/river

PROJECT N°	PROJECT NAME	COUNTRY	AE	EVALUATION DESIGN	EVALUATION QUESTIONS
					<ul style="list-style-type: none"> - Measures of health issues in households - Measure of species diversity - Measure of perception of the project and desire to continue it - Measures of income - Measure of productivity - Amount of payments for environmental services distributed

Chapter III. ACTIVITY REPORT FOR PHASE II PROJECTS

A. SUMMARY OF IE DESIGN

FP026: Madagascar

The Sustainable Landscapes in Eastern Madagascar (SLEM) project aims to (1) enhance the resilience of smallholder farmers, (2) reduce GHG emissions from deforestation, and (3) invest in climate-smart agriculture (CSA) and renewable energy. The sustainable landscape measures consist of a portfolio of activities, of which two will be the focus of the IE: adaptation activities and mitigation activities.

Adaptation activities include the provision of training, inputs and technical assistance to smallholder farmers in order to promote conservation agriculture practices and alternative sources of livelihood. For mitigation activities, the project plans to provide training, per diems and equipment to physically demarcate the limits of protected forest areas and to patrol these areas.

Mitigation activities started in November 2018 throughout the project implementation area. The first implementation phase of adaptation activities started in July 2019, during which inputs and equipment were distributed. Field staff will provide continuous technical support to beneficiary communities until the end of the project and these activities will be extended to additional communities in both 2021 and 2022.

The IE methodology follows a mixed-method approach that combines quantitative and qualitative data analysis, with a strong focus on the quantitative part. A cluster randomized phase-in will be used to identify the short-term effects of the adaptation activities of the SLEM project. For the estimation of longer-term impacts, a DiD approach combined with propensity score matching (PSM) will be used. The assessment of the mitigation activities on deforestation will be based on a similar quasi-experimental method using satellite data on vegetation cover. Additional qualitative data will be collected in the form of key informant interviews and focus group discussions. The complementary qualitative analysis will help to further understand for whom and why interventions work or do not work and to assess the gender sensitivity of the SLEM interventions.

Short-term impacts of adaptation activities: Phased-in cluster RCT

A cluster randomized phase-in is an experimental design that relies on the randomization of the order in which eligible local associations, called Communauté de Base (COBA), receive adaptation activities. The LORTA team randomly assigned some COBA to a later phase to serve as the comparison group until they start to receive the interventions. More specifically, this IE design is focusing on the first and third phases of roll-out, with a total of two and a half years between completed intervention and evaluation.

Long-term impacts of adaptation activities: DiD with PSM

To estimate longer-term impacts of adaptation activities, the IE will turn to a quasi-experimental design as an informative, though less robust, complementary strategy. The DiD approach estimates project effects through the comparison of changes in outcomes over time between beneficiaries and a comparison group. As every COBA located in the intervention area will ultimately benefit from the project, the comparison group will be composed of households in communities where no COBA exists. The LORTA team selected comparison communities based on the expertise and local

knowledge of the project team and by using PSM on available secondary data. Because the formation of COBAs and their memberships are not random, beneficiaries and the comparison group are expected to differ at baseline. The LORTA team plans to identify these initial differences in observable characteristics between COBA members and the comparison group and match beneficiaries with non-beneficiaries using PSM. Changes in outcomes between the two groups will then be compared, accounting for potential remaining time-invariant initial differences.

Impact of mitigation activities

All COBAs of the project implementation area started to receive mitigation activities in November 2018. A quasi-experimental IE design will therefore be used for this component. The main analyses will be based on satellite imagery using DiD with matching methods.

FP034: Uganda

The 14 GCF-funded projects were assessed with the help of a scorecard to determine their eligibility. The project “Building Resilient Communities, Wetland Ecosystems and Associated Catchments in Uganda” focuses on adaptation to climate change via the increased resilience of local ecosystems and communities. The project is a comprehensive undertaking that focuses on improving the living conditions of communities residing around wetland areas, while restoring biodiversity in functioning wetland systems and catchment areas. The project consists of the three components: (1) physically restoring the wetlands, (2) introducing alternative livelihood opportunities, and (3) implementing a climate information system. As a result of consultations during the LORTA mission, only the first two components are considered feasible for an IE.

The IE design is DiD combined with a matching approach. The inclusion of the DiD measurement is necessary, as the treatment and control groups may be dissimilar before implementation, since more vulnerable communities are prioritized for earlier treatment. The matching approach (PSM) then provides that the most similar units between treatment and control groups are compared, in order to measure the impact of the project.

The matching will rely on two levels of matching: one at the restoration point level and the other at the household level. The first level of matching at the restoration point level will use the available ecological data and the GIS information to match the nine selected treatment restoration points (from 2021) to a set of control restoration points (from 61 points). The goal of this matching will be to ensure the matching of the control points to the relevant restoration points from 2021 in the data set. Thereafter, from this set of matched treatment and control restoration points, GIS information will be consulted to generate a complete list of control villages, to determine the control sample. Currently, the IE aims to include 150 villages from the treated and control points. From these selected villages, 10 households per community are planned for the baseline. The sampling is informed by power calculations, as well as the available budget for the baseline and endline activities. The second level of matching will be performed at the household level, based on baseline characteristics, once collected.

In addition to the planned baseline and endline DiD matching design, the evaluation may use available satellite data on vegetation and water cover, in order to evaluate the effect of the wetland restoration activities on the ecological outcomes. Budget permitting, another ecological survey in the matched treatment and control restoration points may also be undertaken at endline. An additional ecological survey at endline would allow for a comparison of more in-depth ecological outcomes, such as flora, fauna, soil and water characteristics.

FP035: Vanuatu

The project “Climate Information Services for Resilient Development in Vanuatu” (referred to by the abbreviation of its local name, Van-KIRAP) aims to increase the ability of decision makers, communities and individuals to plan for and respond to the long- and short-term impacts of climate variability and climate change. It also aims to enhance existing infrastructure to improve forecasting, and climate information will be tailored to the sector-specific needs of end users. Information transmission channels will also be improved.

Given the nature of the project and delays in implementation and reporting to the GCF Secretariat, no IE design has been operationalized to date. The efforts of LORTA have, until now, been to support the monitoring of project implementation by creating a monitoring tool that can be used in a future IE. Some of the current uncertainties on project modalities and delays are due to the COVID-19 pandemic, under which conditions are not favourable for an IE. Given that this project does not currently envision an IE, it is on hold.

FP062: Paraguay

The “Poverty, Reforestation, Energy and Climate Change Project” (PROEZA) aims to increase forest coverage and the resilience of poor indigenous and non-indigenous rural households in Paraguay. The project intends to achieve this goal through conditional cash transfers for sustainable agroforestry practices and the provision of clean cooking stoves. The target group is current participants of the social conditional cash transfers programme *Tekopora* who have access to suitable land for agroforestry.

The evaluation design of PROEZA consists of a clustered phased-in RCT with approximately 2,000 non-indigenous households (in 200 localities) and a DiD with approximately 550 indigenous communities. The RCT will have one comparison arm and one treatment arm, in which the participants are offered agroforestry training and cash transfers conditional on agroforestry-related outcomes and practices. The clean cooking stoves will not be part of the evaluation. The comparison group will be phased in during Q2 2024 of PROEZA. The treatment group will enter the programme in early year 2 (Q1/Q2 2022). For the DiD, satellite data will be used where a comparison of forest cover trends between treatment and control communities can be made. It remains uncertain whether the project team will conduct surveys with indigenous households as many challenges can arise from this, especially guaranteeing the participation of communities and households that are in the control group.

FP068: Georgia

The GCF-funded project “Scaling up multi-hazard early warning system and the use of climate information in Georgia” aims to create a proactive integrated climate risk management approach through the establishment of a countrywide multi-hazard early warning system (MHEWS) and the use of climate information in planning and decision-making.

The project has three components, each consisting of several activities. The third component of the project was identified as the most suitable for a rigorous IE. The IE designed by the LORTA team will particularly focus on activity 3.1 of this component. This activity will implement community-based early warning schemes (CBEWS) in 100 of the most vulnerable communities in Georgia and community-based climate risk management (CBCRM) in 80 of the 100 communities. The communities targeted by CBEWS and CBCRM will be spread (not necessarily evenly) across 11 river basins. Eligible – that is, the most vulnerable – communities will be identified based on risk profiles developed through multi-hazard mapping and socioeconomic vulnerability assessments. The risk profiles will result in summary scores presenting the multi-hazard vulnerability of communities

in hazard-prone areas. At the time of writing, a technical team of consultants hired by the project team is developing a unified methodology for the multi-hazard risk profiling. This method will involve defining a threshold, which will then be used to identify a pool of eligible communities. To determine eligibility, communities' willingness to participate in the project will also be taken into consideration. It is assumed that – given the inherent vulnerability of communities – there will be considerable interest.

Due to implementation constraints (regarding budget and capacity), the exercise of multi-hazard mapping and socioeconomic vulnerability assessment is phased in over time across four groups of river basins. As a result, the identification of eligible communities and hence baseline data collection will also be phased in. This phase-in is not random. The deciding factor for the first group of river basins (Supsa, Natanebi and Kintrishi I) is their small size, and the deciding factor for the second group (Enguri, Khobistskali, Chorokhi-Adjaristskali) is their geographic proximity to the first group. Information on the selection of the third and fourth groups has not yet been shared. The first group of river basins will undergo risk profiling in Q4 2021 and Q1 2022. The timeline for the remaining basins is being reviewed by the project team, due to implementation delays. Given that the phase-in is not random and that the analysis will be conducted on the pooled sample of communities across the four groups, information on the selection factors will be collected and controlled for in the final data analysis.

Proposed IE designs include an RCT or a regression discontinuity design using communities above the vulnerability threshold as the treatment group and households just below the threshold as a control group. Multiple treatment arms will be considered – for example, treatment arm 1 will consist of 20 communities receiving CBEWS, and treatment arm 2 will consist of 80 communities receiving CBEWS plus CBCRM. The comparison group will not receive either CBEWS or CBCRM. However, all communities in the treatment and comparison groups will receive risk awareness activities as part of the project.

FP072: Zambia

The “Strengthening climate resilience of agricultural livelihoods in Agro-Ecological Regions I and II” (SCRALA) project supports the Government of Zambia to strengthen the capacity of farmers to plan for climate risks; promote climate-resilient agricultural production and diversification practices to improve food security and income generation; improve access to markets; and foster the commercialization of climate-resilient agricultural commodities.

The project aims to achieve increased resilience by taking a value-chain approach, addressing barriers to climate-resilient agriculture (CRA) across key stages of the value chain – planning, inputs, production and post-production – through various activities such as input support, training and infrastructure development. To achieve this, the project implements targeted interventions to strengthen and promote viable climate-resilient value chains relating to smallholder agriculture, specifically those that are gender sensitive and provide viable economic opportunities for women.

The IE focuses on the main part of component 2 of the project: input support for more resilient agricultural production and alternative livelihoods. As over-subscription to the inputs provided was expected, the original design was to use a lottery to select among eligible farmers. Unfortunately, the originally planned RCT is not viable because lists of farmers who were unsuccessful in the lottery were not retained. Therefore, the plan is that the evaluation strategy will use a DiD with matching approach.

FP069: Bangladesh

The project “Enhancing adaptive capacities of coastal communities, especially women, to cope with climate change induced salinity” has the goal of strengthening the adaptive capacities of the coastal communities in Bangladesh against the impacts of climate change, by especially aiming at the adoption of climate-resilient livelihoods and an increase of drinking water availability. The AE for this project is the United Nations Development Programme (UNDP), and main implementing partners are the country’s Ministry of Women and Children Affairs, and the Department of Public Health Engineering. The target population of the project is mainly women who are vulnerable to climate change induced salinity in two districts in the coastal area of Southern Bangladesh.

The project consists of three interlinked components, of which component 1 (climate-resilient livelihoods) is most relevant for the IE. As part of component 1, women’s livelihood groups will be formed or reactivated. They will then jointly select three out of eight livelihood options based on their preferences, for which they will receive training as a group. After completion of the training, they will be asked to select two out of the three trained livelihoods, for which they will receive the necessary input.

The IE design is a randomized clustered phase-in design (with two phases), which will measure the impact of the “adaptive livelihoods” component of the project. With this design, all the eligible households selected by the project will eventually receive treatment. The only deviation from the original implementation plan is that treatment is rolled out to several groups of areas progressively. For this, target areas will be randomly split into two groups and livelihood activities will be rolled out in group 1 first, and in group 2 later. To measure the effects of the livelihood component, outcomes between group 1 and group 2 will be compared just before the start of the implementation of activities for group 2. Given the selection process of beneficiaries, wards constitute the relevant clusters for the IE, and randomization will be done at the union level. That is, unions will be randomly split into the two phase-in groups.

A limitation of this design could be the short-term horizon of the IE study. Indeed, the delay in implementation between the two phases determines the time frame of the expected impacts. For some outcomes, there is a risk of observing no effects if they do not materialize in the short run. Therefore, it is important to carefully select the key indicators. Also, this design can answer one evaluation question only – that is, it cannot answer questions about the impact of drinking water solutions or the impact of the whole programme. Lastly, there is a strong commitment needed from the local implementing NGOs to comply with the design (with regard to randomization).

FP073: Rwanda

The project “Strengthening climate resilience of rural communities in Northern Rwanda” (the Green Gicumbi project) aims to increase the resilience of vulnerable communities to climate change. This is being achieved by restoring and enhancing the ecosystem services of sub catchment B of the Muvumba watershed, increasing the capacity of communities to renew and sustainably manage forest resources, and supporting smallholders to adopt CRA. The project is also investing in green settlements for vulnerable families currently living in high-risk areas.

The project has four main components: (1) watershed protection and CRA, (2) sustainable forest management and sustainable energy use, (3) climate-resilient settlements, and (4) knowledge transfer and mainstreaming.

The AE for this project is the Ministry of Environment of Rwanda, and the executing entity is the Rwandan National Fund for Environment.

The principal evaluation question aims to uncover to what extent the Green Gicumbi project contributes to incremental and transformational climate change adaptation and to the mitigation of GHG emissions. Further evaluation questions related to the main question are as follows:

- Do adaptation interventions of components 1 and 2 lead to an increase in farmers' adoption of CRA practices?
- Do adaptation activities of components 1 and 2 lead to an increase in food security and diversity?
- Do component 1 and 2 activities lead to an increase in smallholder farmers' resilience? What dimensions of resilience are the most influenced by the project activities?
- To what extent do mitigation activities of component 2 lead to the production and use of cleaner energy for cooking?
- Do mitigation activities of components 1 and 2 lead to an increase in permanent vegetation cover and in diversity of tree species of targeted areas?
- Do the project activities of components 1 and 2 contribute to an increase in women's participation in economic life? Do the impacts of the project differ by the gender of the household head?
- How do green settlements affect the resilience of vulnerable households and that of expropriated households? What are the factors that helped or hindered transformative change?

In order to evaluate the different project components, a mixed-method approach is being pursued. The quantitative evaluation will focus on the activities of components 1 and 2 and be based on a quasi-experimental design. Specifically, DiD combined with PSM will be used. One limitation of the suggested strategy is that it will not be possible to disentangle the impact of specific project activities. The LORTA team recommends instead exploring the differential impact of various degrees of treatment intensity. Qualitative research methods will complement the quantitative evaluation by focusing on the beneficiaries' perception of the transformational change triggered particularly by component 3 of this project.

The baseline survey for the evaluation was implemented from June to September 2020. Overall, the survey results highlight that, on average, beneficiary households are poor and vulnerable and will benefit considerably from the Green Gicumbi project. In 2021, the LORTA team compared key sociodemographic characteristics of the sample of target beneficiaries with secondary data representative at the Gicumbi district level. For this purpose, existing (recent) secondary data sets were reviewed and the Integrated Household Living Conditions Survey was identified as the most suitable due to the type of indicators measured and the representativeness of the sample at the district level. The comparison of the sociodemographic characteristics of target households with a representative sample of the Gicumbi district revealed that target households have, on average, a lower level of literacy, are less likely to own land and are more likely to live in a dwelling made of cheaper materials. These results hint at the greater vulnerability of households within the target area of the Green Gicumbi project, supporting the relevance of the project interventions in subcatchment B of the Muvumba river. In 2021, the LORTA team also supported the AE and executing entity in developing a methodology to determine baseline emissions, which will facilitate project-specific indicator reporting on incremental mitigation of GHG emissions as well as transformational climate change adaptation.

FP087: Guatemala

The project “Building livelihood resilience to climate change in the upper basins of Guatemala’s highlands” aims to improve the quality of watersheds while enhancing water and food security. The project area covers 24 micro watersheds in the highlands of Guatemala. The project consists of three project components that are implemented at the community and watershed levels. The first component addresses unsustainable land-use practices through extension worker training, financial incentives and the development of a micro watershed management plan. The second component offers financing to community-based organizations present in the area to implement actions in response to climate change. The third component supports the generation of climate information to guide decision-making regarding watershed management and farm practices for agriculture, forestry and conservation purposes to target users.

The AE for this project is the International Union for Conservation of Nature (IUCN). The project is implemented by a range of national and subnational entities – in particular, the Ministry of Agriculture, Livestock and Food; the Ministry of Environmental and Natural Resources; the Rural Development Learning Centers; the National Forest Institute; and the Institute of Agriculture, Natural Resources and Environment. Important roles are also assigned to agricultural extension workers and municipal forestry offices / environment units.

The evaluation design is a DiD design with matching at the household and community level. The comparison group is formed by households living in micro watershed areas similar to the treatment micro watersheds. These comparison micro watersheds were selected purposefully by the project team, taking into account climatic and socioeconomic parameters. The comparison watersheds lie inside the four upper watersheds of the target area. Since components 1 and 3 have the potential to affect all households in the project area, the evaluation design will focus on these components and measure their joint impact.

FP097: Central America

The CAMBio II project aims to improve the resilience of micro, small and medium-sized enterprises (MSMEs) in Central America to the consequences of climate change. The Central American Bank of Economic Integration (CABEI), AE and implementing partner, will establish a credit line for intermediary financial institutions (IFIs) that finances credits for MSMEs’ adaptation projects and provides funds for capacity-building of MSMEs and IFIs. The target population is MSMEs in seven Central American countries: Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama and the Dominican Republic. The project consists of three interlinked components: (1) access to credits for MSMEs through selected IFIs, (2) provision of technical assistance, accompaniment, and training of MSMEs and IFIs on green financing and adaptive measures, and (3) awards to IFIs and MSMEs for the successful implementation of investment projects.

The proposed evaluation designs during the inception report in Honduras were a DiD design with PSM and a randomized encouragement design. However, during a short inception workshop with the project team in November 2021 (the project hired a new project management unit (PMU) team), it became evident that these designs were no longer feasible, for reasons outlined below. At the time of writing, the LORTA team is investigating alternative evaluation methods that fit the nature of the project.

The results from the workshop in November are summarized as follows:

- DiD design is difficult to implement as the team foresees difficulties in the collection of data for the control group. Moreover, eligible MSMEs can take up the credit line at any point in

time, which makes it difficult to establish a sample frame before the start of the implementation.

- Randomized encouragement design cannot be implemented because the credit lines will be promoted to everybody through different workshops.

The LORTA team continues to engage with CABEI to assess the potential for a robust evaluation design that fits within the project modalities.

FP098: South Africa

The Development Bank of Southern Africa (DBSA), AE for this project, has recently launched a new programme, the Climate Finance Facility (CFF). The CFF is a lending facility that aims to increase climate-related investment by the private sector in the Southern African region. The target countries of the CFF are South Africa, Namibia, Lesotho and Eswatini. Since the pipeline is expected to be dominated by projects in South Africa, the primary focus is on this country. The targeted sectors of the CFF are energy, water, waste and transport. The CFF plans to finance both mitigation projects (renewable energy, waste to energy, energy efficiency, low-emission transport) and adaptation projects (water efficiency, water treatment, new clean water).

Since a facility-wide IE would be difficult, if not impossible, the LORTA team decided together with the CFF team to reduce the scope to either the project level or the subsector (i.e. renewable energy) level.

The suggested evaluation method follows the method of an event study: an intervention may be given at different times for different locations. The date of the intervention (i.e. the point in time when a technology becomes operational) is coded as time 0 and called the “event”. The outcome of interest can then be coded as an outcome at the event or some amount of time before or after it. Even though a comparison group, which never experiences an event, is not needed in an event study, being able to include a comparison sample is helpful to better illustrate any changes in outcomes after the event. However, unlike other IE designs in which it is required that the comparison group is not treated during the evaluation period, this is not a necessary condition here. This purely quantitative analysis is planned to rely entirely on administrative information from the project developers. It may be complemented by qualitative information to obtain additional insights into what end beneficiaries think about climate-friendly technology.

FP101: Belize

The International Fund for Agricultural Development (IFAD) is the AE for the project “Resilient Rural Belize (Be-Resilient)” (RRB). The RRB project is managed by a PMU, which is hosted by the Belize Ministry of Agriculture, Food Security and Enterprise. The Ministry of Finance, Economic Development and Investment serves as the lead project agency.

The overall goal of the RRB project is to increase farmers’ resilience and adaptation to climate change. This goal is pursued through three main objectives:

- 1) To introduce CRA practices, which would enable smallholder farmers to operate sustainable production processes even under the stress of climate change and extreme climatic events.
- 2) To develop value chains of smallholder farmers that are resilient and adapted to the effects of climate change and aim at strengthening producers’ organizations (POs).
- 3) To upgrade public infrastructure such as roads, drainage and information systems to improve market access.

The initial target population is poor and vulnerable smallholder farmers in 23 communities clustered in six districts of Belize (Toledo, Stan Creek, Cayo, Belize, Orange Walk and Corozal). The

project's scope has the potential to affect up to 29 per cent of the country's population, both directly and indirectly.

The Matching Grant Fund (MGF) and Backyard Gardens (BYGs) activities within component 1 are the most relevant activities for the IE. The evaluation design leverages existing secondary data set collection by the Statistical Institute of Belize (SIB).

The MGF will target 300 households across the 30 POs. The exact content of the business plans and project variations will be decided based on assessments of the CSA practices needs of the individual POs. A group of farmers outside the 30 treatment POs will be identified using the Population & Housing Census 2022, developed by the SIB. The eligible farmers will be identified according to the eligibility criteria for the project (e.g. geographical location, household size, area of cultivated land). These farmers should have similar characteristics to the selected treatment farmers, except for the POs' participation in and receipt of the MGF, and will hence form an adequate comparison group to measure the additional effect of the POs' MGF.

The impact of the BYG subcomponent will be evaluated by applying an RCT design with phase-in. The random assignment of the treatment enables us to create a sample of farmers that receive the treatment (the BYGs), which is comparable on all observed characteristics to a sample of units that will not receive the treatment during the first phase of the project. By using an RCT, a causal link between the treatment and the outcome variables (food security and income) can be clearly identified. We randomly assigned the treatment to 805 households, clustered by village to limit spillover effects. In all, 790 households were allocated to the comparison group. Baseline characteristics were used to check the balance of basic characteristics for the two groups to correctly estimate the effect of the project component on food security and income. Once the endline data are collected, the comparison group can receive the treatment to complete the project's beneficiary target of 1,595 BYGs.

FP108: Pakistan

The Food and Agriculture Organization of the United Nations (FAO) is the AE implementing the project "Transforming the Indus Basin with Climate Resilient Agriculture and Water Management" in Pakistan. The main objective of the project is to transform agriculture in the Indus River Basin by increasing resilience among the most vulnerable farmers and strengthening the government's capacity to support communities to adapt to climate change. This will be achieved through a number of activities under the project's main components: (1) enhancing the information services for climate change adaptation in the water and agriculture sectors, (2) building on-farm resilience to climate change, and (3) creating an enabling environment for continued transformation. During the engagement workshop in February 2021, FAO and the LORTA team agreed that the project's activities under component 2 could generate important learning and insights and were also feasible for an IE. The two activities under component 2 are (1) farmer training, which will take place in the form of farmer field schools (FFS), including women's open schools, and (2) extension messages for farmers.

The proposed design for both activities is an RCT with different treatment arms. However, these designs have not been approved by the project team, which has delayed the IE.

FP110: Ecuador

The "Ecuador REDD+ RBP for Results Period 2014" project encompasses several components, but the rigorous counterfactual evaluation will focus on component 2: the implementation of FFS that aim to train agricultural producers in sustainable and environmentally friendly practices for efficient soil management. The implementation of FFS began in January 2021 and is expected to end in

October 2022. Activities are separated into two phases, one each year: the first group of producers was selected in early 2021 and was to be trained until the end of that year, and the second group of producers will participate in the FFS starting in January 2022. The activities are demand-driven and are offered to different types of producers, but the IE will focus on coffee and cocoa producers.

Due to limited financial resources, the project team decided not to collect primary baseline data. Instead, secondary data will be used and merged into the beneficiary data set in order to produce a sample of treatment and comparison observations. Conditional on the data available and the output of the merging exercise, a final IE design will be suggested. If the outcome indicator is available at baseline and endline, the LORTA team suggests a DiD combined with PSM approach, which is also preferred by the project team. The LORTA team expects to use this approach at least for deforestation. If data are only available at endline (i.e. they are not available in the secondary data sets), the LORTA team suggests using the instrumental variable approach.

SAP010: The Philippines

This project implements a people-centred multi-hazard impact-based forecasting and early warning system (MH-IBF-EWS) in four vulnerable local government units in the Philippines. The overall project goal is to increase the climate resilience of vulnerable communities and enhance their livelihoods.

The project consists of four main components, divided into a total of 23 subcomponents. The description of the components and subcomponents was documented through a number of workshop sessions (in May–June 2021) and project material.

In component 1, the science-based hazard and risk information is generated. This will be implemented primarily by the Department of Science and Technology, Philippines Atmospheric Geophysical Astronomical Services Administration (DOST-PAGASA), which will produce probabilistic maps of forecasts in ever decreasing time intervals.

Under component 2, the people-centred characteristic of the MH-IBF-EWS will begin to take shape. Through the combined effort of the AE and other co-executing entities, a knowledge and decision support system will be developed to assist those in policy positions with their decision-making process.

Component 3 includes capacity-building at the local and national levels to both engage in the MH-IBF-EWS and initiate its application. Early warning protocols and actions are operationalized and integrated into the disaster risk reduction and management strategy within each target local government unit. In addition, forecast-based financing (FbF) will be implemented to ensure enough resources are available for adopting early actions.

Finally, component 4 of the programme focuses on the national institutionalization of the MH-IBF-EWS and on the integration of early warnings into investment and policy decisions.

During the LORTA inception workshop, the GCF, the IEU, C4ED, LANDBANK, DOST-PAGASA and other key stakeholders identified the early warning messages and dissemination channels to be the most suitable subcomponents for a rigorous IE. The IE aims to assess whether the selected activities under subcomponent 3.4 of SAP010 achieve intermediate outcomes in enhancing the absorptive capacity of beneficiaries. The planned design is an RCT design, clustered at the level of *barangays* (villages).

The IE will be based on piloting different types of early warning messages and dissemination channels. At the time of writing, the evaluation will have three treatment arms or programme variations. The exact content of the programme variations (early warning messages and dissemination channels) will be decided by relevant programme stakeholders including the World

Food Programme and DOST-PAGASA, among others. The programme variations (treatment arms) will be tested in high-risk barangays in which simulation exercises are planned. The project team will identify the list of eligible barangays – that is, high-risk barangays in which simulations will be conducted. Programme variation 1 (treatment 1), is based on the “new type of early warning messages”, where households receive an early warning text that is tailored to the barangay context, speaks to the characteristics of the recipients, and highlights the forecasted risk level and impact of a potential hazard in a simplified manner. Programme variation 2 (treatment 2) disseminates the same type of message using an additional channel of communication. The appropriate additional channel will be identified following the literature and the vulnerability and risk perception assessments conducted by the World Food Programme. Households in barangays that are randomized into programme variation 3 will receive the traditional text of early warning messages commonly disseminated prior to SAP010, this group will serve as the comparison group.

Furthermore, the IE of the FbF under component 3 was also discussed as a potential additional IE. However, at the time of writing, the feasibility of conducting an IE for FbF is still uncertain.

Table 2. Summary of IE designs of projects started in 2018, 2019 and 2020

PROJECT N°	COUNTRY	EVALUATION QUESTIONS	EVALUATION DESIGN	PRIMARY DATA COLLECTION	EXPECTED EVALUATION RESULTS
FP002	Malawi	<ul style="list-style-type: none"> Did PICSA lead farmers attend the trainings? Did they receive access to seasonal forecast and short-term weather forecasts for rainfall? Did they receive agricultural recommendations via SMS? <p>Further, with respect to lead farmers who were not exposed to PICSA:</p> <ul style="list-style-type: none"> Were PICSA lead farmers more likely to make adaptations to their crop and livestock activities? Did they increase yields relatively more? Did they improve their well-being by reducing their work on farms of others (<i>gaynu</i>)? Did they improve their level of food security? 	PSM	Baseline completed in Q4 2018 Endline completed in Q4 2020	2021
FP026	Madagascar	<ul style="list-style-type: none"> Do households implement alternative livelihood strategies? Do households implement conservation agriculture practices? Do adaptation interventions lead to a reduction of households' vulnerability to climate hazards? Does the adoption of new practices lead to an increase in agricultural production and food security? Do patrollers cover a greater distance during patrols? Do mitigation interventions lead to a better enforcement of regulations of the forest protected area? Do mitigation interventions result in a reduction in deforestation? Does deforestation increase in other areas as a result of an increase in forest surveillance in the target areas? 	Clustered phase-in RCT and DiD with PSM	Baseline completed in Q2 2019 Midline expected in Q1 2022	2024
FP034	Uganda	<ul style="list-style-type: none"> Are the ecosystems within wetlands restored to their original capacity? Are income levels of community members increased due to the alternative agricultural and non-agricultural livelihood trainings? 	DiD with PSM	Baseline presumably in Q1 2022	2025

PROJECT N°	COUNTRY	EVALUATION QUESTIONS	EVALUATION DESIGN	PRIMARY DATA COLLECTION	EXPECTED EVALUATION RESULTS
		<ul style="list-style-type: none"> Is income volatility reduced due to the alternative agricultural and non-agricultural livelihood trainings? 			
FP035	Vanuatu	<ul style="list-style-type: none"> Does the use and application of climate information and services lead to improved living conditions and more food security for fishers and farmers? 	NA	Support on implementation tracking. At the moment, the project is not the most suitable for an IE.	
FP062	Paraguay	<ul style="list-style-type: none"> Are farmers changing their agricultural production towards climate-smart plantation systems? Does PROEZA increase forest cover? Does PROEZA decrease households' vulnerability to climate shocks? Are PROEZA households more resilient to weather events? Does participation in PROEZA lead to an increase in diversification of agricultural production? [secondary outcome] Does PROEZA increase the participants' income? [secondary outcome] Does PROEZA increase the participants' food security? [secondary outcome] Are indigenous and non-indigenous farmers changing their agricultural production towards climate-smart plantation systems? 	Phased-in RCT(non-indigenous population) DiD indigenous population	Baseline presumably in Q1 2022	2024
FP068	Georgia	<ul style="list-style-type: none"> To what extent do CBEWS and CBCRM contribute to enhancing households' resilience against natural hazards? Is there a significant additional benefit from providing CBCRM to eligible communities compared to CBEWS only? 	Stratified clustered RCT	Household-level data collection (in synergy with household-level knowledge, awareness and practices survey planned by the project): <ul style="list-style-type: none"> Baseline: Q1 2022 basin group 1, TBD for basin groups 2–4 Endline: 2025 	2025

PROJECT N°	COUNTRY	EVALUATION QUESTIONS	EVALUATION DESIGN	PRIMARY DATA COLLECTION	EXPECTED EVALUATION RESULTS
FP069	Bangladesh	<ul style="list-style-type: none"> Do the adaptive livelihoods promoted by the project provide sustainable means of earning a living? Do the drinking water solutions provided by the project allow beneficiaries to engage in income-generating activities? What drinking water solution is the most cost-effective? What adaptive livelihood has the largest impact on vulnerability to poverty and income stability? 	Phase-in Clustered RCT	Baseline conducted in Q4 2021	2023
FP072	Zambia	<ul style="list-style-type: none"> What is the food security status of farmers based on food consumption score, dietary diversity and coping strategy index? What is the income level, its volatility and stability between treatment and control farmers? What is the percentage of farmers with agriculture as their only source of income and who diversified their livelihoods (other than subsistence agriculture)? What is the number of different income-generating activities that farmers are engaged in? What is the percentage of farmers who declare using climate information? What percentage of farmers adopted sustainable and climate-resilient agricultural practices such as intercropping, crop rotation, organic manure application, composting, leguminous cover cropping, minimum tillage and agroforestry? 	Matching	Baseline in Q4 2020 Endline in Q4 2025	2026
FP073	Rwanda	<ul style="list-style-type: none"> Does the project contribute to incremental and transformational climate change adaptation and to the mitigation of GHG emissions? <p>More specifically, the IE will answer the following questions:</p> <ul style="list-style-type: none"> Do adaptation interventions of components 1 and 2 lead to an increase in farmers' adoption of CRA practices? Do adaptation activities of components 1 and 2 lead to an increase in food security and diversity? 	DiD with PSM	Baseline conducted in Q2 2020 Midline planned for Q2 2022	2025

PROJECT N°	COUNTRY	EVALUATION QUESTIONS	EVALUATION DESIGN	PRIMARY DATA COLLECTION	EXPECTED EVALUATION RESULTS
		<ul style="list-style-type: none"> Do component 1 and 2 activities lead to an increase in smallholder farmers' resilience? What dimensions of resilience are the most influenced by the project activities? To what extent do mitigation activities of component 2 lead to the production and use of cleaner energy for cooking? Do mitigation activities of components 1 and 2 lead to an increase in permanent vegetation cover and in diversity of tree species of targeted areas? Do the project activities of components 1 and 2 contribute to an increase in women's participation in economic life? Do the impacts of the project differ by the gender of the household head? How do green settlements affect the resilience of vulnerable households and that of expropriated households? What are the factors that helped or hindered transformative change? 			
FP087	Guatemala	<ul style="list-style-type: none"> Does the project increase the water security of farmers? Do farmers become more resilient and/or less vulnerable to extreme weather events? Did the intervention lead to better awareness and knowledge of CSA among farmers? Did the intervention lead to the implementation of activities related to CSA by farmers? Did the intervention lead to the diversification of crops by farmers? 	DiD with PSM	Baseline conducted in Q3 2021	2024 (midline)
FP097	Central America (countries TBD)	<ul style="list-style-type: none"> Are MSMEs less vulnerable / better adapted to events of climate change due to the adaptation of CSA? Do the MSMEs have a better knowledge of the effects of climate change? Do the MSMEs have a better knowledge of adaptation measures? Do the MSMEs implement more adaptation measures? Will the effects be different between sectors (and gender)? 	TBD	TBD	TBD

PROJECT N°	COUNTRY	EVALUATION QUESTIONS	EVALUATION DESIGN	PRIMARY DATA COLLECTION	EXPECTED EVALUATION RESULTS
FP098	South Africa	<ul style="list-style-type: none"> Do investments by the private sector, which are funded by the CFF, lead to reduced usage of on-grid electricity? Do they lead to changes in the usage of total electricity? Do the investments lead to reduced usage of water? Is the climate-friendly technology for which CFF funding is provided installed and operational? Do the end beneficiaries use the technology? 	Event study	Not needed	TBD
FP101	Belize	<ul style="list-style-type: none"> Backyard Gardens (BYGs) component: <ul style="list-style-type: none"> Are there changes with regard to healthy diet and households' income as a result of BYGs? Does households' resilience increase as a result of BYGs? MGF component: <ul style="list-style-type: none"> Are the POs adopting CSA practices? Do sales and income increase as a result of CSA practices/business plans? Does households' resilience increase as a result of CSA practices/business plans? 	BYGs: RCT MGF: DiD + PSM	<p>BYGs:</p> <ul style="list-style-type: none"> Baseline conducted in Q4 2021 Endline planned for Q4 2022 <p>MGF:</p> <p>Baseline data will consist of a subset of the 2022 census data, including the 300-household part of the treatment group and 600 households not part of the implementation to use as a control group. The census is planned to be collected in May 2022 by the SIB. The data requested will be available to the LORTA team in 2023. Endline data will be collected by the SIB during the 2024 Labour Force Survey in April for the 900 households identified by the 2022 census data</p>	BYGs: Q4 2022 MGF: Q4 2024
FP108	Pakistan	Activity 1 – Farmer Field Schools Treatment (FFS):	RCT	Not yet planned	NA

PROJECT N°	COUNTRY	EVALUATION QUESTIONS	EVALUATION DESIGN	PRIMARY DATA COLLECTION	EXPECTED EVALUATION RESULTS
		<ul style="list-style-type: none"> • What is the impact of basic or FFS on the outcomes of interest? • What is the impact of only implementing women FFS on the outcomes of interest? • What is the impact of adding women FFS to the standard approach for the outcomes of interest? • What is the relative impact of men only versus women/family field schools for the outcomes of interest? • Should women FFS be always implemented together with those for men to improve the outcomes of interest? <p>Activity 2 – Enhancing the Take-up of Relevant Information of Climate-Resilient Behavioural Changes:</p> <ul style="list-style-type: none"> • What is the impact of sending specific (weather-related) messages to farmers on the outcomes of interest, including credibility and usefulness? • What types of messages work best in raising interest and improve uptake of information? • What type of farmers should be targeted to increase the learning? 			
FP110	Ecuador	<ul style="list-style-type: none"> • Do the FFS have an effect on farming practices, productivity and deforestation? • Do the FFS have differentiated effects across coffee and cocoa producers? 	Deforestation: DiD Farming practices and productivity: PSM or instrumental variable	<ul style="list-style-type: none"> • Primary data: <ul style="list-style-type: none"> – Beneficiary data (includes application data and monitoring data) • Secondary data: <ul style="list-style-type: none"> – Data from the <i>Ministerio de Agricultura y Ganadería Cataster</i> (farm plot delimitations) 	2024 for short-term outcomes (productivity and farming practices) TBD for deforestation

PROJECT N°	COUNTRY	EVALUATION QUESTIONS	EVALUATION DESIGN	PRIMARY DATA COLLECTION	EXPECTED EVALUATION RESULTS
				<ul style="list-style-type: none"> Merging of secondary and primary data in January 2022 	
SAP010	The Philippines	<ul style="list-style-type: none"> What type of early warning messages is more effective in inducing early response actions and enhancing preparedness (absorptive capacity)? What type of dissemination channel is more effective in inducing early response actions and enhancing preparedness (absorptive capacity)? Are there differential effects by gender, age, poverty levels and other socioeconomic characteristics of recipients? 	Clustered RCT	<ul style="list-style-type: none"> Household-level data collection Baseline in 2022 (potentially conducted in synergy with household-level food security vulnerability assessment planned by the project team) Endline in 2024 	2024

B. SUMMARY OF TECHNICAL ADVICE AND QUALITY CHECKS PERFORMED AND NEXT STEPS

FP002: Malawi

Status quo

Throughout 2021, the LORTA team provided support for the analysis and reporting phase of the endline evaluation. Several rounds of feedback on the data, analysis and report draft were conducted until the survey firm completed their endline report for UNDP. Thereafter, C4ED collaborated with the GCF IEU and UNDP to finalize the data cleaning, analysis and report drafting. During the final months, the analysis was revised several times. The presentation of results has been improved through different techniques, and they have been verified through a set of robustness checks. The LORTA team incorporated the latest comments from UNDP and completed the final IE report. Details of the IE estimates are included in the Phase III section below.

FP026: Madagascar

Status quo

In 2021, the LORTA support for this project concentrated on two key thematic areas: (1) assessing the targeting strategy of the SLEM project, and (2) technical advice on planning for the midline data collection.

Regarding the first activity, the LORTA team assessed the comparability of a sample of target beneficiaries of the SLEM project with respect to existing region-level representative samples. This exercise, conducted in September 2021, aimed to inform on the particularities of the target group of the GCF within the Malagasy context. To do so, C4ED compared key sociodemographic characteristics of the sample of target beneficiaries, obtained from the baseline survey, with secondary data representative of the seven regions where the SLEM project intervenes.

The comparison found that there is little difference between the target beneficiaries of the SLEM project and households residing in the same regions in terms of key sociodemographic characteristics. However, two characteristics that do differ between the two samples are the gender and the ethnicity of the household head. Fewer women are heads of the household among SLEM target beneficiaries, and the share of beneficiaries from one ethnic group is larger.

The midline data collection was initially planned for early 2021, but because of delays in project implementation due to the ongoing COVID-19 pandemic, the project obtained a one-year extension and the midline will take place in early 2022. In December, C4ED provided guidance to the project team on two key aspects: (1) the midline questionnaire, and (2) the organization of the midline data collection. The review of the midline questionnaire will focus on its ability to adequately capture all key outcome indicators. The project team shared an updated midline questionnaire for review in January 2022.

The LORTA team is currently working on the DAP, which includes the two evaluation designs described above. A current challenge is to move from a Pen-and-Paper Personal Interview (PAPI) to a Computer-Assisted Personal Interview given the lack of funds from the project team. Most likely, midline data collection will be conducted with a PAPI survey.

Next steps

Preparation for the midline data collection and finalization of the data analysis plan (DAP).

FP034: Uganda

Status quo

During 2021, the LORTA team supported wetland-level matching to facilitate the evaluation design. This matching was based on ecological characteristics of the wetland area, which were collected by consultants hired by the project team. Ecological data were collected for 22 different locations and were then matched to 546 villages. UNDP consultants cleaned the ecological data for these 546 points and grouped them into nine simpler categories. The nine groups are bio-climatic, physio-chemical, hydrologic, soil, vegetation, threat, ecosystem services, activities and wildlife. Some of the groups had data that were redundant or unusable, and others had more than one set of usable data, each of which was converted into a separate surface.⁶ The consultant scored and weighted each of the subgroups of data that were present in the data set and this information was triangulated by two experts. A final surface of these scores was generated using inverse distance weighting.

The first stage of matching employs the data from each of these nine surfaces. To determine the best comparison wetlands points for the wetland points planned to be treated in 2022, the evaluation is using PSM.

In addition, the LORTA team drafted and shared a quantitative survey instrument for the baseline data collection and is awaiting final feedback from the project team. The initially planned timeline for the baseline data collection could not be met, mainly because the project team had not yet procured a local data collection firm. The LORTA team had provided the project team with template terms of reference and several revision rounds. The request for proposals for data collection is currently advertised, and the LORTA team is awaiting a decision on data-collection firm selection.

Next steps

As soon as the data-collection firm is hired, they will have access to all the necessary information available that the IEU and C4ED can provide, in order to start their data-collection preparations. This information includes programming the questionnaire and planning the logistics based on the sample. The baseline data collection is planned for Q1 2022, but this is conditional on when the data-collection firm is hired.

The matching on the wetland level, to select comparable control wetlands points to each treated wetland point, was completed in February 2022. The matching is based on the ecological information and scores generated by UNDP for these ecological points and relies on PSM to determine the best control group matches.

FP035: Vanuatu

Status quo

During 2021, the project team was presented with different options for conducting an IE. However, after several rounds of discussions, it was decided that the team required support on the monitoring component and hence efforts were channelled into this activity. A draft indicator plan to be used in a potential IE was jointly developed with the project team in the second half of 2021, which brought a lot of value for the project team and potential IE as they have now a more solid ground to further develop their monitoring system. However, in December 2021, it was decided to put the project on hold until a final decision is made on the feasibility of conducting an IE.

⁶ A surface is a modelled raster representation of bio-climatic, physio-chemical, hydrologic, soil, vegetation, threat, ecosystem services, activities and wildlife across the project area estimated from observations recorded during the baseline survey.

Next steps

The project is on hold until a decision is made on the IE design.

FP068: Georgia

Status quo

In 2020, C4ED provided feedback on two reports that the project team had shared with them earlier. These reports were (1) the baseline report for activity 3.1 and activity 3.2 of the project “Scaling up multi-hazard early warning systems in Georgia”, and (2) a report on knowledge, attitudes and practices.

In Georgia, the intervention is still at a relatively early stage. In order to identify the eligible communities, the UNDP team has hired a team of international experts to develop the MHEWS methodology. They will establish and coordinate the hazard risk mapping and socioeconomic vulnerability assessments with national implementers in groups of basins. Because of capacity constraints, the communities around the 11 basins have been divided into four groups and the implementation of the MHEWS will be phased in over time until all groups are covered.

Given the importance of closely coordinating with the group of technical experts hired by UNDP, the LORTA team reviewed the vulnerability assessment developed by the latter and in a joint call discussed the remaining open questions concerning the methodology, sample selection and data sources. In November 2020, the LORTA team had another update call in which the LORTA team presented clear infographics on the IE design to the UNDP team and the technical experts. During this call, the LORTA team was informed about revisions to the methodology (still a work in progress) and delays in the project timeline. There are major delays in implementation, which will inevitably move the expected deadline for the completion mapping and assessments (and resulting risk profiles for communities) for the first group of basins to Q4 2021 and Q1 2022. The project team is reviewing the timeline for the remaining groups of basins. The project team confirmed budget availability to implement the suggested IE design; this especially includes the feasibility of reaching the targeted sample size.

Next steps

C4ED is waiting to receive the updated methodology from the technical experts. After this, the IE design report will have to be adjusted accordingly. Once the methodology is ready, UNDP will schedule a meeting with the LORTA team, the governmental agencies and all main project stakeholders in Georgia to jointly finalize the implementation plan and to consolidate the evaluation design and get approval.

The baseline data collection for the first group of basins (out of four) is now currently planned for Q1 of 2022. The UNDP team started to develop the terms of reference for the IE data collection in November 2021, which were reviewed by the LORTA team.

FP062: Paraguay

Status quo

In 2021, considerable progress was made in terms of refining the evaluation questions and indicators and the finding of suitable and cost-efficient sources for satellite data. While C4ED and the project team were successful in defining all of the above, as well as in finding a free satellite source with high resolution, discussion is ongoing regarding the timing of the intervention and the availability of technical capacity and financial resources to conduct the IE. While the baseline survey questionnaire was drafted by the LORTA team during the second half of 2021 (data collection was supposed to occur in Q4 2021), in November 2021 the project team decided to put the project on hold until further notice from the Vice-Minister of Planning, who was recently named as the project lead.

Next steps

Once the green light is received from the vice-minister, C4ED will work on the DAP, finalize the baseline instrument, and support the team with the sampling and the ethical clearance. In addition, C4ED, together with FAO and the IEU, applied for funding from the Abdul Latif Jameel Poverty Action Lab for a pilot study on the PROEZA project. However, since this pilot study depends on the starting point of the intervention, it is also on hold for now.

FP072: Zambia

Status quo

The household baseline survey among eligible households from 15 districts in agroecological zones I and II was conducted in 2021. The final sample has 1,251 treatment households and 1,231 control households. The survey team interviewed 1,218 households in the treatment group and 1,290 households in the control group. The comparison group consists of households who were part of a UNDP crop-cut survey but not the beneficiary of any intervention groups for this project.

The baseline data collection highlighted some systematic differences between the treatment and control groups that will need to be controlled for during statistical analysis. These include significant differences in terms of income sources and consumption practices, expenditures, land holdings, agricultural practices, physical capital holdings, forms of social capital and indicators of vulnerability. Overall, these differences highlight, as theory would suggest, that treatment households are, on average, wealthier and better connected than their control group counterparts.

All possible systematic differences presented above will need to be considered for matching treatment and comparison households for the analysis at midline and/or endline. Given that the team has no means to evaluate the parallel trend assumption for the DiD in this study (as no data were collected prior to baseline), combining DiD and matching promises to be a more robust approach.

In parallel, the LORTA team is working to provide feedback to the existing monitoring system and to review the IE design, and is waiting for approval of the last revisions of the baseline report. The final revision of the monitoring tools as well as the baseline report are expected to be finalized in March 2022.

Next steps

The team expects to finalize the discussions on the feasibility of the IE design, including the assessment of spillovers between treatment and control, and to agree on next steps with the country team for the improvements to the monitoring system.

FP069: Bangladesh

Status quo

Before project implementation started, the project team conducted a census in the project districts, which was completed in January 2021. Randomization and baseline data collection were conducted in the second half of 2021. The census data collection included 66,171 households and was used to randomly select a baseline sample for in-depth interviews. The baseline sample included 3,120 households eligible for the project, out of which 2,000 households will participate in the project in Phase 1 and 1,120 households will participate in Phase 2. The baseline data were collected in September and October 2021 and shared with the LORTA team in early November. The LORTA team completed ex-post data quality checks and received further insights into the data from the project team by mid-January 2022, which will enable the LORTA team to finalize the data cleaning and produce baseline statistics thereafter. The baseline report is expected to be completed in February 2022.

Moreover, in 2021 the LORTA team compared the sociodemographic characteristics of the targeted households included in the baseline sample to those of households not targeted, using the rich census data. In this exercise it became evident that the targeted households are more vulnerable than the non-targeted households residing in the project districts, supporting the relevance of the project interventions and confirming the correct application of targeting criteria when selecting households for baseline.

The project team is revising the M&E plan based on C4ED's feedback, especially related to the feasibility of indicators, and will share the final draft together with the Management Information System (MIS) tools with C4ED for final review. It is expected that the draft will be finalized before the end of December 2021.

C4ED performed ex-post data quality checks on the raw baseline data, which had been shared with C4ED in early November 2021. The outcomes of these checks were (1) a two-pager elaborating on the data quality check system submitted to the IEU at the beginning of December 2021, and (2) a detailed data query report sent to the project team in early December 2021 for further follow-up. The project team has committed to sharing further insights into the data by mid-January 2022, which will enable C4ED to finalize the data cleaning and produce baseline statistics thereafter. The baseline report is expected to be shared in February 2022, assuming that all data quality issues have been clarified by the project team in January.

Next steps

C4ED will provide final feedback on the MIS plan and tools once the project team has shared the revised version.

C4ED will finalize the cleaning of baseline data and analyse the baseline data based on further clarifications that are expected to be shared by the project team in January 2022. The baseline report is expected to be submitted in February 2022.

C4ED will further work on the DAP as a living and growing document. The next step will be to incorporate the baseline statistics.

Intervention roll-out to beneficiaries is planned to start in 2022.

FP073: Rwanda

Status quo

In 2021, the LORTA support to this project was concentrated on technical advice for the project's implementation tracking. C4ED first reviewed the draft M&E Field Manual in February 2021 and then provided capacity-building support on filling in an indicators plan. C4ED then reviewed the project team's data flow map and first draft monitoring tools. In October and November, C4ED provided feedback on the project team's current MIS and quality assurance strategy for monitoring data.

Along with activities on implementation tracking, C4ED assessed the comparability of a sample of target beneficiaries of the Green Gicumbi project with respect to existing district-level representative samples. This exercise, conducted in September 2021, aimed to inform on the particularities of the target group of GCF within the Rwandan context. To do so, C4ED compared key sociodemographic characteristics of the sample of target beneficiaries, obtained from the baseline survey, with secondary data representative at the Gicumbi district level.

The comparison of the sociodemographic characteristics of target households with a representative sample of the Gicumbi district reveals that, on average, target households have a lower level of literacy, are less likely to own land and are more likely to live in a dwelling made of cheaper materials. These results hint at the greater vulnerability of households within the target area of the

Green Gicumbi project, supporting the relevance of the project interventions in the subcatchment B of the Muvumba River.

Next steps

The project team is currently developing monitoring tools harmonized across key institutional entities related to the project's core activities. The comments on these tools were shared by C4ED in November for review. The next key step will be to provide advice for the planning of the midline data collection, currently planned to take place in May 2022.

FP087: Guatemala

Status quo

After IUCN conducted a cluster analysis of the different micro watersheds in the project area, they selected treatment and control micro watersheds. They hired a consultancy firm to conduct the baseline data collection in Q3 2021. The LORTA team supported IUCN and the consultancy firm with feedback on the questionnaires, progress and data quality monitoring, as well as data cleaning.

During the data-collection preparation, the questionnaire and training material were quality assured by the LORTA team. Moreover, IUCN and the LORTA team carried out daily monitoring of data-collection activities. The total sample size consists of 1,486 households distributed into 21 treated (758 households) and 13 control micro watersheds (728 households). The baseline data have highlighted significant differences between treatment and control households. Overall, a greater proportion of treatment households grow annual crops; own a cellular phone; already apply silvopastoral systems, agroforestry and social conservation techniques; and have already implemented agricultural practices against climate change. A greater proportion of control households produce permanent crops and farm livestock. These differences do not threaten the evaluation design, as socioeconomic characteristics that are not balanced will be included in the IE estimates as controls, and systematic differences between clusters of micro watersheds (groups) will be accounted for by using group fixed effects with the panel data. Moreover, any initial differences in outcome variables are accounted for by the DiD design. An important element of the IE is subgroup analysis, where impacts of the interventions are assessed for single-parent households and dual-parent households. Together with IUCN, C4ED finalized and submitted the baseline report to the IEU for feedback.

Simultaneously, C4ED has been working on the DAP and has started to support IUCN on the development of the project monitoring tool.

Project implementation has not started yet but will most likely start by end of 2021 or the beginning of 2022.

Next steps

C4ED has offered IUCN support in the development of a monitoring tool for project monitoring. Also, the baseline report and the DAP were finalized in December.

FP097: Central America

Status quo

The COVID-19 pandemic has delayed the project implementation activities, such as the inception workshop for IFIs and MSMEs, the start-up workshops for MSMEs and the hiring of the PMU. In November 2021, C4ED conducted an online workshop updating the new PMU about the ToC, evaluation questions and IE design that were developed during the inception workshop with CABEI in Honduras in November 2019. Unfortunately, the developed and suggested IE designs are not feasible given the nature of the intervention. Thus, a new design has to be developed. Moreover,

during this workshop the topic of funding was discussed as it seems that there is no available funding for the IE. The funding and the design report are ongoing discussion topics with the project team.

Project implementation will most likely start in Q1 2022.

Next steps

The IE design has to be revised. C4ED will consult with the IEU on alternative designs that could fit the new parameters of the intervention. The collaboration with the PMU will continue, and C4ED will also wait for further information from the project team regarding the budget availability for an IE.

FP098: South Africa

Status quo

The original plan was to study the impact of solar rooftop construction by the Fedgroup and/or energy-efficient social housing by the Trust for Urban Housing Finance (TUHF). The LORTA team has since learned (in June 2021) that the TUHF social housing project will not be funded by the CFF, so this component is no longer an option for the IE. The challenge with this project was that TUHF is a financial institution, and GCF requirements do not allow the CFF to lend to such institutions.

The Fedgroup project still appears interesting and relevant for an IE, but the contracting between the DBSA and the Fedgroup is taking unexpectedly long; the loan agreement was still not signed as of November 2021. The Fedgroup transaction has been approved by the GCF Board; however, the biggest obstacle to finalizing the transaction is linked to the exchange rate loss that occurs when converting money provided by the GCF (which is disbursed in USD) to RAND. Once a solution is found for this obstacle, the loan agreement with the Fedgroup can be signed. An additional project, Bridge City by Instratin, has undergone and passed due diligence at the DBSA, and the loan transaction is close to being signed (expected for the end of November 2021). This project is also a green social housing project, based in KwaZulu-Natal, for which more than 1,000 social housing units will be developed. The CFF money is specifically used for the greening of buildings (e.g. installing solar energy, ensuring water and energy efficiency.) The project has some similarities to the TUHF project. However, the LORTA team learned that Bridge City is most likely not suitable for an event study since all social housing buildings are completely newly built and would therefore not have any data on outcomes to share before the event happened (in this case, installation of energy / solar panel). One remaining possibility for an IE may be to match Bridge City houses with comparable houses that are not financed by the CFF, but the LORTA team sees several serious complications for this approach.

Therefore, the Fedgroup project still seems to be the most suitable option for an IE, and the LORTA team awaits any further progress in the Fedgroups' signing of a loan agreement.

Next steps

As soon as the loan agreement has been signed, the LORTA team aims to obtain a sample of administrative data collected by the Fedgroup to verify that all our data requirements are met, including those that go beyond the indicators specified in the development results template. Depending on the size of the sample, C4ED could even run some first estimations to make sure that certain data needs are specified. In addition, C4ED can complete the current DAP, which will present an updated version of the analysis for the IE for submission to the IEU.

FP108: Pakistan

Status quo

C4ED is awaiting feedback and input from the project team on the proposed design and prospective timeline and next steps for conducting the study.

Next steps

Once the proposed designs are approved, the LORTA team will provide capacity-building and support in the development of survey instruments, sampling, monitoring and so forth, which are part of the activities of Phase II of the LORTA Programme.

FP101: Belize

Status quo

As mentioned above, this project has two main IE designs: BYGs and the MGF. For the first design, baseline data were collected by the team up to September 2021. C4ED received a list of potential beneficiaries along with basic sociodemographic characteristics. This made it possible to generate the treatment group (805 households) and the control group (790) for the planned RCT. Based on this information, individuals were randomly allocated into treatment and control groups for the intervention. For the second design, the implementation of the business plans is still ongoing for 16 POs. In addition, secondary data were deemed necessary for the IE of this component, and a cooperation agreement was therefore submitted to the SIB in November 2021. A final decision is expected by the end of the year. This agreement will allow the LORTA team to access census data from 2022 (baseline) and for future rounds.

Next steps

Regarding the BYGs component, the team started the implementation in November 2021, and the final outcome of the project will be evaluated with an endline data collection that will take place at the end of 2022.

Regarding the MGF component, the remaining business plans for 14 POs will be developed and finalized during 2022. By the end of the year all 30 POs will develop and implement business plans (which are defined as “treatment” for this project component). Once the cooperation agreement is signed by the SIB, the local team and IFAD, the quality of the data will be assessed (census data that will be collected in May 2022). It is estimated that the LORTA team will have access to the requested variables for a subset of observations from the 2022 census data during 2023. The quality of the data will be assessed, and if they are deemed of sufficient quality, the matching of households will be performed based on sociodemographic characteristics in order to generate a control group to evaluate the effect of this component on households’ resilience and farming outputs, as described in the evaluation questions.

SAP010: The Philippines

Status quo

The project team successfully completed the execution of the FAA on 10 December 2021.

Next steps

The LORTA team will engage with the project team in early January 2022 to gather project documentation, get updates on any progress in the project implementation planning as well as discuss the IE design in more detail.

FP110: Ecuador

Status quo

The LORTA team has held fortnightly meetings with the project team in order to define an IE design, as well as to provide feedback on the beneficiary survey tools from the PROAmazonía team. While the tool has already been used for the first cohort of producers trained, suggestions are currently being provided to increase the efficiency of data collection for cohort 2 (to reduce the need for data cleaning and to obtain feedback on training quality and absenteeism) as well as to facilitate the merging with secondary data sets. Future discussions will be held to assess whether the feedback can be implemented by the PROAmazonía team.

Moreover, the LORTA team intends to support the PROAmazonía team in the merging of different data sets (by beneficiary ID, location and names) in order to obtain a data set that includes socioeconomic variables, yield, agricultural practices and other relevant variables for the IE. Based on the information available, the LORTA team will decide on a final evaluation design.

Next steps

The LORTA team will suggest and set up an adapted data sharing protocol with the PROAmazonía team. If possible, the protocol will include data encryption.

PROAmazonía teams will receive the complete data set and will share it with the LORTA team.

C4ED will conduct the merging of the three data sets and define the evaluation designs, review the monitoring tools of the project team, and revise and submit the DAP.

Chapter IV. ACTIVITY REPORT FOR PHASE III PROJECTS

FP002: Malawi

The goal of the project “Saving Lives and Protecting Agriculture-Based Livelihoods in Malawi: Scaling Up the Use of Modernized Climate Information and Early Warning Systems” is to save lives and enhance livelihoods at risk from climate-related disasters by modernizing the early warning system and creating new climate information products that will help increase the resilience of the most vulnerable communities. During the LORTA mission in 2018, it became clear that the Participatory Integrated Climate Services for Agriculture (PICSA) programme was the only suitable subcomponent of the project for an IE. PICSA is a multilevel training scheme, which aims to teach farmers to make informed decisions based on accurate, location-specific climate and weather information – in particular, on how to choose locally relevant crop, livestock and livelihood options. UNDP Malawi and a research team at the University of Reading led the implementation and M&E of PICSA.

Although the roll-out of PICSA had not yet taken place at the time of the LORTA mission, extension officers had already selected lead farmers for the PICSA trainings. In the selection of lead farmers, extension officers considered – among other criteria – gender, literacy, motivation and the ability to successfully reproduce the training for contact farmers. Because of the purposive selection, only quasi-experimental designs could be considered. In fact, an IE design to estimate causal impacts of the intervention, PSM, was employed. This project completed the endline report.

Under this methodology, the lead farmers who participated in the programme’s PICSA trainings in 2018 were matched with farmers in districts where PICSA trainings were to be rolled out in 2020 (after the endline data collection). The quantitative evaluation was triangulated with the results from endline qualitative interviews with farmers, implementing partners and other programme stakeholders.

The results from this IE suggest that PICSA had a statistically significant and positive impact on building the adaptation capacity of lead farmers who face the risks of climate change and climate variability. In particular, LORTA found that 1 per cent more farmers started to use seasonal forecasts to plan farming decisions due to programme participation, 15 per cent more farmers started to make changes in crop activity and 3 per cent of farmers started to work less on other farms (a practice known as *ganyu*). Finally, the project analysis found a substantial increase in maize yields of around 350 kg per hectare, which represents an increase of 39.5 per cent over the control group mean. The LORTA analysis did not find significant impacts on food security as measured by food expenditures or the subjective measure of worrying about food shortage during the previous 30 days.

While the evaluation suffered from a range of challenges and limitations, which included data quality and inconsistencies across two waves of data – including measurement errors in self-reported crop yields, missing information and other limitations – this IE provides the first evidence of causal attribution that contributes to the literature on the adaptation programmes in the climate change domain.



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