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LEARNING-ORIENTED REAL-TIME IMPACT ASSESSMENT (LORTA) PROGRAMME

Inception Report - Phase I 2019

GREEN CLIMATE FUND
INDEPENDENT EVALUATION UNIT

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

INCEPTION REPORT – PHASE I 2019

2 October 2019

THE CENTER FOR EVALUATION AND DEVELOPMENT



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ABBREVIATIONS

AE	Accredited entity
ARAF	Acumen Resilient Agriculture Fund
C4ED	Center for Evaluation and Development
CABEI	Central American Bank for Economic Integration
CFF	Climate finance facility
CGIAR	Consultative Group on International Agricultural Research
DBSA	Development Bank of Southern Africa
DiD	Difference-in-differences
DRC	Democratic Republic of the Congo
EbA	Ecosystem-based adaptation
EBRD	European Bank for Reconstruction and Development
EE	Energy efficiency
FI	Financial institution
GCF	Green Climate Fund
GHG	Greenhouse gas
GMG	Green mini-grid
GWRS	Groundwater recharge system
IEU	Independent Evaluation Unit
IPP	Independent power producer
LD	Lean data
LFI	Local financial institution
LORTA	Learning-Oriented Real-Time Impact Assessment
MDES	Minimum detectable effect size
MFI	Microfinance institution
MoU	Memorandum of understanding
MSME	Micro, small and medium enterprises
MW	Megawatt
NDC	Nationally determined contribution
NGO	Non-governmental organization
PPP	Public–private partnership
PSM	Propensity score matching
RBP	Results-based payment
RCT	Randomized control trial
RDD	Regression discontinuity design
RE	Renewable energy

REDD+	Reducing emissions from deforestation and forest degradation
SMEs	Small and medium-sized enterprises
ToC	Theory of change

A. INTRODUCTION TO THE LORTA PROGRAMME

Evaluating the impact of development projects and programmes has gained importance in recent years. Impact evaluation allows for not only increased transparency by measuring outcomes but also the opportunity to design and implement development projects more effectively. To contribute to this end, the Independent Evaluation Unit (IEU) of the Green Climate Fund (GCF) started the Learning-Oriented Real-Time Impact Assessment (LORTA) programme in 2018.

The LORTA programme has the following aims:

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

The LORTA programme incorporates state-of-the-art approaches for impact evaluations to measure results and inform about the effectiveness and efficiency of GCF projects. The purpose of these impact evaluations is to measure the change in key result areas of the GCF that can be attributed to project activities. LORTA therefore uses theory-based counterfactual impact assessment (experimental or quasi-experimental) designs. Furthermore, LORTA employs mixed-method approaches that involve both quantitative and qualitative methods. The real-time measurement systems and qualitative data systems established for impact evaluation will help project teams measure progress in implementation and provide rapid lessons on the early progress of the projects.

LORTA is organized in three phases:

- Phase I – formative engagement and design: In 2018, the LORTA Design Workshop was held in Bangkok, Thailand. Out of 16 invited projects, 8 GCF-funded projects were selected to be part of LORTA. The IEU supported these eight projects to build high-quality, theory-based impact evaluation designs at inception. Formative work included engagement with project teams, accredited entities (AEs) and GCF staff, and designs for theory-based impact evaluations. In 2019, new projects will enter Phase I.
- Phase II – impact assessment: The second phase of LORTA will involve the main impact assessment stage (3–5 years) and include implementing measurement and tracking systems, collecting baseline and endline data (both qualitative and quantitative), and continuous monitoring for real-time learning. The eight GCF-funded projects from Phase I 2018 have transitioned into Phase II in 2019.
- Phase III – data analysis and feedback: The final stage will involve analysing baseline and endline data (both qualitative and quantitative), discussing results and engaging with diverse stakeholders to share results and incorporate feedback as required.

B. LORTA DESIGN WORKSHOP IN MANNHEIM, GERMANY

1. GENERAL REMARKS

The second LORTA Design Workshop was organized by the IEU and the Center for Evaluation and Development (C4ED). It took place from 15 to 17 April 2019, at the University of Mannheim, Germany. Participants were representatives from different divisions within the GCF, impact evaluation specialists from C4ED, evaluation specialists from other international organizations, representatives from the Consultative Group on International Agricultural Research (CGIAR) as well as representatives of AEs, implementing partners and project staff from 21 GCF-funded projects.

The aims of the workshop were manifold:

- Initiate possibilities for collaboration between all groups of participants
- Provide the opportunity for project representatives to critically discuss viable impact evaluation designs for their respective projects, under the guidance of experienced and qualified impact evaluation specialists
- Provide the opportunity for participants to further increase their knowledge about impact evaluations and their importance, learn from case studies and be introduced to different impact evaluation methods (especially randomized and quasi-experimental designs)
- Identify GCF-funded projects for which impact evaluation designs shall then be worked out in the remaining 2019 inception and engagement phase of the LORTA programme

The workshop consisted of different elements and capacity-building measures using various formats, such as keynote addresses, presentations, case studies and group work (for the full workshop agenda, please refer to Appendix I). Every workshop day started with a keynote address. The keynote's focus on Day 1 was on the power of impact evaluations and their implication for policy and development cooperation, on Day 2 it was strategies for engaging the private sector in impact evaluation, and on Day 3 it was the role of behavioural insights in impact evaluation. All keynote addresses gave inspiring inputs towards thinking in a creative way about measuring the impact of GCF interventions.

On Day 1, the keynote was followed by a presentation on impact evaluation methods, providing insights into experimental and non-experimental impact evaluation as well as mixed-method approaches.

Activities over the following days were a mix of further presentations and discussions in the plenary and a series of group work tasks. The presentations covered case studies tackling experimental and non-experimental evaluations as well as a study on implementation tracking and real-time monitoring. The latter was an innovation compared to the LORTA Design Workshop in 2018 and proved helpful to illustrate how real-time learning can be done in practice. The experience with LORTA of two GCF-funded projects involved in Phase I in 2018 was demonstrated by project representatives from Paraguay and Madagascar. The workshop participants used the opportunity to ask these representatives many questions about Phase I and the outlook for their involvement in LORTA in the future.

The workshop contained five group work sessions, which focused on the following topics:

1. Programme modalities and evaluation questions
2. Theory of change (ToC)
3. Evaluation methods
4. Costing – sample size and power calculations
5. Implementation and timeline

During these group work sessions, each group (except for one) contained representatives from two projects, resulting in 11 groups in total. Furthermore, each group contained impact evaluation designers – who provided guidance on the tasks, acted as group facilitators and in some cases took notes of the discussion – as well as a representative from the GCF Secretariat. There were two impact evaluation designers in each group, whereas there was only one in the first LORTA Design Workshop, in 2018. Some groups split up into subgroups, enabling each impact evaluation designer to focus on one project. In those groups that did not split up, having two designers was also helpful because it reduced their individual workloads for facilitating, guiding the discussion and taking

notes. The five topics of the group work sessions were briefly introduced in the plenary, after which the groups worked on applying the concepts to their own projects.

2. OUTCOMES OF THE GROUP WORK

The 11 groups worked on their tasks independently and with support from the two impact evaluation specialists, respectively. The outcomes of the group work on the above-mentioned five tasks for all 21 participating projects are summarized below and described in more detail in Appendix II. The corresponding ToC for each project can be found in Appendix III.

Group 1

A) FP003: Increasing resilience of ecosystems and communities through the restoration of the productive bases of salinized lands (Senegal)

This project started in 2016 and will last until 2020. It aims to reduce salinization of soils on 17,000 ha of land. A pilot project identified locally adapted plants and a technique to construct anti-salt dams, which both reduce the salinization of the soil. The project will provide training on these techniques to improve the farmers' capacity to adapt to climate change. A cluster randomized control trial (RCT) approach was recommended; however, the practical feasibility of randomization is highly unlikely.

B) FP053: Enhancing climate change adaptation in the North coast and Nile Delta Regions in Egypt

This project started in 2018 and will last for seven years. It aims to increase the resilience of vulnerable food-insecure and flood-prone fishing communities to climate variability through upgraded weather stations, capacity-building, and the delivery of more accurate and better-customized climate information. The interventions most suitable for impact evaluation are community consultations and nature-based barriers against inundation. For the former, a phased-in RCT approach was recommended; for the latter, a randomized approach was suggested, but it was unclear whether randomized phase-in was feasible for erecting the barriers. It also needs to be clarified whether a control group can be maintained for the community consultations.

Group 2

A) FP045: Ground water recharge and solar micro irrigation to ensure food security and enhance resilience in vulnerable tribal areas of Odisha

This project started in 2017 and has a lifespan of five years. The aim is to enhance groundwater recharge in community ponds through structural adaptation measures and use of solar pumps for micro irrigation. The final goal of these project components is to ensure water security and food security in vulnerable areas of the state of Odisha. The intervention most suitable for evaluation is the installation of a groundwater recharge system (GWRS) as a concrete adaptation measure to ensure groundwater conservation in 15 water-stressed districts of Odisha. Provided that the executing entity reconfirms the feasibility of randomization, a clustered phased-in RCT approach was recommended to evaluate the GWRS's impact on the communities' water levels (and quality).

B) FP058: Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities (Ethiopia)

This project started in 2017 and has a lifespan of five years. The aim is to increase the resilience of the targeted rural community to the adverse impacts of climate change, by introducing new approaches to water supply and management that are capable of increasing the productive capacity of the community and the carrying capacity of the natural water ecosystems. Out of several intervention components, the intervention most suitable for evaluation was considered the

construction of drilled wells and hand-dug wells, springs, community ponds, water reservoirs and water points across 66 Kebele.¹ Several options for an impact evaluation design were discussed. Nevertheless, an impact evaluation was not considered possible due to the lack of a budget for the collection of beneficiary-level data and also less buy-in from the AE.

Group 3

A) FP063: Promoting private sector investments in energy efficiency in the industrial sector in Paraguay

This project started in 2018 and will continue until 2023. The aims are to increase the productivity of small and medium enterprises (SMEs) and to contribute to greenhouse gas (GHG) emission reductions by investing in energy efficiency (EE) in the industrial sector in Paraguay. The project component most suitable for impact evaluation is the offer of new financial instruments to SMEs from pre-determined sectors in order to invest in EE. A difference-in-differences (DiD) design with propensity score matching (PSM) was proposed. However, the project representatives saw several caveats with impact evaluation, such as the time burden for the SMEs when they have to participate in surveys and the danger of losing potential customers by delaying loan payouts. An impact evaluation is therefore not considered feasible for the current project.

B) FP084: Enhancing climate resilience of India's coastal communities

This project started at the beginning of 2019 and has a lifespan of six years. It aims to enhance the climate resilience of coastal communities in India through an ecosystem-based, community-centred approach to adaptation. The intervention most suitable for evaluation is livelihood trainings that are supposed to lead to enhanced climate adaptive livelihoods and hence to enhanced adaptive capacity and resilience of vulnerable coastal communities. A DiD design with PSM was proposed. In order to find sufficiently comparable matches for the treatment group, the recommendation is to conduct the evaluation in the state of Odisha only, which has the highest within-state comparability according to the project team.

Group 4

A) FP073: Strengthening climate resilience of rural communities in Northern Rwanda

This project started in 2018 and will continue until 2024. It aims to strengthen the climate resilience of landscapes and communities through support for watershed protection, forest management, climate-resilient agriculture and the construction of low-carbon social housing for highly vulnerable households. A DiD with PSM design was recommended for the evaluation of the overall impact of the project. One or several complementary designs could be implemented to evaluate the respective effects of specific interventions (such as watershed protection and climate-resilient agriculture or sustainable forest management and more efficient use of wood for fuel). Experimental methods or a discontinuity regression approach using vulnerability rankings could be used whenever an activity is oversubscribed.

Group 5

A) FP087: Building livelihood resilience to climate change in the upper basins of Guatemala's highlands

This project started at the beginning of 2019 and has a lifespan of seven years. The aim is to reduce the impact of climate change on the hydrological cycle in targeted areas of the Guatemalan highlands through improved land-use practices. Training farmers on ecosystem-based adaptation

¹ Kebele refer to the lowest administrative unit in Ethiopia.

systems and establishing information flows to the population are the most suitable project components for evaluation because they have clearly defined target groups. For the former, a DiD design with PSM was proposed. For the latter, an RCT would enable rigorously testing which mode is the most effective for early warning information distribution to the remote and vulnerable communities.

B) FP089: Upscaling climate resilience measures in the dry corridor agroecosystems of El Salvador (RECLIMA)

This project started at the beginning of 2019 and has a lifespan of five years. It aims to improve the resilience to climate change of vulnerable farming households through an integrated landscape approach. The interventions most suitable for evaluation are the provision of inputs to and training of extension workers on adaptive land management practices and the construction of water storage and collection systems. Because these are targeted at the household level, the outcomes are more traceable. A phased-in RCT design was considered feasible. In the phasing in, municipalities will be entering the programme in different waves throughout the project timeline.

Group 6

A) FP093: Yeleen rural electrification project in Burkina Faso through a private sector driven Green Mini Grid model

The project commenced at the beginning of 2019 and has a lifespan of seven years. It aims to provide access to electricity to approximately 355,000 people and to reduce GHG emissions. Private developers are expected to build mini-grids in 100 rural localities and to operate, manage and maintain them. The rural localities were already selected, making randomized assignment to treatment impossible. The suggested impact evaluation design was therefore DiD with PSM. Comparison areas could be selected within the same regions where the project is implemented and with the use of criteria that were also applied to select the treatment areas. A major constraint is that the project only budgeted for traditional monitoring and evaluation activities, without planning an extra budget for impact evaluation.

B) FP102: Mali solar rural electrification project

The project has not yet started. It will start in July 2019 and last for five years. The aim is to provide access to electricity to approximately 28,300 households in 70 localities of rural Mali, to substitute clean energy for imported fossil fuels and to reduce GHG emissions. Given that target areas were already selected, the suggested impact evaluation design was DiD with PSM. Fifty villages where the project is to be implemented had been selected from a pre-identified list of 300 villages. How this selection was made remained unclear, and any identification of a comparison group on the remaining list was therefore highly speculative. Although project representatives assured they have leeway to negotiate extra budget for impact evaluation, it is not possible to design a high-quality impact evaluation in the given setting.

Group 7

A) SAP001: Improving rangeland and ecosystem management practices of smallholder farmers under conditions of climate change in Sesfontein, Fransfontein, and Warmquelle areas of the Republic of Namibia

This programme started in 2018 and will continue until 2023. The aim of the programme is to strengthen the adaptive capacity of smallholder farmers through promotion of drought-tolerant livelihoods. The intervention most suitable for evaluation is rangeland management practices – in particular, hydroponic fodder production and supply, which seems to be an innovative element to reduce overgrazing. It was agreed that an RCT can be used because project funds are not sufficient

to provide benefits (in particular, fodder) for all farmers in the region. However, there is insufficient budget for the data collection for the impact evaluation.

B) FP100: REDD+ results-based payments for results achieved by Brazil in the Amazon biome in 2014 and 2015

The GCF investment is a payment for an equivalent of 2 per cent of the REDD+ mitigation results achieved by Brazil between 2014 and 2015. The payment will contribute to the implementation of the forest sector actions of the nationally determined contribution (NDC) for Brazil. The intervention most suitable for evaluation is the implementation of the Floresta+ pilot programme in the Brazilian Legal Amazon through payments to smallholder farmers for forest conservation and forest recovery. Although several options were discussed, a rigorous impact assessment that focuses on the effects of Floresta+ on legally compliant farmers is challenging since a credible control group is highly unlikely to be identified.

Group 8

A) FP039: GCF–EBRD Egypt renewable energy financing framework

This programme will start in the second half of 2019 and continue for three years. The aim of the programme is to support the Government of Egypt in achieving its renewable energy (RE) penetration goal by having 20 per cent of electricity consumption sourced from RE. The first component aims at enhancing RE integration, policies and planning, while the second component has the goal to scale up RE investments (by financing 8–12 individual projects). Given that the RE produced by the projects is integrated into the national grid, it is difficult to divide the population into a sample of beneficiaries and control group. Thus, impact evaluation is not possible due to the lack of a comparable control group.

B) FP104: Nigeria solar IPP support programme

This programme starts in 2019 and lasts for three years. The aim of the programme is to catalyse the delivery of approximately 400 megawatts (MW) of renewable power through the successful financing, construction and operation of three to five selected solar power projects in Nigeria. It was identified as interesting to evaluate the impact of financing independent power producer (IPP) solar projects on increased access to electricity of households and businesses in the northern parts of Nigeria. The design suggested is DiD with PSM. However, finding a comparable control group is a large challenge.

Group 9

A) FP047: GCF–EBRD Kazakhstan renewables framework

This programme started in 2017, lasts for five years and aims to create a sustainable market for RE and to increase the usage of RE in the country. It has two components: building power plants and an auction system. The main problem for identifying a suitable impact evaluation design for the power plants was small sample size – that is, the small number of sites covered within the programme. Another problem was the selection of sites. One idea suggested by the impact evaluation specialists was to use regression discontinuity design (RDD). Furthermore, possibilities for impact evaluation for an auction system were discussed, but no feasible and rigorous option was encountered.

B) FP098: DBSA Climate Finance Facility (CFF)

This programme started in 2018 and has a lifespan of five years. It aims to provide projects related to the mitigation of and the adaptation to climate change with the required funding. Projects from four southern African countries will be able to apply for the CFF on a rolling basis, with about 25 projects selected each year. The programme ultimately aims at supporting the emergence of a market for financial products for climate-related projects, thereby facilitating additional GHG

emissions reductions in the long term. As randomization was not considered possible, a variety of the DiD approach was determined to be the most suitable evaluation design for this programme. The chosen design differs from the classical DiD in that the treatment occurs at multiple points in time because applications from the projects are accepted on a rolling basis. The impact evaluation design for this project can be developed with additional considerations on a potentially limited sample size.

Group 10

A) FP080: Zambia renewable energy financing framework

This programme started in 2018 and will last until 2023. It aims to increase access to RE provision by providing finance for six RE projects. Furthermore, the programme aims to facilitate capacity-building and enable a policy framework for further RE projects. The Government of Zambia had already completed the tendering process for the IPPs that would construct the six RE projects. The successful bidders will sell the energy they produce to the national utility at previously agreed tariffs. This energy will then be part of the national grid. It quickly became clear that a rigorous impact evaluation would be difficult, if not impossible, with this kind of programme.

B) FP096: Democratic Republic of the Congo (DRC) Green Mini-Grid Programme

This programme started in 2019 and will last for five years. It aims to increase access to and productive use of energy by providing finance for three solar power plants, to replace fossil-fuel use with RE sources, to facilitate capacity-building and to enable a policy framework for further green mini-grid projects in the DRC. The intervention most suitable for evaluation is the co-financing for three mini-grid projects in the towns of Isiro, Bumba and Genema, each consisting of a solar hybrid power plant of 5–10 MW, battery storage and an associated distribution network. Given that the three towns where the mini-grids will be set up were already selected, no experimental design seems feasible. However, a quasi-experimental design based on DiD combined with PSM is an option. The remaining towns on a shortlist from which the three target towns had been selected and/or any other suitable towns could serve as a comparison group.

Group 11

A) FP097: Productive investment initiative for adaptation to climate change (CAMBio II)

This programme will commence in 2019 and has a lifespan of five years. The aim is to increase the resilience to climate change of micro, small and medium enterprises (MSMEs) in Central America by removing barriers to access to financial and non-financial services for adopting and implementing adaptation measures. The interventions most suitable for evaluation are adaptation loans and an incentive scheme to promote the implementation of adaptation measures. During the group work, it became clear that the selection of potential beneficiary MSMEs will be highly purposive. Three main potential impact evaluation designs were discussed: for the adaptation loans, an RDD comparing eligible MSMEs on either side of the credit assignment threshold and, alternatively, a DiD design comparing beneficiary MSMEs to non-beneficiary MSMEs; for the incentive scheme, an RCT exploiting the randomization of incentive scheme assignment or the type of incentive scheme.

B) FP078: Acumen Resilient Agriculture Fund (ARAF)

This programme started in 2018 and will last for 12 years. It aims to increase the climate resilience of smallholder farmers in East Africa, Ghana and Nigeria, while providing Acumen investors with risk-adjusted market returns. The intervention most suitable for evaluation is the equity funding to 15 agribusinesses to help smallholder farmers become more resilient to climate change. This intervention directly targets the end beneficiaries of the Acumen project – that is, the smallholder farmers. The project representative expressed interest in proposing to selected investees a robust

impact evaluation of one or a few funded projects. The workshop discussions revolved around examples of randomized assignment of villages/farmer groups or programme components.

3. PROJECT SELECTION

The 21 projects were assessed to determine their eligibility for LORTA by taking into account the following strategic criteria and guiding principles:

- **Buy-in from AE:** Project selection takes into account the commitment of the AE to conduct a theory-based, rigorous impact evaluation. Support from the AE and the project team is essential during all phases of LORTA.
- **Budget:** The project needs to be aware of the budget implications of an impact evaluation and be willing to make sufficient budget available to conduct a data collection of a representative scope.
- **Focus on private sector:** The LORTA Phase I 2019 especially encourages the inclusion of private sector projects.
- **Regional representation:** The selected projects should be regionally representative of the GCF portfolio.

Directly after the LORTA Design Workshop in Mannheim, staff members of the IEU and C4ED, as well as other impact evaluation experts, held a meeting to discuss the evaluability and emerging impact evaluation designs of the 21 projects. Following the workshop, the IEU consulted with relevant divisions of the GCF Secretariat to build consensus regarding the most appropriate and eligible projects for the LORTA programme against the criteria above. Each division brought invaluable insight into the projects' details and the broader dynamics within the GCF. Staff members of the GCF echoed the keen interest expressed by workshop participants and conveyed their continued support for the LORTA programme moving forward. Discussions from these consultations were synthesized to inform the final deliberation of shortlisted projects.

Nine projects were considered to be eligible for LORTA:

1. FP045: Ground water recharge and solar micro irrigation to ensure food security and enhance resilience in vulnerable tribal areas of Odisha
2. FP073: Strengthening climate resilience of rural communities in Northern Rwanda
3. FP078: Acumen Resilient Agriculture Fund (ARAF)
4. FP084: Enhancing climate resilience of India's coastal communities
5. FP087: Building livelihood resilience to climate change in the upper basins of Guatemala's highlands
6. FP089: Upscaling climate resilience measures in the dry corridor agroecosystems of El Salvador (RECLIMA)
7. FP096: Democratic Republic of the Congo (DRC) Green Mini-Grid Programme
8. FP097: Productive investment initiative for adaptation to climate change (CAMBio II)
9. FP098: DBSA Climate Finance Facility (CFF)

The AEs of these projects were informed that the projects had been selected to be part of the LORTA programme. They received a memorandum of understanding (MoU), which they were requested to sign. The MoU lays out the intention of the collaboration between the IEU and the AE, and sets forth its objectives, the scope and the terms. While the IEU commits to provide technical support, advisory and quality control for the impact evaluation, the AE commits to actively engage, collaborate and work closely with the IEU throughout the evaluation, comply with timelines and quality standards, allocate the necessary budget for data collection and give the IEU the right to access and use all data collected during the impact evaluation.

The responses and signed MoUs from the projects are still being received. The confirmed project list for LORTA Phase I 2019 is expected to be finalized by July 2019.

C. WAY FORWARD

1. ENGAGEMENT WITH STAKEHOLDERS AND FORMATIVE WORK

For each of the selected projects, an evaluation team will be formed consisting of two impact evaluation specialists from C4ED and one IEU staff member per project. For selected projects, researchers from the CGIAR network will support the evaluation teams. They will either serve as resource persons remotely or join a field mission. The task of the evaluation teams will be to engage closely with key stakeholders of the projects – namely, nationally designated authorities, AEs, implementing agencies, project staff and potential end beneficiaries – to ensure their interest in, understanding of and sense of ownership for the planned theory-based impact evaluations.

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

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

2. REPORTS

C4ED will produce an impact evaluation design report for each of the selected GCF-funded projects. These reports will include a justified, relevant empirical strategy on the measurement of causal change, including potential challenges and an implementation tracking and measurement framework, agreed upon by the evaluation team and key stakeholders. The impact evaluation design report will consist of a detailed ToC, feasibility considerations, evaluation design, implementation tracking and real-time measurement system, calculated sample size, timeline and budget. The reports will be submitted approximately 3–4 weeks after field missions took place (please refer to Section **Error! Reference source not found.** below for a preliminary timeline, which will be updated once more information on timing is known).

C4ED will also write a synthesis report, which will inform about the status quo of the field visits and formative work as well as general lessons learned during LORTA Phase I 2019.

3. TIMELINE

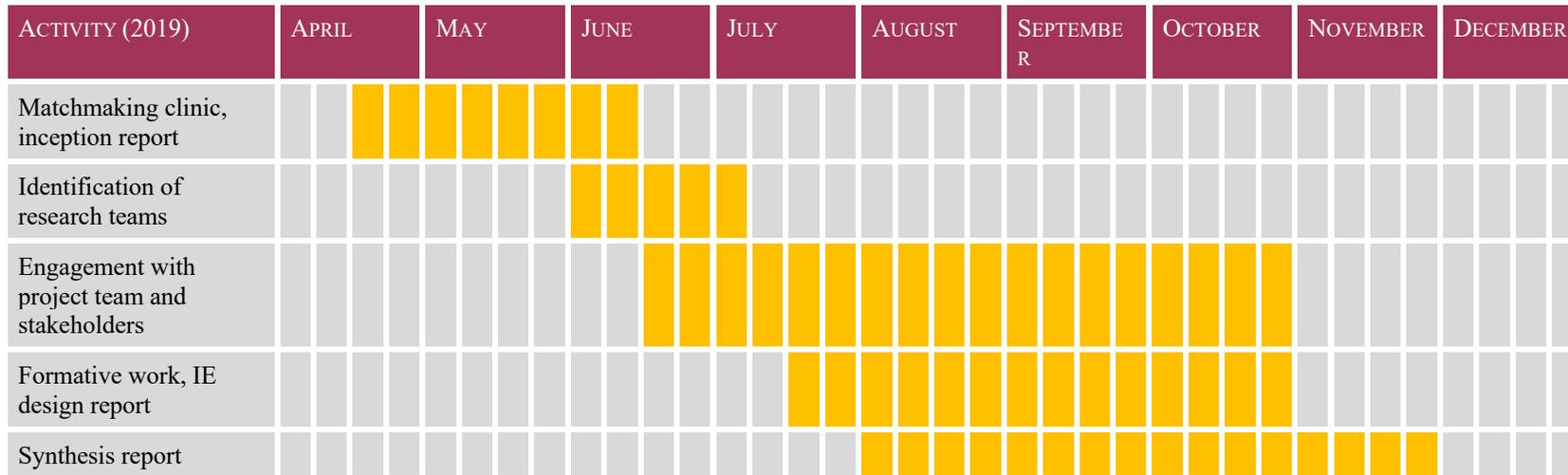


Figure A - 1. Timeline for inception phase (Phase I)

APPENDIX 1. LORTA DESIGN WORKSHOP AGENDA



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Learning-Oriented Real-Time Impact Assessment

Design Workshop

Independent Evaluation Unit (IEU) of the Green Climate Fund (GCF)

April 15 – 17, 2019 | Mannheim, Germany

University of Mannheim

Schloss, 68131 Mannheim, East Wing (main entrance), Germany

AGENDA

Day 1

Monday, 15/04/2019

Time	Agenda
07:30 - 08:00 <i>Lobby</i>	Briefing for the chairs, discussants and presenters of Day 1
08:00 – 08:45 <i>Lobby</i>	Water and coffee Participant check-in Project Teams should prepare their posters for display at this time as well.
08:45 – 09:30 <i>Main Hall</i>	Setting the Stage: Welcome speech of Solomon Asfaw, GCF-IEU Welcome speech of Markus Frölich, C4ED Objectives of workshop and introductions <i>Presenter: Solomon Asfaw, GCF-IEU</i>
09:30 – 10:15 <i>Main Hall</i>	Keynote: The power of impact evaluation - implications for policy and development cooperation <i>Presenter: Joerg Faust, DEval</i> <i>Chair: Solomon Asfaw, GCF-IEU</i>
10:15 – 11:15 <i>Main Hall</i>	Impact Evaluation Methods: <i>Experimental and non-experimental impact evaluation;</i> <i>Mixed-method approaches</i> <i>Presenter: Jo Puri, GCF-IEU</i> <i>Chair: Alexandra Avdeenko, C4ED</i>
11:15 – 11:30 <i>Lobby</i>	Coffee break
11:30 – 11:40 <i>Main Hall</i>	Plenary: Introduction to Group Work Clinic & Task 1 - Guidance provided to everyone in plenary. <i>Chair: Markus Olapade, C4ED</i>
11:40 – 13:00 <i>Breakout rooms</i>	Task 1: Program Modalities & Evaluation Questions
13:00 – 14:00 <i>Dining area</i>	Lunch
14:00 – 14:10 <i>Main Hall</i>	Plenary: Introduction to Task 2 <i>Chair: Susan Steiner, C4ED</i>
14:10 – 15:15 <i>Breakout rooms</i>	Task 2: Theories of Change

Time	Agenda
15:15 - 15:30 <i>Dining area</i>	Coffee Break
15:30 – 16:45 <i>Main Hall</i>	Poster Presentation <i>Project Teams will briefly present on their posters</i> Chair: Pierre Telep, GCF-DMA and Johann Elysee, GCF-OPM
16:45 – 17:30 <i>Main Hall</i>	Case Studies: Experimental & Non-experimental Evaluation <i>Presenter: Dean Karlan, Northwestern University</i> Chair: Babatunde Abidoye, UNDP
17:30 - 18:00 <i>Main Hall</i>	Day 1 Closing Remarks <i>Debrief</i> Chair: Solomon and Fatima, GCF-IEU
18:00-19:00 <i>Main Hall</i>	Teamwork on Task 1 -2 before the final presentation on Day 3 Please use " Group Presentation Template 2019.ppt"
19:00 - 22:00 Restaurant	Opening Dinner Venue: Rheinterrassen (Gasthaus am fluss) Rheinpromenade 15, 68163 Mannheim Tel: +49 621 8335017

Day 2

Tuesday, 16/04/2019

Time	Agenda
08:30 - 09:00 <i>Lobby</i>	Briefing for the chairs, discussants and presenters of Day 2
09:00 – 09:15 <i>Main Hall</i>	Recap of Day 1 Chair: Jo Puri, GCF-IEU
09:15 – 10:00 <i>Main Hall</i>	An Opportunity to Lead: Strategies for Engaging the Private Sector in Impact Evaluation <i>Speaker: Edward Jackson, University of Ottawa & IDS</i> Chair: Solomon Asfaw, GCF-IEU & Elie Aloko, GCF-PSF
10:00 – 10:10 <i>Main Hall</i>	Plenary: Introduction to Task 3 <i>Chair: Nathan Fiala, GCF-IEU & University of Connecticut</i>
10:10 – 11:30 <i>Breakout Rooms</i>	Task 3: Evaluation Designs
11:30 – 11:45 <i>Dining area</i>	Coffee break
11:45 – 12:05 <i>Main Hall</i>	Plenary: Introduction to Task 4 <i>Presenter: Jo Puri, GCF-IEU</i>
12:05 – 13:00 <i>Breakout rooms</i>	Task 4: Costing – Sample Size and Power Calculations
13:00 – 14:00 <i>Dining area</i>	Lunch
14:00 - 14:30 <i>Main Hall</i>	Plenary: The real time monitoring/implementation tracking in Zambia <i>Presenter: Markus Frölich, C4ED</i> Chair: Silvio Daidone, FAO

Time	Agenda
14:30 – 14:40 <i>Main Hall</i>	Plenary: Introduction to Task 5 Chair: Atika Pasha, C4ED
14:40 – 16:00 <i>Breakout Rooms</i>	Working Coffee break Task 5: Implementation and Timelining
16:00 – 17:30 <i>Main Hall</i>	What are we learning? Paraguay and Madagascar pilot phase <i>Discussants: Nathan Fiala, ZoLalaina Rakotobe, Rebecca Toole, Rafael GonzalezBordón</i> Chair: Janie Rioux, GCF
17:30 - 18:00 <i>Main Hall</i>	Day 2 Closing remarks Debrief Chair: Solomon Asfaw, GCF-IEU
18:00 ~	Teamwork on Task 3 -5 before the final presentation on Day 3

Day 3

Wednesday, 17/04/2019

Time	Agenda
8:30 - 09:00 <i>Lobby</i>	Briefing for the chairs, discussants and presenters of Day 3
09:00 – 09:10 <i>Main Hall</i>	Recap of Day 2 Chair: Solomon Asfaw, GCF-IEU
09:10 - 09:45 <i>Main Hall</i>	Evaluation for Humans: Why Behavior Matters? <i>Presenter: Elspeth Kirkman, The Behavioral Insights</i> Chair: Arne Weiss, C4ED
09:45 – 11:45 <i>Main Hall</i>	Presentation of Group Results Chair: Amy Duchelle & Lini Wollenberg, CGIAR
11:45 – 12:45 <i>Main Hall</i>	Synthesis, Operational Framework and Roadmap MOU presentation and discussion <i>Presenter: Jo Puri and Markus Frölich, GCF-IEU & C4ED</i>
12:45 – 13:15 <i>Main Hall</i>	Open Questions and Discussion
13:15 – 13:30 <i>Main Hall</i>	Close of session
13:30 – 14:30 <i>Dining area</i>	Lunch

Note:

<i>Lobby:</i>	Lobby in the University of Mannheim near Main Hall
<i>Main Hall:</i>	Main auditorium for plenary sessions, University of Mannheim (EW 045: Ehrenhof)
<i>Breakout rooms:</i>	Rooms for groupwork on Tasks 1-5, University of Mannheim (EW 156 and EW 154)
<i>Dining area</i>	Hall on the same level as the break out rooms

APPENDIX 2. OUTCOMES FROM GROUP WORK

GROUP 1.A) “INCREASING RESILIENCE OF ECOSYSTEMS AND COMMUNITIES THROUGH THE RESTORATION OF THE PRODUCTIVE BASES OF SALINIZED LANDS (SENEGAL)” (FP003)

GCF grant: USD 7.6 million

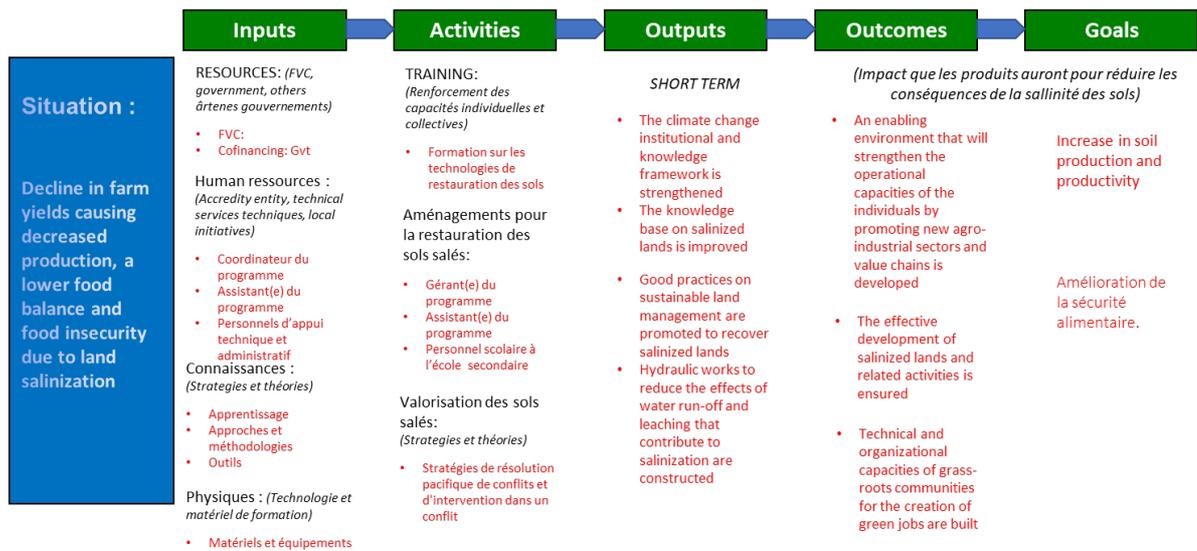
Goal: To improve knowledge on salinized lands, develop adequate responses through the adoption and dissemination of appropriate technologies and improve the living conditions of the worst-hit local communities

Task 1: Programme modalities & evaluation questions

- Overall timeline: 4 years, 02/2016–02/2020
- Main interventions:
 - Project Components:
 - + Component 1: Strengthening individual and institutional capacities for improved land management to reduce salinization
 - + Component 2: Improving productivity of agricultural, pastoral and forest lands
 - + Component 3: Enhancing the resilience of grass-roots communities through the socioeconomic valorization of salinized lands
 - To address the problem of land salinization, the project envisions – through the provision of information and training, and the raising of awareness – to (a) improve knowledge on the phenomenon; (b) promote the adoption and dissemination of appropriate technologies; and (c) encourage the broad participation of beneficiaries (populations and local authorities).
 - A pilot project identified locally adapted plants and a technique to construct anti-salt dams, which both reduce the salinization of the soil. The project will introduce these techniques and provide training on them to improve the farmers’ capacity to adapt to climate change.
- Intervention most suitable for evaluation:
 - Training in soil restoration techniques:
 - + To address the anthropogenic causes of land degradation, producers will need more innovative and more appropriate techniques that will be disseminated by the project. In total, 1,000 producers selected from the cooperatives will benefit from this training.
- Targeted beneficiaries:
 - Farm households
- Evaluation question:
 - Can training in soil restoration techniques improve food security?

Task 2: Theory of change (ToC)

Overall, the ToC is well articulated.



Task 3: Evaluation method

- **Evaluation strategy:**
 - A cluster RCT approach was recommended.
- **Potential treatment arms:**
 - Treatment arm: Training in soil restoration techniques
 - Control group: No training
- **Caveats:**
 - It is unclear whether randomization can be implemented.

Task 4: Costing – sample size and power calculations

Not known yet.

Task 5: Implementation and timelining

Not known yet.

GROUP 1.B) “ENHANCING CLIMATE CHANGE ADAPTATION IN THE NORTH COAST AND NILE DELTA REGIONS IN EGYPT” (FP053)

GCF grant: USD 31.4 million

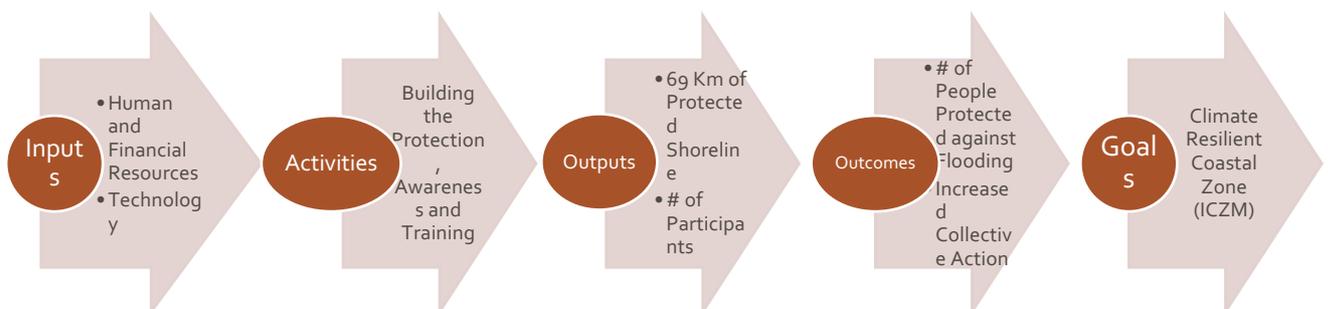
Goal: To increase resilience to climate variability through upgraded weather stations, capacity-building and the delivery of more accurate and better-customized climate information to vulnerable food-insecure and flood-prone fishing communities

Task 1: Programme Modalities & Evaluation Questions

- **Overall timeline:** 7 years, 01/2018–12/2024
- **Main interventions:**
 - Soft coastal protection (pre-construction) detailed designs and site-specific assessments undertaken for protecting 69 km of the Nile Delta in five vulnerable hotspot locations, construction of coastal soft protection structures at the five vulnerable hotspot locations and development and implementation of an operations & maintenance programme for the installed soft protection structures (nature-based barriers)
 - Development of an integrated coastal zone management plan for the entire North Coast (including capacity-building components)
- **Interventions most suitable for evaluation:**
 - Nature-based barriers against inundation
 - Community consultations
- **Targeted beneficiaries:**
 - Coastal communities: beneficiaries are selected based on exposure to sea level rise impacts in five hotspot areas in the Nile Delta.
- **Evaluation questions:**
 - Do nature-based barriers affect beneficiaries’ behaviour or attitudes towards risk?
 - Can community consultations with local stakeholders improve coastal management?

Task 2: Theory of change

Overall, the ToC is well articulated.



- Resistance to change (engineers not willing to use soft structures)
- Business pressure against ICZM
- Collective action in ICZM can be too time-consuming (coordination)

Task 3: Evaluation Method

Evaluation strategy: A phased-in RCT approach was recommended to evaluate the effectiveness of the coastal barriers. A randomized approach was suggested to assess the effectiveness of community consultations.

- Potential treatment arms:
 - Treatment 1: nature-based barriers
 - Treatment 2: nature-based barriers + community consultation meetings
 - Control group: no treatment
- Caveats:
- It is unclear whether randomized phase-in is feasible for erecting the barriers. It is unclear whether a control group can be maintained for the community consultations.

Task 4: Costing – sample size and power calculations

- GIS data on topography, villages, infrastructure
- Household survey on security and meetings to measure security against sea-level-rise impacts and participation in integrated coastal zone management
- Total number of direct beneficiaries is approx. 800,000; sample size needs to be determined

Task 5: Implementation and timelining

Activity	Year 2 :		Year 3 : 2020				Year 4 : 2021				Year 5: 2022				Year 6 : 2023				Year 7 : 2024				End :	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Phase I																								
Formation of core team	■																							
Review of documentation	■																							
Evaluation strategy and design	■																							
Phase II																								
Implementation of interventions																								
Preparation work	■	■	■	■	■	■																		
Construction	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Data collection																								
Monitoring																								
Baseline	■	■																						
Endline																						■	■	■
Data analysis								■			■			■			■			■			■	■
Reporting								■			■			■			■			■			■	■
Dissemination of results														■									■	■

GROUP 2.A) “GROUND WATER RECHARGE AND SOLAR MICRO IRRIGATION TO ENSURE FOOD SECURITY AND ENHANCE RESILIENCE IN VULNERABLE TRIBAL AREAS OF ODISHA” (FP045)

GCF grant: USD 34.4 million

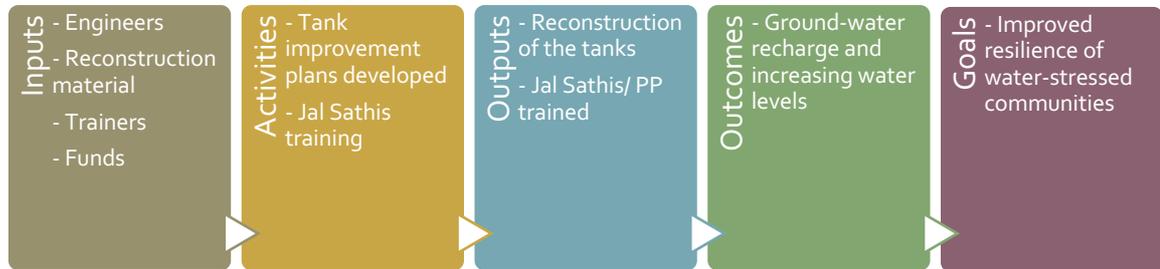
Goal: To enhance groundwater recharge in the community ponds through structural adaptation measures and use of solar pumps for micro irrigation to ensure water security and food security in the vulnerable areas of the state

Task 1: Programme modalities & evaluation questions

- Overall timeline: 5 years, 2017–2021
- Main interventions:
 - Installation of GWRS in 10,000 tanks as a concrete adaptation measure to ensure groundwater conservation in 15 water-stressed districts of Odisha state
 - Installation of 1,000 solar pumps (10 per cent of tank villages) in the pilot locations as part of a low-emission, climate-resilient crop-planning strategy
 - Capacity-building plans for livelihood support systems (training of jal sathis and pani panchayats) for water users and landless in the tanks command to build resilience
 - Establish a quality monitoring system for groundwater governance to create a knowledge base for enabling policy and regulatory framework for market transformation
- Intervention most suitable for evaluation:
 - Installation of GWRS in 10,000 tanks as a concrete adaptation measure to ensure groundwater conservation in 15 water-stressed districts of Odisha state
- Targeted beneficiaries:
 - The project will directly impact a vulnerable population of 5.2 million, of which half are females. The beneficiaries account for 12 per cent of the entire population of the state. Nearly all of these beneficiaries are households of scheduled castes / scheduled tribes (1.54 million households).
- Evaluation question:
 - What is the effect of the installation of the GWRS on the water levels and water quality in these villages/communities?

Task 2: Theory of change

The existing ToC of the project was designed as a single causal chain including all the various components at different stages, implying a slightly chaotic structure, and assuming that the synergetic nature of the delivery of each output is maintained. The key evaluation questions were not in line with any proper impact evaluation, and therefore these needed to be rephrased or developed anew. The outputs that were identified by the project team were often confused with outcomes, and therefore three out of the total seven outputs were categorized as outcomes during the group work.



No barriers (institutional, financial, etc.) were identified within the ToC. The following barriers and bottlenecks were additionally raised as part of the discussion of the ToC for the project:

- The reconstruction of the tanks heavily relies on the rural employment scheme in the region and other infrastructure-related activities might delay or completely halt the installation of the GWRS. Therefore, the roll-out of the implementation might not be in line with the yearly plan and might shorten the length between the roll-out of the first 3,000 and last 3,000 tanks.
- The training of the jal sathis relies on enough capable farmers being available and willing to join the pani panchayat in the first place.
- The vulnerable farmers are unable to collect enough funds to be able to buy the solar pumps, especially since the pump enables irrigation for up to 5 hectares, or 10 farmers' land. The idea was then to target women's self-help groups, to reach not only the more vulnerable groups of individuals but also a group that collectively can gather enough funds.
- Similarly, the crops and seeds that are to be encouraged as part of the water budgeting are not within the financial means of farmers; therefore, the project should ensure that the water-budgeting plan can be implemented in a subsidized or sustainable manner. This will help prevent overuse of water that is now more easily available to the farmers.
- The marketing of the grains was another concern, given that the development of the value chain might be slower than the first few cycles of harvest. This might again imply that farmers rely on the old market value chains and revert back to the old harvest.

Task 3: Evaluation method

A clustered phased-in RCT approach was recommended to evaluate the GWRS's impact on the community water levels (and quality).

Currently the plan for the implementation of the intervention (10,000 tanks in total) is staggered (see Task 5). As a result, we can consider the first 3,000 as the treatment tanks and 3,000 of the final 3,500 in 2023 as the comparison group. The implementation already allows for a clean randomization design across the 15 implementing districts. At this stage all approximate locations of the 10,000 tanks (that will be improved) have already been geo-tagged. However, precisely where the tanks are located and what particular improvements each tank would require is not known, and therefore there are no "more vulnerable" categories that will be improved first or last. Also, the

possibility that selection is based on political will is unlikely (and not only because the exact location of the tank is not clear).

Nonetheless, the possibility of geographical clustering of the implementation of the tanks (within each district) could still arise. Even if there was no geographical clustering in implementation, since the water levels in one tank might influence the water levels in another tank, a cluster RCT (10 tanks per cluster, discounting attrition) was suggested. It is still unclear what geographical area could serve as a cluster.

- Caveats:
- The cluster RCT design needs to be clarified with the executing entity, to ensure that there is no “cross-cluster” implementation that would lead to contamination. This should not be a problem as long as there is a decent number of clusters that are still untouched. The larger comparison group (50 clusters additional to the treatment clusters) as well as the clustering based on geographical proximity (in case there is lazy implementation) were additional considerations that might mitigate this issue to some extent.
- Access to the monitoring data collected on each of these tanks is important to be able to establish the final outcomes after two years, to be able to compare to the baseline at the start of the project.
- Two years (two rain cycles) is the minimum time required for establishing impact for the outcomes. Droughts are a concern in being able to replenish the groundwater levels (and thereby credibly measure impact) in these communities, since implementation in the control group will take place after two years.

Task 4: Costing – Sample Size and Power Calculations

There will be no evaluation baseline for the comparison group, since the project’s baseline data collection will take place right before implementation (i.e. in early 2022 for the comparison group). This implies that the evaluation can only be done on indicators that are likely to be collected in the baseline tank survey, or as part of the monitoring/auditing of the project (both of which have already been budgeted), since there is a very small provision for external evaluation in the overall project budget. The indicator that was considered most appropriate to indicate impact was the rise in water level. Since these data will be collected as part of the project activity anyway, there will be no additional funds required for this evaluation.

It is important to note that no beneficiary-level data will be collected.

The power calculations indicate that a total of 5,460 tanks (2,730 per group, 182 clusters each = 384 clusters total) will be required for achieving 90 per cent power. The assumptions used to derive these numbers are as follows:

- Current target for increase in water level is 0.5 metres (from 2.5 to 3 metres) ~ 20 per cent increase.
- With 2.5 m standard deviation, we achieve a minimum detectable effect size (MDES) of 0.2.
- We assume an intra-cluster correlation of 0.3.
- The proportion treated is 50 per cent; that is, our treatment and control groups are equal in the overall sample.
- The average cluster size is assumed as 10, where we account for 30 per cent attrition (15 per cluster).

If we were to reduce the power to 80 per cent, the number of required observations would shrink to 4,080 (2,040 per group, 136 clusters each = 272 clusters total).

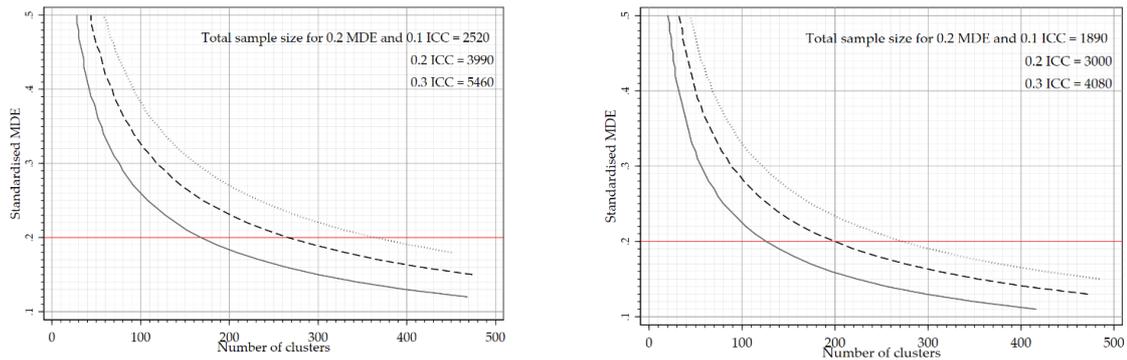


Figure A - 2. Power in graph 1 = 90 per cent and graph 2 = 80 per cent

Task 5: Implementation and timelining

The implementation was planned to start in June, but due to a change in the executing entity this will be delayed by a minimum of six months. As soon as the new executing entity is confirmed and approved by the GCF, the implementation can start in all 15 districts. In the first year, GWRSS are to be installed in 3,000 tanks, followed by 3,500 tanks in 2021 and the final 3,500 tanks in 2022. The midline evaluation is potentially planned for March 2022 (accounting for current delays due to change in executing entity), and the final evaluation is planned for March 2025.

The following timeline was developed, keeping in mind the delays on account of the changes in the executing entity. These timelines are bound to change depending on further delay in establishing the executing entity.

DATES	ACTIVITIES
September/October 2019	Start of project implementation
March/April 2022	Midterm / interim evaluation (2.5 years after a project starts)
September/October 2024	Project completion (5 years after a project starts)
May/June 2025	Final evaluation (6 months after a project completion)

GROUP 2.B) “RESPONDING TO THE INCREASING RISK OF DROUGHT: BUILDING GENDER-RESPONSIVE RESILIENCE OF THE MOST VULNERABLE COMMUNITIES (ETHIOPIA)” (FP058)

GCF grant: USD 45 million

Goal: To increase resilience of the targeted rural community to the adverse impacts of climate change, by introducing new approaches to water supply and management that are capable of increasing the productive capacity of the community and the carrying capacity of the natural water ecosystems

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 5 years, 08/2017–09/2022
- Main interventions:
 - Construction of 112 drilled wells and 80 hand-dug wells, 30 springs, 31 community ponds, 30 water reservoirs and 30 water points across the 66 Kebele (villages) targeted
 - Implementation of groundwater monitoring systems in 44 wells
 - Use of solar-powered pumps in the 112 drilled wells
 - 7,850 ha of land will be rehabilitated and managed, of which 5,000 ha shall be reforested
 - Implementation of small-scale irrigation systems covering an area of 5,421 ha (and 10,842 households)
- Intervention most suitable for evaluation:
 - Construction of 112 drilled wells and 80 hand-dug wells, 30 springs, 31 community ponds, 30 water reservoirs and 30 water points across 66 Kebele
- Targeted beneficiaries:
 - The project aims to benefit 330,000 people (direct beneficiaries), 30 per cent of which are women-headed households, across 22 districts (Woreda) and 66 villages (Kebele).
- Evaluation question:
 - What is the effect of the improvement in the water system on the area of land irrigated?

Task 2: Theory of change

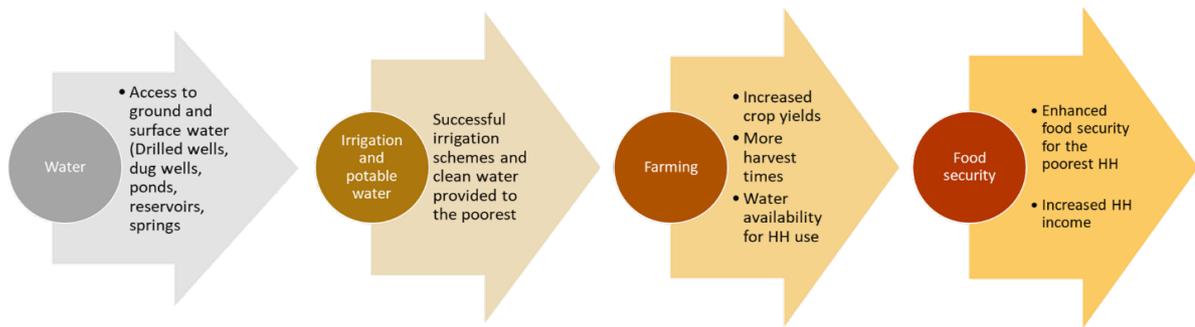
The ToC described the causal chain to lead to two final outcomes: enhanced food security for the poorest households and an increase in households’ income, both of which in turn would improve their climate change resilience. To ensure the fulfilment of these goals, the targeted outcomes were related to access to clean water. Therefore, the successful implementation of the water supply and management activities would lead to increased crop yields, longer and more frequent harvest times, and improved water availability for the households. The inputs and activities that would be undertaken to ensure these outcomes and the preceding outputs (number of water structures – i.e. wells, springs, reservoirs, ponds, etc. – constructed and irrigation system) would be the drilling activities (procurement of work equipment and machines), solar pump systems, irrigation structures and the provision of manpower associated with these.

There are, however, several assumptions that are critical in the fulfilment of these outcomes and goals. Impacts will depend on proximity of households to water, whether they are farmers with landholdings, and the amount of water available. They are also contingent on the extension agents being available and their adequate capacity-building.

Additional bottlenecks were identified along the causal chain:

- Drilling success rate: where to drill to ensure water for irrigation
- Target and reach the poorest and women-headed households

- Enable sustainable water use among water users' association



Task 3: Evaluation method

The impact evaluation designers discussed several options for an impact evaluation design, but these were all assessed to be unfeasible. The primary reason for this was that there is no budget available for the collection of beneficiary-level data. This implies that our units of observation would be the Kebele, with a maximum sample size of 176 (control and treatment together). This information was conveyed during the costing session, which was much later in the workshop and therefore certain designs had already been discussed. Additional reasons for rejecting each of the discussed designs are provided below.

- Option 1: Random selection of 66 Kebele from the 176 that a hydrological feasibility study will be conducted in. The contact point for this project was sceptical that the randomization protocol will be adhered to, as there might be selection based on political calculus. Furthermore, it was also unclear whether there would be enough control Kebele after the feasibility study is conducted, since the project wants to choose the Kebele based on their feasibility and vulnerability, and many Kebele might not even qualify, as they may be lacking in either or both criteria.
- Option 2: A phased-in RCT design was also suggested. This option was also not considered plausible since the roll-out of the programme will take place in all Kebele at the same time.
- Option 3: Purposive selection of 66 Kebele for DiD design with PSM. It was unclear whether among the non-selected six Kebele per Woreda, there are at least three to four that are comparable to the three selected treatment Kebele.

Task 4: Costing – Sample Size and Power Calculations

Impact evaluation design not feasible due to extremely small sample size at the randomization level. As a result, no sample size and power calculations were conducted.

Task 5: Implementation and Timelining

Task 5 was also not required given that the project will not involve an impact evaluation.

GROUP 3.A) “PROMOTING PRIVATE SECTOR INVESTMENTS IN ENERGY EFFICIENCY IN THE INDUSTRIAL SECTOR IN PARAGUAY” (FP063)

GCF grant: USD 3 million

Goal: To increase the productivity of SMEs by investing in EE in the industrial sector in Paraguay and contribute to GHG emission reductions, supporting the achievement of the country’s climate change goals

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 5 years, 04/2018–04/2023
- Main interventions:
- Empower the “Agencia Financiera de Desarrollo” to structure and coordinate innovative financing mechanisms for EE and promote the engagement of local financial institutions (LFIs) in the deployment of new innovative financial products
- Promote an institutional, policy and regulatory enabling environment for private investments in EE, reducing biomass
- Provision of medium- and long-term EE credit lines to SMEs
- Intervention most suitable for evaluation:
- Provision of medium- and long-term EE credit lines to SMEs
- Targeted beneficiaries:
- The project is targeting 16 LFIs and all SMEs in pre-identified industrial sectors, commercial sectors and agricultural sectors. In total, there are approximately 3,000 SMEs who will be informed about new financial instruments and credit lines offered, of which 10 per cent are estimated to actually demand credit.
- Evaluation question:
- What is the impact of the credit lines on GHG emissions and energy consumption through investments in EE?

Task 2: Theory of Change

Overall, the ToC is relatively well developed. More emphasis should be given to the development of underlying assumptions, which could threaten the causal chain from inputs to activities, outputs, outcomes and final goals. The project team was not consciously aware of potential obstacles in project implementation, which might prevent the final goal of GHG emission reduction. We generally worked on a translation of the ToC into the logic of the terms “inputs”, “activities”, “outputs”, “outcomes” and “goals”.

Task 3: Evaluation Method

The component theoretically most suitable for impact evaluation is the offer of new financial instruments to SMEs from pre-determined sectors in order to invest in EE. According to project implementation plans, all sector-related SMEs will be invited to information events on the new financial instruments through their associations. After the information events, the interested SMEs have the opportunity to apply for the new credit line. In a phase-in design, the project team could proceed the credit line to 50 per cent of the SMEs in the first year (presumably 150 SMEs), while the second half would receive the credit line in the year after. The first group would hence serve as treatment and the second as control group. We propose a DiD design with PSM.

This impact evaluation approach has several caveats. An impact evaluation is therefore not considered feasible for the current project, for the following reasons:

- As the project intends to foster SMEs’ demand for investments in EE, the project team is very sensitive towards all actions, including short surveys, that might increase administrative burdens to their potential customers (the SMEs), particularly in a control group, but which would nevertheless be necessary for baseline data collection.
- Out of the same concern of losing potentially interested customers by delaying the loan payout, the project team does not want to artificially delay loan procedures for 50 per cent of the interested SMEs.
- Offering the training (to determine demand for EE loans) in a phase-in approach is also not possible for the same reason.
- EE savings are estimated to materialize only after three years. Loans to the control group would hence need to be delayed for more than one year.

Task 4: Costing – Sample Size and Power Calculations

The estimated sample size of 300 SMEs is low; the assumed improvements in EE or GHG emission reductions would need to be very (even implausibly) high in order to lead to enough power.

Task 5: Implementation and Timelining

The timeline for the project component of approaching SMEs is not yet clear; financial instruments have to be developed first. Based on very preliminary and incomplete information from the project proposal and information provided during the workshop, the following preliminary timeline is estimated.

DATES	ACTIVITIES
January 2021	Inception report
February – July 2021	Baseline data and reporting
August – October 2021	Interim evaluation and reporting
August – October 2023	Final evaluation and reporting

GROUP 3.B) “ENHANCING CLIMATE RESILIENCE OF INDIA’S COASTAL COMMUNITIES” (FP084)

GCF grant: USD 18 million

Goal: To enhance the climate resilience of coastal communities in India through an ecosystem-based, community-centred approach to adaptation

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 6 years, 01/2019–12/2024
- Main interventions:
 - Enhanced resilience of coastal and marine ecosystems and their services through community-based conservation and restoration of ecosystems such as mangroves and seagrass
 - Climate adaptive livelihoods for enhanced adaptive capacity and resilience of vulnerable coastal communities through livelihood trainings
 - Strengthened coastal and marine governance and institutional framework through an integrated coastal management plan
- Intervention most suitable for evaluation:
 - Climate adaptive livelihoods for enhanced adaptive capacity and resilience of vulnerable coastal communities through livelihood trainings
- Targeted beneficiaries:
 - The project is targeting 10 million people living in 600 communities in 12 districts of three states (Maharashtra, Odisha, Andhra Pradesh). Half of the target group are women. The beneficiaries are selected through community participation at the grass-roots level and are members of self-help groups.
- Evaluation question:
 - What is the effect of tailored livelihood training on beneficiaries’ resilience?

Task 2: Theory of Change

Overall, the ToC is relatively well developed. The project is a scale-up from former projects. Accordingly, the project team is very experienced with implementation processes and aware of the underlying assumptions that could threaten the causal chain from inputs to activities, outputs, outcomes and final goals. We generally worked on a translation of the ToC into the logic of the terms “inputs”, “activities”, “outputs”, “outcomes” and “goals”.

Task 3: Evaluation Method

We propose a DiD design with PSM. The treatment is livelihood trainings that are administered at the community level; hence, we will follow a clustered approach. Pure randomization among communities will not be possible as the project team fears the potential for conflict if two neighbouring communities are not treated at the same time. However, a geographical separation within one state is considered feasible. Hence, one part of the state can serve as control and the other part as treatment. The allocation to treatment or control of the two parts can be random.

- Caveats: One caveat of the design is that the livelihood trainings are not exactly the same but differ according to the demand for alternative livelihoods from the different communities. We therefore propose PSM in order to find the most similar matches between treatment and control individuals, including with regard to the livelihood training they receive (or are meant to receive in the control group case). In order to find similar-enough matches, it might be necessary to conduct the evaluation only in the state of Odisha, which has the highest within-state compatibility according to the project team. The target group within the state of Odisha only would still be large enough to produce a powerful sample.

Task 4: Costing – Sample Size and Power Calculations

Based on preliminary information and assumptions, the necessary sample size would amount to approximately 180 clusters and 3,000 individuals, assuming an MDES of 0.2 and intra-cluster correlation between 0.1 and 0.2 at 95 per cent confidence levels, 90 per cent power and 30 per cent attrition. The budget for this, estimated by the project team, amounts to USD 100,000.

Task 5: Implementation and Timelining

The timeline for the project is preliminary and based on discussions during group work.

DATES	ACTIVITIES
June 2019	Inception report
July – December 2019	Baseline data and reporting
January 2020	Commercial operation starting date
September 202 – March 2021	Final evaluation and reporting

GROUP 4.A) “STRENGTHENING CLIMATE RESILIENCE OF RURAL COMMUNITIES IN NORTHERN RWANDA” (FP073)

GCF grant: USD 32.79 million

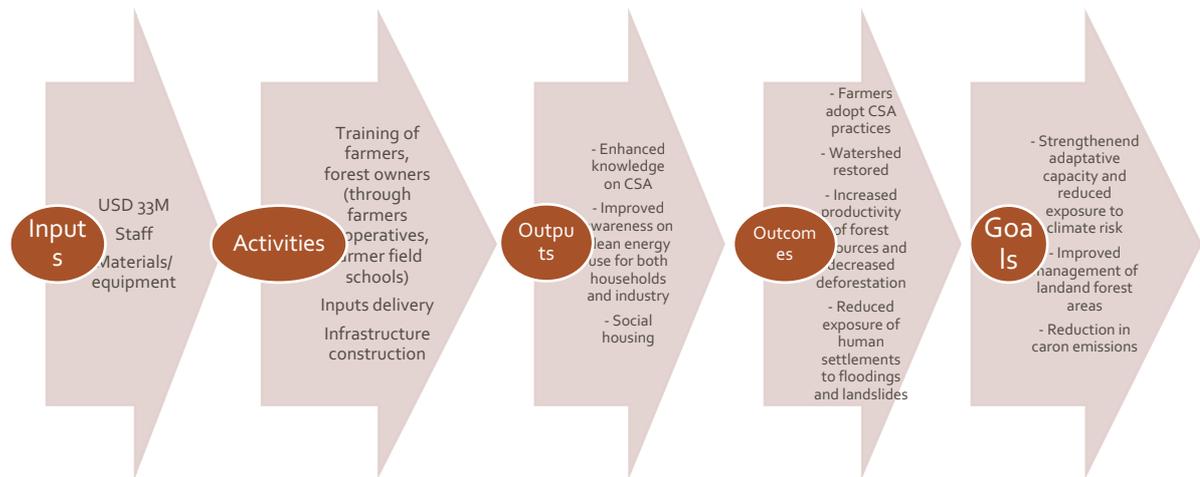
Goal: To strengthen the climate resilience of landscapes and communities through support for watershed protection, forest management, climate-resilient agriculture and the construction of low-carbon social housing for highly vulnerable households

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 6 years, 05/2018–04/2024
- Main interventions:
 - Adaptation: watershed protection and climate-resilient agriculture
 - Mitigation: sustainable forest management and more efficient use of wood for fuel
 - Mitigation: climate-resilient settlements
 - Learning: knowledge transfer and mainstreaming
- Interventions most suitable for evaluation:
 - The first two components (specific activities within these components may be considered)
 - Watershed protection and climate-resilient agriculture
 - Sustainable forest management and more efficient use of wood for fuel
- Targeted beneficiaries:
 - Vulnerable households and areas in the Gicumbi district. Depending on the interventions, target beneficiaries include smallholder farmers, tea and coffee producers and forest producers. Areas will also be selected according to population density and disaggregation by gender (based on census data).
- Evaluation questions:
 - What is the number of carbon tons reduced from improved forest and land-use management?
 - How do both male and female household members benefit from the adoption of diversified climate livelihoods?
 - The project team is open to exploring the respective effects of some of the activities to better inform the scale-up to the whole country.

Task 2: Theory of Change

The different interventions include training of farmers and forest owners through farmers’ cooperatives and farmer field schools, inputs delivery (such as improved seeds but also improved cooking stoves) and infrastructure construction. These activities aim at improving awareness on climate-smart agricultural practices, clean energy use for both households and industry, and building green social housing. These in turn will result in the restoration of the watershed, an increase in the productivity of forest resources, and a decrease in deforestation and in exposure of human settlements to flooding and landslides. End goals consist of a strengthened capacity and reduced exposure to climate risk, an improved management of land and forest areas, and a reduction in carbon emissions.



Task 3: Evaluation Method

A DiD with PSM design was recommended for the evaluation of the overall impact of the project. PSM would be performed on two levels: (i) at the area level, using disaster-prone-area maps, GIS and other available sources of secondary data; (ii) at the household/individual level.

One or several complementary designs could be implemented to evaluate the respective effect of specific interventions within Gicumbi. Experimental methods or a discontinuity regression approach using vulnerability rankings could be used whenever an activity is oversubscribed.

Task 4: Costing – Sample Size and Power Calculations

Little time was devoted to this activity during the workshop.

- Sample size: We expect at this time to survey 2,000–3,000 households.
- Power calculations: These will be performed considering the number of clusters (farmers' cooperatives). Key impact indicators are food security, number of households affected by flooding and landslides, deforestation and carbon emissions.
- Secondary data: Among others, data include national statistics (EICV5, 2018) on socioeconomic characteristics, including agriculture; GIS; disaster-prone-area maps; and a District Development Strategy (7-year plan on activities to implement).

Task 5: Implementation and Timelining

The timing of the baseline assessment and of the beginning of the intervention has not yet been decided but is planned for 2019. The project envisions three waves of household data collection as well as the collection of monitoring data on a quarterly basis. Focus group discussions will be organized with project beneficiaries each year. Implementation progress will be discussed at the end of each quarter by the steering committee and with beneficiary communities.

Project Number: FP0073 Rwanda																									
Activity	Year 0 : 2019			Year 1: 2020			Year 2: 2021			Year 3 : 2022			Year 4: 2023			Year 5: 2024			Year 6 : 2025						
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Phase I																									
Formation of core team																									
Review of documentation																									
Evaluation strategy and design																									
Phase II																									
Implementation of intervention																									
Data collection																									
Monitoring																									
Baseline																									
Midterm																									
Final																									
Focus Group Discussions (with beneficiaries)																									
Data analysis																									
Reporting on results of data analysis																									
Reporting on project implementation progress																									
Annual progress review																									
Dissemination of results of HH data																									
Dissemination of results of M&E																									

Note. Steering committee and technical coordination committee meets at the end of each quarter to discuss implementation progress.

GROUP 5.A) “BUILDING LIVELIHOOD RESILIENCE TO CLIMATE CHANGE IN THE UPPER BASINS OF GUATEMALA’S HIGHLANDS” (FP087)

GCF grant: USD 32.79 million

Goal: To reduce the impact of climate change on the hydrological cycle in targeted areas of the Guatemalan highlands through improved land-use practices

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 7 years, 01/2019–01/2026
- Main interventions:
 - Component 1: a) Provision of additional funds for the national incentive programme PROBOSQUE (payment for environmental services), and b) training of participating farmers on ecosystem-based adaptation (EbA) systems
 - Component 2: Provision of grants for grass-roots organizations and small community-based organizations (17 medium-sized grants and 52 small-sized grants)
 - Component 3: a) Equipment for early warning systems, and b) establishment of information flows to the population
- Intervention most suitable for evaluation:
 - Components 1b) and 3b) are most suitable for evaluation because they have clearly defined target groups.
 - Component 1a) only adds financially to an existing incentive scheme. The impact of the GCF investment cannot be distinguished from that of the overall scheme. Component 2 targets only a small number of organizations, which does not give enough sample size for an impact evaluation. Component 3a) will affect the entire country as it targets the national meteorological institute.
- Targeted beneficiaries:
 - 50,000 people in pre-selected municipalities in the water sheds of Samalá, Pucá Cacá, Motagua Alto, Xajá and Pixcayá. EbA training beneficiaries are farmers who self-select into the national incentives programme and live in the programme area. The information intervention beneficiaries are all communities in the programme area, with different modes of information distribution implemented.
- Evaluation questions:
 - What is the effect of the EbA training on the vulnerability to climate change of farming households? Does the EbA training improve productivity, income and food security?
 - Does the provision of early warning information affect households’ vulnerability to climate change, income and food security? Which mode of information transfer is the most effective?

Task 2: Theory of Change

Two theories of change were developed – one for each of the subcomponents suitable for impact evaluation.



Figure A - 3. ToC component 1b

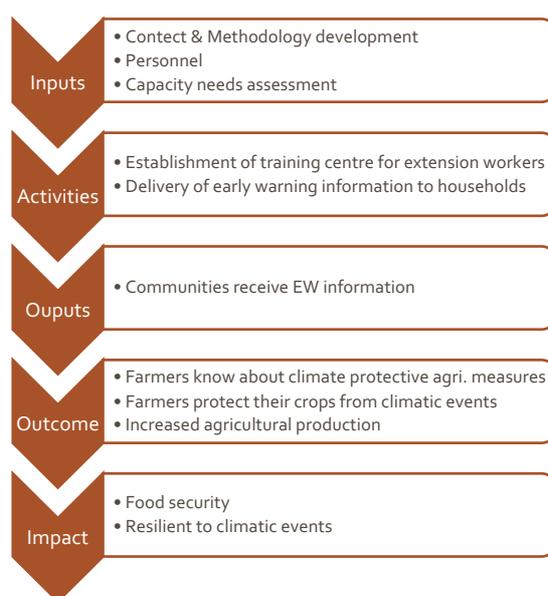


Figure A - 4. ToC component 3b

Task 3: Evaluation Method

- Component 1b (EbA training)

We propose a DiD Design with PSM. The control group will consist of households outside the programme area that participate in the national incentive programme PROBOSQUE. This way we overcome the self-selection bias of programme participants. The matching of households using baseline data makes it possible to control for any time-invariant observable differences between participants of programme and non-programme areas.

Caveat: Community-level interventions of the overall project might induce a different trend in outcomes in the treatment group, which is not solely attributable to the EbA training.

- Component 3b (Early warning information transfer)

The programme already plans on using different modes of early warning information distribution to the remote and vulnerable communities – for example, text messaging, social media, radio spots and the involvement of community leaders (e.g. pastors). The workshop participants signalled openness to a randomization in information transfer mode. An RCT would make it possible to rigorously test which of the modes of communication is the most effective. While a pure control group is not strictly necessary in this set-up, farmers who receive EbA training but no information could serve as a control group (see **Error! Reference source not found.**).

Caveat: It is not clear how many communities exist in the programme area. As the information treatment is rolled out on the community level, a large enough number of communities is needed to ensure sufficient power.

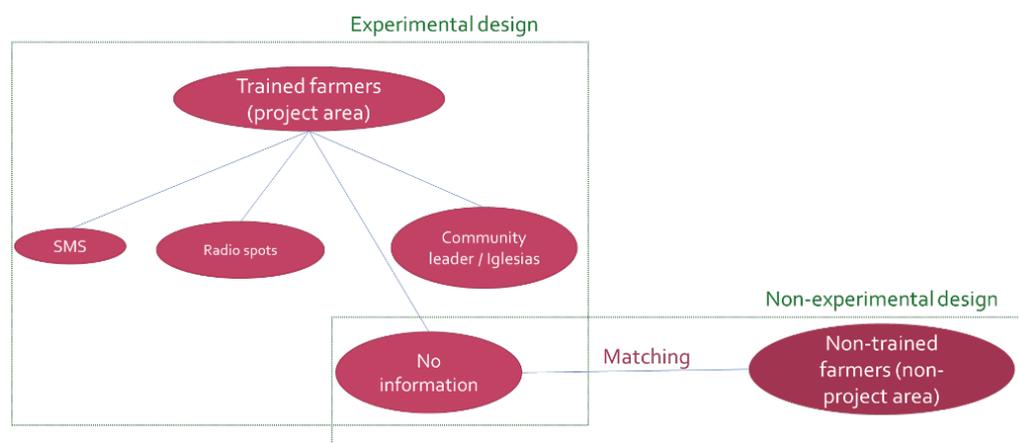


Figure A - 5. Evaluation design

Task 4: Costing – Sample Size and Power Calculations

Sample size and power calculations have not yet been conducted because no information on outcome variables was available at the time of the workshop.

Task 5: Implementation and Timelining

DATES	ACTIVITIES
Q1 2019	Formation of core team, review of documentation
Q1-Q2 2019	Design of evaluation strategy
Q3-Q4 2019	Preparation of interventions
Q4 2019	Baseline data collection
Q1 2020	Implementation start
Q1 2020	Baseline data analysis and reporting
Q4 2022	Midline data collection
Q1 2023	Midline data analysis and reporting
Q4 2024	Endline data collection
Q1 2025	Endline data analysis and reporting
Q2-A3 2025	Dissemination of results

GROUP 5.B) “UPSCALING CLIMATE RESILIENCE MEASURES IN THE DRY CORRIDOR
AGROECOSYSTEMS OF EL SALVADOR (RECLIMA)” (FP089)

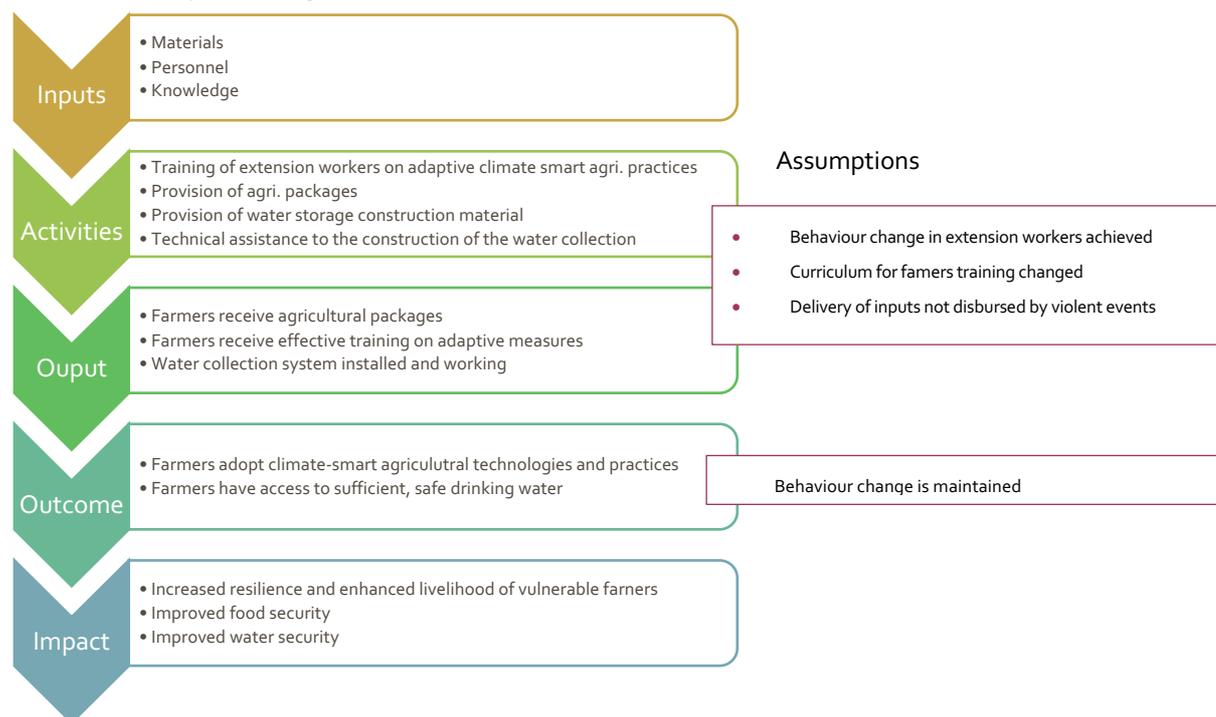
GCF grant: USD 35.8 million

Goal: To improve the resilience to climate change of vulnerable farming households through an integrated landscape approach

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 5 years, 01/2019–12/2023
- Main interventions:
 - Component 1: a) Provision of inputs to and training of extension workers on adaptive land management practices, and b) construction of water storage and collection systems on household (N=3,930) and community levels
 - Component 2: Restoration of vegetation cover in critical locations
 - Component 3: a) Strengthening of local capacity in planning, governance and coordination, and b) adjustment of regulatory, policy, planning and incentive instruments (national level)
- Intervention most suitable for evaluation:
 - Component 1 interventions are most suitable as they are targeted at households, which makes the outcomes more traceable.
- Targeted beneficiaries:
 - 50,000 poor smallholder farmer households with less than 3 ha of land and reliance on family labour in 114 pre-selected municipalities. Municipalities were selected based on social and environmental indicators. Households are already registered with the Ministry of Agriculture.
- Evaluation questions:
 - What is the impact of training extension workers on adaptive land-use practices on the food security of households in the area?
 - What is the impact of the construction of water collection and storage systems on the water security of households?

Task 2: Theory of change



Task 3: Evaluation Method

During the workshop, a phased-in RCT design was considered as feasible. In the phasing in, municipalities will be entering the programme in different waves (points in time) during the project timeline. Municipalities entering in year 2 and year 5 will be used for the impact evaluation. Year 1 municipalities will be used for exploratory analysis to inform sample size and implementation. The RCT could be designed such that the contribution of each activity (1a and 1b) can be disentangled. Further, there is the possibility to collect data on ineligible households in the same communities to calculate indirect/rebound/spillover effects.

- Caveat: The impact evaluation needs to be adapted to the project implementation plans.
- Alternative methods (escape strategy): A DiD approach could be used if not all key randomization steps can be respected and if no phase-in approach is implemented.

Task 4: Costing – Sample Size and Power Calculations

The impact indicators have been collected in national surveys (Encuesta de Hogares de Propósitos Múltiples 2014) and can be used to retrieve the parameters needed to calculate the sample size (σ^2).

- Assumptions:
 - Food insecurity decreases by 5 percentage points²
 - Take-up rate of the programme is 60 per cent
 - Attrition rate is 10 per cent
 - Power of 80 per cent and alpha of 5 per cent
 - The average cost per household interview is approximately USD 65
- Total sample and cost per wave:
 - Eligible households only: 2,800 households = USD 182,000
 - Also including ineligibles: 3,600 households = USD 234,000 (to be discussed)

² Households experiencing acute food insecurity according to FIES.

- Scoping study: approx. 500 households = USD 30,000

Task 5: Implementation and Timelining

The first year of the project will be dedicated to team formation, review of documentation and finalization of impact evaluation design. In the second year, we will start data collection and analysis. The impact evaluation design will be rolled out from year 3 of the project (year 2 of the implementation of activities).

Activity	Year 1: 2019			Year 2: 2020				Year 3: 2021				Year 4: 2022				Year 5: 2023			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase I																			
Formation of core team	■	■	■																
Review of documentation	■	■	■																
Evaluation strategy and design		■	■	■															
Phase II																			
Implementation of intervention				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Data collection				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Monitoring				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Scoping study					■														
Baseline									■										
Endline																	■		
Data analysis						■													
Reporting						■	■	■		■	■	■							
Dissemination of results									■	■	■							■	■

GROUP 6.A) “YELEEN RURAL ELECTRIFICATION PROJECT IN BURKINA FASO THROUGH A PRIVATE SECTOR DRIVEN GREEN MINI GRID MODEL” (FP093)

GCF grant: USD 17.2 million

Goal: To provide access to electricity to approximately 355,000 people: achieve 50,000 connections, including around 3,000 connections for productive use; the target for GHG emissions reductions is 15,000 tCO₂ (tons of CO₂ equivalent) per year

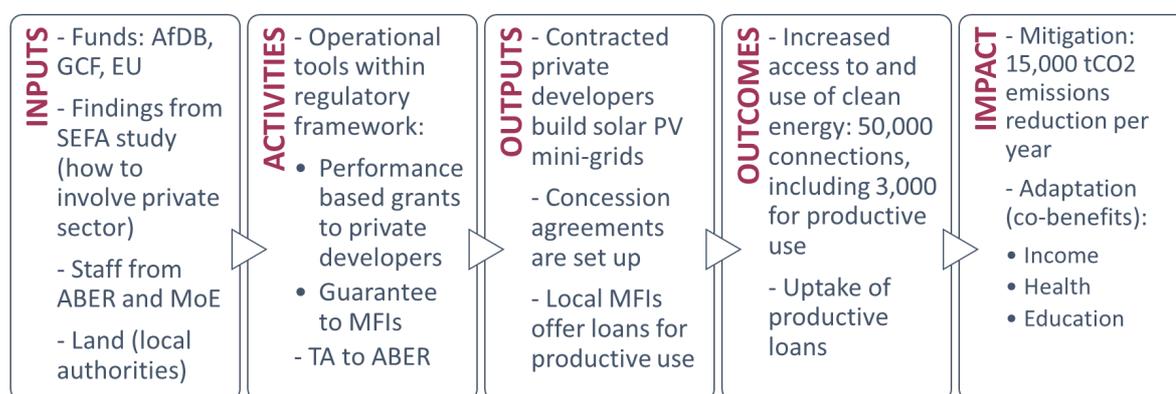
Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 7 years, Q1/2019–Q3/2025
- Main interventions:
 - Review of the regulatory and legal framework to allow sustainable engagement of private developers in the sector of rural electrification / capacity-building for rural electrification public entities
 - Private developers build mini-grids in 100 rural localities (one mini-grid per village/town) and operate, manage and maintain the mini-grids
 - Microfinance institutions (MFIs) in target areas provide loans for productive purposes: unlocking access to credit is key to ensuring the financial viability of mini-grids and sustainable engagement of private developers
- Programme modalities:
 - Study financed by the Sustainable Energy Fund for Africa to review the regulatory and legal framework; it should result in, for example, template concession agreements for mini-grid developers and electricity tariff guidelines
 - Target areas to be grouped in “lots” based on accessibility and geographical proximity; each lot is covered by one mini-grid developer (there should be 3 to 5 lots in total)
 - Incentives to private developers: concessional agreements and results-based payments (RBP) in function of the number of connections achieved (monitored quarterly)
 - Universal reach in target areas – that is, all households/SMEs that wish to be connected will be
 - African Guarantee Fund provides guarantee to selected MFIs on loans issued for productive use
- Targeted beneficiaries:
 - Programme across all regions of Burkina Faso (pre-feasibility study in two regions – Hauts de Bassin and Boucle de Mouhoun – but programme expanded for political reasons); selection criteria of target communities: distance to national grid, population size, ability to pay for electricity, types of economic activity
- Evaluation questions:
 - What is the effect of a supply-side results-based financing mechanism on the number of (low-emissions) connections and the energy access rate? What are the impacts in terms of CO₂ emissions reduction?
 - Does electrification in conjunction with access to microfinance loans for productive use boost economic activity in target areas, hence improving beneficiaries’ productivity, ability to pay for electricity and other socioeconomic indicators (at household and business levels)?

Task 2: Theory of Change

The ToC mainly built on that prepared by the project and on discussions from the previous session. Here are the main remarks about this work session:

- Main outcome of interest: number of connections (use monitoring data compiled to enable RBP)
- Main impact of interest: CO₂ emissions reduction (GCF preference); exact causal chain unclear
- Include “co-benefits” of the programme as impacts to be measured – for example, on income levels and stability, health and education outcomes
- Synergies between providing access to electricity and alleviating credit constraints for productive purposes; cannot disentangle contribution of each component to expected programme impacts



Task 3: Evaluation Method

Three important constraints were identified:

- Target areas have already been selected
- Interventions go hand-in-hand (e.g. cannot randomize credit access component)
- The project only budgeted for monitoring and evaluation, no extra for impact evaluation, as there was an expectation that the GCF would provide the funds if the project was selected for LORTA.

Proposed design: DiD with PSM; comparison areas in same regions as programme areas and selected based on criteria used in the programme; assumption: five “lots” of target areas, communities comparable within each lot; sample five communities in each lot – three treated / two comparison – and 100 households in each community; large sample size (2,500) while cutting logistical costs during survey (budget constraints); rely on administrative data for connections to grid and energy usage

Task 4: Costing – Sample Size and Power Calculations

Power calculations were not feasible. The only quantified expected impact of the project is CO₂ emissions reduction. Projections come from energy consumption models at highly aggregated levels. Not suitable for power calculations using MDES at household level.

Task 5: Implementation and Timelining

Activity	Year 1 : 2019			Year 2 : 2020				Year 3 : 2021				Year 4 : 2022				Year 5 : 2023			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Programme Implementation																			
Connections																			
Community sensitization																			
Baseline																			
Formation of core team																			
Review of documentation																			
Ethical approvals																			
Evaluation strategy and design/survey testing																			
Data collection																			
Data cleaning																			
Data analysis																			
Reporting																			
Monitoring																			
Construction monitoring																			
Energy use																			
Connections																			
Loans uptake																			
Monitoring																			
Survey design and field strategy																			
Data collection																			
Data analysis																			
Reporting																			
Dissemination of results																			

GROUP 6.B) “MALI SOLAR RURAL ELECTRIFICATION PROJECT” (FP102)

GCF grant: USD 1.65 million

Goal: To provide access to electricity to approximately 28,300 households in 70 localities of rural Mali; substitute clean energy for imported fossil fuels; the target for GHG emissions reductions is 821,000 tCO₂ (tons of CO₂ equivalent) in 25 years

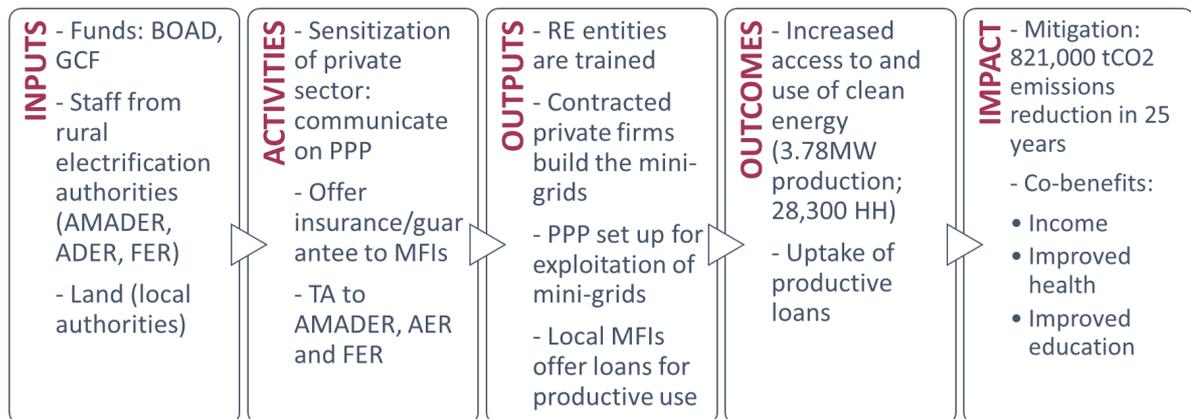
Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 5 years, 07/2019–06/2023
- Main interventions:
 - Strengthen institutional environment / capacity-building for rural electrification public entities (technical assistance to AMADER, ADER and FER)
 - Public–private partnerships (PPP) set up for private firms to operate, manage and maintain green mini-grids (GMG)
 - MFIs in target areas provide loans for productive purposes: unlocking access to credit is key to ensuring financial viability of GMG and sustainable engagement of private developers
- Programme modalities:
 - New regulatory framework to allow engagement of private sector in the Mali electricity sector (as of now completely public)
 - Target areas are to be grouped in “lots” based on accessibility and geographical proximity; each lot is covered by one mini-grid developer
 - Private companies are contracted to build solar photovoltaic GMG
 - Incentives to private developers: PPP for exploitation of GMG, partial private ownership of GMG
 - Universal reach in target areas – that is, all households/SMEs that wish to be connected will be
 - Selected MFIs are provided with guarantees on loans issued for productive use
 - Remark: The programme will be first implemented in 50 villages (Phase 1) from 2019 to 2022. After assessment of Phase 1, it will be decided if Phase 2 is viable (additional 20 villages).
- Targeted beneficiaries:
 - Programme across six regions of Mali; target areas homogeneous except for those in Timbuktu region
 - Programme communities were selected from a list of 300 villages that expressed interest in being electrified (during a World Bank “poll” several years ago; note: how this selection was made was addressed several times but remained unclear)
 - Selection criteria of target communities: expression of interest, distance to national grid, population density, ability and willingness to pay for electricity, types of economic activity
- Evaluation questions:
 - Main impact of interest: CO₂ emissions reduction
 - Main outcome of interest: number of connections
 - Co-benefits: Does electrification in conjunction with access to microfinance loans for productive use boost economic activity in target areas, hence improving beneficiaries’ productivity, ability to pay for electricity and other socioeconomic indicators (household and business level)?

Task 2: Theory of Change

The ToC mainly built on that prepared by the project and on discussions from the previous session. Here are the main remarks about this work session:

- Main outcome of interest: number of connections (biannual field visit for monitoring)
- Main impact of interest: CO₂ emissions reduction (GCF preference); exact causal chain unclear
- “Co-benefits” of the programme as impacts to be measured – for example, on income levels and stability, health and education outcomes
- Synergies between providing access to electricity and alleviating credit constraints for productive purposes; cannot disentangle contribution of each component to expected programme impacts



Task 3: Evaluation Method

Several constraints were identified:

- Target areas have already been selected.
- Interventions go hand-in-hand with each other (e.g. one cannot randomize credit access component).
- Based on population size there are four categories of treatment communities, containing 20 villages are from Phase 2 and all are from the same category; hence these categories are not usable for Phased-In comparison group.
- Target areas are selected from a list of 300 villages pre-identified by the World Bank (expression of interest for rural electrification). Non-programme villages on that list cannot be used because they might receive RE intervention from another source.

Proposed design: DiD with PSM; comparison areas selected based on criteria used in the programme; project representatives insisted on using mixed-methods approach; because the nature of the pre-identified list of 300 villages remained unclear, any tentative sampling strategy was highly speculative; potentially visit all of the 50 Phase-1 treatment villages and find 50 comparison communities; project representatives assured they have leeway to negotiate extra budget for impact evaluation

Task 4: Costing – Sample Size and Power Calculations

Power calculations were not feasible. The only quantified expected impact of the project is CO₂ emissions reduction. Projections come from energy consumption models at highly aggregated levels and are not suitable for power calculations using MDES at household level.

Task 5: Implementation and Timeline

Activity	Year 1 : 2019			Year 2 : 2020				Year 3 : 2021				Year 4 : 2022			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase I															
Formation of core team		■													
Review of documentation			■												
Evaluation strategy and design			■												
Phase II															
Implementation of intervention (mini-grid construction + MFI guarantee)					■	■	■	■	■	■	■	■	■		
Data collection															
Monitoring			■	■	■	■	■	■	■	■	■	■	■		
Baseline				■										■	
Endline													■	■	
Data analysis														■	■
Reporting															■
Dissemination of results															■

GROUP 7.A) “IMPROVING RANGELAND AND ECOSYSTEM MANAGEMENT PRACTICES OF SMALLHOLDER FARMERS UNDER CONDITIONS OF CLIMATE CHANGE IN SESFONTEIN, FRANSFONTEIN, AND WARMQUELLE AREAS OF THE REPUBLIC OF NAMIBIA” (SAP001)

GCF grant: USD 9.3 million

Goal: To strengthen adaptive capacity of smallholder farmers through promotion of drought-tolerant livelihoods; project is implemented in Kunene, one of the driest and poorest regions of Namibia, making it particularly vulnerable to climate change

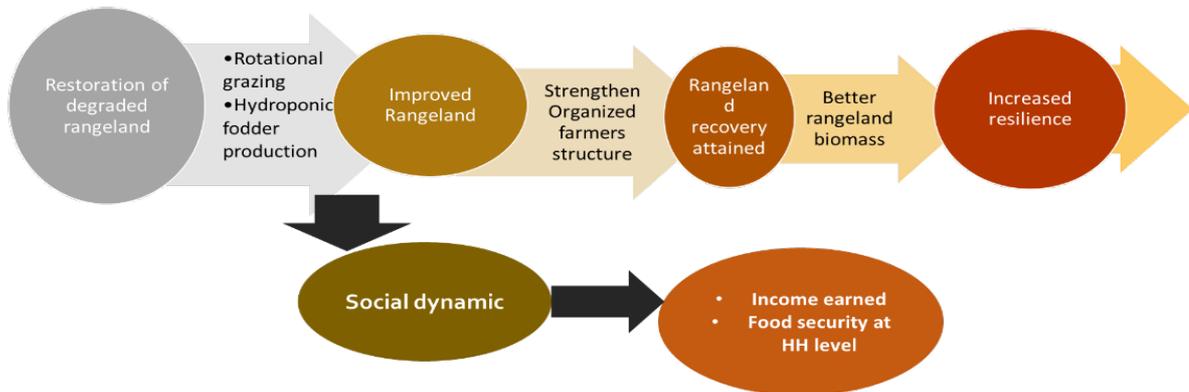
Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 5 years, 06/2018–05/2023
- Main interventions:
 - Component 1: Promote cost-effective investments in early warning systems that determine climate-driven vulnerabilities and effective adaptation options
 - Component 2: Reduce climate-driven risks in target ecosystem and land through supporting innovative drought adaptation actions (diversify livelihoods; drought-tolerant agricultural production; boost rangeland management; rotational grazing; hydroponic fodder production; water rehabilitation)
 - Component 3: Knowledge and information support mechanisms
 - Component 2 makes up almost 80 per cent of the GCF funding.
- Intervention most suitable for evaluation:
 - Parts of component 2: The rangeland management practices and, in particular, hydroponic fodder production and supply, which seems an innovative element to reduce overgrazing.
- Targeted beneficiaries:
 - Beneficiary selection criteria not set yet, but project targets the most vulnerable households, including indigenous people and female-headed households; approximately 44,000 beneficiaries in an area of 50,600 ha.
- Evaluation question:
 - Is rotational grazing alone or in combination with fodder supply effective in improving rangeland quality?

Task 2: Theory of Change

Overall, the ToC is not clear since a separation of activities, outputs and outcomes is missing. It is also not clear what the assumptions are that can potentially introduce barriers in the flow of the change from interventions to outputs to outcomes.

2. THEORY OF CHANGE (TOC)



Task 3: Evaluation Method

It was agreed that an RCT can be used to answer the evaluation question because project funds are not sufficient to provide all farmers in Kunene with benefits (in particular fodder). Two treatments and one control group are proposed:

- Treatment 1: Receives both rotational grazing training and fodder
- Treatment 2: Receives only rotational grazing training
- Control group: Receives neither rotational grazing training nor fodder

We also discussed focusing more specifically on fodder supply as a new and hitherto possibly untested component, by replacing treatment 2 with a treatment in which fodder is given conditional on practising rotational grazing. The previous Millennium Challenge Account funded impact evaluation of rangeland management practices (including training on rotational grazing) in Northern Namibia found no effect on rangeland quality. Therefore, the added value of another impact evaluation of rotational grazing training is unclear. However, the idea of conditional fodder supply still needs to be discussed further because it is not yet clear how the conditionality could be implemented (and monitored).

It was not yet discussed at which level the randomization would take place. Since most of the land in Kunene is communal and since it may not be feasible to exclude farmers from fodder supply within the same area, the randomization would have to take place at an appropriate cluster level.

- Caveats:
 - It is unclear how much budget is available for data collection for an impact evaluation.
 - [Not discussed at the workshop] It may be difficult to find an appropriate cluster level at which to randomize. There are only three fodder supply units planned. If randomization took place at the village level, then some villages would be excluded even though they are equally close to the fodder unit, which might not be politically feasible. Possibly, exclusion from fodder supply will have to be based on some logistical criterion/constraint, in which case the design would no longer be an RCT, but possibly be RDD or a DiD with PSM.

Task 4: Costing – Sample Size and Power Calculations

Calculations of sample size, power and cost were not done during the workshop.

Task 5: Implementation and Timelining

Project implementation is planned to start in May 2019 but can be postponed to accommodate an impact assessment.

DATES	ACTIVITIES
May 2019	Project start (may be delayed for the sake of impact evaluation)
2019	Baseline survey
2021	Midline survey
2023	Endline survey
Quarterly	Monitoring of rangeland practices

GROUP 7.B) “REDD+ RESULTS-BASED PAYMENTS FOR RESULTS ACHIEVED BY BRAZIL IN THE AMAZON BIOME IN 2014 AND 2015” (FP100)

GCF grant: USD 96.5 million

Goal: The GCF investment is a payment for an equivalent of 2 per cent of the REDD+ mitigation results achieved by Brazil between 2014 and 2015. The payment will contribute to the implementation of the forest sector actions of the NDC for Brazil.

Project Objectives:

- Development of a pilot of an Environmental Services Incentive Programme for Conservation and Recovery of Native Vegetation (Floresta+)
- Strengthening the implementation of the National REDD+ Strategy (EN-REDD) of Brazil through improvements in its governance structure and systems

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: Not yet determined
- Main interventions:
 - Component 1: Implementation of Floresta+ pilot programme in the Brazilian Legal Amazon through four different modalities:
 - + Payments to smallholder farmers for forest conservation
 - + Payments to smallholder farmers for forest recovery
 - + Support to local associations and representative entities of indigenous peoples and traditional peoples and communities
 - + Innovation projects for forest conservation and recovery (academia, private and public sector).
 - + Priority areas for these actions: areas with high risk of deforestation and degradation; priority areas for biodiversity conservation and/or recovery of native vegetation; buffer zones around protected areas; regions with higher density of small farmers and IP/LC; areas that would provide opportunities for integration with other public policies
 - Component 2: Strengthening of national REDD+ strategy (EN-REDD+)
- Intervention most suitable for evaluation:
 - The first two modalities of the Floresta+ programme
- Targeted beneficiaries:
 - Potentially 60,000 smallholder farmers
 - The exact number of beneficiaries will be derived from evaluating which farmers are registered in the national land registry (SICAR) and are legally compliant with the Forest Code
- Evaluation question:
 - Is Floresta+ effective in promoting forest conservation and recovery among legally compliant as well as non-compliant farmers?

Task 2: Theory of Change

Overall, the ToC on the project poster is well developed for the Floresta+ programme, despite the fact that the original funding proposal did not include a ToC, as it is an RBP programme. Only small adjustments were made during the workshop, leading to the following ToC with a focus on Floresta+:



Task 3: Evaluation Method

A rigorous impact assessment that focuses on the effects of Floresta+ on legally compliant farmers is challenging since a credible control group may not be found. Floresta+ will be a national public policy, so all legally compliant farmers have the right to receive the payments at the same time. Therefore, the working group discussed several options to answer the evaluation question indirectly or focus on related evaluation questions. We also discussed methods that are not rigorous but may nevertheless provide valuable insights into policy design for forest conservation.

- Behavioural RCTs:
 - Behavioural interventions through different messages (e.g. via radio) to non-compliant farmers to test how Floresta+ can best be used to motivate non-compliant farmers to become legally compliant with the Forest Code
 - Behavioural interventions through different messages (e.g. eliciting pledges or plans for future forest recovery at the bank where farmers receive their benefits and/or messages via radio) to compliant farmers to test how Floresta+ can be best used to motivate farmers to stay legally compliant and to possibly go beyond their legal obligations
- DiD with PSM:
 - Does Floresta+ make legally non-compliant farmers more likely to become legally compliant through local spillover effects?
 - Evaluation design exploits spatial variation in the local treatment intensity (the amount of Floresta+ payments handed out locally) to test whether non-compliant farmers are more likely to become legally compliant when there are more farmers nearby who receive Floresta+ benefits.
 - A further source of variation may come from spatial differences in registration rates in the SICAR system among legally compliant farmers. This variation may be used as an important variable to match areas with higher and lower treatment intensity.
- Encouragement RCT on Floresta+ payment structure:
 - Farmers may be invited to take up different payment options – for example, a one-time payment versus payments in several tranches – in order to test whether the payment structure affects forest recovery.
- Caveats:

- There are doubts within the AE about the feasibility of undertaking any impact assessment for this programme, given its nature as a national public policy and its political sensitivity. In addition, an impact assessment was not foreseen in the GCF funding proposal and needs to be approved by the Government of Brazil. Any design that requires collection of primary data, in particular of control farmers, may be too costly to be financed by the Government of Brazil because of the high cost of data collection among beneficiaries in remote locations. On the other hand, there is a substantial budget for monitoring, which may be tapped into. Furthermore, Brazil has arguably the world’s best remote-sensing data for land cover change monitoring, available through the Brazilian National Institute for Space Research (INPE: www.inpe.br/). Also, there is extensive socioeconomic data, available from regular surveys available through the Brazilian Institute of Geography and Statistics (IBGE: www2.ibge.gov.br/english/). Therefore, the measurement of the primary outcome variables (i.e. forest cover, socioeconomic conditions of target populations, and registration in the SICAR system (<http://www.car.gov.br/#/>)) may come without significant additional cost. Furthermore, co-variables may be collected at relatively low cost from all farmers through short surveys when they pick up their payments at their local bank.

Task 4: Costing – Sample Size and Power Calculations

Calculations of sample size, power and cost were not done during the workshop. However, any analysis of secondary data may be done on the entire population of eligible farmers.

Task 5: Implementation and Timelining

If the Brazilian federal government accepts the GCF grant, project implementation could begin as soon as August 2019, with first instalments to smallholder farmers in February 2020. In this best-case scenario, LORTA data collection could be in the period of February 2020 to February 2025.

DATES	ACTIVITIES
August 2019	Project implementation starts
February 2020	First instalments to farmers
February 2020 – february 2025	Yearly data collection of participating farmers through surveys at local banks
2019-2025	Yearly monitoring of forest coverage through SICAR
2022	Midline evaluation
2025	Endline evaluation

What the midline and endline evaluation entails in terms of data collection and methodology was not discussed.

GROUP 8.A) “GCF–EBRD EGYPT RENEWABLE ENERGY FINANCING FRAMEWORK” (FP104)

GCF grant: USD 4.7 million

GCF senior loan: USD 150 million

Goal: To support the Government of Egypt in achieving its RE penetration goal by having 20 per cent of electricity consumption sourced from RE

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 3 years, Q3/2019–Q3/2022
- Main interventions:
 - Component 1: Enhancing RE integration, policies and planning
 - + Enhancing and planning RE integration: conduct an assessment of the network’s capacity to absorb the addition of RE capacity; provide technical recommendations; provide training and follow-up support to the managers of the Egyptian Electricity Transmission Company
 - + Enhancing capacity for administering RE tenders: provide the relevant institutions (including but not limited to the Ministry of Electricity and Renewable Energy, the Egyptian Electric Utility and Consumer Protection Regulatory Agency, the Egyptian Electricity Transmission Company and the New and Renewable Energy Agency) with technical assistance needed for the successful completion of competitive tenders for RE
 - Component 2: Scaling up RE investments: The project aims at financing 8–12 individual RE subprojects
- Targeted beneficiaries:
 - Given that the RE produced by the subprojects is integrated into the national grid, it is difficult to divide the population into a sample of beneficiaries and a control group.
- Intervention most suitable for evaluation:
 - Impact evaluation is not possible due to the lack of a comparable control group.

Task 2: Theory of Change

The ToC discussed in the workshop (for monitoring reasons) looks as follows:

- Inputs: Financial resources, trainers and experts on grid code
- Activities:
 - Conduct assessment of the network’s capacity
 - Provide training for managers of the Egyptian Electricity Transmission Company
 - Scaling up of private RE investments by financing 8–12 subprojects
- Outputs:
 - Recommendations made to increase the RE capacity of the national grid
 - Energy generated by new private sector investments is successfully integrated into the grid
- Outcomes:
 - The emission intensity from power generation in Egypt decreases due to higher share of renewables in the generation mix
 - Increased number of small, medium and large low-emission power suppliers
 - Impacts: 20 per cent of electricity consumption derived from RE sources

Task 3: Evaluation Method

No rigorous impact evaluation is possible.

Task 4: Costing – Sample Size and Power Calculations

Due to the previous considerations, no power calculation was conducted.

Task 5: Implementation and Timelining

Due to the previous considerations, no timeline was elaborated.

GROUP 8.B) “NIGERIA SOLAR IPP SUPPORT PROGRAMME” (FP104)

GCF senior loan: USD 100 million

Goal: To catalyse the delivery of approximately 400 MW of renewable power through the successful financing, construction and operation of three to five selected solar power projects in Nigeria

Task 1: Programme Modalities & Evaluation Questions

- Overall timeline: 3 years, 2019–2022
- Main interventions:
 - Finance the construction and operation of three to five IPP solar projects
 - The programme will support the implementation of two critical credit enhancement structures that improve the bankability of the solar projects: a letter of credit and a Potential Risk Guarantee
- Targeted beneficiaries:
 - Given that the renewable energy produced by the IPP projects is integrated into the national grid, it is difficult to divide the population into a sample of beneficiaries and a control group.
 - Communities residing in the northern part of Nigeria have more frequent blackouts and are more dependent on petrol and diesel generators compared to those residing in the south. Therefore, the expectation is that those communities may benefit relatively more from the 400 MW added to the grid.
- Intervention most suitable for evaluation:
 - Examine the impact of financing IPP solar projects on increased access to electricity of households and businesses in the northern parts of Nigeria.
- Evaluation question:
 - Does increased access to RE reduce dependency on petrol generators, hence mitigating the emission of GHG?

Task 2: Theory of Change

The ToC discussed in the workshop looks as follows:

- Inputs: Financial and human resources (experts on grid code)
- Activities: Select and finance IPP projects meeting the selection criteria
- Outputs:
 - Plants installed and operational
 - Electricity generated from newly installed renewables capacity is integrated into the national grid (over 400 MW)
- Outcomes:
 - Increased number of households with improved access to low-emission energy (reduced use of firewood, charcoal, and diesel- and petrol-powered generators)
 - Other benefits: employment, health, education
- Impacts: Reduced emissions through increased low-emission energy access and power generation

Task 3: Evaluation Method

The design suggested is DiD with PSM. Given the difficulty in finding a comparable counterfactual, it was suggested that the communities residing in the south are likely to benefit less from the added energy to the grid and can thus be used as a control group.

- Caveats:
 - Communities in the south and communities in the north may be systematically different.
 - A large sample size is required in order to match on as many confounding variables as possible.
 - The project team showed low interest in implementing the suggested impact evaluation design, mainly for lacking the financial and technical capacity to do so.

Task 4: Costing – Sample Size and Power Calculations

Has not been identified; requires further discussions

Task 5: Implementation and Timelining

Has not been elaborated

GROUP 9.A) “GCF–EBRD KAZAKHSTAN RENEWABLES FRAMEWORK” (FP047)

GCF grant: USD 4 million

GCF senior loan: USD 106 million

Goal: To create a sustainable market for RE and increase the usage of RE in the country

Task 1: Programme Modalities & Evaluation Questions

- **Overall timeline: 5 years, Q4/2017–Q3/2022**
- **Main interventions:**
 - The programme will scale up investment in renewables, crowding-in low-carbon investors through a programme of investment and creating a viable alternative to cheap coal-based power. The programme will also provide technical assistance and build institutional capacity for energy integration, policies and planning.
- **Intervention most suitable for evaluation:**
 - Building power plants: The project is currently running in a pilot regime which covers three sites selected out of all available sites in the country.
 - Auction system: This component of the project aims at improving the purchasing mechanism in the RE market. In contrast to the initial system where the price in the energy market was fixed, the European Bank for Reconstruction and Development (EBRD) has initiated a pilot of the auction system in the RE market in 2018.
- **Targeted beneficiaries:**
 - 8–11 RE projects
- **Evaluation question:**
 - Does the auction system improve the purchasing mechanism in the RE market?

Task 2: Theory of Change

Was not discussed separately, but as part of Task 3.

Task 3: Evaluation Method

Building power plants

At the time of the LORTA workshop, consultants were working on the selection of sites for the energy projects. We understood that they had identified some areas and were exploring to what extent they would be suitable.

The main problem was small sample size – that is, the small number of sites covered within the project. The analysis at company level was not supported due to unavailability of the relevant data. Another problem was the selection of sites. EBRD representatives stated that the selection of sites is crucial to ensure successful implementation of the project, which makes it difficult to select sites on a random basis. A solution suggested by the impact evaluation specialists was to first select 10 sites that are of the same (“good”) quality and randomly assign three sites to the treatment group and seven to the control group. However, as pointed out by the EBRD representatives, only few sites are being prepared for selection to the project because the selection of sites is a complicated process based on many indicators observed over a long period of time.

Another idea suggested by the impact evaluation specialists was to use RDD. The method is based on comparing general outcomes of the sites that are slightly below and slightly above the threshold value of a specific indicator (e.g. index for site being of “good” quality). The sites above the threshold will be selected. Those which are just below the threshold level will serve as the control group, given that a small difference in the level of the selected indicator makes this group of

companies almost qualified for the project. But again, the small sample size retained is the main problem here as well.

Auction system

From our understanding, the general process of the auction system runs as follows. The Government is the key operating body of the auction. The auction is organized online, and the date and time of the auction's opening is also announced online. In order to participate in the auction, companies have to pay participation fees. One round of auction is determined by the megawatts of electricity that have to be delivered by the winning company. That is, companies bid at what price they will be able to provide electricity, the amount determined within the auction, in a given region. The company bidding the lowest price wins the auction. In total, there are 20–40 sites (regions for which electricity will be produced and provided) in the country, and the pilot covers only three sites. One round of auction is organized per site – that is, for one site there will be one company providing electricity (the one that wins the auction). The number of participants per auction (or per site) ranges from 4 to 10.

One problem with the current auction system might be the participation of companies with speculative behaviour. In other words, companies try to bid a very low price to win the auction even if they do not have capacity to deliver electricity at such low price.

The solution offered by the EBRD was to introduce a screening process for participation in the auction. That is, companies willing to participate in the auction have to meet pre-defined requirements, which helps to minimize speculative bidding. This is expected to increase the likelihood that the winning company will not fail in the implementation. The requirements for participation in the auction are discussed to mainly address the question of whether participating companies have enough capacity to deliver the required amount of electricity at the site.³

One of the ideas discussed for the implementation of impact evaluation within the project was the introduction of a “nudge”, which involves providing information for all auction participants in randomly selected sites (i.e. auctions). An example discussed was to expose all pre-qualification requirements in randomly selected auctions (the treatment group), while for some auctions this information would not be exposed to participants (the control group). However, several problems with this method were discussed. Most importantly, the concern was that the markets are to be free; therefore, nudging some companies but not others would distort them.

Before–after analysis was suggested by the EBRD representatives. But, as mentioned by the impact evaluation specialists, the analysis of this nature would be subject to the effects from other parallel processes in the economy, which would likely make it difficult to isolate the pure impact of the GCF–EBRD project.

Task 4: Costing – Sample Size and Power Calculations

As already identified, the small sample size is one of the main problems.

Task 5: Implementation and Timelining

Due to the previous considerations, no timeline was elaborated.

³ We also explored a similar idea for the carbon market to be set up. Its implementation, however, is far in the future and, in essence, faced similar evaluation challenges. In the main text following this note, we summarize the auction system in more detail.

GROUP 9.B) “DBSA CLIMATE FINANCE FACILITY (CFF)” (FP098)

GCF grant: USD 0.61 million

GCF subordinated loans: USD 55 million

Goal: To create a sustainable market for RE, increase the usage of RE in the country and provide projects related to the mitigation of and adaptation towards climate change with the required funding

Task 1: Programme Modalities & Evaluation Questions

- **Overall timeline: 5 years, 11/2018–11/2023**
- **Main interventions:**
 - The Development Bank of Southern Africa (DBSA) representatives briefed the impact evaluation specialists about the structure and aims of their CFF. The programme aims at providing projects related to the mitigation of and the adaptation towards climate change with the required funding. Those projects can come from various sectors (e.g. energy, transportation, water management) and four different countries (South Africa, Namibia, Lesotho and Eswatini). Despite their financial viability, those projects are currently underrepresented in the portfolio of financial market actors, potentially because the perceived risk of those actors with regard to climate-related projects exceeds the actual risk. To achieve the programme aims, implementers of environmental projects can apply to DBSA’s CFF. CFF will then offer 30 per cent of the required funding for a successful applicant’s project, while the rest must be provided by private lenders and the project owners themselves. The CFF funding will act as a first-loss guarantee for the loan offered by the private lender. Projects will be able to apply for the CFF on a rolling basis, with about 25 projects selected each year.
- **Targeted beneficiaries:**
 - Implementers of climate-change-related projects
- **Evaluation question:**
 - DBSA pointed out that apart from supporting the immediate projects selected, the programme ultimately aims at supporting the emergence of a market for financial products funding climate-related projects, thereby facilitating additional emissions reductions in the long term.
 - A key point in the discussion was the question of how to measure the creation of a market. It was agreed that the share of private capital the projects attract is a feasible indicator on the firm level.

Task 2: Theory of Change

During this session the DBSA representatives presented their draft for the ToC for the CFF, which was then discussed and further developed, taking into account the impact evaluation specialists’ remarks.

The loans given out by the CFF are expected to crowd-in private investment, which will in turn lead to the development of new climate finance products and the growth of the climate finance market, which will finally lead to more environmental projects being realized.

During the discussion, the change in the perceived risk of climate-related projects was pointed out as one decisive channel through which change is expected to be induced. The CFF will directly reduce credit risk for lenders to the beneficiary projects through its first-loss guarantee. Moreover, in the long term the success of the projects is expected to lead to a general change in the perceived risk of lending to climate projects, thus also easing the access to funds for projects that did not directly benefit from the programme itself.

It was therefore determined that the programme leads to GHG emission reductions through two different channels: first, through the realization of the projects directly benefiting from the CFF and, second, through increased private lending to climate-related projects in the future that are not directly part of the programme.

Emphasis was drawn on the assumption that the perceived risk can only be reduced substantially if the number of funded projects that default is sufficiently small.

Task 3 – Evaluation design

The first evaluation design discussed was to randomize the assignment of CFF loans among a pool of projects that all equally meet certain eligibility criteria. However, it was found that a randomization is not possible because of the high importance of strictly selecting the most suitable applications.

A type of DiD approach was thus worked out as the most suitable evaluation design for this programme. The chosen design differs from the classical DiD in that the treatment occurs at multiple points in time because projects' applications are accepted on a rolling basis.

The impact evaluation specialists pointed out the importance of the parallel trends and the stable unit treatment value assumptions for the validity of the DiD design. It was furthermore worked out that the selection of the projects should be done on very objective criteria, ideally based on a well-defined score, so that this can later be controlled for in the evaluation. Project selection based on a score would also enable an additional analysis in the style of an RDD.

Moreover, the impact evaluation specialists pointed out the importance of collecting baseline, monitoring and endline data on the outcomes for the selected projects, as well as for the rejected ones, which act as the control group. Obtaining robust data from the control projects was recognized as a key challenge. A possible solution discussed was to motivate the control projects with the possibility to be considered for the programme later – for example, in case of its expansion.

A further challenge for the analysis noted in the discussion is the fact that the sample size is limited and cannot easily be expanded due to the relatively large size of the individual projects. However, everybody agreed that even given a low sample size an impact evaluation of the programme will still prove valuable.

The work on Task 3 concluded with a discussion on the definition of the outcome variables to be measured. The agreed outcome variables were share of private capital attracted, the reduction of emissions, the number of newly electrified households and the number of jobs created.

Task 4 – Power Calculations and Sample Size

Given the small sample size, it was discussed that the study will likely be underpowered.

Task 5 – Implementation and Timelining

As the programme and evaluation design had already been discussed earlier, the main open point left for discussion was when to evaluate the programme. It was pointed out that this depends on when impacts are expected to be realized. This point in time probably differs for the various outcomes. For example, an increase in private investment could be expected earlier than a reduction in GHG emissions.

GROUP 10.A) “ZAMBIA RENEWABLE ENERGY FINANCING FRAMEWORK” (FP080)

GCF grant: USD 2.5 million

GCF senior loans and standby loans: USD 50 million

Goal: To increase access to and ensure RE provision by providing finance for six RE projects; to facilitate capacity-building and an enabling framework for further RE projects in Zambia

Task 1: Programme Modalities & Evaluation Questions

- **Overall timeline: 5 years, Q3/2018–Q2/2023**
- **Main interventions:**
 - Provide a financing package for RE independent power producers to be selected through competitive bidding; these producers shall implement solar- and hydropower projects
 - Technical assistance for the financial industry in Zambia and selected LFIs to build the requisite team, expertise and process needed to originate, appraise, finance, monitor and supervise RE projects
- **Intervention most suitable for evaluation:**
 - It quickly became clear that a rigorous impact evaluation would be difficult, if not impossible with this kind of programme (see Task 2). Nevertheless, several evaluation questions (see below) can and should be addressed by other kinds of evaluation.
- **Targeted beneficiaries:**
 - The main beneficiaries of the financing package are the independent power producers (three producers for the six projects). The technical assistance under this programme will mostly benefit LFIs.
- **Evaluation questions:**
 - Is the programme economically efficient?
 - Is the financing scheme financially sustainable?
 - Are private companies maintaining the operations of the plants?
 - Is the local financial sector more engaged with providing funding for RE projects after the technical assistance received?
 - What is the amount of GHG reduced by USD invested?

Task 2: Theory of Change

- Inputs: Financial resources, human capital
- Activities: Financial envelope, tendering process, technical assistance for long-term scale-up
- Outputs: Private companies receive loans and set up solar- and hydropower plants, energy produced is sold to the national utility
- Outcomes: Private companies operate the plants with financial sustainability
- Impacts: Reduced GHG emissions, increased share of RE in national energy mix

Crucial assumptions:

- Regulatory architecture is in place
- Sufficient capacity at private companies and LFIs
- Private companies apply to tender
- Successful, timely payment made by national utility
- Economically viable tariff structure

Task 3: Evaluation Method

At the time of the LORTA workshop, the Government of Zambia had completed the tendering process for the independent power producers. The sites at which the RE projects were to be set up had not been pre-selected but were suggested by the producers in the context of the tendering process. The successful bidders will sign a standardized power purchasing agreement with ZESCO, the national utility, and sell the energy they produce at tariffs previously agreed on. This energy will then be part of the national grid. There is no direct interaction between the independent power producers and the end beneficiaries, which makes an impact evaluation design unfeasible.

As noted above, this programme is nevertheless interesting to study with different forms of evaluation (for example, process evaluation). If it works well, it can serve as an example for similar projects in other countries.

Task 4: Costing – Sample Size and Power Calculations

Not elaborated because no impact evaluation seems possible.

Task 5: Implementation and Timelining

Not elaborated because no impact evaluation seems possible.

GROUP 10.B) “DEMOCRATIC REPUBLIC OF THE CONGO (DRC) GREEN MINI-GRID PROGRAMME”

GCF grant: USD 1 million

GCF senior loan: USD 20 million

Goal: To increase access to and productive use of energy by providing finance for three solar power plants; replacing fossil fuel use with RE sources; facilitating capacity-building and enabling framework for further green mini-grid projects in DRC

Task 1: Programme Modalities & Evaluation Questions

- **Overall timeline: 5 years, Q1/2019–Q4/2023**
- **Main interventions:**
 - Co-financing for three mini-grid projects in the towns of Isiro, Bumba and Genema, each consisting of a solar hybrid power plant of 5–10 MW, battery storage and associated distribution network
 - Technical assistance for enabling environment, institutional capacity and finance in the context of RE development
- **Intervention most suitable for evaluation:**
 - Co-financing for three mini-grid projects in the towns of Isiro, Bumba and Genema, each consisting of a solar hybrid power plant of 5–10 MW, battery storage and associated distribution network
- **Targeted beneficiaries:**
 - The programme is expected to provide 21,000 connections to the mini-grid for households and 2,000 for SMEs (with 20 employees each), all of whom are currently off grid.
- **Evaluation questions:**
 - Do the mini-grids increase access to energy and the productive use of energy?
 - What is the impact of the mini-grids on GHG emissions?
 - Are beneficiaries (households and SMEs) better off because of the set-up of the mini-grids?

Task 2: Theory of Change

- Inputs: Technical assistance by the Department for International Development (pre-feasibility studies), financial resources, human capital
- Activities: Financial envelope, tendering process, technical assistance for long-term scale-up
- Outputs: Private companies receive loans and set up solar power plants and low voltage lines in the three towns
- Outcomes: Private companies operate the plants with financial sustainability, end beneficiaries connect to the grid
- Impacts: Increase in energy access and productive use of energy, reduced GHG emissions, higher welfare

Crucial assumptions:

- Regulatory architecture is in place
- Sufficient capacity at private companies
- Private companies apply to tender
- End beneficiaries have financial ability to connect to the mini-grid
- Mini-grid provides reliable service

Task 3: Evaluation Method

Given that the three towns where the mini-grids will be set up were already selected, no experimental design seems feasible. However, a quasi-experimental design based on DiD combined with PSM is an option.

Isiro, Bumba and Genema were chosen from a shortlist of towns. The remaining towns on the shortlist and/or any other suitable towns that (1) are currently off grid, (2) do not receive a mini-grid soon, and (3) are comparable to the selected towns in other regards could serve as a comparison group. It was discussed to identify 10 or even 20 potential comparison towns and then match them with the selected towns (based on key informant interviews or field visits by the research team) to choose those that are most similar.

In the treatment towns, 20–30 per cent of households and SMEs are expected to connect to the mini-grid. It is important to clearly determine to whom they should be compared in the comparison towns. Based on information from the treatment towns, it seems possible to predict who in the comparison towns would be likely to connect to the mini-grid if there was one.

Task 4: Costing – Sample Size and Power Calculations

Data on connections to the grid and usage of energy can be obtained from the grid provider (administrative data). For information on what end beneficiaries use the energy for and what other sources of energy they use, a survey needs to be conducted. DRC does not appear to be a low-cost country for primary data collection. It is estimated that the cost per survey interview lies between USD 50 and USD 100.

Task 5: Implementation and Timelining

DATES	ACTIVITIES
Q2 2019	Tendering process open
Q3 2019	Tendering process completed
Q4 2019	Private companies finance feasibility studies in the 3 selected towns and African Development Bank funds pre-feasibility studies in other towns
Q4 2019	Baseline data collection
2020	Solar power plant set up
Q4 2022	Endline data collection

GROUP 11.A) “PRODUCTIVE INVESTMENT INITIATIVE FOR ADAPTATION TO CLIMATE CHANGE (CAMBIO II)” (FP097)

GCF grant: USD 3 million

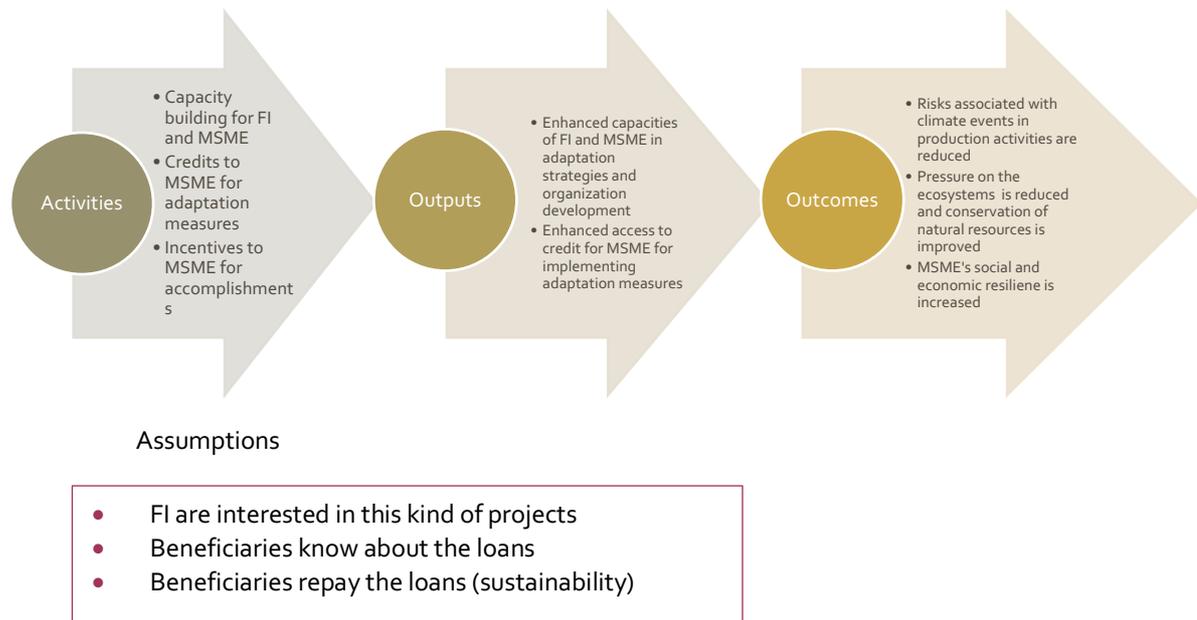
GCF senior loans: USD 12.5 million

Goal: To increase resilience to climate change of MSMEs in Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama and Dominican Republic by removing barriers to access financial and non-financial services for adopting and implementing climate change best adaptation measures

Task 1: Programme Modalities & Evaluation Questions

- **Overall timeline: 5 years, 06/2019–06/2024**
- **Main interventions:**
 - Component 1: Capacity-building for financial institutions (FI) and MSMEs for the development of production models resilient to climate change
 - Component 2: Credit for adaptation to MSMEs through FI
 - Component 3: Incentive scheme to MSMEs to promote the implementation of adaptation measures
- **Intervention most suitable for evaluation:**
 - Component 2 and 3 interventions, as they provide direct answers to the evaluation questions of interest
- **Targeted beneficiaries:**
 - 5,000 MSMEs with good credit history and an interest in applying for credit for a business plan to develop any of pre-defined “eligible” climate-resilient activities.
- **Beneficiary selection:** First, FI partners for the programme will have to be secured. The AE, the Central American Bank for Economic Integration (CABEI), aims to do so by reaching out to the network of FI that are already collaborating with the development bank. The target is to secure at least one financial institution per country. Potentially eligible MSMEs will be recruited via the FI as well as via the NGO partners already collaborating with CABEI. They will then be invited to attend training workshops and to apply for credit. Workshops will start in 2020 and will be set up on a rolling basis until the target of 5,000 MSME beneficiaries is reached.
- **Evaluation questions:**
 - Do MSMEs’ productive activities become more resilient to climate events?
 - Do MSMEs reduce the pressure on the ecosystems and improve the conservation of natural resources?
 - Do MSMEs increase their social and economic resilience?

Task 2: Theory of change



Task 3: Evaluation Method

During the LORTA workshop, it became clear that the recruitment of potential beneficiary MSMEs will be highly purposive. Three main potential impact evaluation designs were discussed:

- Component 2: RDD comparing eligible MSMEs on either side of the credit assignment threshold
- Component 2: DiD design comparing beneficiary MSMEs to non-beneficiary MSMEs
- Component 3: RCT exploiting randomization of incentive scheme assignment or type of incentive scheme assignment

The first two options appear as alternative impact evaluation approaches for the evaluation of Component 2. One caveat to consider is the purposive selection of potential MSME applicants and the rolling basis of workshops, which may render the establishment of a comparison unfeasible. The pool of MSME applicants is expected to be highly self-selective, given the purposive recruitment. Upon discussions with the project representatives, it also seems the case that the same MSMEs may re-attend and re-apply for funding if they did not succeed at their first application.

While a potential RCT approach was discussed for Component 3, the team did not seem keen to apply a randomization strategy in their implementation.

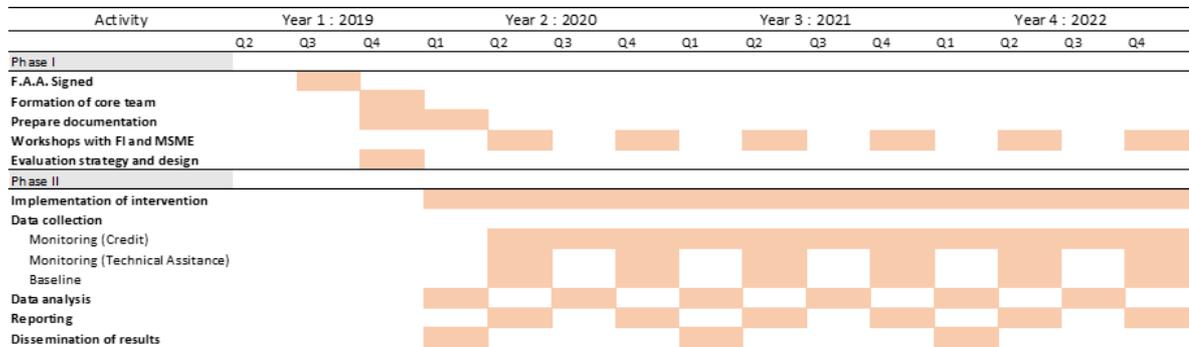
Task 4: Costing – Sample Size and Power Calculations

The project representatives mentioned that they will include a budget line for impact evaluation data collection before summer (June) 2019, when the first closure of the agreements with the GCF is scheduled. However, the project representatives were not comfortable in discussing budget details for impact evaluation needs.

The project representatives indicated the existence of a database recording all MSME application forms, which can be accessed for evaluation purposes. The minimum sample, and therefore the cost of the impact evaluation, will be determined by objective power calculations.

Task 5: Implementation and Timelining

The implementation timeline is depicted in the figure below. The project team formation and roll-out preparation will occur in 2019. During 2019, the project team should be starting to secure interest among FIs within the CABEI network. The official roll-out of the programme is planned to start in the first quarter of the year 2020, with the first workshops with FIs and MSMEs taking place in quarter 2. The impact evaluation methodology shall therefore be finalized before the end of the current year.



GROUP 11.B) “ACUMEN RESILIENT AGRICULTURE FUND (ARAF)” (FP078)

GCF grant: USD 3 million

GCF equity: USD 23 million

Goal: To increase the climate resilience of smallholder farmers in East Africa, Ghana and Nigeria, while providing Acumen investors with risk-adjusted market returns

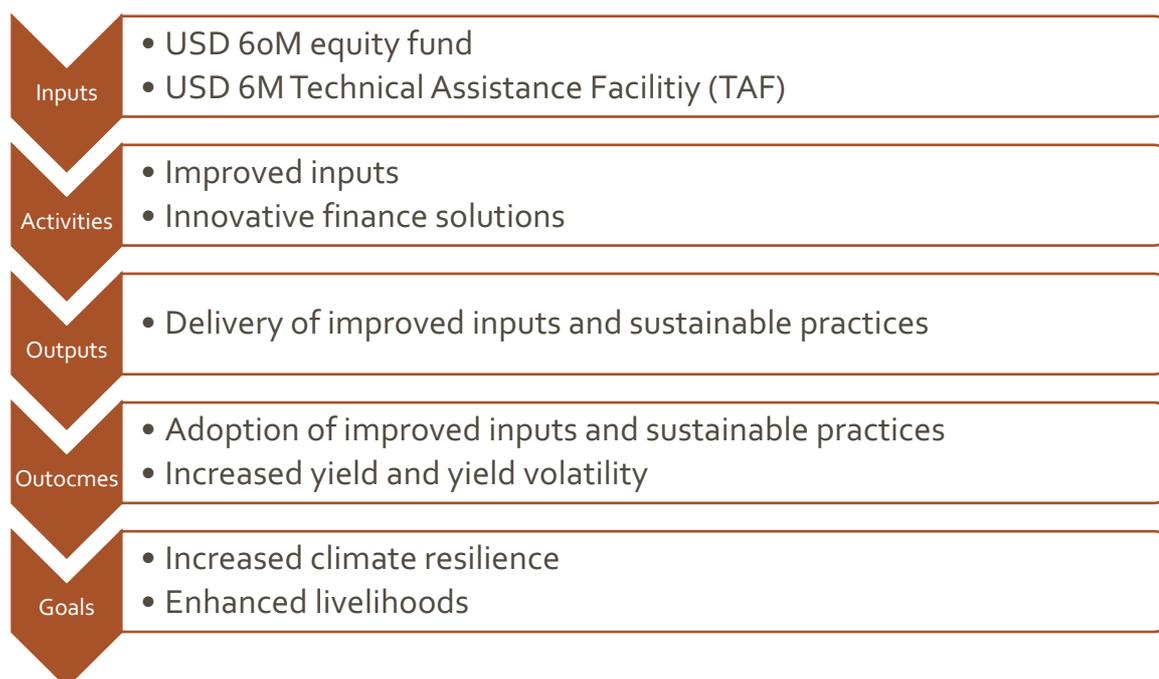
Task 1: Programme Modalities & Evaluation Questions

- **Overall timeline: 12 years, 10/2018–09/2030**
- **Main interventions:**
 - Component 1: Equity funding to 15 agribusinesses at the stage of early growth to help smallholder farmers become more resilient to climate change
 - Component 2: Technical Assistance Facility to assist core needs of portfolio companies to build capacity and ensure financial viability of business plans
- **Intervention most suitable for evaluation:**
 - Component 1, as it directly targets the end beneficiaries of the Acumen project, the smallholder farmers
- **Targeted beneficiaries:**
 - The targeted population of end-beneficiary smallholder farmers is 10 million.
 - Beneficiary selection: First, a target of 15 agribusiness companies will be selected for funding. Eligibility criteria for funding are the climate adaptation focus and the suitability of the business plan. The selection process of end beneficiaries will highly depend on the investee companies and their business models being funded.
- **Evaluation questions:**
 - Do smallholder farmers become more resilient to climate events?
 - Do smallholder farmers improve their livelihoods?

Task 2: Theory of Change

The overall ToC envisioned by the ARAF project accounts for a wide range of outputs and outcomes, given the large pool of potentially eligible business models that could be funded (i.e. insurance products, farmer field training, provision of agricultural inputs, value chain interventions and so forth).

The following shows a more focused ToC, following discussions during the workshop, concentrating on examples of potential investee companies involved in the provision of improved agricultural practices to farmers.



Important underlying assumptions are the financial sustainability of the business models over the project lifetime and beyond equity exit, as well as the actual take-up of practices from the side of farmers to trigger the transformation needed to enhance livelihoods and generate climate resilience.

Task 3: Evaluation Method

Acumen reserves a very large proportion of the project funds (USD 2 million) for impact measurement under the Technical Assistance Facility component.

An innovative component of Acumen is the Lean Data support, partially financed by the GCF. Lean Data is a platform created for Acumen to access real-time data directly from the end beneficiaries of the funded projects. All investee companies will have to agree to this facility for accountability purposes. Past quantitative data collections mainly relied on phone-based surveys.

Given the very large budget for impact measurement, the project representative expressed interest in proposing selected investees a robust impact evaluation of one or few funded projects. The workshop discussions revolved around examples of randomized assignment of villages/farmer groups or programme components.

Task 4: Costing – Sample Size and Power Calculations

As mentioned above, Acumen has a sizeable budget share for impact measurement. The minimum sample, and therefore the cost of a given impact evaluation, will be determined based on objective power calculations.

Task 5: Implementation and Timelining

Acumen will achieve first closure of agreements with the GCF in July 2019. Funds will then be deployed, and the investment period will run until 2024. Therefore, Acumen will have five years to invest in 15 companies. The target for 2019 is to invest in one company.

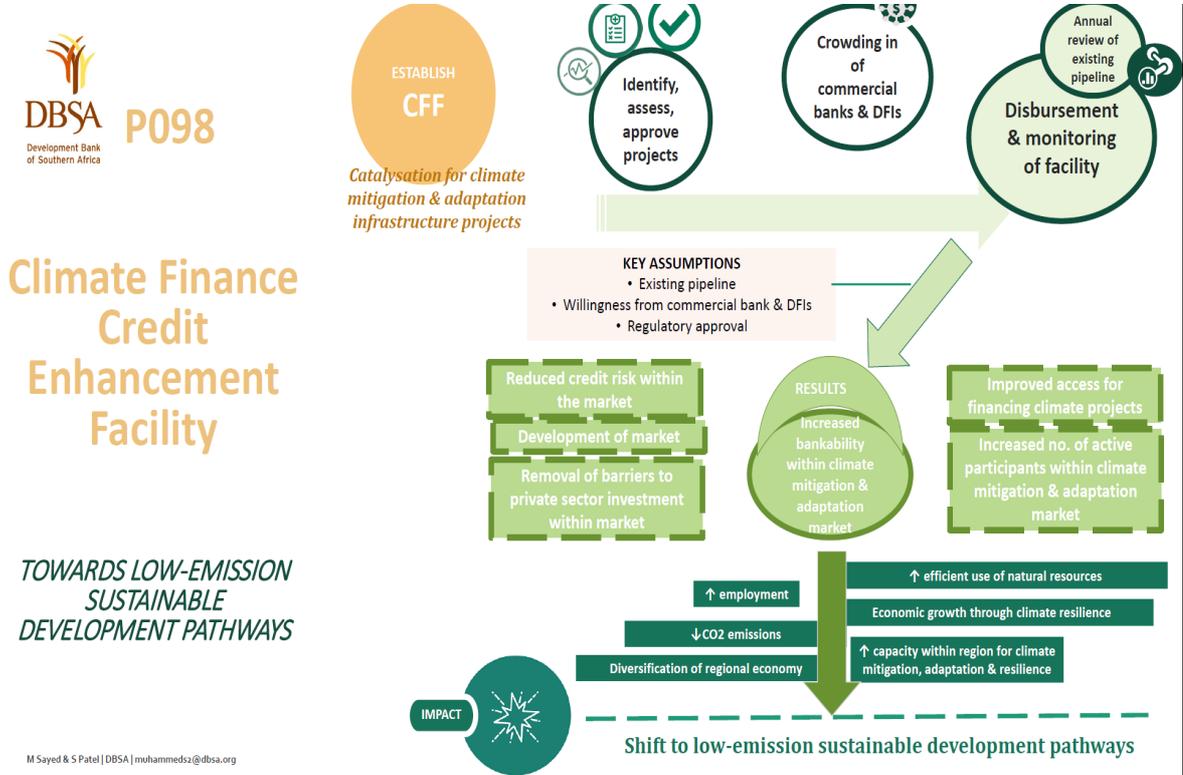
The holding period for a given company will be seven years. At the end of the holding period, the fund will sell its equity share.

APPENDIX 3. PROJECT POSTERS (THEORY OF CHANGE)

FP098 – CLIMATE FINANCE FACILITY

Location: South Africa, Namibia, Lesotho, Eswatini

AE: DBSA

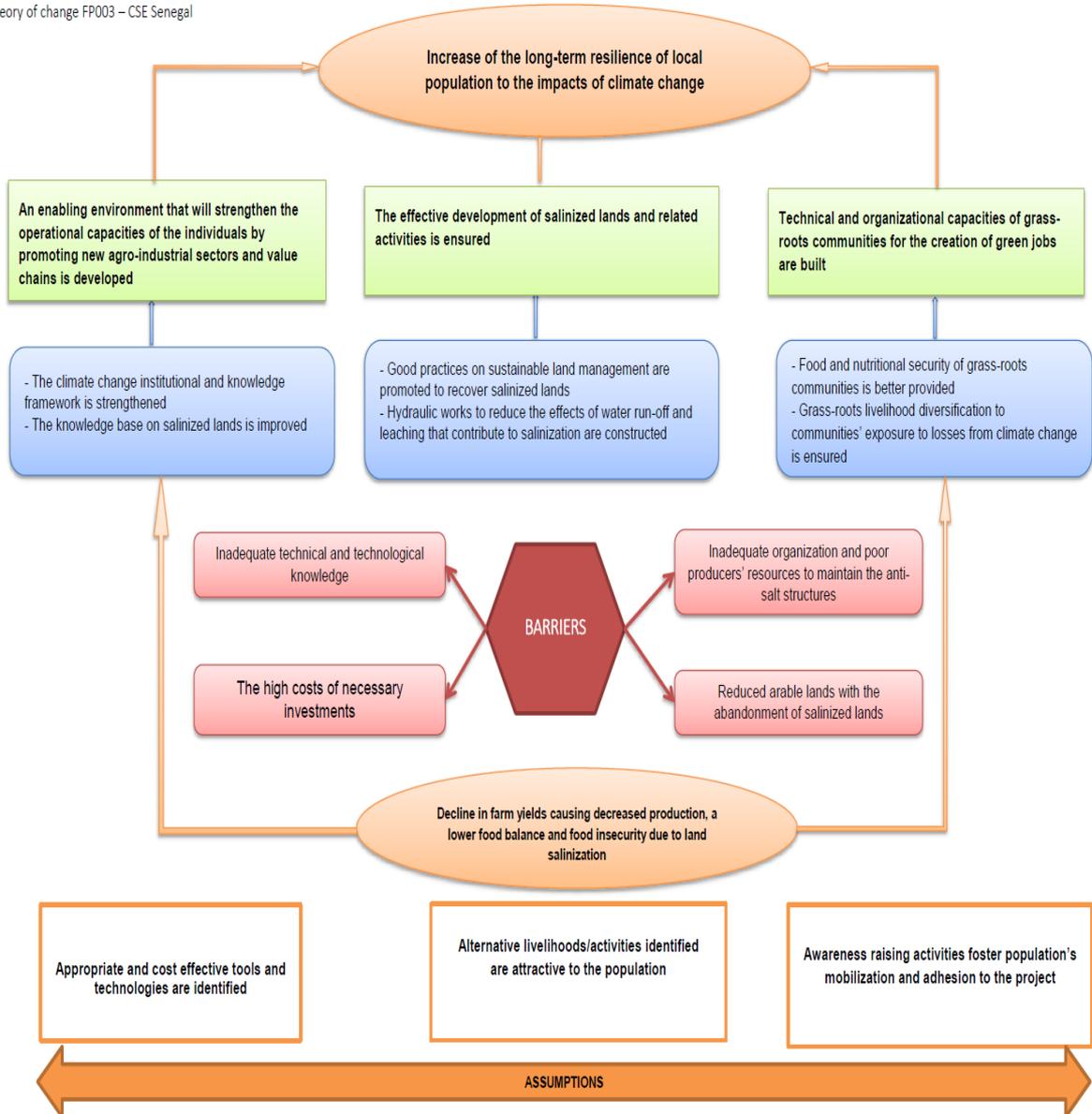


FP003 – CSE SENEGAL

Location: Senegal

AE: EBRD

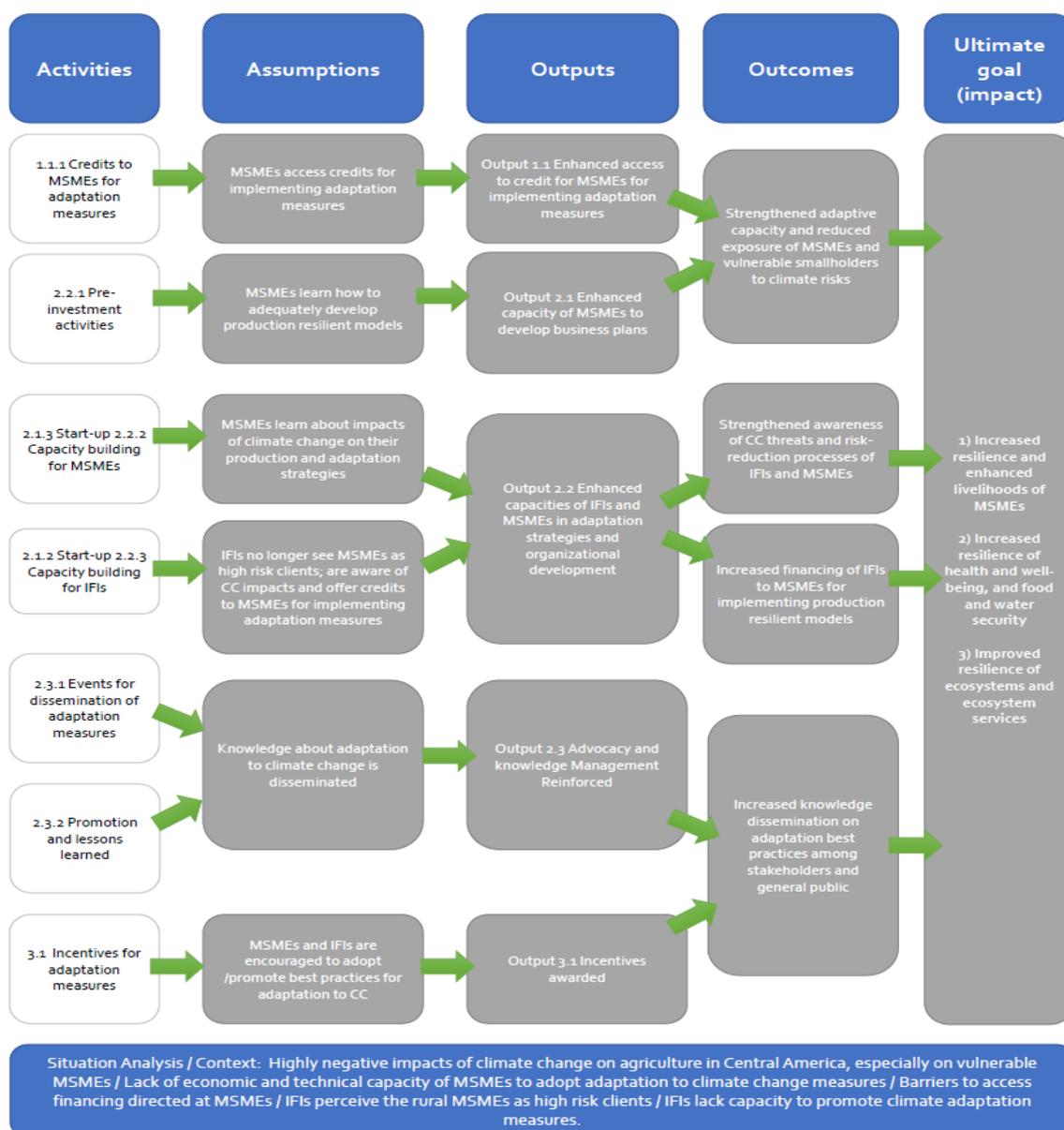
Theory of change FP003 – CSE Senegal



FP097 – PRODUCTIVE INVESTMENT INITIATIVE FOR ADAPTATION TO CLIMATE CHANGE

Location: Honduras

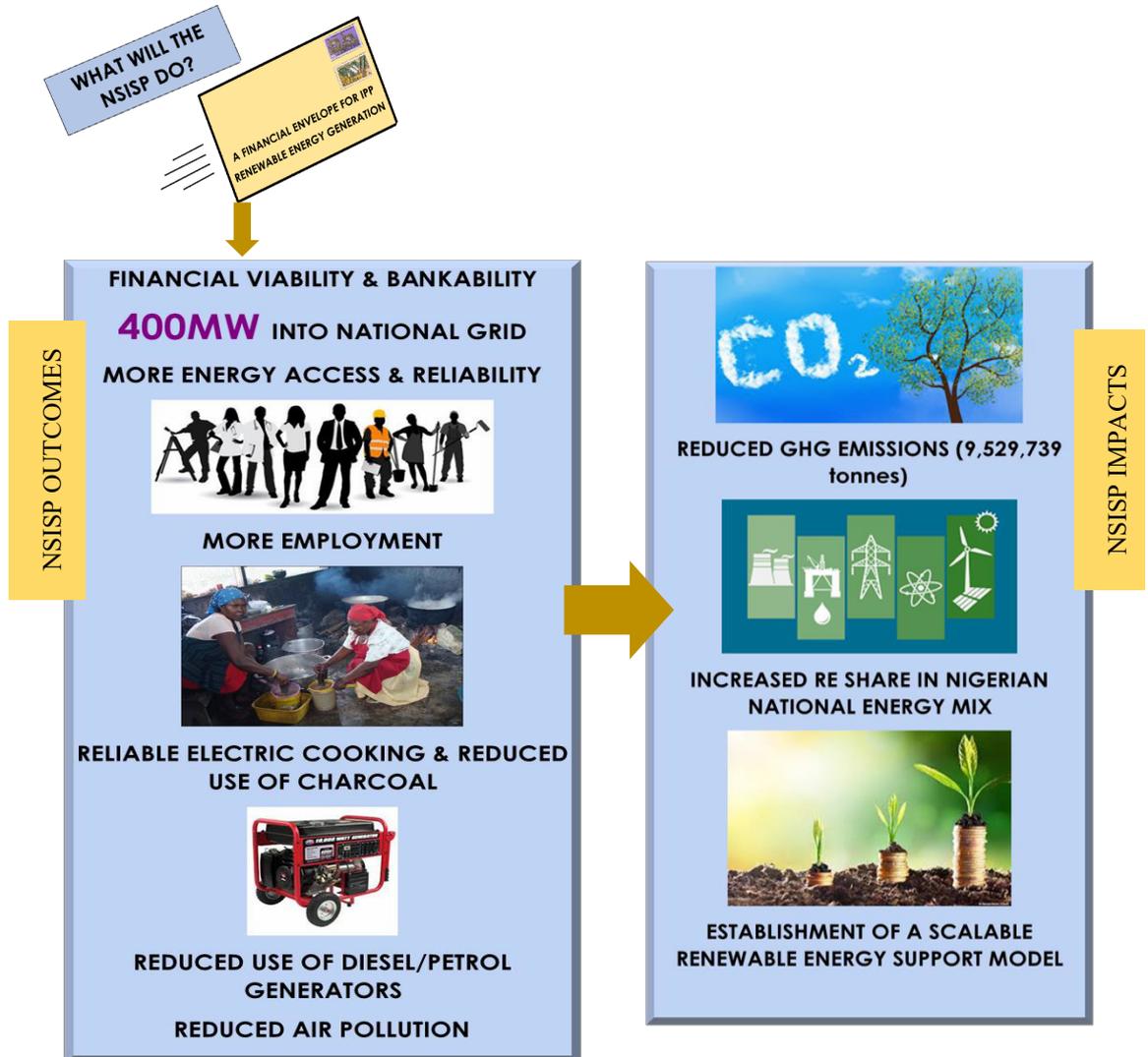
AE: CAMBio II



FP104: NIGERIA SOLAR IPP SUPPORT PROGRAMME

Location: Nigeria

AE: Africa Finance Corporation (AFC)



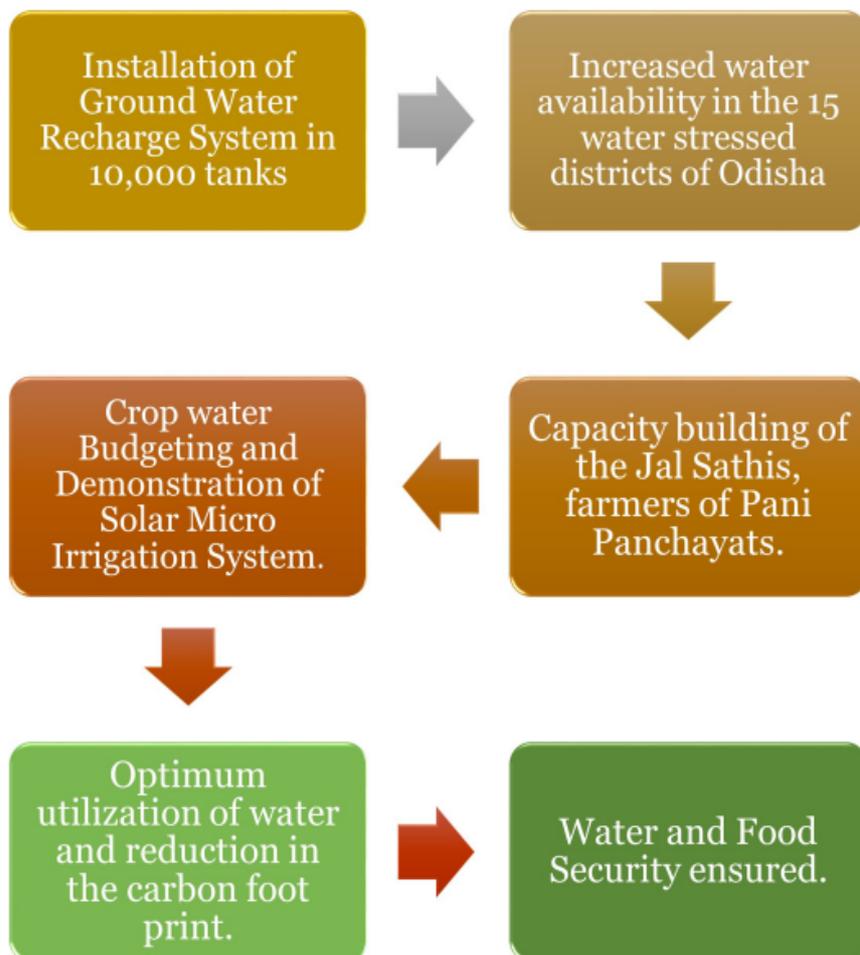
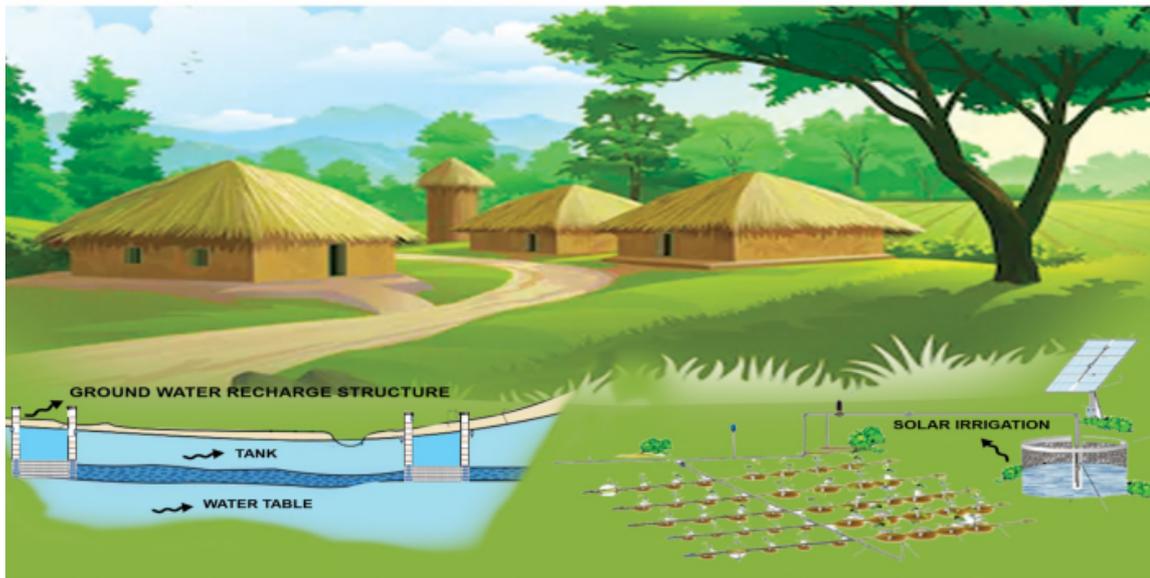
WHAT ARE NSISP'S CHALLENGES AND ASSUMPTIONS?



FP045 – GROUNDWATER RECHARGE AND SOLAR MICRO IRRIGATION TO ENSURE FOOD SECURITY AND ENHANCE RESILIENCE IN VULNERABLE TRIBAL AREAS OF ODISA

Location: India

AE: NABARD

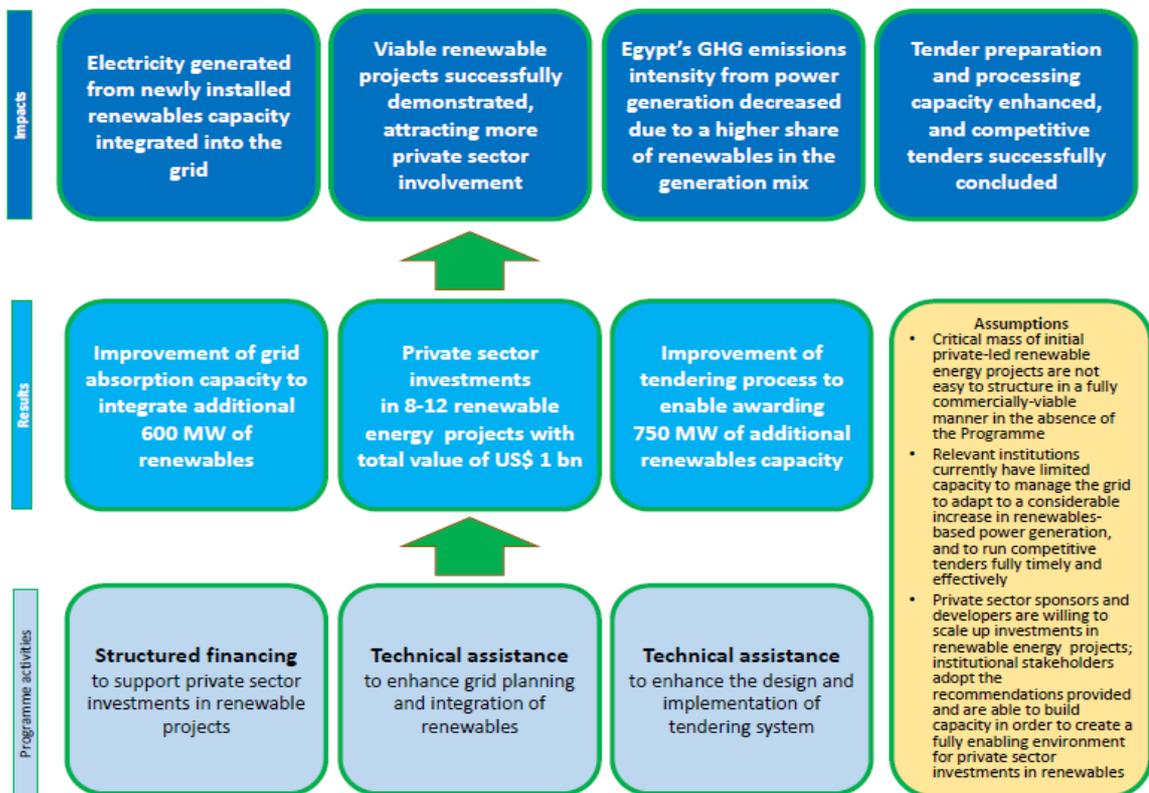


Neela Lohit Sahoo,AGM,NABARD,nl.sahoo@nabard.org

FP039 – EGYPT RENEWABLE ENERGY FINANCE FRAMEWORK

Location: Egypt

AE: EBRD

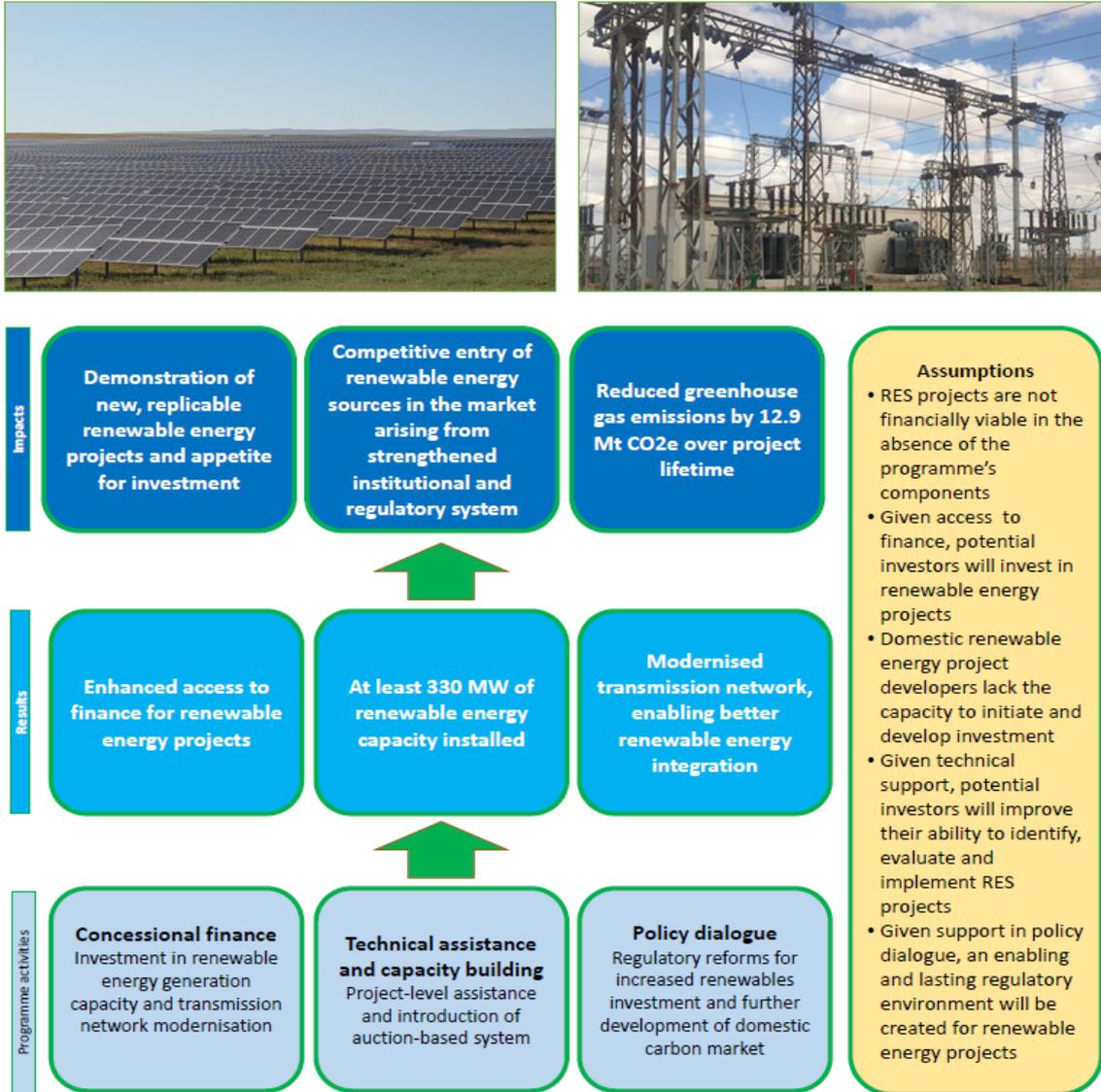


Programme contact:
 Mr Mahmoud Shata
 Associate Banker, SEMED,
 EBRD Cairo, Egypt
shatam@ebrd.com

FP047 – KAZAKHSTAN RENEWABLES FRAMEWORK

Location Kazakhstan

AE: EBRD

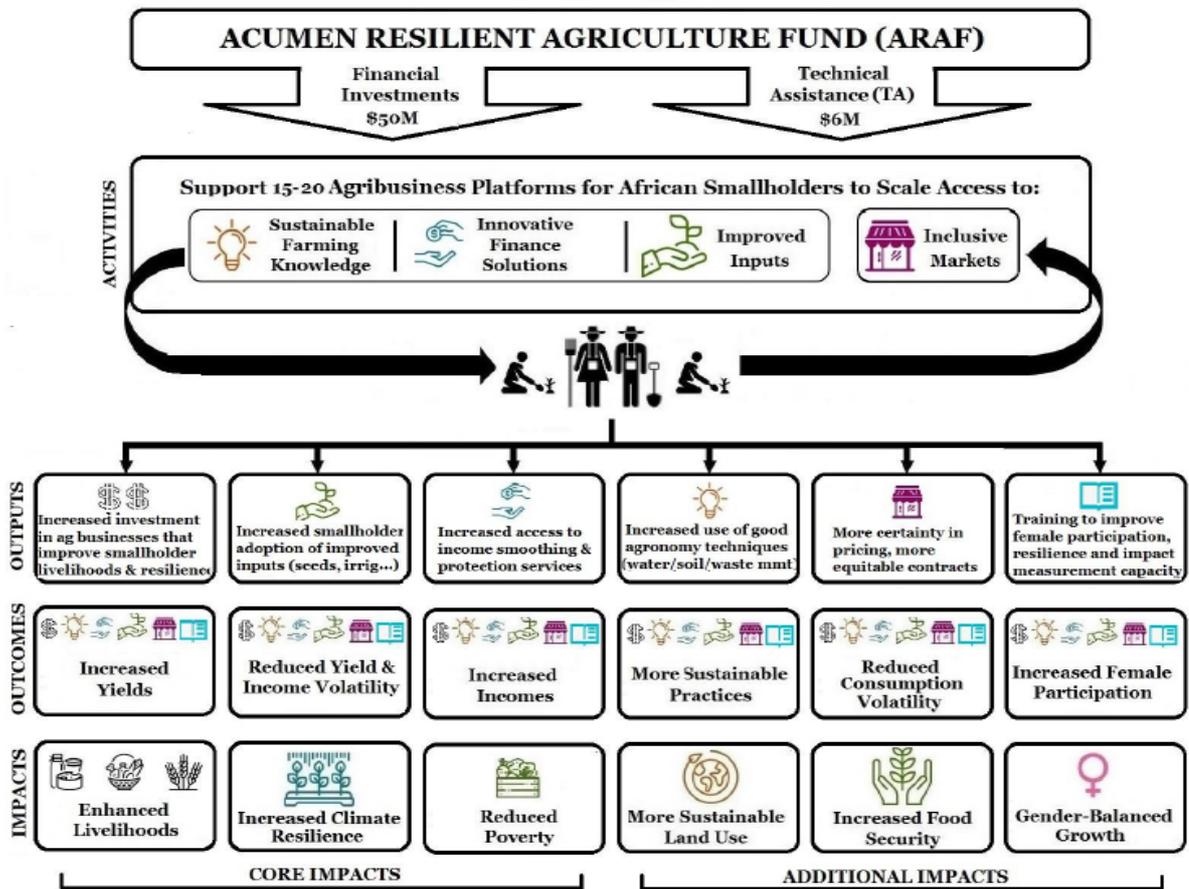


Programme contact: Mr Serik Shashdauletov, Analyst, Energy Eurasia, SIG, EBRD shashdas@ebrd.com

FP078 – ACUMEN RESILIENT AGRICULTURE FUND (ARAF)

Location: Kenya

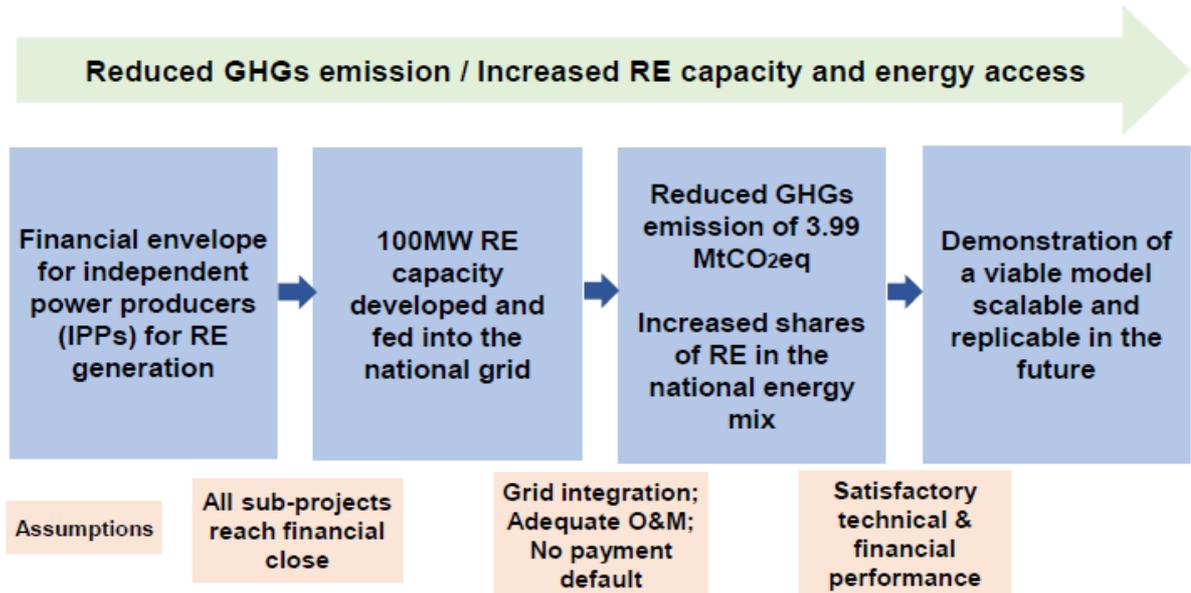
AE: Acumen



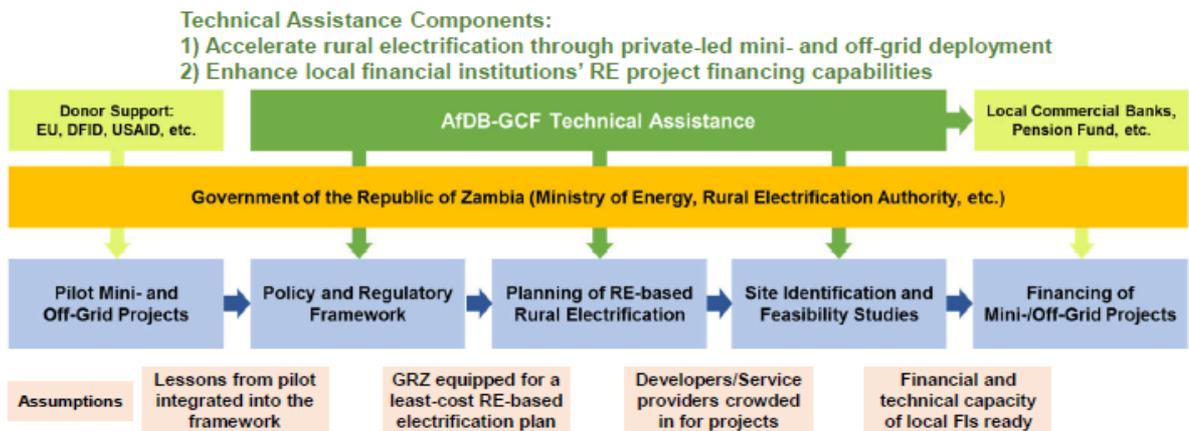
FP080 – ZAMBIA RENEWABLE ENERGY FINANCING FRAMEWORK

Location: Zambia

AE: AfDB



Theory of Change for Debt Financing Envelope for 100MW RE Projects

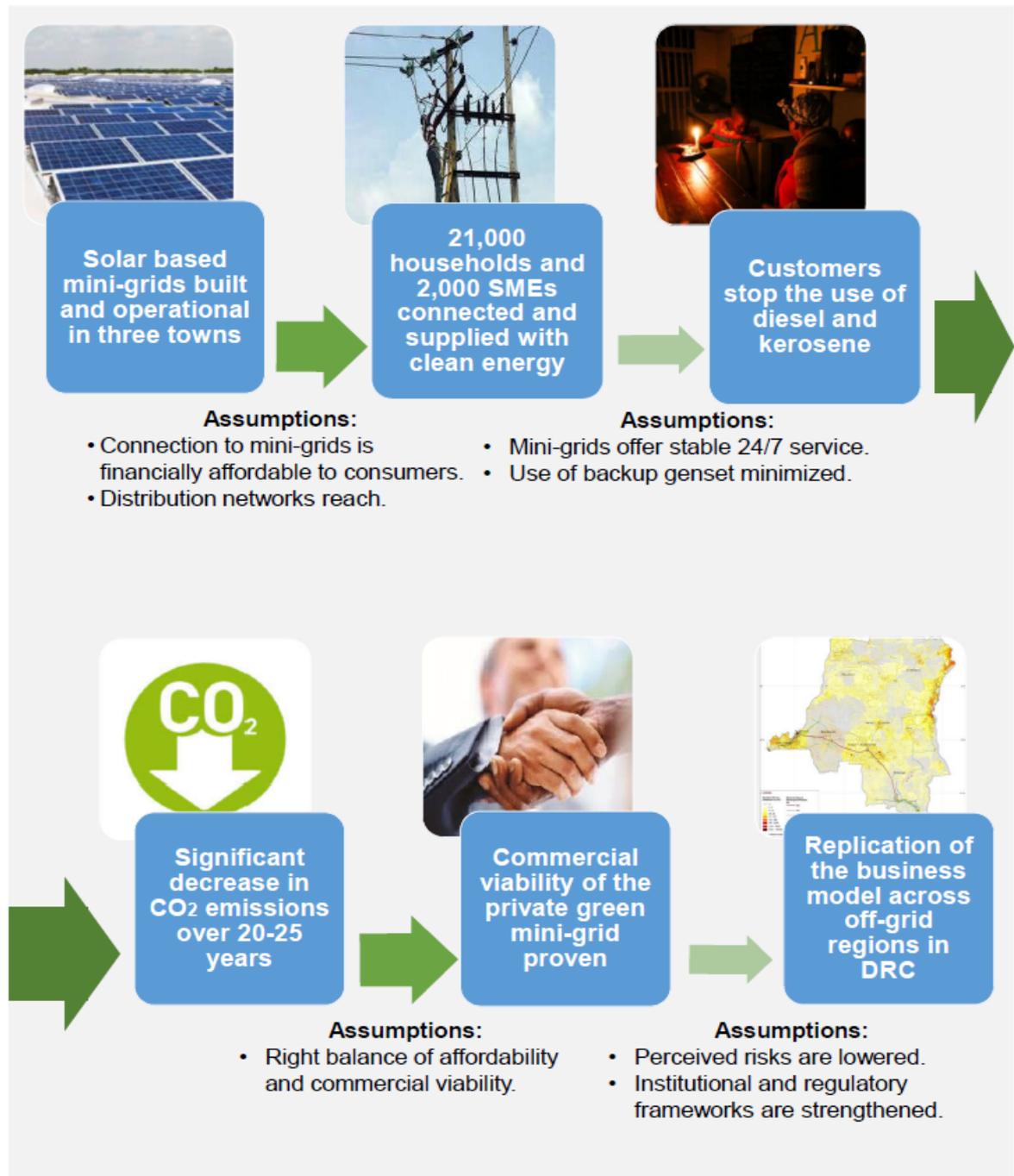


**Theory of Change for Technical Assistance:
 Development of ecosystem and value chain for RE-based rural electrification**

FP096 – DRC GREEN-MINI-GRID PROGRAMME

Location: Democratic Republic of Congo

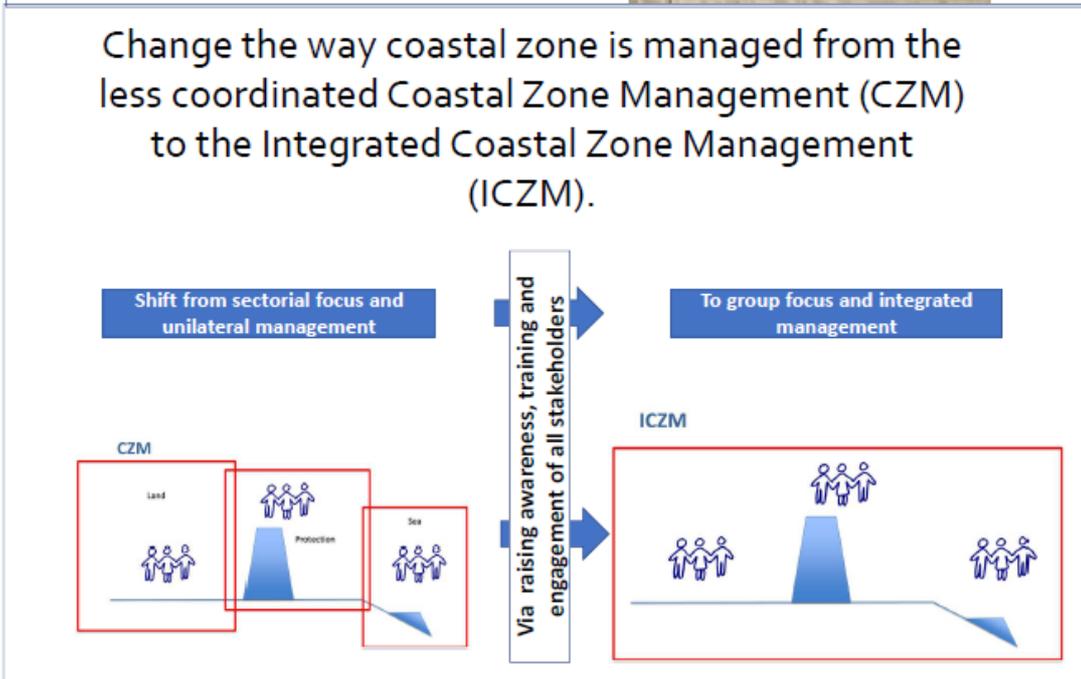
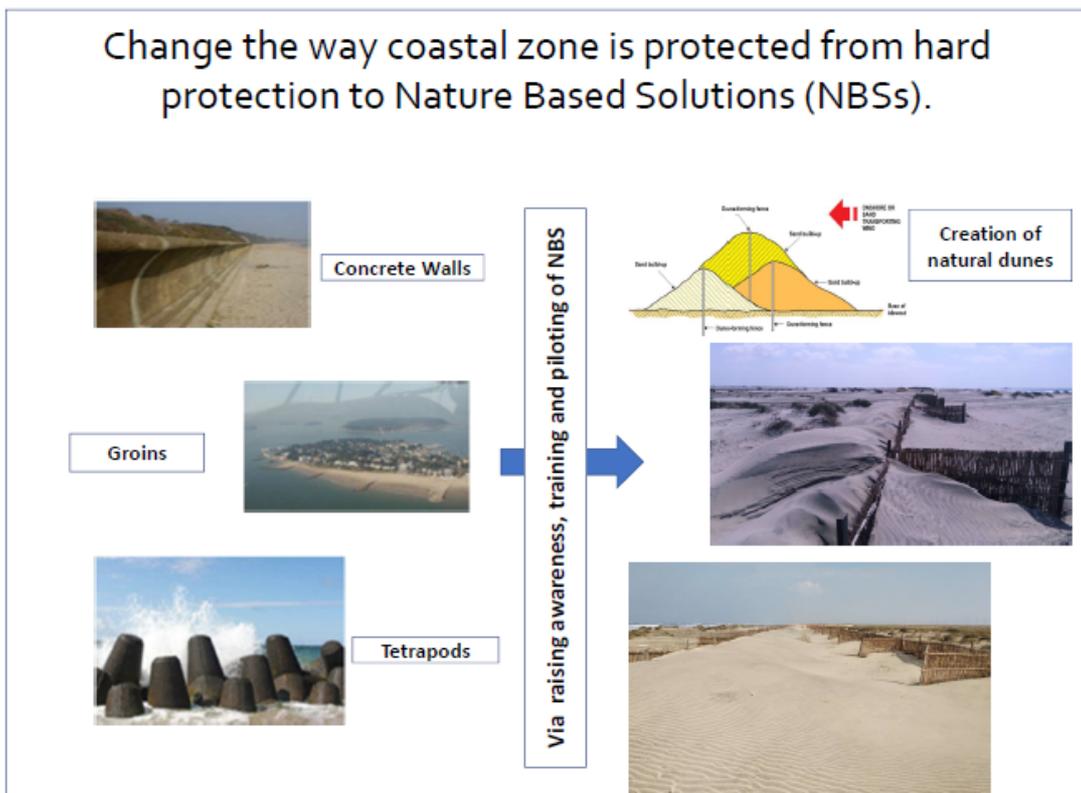
AE: AfDB



FP053 – ENHANCING CLIMATE CHANGE ADAPTATION IN THE NORTH COASTAL AND NILE DELTA REGIONS IN EGYPT

Location: Egypt

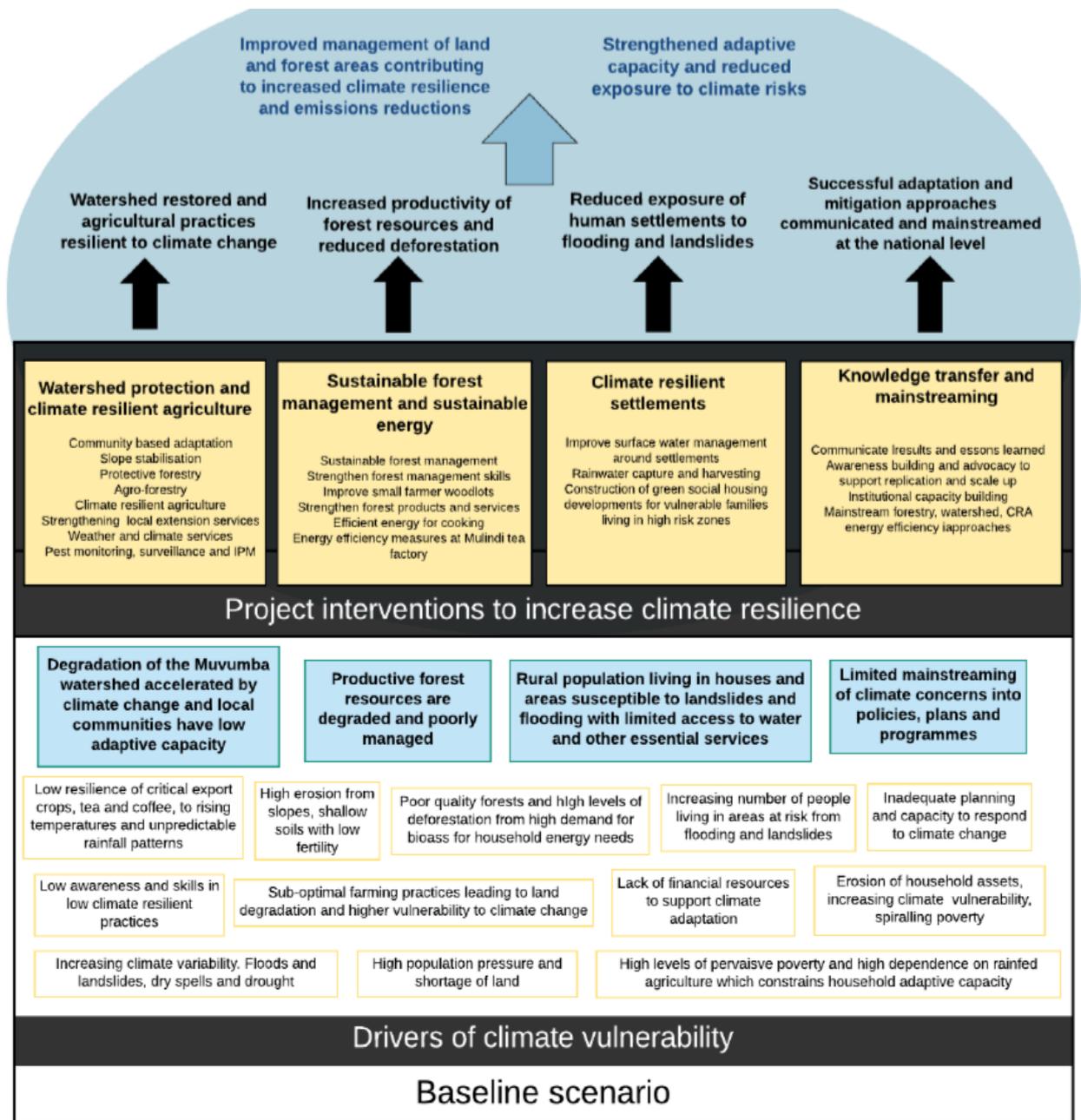
AE: ACCADP



FP073 – STRENGTHENING CLIMATE RESILIENCE OF RURAL COMMUNITIES IN NORTHERN RWANDA

Location: Rwanda

AE: Ministry of Environment, Rwanda



Key Assumptions

- External factors**
- District managers commit to including project targets in AAPs and imihigo
 - Communities supportive and adopt improved practices
 - Forest owners and workers commit to forest renewal and best practice
 - Subsidies are sufficient to motivate households to invest in rainwater harvesting and efficient energy for cooking
 - Tea factory owner and managers support and invest in efficiency measures
- Programme implementation**
- The TA team recruited has the skills and the relevant contextual understanding to implement project
 - Funds disbursed in timely manner at all levels
 - Project monitors its progress and makes changes as needed
 - Suitably qualified service providers are available and procured in a timely manner
- Causality**
- Technologies and approaches applied successfully, yield positive results and stimulate demand
 - Policy makers and planners receptive and responsive to mainstreaming approach and endorse and adopt new approaches

Risks

- Low capacity of farmers and communities to invest in adaptation actions where public benefits dominate jeopardises project objectives
- 6 years is insufficient time to prove adaptation benefits
- High costs of improved cooking technologies deter households from investing.
- Operational targets for each component not included in District Imihigo framework. Project activities then become deprioritised by District staff and activities are not delivered to time/quality, and capacity to manage the activities is not developed.
- Contracted service providers maintain BAU and do not follow best practice. This would severely impact on the adaptation and mitigation potential because many of the results depend on the uptake of improved technologies and approaches. This would also compromise the project's value for money.

FP084 – ENHANCING CLIMATE RESILIENCE OF INDIA’S COASTAL COMMUNITIES

Location: India

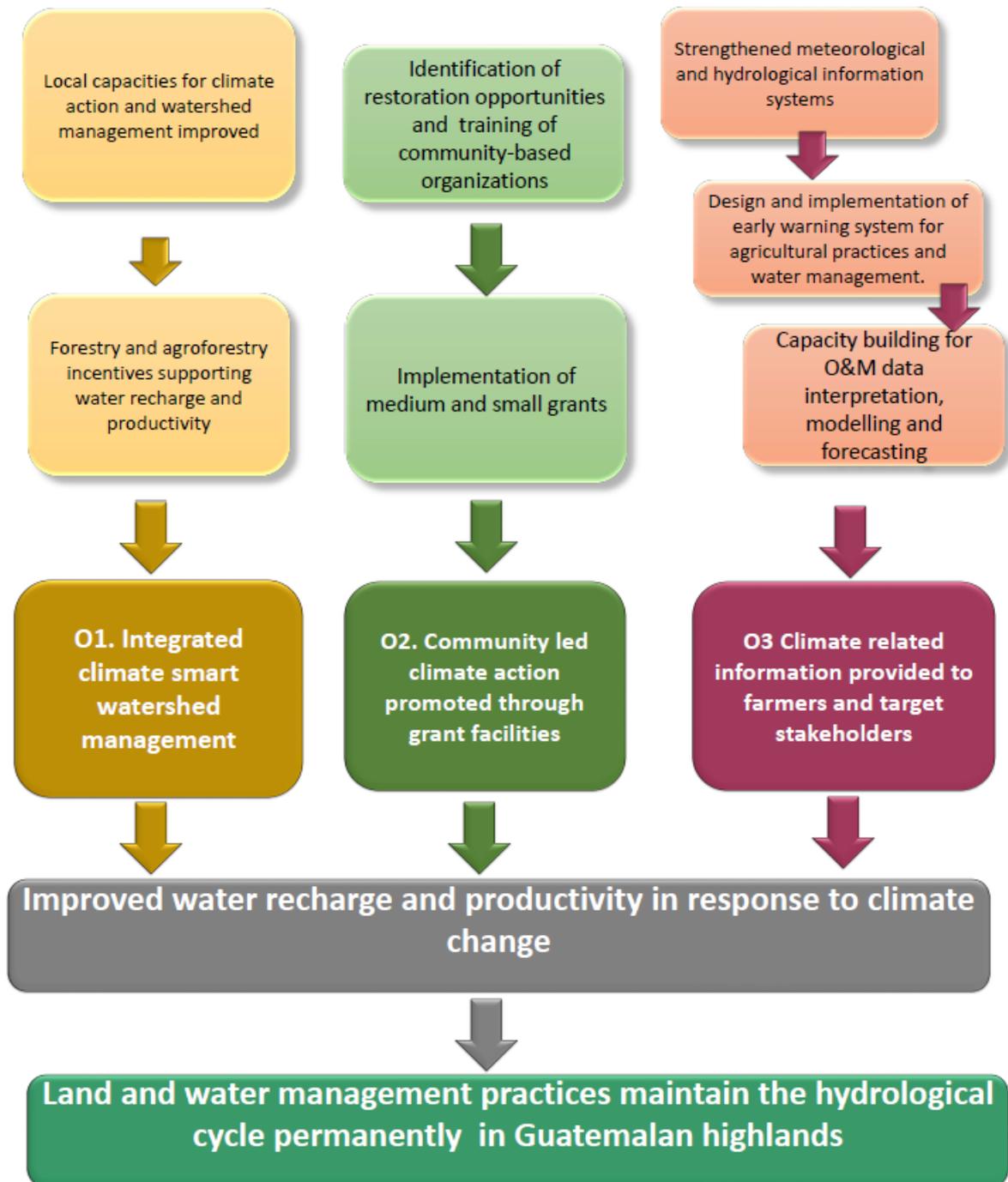
AE: UNDP



FP087 – BUILDING LIVELIHOOD RESILIENCE TO THE CLIMATE CHANGE IN THE UPPER BASINS OF
GUATEMALA’S HIGHLANDS

Location: Guatemala

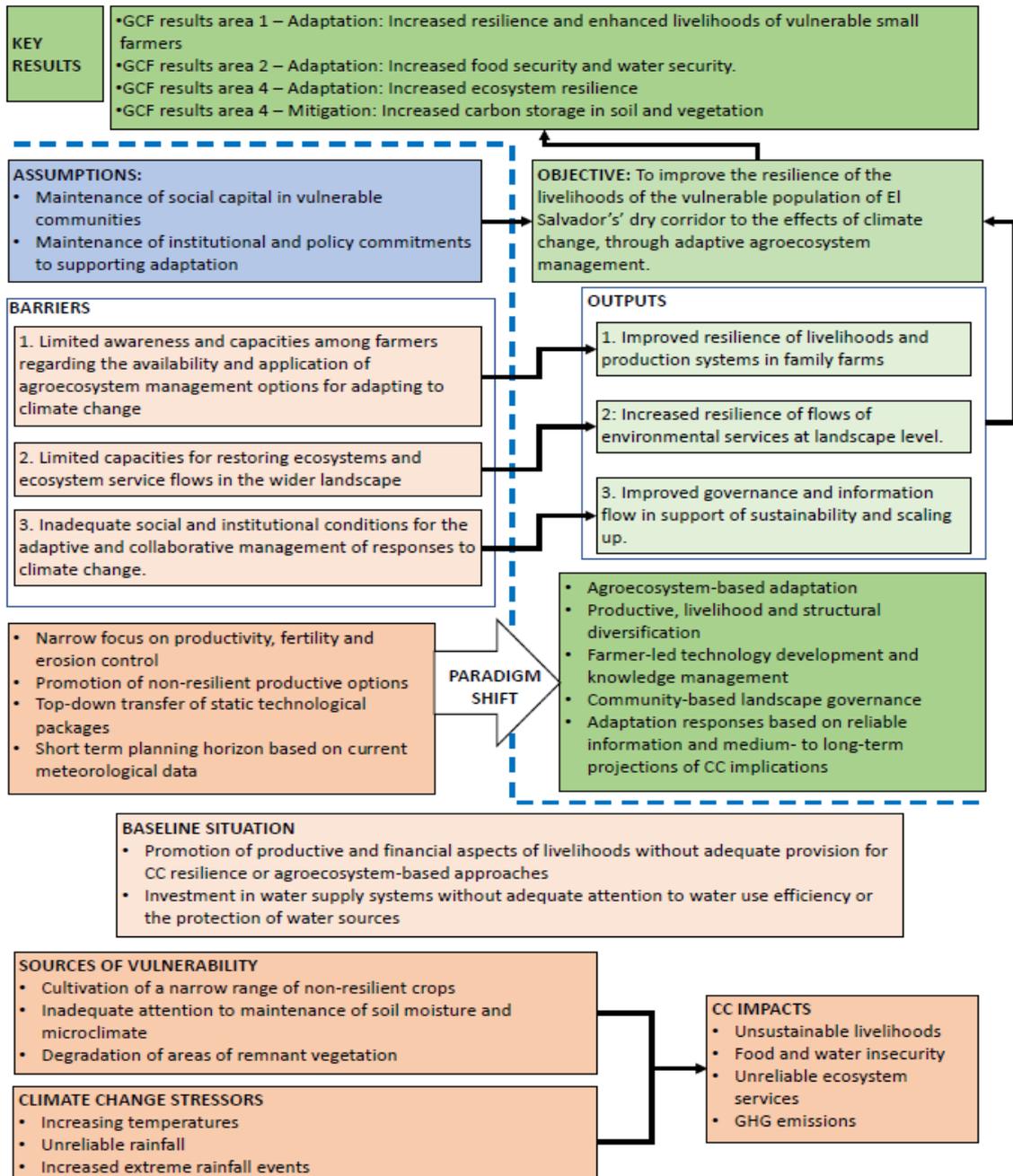
AE: IUCN



FP089 – UPSCALING CLIMATE RESILIENCE MEASURES IN THE DRY CORRIDOR AGROECOSYSTEM OF EL SALVADOR (RECLIMA)

Location: El Salvador

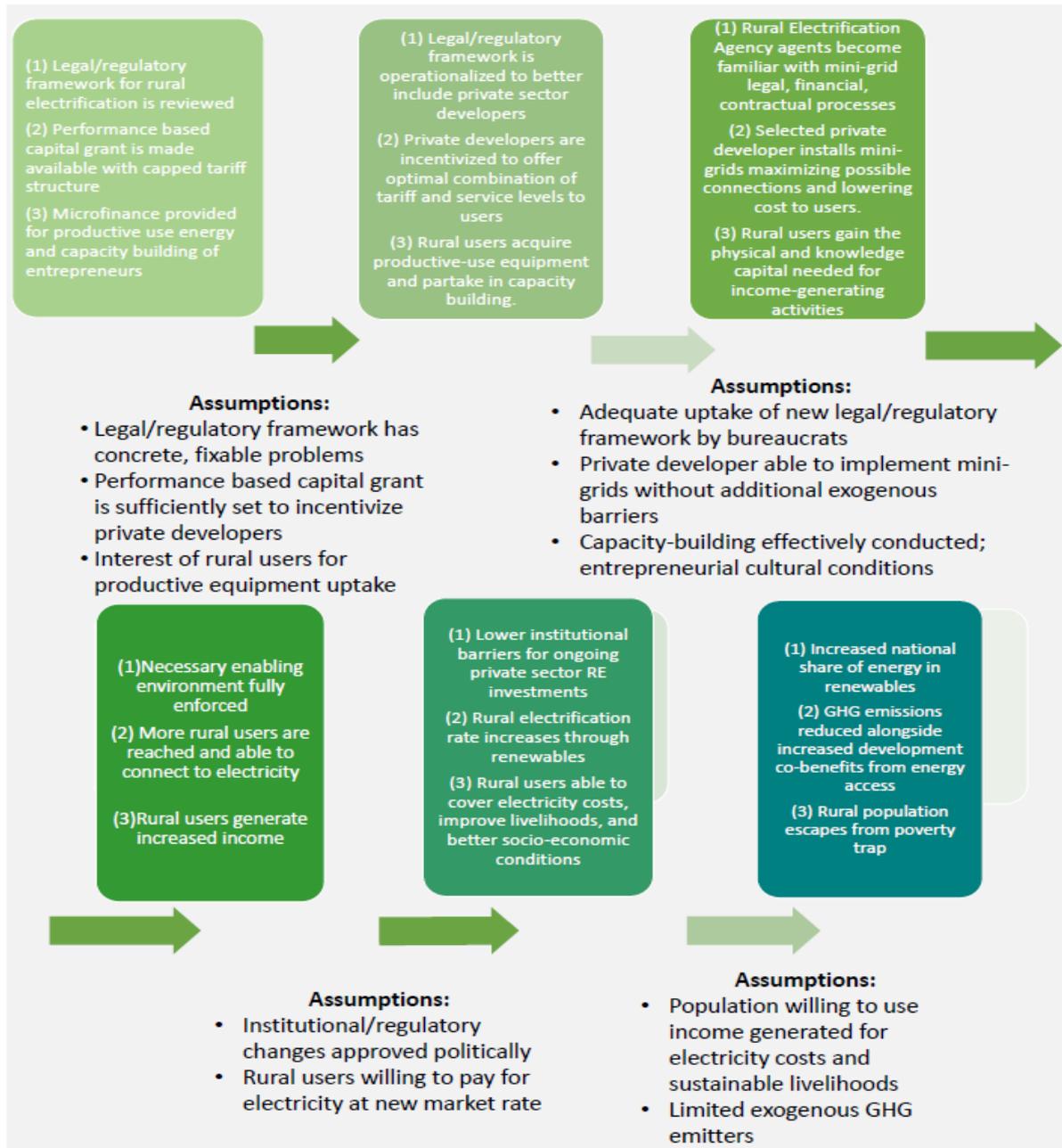
AE: FAO



FP093 – YELEEN RURAL ELECTRIFICATION PROJECT THROUGH PRIVATE SECTOR -DRIVEN MINI-GRID

Location: Burkina Faso

AE: AfDB

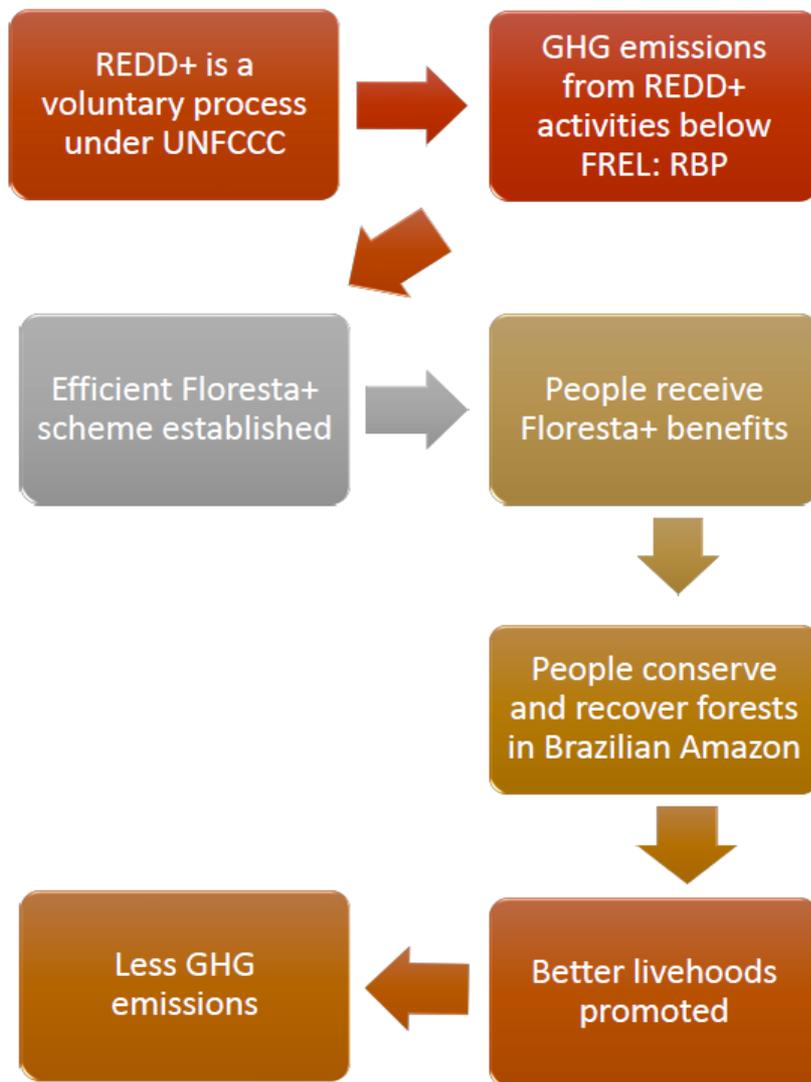


FP100 – REDD+ RESULTS-BASED PAYMENT FOR RESULTS ACHIEVED BY BRAZIL IN AMAZON BIOME
IN 2014-2015

Location: Brazil

AE: UNDP

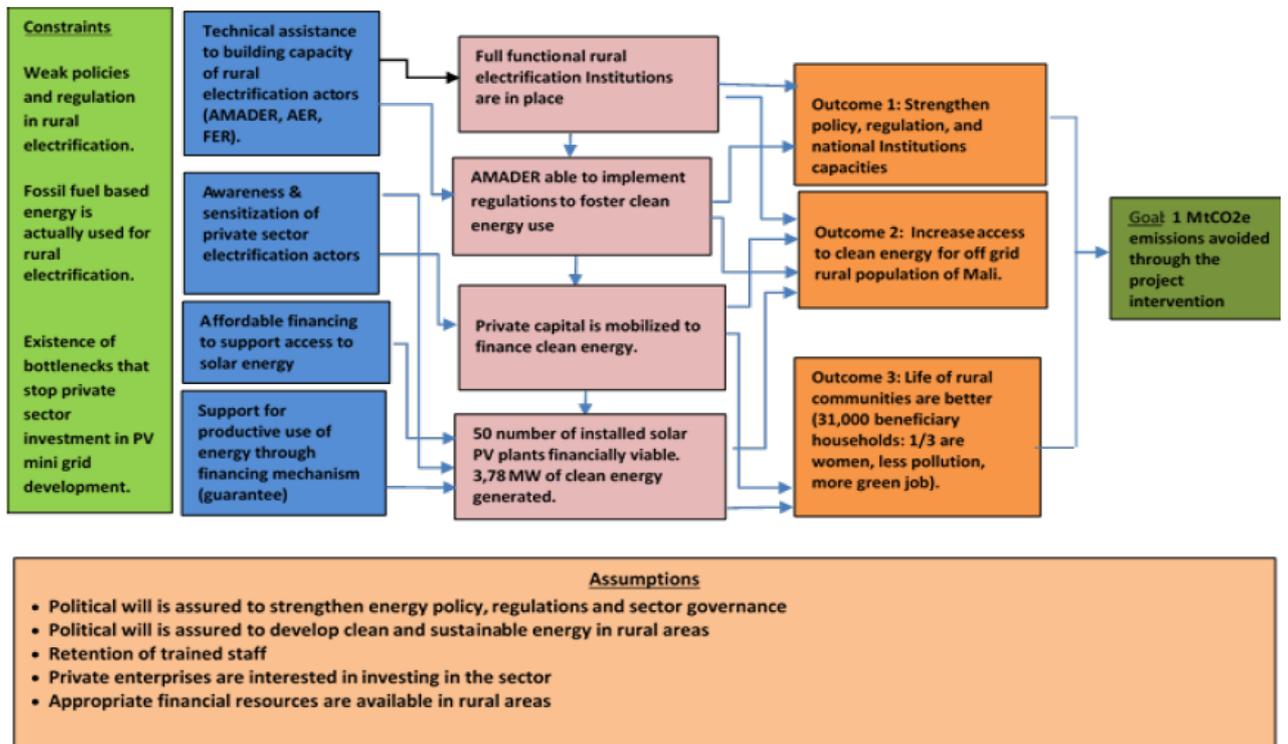
Results-Based Payment Project: no TOC applied



FP102 – MALI SOLAR RURAL ELECTRIFICATION PROJECT

Location: Mali

AE: Banque Ouest Africaine de Développement (BOAD)



SAP001 – IMPROVING RANGELAND AND ECOSYSTEM MANAGEMENT PRACTICES OF SMALLHOLDER FARMERS UNDER CONDITIONS OF CLIMATE CHANGE IN SESFONTEIN, FRANSFONTEIN AND WARMQUELLE AREAS OF THE REPUBLIC OF NAMIBIA

Location: Namibia

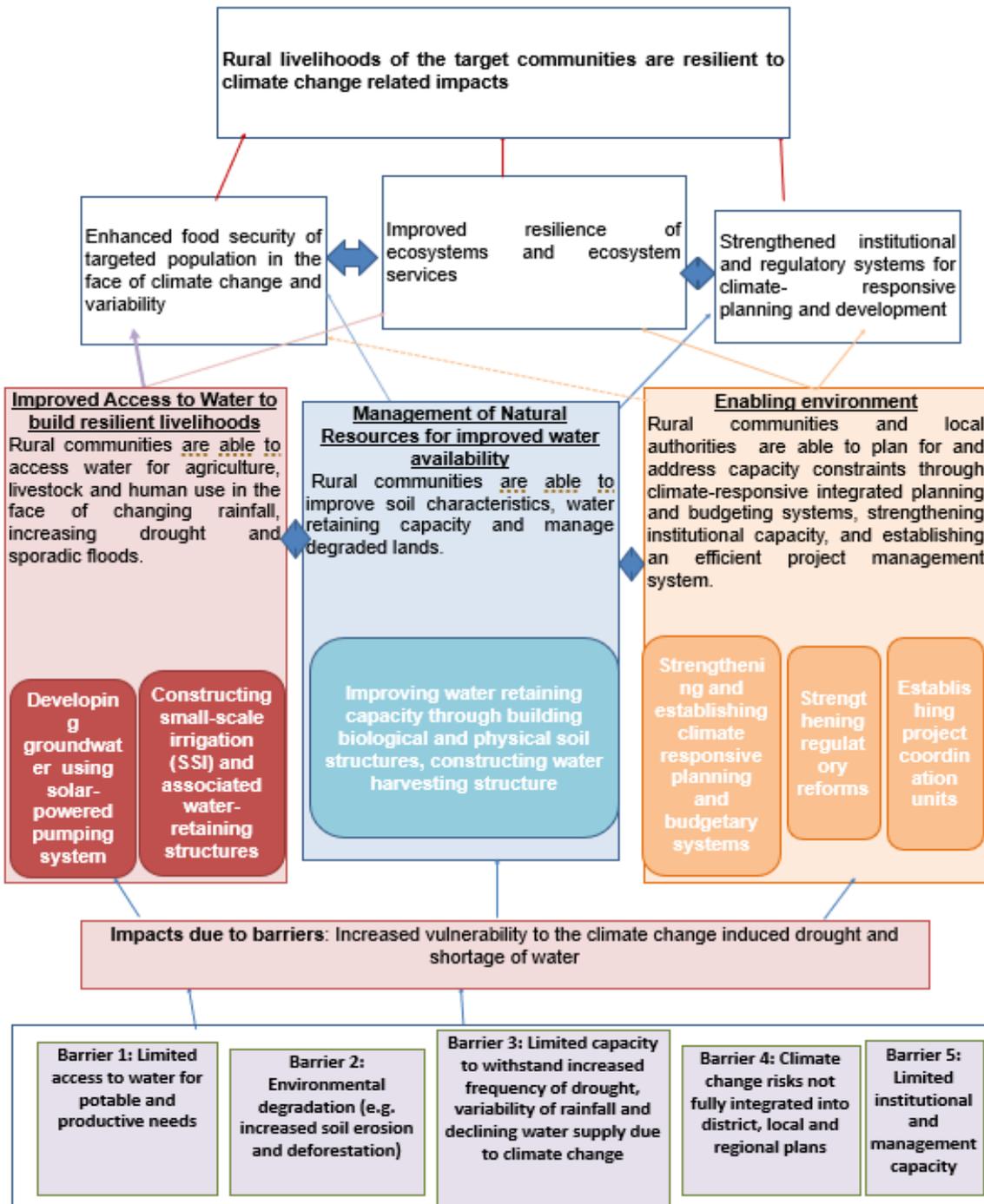
AE: Environmental Investment Fund of Namibia



FP058 – RESPONDING TO THE INCREASING RISK OF DROUGHT: BUILDING GENDER-RESPONSIVE RESILIENCE OF THE MOST VULNERABLE COMMUNITIES

Location: Federal Democratic Republic of Ethiopia

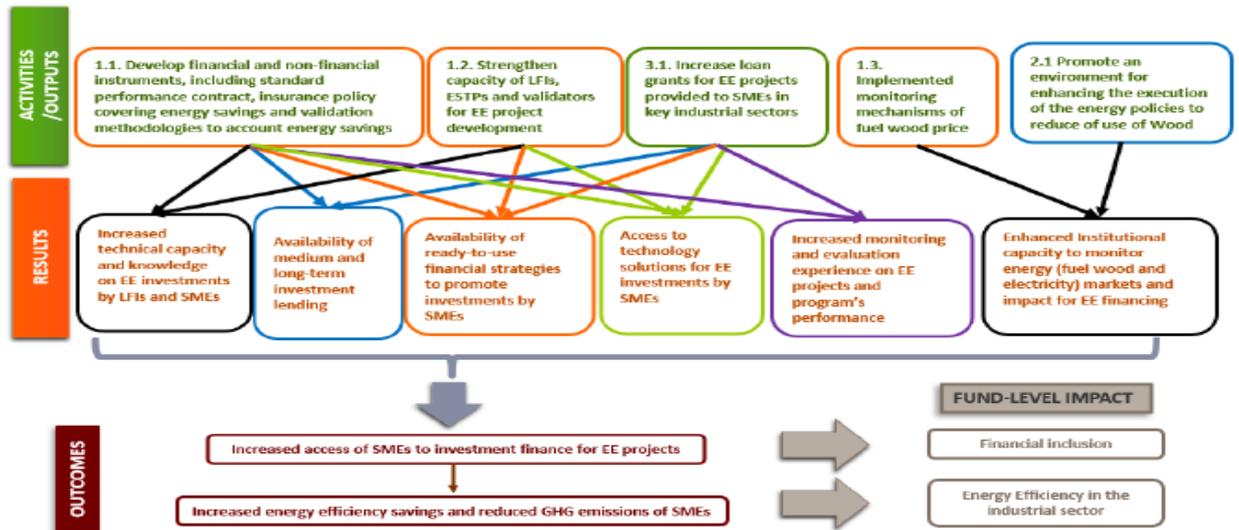
AE: Ministry of Finance and Economic Cooperation of the Federal Democratic Republic of Ethiopia (MOFEC)



FP063 – PROMOTING PRIVATE SECTOR INVESTMENTS IN ENERGY EFFICIENCY IN THE INDUSTRIAL SECTOR

Location: Paraguay

AE: IDB



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