Enhancing Climate-Resilience Among Smallholder Farmers:

An Evaluation Plan for Illuminate Change's Climate-Smart Agriculture (CSA) Project on Buvuma Islands of Lake Victoria in Uganda.

A Project Paper

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Cyprian Kaziba

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ABSTRACT

Agricultural development projects can have a tremendous positive impact if well planned, implemented, monitored, and evaluated, but this calls for a thorough monitoring, evaluation, and learning plan. This paper is a presentation of an evaluation plan for a climate-smart agriculture (CSA) project developed and implemented by the non-profit organization *Illuminate Change* on Buvuma Islands of Lake Victoria in Uganda. The project's main goal is to enhance climate resilience among rural smallholder farmers. The purpose of the proposed evaluation is to improve project design and strategies, improve project performance, examine project impact, and generate knowledge and lessons. The evaluation questions relate to project relevance, farmers' preferences among CSA practices and technologies, determining factors in farmers' choices, barriers and opportunities for CSA adoption, project outcomes and impact, as well as best practices and lessons learned. The evaluation design will include the matched difference-in-differences approach with a mixed method of both qualitative and quantitative data collection methods and analysis.

BIOGRAPHICAL SKETCH

Hailing from Uganda, Cyprian is completing a Master of Professional Studies in Global Development with a concentration in International Agriculture and Rural Development at Cornell University. He is a Cornell Institute for African Development (IAD) graduate fellow (2019/2020). Prior to enrolling for a master's program, he was a Fulbright Humphrey Fellow (2018/2019) at Cornell, a prestigious 10-months professional development program for mid-career professionals, funded by the US Department of State. For seven years, before winning the Fulbright Humphrey Fellowship, Cyprian worked for Buvuma district local government in Uganda under the Department of Agricultural Production and Marketing.

Cyprian has won several other competitive international fellowships that enabled him to travel and attend international agricultural-related short courses including; *Optimizing the performance of producer organizations: Farmers in agribusiness* (at Wageningen University, Netherlands), *Local economic development* (at The Hague Academy for Local Governance, Netherlands), *Gender in local food markets and value chains* (at Egerton University, Kenya), as well as *Agricultural produce processing & export* (at Shandong Foreign Trade Vocational College, China).

To my parents,
and
all the people who have helped me complete this degree.

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I acknowledge Cornell Institute for African Development (IAD) for granting me a fellowship to study at Cornell and for funding our climate-smart agriculture pilot project in Buvuma, Uganda, for which this evaluation plan is written. Special thanks to the Department of Global Development for the financial support amidst COVID-19, and CALS Office of Professional Studies and Extended Learning (OPPEL) for the incredible support whenever needed.

Last but not least, thanks to the project team - Laura Simmons-Stern, Michal Matejczuk, and Sara Wasser; our interns, volunteers, and all project partners. Together, our small steps have contributed, and are still contributing, to global development.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

CALS	College of Agriculture and Life Sciences
CCAFS	Climate Change, Agriculture, and Food Security
CGIAR	Consultative Group for International Agricultural Research
COVID-19	Corona Virus Disease - 2019
CSA	Climate-Smart Agriculture
ECRARF	Enhancing Climate Resilience Among Rural Smallholder Farmers
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GHGs	Greenhouse Gasses
IAD	Cornell Institute for African Development
IC	Illuminate Change
LaVITO	Lake Victoria Islands Transformation Organization
NARO	National Agricultural Research Organization
NGO	Non-Governmental Organization
OPPEL	Office of Professional Studies and Extended Learning
PA	Participatory Assessment
PLA	Participatory Learning and Action
RPFs	Resource Poor Farmers
ToC	Theory of Change
UBOS	Uganda Bureau of Statistics
UIRI	Uganda Industrial Research Institute

Chapter One

General Background

1.0 Introduction

This paper presents an evaluation plan for Illuminate Change's (IC) Climate-Smart Agriculture pilot project on Buvuma Islands of Lake Victoria in Uganda. After two years of implementation, IC would like to evaluate the project design and strategies, assess project progress and performance, assess the project's prospects for longer-term, sustained impact, and examine lessons learned during implementation. The first chapter of this plan offers background including a brief profile of Illuminate Change, the context of Buvuma district and the problem that warranted project intervention, an overview of the project, an elaboration on the purpose of the evaluation, as well as leading evaluation questions. Chapter two discusses the proposed evaluation methodology including the evaluation design, data collection and analysis methods, sampling, as well as the anticipated limitations and proposed mitigation. Chapter three presents the proposed evaluation implementation process, as well as the methods to be used in the dissemination of evaluation findings. Data collection tools including a survey questionnaire, a focus group discussion guide, and a participatory assessment tool are presented in the annexes.

1.1 Illuminate Change

Illuminate Change (IC) is a non-profit organization, founded in 2018 in a collaboration between two Cornell graduate students (Global Development majors) and Cyprian Kaziba, then a Fulbright Humphrey Fellow at Cornell University. The organization's goal is to improve livelihoods and climate resilience among rural smallholder farmers. This organization was intended to play a catalyst role, mobilizing resources locally and internationally, supporting

smallholder farmers and strengthening farmer groups capable of sustaining themselves. To achieve that, Illuminate Change embraces collaboration with other stakeholders including organizations, research institutions and government as the best way to facilitate local and international exchange of support and lessons for meaningful impact. Built on an existing community-based organization, Lake Victoria Islands Transformation Organization (LaVITO), founded by Cyprian in Buvuma, Illuminate Change has enjoyed considerable community support and buy-in, and draws upon significant prior experience and knowledge of the local context.

In 2018, with support from Cornell's Institute for African Development (IAD) and the College of Agriculture and Life Sciences (CALS), Illuminate Change designed a pilot climate-smart agriculture (CSA) project for implementation in Buvuma district as a contribution to addressing the growing challenge of climate change among smallholder farmers in sub-Saharan Africa. Later, the organization team grew to include one more then Cornell graduate student (Public Health major), one Cornell undergraduate intern, two Makerere University student interns, one Makerere graduate volunteer, four Buvuma district local government officers, and officers from Uganda's National Agricultural Research Organization (NARO), our partner.. It is this team that has been involved in the implementation of the ECRARF (Enhancing Climate Resilience among Rural Smallholder Farmers) project whose goals and objectives are elaborated in the subsequent sections of this plan.

1.2 Buvuma Island District

Location and Access

Buvuma is a remote rural district comprising 51 inhabitable islands of Lake Victoria in Uganda with no territory on the mainland. Buvuma was established as a district local government by an act of parliament in 2010 with the aim of improving service delivery to these remote islands. The district is located in central Uganda, approximately 60km east of Kampala, the capital city of Uganda, and 30km south of the city of Jinja. Buvuma district borders Jinja district to the north, Tanzania to the South, Buikwe and Mukono districts to the west, and Mayuge district to the East.

The journey from Kampala to Buvuma takes about 3 to 4 hours including time (1 hour) across the lake. Travel time is increased by the heavy traffic within Kampala and neighboring towns, as well as the unpaved roads along the way. A free public ferry is used to transport people from the mainland in Buikwe district (Kiyindi landing site) to Buvuma Island (the main and largest Island of the 51, from which the district took its name), the home of the district headquarters. Public transport engine boats are also available to transport people to the different Islands within Buvuma.

Population and Economy

At the time of the 2014 census, Buvuma district had approximately 89,890 people (Uganda Bureau of Statistics, 2016), but with Uganda's annual population growth rate of 3.7%, the population is now estimated to be over 100,000 people. Buvuma's economy is primarily based on agriculture and fishing. The majority of farmers are smallholders involved mainly in

the production of food crops, including maize, cassava, sweet potatoes, bananas, paddy and upland rice, beans, as well as coffee at a very small scale.

Because of its location, surrounded by water with an unreliable transportation network, Buvuma is considered a hard-to-reach area and still receives very limited social and economic attention from either national or international development institutions. This has contributed to chronic poverty and limited access to basic needs and services. Residents face numerous challenges including inadequate infrastructure like roads and housing, as well as limited access to agricultural inputs, storage facilities, agricultural credit, information, and markets.

The Problem: Climate Change

Even though climate change has enormous consequences for everyone, the world's smallholder farmers are among the most vulnerable, yet they produce about 70-80% of the world's food. Agriculture is a pillar in Uganda's rising economy, employing over 72% of the population and contributing approximately 24% to GDP according to Uganda Bureau of Statistics (UBOS, 2016). However, in recent years, weather patterns have become more unpredictable and have altered agricultural seasons with adverse effects on agricultural production and livelihoods. The rural smallholder farmers almost entirely depend on agriculture for survival, and when agriculture is threatened by devastating climatic changes, their household food security, livelihoods, and even survival are threatened.

Findings from a situation analysis conducted by Illuminate Change team in Buvuma in 2018 showed that the major climatic change effects affecting farmers are prolonged dry spells and unexpected heavy and destructive rains which often result in loss of harvest. The mentioned climate change effects lead to a long list of other challenges including water shortages, flooding,

pests and diseases, food and nutrition insecurity and low incomes, among others. Regrettably, many farmers in Buvuma also engage in agricultural practices that contribute to environment degradation, further exacerbating existing challenges. Unfortunately, these smallholder farmers do not have adequate capacity to cope with the negatives impacts of climate change.

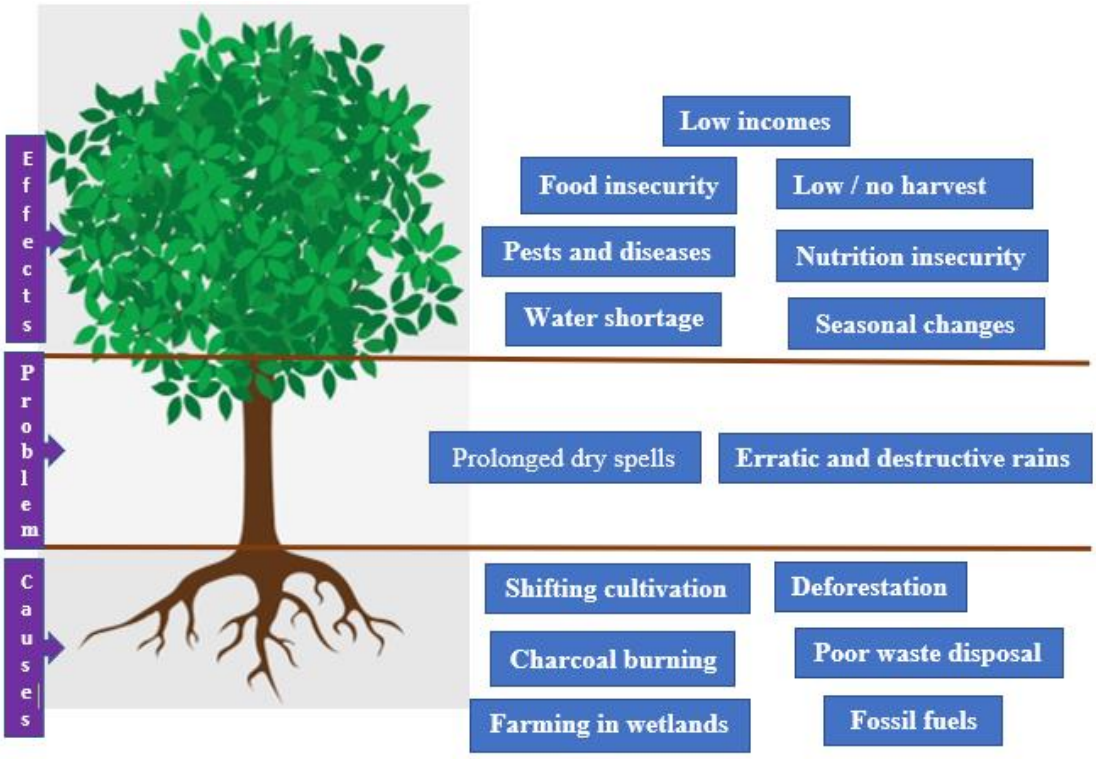

Figure 1. Problem Tree Analysis

1.3 Project Overview

Project Goal

The main goal of the project is to enhance climate resilience and improve livelihoods and food security among rural smallholder farmers in Buvuma district of Uganda. Our project seeks to determine useful approaches for helping smallholder farmers in Buvuma district adopt accessible, resilience-enhancing agricultural practices and technologies which would strengthen

food system and livelihood resilience in the face of climate change. It is believed that this focus on resilience will also lead to improved food and nutrition security, incomes and general living conditions at both the household and district levels. Our program is based on the Food and Agriculture Organization (FAO)'s concept of Climate-Smart Agriculture (CSA). According to FAO's CSA Sourcebook (2017), Climate-Smart Agriculture is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. It aims to tackle three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing greenhouse gas emissions, where possible.

Theory of Change

Capacity building interventions in form of climate-smart agricultural (CSA) trainings for farmers, coupled with enhanced management skills, social capital, and financial support, will stimulate the adoption of CSA practices and technologies leading to sustainably increased productivity and incomes, enhanced resilience to climate changes effects, reduced greenhouse gas emissions, and ultimately to food security and resilient livelihoods.

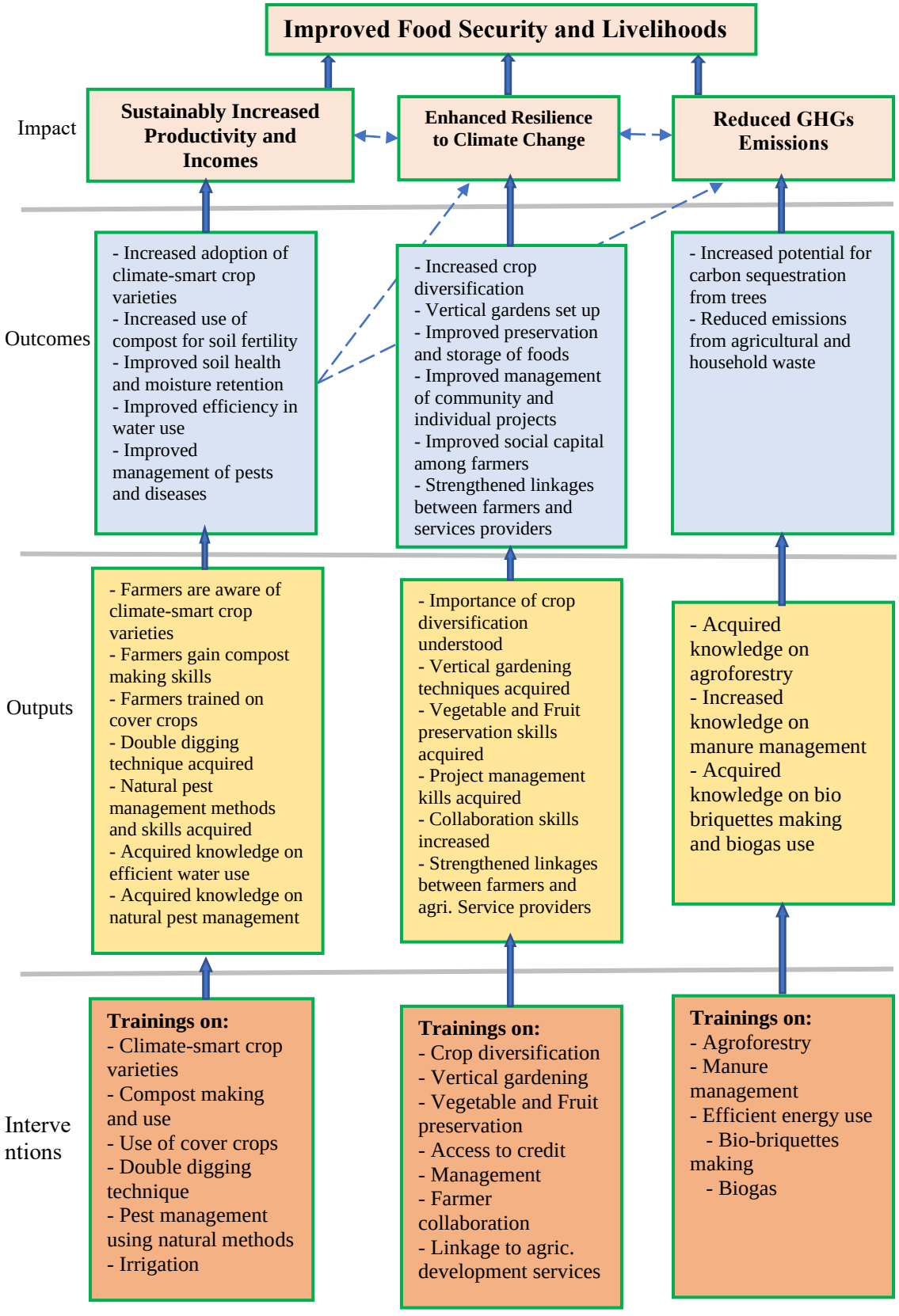

Figure 2. Theory of Change

Project Objectives and Outcomes

Table 1. Objectives and Outcomes

1	Implement capacity building interventions that enhance climate resilience, food and nutrition security and environmental conservation among 200 households across 2 sub-counties of Buvuma District by 2020.
Improved capacity among farmers to deal with the effects of climate change.	
2	Initiate and strengthen collaboration amongst target farmers, as well as between Illuminate Change and at least 3 development partners, for improved social capital and sustainable community development in Buvuma district by 2020.
Improved collaboration amongst farmers in Buvuma, as well as between Illuminate Change and other development partners.	
3	Promote more successful, impact-oriented and sustainable community-led projects through conducting 5 management training modules for local program staff and community group leaders.
Improved people and project management skills among program staff and community groups leaders.	
4	Establish a sustainable and strong organization capable of managing and expanding this project as well as mobilizing support for further community development.
A strong and sustainable organization established	

Objective 1: Implement capacity building interventions that enhance climate resilience, food and nutrition security and environmental conservation among 200 households across 2 sub-counties of Buvuma District by 2020.

Outcome 1: *Improved capacity among farmers to deal with the effects of climate change.*

Activities:

To achieve this objective, the program, in close collaboration with local stakeholders, agreed to consider implementing the following activities:

Setting up Climate-Smart Agriculture (CSA) Demonstration Gardens and Trainings

The aim of the CSA demonstration gardens is to help smallholder farmers embrace agricultural practices and technologies that sustainably increase productivity and incomes, enhance resilience to climate change effects, as well as promoting the mitigation of greenhouse gasses where possible. They are intended to act as learning and technology dissemination points for farmers to reduce environmentally unfriendly agricultural practices and promote increased production by embracing CSA technologies and more sustainable agricultural practices. A lot more CSA trainings were conducted as reflected in the theory of change (ToC) illustration above.

Conducting Food Preservation and Fortification Trainings

The food preservation trainings are to enhance farmers' capacity to preserve and store food during bumper harvests for use during off seasons or when production is affected by climate change. Focus was put on vegetables and fruits to ensure nutrition security among households, but also because these are very perishable and difficult to preserve in a rural area like Buvuma where there is no electricity. Farmers were trained on how to preserve vegetables by fermentation and fruits by solar drying (dehydrating). These interventions would also boost farmers' incomes by taking extra products to local markets and schools, thereby further improving livelihoods.

Conducting Efficient Energy Use Trainings

This activity involved practical trainings on making bio-briquettes from agricultural and household waste. The aim is to reduce deforestation and promote good waste management

through promoting the use of bio-briquettes and biogas for cooking among households instead of charcoal and firewood. These interventions would not only reduce greenhouse gas (GHGs) emissions, but also present an opportunity for farmers to earn an extra income by selling bio-briquettes, gas and bio-slurry (as fertilizer) to other members of the community.

Facilitating Access to Micro-Credit

With support from the First Presbyterian Church in Ithaca, the program established a microcredit scheme based on revolving loans to farmer groups. These funds are intended to enable farmers to replicate lessons learned from our CSA, food preservation and efficient energy use trainings by implementing their own impact-driven projects in their respective groups. Buvuma district, with a population of over 100,000, has not a single bank. Thus, access to credit remains a big challenge among smallholder farmers. The micro-credit scheme is, therefore, important in improving food and nutrition security and household incomes among farmers.

Objective 2: Initiate and strengthen collaboration amongst target farmers, as well as between Illuminate Change and at least 3 development partners, for improved social capital and sustainable community development in Buvuma district by 2020.

Outcome 2: *Improved collaboration amongst farmers in Buvuma, as well as between Illuminate Change and other development partners.*

Activities:

Networking with Development Partners

Collaboration is a core aspect of this program as it promotes resource and knowledge sharing with other stakeholders including for-profit and non-profit organizations, research institutions, and government. Collaboration is the best way to allow cross-country and international exchange of lessons and approaches and have a meaningful impact. Therefore, as part of our sustainability plan, the program set to build collaboration with relevant stakeholders including Uganda's National Agricultural Research Organization (NARO) to help with the CSA demonstration gardens, Biogas Solutions Uganda limited to help with the biogas project, Uganda Industrial Research Institute (UIRI) to help with the bio-briquettes project, Cornell University which gave us financial support and one intern, Makerere University which gave us two interns, and Buvuma district local government which helps with community mobilization.

Facilitating Farmer Interaction and Networking

The project facilitated farmer interaction during trainings, and also organized 2 special networking events to promote inter-group and inter-community collaboration. This kind of interdependence among farmers is important for ensuring social capital and enhanced resilience amidst tough times of climate shocks. The strong relationships also facilitate exchange of support, resources, knowledge and best practices among farmer groups.

Objective 3: Promote more successful, impact-oriented, and sustainable community-led projects through conducting 5 management training modules for local program staff and community group leaders.

Outcome 3: *Improved people and project management skills among program staff and community groups leaders.*

Activities:

Trainings on NGO Management

Management trainings are significant for ensuring proper management, success, and sustainability of impact projects and the organization at large. Often, organizations set up community projects without adequately preparing community members to manage and sustain them, and that leads to failure. Therefore, it was planned that our program staff as well as community group leaders be trained on 4 NGO management modules including community leadership and organizing, networking and developing sustainable collaborations, goal setting and resource mobilization, and monitoring and evaluation.

Trainings on Agricultural Business Management

Under this module, farmers were trained on basic principles of successful agricultural business management including business planning, budgeting, and record keeping. All these trainings were hands-on, giving farmers an opportunity to try out things practically with the help of facilitators. In addition, all target farmer groups received financial training before receiving a loan from our micro-credit scheme (under objective one). This was to ensure proper financial management and accountability.

Objective 4: Establish a sustainable and strong organization capable of managing and expanding this project as well as mobilizing support for further community development.

Outcome 4: *A strong and sustainable organization established*

Activity:

Establish an organizational framework for Illuminate Change

Under this objective, the aim is to create a strong and sustainable non-profit organization as a force for facilitating innovation, change, and improvement among smallholder farmers. Through strong community mobilization, the organization would make it possible for local community members to be the primary participants in the development process of their communities. Through networking and lobbying, the organization would facilitate community access to resources, expertise, and other support needed to strengthen local capacities for economic growth and development.

Project Indicators

Project indicators were developed based on project objectives, project theory of change, and a review of existing literature on indicators for climate-smart agriculture developed by different organizations, notably, the World Bank and the Consultative Group for International Agricultural Research – Climate Change, Agriculture and Food Security (CGIAR-CCAFS). The intention was to come up with indicators that would adequately measure our climate-smart agriculture interventions.

The CGIAR research program on Climate Change, Agriculture and Food Security (CCAFS) designed a CSA Programming and Indicator Tool which helps users to examine the scope of a given program or intervention through the three dimensional lenses of Climate Smart Agriculture, that is, *Productivity/Income*, *Adaptation* and *Mitigation* (Quinney et al, 2016). The tool consists of 3 steps, with the first two steps examining the scope/desired outcomes and scale/level of the intervention respectively, and the last step providing a proposed list of indicators relevant to the intervention. From the proposed list, users can identify appropriate indicators for their interventions. CCAFS, however, acknowledges that the tool puts emphasis on quantitative indicators and that there is a significant lack of indicators relating to mitigation, as well as gaps on indicators relating to productivity and adaptation (Ibid).

As stated by the World Bank (2016), whereas there is a range of indicators currently in place to measure agricultural performance, natural resources management, climate change, and a variety of variables relating to food security and nutrition, most of these indicators are not sufficient to guide policy formulation, prioritize production systems, or gauge how successful the adoption of a CSA intervention has been. The World Bank, therefore, developed a set of CSA indicators structured into three categories/indices; the CSA Policy Index (to measures countries' institutional readiness to support CSA interventions); the CSA Technology Index (to measure the ability of CSA interventions to reach the CSA triple-win goals); and the CSA Results Index (to measure a project's success to reach its goals in the CSA triple-win areas) (Ibid). These indicators aim to capture direct project outputs and behavioral changes from a range of stakeholders (Ibid).

For purposes of this project evaluation plan, attention was put on the CSA Technology Index and CSA Results Index, from which relevant indicators were selected. These were

combined with indicators from CCAFS to produce a list of project indicators shown in the table below.

Table 2. Project Indicators

Objective 1: Implement capacity building interventions that enhance climate resilience, food and nutrition security and environmental conservation among 200 households across 2 sub-counties of Buvuma District by 2020.	
Outcome 1: *Improved capacity among farmers to deal with the effects of climate change.*	
Objectively Verifiable Indicators	**Means of Verification**
- % of target farmers reporting improved awareness and knowledge of CSA from our demonstration projects - % of target farmers adopting sustainable and climate-smart agricultural practices on their farms - % of target farmers reporting benefits from NARO's improved crop varieties. - Number of farmer groups benefiting from our micro-credit - % of target farmers reporting increased productivity and availability of food in their households - % target farmers reporting an increase in incomes - % of target farmers reporting improved capacity to preserve food, fruits and vegetables. - % of target farmers embracing efficient energy use	- Focus group discussions - Household survey - Farmer group records - Activity reports - Progress reports - Attendance lists - Photos
Objective 2: Initiate and strengthen collaboration amongst target farmers, as well as between Illuminate Change and at least 3 development partners, for improved social capital and sustainable community development in Buvuma district by 2020.	
Outcome 2: *Improved collaboration amongst farmers in Buvuma, as well as between Illuminate Change and other development partners.*	
Objectively Verifiable Indicators	**Means of Verification**
- Number of partnerships established between Illuminate change and other stakeholders - Number of community groups reporting inter-group collaboration - % increase in membership within farmer groups	- Progress reports - Focus group discussions - Farmer group records - Photos

Objective 3: Promote more successful, impact-oriented, and sustainable community-led projects through conducting 5 management training modules for local program staff and community group leaders.	
Outcome 3: *Improved people and project management skills among program staff and community groups leaders.*	
Objectively Verifiable Indicators	**Means of Verification**
- Number of successful impact projects implemented by target farmer groups - Number of famer groups reporting use of planning tools like seasonal calendars and business plans - % of individual target famers reporting use of planning tools like seasonal calendars and business plans - Number of famer groups keeping project records - % of target farmers keeping project records	- Focus group discussions - Household survey - Farmer group records - Activity reports - Progress reports - Photos
Objective 4: Establish a sustainable and strong organization capable of managing and expanding this project as well as mobilizing support for further community development.	
Outcome 4: *A strong and sustainable organization established*	
Objectively Verifiable Indicators	**Means of Verification**
- An organizational framework in place - Non-profit registration	- Organization framework - Registration certificate

1.4 Evaluation Purpose

Our project began as a pilot with hope for expansion. It is, therefore, important that after a period of project implementation, we evaluate the project to see what works and what does not work, so as to make well-informed decisions going forward. The purpose of this evaluation is broken down as follows:

Improve project design and strategies

The evaluation will look at the overall program design, objectives, as well as approach and strategies for achieving planned outcomes. It will seek to understand whether the assumptions made during the planning phase are still valid, whether the planned activities

adequately drive the project to its intended outcomes, and whether there have been any new unexpected occurrences that warrant a change in project design and strategy. The evaluation will also examine the perceptions of stakeholders including primary beneficiaries towards the program. The intension is to inform program administrators and other stakeholders of the overall program relevance to date, as well as the effectiveness of the design and implementation strategies, so that improvements are made based on evidence, need and current contextual changes.

Improve project performance

The second purpose of the evaluation is to assess program performance in order to make improvements where required. It will assess the level of progress towards achieving the planned outputs and outcomes, and examine the problems and challenges encountered by program staff and other stakeholders during program implementation. It will assess the level of buy-in by local stakeholders including their support and participation, and examine the interaction and relationship between project staff, target beneficiaries and other key stakeholders. The evaluation will also look at the effectiveness and efficiency in carrying out program activities, including whether funds were used appropriately in accordance with the program plan and budget. This will inform all stakeholders, including program administrators and staff, primary beneficiaries and other key stakeholders of the issues that need to be addressed in order to improve performance at different levels.

Examine Project Impact

Because it is early to assess the real project impact, the evaluation will mainly concentrate on the outcomes and intermediary impacts that have resulted from our project intervention. Focus will be put on things like knowledge and skills acquisition, behavioral changes, the adoption of climate-smart agricultural practices and technologies, which are prerequisites for achieving the ultimate desired impact of a resilient food and livelihood system. This evaluation will be helpful in understanding the extent to which project outcomes have advanced the ultimate project goals or impacts. In this evaluation process, priority will be given to understanding local stakeholders' versions of what has changed in their lives and in their communities as a result of our project interventions. It is also important to note that the evaluation will focus on both positive and negative impacts directly and indirectly caused by our project interventions. The findings will offer accountability to the primary and funding stakeholders, and also be used by program administrators in planning expansion as well as lobbying for further funding and support.

Generate Knowledge and Lessons

The last purpose of the evaluation is to generate knowledge and draw lessons about good practices. The evaluation will help stakeholders to understand what interventions did and did not lead to desired results and why. This will help in drawing lessons regarding conditions under which interventions lead to successful outcomes. As we look forward to project expansion, we will use the lessons learned to make important decision during the process and to consider and critically monitor particular elements and conditions.

1.5 Evaluation Questions

1. How relevant is the program to the target beneficiaries?
2. What are the preferred CSA practices/technologies among farmers?
3. What factors influence farmers' adoption choices?
4. What are some of the barriers and opportunities for CSA adoption among rural smallholder farmers?
5. What outcomes have been achieved as a result of project interventions? To what extent have these outcomes and intermediate impacts advanced the ultimate goals of food security and livelihood resilience?
6. What are some of the best practices and lessons learned during project implementation?

Chapter Two

Evaluation Methodology

2.0 Introduction

This chapter presents the methodology to be used during the evaluation exercise. It elaborates on the evaluation design, data collection methods and tools, sampling, data analysis, as well as the anticipated limitations and proposed mitigation.

2.1 Evaluation Design

Matched Difference-in-Differences Approach

The evaluation will use the matched difference-in-differences method (also known as the double difference) to establish the causal relationship between project intervention and results. The difference-in-differences method compares the changes in outcomes over time (before-and-after) between a population that is enrolled in a program (the treatment group) and a population that is not (the comparison group) (Gertler et al, 2016). In other words, it compares change in the treatment group with change in a comparison group. In trying to establish a causal impact and counterfactual, it will be important to have a comparison group and a treatment group, and to compare their before-and-after. This is because a simple before-and-after observation only within the treatment group may not capture the program's causal impact because many other factors are also likely to influence changes over time. In addition, simply comparing the treatment group with the comparison group without considering the double differences, will leave the selection bias challenge unaddressed. Comparison groups will be constructed through matching; selecting a group that is as similar as possible to the treatment group.

This method is chosen because the project intervention could not follow a randomized assignment when choosing which sub-counties to target or even the target farmer groups during project implementation. In addition, although there was some sort of criteria followed in selecting target farmer groups, there was no clearly or strictly defined cutoff that would permit the use of, for example, regression discontinuity. To ensure availability of substantial baseline data, the evaluation team will use the pre-project information collected during the situation analysis conducted in December 2018, data collected during project monitoring, as well as any other existing secondary data. Additionally, during data collection, the evaluation exercise will follow a retrospective pretest model, concurrently generating participants' assessment of the situation before and changes after project intervention. Although, the retrospective pretest model has its limitations, including challenges in recalling previous situations, it remains a good design for collecting information on changes over time.

Mixed Evaluation Methods

To effectively answer the evaluation questions, the evaluation exercise will use mixed methods including both qualitative and quantitative. A multimethod approach to evaluation can increase both the validity and the reliability of evaluation data (Westat, 2002). Within the context of an agricultural development project, a mixed method helps to explain the dynamic social phenomena within agricultural settings. As Satar et al (2017) noted, whether development programs work as they intend depends not only on how efficiently resources and knowledge are transferred, but also on complex economic and social dynamics in households, communities, and institutions. Similarly, adoption of climate-smart agricultural practices and technologies involves behavior change, and as Westat noted, when investigating human behavior and attitudes, it is

most fruitful to use a variety of data collection methods. He argues that by using different sources and methods at various points in the evaluation process, the evaluation team can build on the strength of each type of data collection and minimize the weaknesses of any single approach.

Participatory Approach

The evaluation will use a participatory approach, giving an opportunity to different stakeholders, especially the project's intended beneficiaries, to participate and express their perspectives on the project. In reconceptualizing the research and development process, there has been a growing interest in the use of participatory approaches in the natural resource management, agriculture, and rural livelihoods sectors (Gonsalves et al, 2005). Participatory approaches provide the opportunity to go beyond mere consultation and promote the active participation of communities in the issues and interventions that shape their lives (Thomas, n.d). According to Chambers (2008) for example, participatory learning and action (PLA) enables and empowers local people to share, analyze and enhance their knowledge of life and conditions, and to plan, act, monitor, evaluate and reflect. He also asserts that when resource poor farmers (RFPs) express, share and analyze what they know, experience, need and want, they bring to light dimensions which normal professionals tend to miss or misperceive (Chambers, 1999). Therefore, a participatory evaluation involving the local people, who are the climate change victims, and project beneficiaries is very critical in assessing what is desirable, what works and what does not work in a given social, economic and environmental context.

Through participatory approaches, we are able to appreciate indigenous knowledge on climate change as well as adaptation and mitigation strategies which might not be getting adequate attention. It is true that people always have some sort of indigenous climate change

adaptation and mitigation strategies that have enabled them to reduce their vulnerability to past climate variability and change. Such indigenous knowledge influences people's choice of adaptation methods and could form a good foundation for developing formidable resilience to climate change among local communities if given attention. Also, participatory approaches encourage information sharing and are credited for fostering rapid progressive learning among participants. This knowledge sharing and learning process can have a very positive impact on adoption of climate-smart agricultural practices among farmers. Therefore, amidst all philosophies of agricultural research, extension and development, a paradigm shift to more farmer-centered, participatory approaches remains very significant and critical as we try to solve agricultural challenges in the face of climate change.

2.2 Data Collection Tools

During the data collection exercise, a range of qualitative and quantitative data collection methods and tools will be used including key informant interviews, focus group discussions, survey questionnaires, as well as participatory assessment (PA) methods like pairwise ranking.

Survey

Using a questionnaire, the survey will be conducted through individual interviews with selected households to collect quantitative and qualitative data on key indicators relating to adoption of climate-smart agricultural practices, food security and incomes.

Key Informant interviews

These will be one-on-one interviews and in-depth discussions with the key informants using an interview guide to enable a systematic and orderly flow. To ensure that respondents get chance to freely give their opinions and experiences, the interview guide will be flexible and open as much as possible, but within the scope of the evaluation. Through key-informant interviews, the evaluation team will explore participants' perceptions of project results, as well as the process and factors that led to those results. Key informant interviews will also provide a good platform for revealing attitudes and feelings which could otherwise be difficult to get from a focus group setting.

Focus group discussions

Discussions with small groups of about 8 people will be conducted, following a focus group discussion guide. During the process, the focus group facilitator will manage the discussion by ensuring that everyone gets a chance to express their views. The facilitator will try to probe and follow up interesting responses to get as much detailed information as possible. Through focus group discussions, the evaluation team will seek to observe a large amount of interaction about the project and obtain direct evidence about similarities and differences in participants' experiences, perceptions and opinions.

Participatory Pairwise Ranking

The pairwise ranking tool is a participatory assessment (PA) tool that compares pairs of elements to demonstrate preference. The intention is to see participants' perceptions of what elements or options are most important or less important. It can also portray the relevance and

appropriateness of interventions through an increased understanding of priorities (Narayanasamy, 2009).

2.3 Sampling

Purposive sampling was used to select target sub-counties and farmer groups during project implementation. The project was designed to target sub-counties for which an agricultural development intervention addressing climate change would be more relevant. Within those sub-counties, the project focuses on farmer groups with agriculture as their primary source of livelihood, and who expressed a high demand for agricultural support. Additionally, priority was given to farmer groups who were easily accessible, given the unpaved and poorly maintained road network and the limited means of transport on Buvuma Islands.

Therefore, going forward, the evaluation will target Busamuzi sub-county and Buvuma town council which were our main focal (geographical) areas of project implementation. Three (3) farmer groups will be purposively selected from each sub-county (2 treatments and 1 comparison), making a total of six (6) farmer groups. Treatment groups will be those which fully participated in the project, with a high potential for generating useful information.

As shown in the table below, approximately 90 surveys will be conducted using a questionnaire and 8 respondents will be randomly selected from each famer group. On the other hand, 12 focus group discussions (FGDs) will be conducted using a focus group guide and one participatory assessment tool (the pairwise ranking tool). Participants will include 8 farmers, including women, men and youth.

Table 3. Sampling

Sub-county	Farmer Group	Type	# of surveys	# of FGDs
Busamuzi	Group 1	Treatment	15	2
	Group 2	Treatment	15	2
	Group 3	Comparison	15	2
Buvuma Town Council	Group 1	Treatment	15	2
	Group 2	Treatment	15	2
	Group 3	Comparison	15	2
Total	**6**		**90**	**12**

2.4 Data Analysis

Given the prominent role that qualitative methods will play in the program assessment, data analysis will mostly involve managing, sorting and interpreting interview transcripts, focus group discussions, field observations and other qualitative data to gain insights on selected indicators, the general changes that have occurred, and the processes that led to such changes. It will also be the intention of the analysis process to capture lessons learned from different points of view. Some of the initial analysis will take place during data collection. Estrella et al (2000) argue that ideally, data analysis should take place throughout the data gathering stage. For example, during the use of participatory data collection tools, like the pairwise ranking, where project beneficiaries will be collectively and actively involved. At this stage, Estrella et al noted, the idea is to involve the relevant stakeholders to reflect critically on problems and successes, understand the impacts of their efforts, and act on what they have learned.

However, second level analysis will be carried out for different themes, involving the interpretation of data collected and establishing patterns such as similarities and differences in responses, among others. Triangulation will be used to improve the reliability, validity and credibility of information collected. Atlas.ti analysis software will be used to help consolidate and keep track of all qualitative data collected for analysis. Atlas.ti will be an important tool for

supporting interpretation using its components of visualization, integration, serendipity, and exploration. Microsoft excel, on the other hand, will be used in analyzing the quantitative data which will be collected.

2.5 Anticipated Limitations and Proposed Mitigation

Communication and Mobilization Challenges

A participatory evaluation requires commitment and willingness by stakeholders to participate. Without this commitment and willingness, time and resources might just be wasted, hindering project performance and community improvement. To address this, responsible project officers should ensure good mobilization and communication strategies at different levels. At the grassroots level, it requires the ability to be inclusive, involving the different key groups of people including the marginalized like women and the poor.

Participant Expectations

It is not uncommon for some stakeholders to have expectations for tangible incentives, including money and food, whenever they are called to take part in collective actions such as participatory evaluations. This presents a challenge, especially when the project does not have plans or resources to meet such stakeholders' expectations. It is, therefore, important that project administrators try to understand all stakeholders and their expectations in the first place and try to respond appropriately and with full transparency.

Logistical Challenges

A mixed method approach to evaluation requires additional resources in terms of logistics, finances, human resources, and time. Reaching out to different stakeholders and involving them in the planning and data collection processes means additional resources. For example, training of enumerators, transportation, venues for the exercises, all require money and time. Buvuma district in particular presents challenges with meeting venues and transportation due to lack of vehicles as well as poor roads. However, with proper planning, all this can be possible and rewarding.

Expertise

Qualitative and participatory evaluation approaches require good facilitation skills, especially during the data collection and analysis process. A facilitator should be able to encourage participation, probe, and offer suggestions. Being a collective group process, participatory evaluation comes with challenges associated with group dynamics such as power struggles and conflicts, all of which need special skills to address. Therefore, it is important to have a well-trained team of facilitators who can manage conflicts when they arise during group activities. Inadequacy in terms of the facilitation and conflict resolution skills required for participatory evaluation is likely to sabotage the process and hinder the achievement of intended outcomes.

Chapter Three

Implementation and Dissemination of Findings

3.1 Implementation Process

Implementation of the evaluation exercise will involve a series of activities including community mobilization, enumerator identification and training, pilot testing and tools refinement, data collection, report writing, and dissemination as elaborated below.

Community Mobilization

As a starting point, awareness mobilization will be conducted among target communities and farmer groups ahead of the project evaluation exercise. Timely mobilization will be aimed at ensuring target communities' readiness for the evaluation exercise, as well as getting any context-related feedback that might be helpful to the evaluation team during the preparations and data collection processes. Community mobilization will be done through farmer group leaders and other local community leaders the project has collaborated with during project implementation.

Enumerators Identification and Training

Six (6) enumerators will be identified and trained to assist in the data collection process. Identified enumerators will be those familiar with the local context of Buvuma district and with a good understanding of both English and Luganda. Enumerators' training will focus on ensuring they (enumerators) get a clear understanding of the project (including objectives, intended outcomes and indicators), the evaluation objectives and key questions, as well as the data collection tools. Enumerators will be equipped with basic interview and focus group discussion

(FGD) facilitation skills, emphasizing the importance of collecting quality data. Engaging enumerators in role-plays using data collection tools, where each one of them demonstrates best interview and FGD facilitation scenarios, will enhance internalization of what is required to successfully collect quality data. Enumerators will also learn to appropriately request and obtain informed consent from respondents as a crucial part of the data collection process. Additionally, all questions in the data collection tools will be rehearsed to ensure they make sense to enumerators and that proper translations into the local language are generated and agreed upon.

Pilot Testing and Tools Refinement

Prior to actual data collection, a pilot test of the data collection tools will be conducted to assess their applicability and potential for collecting the required data. Pilot testing will be a one-day exercise with a selected group of farmers in each of the two target sub-counties. These farmer groups may not be targeted for actual data collection. After the exercise, enumerators will be asked to work with the concerned officer(s) in refining data collection tools depending on their experiences and feedback from farmers during pilot testing. This may include highlighting confusing words and statements, rephrasing questions or making other changes as may be necessary. The pilot testing exercise will also be an opportunity for enumerators to practically try out the skills acquired during their training, while at the same time taking note of any challenges encountered for amelioration.

Data collection

Once communities have been mobilized, enumerators trained, and tools pilot tested, then actual data collection will commence. As already indicated in the previous chapter, the data

collection process will involve using mixed methods; both qualitative and quantitative. The mixed methods approach draws on the strengths of both quantitative and qualitative approaches and integrates them to overcome their weaknesses (Bamberger, 2012). For example, closed-ended questions in a quantitative survey may easily generate numeric data from respondents, while open-ended questions in a qualitative assessment offer respondents an opportunity to fully express their views and opinions. The survey and participatory assessments are elaborated below.

a). Survey

The survey will be conducted as an individual interview to collect quantitative and qualitative data on key project indicators. In executing the survey, a team of (4) enumerators will be commissioned to the field (2 per sub-county) and they will be supported by selected community leaders, for example, in navigating household locations and arranging venues. As earlier stated, approximately 90 surveys will be conducted in total, with 15 respondents from each of the purposively selected 6 farmer groups (4 treatments and 2 comparisons).

b). Participatory Assessment (PA)

As earlier noted, 12 focus group discussions (6 in each sub-county) will be conducted using a focus group guide and one participatory assessment tool. The focus group discussions and participatory assessment will explore some of the same evaluation questions as the survey, generating data that complements and goes deeper than data collected in the survey. Results from the focus group discussions and participatory assessment will also be used to triangulate the survey data. The participatory assessment tool will be administered to each focus group.

Data Entry and Analysis

After data collection, data entry will take place and then data analysis. As already noted, some data analysis will take place during data collection, and so this will be the second level of data analysis. Data will be thematically sorted and analyzed around project objectives, research questions, and selected indicators, although other themes may emerge during the analysis process basing on findings. In addition, captured narratives of stories will also be analyzed to answer the why and how questions surrounding findings.

Report writing

Evaluation findings will be documented into an evaluation report and disseminated to different stakeholders to let them know of the results of the project intervention and get feedback where possible.

3.2 Audience and Dissemination

Audience

The main audience for the evaluation findings will include project administrators, current and potential funders, project partner organizations, project beneficiaries, and Buvuma district local government administrators. Others will include researchers and the general public. Project administrators will use the findings to re-strategize and address any concerns required for project expansion. They will also use findings to give accountability to both funders and beneficiaries, while at the same time lobbying for new funding. On the other hand, the district local government, as well as the target smallholder famers, will use findings to understand and

appreciate intervention results, and facilitate decision-making towards enhanced climate action including adaptation and mitigation.

Dissemination

Dissemination will play an important awareness role among potential partners, donors, policy makers, and beneficiaries to support project scaling (where the evidence suggests doing so), encourage others to implement similar interventions, or address emerging issues using lessons learned. Guijt and Woodhil (2002) note that the main purpose of communicating findings is to ensure accountability and motivate stakeholders to action. Although all target audiences may have access to the full evaluation report, the main focus will be put on ensuring that a specific audience receives tailored information relevant to them. For example, it will be very important to disseminate lessons learned to program administrators, while funders may be more interested in findings relating to 'value for money' and project impact.

Findings will be disseminated using methods and formats that enable access by the different stakeholders. For example, an evaluation report written in English will be disseminated to partner organizations and funders, whereas a summary of findings translated into Luganda will be disseminated to the different target smallholder farmer groups in Buvuma district. Depending on availability of funds, dissemination meetings will be conducted with the target farmers, Buvuma district officials, partner organizations, and funders, to give room for clarifications, as well as capturing feedback and new ideas. Established contacts with the partner organizations, farmers, and Buvuma district local government will be used in facilitating the dissemination process. The project website and social media will also be important tools for disseminating some of the evaluation results.

A detailed dissemination plan with specific action items, timeline, and responsible persons will be developed as soon as possible, to ensure that evaluation results are released while still current. Efforts will be made to evaluate and follow up on the dissemination process to ensure that information successfully reaches the intended audience. This will include making follow up emails and phone calls, evaluating dissemination meetings, and tracking reach by website and social media posts.

Conclusion

It is important to remember the purpose of carrying out this evaluation and the kind of information needed. Thorough preparation is needed in terms of stakeholder mobilization, data collection instruments, enumerators' training, and other required logistics. It is also critically important to remember that quality is a key aspect of data to be collected. At the end of the day, what is required is reliable, credible, and valid data. According to INTRAC (2017), data is *reliable* when there is confidence that similar results would be obtained if the data collection exercise was repeated within the same period, using the same methods; *valid* when it measures or describes what it set out to measure or describe (in line with indicators and using an appropriate sample); and *credible* when it is believable, and is consistent with a 'common sense' view of the world.

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Appendices

Appendix I: Timeline

	Mon	Tues	Wed	Thu	Fri	Sat	Sun
Week One							
Community Mobilization							
Week Two							
Enumerators' Identification							
Week Three							
Enumerators' Training							
Pilot Testing							
Tools Refinement							
Week Four							
Data Collection							
Data Entry							
Week Five							
Data analysis							
Week Six							
Report Writing							

Appendix II: Proposed Budget

Category	Item	Units	Price for Unit	Days	Total (UGX)	Total (USD)
Personnel	Enumerators' training	6	30,000	3	540,000	
	Enumerators' data collection	6	30000	4	720,000	
	Data entry	6	30,000	1	180,000	
	Local support/interpreters	2	30,000	5	300,000	
	Team leader	1	100,000	14	1,400,000	
	Sub-total				3,140,000	**897.14**
Supplies	Notebooks	12	3,000	1	36,000	
	Folders	7	4,000	1	28,000	
	Pens/pencils (packet)	1	15,000	1	15,000	
	Erasers (packet)	1	10,000	1	10,000	
	Flip charts	3	10,000	1	30,000	
	Markers (packet)	2	10,000	1	20,000	
	Masking Tape	3	5,000	1	15,000	
	Rim of papers	1	15,000	1	15,000	
	Sub-total				**169,000**	**48.29**
Communication	Airtime and internet	1	150,000	1	150,000	
	Sub-total				**150,000**	**42.86**
Foods and Beverages	Water for personnel (box)	1	20,000	8	160,000	
	Breakfast/lunch during training	9	10,000	3	270,000	
	Soda for FGDs	6	25,000	1	150,000	
	Sub-total				**580,000**	**165.71**
Transport	Transport	9	15,000	4	540,000	
	Sub-total				**540,000**	**154.29**
Miscellaneous	Miscellaneous				500,000	142.86
GRAND TOTAL					**5,079,000**	**1451.14**

Appendix III: Evaluation Survey Questionnaire

Introduction:
"My name is ……., and I am working for Illuminate Change under the ECRARF (*Enhancing Climate Resilience Among Rural Smallholder Farmers*) pilot project. The project was implemented in Busamuzi sub-county and Buvuma town council in Buvuma district for the past 2 years since 2018. We are now conducting an evaluation of the project to find out what worked and what did not work, and figure out a way forward. We kindly request for permission to ask you some questions about your participation in the project. All information you provide will be treated with high confidentiality. Thank you."

Demographic Information

Gender		Age bracket	
Male		Below 18	
Female		18 - 25	
Other		26 - 30	
		31 - 45	
		Above 45	

A. Background Questions

1. Which farmer group do you belong to?
   _____
2. What is the main crop that you grow as a group?
   _____
3. What is the main crop that you grow as an individual?
   _____
4. What other crops do you grow?
   Crop 1: _____
   Crop 2: _____
   Crop 3: _____

B. Project Participation

5. Did you ever participate in the ECRAF project interventions like trainings and demonstration activities? (circle one)
   a. Yes, all
   b. Yes, some
   c. No

6. If yes, which of the following project interventions did you participate in and how many times? Were the practices/technologies introduced new to you? (*Use codes in the table below*)

	Project Activities	**Yes/No**	**Number**	**New?**
				0 = N/A 1 = Not new and were being used 2 = Not new but were not used 3 = New
a	Awareness training on climate-smart crop varieties by NARO			
b	Demonstration trainings on planting/sowing methods by NARO			
c	Demonstrations on the double digging technique for loosening compacted soil			
d	Demonstration trainings on permaculture-style berms and swales for water conservation			
e	Training on mulching, agroforestry, cover crops & irrigation			
f	Demonstration trainings on compost making			
g	Training on the use of biochar for water retention and carbon sequestration			
h	Trainings on pest control using low cost and organic ingredients			
i	Demonstration training on vertical gardening			
j	Vegetable preservation (by fermentation) trainings for food and nutrition security			
k	Trainings on fruit drying for food and nutrition security			
l	Trainings on solar dryer construction			
m	Trainings on animal health and care			
n	Training on manure management			
o	Trainings on biogas for waste management and efficient energy use			
p	Trainings on bio-briquettes makings using household waste			
q	Community projects management and leaderships trainings			
r	Trainings on agricultural business planning			
s	Trainings on financial management, saving and access to rural credit			
t	Exchange visits/networking events			
u	Micro-credit scheme		N/A	

C. Adoption of CSA Practices and Technologies

7. Which of the following climate-smart agricultural practices have you implemented/adopted?

	CSA Practice	**Score**	**If nil or low, what has prevented you?**
		0 = Nil 1 = Low 2 = Moderate (Sometimes) 3 = High	1 = Limited skills 2 = It is not useful 3 = Lack of resources or tools to do so 4. Time consuming 4 = Other (Specify)
a	Using climate-smart crop varieties		
b	Crop diversification		
c	Irrigation		
d	Compost manure making and use to avoid synthetic fertilizers		
e	Mulching		
f	Using cover crops like beans		
g	Double digging		
h	Using permaculture-style berms and swales for water conservation		
i	Wide spacing during planting		
j	Using organic pesticides		
k	Agroforestry		
l	Vertical gardening		
m	Using biochar for water retention and carbon sequestration		
n	Using animal waste for manure		
o	Using animal waste for biogas		
p	Vegetable fermentation for food security		
q	Fruit drying for food & nutrition security		
r	Agricultural business planning for profitability		

8. What are the top 3 things that you need in order to adopt more CSA practices important to you? (rank max 3)

1.	
2.	
3.	

a= More trainings on practices; b= Access to planting materials/seeds; c= Visit adopting farmers; d= Access to affordable credit; e= Secure land; f= Access to inputs; g= Access to markets; h=Other (specify)____

9. Did you or your farmer group or a member of your household obtain agricultural credit from the ECRAF project?
   a). Yes b). No c). Do not know

10. If yes, what was the loan used for? (*circle all that apply*)
    a. Purchasing farm inputs
    b. Buying/leasing/renting land
    c. Buying livestock
    d. Constructing farm structures
    e. Buying machinery and equipment
    f. Paying labor costs
    g. Other (specify)

D. Adoption Benefits

11. In your opinion, which of the adopted CSA practices have been most beneficial to you? (*Use practice codes from question 7*). What do you consider as the most important benefits from applying these climate-smart practices? (*Use codes from the list of benefits below*)

CSA Practice	**Important benefits**		
1.	1.	2.	3.
2.			
3.			

Benefits
1=More income; 2= Increased crop production; 3= Less affected by climate risks; 4= Less labour use; 5= Less time demanding; 6= Better for the environment; 7= Improved household food security; 8= Other (specify)

12. In your view, to what extent has the implementation of the CSA practices (in question 7) contributed to the achievement of the following CSA goals in your household?

CSA Goal	**Score**
	0 = Not at all; 1 = A little; 2 = Somewhat; 2 = A lot
Productivity	
Income	
Food security	
Resilience to climate change impacts	
Reduced greenhouse gas emissions	

E. General Changes Resulting from Project Intervention

1. Looking back to the time before project intervention and now, following the project intervention, indicate your agreement or disagreement about the following statements regarding changes brought by the project.

	0 = N/A 1 = Strongly disagree 2 = Disagree 3= Neutral 4 = Agree 5 = Strongly agree
The project improved my awareness and knowledge of climate-smart agricultural practices and technologies	
Since project intervention, I have adopted climate-smart agricultural practices on my farm	
I have gained access to at least one of NARO's improved crop varieties including maize, beans, cassava, & sweet potatoes.	
The project improved my access to credit through the micro-credit scheme.	
Climate-smart agricultural practices have improved productivity on my farm.	
As a result of project intervention, there is increased availability of food in my household	
As a result of project intervention, my annual income has increased	
The project enhanced my capacity to preserve fruits and vegetables for months, hence mitigating food and nutrition insecurity	
The project enhanced my capacity for efficient energy use through bio briquettes making and biogas trainings	
I feel better off in terms of living standards compared to the time before project intervention	
The project increased our collaboration with other farmer groups in the district	
The project led to increased membership in my farmer group	
My farmer group successfully implemented at least one impact project with support from *Illuminate Change*	
My farmer group uses planning tools like seasonal calendars, business plans and budgets as trained by the project	
I personally use planning tools like seasonal calendars, business plans and budgets as trained by the project	
My farmer group keeps projects records as trained by *Illuminate Change*	
I personally keep records of my agricultural activities as trained by *Illuminate Change*	

F. General Attitude Towards the Project

2. Please indicate your opinion towards the project intervention in general

	0 = N/A 1 = Strongly disagree 2 = Disagree 3= Neutral 4 = Agree 5 = Strongly agree
The project was based on farmers' needs	
All project activities and interventions were relevant	
The project design involving practical demonstrations and a participatory approach was satisfying	
There was adequate involvement of farmers in project formulation and execution	
Working with farmer groups facilitated coordination and enhanced farmer participation	
The project promoted the development of local leaders.	
The involvement and collaboration with other stakeholders including the National Agricultural Research Organization (NARO), Makerere University, Cornell University and other actors was very beneficial to farmers	
The project provided adequate training for farmers	
The duration of the project was sufficient to address challenges	
The project has yielded positive benefits for participants	

3. Do you have any recommendations on how to improve the project?

Thank you so much for your time

Appendix IV: Pairwise Ranking Tool

Objectives

The pairwise ranking tool explores farmer's preferences for different climate-smart agricultural practices and technologies, as well as the reasons for their preferences. The main objective for using this tool is:

- To learn about farmers' preferences and perspectives regarding climate-smart agricultural practices and technologies, as well as factors influencing their choice of those practices.

Key questions

- What are the most important CSA practices or technologies to the farmers in Buvuma?
- Which practices are perceived to be the most important for achieving the following CSA's goals?
    - Sustainably increasing productivity and incomes (productivity)
    - Enhancing resilience (adaptation)
    - Reducing greenhouse gas emissions (mitigation)

Preparation

- Make sure that you have all necessary materials. Arrange a meeting location with adequate space to facilitate the discussion where participants are unlikely to be disturbed by others.
- Materials: flip chart, markers, guide, data entry form, digital camera

Description

Part A:

- With the help of the facilitator, participants brainstorm a list of CSA practices and technologies introduced by the project. The facilitator writes the list on a flip chart as it is generated.
- Participants assign a symbol to each of the identified practices and technologies and drawings are done by different participants to encourage active participation.
- Ask participants to choose 3 CSA practices form the list, which they think are most important to farmers in Buvuma.
- Ask participants why they think those 3 are the most important. Make notes.
- Draw up a matrix and write down the 3 chosen practices in the upper raw (skip the first box) and write down the same practices in the first column following the same order, leaving some space for a drawing in each cell/box.
- Ask different participants to draw symbols (in the upper row and first column) representing each CSA practice/technology.
- Now ask participants to compare the first practice/technology in the row with the various practices/technologies listed in the column, one by one, drawing a symbol of what they consider the most important practice in the intersection box.
- Put an **x** mark in intersection boxes of the same practices, and those already discussed.
- Ask participants to give reasons for their preference. Make notes.
- Repeat the preceding three steps above until all the practices are compared pairwise.

Example:

CSA practice	 Compost use	 Irrigation	 Wide space planting
 Compost use	x	x	x
 Irrigation		x	x
 Wide space planting			x

- Ask participants to count the number of times each practice was selected as the most preferred option.
- Enter the number of times for each practice in the 'score' column (in the table below) and enter the rank of each practice in the 'rank' column.

Pairwise ranking results: most important CSA practices to farmers

CSA practice	Rank	Score

Part B:

- Now the facilitator introduces the second part concerned with collecting farmer's perspectives on what CSA practices/technologies are best or preferred for achieving the different CSA goals; productivity, adaptation, and mitigation.

Productivity:

- Ask participants to choose 3 CSA practices form the list, which they think are most important for achieving productivity.
- Ask participants why they think those 3 are the most important. Make notes.
- Follow other steps as laid out in part A above.

Adaptation:

- Ask participants to choose 3 CSA practices form the list, which they think are most important for achieving adaptation.
- Ask participants why they think those 3 are the most important. Make notes.
- Follow other steps as laid out in part A above.

Mitigation:

- Ask participants to choose 3 CSA practices form the list, which they think are most important for achieving mitigation.
- Ask participants why they think those 3 are the most important. Make notes.
- Follow other steps as laid out in part A above.

Appendix V: Focus Group Discussion (FGD) Guide

On CSA adoption

1. Which of the listed climate-smart agricultural practices and technologies have been mostly taken up by farmers including you?
2. What encouraged you and other farmers to adopt those practices? (*Probe for social, cultural, and economic factors*)

Adoption benefits

3. What benefits have you realized as a result of the CSA practices adopted? (*Probe for changes relating to productivity, income, livelihoods, e.t.c*)
4. What are the potential environmental co-benefits from these CSA practices?

Adoption barriers

5. In your opinion, why are some CSA practices not adopted at all or abandoned after some time? (*Probe for examples of such practices and any failure stories*)
6. How can the adoption of CSA practices be enhanced?

Upscaling

7. What kind of support and by whom would be required for large-scale adoption of CSA practices?
8. How can more farmers be reached with information on CSA practices?