USAID
FROM THE AMERICAN PEOPLE

Tools for Evaluating Climate Change Adaptation Program Interventions

A Toolkit

SEPTEMBER 2019

This document was produced for review by the United States Agency for International Development. It was prepared by TANGO International for the Adaptation Thought Leadership and Assessments (ATLAS) Task Order No. AID-OAA-I-14-00013, under the Restoring the Environment through Prosperity, Livelihoods and Conserving Ecosystems (REPLACE) IDIQ.

Chemonics contact:
Chris Perine, Chief of Party (cperine@chemonics.com)
Chemonics International Inc.
1717 H Street NW
Washington, DC 20006

TANGO International Contact:
Tim Frankenberger, President (tim@tangointernational.com)
TANGO International
376 S. Stone Street
Tucson, AZ, 85701

ATLAS reports and other products are available on the ClimateLinks website:
https://www.climatelinks.org/projects/atlas

Cover Photo: Farmer promoters, agronomists, farmers and socio-economic development officers received training on Participatory Integrated Climate Services for Agriculture (PICSA) across Kigali City districts in Rwanda in February 2019. S. Samuel, Climate Change, Agriculture, and Food Security (CCAFS).

Tools for Evaluating Climate Change Adaptation Program Interventions

A Toolkit

AUGUST 2019

Prepared for:
United States Agency for International Development
Adaptation Thought Leadership and Assessments (ATLAS)

Prepared by:
Chemonics International, Inc.
TANGO International, Inc.

This report is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of the author or authors and do not necessarily reflect the views of USAID or the United States Government.

CONTENTS

LIST OF FIGURES AND TABLES

ACRONYMS

ATLAS	USAID Adaptation Thought Leadership and Assessments project
CARE	Cooperative for Assistance and Relief Everywhere
CBA	Cost-benefit analysis
CCA	Climate change adaptation
CVT	Community validation team
FGD	Focus group discussion
GIZ	Gesellschaft für Internationale Zusammenarbeit
KI	Key informant
KII	Key informant interview
M&E	Monitoring and evaluation
MCA	Multi-criteria analysis
NGO	Nongovernmental organization
PRA	Participatory research and analysis
RVT	Regional validation team
USAID	United States Agency for International Development

INTRODUCTION

Communities across the globe are coping with the impacts of a changing climate. Weather patterns have become more erratic, and droughts, storms and floods have become more extreme and frequent. To help communities in developing countries manage these impacts, USAID and its partners increasingly apply a "climate lens" to activities across their portfolios. This process involves understanding localized climate risks and integrating effective, context-appropriate responses to improve resilience. A critical input to the process is guidance on best practices on both the use of climate change adaptation (CCA) strategies and the targeting of resources to where they can achieve the greatest impact.

This toolkit is a resource for development practitioners to assess the effectiveness of various CCA interventions. Produced by USAID's Adaptation Thought Leadership and Assessments (ATLAS) project, the toolkit presents a framework for analysis and recommends four research tools that USAID and partners can use together with local communities to help prioritize interventions to improve climate resilience.

It is important to note at the outset that CCA interventions should be designed and implemented to respond to climate risks and vulnerabilities that have been identified through a rigorous risk analysis or vulnerability assessment process. When the CCA interventions are designed and implemented in this way, assessment of their effectiveness is more likely to yield useful results. Furthermore, assessment of CCA intervention effectiveness is facilitated by Monitoring and Evaluation (M&E) systems explicitly including indicators that track CCA interventions. Having those data available to assessment teams, whether assessments are undertaken during project implementation or following project completion, greatly improves the usefulness of assessment results.

WHAT YOU WILL FIND IN THE TOOLKIT

This toolkit provides background and context for conducting a CCA interventions assessment, and then provides step-by-step guidance and templates for developing an assessment framework and implementing four research tools (Table 1). Examples are based on a hypothetical agriculture sector project, with illustrative material primarily featuring CCA interventions related to food security and livelihoods.

Table 1. The four tools presented in this toolkit

CCA INTERVENTIONS ASSESSMENT TOOLS	ILLUSTRATIVE FINDINGS
TOOL 1: Quantitative Analysis of Project Monitoring Data	• Adoption rates of CCA interventions • Characteristics of adopters and non-adopters • Perceptions of effectiveness (interim monitoring data)
TOOL 2: Participatory Research and Analysis	• Qualitative descriptions of climate shocks and impacts, and CCA interventions • Participatory rankings of CCA interventions • Clustering and sequencing strategies • Qualitative changes in livelihoods and resilience attributed to CCA interventions
TOOL 3: Cost-Benefit Analysis	• Monetary costs and benefits of CCA interventions • Stakeholder perceptions of challenges and benefits of each option
TOOL 4: Multi-Criteria Analysis	• Criteria used to make decisions about CCA strategies • Rankings of CCA interventions weighted and scored against criteria

WHY CONDUCT A CCA INTERVENTIONS ASSESSMENT?

Dealing with climate variability and change means dealing with uncertainty. A step toward managing that uncertainty is an assessment of CCA interventions, which can provide evidence for decision-making and local insights on appropriate program responses.

What is a CCA intervention assessment?

A systematic approach to identify, assess and prioritize CCA interventions. The assessment is not an evaluation, but rather a focused study on the effectiveness of a defined set of activities.

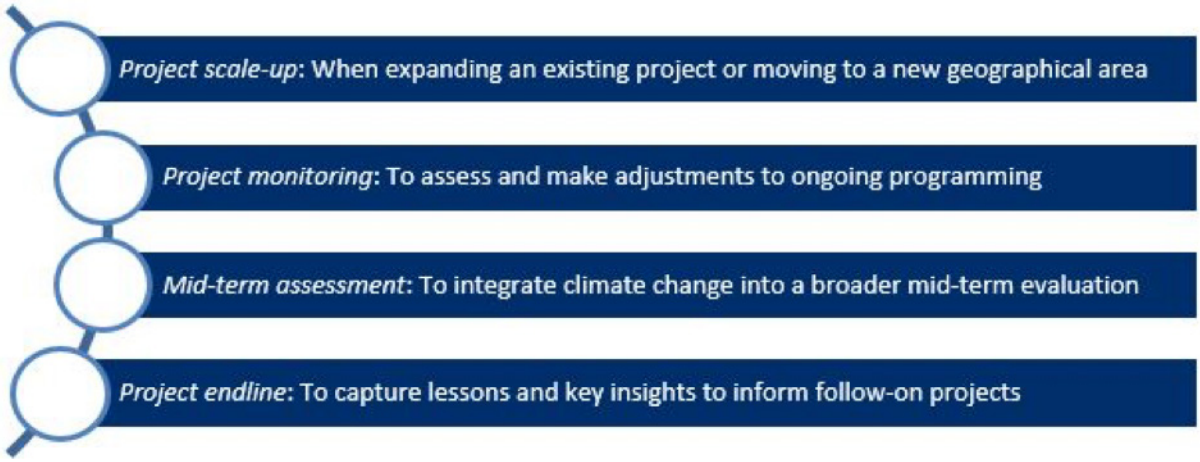
What is the benefit of an assessment?

To test assumptions about the effectiveness of a certain set of CCA interventions in countering the potential adverse impacts of identified climate risks. The assessment helps ground investment decisions in localized information and data on CCA interventions, and perspectives from households, community leaders and institutional stakeholders.

When should an assessment be conducted?

At various points in the project cycle, depending on study objectives (Figure 1). In most cases, it should complement other climate assessments, such as CARE's Climate Vulnerability and Capacity Analysis, which integrates climate risks into a broader vulnerability assessment.[1] Note, however, that a CCA interventions assessment should examine on-going interventions in place long enough to yield sufficient data for analysis.

Figure 1. Assessment of CCA Interventions is Useful at Various Points in the Program Cycle



[1] Dazé, A., K. Ambrose, and C. Ehrhart. (2009). Climate Vulnerability and Capacity Analysis Handbook. CARE International.

BACKGROUND ON CCA INTERVENTIONS

CCA interventions are activities, practices, strategies and investments that specifically target risks associated with climate variability and climate change (examples are provided in Table 2).

Most CCA interventions address short-term climate variability, such as seasonal or annual variations in temperature and/or rainfall, and extreme events. Use of drought-tolerant crops or livestock breeds, water conservation strategies, irrigation systems and even flood mitigation structures all address short-term variability more than the potential impact of long-term changes in average temperature or rainfall. Access to climate information is a CCA intervention that explains the short-term focus: seasonal or annual forecasts of temperature and/or rainfall are more useful to smallholder farmers than modeling of predicted average temperature in the year 2050; long-term climate projections are of limited use in making informed decisions from year to year about what or when to plant or where to graze livestock.

In contrast, some adaptation interventions more directly address longer-term climate impacts. Examples include development of drought-tolerant crop varieties by plant breeders, adapting building codes to future climate conditions and extreme weather events, or carbon-neutral interventions.

Table 2. Examples of CCA Interventions for Agriculture-focused Activities

CCA INTERVENTIONS	
Improved agricultural practices	Planting of early-maturing, drought-tolerant, or short season crops and use of post-harvest storage bags
Soil and moisture conservation	Upland and on-farm activities including terracing, stone bunds, gully treatment, trenching, diversion ditches, check-dams, micro-basins and mulching
Water harvest/water points improvements	Community and household water ponds, reinforced in some cases by plastic sheeting or concrete, and rooftop harvesting
Rope-and-washer pumps	Simple technology enabling water collection when the water table is relatively shallow
Alternative and diversified livelihoods	Shoat fattening, poultry raising, honey production, micro-gardening, grain trading, micro-franchise, transportation services, and sale of artisanal products (e.g., baby carriers). Activities linked to financial/ business skills training and value-chain promotion.
Savings	Collective village savings and loan associations; social funds for household emergencies; microcredit; in-kind savings of grain and fodder
Improved livestock practices	Herd diversification, fodder-hay production, management of dry/wet season grazing
Information for decision making	Dissemination of weather forecasts and market information to inform household-decision making around production and sale of crops and livestock, along with participatory scenario planning to integrate indigenous knowledge from traditional weather forecasters
Reforestation	Community and household level tree planting

LINKS BETWEEN CCA INTERVENTIONS AND RESILIENCE

With increasing attention to climate change impacts, donors, development actors and governments have widely promoted CCA activities over the last decade or so. The more recent interest in resilience, particularly in relation to climate shocks and stresses, has blurred the line slightly between where CCA ends and resilience-building begins.

In a development context, resilience is the capacity to ensure that adverse stressors and shocks do not have long-lasting adverse consequences. Building resilience centers on three capacities:

Absorptive capacity: Using risk management strategies that moderate or help people cope with the impacts of shocks and stresses.

Adaptive capacity: Reflecting the ability to make forward-looking decisions and changes in behavior based on past experience and knowledge of future conditions.

Transformative capacity: Promoting enabling environments that support absorptive and adaptive capacity, such as: good governance, infrastructure, formal and informal social protection mechanisms, basic service delivery, policies/regulations.

Although the concepts may be articulated differently, there is tremendous overlap between the ability to respond to climate variability and change and building resilience capacity. Both concepts, climate adaptation and climate resilience, involve responding to climate risks to reduce or eliminate adverse impacts. For example, drought is increasing in frequency, longevity, and severity in some parts of the world. Responding to drought can include a climate adaptation intervention such as improving on-farm irrigation to help bridge the gap in less reliable rains. It can also include resilience measures, such as promoting household level livelihood diversification that provides households with substantial non-farm income that can reduce the adverse impact on crop yields resulting from drought. CCA and resilience capacity are in fact mutually reinforcing and are not represented by distinct CCA, resilience, or development interventions. In fact, it has been argued that adaptation options derive from existing good development practice.[2] For example, CARE's Climate Vulnerability and Capacity Analysis study in Ethiopia suggests that climate change cannot be tackled in isolation from livelihoods and food security and that CCA is tightly linked to sustainable management of natural resources, which is also important in building resilience. [3]

[2] Vermeulen, S., A. Challinor, P. Thornton, B. Campbell, N. Eriyagama, J. Vervoort, J. Kinyangi, A. Jarvis, P. Läderach, J. Ramirez-Villegas, K. Nicklin, E. Hawkins and D. Smith. 2013. Addressing uncertainty in adaptation planning for agriculture. Proceedings of the National Academy of Sciences. Vol. 110 (21): 8357-8362.

[3] CARE Ethiopia. 2014. Building adaptive communities through integrated programming: CARE Ethiopia's experience with Climate Vulnerability and Capacity Analysis (CVCA). https://careclimatechange.org/publications/care-ethiopia-cvca-experience/

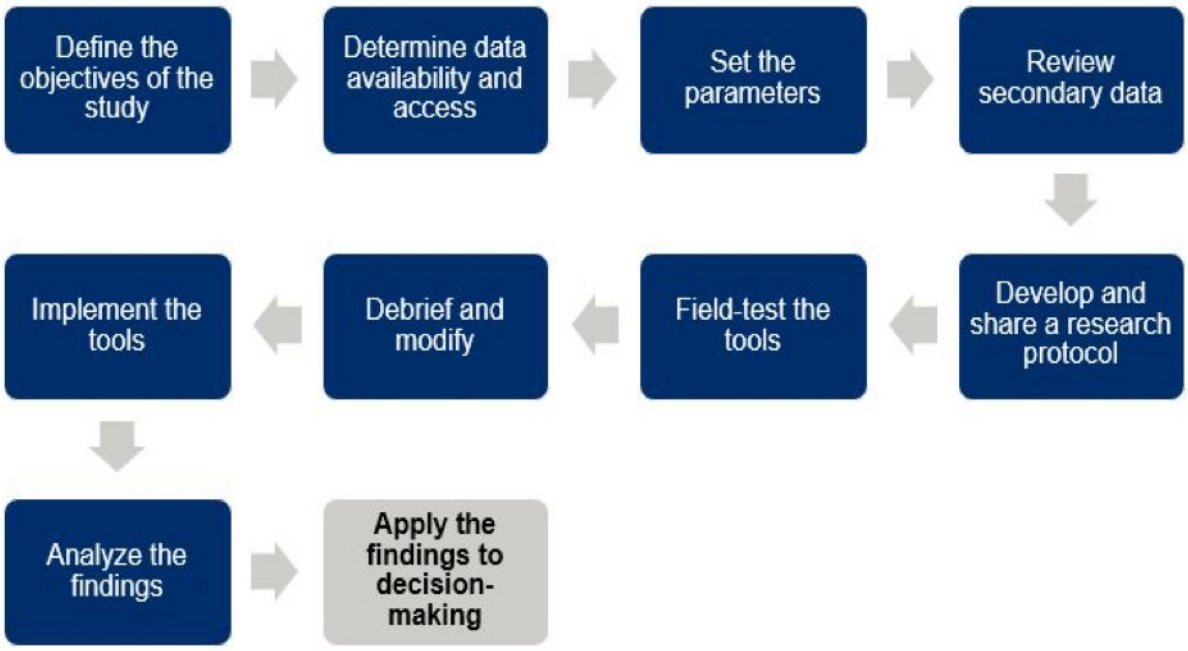
HOW TO PLAN A CCA INTERVENTIONS ASSESSMENT

This section describes a 10-step framework for conducting a CCA interventions assessment (Figure 2). Typically, the assessment should look at existing CCA interventions, including ongoing adaptation strategies practiced by households and communities, or initiatives implemented by NGOs or government.

While the approach should be adapted to a specific research objective and environmental and operational contexts, underlying research principles include:

- **Complementary and integrated qualitative and quantitative methods:** Maximize information collection in a short time and capture depth and breadth across multiple stakeholder groups
- **Multiple levels of inquiry and analysis:** Help grapple with the complexity of climate change and inform decision-making processes and outcomes across multiple scales
- **Context specificity:** Accounts for the diversity of agroecological, livelihood, markets, infrastructure, resource and sociocultural contexts
- **Clear focus on CCA:** Centers on local challenges and existing CCA interventions
- **Adaptability:** Adjusts level of effort to balance data needs and resource availability

Figure 2. A 10-Step Framework for Planning a CCA Interventions Assessment



☐ **Step 1:** Define the objectives of the study

To get started, the first question to answer is: **What is the specific purpose of this CCA assessment?**

To help define that objective, it is important to understand the various CCA interventions promoted by a particular project and how each is expected to contribute to climate change adaptation. In most cases, the starting point likely will be a review of project documents. From that review and consultation with key project stakeholders, the assessment objective for a project that is implementing a broad range of adaptation interventions might be: "***better select from a range of potential adaptation interventions those that are most effective in meeting development outcomes.***" Once the objective is framed, the researchers then can devise a set of guiding questions for the assessment:

- What CCA interventions are being adopted? Why/why not?
- For projects implementing household level interventions, what criteria do households use in deciding what to adopt? How are decisions made?
- For projects implementing community level interventions, how have adopted CCA interventions helped communities deal with climate variability and risk? What are the benefits? Costs?

☐ **Step 2:** Determine data availability and access

Next, **review what relevant data is available to answer the questions**. Ideally, you would want information and data on:

- Climate-related shocks in the target area;
- Project causal models, interventions, implementation strategies and geographic coverage; and
- CCA intervention uptake rates, household characteristics and development outcomes. These may be available through project monitoring and evaluation, including baseline surveys, annual and interim monitoring surveys, and midterm and final surveys.

☐ **Step 3:** Set the parameters

Then, **determine the scope of the assessment** based on how much new data needs to be collected, where, and at what levels. Key questions in order to make that determination include:

- What range of operational contexts needs to be covered?
- What agroecological zones and livelihood systems need to be included?
- What CCA interventions are implemented in the project areas/agroecological zones?

The scope of the assessment will also reflect practical constraints, such as time or resource limitations and logistic requirements. For example, are sites accessible within the timeframe allocated for fieldwork? Will road infrastructure or seasonal rains impede access?

For qualitative fieldwork, it is recommended to 1) select a minimum of three communities in each region where the program is operating, and 2) conduct a minimum of one regional-level workshop in each region.

☐ Step 4: Review secondary data

Review of relevant secondary research is important in preparation for fieldwork and the subsequent analysis of primary data. It should cover climate variability and change in the anticipated assessment areas as well as the food and livelihood context. This preparation will help researchers refine choices of study sites and questions. Key topics for the review include:

- Climate trends and seasonal forecasts
- Documentation on food and livelihood security
- National census and poverty data
- Research in targeted agroecological zones
- Project documents (theory of change, monitoring and evaluation reports, case studies, assessment reports)

Along with project documents, project staff are a key source on knowledge. They can also help access relevant reports and publications from government and partner agencies. In addition, detailed information on climate trends, adaptation and food security may be available online (Table 3).

Table 3. Recommended Internet Sites for Secondary Research

SOURCE	WEBSITE
AfricaAdapt, Climate Science theme	http://www.africa-adapt.net/en-us/
USAID Climatelinks	https://www.climatelinks.org/
Eldis, Climate Change Resource Guide	http://www.eldis.org/
Relief Web	https://reliefweb.int/topics/environment-humanitarian-action
CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)	https://ccafs.cgiar.org/
FEWS NET	http://www.fews.net/
FAO, Climate Change	http://www.fao.org/climate-change/en/
Intergovernmental Panel on Climate Change (IPCC)	http://www.ipcc.ch/
International Institute for Sustainable Development, Climate Change Policy and Practice	https://www.iisd.org/topic/climate-change-adaptation
Tyndall Centre for Climate Change Research, University of East Anglia	http://www.tyndall.ac.uk/
UNDP and the School of Geography and Environment at Oxford University, Climate Change Country Profiles	http://www.geog.ox.ac.uk/research/climate/projects/undp-cp/
UNFCCC National Adaptation Programs of Action	http://unfccc.int/adaptation/napas/items/4585.php
UNFCCC National Reports	https://unfccc.int/national-reports-from-non-annex-i-parties
World Bank Climate Knowledge Portal	http://sdwebx.worldbank.org/climateportal/

Step 5: Develop and share a research protocol

The protocol is the assessment "roadmap." It **outlines the purpose of the research, and where and how it will be conducted**.

During this step, researchers will finalize choices about which tools to use based on the objective and scope of the assessment, data gaps and resource constraints. Consultations with project staff and key stakeholders is an important part of the process; they present an opportunity to select research sites and coordinate with project staff on logistics. Primary elements of the assessment protocol are:

- Background and assessment rationale
- Objectives / key questions of the study
- Study sites
- Study approach and methodology
- Assessment participants
- Data analysis plan
- Logistic requirements and coordination
- Fieldwork schedule
- Data collection tools

A sample research protocol is included in **Annex I**.

Step 6: Field-test the tools

Recognizing that it will not always be possible, given time, budget or logistical constraints, a **practice run** enables the team to become comfortable with the tools and team roles and responsibilities, practice the timing and flow of activities, and test the effectiveness of any materials that may be used. The practice run can be a truncated, one-day or even half-day exercise. It must be long enough to allow at least a minimal test of the tools and practice by team members. It should be noted that the field test represents best practice, but that it is not critical to the successful use of the assessment tools.

Based on the field test, researchers might redefine variables and refine the vocabulary associated with each tool. Keep in mind that the process of validating and redefining will likely continue throughout the fieldwork.

The field test should be conducted in a community other than one included in the actual CCA assessment. To avoid misunderstandings and false expectations in the practice community, it is important to be clear about the purpose of the field test with all project staff and participants.

☐ **Step 7:** Debrief and modify

After the field test, gather the team and project staff to reflect on what worked and what might be improved. Key questions to consider might include:

- How did the participants respond to the questions and activities? Did they understand the purpose and process? Were the questions appropriate and clear? Did the facilitators establish rapport with participants? What techniques could the team use to improve communication and participation (e.g., visual techniques, different materials, different vocabulary)?
- Were the tools well integrated? Was the team able to effectively combine discussions of costs and benefits with the MCA scoring exercise? How was the organization of data collection activities?
- Is the role of each team member well-established, in terms of facilitation, data recording and translation? Did participation of local field staff enhance the research?
- How was the timing and flow of activities? Did participants become tired and disengage? If so, how can this be remedied?
- Did the use of the tools render the desired data?

Based on this discussion, the team can modify the process and revise and finalize the tools.

☐ **Step 8:** Implement the tools

Next, implementation begins. Some tips include:

- **Be prepared.** Ensure that field coordinators have prepared communities and focus group participants, logistics are well organized, all materials are ready to go, and team members know the tools, how they will be implemented, and their roles.
- **Be flexible.** Expect the unexpected and be prepared to make adjustments. Although the tools have been tested, each community context will differ. You may need to adapt the sequencing of the tools and the level of depth on the spot.
- **Stay focused.** The CCA interventions assessment is not a broad assessment of program interventions or an evaluation of the project. Stay focused and conserve time by tailoring outlines to specific audiences and key informants.
- **Make time for reflection and analysis.** Designate time to reflect each day: What worked? What can be improved? What are the collective learnings from preliminary analysis in the field?

☐ **Step 9:** Analyze the findings

After the data is analyzed for each tool, step back and consider the overall findings. Key questions to guide the analysis include:

- Across the tools, what convergence or variation exists in perceptions and/or rankings?
- What patterns, if any, can you discern between and across findings when considering gender and other socioeconomic factors?
- Similarly, do any patterns of prioritization emerge within agroecological zones? Within defined operational areas?
- How do preferences for CCA strategies differ by shock, season and characteristics of the shock?
- Do the findings suggest particular clusters of interventions, e.g., community-based watershed management, reforestation and water harvesting as an intervention set?
- What contributing factors does the analysis identify?

☐ **Step 10:** Use the analysis for decision-making

In some cases, the findings may indicate a clear prioritization of CCA interventions across a program and a clear case for investing in specific interventions. It is more likely that the analysis will yield a complex, nuanced assessment of CCA activities.

While the latter scenario may not translate neatly into an investment strategy, the value of such analysis is multi-faceted, in that the findings will:

- Be contextually relevant to a particular set of conditions and/or constraints characteristic of specific agroecological zones, livelihood systems, and sociocultural dynamics.
- Reflect different sets of decision criteria and preferences with respect to the level of analysis (e.g., household, community, zone/region).
- Indicate trade-offs across a suite of potential CCA interventions.
- Suggest preferred clusters of sets of CCA interventions or appropriate implementation sequences for a particular agroecological zone.
- Provide insights into how preferences for various interventions shift depending on seasonal differences and the characteristics of a climate-shock (e.g., frequency, severity, duration).
- Identify critical governance issues that underlie the effectiveness of a given CCA option or set of interventions.

Keep in mind that CCA interventions prioritized similarly across agroecological zones would allow for broad targeting. In contrast, if the most effective CCA interventions are context-specific – that is, no one-size fits all interventions are identified across zones – programming in each context would need to be tailored to the most appropriate CCA interventions.

In addition, the analysis may also highlight components of a program or enabling conditions that contribute to the benefits attributed to an intervention or set of interventions. These may include, for example: training programs, group formation, integration of CCA activities with livelihood programming or efforts to promote market linkages. In other words, the findings may simultaneously inform investment decisions in particular CCA interventions, as well as the processes, conditions and structures that facilitate adoption and effective application of a given CCA intervention or set of interventions.

SUGGESTED CCA ASSESSMENT TOOLS

This section recommends four complementary decision-making tools to assess CCA interventions. Combining qualitative and quantitative methods, the tools offer a means of gathering critical data and rich insights into how households, communities and their partners in government and nongovernmental organizations experience and adapt to climate change. Although each can be used independently, the tools will yield best results when integrated, such that, as the Greek philosopher Aristotle said, "the whole is greater than the sum of its parts."

Farmers share climate services lessons and practices learned. Bugesera District, Rwanda. T. Muchaba, Rwanda Climate Services for Agriculture Project. June 2018.

WHO SHOULD IMPLEMENT THE TOOLS?

USAID Missions and partners working to improve food and livelihood security, reduce climate-risk, and enhance household and community resilience. Ideally, the tools will be implemented by trained researchers, both connected to and external to the project, who have combined expertise in participatory qualitative and quantitative research and analysis. The discussion of each tool notes required skills and experience.

HOW ARE THE TOOLS ARE PRESENTED?

Each description includes basic information on how to get started and a brief overview of the tool and its application, including step-by-step guidance, illustrative examples, suggested field work schedules and useful tips. Sample facilitation guides and data collection and recording templates are included in annexes at the end of this toolkit. The sections also offer recommendations to help select the most appropriate level of effort in implementing the tool.

TOOL 1: QUANTITATIVE ANALYSIS OF PROJECT MONITORING DATA

WHAT is quantitative analysis of project monitoring data?

Desktop analysis of the project's existing M&E data (such as baseline, midterm and endline surveys, if available) to analyze adoption of CCA interventions by project beneficiaries.

HOW will this tool help?

- Assess the proportion of individuals/households or project beneficiaries adopting specific climate change adaptation actions.
- Compare the characteristics of adopters and non-adopters of specific climate change adaptation actions.

WHO should implement this tool?

Analysts familiar with quantitative techniques and statistical software packages, such as Statistical Analysis System, Statistical Package for the Social Sciences, Statistics and data software analysis package, etc.

WHAT information do you need to get started?

- Project monitoring data sets, including baseline survey, annual monitoring surveys, and midterm and final surveys.
- Detailed information about the design of these surveys, including sampling design, data dictionaries (detailed descriptions of the variables included in the data sets).
- Background information about project interventions, implementation strategies, and geographic coverage.

Suggested **RESOURCES**

- Computers with necessary statistical software packages installed.
- If necessary, data conversion software (e.g., Stat Transfer) to convert data from form provided by the project to the software to be used by the analyst.

BACKGROUND ON TOOL 1

Tool 1 draws on existing project data to identify and compare numbers of adopters versus non-adopters, together with related variables and characteristics of both groups. USAID projects normally have extensive M&E systems, which yield enough data for statistical analysis. This data is available through performance indicators, including impact indicators, which measure changes related to individuals and households, and outcome indicators, which measure changes in behaviors. In addition, project surveys usually collect information about household characteristics, including household demographic characteristics and livelihood activities. The templates provided later in this section offer examples of variables and characteristics, and also demonstrate a method for capturing and tracking this data.

The following commonly used surveys can be used to support CCA interventions analysis:

- **Baseline surveys:** Sampled from the population in project implementation areas, these surveys may provide helpful contextual information. Unless the baseline data sets include variables to identify whether households have adopted specific CCA interventions, they may be of limited use. Even if the baseline data sets have information about adoption of specific practices, the number of adopters will likely be very low so statistical comparisons between adopters and non-adopters will not be feasible.
- **Midterm and endline surveys:** Also population-based, these surveys have the same information as the baseline, and should also include variables identifying which specific CCA interventions have been adopted. With this additional information, these surveys permit comparison of differences across adopters and non-adopters.
- **Annual monitoring surveys:** Typically sampled from project beneficiaries only, these surveys normally track key outcome indicators. In particular, they identify specific practices, including adopted CCA interventions. Limitations include: 1) they are not representative of the entire population in the project area and 2) they collect no or limited information about the characteristics of respondent households or impact indicators.
- **Interim monitoring surveys:** These recurrent surveys track a sample of households over time in a panel survey design, measuring their reaction to shocks and the extent to which they are able to recover. They normally do not collect information about adoption of CCA interventions, so they cannot be used to assess the impacts of adoption of specific practices on resilience capacities or recovery. However, if clear patterns of differences of characteristics between adopters and non-adopters of specific CCA interventions emerge, the information can be separated by characteristic to estimate recovery and resilience capacities of adopters compared to non-adopters.

IMPLEMENTING TOOL 1

☐ Step 1: Identify relevant variables for analysis

» First, identify all available project surveys: baseline, midterm, endline, annual monitoring and/or interim monitoring surveys.

» Next, identify and record the variables available in each survey. Some surveys may include useful information about households' perceptions about the benefits of specific CCA interventions. **Template 1.1** can be used to record variables by checking off the appropriate cells in the table.

☐ Step 2: Assess what kinds of analysis are possible with available data

Use the following questions to determine what kinds of analysis will be possible with data on hand:

» **Do the data sets include variables about adoption of particular CCA interventions?** These would be yes/no variables about whether or not respondents have adopted specific practices, such as whether they have adopted drought resistant or early maturing seed varieties. If these variables are not available in the data sets, then comparisons between non-adopters and adopters will not be possible. The analysis will only be able to provide general information about the characteristics of the sample (project population or beneficiaries, depending on the sample frame used for the survey). If this information is available, calculation of the percentage of adopters and non-adopters is possible, as well as comparison of differences in characteristics between these two groups.

» **If there is information about adoption of specific practices, is there information about who provided the support to the adopters to adopt these practices (e.g., project, government extension service, neighbors, private companies)?** If this information is available, it will be possible to identify those adopters who received support directly from the project, as compared with those adopting with support or information from other sources.

» **Is there information available about the perceived benefits from adopters of specific CCA interventions?** If this information is available, it will be possible to calculate frequencies of the various types of reported benefits.

» **Do the data sets include information about impact-level indicators, such as nutritional or food security status, income or expenditures?** If these indicators are available, the assessment team can make comparisons of outcomes between adopters and non-adopters.

» **Do the data have information about geographic location of the respondents (e.g., administrative area, agro-climatic zone)?** If this information is available, the assessment team can compare adoption rates across the geographic zones.

» **Has the project undertaken interim monitoring of household responses over time after exposure to shocks?** If this monitoring activity has been undertaken by the project, it will be possible to assess how different types of households respond to shocks and how their resilience capacities are affected by the shocks. If there are substantial differences in the household characteristics of adopters and non-adopters of specific CCA interventions, and these differences can be identified within the interim monitoring sample, it may be possible to assess how adoption of CCA interventions influences households' responses to shocks and their resilience capacities.

USING A SAMPLING FRAME

What is a sampling frame? A complete list of all the members of the population you wish to study. It may include individuals, households or institutions. From this list, you can select an appropriate number of representatives of the population to participate in the study (i.e., the sample).

How should it be used for this tool? Interpretation of the tables depends on the sample frame from which the information is derived. If the information is from population-based surveys (e.g., midterm or endline), then the figures are representative of all households within project areas that adopt each option. If from an annual monitoring survey, they are representative of project beneficiaries only, and are likely to be different from the population as a whole.

☐ Step 3: Analyze the data

Based on responses to the questions above, develop a detailed data analysis plan, organized around the following questions:

» What proportion of survey respondents have adopted specific CCA interventions?

» What are the differences in the household characteristics of adopters and non-adopters of specific CCA interventions? For example, are there measurable differences in assets, livelihood strategies or household demographic characteristics?

» What do adopters report are the perceived benefits of adoption of specific CCA interventions? If this information is available in the project data sets, compute the frequencies of the various types of reported benefits.

» What are the differences in impact indicators between adopters and non-adopters?

Use **Template 1.2**, **Template 1.3**, **Template 1.4**, and **Template 1.5** to present the results of the analysis. Note that these tables may be broken down by geographic zones, if that information is available.

In addition, statistical tests for differences across sub-groups should be conducted. If any statistically significant differences emerge, they should be appropriately indicated in the table, for example, with stars or superscripts.

TOOL 1 TEMPLATES

Step 1:

Template 1.1: Identification of Variables Available by Project Survey Data Set

VARIABLES	BASELINE	MIDTERM	ENDLINE	ANNUAL	INTERIM MONITORING
Impact variables					
Incidence of wasting, stunting, underweight					
Household dietary diversity score (HDDS)					
Household Food Insecurity Access Score (HFIAS)					
Household Hunger Scale (HHS)					
HH income / expenditure					
Perceived benefits of specific CCA interventions					
Outcome variables – adoption of specific CCA interventions					
Drought-tolerant/early maturing crops					
Moisture conserving practices					
Fuel-efficient stoves					
Reforestation					
Watershed management					
Other household characteristics					
HH size and composition					
Dependency ratio					
Education of HH members					
Livelihood activities of HH members					
Land area farmed					
Number of livestock animals owned, by type					
Household assets					
Savings					
Access to credit/borrowing					

Step 3:

Template 1.2: Adoption of CCA Interventions

	% SAMPLED HH ADOPTING	% ADOPTERS SUPPORTED BY THE PROJECT
CCA option 1		
CCA option 2		
CCA option 3		

HH = household

Template 1.3 Characteristics of Adopters and Non-adopters of CCA Interventions

	CCA OPTION 1		CCA OPTION 2		*ETC.*	
	A	N-A	A	N-A	A	N-A
HH size						
% Female HoH						
Dependency ratio						
Assets (index)						
Cropland (hectares)						
Average # cattle						
Average # shoats						
% HH with savings						
% HH with loans						
[Others as needed]						

A = adopter, N-A = non-adopter, HH = household, HoH = head of household

Template 1.4: Perceived Benefits of CCA Interventions

	CCA OPTION 1	CCA OPTION 2	*ETC.*
	PERCENT OF ADOPTERS REPORTING		
Increased production			
Increased yield			
Increased sales			
Improved quality			
[Others as needed]			

Note: These are illustrative examples of benefits and may need to be tailored to the specific project.

Template 1.5: Impact Indicators of Adopters and Non-adopters of CCA Interventions

	CCA OPTION 1		CCA OPTION 2		*ETC.*	
	A	N-A	A	N-A	A	N-A
% wasting						
% underweight						
Mean value HFIAS						
Mean value HHS						
Mean value HDDS						
Mean HH income						
[Others as needed]						

A = adopter, N-A = non-adopter

TOOL 2: PARTICIPATORY RESEARCH AND ANALYSIS

WHAT is participatory research and analysis?

A field-based, qualitative approach that engages stakeholder in sharing views of changes due to specific interventions. Participatory research and analysis (PRA) can 1) illuminate cultural, societal and household factors not evident at first sight, and 2) provide complementary context to quantitative data. Participatory approaches are useful for assessing changes in attitudes and decision-making, particularly in complex adaptation contexts. They also help assess the impact and effectiveness of program interventions.

The approach described here combines focus group discussions (FGDs) and individual key informant interviews (KIIs), followed by a validation process among research participants using a modified Delphi Technique to rank responses and build consensus on preferred CCA strategies. The FGDs provide diverse, broad-based views on CCA interventions while the KIIs help fill data gaps and enrich the overall quality and depth of information. The validation process engages the community in setting priorities, which helps ground program planning in local realities and catalyze stakeholder buy-in.

Sample templates for this tool are provided at the end of the section.

HOW will this tool help?

- Collect in-depth information that is not easily quantified through household surveys
- Understand local perceptions, feelings, experiences, beliefs and preferences
- Identify and rank effectiveness of different CCA strategies

WHO should implement this tool?

A research team collects the data, using a pre-determined guide to conduct in-depth discussions. A trained facilitator should lead the discussion, following the discussion guide and encouraging all participants to reflect upon and debate relevant topics. Other team members should include a translator, if needed, and one or two trained notetakers who can to take comprehensive and detailed notes. The facilitator should:

- Have good listening, observational, and writing skills
- Maintain a neutral expression (both verbal and non-verbal)
- Refrain from making judgmental or biased comments
- Be enthusiastic and interested
- Ask probing follow up questions
- Explore divergent opinions
- Stimulate and support discussion

WHAT information do you need to get started?

To begin designing the discussion guide and choosing research sites, it is important to have the following types of information:

- **Project data:** What types of CCA interventions are implemented in various project sites? What are the rates of uptake?
- **Agroecological zones and livelihood systems:** What are the environmental characteristics of the area, including topography, altitude and rainfall patterns? What are the primary livelihood activities, e.g., pastoral, agricultural, aquaculture?
- **Climate hazards:** What are the typical climate-related shocks in the area? What are the impacts of these shocks?
- **Proximity and logistics:** Ideally, researchers will visit both easily accessible and more isolated sites. To that end: are sites accessible within the timeframe allocated to fieldwork? Are there constraints related to road infrastructure? Will seasonal rains impede access? Who are the primary contact people in the field offices?

Suggested **RESOURCES** for field work

- Flipchart paper
- Thick-tipped markers in a variety of colors
- Masking tape
- Adhesive notes (e.g., 'post-it notes') or index cards
- Local materials such as stones, sticks, seeds, etc.
- Notebook, clipboard and extra pens
- Camera and voice recorder to document process (with permission from participants)
- Snacks/lunch/water (depending on the length of the meeting, and where it takes place)
- Access to laptop computers and a power source at a central location for data entry in the field

IMPLEMENTING TOOL 2

☐ Step 1: Identify research sites

First, select research sites capturing the variation of the program's operational area, per these criteria:

- Rates of adoption of CCA strategies
- Proximity to urban centers
- Agroecological zone/ livelihood system

Ideally, select a minimum of three communities in each region where the program is operating.

☐ Step 2: Identify participants

Next, determine who should participate in FGDs and KIIs.

Leaders of the research team should clearly communicate the participant criteria to field-level project staff and any others who will help in securing the participants and coordinating meetings and interviews. Having the "right" participants is critical.

For FGDs, participants should:

- **Represent the target population or project beneficiaries.** The ideal group size is six to eight, and no larger than 10. A smaller group facilitates more in-depth discussion and an opportunity for all members to participate. Larger groups allow individuals to "hide."
- **Be as homogeneous as possible in terms of participation in CCA programming.** For example, members of a Village Savings and Loan Association or participants in a value chain would be likely to have similar experiences with CCA interventions.
- **Be separated by sex, ideally.** Women and men often have different perspectives. In some contexts, cultural norms may limit women's input in a mixed gender group. Separate male and female groups will yield richer and more representative views.

For KIIs, the individual interviewees should:

- **Represent a cross section of knowledge, experience and sectors.** Typically, key informants would have comparatively greater or more specialized experience and knowledge than FGD participants.
- **Be drawn from various levels of leadership.** Examples include traditional leaders; "key" households representing community role models; local, district regional and/or national government leaders and/or officials; community development workers; program field staff; private sector stakeholders; and implementing partners.

☐ **Step 3:** Develop a discussion guide

Next, develop a discussion guide to structure the FGDs and KIIs. The starting point for this is the set of overarching questions identified in the first step of the CCA assessment design.

This guide will comprise questions on 1) whether and how various CCA interventions are helping people and communities deal with and adapt to climate variability and risk, and 2) how household and community decisions are made regarding which adaptation option to implement.

The same topics are covered in both FGDs and KIIs, but KII questions should be tailored to the specific respondent and focus on his/her area of expertise. For example, an interview with a crop extension agent working with community members to improve on-farm moisture conservation will yield different insights than one with a model farmer or project staff working on multiple CCA interventions.

If time and resources allow, best practice suggests testing the guide with a mock group. This exercise also offers a good opportunity to train the facilitators and notetakers. A sample discussion guide is provided below in **Template 2.1**.

☐ **Step 4:** Conducting the FGDs and KIIs

Once the research team has finalized the discussion guide and collaborated with partners in organizing the FGDs and KIIs, the field work begins. Here are a few recommendations:

- Be sure to have one or more dedicated notetakers to record the discussion. Prepare them in advance for their roles and responsibilities. Ideally, there should be enough facilitators, translators and recorders to enable efficient data collection during the FGDs, and if possible, to conduct simultaneous FGDs with men and women and KIIs.
- When the group or interview convenes, the facilitator should begin by introducing purpose of the discussion and each of the researchers. Let participants know how the information they share will be used and address any concerns about confidentiality. If you wish to take photographs or make an audio or visual recording, ask permission.
- Remember, the guide is a tool to facilitate a semi-structured conversation and ensure that key topics are covered during the discussion; it is not a questionnaire.
- Be sure to ask open ended and follow-up questions to probe on issues participants raise during the discussion.
- The role of the facilitator is to guide the conversation, stimulate discussion and ensure everyone participates. The participants are the experts.
- As needed, use flip charts, index cards and other materials to display images and catalyze discussion.

» At the end of the discussion, summarize the main points and ensure participants are in agreement.

» After the FGDs, conduct a team debrief. This will allow team members to compare experiences using the tools, as well as preliminary findings.

☐ Step 5: Validate the findings

The next step is to validate findings. Two approaches are recommended:

1. **Community Validation Team (CVT):** individuals from the community serve as "representatives" or "experts" for the purposes of reconciling FGD perspectives on the relative importance and effectiveness of individual CCA interventions. A modified Delphi technique is used to help participants review and rank CCA priorities.

   Suggested approaches for CVT composition include:

   » **A sub-set of participants from a male and female FGD.** At the closing the specific FGDs, each group can "nominate" three representatives to take part in subsequent CVT.

   » **Individuals considered by the community to hold some level of leadership or expertise.** This approach helps minimize the time burden for those who already participated in FGDs.

   If possible, conduct the CVT on a second day of fieldwork in the community. This allows time for researchers to review data, identify issues for follow-up, and do a preliminary synthesis of findings. If FGDs and CVT must be done in one day, the second option above is recommended.

2. **Regional Validation Team (RVT):** stakeholders representing experts at higher geographic (i.e., region or zone) and institutional levels consider the same questions used during the FGDs and KIIs but go a step further to participate in the Cost-benefit Analysis (**Tool 3**) and Multi-criteria Analysis (**Tool 4**) exercises.

   The RVT meetings serve to elicit a new regional or zonal-level set of data, rather than verifying findings at the community level. The data generated, whether community, zonal or regional, can be analyzed and compared to identify where priorities converge or how perspectives are complementary. A sample outline for an RVT workshop is provided as **Template 2.2** at the end of this section.

ENSURING ADEQUATE TIME

PRA tends to require a great deal of time from participants. It is important to plan for enough time in each community to gather robust data while minimizing demands on informants. In general, allow 60 to 90 minutes for each FGD and 30 to 45 minutes for each KII. Time should also be allotted for a team debrief (read more on this in Step 6).

WHAT IS THE DELPHI TECHNIQUE?

Developed in the 1950s, the Delphi Technique aims to build consensus through a series of questionnaires among a group of selected subjects, often experts in a specific area of interest. The technique involves multiple iterations of questions and a feedback process wherein participants are asked to reconsider their previous answers based on a summation of answers from a previous round.

The modified Delphi technique, which is better suited to a rural field work context, solicits expert opinions in a structured way to achieve consensus on CCA options. For FGDs that include both men and women, post-it notes can be used to illustrate two separate rankings of CCA options, one from the men's group and one from the women's. Through thoughtful deliberation, participants can merge two separate rankings into a single community-level list of priority CCA options.

☐ **Step 6:** Data entry

After the field work, the research team meets to enter the data. During this process, the team reviews the information to discuss key issues, trends and information gaps, as well as how the process can be improved.

For each FGD, notes recorded in notebooks and flipcharts are transferred to data entry matrices for that specific group. In this way, responses can be systematically organized and used to answer the key questions. Sample entry matrices for FGDs are provided in **Template 2.3**.

For KIIs, responses can be entered into a similar matrix or captured as a narrative description of the informant's experience. Model farmers, for example, may be able to tell the story of their experience during previous shocks; the types of CCA interventions they have implemented (or not), why, and how; and how these CCA interventions have changed life for them and their families. In this case, it is helpful to enter notes in a narrative form, indicating (or coding) key aspects of the interview in relation to the study questions. This can be done using a simple matrix, a sample of which is found in **Template 2.4**.

Be sure to allocate sufficient time for data entry. A general rule to follow is a full day of data entry for every two days of data collection. This ensures adequate time for collective and systematic data entry, as well as an opportunity to ensure the triangulation of results, further tool refinement and data quality assurance. Building adequate time into the research plan for data entry and collaborative review of findings, trends and gaps will improve the data collection process and the overall quality of data.

Be sure to back-up the completed matrices, for example, by copying them to an external drive or cloud-based storage, or even taking photos of them.

☐ **Step 7:** Analyze the data

Last, consolidate findings from the FGDs and KII matrices on a predesigned matrix for each community. In this way, the findings are aggregated to identify trends and compare differences across communities in a particular zone or region. The matrix provides a method for triangulating data from all different sources for the research questions. A sample matrix is provided in **Template 2.5.**

Template 2.1 Sample CCA Interventions Discussion Guide

Focus Group Discussions/Key Informant Interviews	
Date:	Gender/# Participants
Location:	
Facilitator:	Recorder:

A. Climate-related shocks/stresses:
   1. Review the main climate-related shocks/stresses experienced by the community over the last 10 years. When do they occur? What is the frequency, duration, severity?
   2. Describe a 'good year'. How is this locally defined? When does the rain(s) start, how long does it last, how much?
   3. Are certain shocks or stressors drivers of others?
   4. How do climate-related shocks/stresses affect households and the community? Probe for differences between women, men, youth, PWD, elderly, poor woman-headed households.

B. Adaption interventions
   1. Ask participants to identify CCA interventions that have been adopted in the community in response to weather events.
      a. Probe for any of the project promoted CCA interventions the participants do not indicate.
      b. Are there others being used to deal with the climate-related shocks/stresses (that are promoted by the project; that are not promoted by the project)?
      c. Probe for differences between rich, poor, age, women, men, youth, PWD, elderly, poor woman-headed households.
   2. Rank the CCA interventions in terms of their perceived effectiveness in dealing with the identified climate-related shocks/stresses.

C. Costs and benefits: (what are the benefits of the CCA interventions; what are the costs/limitations)
   1. Which interventions are of most benefit to you/your family and why (what is the value of that benefit – in terms of income or other value, e.g., time savings, improvement in environment, enhanced social capital)? Try to elicit values such as yield/ha, where possible and appropriate. Link the costs-benefits to the weather events identified earlier.
   2. What are the benefits to your community and why? Probe for differences between women, men, youth, PWD, elderly, poor woman-headed households.
   3. What are the constraints to adoption? Probe for differences between women, men, youth, PWD, elderly, poor woman-headed households.

D. Decision-making criteria: (how people and communities decide what to adopt)
   1. Have the group develop list of criteria that households/communities use to determine which interventions they adopt. Probe for differences between men, women, elderly, disabled, etc.

      Potential examples include:
      a. Cost (financial, time)
      b. Short-term v long-term benefits (land tenure?)
      c. Tradeoffs: in terms of education, health, income
      d. Household and community labor allocation
      e. Access to requisite knowledge and information

f. Arable land, water supply saved
g. Level of potential risk
h. Human life/health improved
i. Access to markets, savings, credit
j. Aspirations: family and social networks
k. Effectiveness in protecting livestock, crops, assets
l. Effectiveness in protecting/restoring pasture, arable, land, forests, water, etc.
m. Effectiveness in protecting human life/health and human resources/labor
n. Receipt of food/cash transfer

2. Ask participants about factors, conditions, activities that have enabled adoption of a given CCA option (e.g., a training program, collection action, connection with technical expertise, market).
3. Investigate who makes decisions around CCA and how these decisions are made.

Template 2.2 Sample CCA Interventions RVT Workshop Outline (half-day)

ATLAS Climate Change Adaption (CCA) Interventions Study
Adaptation Thought Leadership and Assessment

8:30 am Welcome, Regional Project Coordinator
8:40 am Introduction

The USAID ATLAS CCA Interventions Study
Identify and prioritize key CCA interventions
Test a set of tools for decision-making for CCAs: FGDs, KIIs, CBA, MCA, Validation

Key questions
What CCA interventions are being adopted? Why/why not?
How have chosen CCA interventions helped communities deal with climate variability and risk?
What are the benefits? Costs?
What criteria are used to make these decisions?

Study approach: Focus on target local and regional communities in project area
Level 1, local: Male and female focus groups in two communities per region
Level 2, local: Community Validation Team meeting, mixed group
Level 3, region: Regional Validation Team Workshop

Workshop objectives
Validate weather scenarios
Identify and rank CCA interventions, by weather scenario
Identify costs, benefits. Are some communities better able to adopt?
Conduct multi-criteria analysis (MCA) of CCA interventions

9:00 am Validate Weather Scenarios (frequency, severity): Findings from the kebeles
Drought / consecutive drought
Erratic and heavy rainfall
Define a 'good year'

9:15 am Primary CCA Interventions, by Scenario: Rank and Select Top Interventions

Sample Agriculture and Livestock-oriented Project CCA Interventions

Planting early-maturing, drought-tolerant, or short season crops
Soil & water conservation (terracing, diversion ditches, check dams, soil & stone bunds)
Water harvesting (ponds)
Fuel-efficient stoves
Information for decision making (weather & markets)
Alternative and diversified livelihoods (IGAs: fattening, honey, micro-gardens)
Reforestation

Community-based upland management (CCA planning, afforestation, terracing)
Savings (community savings, household savings, grain savings)
Crop insurance
Livestock diversification (shift from cattle to shoats)
Adjust cultivation cycle (early harvesting, reseeding)

10:00 am Cost-benefit Analysis of CCAs (for drought and erratic rainfall)
What are the benefits of the interventions for households and communities?
The costs, constraints?
Are some communities better able to adopt certain interventions?

10:40 am Coffee Break

11:00 am Multi-criteria Analysis of Priority CCA Interventions
Choose a set of 5-7 criteria that guide decisions about which CCA interventions to adopt.
Score each of the criteria using a scale of 5 to 1 (5=high, most important), for each CCA option.
Compare with findings from different local communities.

12:00 pm Feedback and Closing

12:30 pm Break for lunch

Template 2.3 ATLAS CCA Interventions FGD Data Entry Matrix

Date:
Region/district:
Community:

participants, women:
participants, men:

Translator(s):
Facilitator:
Recorder:

Part I. Climate-related shocks and stresses / weather scenarios, in rank order of importance					
	Shock/stress	**Frequency, duration, severity**	**General experience and effects**	**'Benchmark' coping strategies**	**Differential effects**
1					
2					
3					
4					
5					
	Good year				

Part II. CCA Interventions by climate shock / weather event					
Shock/stress	**Interventions, in rank order for each scenario**	**Source (e.g., project, gvt, community)**	**Description / application**	**Enabling factors/ conditions**	**Differential access/ uptake**
1					
2					
3					
[Others as needed]					

Part III. Cost-benefit analysis				
CCA Interventions	Benefits (HH & community)	Quantitative values (units)	Costs & constraints (HH & comm)	Quantitative values

Part IV. Decision-making criteria / MCA		
Criteria	Discussion (specific examples, application)	HH/Community differences

Process notes/ general observations	
Start time	
End time	
Location	
Notes / observations	
Lessons learned	

Template 2.4 ATLAS CCA Interventions Key Informant Data Entry Matrix

Date:	Region/district:	KI (name, role or position):
Interviewer:	Community:	

NOTES	KEY WORDS/ TOPICS/ COMMENTS (CODES*)

*Codes correspond to the key topics in the topical outline and the FGD data collection matrix, e.g., climate-shock, CCA option, coping strategy, cost, benefit, decision-making criteria.

Template 2.5 ATLAS CCA Interventions Consolidated Data Matrices

Date:_____ Data entry by:_____
Community:_____ District/region/zone:_____

I. Good year, defined:

II. Main Climate-related Events in Rank Order, by FGD/ Key Informant

WOMEN'S FGD			MEN'S FGD			KI (SPECIFY)		
SHOCK/ STRESS	FREQUENCY (10 YEARS)	SEVERITY	SHOCK/ STRESS	FREQUENCY (10 YEARS)	SEVERITY	SHOCK/ STRESS	FREQUENCY (10 YEARS)	SEVERITY
A.								
B.								
C.								

III. CCA Option by Climate-related Shock/ Stress, by Gender/ Key Informant; Rank Order

SHOCK/ STRESS	WOMEN'S FGD	MEN'S FGD	KI (SPECIFY)
A.	1.	1.	1.
	2.	2.	2.
	3.	3.	3.
	4.	4.	4.
	5.	5.	5.
	6.	6.	6.
B.	1.	1.	1.
	2.	2.	2.
	3.	3.	3.
	4.	4.	4.
	5.	5.	5.
	6.	6.	6.
C.	1.	1.	1.
	2.	2.	2.
	3.	3.	3.
	4.	4.	4.
	5.	5.	5.
	6.	6.	6.

IV. Main Costs and Benefits for Each CCA Option, by Gender/Key Informant

CCA INTERVENTIONS	WOMEN'S FGD		MEN'S FGD		KIS (SPECIFY)	
	BENEFITS	COSTS	BENEFITS	COSTS	BENEFITS	COSTS

V. Primary Decision-making Criteria, by Gender/Key Informant (not ranked)

WOMEN	MEN	KIS (SPECIFY KI)
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.
7.	7.	7.
8.	8.	8.
[Others as needed]		

TOOL 3: COST-BENEFIT ANALYSIS

WHAT is Cost-Benefit Analysis?

A modified economic appraisal and evaluation tool that captures both tangible (e.g., production) and less tangible benefits such as social and institutional capital (e.g. empowerment of women). Cost-benefit analysis (CBA) focuses on qualitative and quantitative changes – for example, in income, livelihoods and health – achieved through the interventions. It also considers outputs produced by the project and calculates monetary value for project costs. The quantitative output is financial cost/benefit.

HOW will this tool help?

Systematically collect qualitative and quantitative data on the costs and benefits of CCA investments

- Understand diverse perspectives on non-monetary costs and benefits, barriers to adoption, and trade-offs associated with alternative investments
- Estimate monetary benefits and costs of interventions at the household and project levels
- Provide a framework to assess the relative advantages and disadvantages of allocating resources into alternative CCA activities

WHO should implement this tool?

A research team with skills in qualitative and quantitative methods. Qualitative researchers use FGDs and KIIs to collect both monetary and non-monetary information about the CCA interventions. Quantitative researchers measure quantitative changes achieved through CCA interventions, together with monetary costs and benefits, using data from surveys, project budgets and knowledgeable key informants.

To implement the qualitative component, a researcher needs a skill set similar to what is described in **Participatory Research and Analysis (Tool 2)**. For the quantitative assessment of costs and benefits, it is useful to have:

- Good interviewing skills
- Understanding of economic appraisal, with familiarity of direct and indirect costs and possible externalities and incorporate estimates of risk aversion
- Economic and statistical analysis skills

WHAT information do you need to get started?

Some of the qualitative and quantitative data required to start will be collected during the analysis of project data in **Tool 1** and conduct of focus groups and key informant interviews in **Tool 2**. In addition, information is needed on:

- **Project data:** What are direct and indirect costs associated with CCA interventions at the project level? What are the adoption rates for the project's CCA interventions?
- **Technical expertise:** Are there technical experts and key informants who can provide you with cost and benefit data for the various interventions, such as the use of improved drought resistant seeds?

Suggested **RESOURCES** for field work

Refer to suggested resources for **Participatory Research and Analysis (Tool 2)** and the CBA data collection templates.

BACKGROUND ON CBA

The objective of CBA is to provide a rigorous framework in which the costs and benefits of investments can be estimated and added up, and compared and ranked across alternatives, even with investments that may have a wide range of costs and benefits to society but that are not directly comparable. For example, one investment may reduce incidence of diarrhea in under-five children by 5,000 cases, while another investment may increase the income of farmers participating in a new irrigation scheme by $50,000. These two benefits are not directly comparable, since they are measured in different units: number of children with diarrhea compared with dollars of income.

In order to have comparable results, CBA uses a set of methodologies to estimate the monetary values of many different kinds of non-monetary benefits. These techniques are always approximations. While some argue there is no point to try to derive monetary estimates of non-monetary benefits, cost-benefit analysts point out that decision-makers are already implicitly making these estimates. In the example above, government decision-makers must decide how much to allocate to reducing child diarrhea and developing new irrigation schemes. CBA is an attempt to provide the necessary information to make this decision in the most rigorously defensible and transparent way possible.

With this objective in mind, there are several things to note about CBA:

- **CBA provides objective and clearly defined procedures for estimating monetary values of non-monetary benefits (and costs).** As an example, food security projects work toward achieving important non-monetary goals, such as enhancing the resilience of vulnerable populations and supporting the empowerment of women and other vulnerable individuals. In CBA, the monetary values of these non-monetary benefits are estimated. In many cases, however, formal techniques for estimating the monetary values are not available. In those cases, CBA is used in tandem with **Tool 4,** multi-criteria analysis.

- **CBA incorporates economic externalities into the analysis.** One reason that costs and benefits may not be reflected in monetary values is because of the existence of either positive or negative economic externalities. Externalities exist when individuals who invest in a particular activity do not directly bear all its costs to society, or are not able to capture all its benefits to fully recover the cost of their investment. An example of a negative externality would be if farmers remove all crop residue from a field after harvesting. This activity benefits that farmer by removing weeds that compete with crops. But the lack of vegetative cover can lead to gullying and erosion problems for downstream farmers; these are not direct costs to the farmer who removes the crop residue. Such externalities imply that market prices do not fully reflect the true value (or cost) to society of specific activities. Estimates of the monetary values of these positive or negative externalities must be included into the cost-benefit analysis.
- **In its most basic form, CBA does not address equity or distributional concerns.** For example, an additional dollar earned by a rich individual provides as much value as an additional dollar earned by a poor individual; this is a major limitation. As such, CBA techniques have evolved to provide greater weight to benefits that accrue to more vulnerable populations (i.e., poorer households). Methodologies have been proposed to estimate the relative weights of benefits accruing to different types of households and incorporate them into the analyses.
- **Discounting allows comparability of costs and benefits over time.** Because cost-benefit analysis normally measures costs and benefits over long periods of time, the approach must include discounting techniques to ensure that costs and benefits at different points in time are comparable. One dollar available today has a different (higher) value than one dollar available one year in the future. Appropriate social discount rates for long timeframes, relevant for examining the impacts of climate change, raises methodological questions about the appropriate discount rates to use.
- **CBA must effectively incorporate uncertainty about future events.** Another important aspect that arises from the long timeframe of analysis, and one of particular importance for analyzing climate change impacts, is uncertainty about future events. In CBA, the estimation of costs and benefits must consider the degree of risk aversion of affected individuals. In particular, a risk-averse individual places higher value on a certain payment, even if its expected value is lower than a more uncertain alternative.

IMPLEMENTING TOOL 3

☐ Step 1: Determine which CBA tools to use

Evaluate a range of CBA tools to determine which best suits the adaptation interventions under study. The use of tools will vary depending on whether the CCA interventions have:

- **Well-defined monetary benefits:** Improved agricultural and livestock techniques that enhance economic returns for adopters. These might include adoption of early-maturing or drought-tolerant crops, rope and washer pumps, and post-harvest storage bags.
- **Other external benefits:** CCA practices such as water harvesting, adoption of fuel-efficient stoves, reforestation and gully treatment may have important external benefits, such as reducing erosion or deforestation. Incorporate these explicitly in the CBA.
- **Monetary and non-monetary benefits:** Adaptation interventions such as community-based upland management, participatory planning processes and savings promotion are examples. These types of interventions may require a more qualitative use of CBA or a multi-criteria analysis approach (presented in **Tool 4**).

The key considerations for determining the best CBA approach are the availability of information, time and research expertise (Figure 3). The implementation of subsequent steps will vary depending on which option the team decides to pursue:

- **Option 1**, qualitative CBA (*step 2 only*)
- **Option 2**, partial quantitative CBA (*steps 2-4*)
- **Option 3**, implementation ends at (*steps 2-5*)

☐ Step 2: Qualitative CBA as part of PRA (TOOL 2)

As a starting point for all CBA analysis, all CCA intervention assessments should integrate a discussion of costs and benefits in the implementation of **Participatory Research and Analysis (Tool 2)**, particularly the focus groups. FGD participants may be good sources of monetary and non-monetary information on cost or benefit values and perceived externalities (Table 5).

Specific ways to integrate CBA questions into participatory research include:

- **In FGDs**. Refer to the sample guide (**Template 2.1**) for examples of questions. To assist notetakers in being as specific as possible in recording data, a sample FGD data collection template for CBA is presented in **Template 3.1**.
- **In KIIs:** Local experts, such as agricultural extension agents, can provide useful information into the specific monetary costs and benefits associated with various CCA interventions.

Table 4. Types of Cost and Benefit Information Collected in FGDs

COSTS / CHALLENGES / CONS	EXAMPLES
Perceived risks and barriers to adoption	• Initial investment cost (seeds, livestock, water-pump, etc.) • Loss of investment (potential death of livestock or seedlings) • Lack of social networks, market access or information • Cultural barriers (for savings) • Lack of trust or transparency (for collective action or mistrust of new "unproven" technology) • Poorest households may lack resources (time and money) to invest in a CCA option or be unwilling to take the perceived risk
Non-monetary or intangible costs	• Social costs (allocating HH resources to CCA option instead of community events can result in "loss of respect", stress resulting from reliance on social networks) • Opportunity cost (forego consumption of HH items, transport to invest in CCA option) • Costs related to household labor allocation or decision-making (time required for training, workshops, implementation of CCA option; drain on household resources; increased time and labor burden, especially for women)
Negative externalities	• Environmental impacts (limited water resources allocated to new species, e.g., eucalyptus; impacts of increased chemical fertilizer use)
Costs that vary seasonally, over time, or in relation to the characteristics (e.g., severity, frequency) of the shock	• Increased input costs, such as feed or water during drought, seasonal farm inputs • Cost in terms of declining profits during prolonged or recurrent droughts with collective impacts (e.g., small-business operators are unable to sell to their "neighbors"; honey production declines during drought)
Monetary costs	• Actual HH monetary costs of investment over time (initial cost of materials and installation, e.g., physical water pump, labor to dig well) • Recurrent costs (seeds and other inputs, transport, maintenance))
BENEFITS / PROS	**EXAMPLES**
Non-monetary or intangible benefits	• Lifesaving • Reduces vulnerability to a shock, promotes resilience • Increase/improve social networks and collective action • Increase access to information and markets • Improve HH decision-making and labor allocation • Improved health and hygiene • Minimize risk • Improve management practices • Reduce time burden (fuel, fodder or water collection), especially for women
Positive externalities	• Improve environmental conditions (soil quality; water catchment; increase flora, forest cover, animal habitat) • Reduce pressure on common-property resources (grazing lands, water, reduce timber extraction) • Improve market and transport infrastructure
BENEFITS / PROS	**EXAMPLES**
Benefits that vary seasonally, over time, or in relationship to the type of shock	• Income smoothing, by using different CCA interventions over time, depending on conditions • Interventions well-suited to drought, floods, or both (year-round). • Benefits, such as income from micro-franchise, may decline in severe / persistent drought; livestock diversification, e.g., selling cattle to acquire shoats, may prove more beneficial to cope with drought.
Monetary benefits	• Increased production, income and food consumption (monetized) • Reduction in HH expenses (e.g., lower fuel wood costs using fuel-efficient stove, reduced water costs using water pump or improved water harvesting technology) • Diversified income sources
Sequencing or clustering of CCA interventions influences perceived benefits	• Sequencing or clustering sets of CCA interventions (e.g., savings and IGAs; terracing/ gully treatment and water harvesting in community ponds; reforestation and fuel-efficient stoves), overall benefits enhanced

This information can also add robustness of the data in both a partial or full qualitative CBA. **Template 3.2** may also be used for KIIs.

» **In analysis of qualitative CBA data:** Synthesize and organize FGD and KII findings according to each CCA option included in the assessment. An example of how information on costs and benefits can be organized and presented, based on the Ethiopia study, is in **Annex 2**.

Note that it is useful to conduct the participatory inquiry into costs and benefits before conducting the multi-criteria assessment exercise described in **Tool 4**, as this discussion provides a chance for group members to systematically consider each CCA intervention and the criteria they use to on whether to adopt.

☐ Step 3: Estimate monetary benefits for adopters of CCA interventions

Steps 3 and 4 are needed when the team has decided to pursue Option 2, a partial quantitative CBA, or Option 3, full quantitative CBA. Step 3 centers on measuring the economic benefits to adopters of CCA practices based on information from KIIs.

The examples below illustrate the types of findings CBA can provide. They are based on two agricultural-focused CCA practices: improved seeds and fuel-efficient stoves. These activities were selected in large part because it was relatively easy to quantify their costs and benefits, clear budge figures were available, and project staff estimates of costs and benefits appeared realistic. Note that these results should not be interpreted as accurate findings from CBA, further empirical research would be required to verify the values in the tables.

EXAMPLE 1: IMPROVED SEEDS (EARLY MATURING/ DROUGHT TOLERANT)

Key points and observations

» In applying CBA to CCA interventions, it is critical to capture the effects of climate and weather on the alternative strategies. In order to address this element of the analysis, key informants were asked to assess the probability of alternative weather scenarios, specifically the likelihood of their occurrence in a 10-year period. The first two columns of Table 6 identify alternative weather scenarios and the likelihood of them occurring within any given period, such as over 10 years. In this case, information from KIIs indicated a 30 percent chance of a drought in a given year (3 years out of 10), a 10 percent chance of a severe drought (one year out of 10), etc.

» Table 6 provides information about the expected returns of improved sorghum compared with the local variety commonly used by farmers in an illustrative project area. Costs and returns are estimated for each of the weather conditions. The costs columns refer only to costs associated with application of the improved seed, so for the local variety are 0.

» The results show that the improved seed variety performs better than the local variety under all conditions, except in the case of severe drought, where there is no production, but farmers adopting the improved variety incur the cost of the seed.

» The final row of the table summarizes the expected net revenues per hectare for local and improved sorghum in US dollars per hectare. This is computed as the weighted average of the net revenues under each weather scenario, weighted by the probability of each scenario occurring in a given year.

» The results from these revenue and costs estimates show that farmers who adopt the improved sorghum variety can expect a net revenue of almost $850 per hectare, almost $450 higher than if they planted local sorghum. This is an increase in net revenues of 112 percent resulting from adoption of the improved variety.

Table 5. Household-level Net Benefits of Drought-tolerant/Early Maturing Seed (sorghum)

WEATHER CONDITION	LIKELIHOOD OF OCCURANCE	LOCAL SEEDS			IIMPROVED SEEDS			DIFFERENCE COST	
		REVENUE	COST	NET REVENUE	REVENUE	COST	NET REVENUE		
	Percent	*USD/ha*						*USD/ha*	*%*
Drought	30%	210	0	210	630	180	450		
Severe drought	10%	0	0	0	175	180	-5		
Normal	40%	525	0	525	1260	180	1080		
Flood	20%	630	0	630	1575	180	1395		
Weighted average				399			846	447	112%

EXAMPLE 2: FUEL-EFFICIENT STOVES

One CCA option not directly affected by weather or climate is the adoption of fuel-efficient cook stoves, which require about one-half the amount of fuel as traditional stoves.

For example, in Ethiopia, where wood is used for fuel, the estimated savings on fuel costs per household are 6.25 *birr* per day, or 2150 *birr* per year. This corresponds to an annual saving of $109. The cost of a fuel-efficient stove is 70 *birr*, or USD3.50, which is paid over two years. Therefore, the annual net benefits are estimated to be $107 per year factoring in the purchase cost of the stove every two years (≈109 – 1.75=107)

Step 4: Calculating CCA interventions project costs

To support Options 2 and 3, the next step in the CBA is to incorporate the costs incurred by the project to promote these activities (Table 7). This analysis uses data from key informants as well as information from the project on direct project costs and numbers of households adopting a given practice.

Table 6. Estimating Project-Level CBA for Agriculture-Focused CCA Practices

			CCA INTERVENTIONS	
			IMPROVED STOVE	IMPROVED SEEDS
1	Net benefit per ha	*USD/ha*	447	
2	Ha/household	*Ha/HH*	0.5	
3	Net benefit per HH	*USD/HH*	223.5	107
4	Number of HH	#	2,060	300
5	Total net benefits	*USD*	460,410	32,100
6	Project costs	*USD*	37,099	2,724
7	Benefit cost ratio		12.4	11.8

UNDERSTANDING THE TABLE

» **Net benefits:** Row 1 shows net benefit per hectare, or the increase in net revenue that households obtain by adopting the practice. In the case of improved seeds, the net benefits were estimated on a per-hectare basis, assuming that on average households applied improved seeds on 0.5 hectare of land (row 2). Of the households that own farmland, the average land area farmed is about 1.5 hectare, so this assumption considers that these practices are applied to about one-third of total land farmed by the households that adopt these land-based practices. Based on this, the average net benefit of using improved seeds can be calculated on a household basis, as shown here for improved seeds:

Row 1: Net benefit per hectare	*Row 2: # hectares per HH*	*Row 3: Net benefit per HH*
447 USD/ha	**x 0.5 hectares/HH**	**= 223.5 USD/ha**

Based on the assumptions of the returns to households and the number of households adopting these practices (row 4, provided by the project), total net benefits accruing to households supported by the project can be estimated. The total net benefits to adoption of improved seeds are over $460,000, compared with much smaller amounts, $32,000 for fuel-efficient stoves (row 5).

» **Project costs:** However, the cost incurred by the project to promote improved seeds is also much higher than for the fuel-efficient stoves. These costs, available from project staff, are only the direct costs that are directly attributable to each practice, that is purchase of materials and costs incurred in providing training to participants.

» **Benefit Cost Ratio (BCR):** Row 7 of Table 7 presents the BCR, providing insight into the relative effectiveness of these interventions. This ratio can be interpreted as the amount of net benefits provided to adopters of each of the three practices, per dollar spent by the project. Overall, the values are high: approximately 12 dollars net revenue per each dollar spent on promotion. This is for two important reasons: 1) the estimates of the net benefits to adopters are probably quite optimistic, and 2) the costs are only the direct costs of promoting these specific interventions, and project overhead costs should also be factored into the calculations. It is also interesting to note that BCRs are quite similar in magnitude across the practices. This result indicates that, in terms of generating net benefits, investment in both strategies provides similar returns.

☐ **Step 5:** Estimate values of indirect and external effects

If Option 3, full quantitative CBA, is undertaken, the next step would be to estimate the monetary values of all the indirect and externality effects associated with each practice. An example of these effects is the environmental benefits associated with reduced biomass harvesting for fuel as more efficient stoves are adopted. This process would also take into account an appropriate discounting rate. As previously noted, this analysis is typically part of a large-scale, specialized CBA commissioned to obtain rigorous cost and benefit data and quantitative estimates of the externality effects associated with CCA practices.

TOOL 3 TEMPLATES

☐ Step 2:

Template 3.1 Costs and Benefits for Each CCA Option

CCA INTERVENTIONS	BENEFITS / PROS (HH & COMMUNITY)	VALUE (SPECIFY UNITS)	COSTS / CONSTRAINTS	VALUE (SPECIFY UNITS)
Option 1				
Option 2				
Option 3				
[Others as needed]				

☐ Step 3:

Template 3.2 ATLAS CCA Interventions Cost-Benefit Analysis: KII

Date: Key informant: Interviewer:
Location: Title: Translator:
Contact info:

A. First, identify the primary weather scenarios (e.g., drought, severe drought, erratic rainfall, flood) and indicate the average frequency of occurrence over a period of 10 years.

Weather Scenario	Likelihood of occurrence *(# years in 10)*
A	
B	
C	
D	
E	

B. For each weather scenario, estimate the revenue (benefits) when the new CCA option is not applied. Then estimate the cost of implementing the new CCA technology. What is the estimated income (benefits) when the new technology is used? Use the sample template provided below to record the information. A similar template can be developed for each CCA option.

For each CCA option, please adjust the units (e.g., kgs per hectare, 10x10 plot) as most appropriate so we can estimate an average change in revenue (benefit or cost) for a given option over a specified period of time (week, month, year). Thank you!

EXAMPLE: **Specify CCA Practice:** Improved Seeds (drought tolerant maize)

Weather Scenario	Likelihood of occurrence	Benchmark – local seeds			Improved practice – improved seeds			Net benefit of improved practice/ hectare
		Revenue/ ha	Cost/ha	Net revenue/ ha *(4)-(3)*	Revenue/ ha	Cost/ ha	Net revenue/ ha *(7)-(6)*	*(8)-(5)*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
A								
B								
C								
D								
E								

Note: ha=hectare

TOOL 4: MULTI-CRITERIA ANALYSIS

WHAT is Multi-Criteria Analysis?

A qualitative analytic approach that can provide insights into how households, communities and institutions make strategic decisions when there are multiple objectives (or "criteria") to consider, and when the costs, benefits or impacts of a particular strategy are difficult to quantify.

Multi-criteria analysis (MCA) tool should be integrated, as needed, with PRA using a modified Delphi technique.

HOW will this tool help?

- Provide a common framework to establish preferences among a range of CCA interventions
- Consider interventions that have multiple objectives and multiple criteria
- Manage large amounts of complex information from multiple perspectives
- Systematically rank interventions using qualitative methods, when monetary values for costs and benefits are not available and the impacts are difficult to quantify

WHO should implement this tool?

As an added component to Participatory Research Analysis (**Tool 2**), MCA requires researchers with similar qualitative skills.

WHAT information is needed to get started?

Implemented together with PRA, MCA requires the same information described in **Tool 2**.

Suggested **RESOURCES** for field work

In addition to the resources described in **Tool 2**, MCA requires specific data collection templates.

IMPLEMENTING TOOL 4

While participatory approaches help researchers collect open-ended information on climate shocks and the strategies people use to manage them, MCA serves to narrow the data set and prioritize interventions. MCA is often used alongside CBA; qualitative findings on costs and benefits may provide specific criteria for MCA exercises. Alternatively, MCA can be used to define a narrow set of interventions to which a full quantitative CBA may be applied.[4]

MCA is used to evaluate CCA interventions against an explicit set of objectives or weighted criteria. Alternative interventions are scored as to how well they meet each objective. Scores are then aggregated to indicate overall performance or priorities among interventions.

☐ Step 1: Identify the most common climate shocks

Following discussion of climate shocks during the FGD, an MCA exercise may be conducted.

For the MCA, it is best to choose no more than two of the most significant climate shocks so that participants remain engaged and the MCA does not deteriorate into a mechanical exercise of weighting and scoring.

In some cases, it may be possible to combine shocks described by the community. For instance, community members may identify drought and high temperatures as two shocks. Through follow up discussions, participants conclude that these two events tend to occur together and could be combined as a single shock: drought. Using PRA tools, researchers can elicit a broad range of climate-related shocks, how people experience them, and the impacts on different social groups. MCA can then be used to aggregate and refine the qualitative data to identify priorities for CCA interventions.

☐ Step 2: Identify the CCA interventions

In the second step of the MCA exercise, FGD participants identify the most effective adaptation interventions for managing the respective shocks. These interventions do not need to be ranked as with the PRA tool; the process of assigning weights and scoring results in a list of ranked priorities.

As with climate-related shocks, choosing a limited number of CCA interventions – preferably around five and no more than 10 – facilitates a more focused MCA exercise. For the most severe and persistent shocks, it may be difficult to narrow the list of CCA interventions. For difficult and enduring climate-related challenges, having as many interventions as possible may be advantageous. Keep in mind that you won't "lose" data on the full suite of interventions that emerge from the PRA exercise. This rich qualitative data set will be considered together with the more narrow and specific findings from MCA.

[4] Watkiss, P., A. Hunt, W. Blyth and J. Dyszynski. (2014). The use of new economic decision support tools for adaptation assessment. A review of methods and applications, towards guidance on applicability. Climate Change, October; OECD. (2015). Climate Change Risks and Adaptation: Linking Policy and Economics. OECD Publishing, Paris. Accessed at: http://www.keepeek.com/Digital-Asset-Management/oecd/.

Step 3: Identify the decision-making criteria

The next step is to choose a set of performance or decision-making criteria. Ideally, the FGD facilitator guides the discussion to develop list of criteria that households and/ or communities use to determine which interventions they adopt (Table 8).

Table 7. Example Criteria for MCA

MCA CRITERIA	
Costs	Access to markets, savings, credit
Short-term vs. long-term benefits (e.g., land tenure?)	Aspirations: family and social networks
Tradeoffs: in terms of education, health, income	Effectiveness in protecting livestock, crops, assets
Household and community labor allocation	Effectiveness in protecting/ restoring pasture, arable, land, forests, water, etc.
Access to requisite knowledge and information	Effectiveness in protecting human life/health and human resources/labor
Arable land, water supply saved	Receipt of food/cash transfer
Level of potential risk	

AN APPROACH FOR INTEGRATING MCA INTO PARTICIPATORY RESEARCH

In some cases, it may be difficult to elicit criteria in the FGD setting. Where possible, consider two days of community-level fieldwork, organized in this manner:

- Conduct FGDs and KIIs to implement MCA Steps 1 and 2
- Conduct participatory inventory of costs and benefits for each of the identified CCA options, in line with CBA.
- Use the findings from the discussion of costs and benefits to establish the list of decision-making criteria. Scan the data collected for costs and benefits to identify those mentioned most commonly, with the greatest emphasis, or with FGD participant consensus. Often, these costs and benefits, drive the decision-making process.
- Selected criteria should be relevant across the CCA options and social groups (e.g., both women and men).
- Present the list of criteria gleaned from the participatory discussions and costs benefits for confirmation that these are indeed significant factors people consider when deciding whether or not to adopt a particular CCA option.

☐ **Step 4:** Rate the performance of the CCA interventions

Once criteria have been selected and verified, participants rate the performance (i.e., effectiveness) of each CCA option against the criteria. This participatory exercise should be facilitated for each climate scenario.

A matrix is helpful to guide the discussion and record scores. Table 9 offers an illustrative example; the complete template is included later in this section (**Template 4.1**). Before this step of the exercise, complete the matrix using data collected in steps 1 to 3. Specify the climate shock, the CCA interventions (rows 1-7), and the criteria (columns A to E).

Then, with the group, record the scores. Use a scale of 1-5 or 1-10 to score each option, and explain clearly which end of the scale represents the greatest value (e.g., 5=high). Make sure the scale is consistent for every MCA exercise conducted during fieldwork. Then, for each CCA option, ask participants to assign a value (1-5, or 1-10) of importance or effectiveness in relation to each criterion.

Table 8. Example of MCA Scoring Matrix

Shock / Stress / Weather Scenario: DROUGHT

	A	B	C	D	E	F	G
CRITERIA	**Community benefits**	**Life-saving, humans & animals**	**Protects land**	**Multi-purpose**	**Tested & proven**		
CCA INTERVENTIONS	**SCORING OF CRITERIA**						
1. Savings	*5*	*5*	*3*	*5*	*4*		
2. Water harvesting	*5*	*5*	*3*	*5*	*5*		
3. Livelihood diversification / IGAs	*5*	*5*	*1*	*5*	*5*		
4. Improved Seeds	*3*	*5*	*3*	*4*	*5*		
5. Reforestation	*5*	*5*	*4*	*5*	*5*		
6. Info for decision making	*4*	*3*	*4*	*4*	*3*		
7. Fuel efficient stoves	*4*	*3*	*1*	*3*	*3*		

Score the criteria for each adaptation option. Scores range from 5-1, with 5=high and 1=low.

TIPS FOR SCORING CCA INTERVENTIONS WITH FGDS

- **Encourage discussion and debate among all participants until consensus is reached.** Some interventions will stimulate intense discussions; participants may opt to assign a score by voting.
- **Record notes on the process.** Observations on the group decision-making process provide insight into how people weigh alternatives, prioritize, and cluster or sequence interventions. Include space on your matrix for notes or use a notebook.
- **If you find all interventions are rated similar, probe for differences.** If the exercise becomes mechanical – for example, the group assigns the same scores across all interventions or criteria – this is a sign that there is confusion about the exercise or focus group "fatigue". Pause and ask the group to reconsider and differentiate among criteria for each option.
- **Be sensitive to the pace and timing.** The facilitator should help move the group through discussions to avoid fatigue while still ensuring collection of robust data. If you conduct MCA for two climate-shock scenarios, it is likely the second scoring exercise will move along more quickly than the first, as participants become familiar with the exercise.

☐ Step 5: Assign weights to the criteria

Next, stakeholders assign a weight to each criterion to show which are most important in the decision-making process. While improving household labor allocation, for example, may be a significant benefit of a particular option and thus a key criterion, it is likely considered less important than saving lives of people and livestock. Across the criteria, weights must add up to 100. Table 10 offers an example of a list with five criteria.

Weights may be determined through a ranking exercise and group discussion. Alternatively, the group can use available materials, such as pebbles, beans or maize kernels, to express differences across the list of criteria using a technique known as proportional piling.

Table 9. Sample Allocation of Assigned Weights to Decision-Making Criteria

	A	B	C	D	E	F	G
Criteria	Community benefits	Life-saving, humans & animals	Protects land	Multi-purpose	Tested & proven		
Weights	0.15	0.25	0.2	0.2	0.2		

HOW TO CONDUCT PROPORTIONAL PILING

- Present the list of agreed-upon criteria on a flip chart. The criteria can be displayed in text, symbols or graphics, depending upon the audience.
- Give the group around 100 beans (or similar material) and ask them to divide the beans across the criteria, with the largest pile allocated to the most important thing they consider when deciding to adopt CCA options.
- Estimate the proportion of 100 beans assigned to each criterion and use this as the weighting value.

☐ Step 6: Rank the selected CCA interventions

This step is considered part of the analysis phase of MCA, carried out after the fieldwork.

- First, transfer scores and weights recorded on matrix forms into excel sheets. GIZ has developed a useful template for scoring, available online.[5] Once scores are entered for each CCA option under each criterion, the excel template automatically calculates a total weighted score for each option by multiplying each score with the weight of the respective criterion.
- Notes recorded on the decision-making process can be entered into FGD data collection matrices accompanying **Tool 2**.

IMPLEMENTING MCA STEPS 1 TO 5: A RECOMMENDED PROCESS

Community level: To implement MCA using PRA techniques and a modified-Delphi approach (discussed in **Tool 2**), the following process is recommended for community-level fieldwork conducted over two days in each community. Plan to limit each FGD meeting to 1 ½ hours.

Day 1: Initial PRA discussions with FGDs

- Using PRA techniques and tools discussed in **Tool 2**, convene FGDs with separate groups of men and women in a sample community.
  - Collect data on climate shocks and define a "good year" (Step 1, Day 1).
  - Collect data on CCA interventions (Step 2, Day 1).
  - Collect data on costs and benefits for each CCA option (Step 3, Day 1).
  - Invite each of the focus groups to choose three representatives to reconvene the following day in a mixed FGD. (Adjust the number of FGD representatives if you plan to include key informants.)

[5] Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. 2013. Economic approaches for assessing climate change adaptation options under uncertainty: Excel tools for Cost-Benefit and Multi-Criteria Analysis. Accessed at: https://gc21.giz.de/ibt/var/app/wp342deP/1443/index.php/knowledge/mainstreaming/tools/

» After, the research team meets after data collection to prepare for Day 2

- Compare definitions of climate shocks between the men's and women's groups. If they are similar, the definitions can be consolidated. Where they differ, prepare to present these differences to the mixed group.
- Compare the lists of ranked CCA interventions generated by each FGD. Look for similarities and differences. Prepare to present each list to the group on Day 2.
- Review data collected on costs and benefits for each option. As a team, identify the primary decision-making criteria that emerged from the discussions. Prepare a list of criteria to present to the group on Day 2 for validation. Remember, the criteria must be well defined and limited in number (around 5 and no more than 10).
- Be sure to have copies of MCA data collection matrices for the two (or more) most significant climate shocks.

Deliberating on-the-ground community-led CCA interventions in a community meeting, Thuan Hoa Commune, Kien Giang Province, Vietnam. USAID/Mekong ARCC. August 2014.

Day 2: Community Validation Team (CVT)

» Verify findings from Day 1 using the modified Delphi technique to establish community-level definitions and rankings through a mixed-gender FGD and MCA exercise.

- Confirm and refine characteristics for each climate shock and a "good year" (Step 1, Day 2).
- Present rankings of CCA interventions generated by male and female FGDs. Facilitate discussion to consolidate the lists and derive a single community-level list. After the full ranking is completed, look for opportunities to reduce the list of interventions, especially if the list is long and time is limited (Step 2, Day 2).
- Explain decision-making criteria and present the criteria pulled from data collected on Day 1. Adjust the list according to community feedback (Step 3, Day 2).

» Call for a short break to allow the team to prepare the MCA matrices (this can be done quickly). For each climate shock, indicate CCA interventions and criteria.

» Explain and initiate the scoring exercise (Step 4).

» Assign weights to the criteria (Step 5).

A sample guide for field researchers to use to facilitate the CVT is presented in **Template 4.2** at the end of this section.

ALTERNATIVE MCA PROCESSES

Time limitations or demands on FGD participants may require adjustments to the process proposed above. A couple of alternatives to consider:

» **Change the composition of the mixed focus group (Day 2).** This is particularly useful in averting participant fatigue or if they limited availability and cannot return for a second meeting. The second day meeting could include key informants and knowledgeable community members who were not able to participate in the initial FGDs, along with a couple of representatives from Day 1. Be sure to maintain gender balance in the group.

» **Consolidate the research into a single day.** Although not recommended, this may be necessary due to logistical or time constraints. In this case, the process is similar, with a few proposed adjustments:

- Schedule a midday break to allow the team to review findings and prepare for data verification and MCA scoring in the afternoon.
- Increase the number of facilitators, recorders, and (if needed) translators. This enables the team to conduct simultaneous FGDs with groups of men and women in the morning. In the afternoon, half of the research team can conduct the MCA exercise with the mixed FGD, while remaining team members conduct key informant interviews.

» **Adjust the composition of the mixed group to accommodate participants and include key informants,** particularly if time in the community is too limited to meet with key informants otherwise. Be attentive to the potential for expert informants to dominate the discussion. Ensure that women are free to participate in the mixed group.

Regional Validation Team (RVT) Meetings

As discussed in Participatory Research and Analysis (**Tool 2**), the RVT meetings provide an opportunity to collect data from key stakeholders at the regional or zonal level. Allow a half-day for each RVT meeting. The process suggested for the RVTs is similar to that proposed for a single day of fieldwork in a community. A sample agenda for an RVT workshop is presented in **Tool 2**, **Template 2.2**.

TOOL 4 TEMPLATES

Template 4.1 ATLAS CCA Interventions Study MCA Data Collection Matrix

Community / RVT: _____ Date: _____

Facilitator: _____ Recorder: _____

Shock / Stress / Weather Scenario: _____

	A	B	C	D	E	F	G	H	J
Criteria									
Weights									
CCA Interventions	**Scoring of criteria**								
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Score the criteria for each adaptation option. Use a consistent scale across all groups and climate shocks. Specify: (E.g., Scores range from 5-1, with 5 high and 1 low.)

Notes/ observations:

Template 4.2 ATLAS CCA Interventions Study Community Validation Team (CVT) Field Guide: Validation and Multi-criteria Analysis FGD

Objectives:

- Facilitate local level consensus on climate shocks, priority CCA interventions, and decision-making criteria
- Score interventions to complete MCA
- Fill gaps/ expand on cost-benefit findings from FGDs, as needed and if time permits

Participants: +/- 6 representatives from women's FGD, men's FGD, and /or key informants [preferred group composition is 3 women and 3 men]

Process:

1. Climate shock/ stress
    a. Define a good year: Relay to participants the definition(s) of a "good year" collected on Day 1. Facilitate discussion to agree on a kebele-level definition.
    b. Identify most significant climate-related shocks/stresses:
        - Share results from M/F FGDs. Reach agreement on most significant events across FGDs and rank.
        - Validate/ estimate frequency over the past 10 years, severity, periodicity within a year, drawing on findings from Day 1.
        - Indicate each climate shock (drought, flood, extreme temperatures, unpredictable rainfall) on a flip chart.
        - Select the top 2 (at most 3) climate shocks for the purpose of the MCA exercise.
        - Review differential effects of climate on households, community (e.g., who is most affected?).
2. CCA interventions by climate shock/ stress
    a. Using post-its, present to the group the two gender-specific lists of CCA interventions for each weather-related shock/stress identified on Day 1.
    b. Agree on set of interventions and rank. Select top 5-6. Validate / probe for costs and benefits of each CCA option if time permits. What type of household is most likely to benefit? [Data from day 1 may be sufficient.]
3. Identify decision criteria and assign weights
    a. By climate event, indicate primary decision-making criteria. Use the list of criteria developed in day 1 (or derived from discussion of costs and benefits) to prompt.
    b. Assign a weight (out of of 100%) to each criterion.
4. Score interventions
    a. Score each option (from 1-5, with 5 being highest/ most important) against each criterion.
5. Discussion
    a. What types of HH / community members are most likely to adopt an option? Who faces greatest constraints?
    b. Fill any gaps (e.g., costs-benefits, clarify questions about CCA interventions or criteria) if time remains.

CONCLUSION

As CCA practice continues to mature, a clearer picture is emerging about how to design and implement adaptation measures that effectively respond to identified climate risks and vulnerabilities, thereby contributing to improved climate resilience. A critical aspect of refining approaches to CCA is rigorous assessment of CCA measures both during project implementation and following project completion. As with all project activities, CCA measures are necessarily developed with incomplete information about the many ecological and socioeconomic variables that influence the way they are implemented, and ultimately, their effectiveness. Coupled with the uncertainty that is inherent in climate projections, the need to adjust the scope or scale of a CCA measure based on assessment of its effectiveness is likely and should be welcomed by project implementers and beneficiaries.

Having a set of assessment tools to produce both quantitative and qualitative information about specific CCA measures, or groups of measures developed to be mutually reinforcing when implemented together, provides useful information to make midcourse adjustments to specific measures or to an overall CCA strategy. Assessment also gives practitioners critical information to inform future CCA strategies.

For example, a straightforward engineering and construction intervention, such as a culvert placed beneath a road to allow seasonal flood water to drain without disrupting surface water flow patterns or damage the roadway above, may through assessment be found to be inadequate in size to handle actual flow volume. Measuring water flow rates, observing damage to the roadway, and interviewing local residents and officials using the assessment tools described in this toolkit can provide the evidence required to increase the size of the culvert and improve its effectiveness against seasonal flooding or extreme rainfall events. Likewise, assessing the effectiveness of a smartphone-based weather alert app provided to farmers to improve their decision-making for planting, irrigation, and fertilizer/herbicide application can be assessed to determine whether it is actually leading to better outcomes in terms of agricultural yields and household livelihood security. By interviewing farmers to see whether they find the application useful (and if not, why not) and analyzing crop yield data from before and after the application's implementation, practitioners can make any necessary adjustments to the information itself or the way it is provided.

As discussed earlier, data availability for assessment is critical. M&E systems for projects that include CCA interventions should be set up with indicators that directly track them, thus facilitating assessment during and after project implementation. Developing indicators specifically to assess CCA intervention effectiveness is good practice. However, if specific CCA intervention indictors are not available, other M&E data can be used as a proxy; when combined with data generated through the assessment itself, this data can yield useful results and guide mid-term corrections as well as provide useful input into new programming.

ANNEX 1: SAMPLE RESEARCH PROTOCOL

ATLAS Phase II CCA Interventions Assessment
Research Protocol

Background

ATLAS aims to improve the quality and effectiveness of USAID's and countries' development programs to reduce climate risks through: tested and harmonized approaches to adaptation assessment; thought leadership; and capacity building of USAID and its partners. In doing so, the project promotes adaptation to climate change and integration of adaptation into other economic investments, to safeguard and promote sustainable, climate resilient growth. A wide range of approaches to vulnerability and adaptation assessment exist, but there is a need to identify good practices or standards to help people design adaptation assessments effectively and get useful information from them. As such, ATLAS guides USAID Missions and their partners to the best tools for assessing risks and evaluating adaptation interventions and help synthesize best practices. The analysis carried out by this study will form the basis of a product that will help to inform better investment decisions in the future.

The protocol describes how a number of tools and methods, including fairly simple qualitative approaches (i.e., FGDs, KIIs), cost-benefit analysis and multi-criteria analysis, will be applied to USAID's **XXX** and **YYY** projects. Fieldwork will be conducted in the operational areas of each project.

Key questions

- What CCA interventions are being adopted? Why/why not? (In clusters, in concert with other project interventions?)
- HH and community decision-making criteria about what to adopt? How these decisions are made?
- How have chosen CCA interventions helped communities deal with climate variability/risk? What are the benefits? Costs?

Site selection criteria

A total of 4 local communities per program area will be purposively selected, with 2 communities per region. For example, 2 communities in Region A and 2 in Region B, for a total of 4 communities from the **XXX** program. Likewise, 2 communities in Region C and 2 in Region D will be selected from the **YYY** program. Key criteria for sites include:

- » High level of adoption of CCA interventions (see Table 1 for program-specific CCA interventions)
- » Accessible and in close proximity
- » Similar agroecological zone/ livelihood system

For both project **XXX** and project **YYY**, 10 adaptation interventions were prioritized for further study (see listing below). This selection was based on the CCA interventions identified through CVCA and the interventions that have been shown to have uptake and value among project communities. The lists also ensure evaluability for the purpose of the study including a mix of household and community level interventions or processes, both crop and livelihood production interventions, as well as activities with a gender focus and those related to access to information, governance and alternative livelihoods.

PROGRAM-SPECIFIC CCA INTERVENTIONS

Project XXX adaptation interventions	Project YYY adaptation interventions
1. Planting early-maturing, drought-tolerant, or short season crops	1. Gully treatment
2. Moisture-conserving practices	2. Water point rehabilitation/upgrade
3. Water harvesting	3. Fodder production-hay making
4. Fuel-efficient stoves	4. Herd diversification
5. Rope and washer pumps	5. Post-harvest storage bags
6. Information for decision making	6. Information for decision making
7. Alternative and diversified livelihoods	7. Alternative and diversified livelihoods
8. Reforestation	8. Management of dry and wet season grazing
9. Community-based upland management	9. Participatory Scenario Planning
10. Savings	10. Savings

Sample Community, Project XXX

As background, the study will obtain descriptive information on field sites, including basic data on: agroecological zone (altitude, rainfall, topography); livelihood system; climate hazards; climate change adaptation adoption rates.

Region A (highland zone; 6 of 10 CCA interventions implemented)

Project XXX CCA Interventions	Focus District 1		Back-up District 1
	Community 1	Community 2	Community 3
Planting early-maturing, drought-tolerant, or short season crops	X	X	X
Moisture-conserving practices	X		
Water harvesting	X	X	X
Fuel-efficient stoves	X	X	X
Rope and washer pumps	X	X	X
Information for decision making			
Alternative and diversified livelihoods	X	X	X
Reforestation			
Community-based upland management			
Savings	X	X	X

Region B (lowland zone; 5 of 10 CCA interventions implemented)

Project XXX CCA Interventions	Focus District 2		Back-up District 2
	Community 1	Community 2	Community 3
Planting early-maturing, drought-tolerant, or short season crops	X	X	X
Moisture-conserving practices			
Water harvesting	X	X	X
Fuel-efficient stoves	X	X	X
Rope and washer pumps			
Information for decision making			
Alternative and diversified livelihoods	X	X	X
Reforestation			
Community-based upland management			
Savings	X	X	X

ANNEX 2: ILLUSTRATIVE CBA ANALYSIS

Table A-1 Sample costs and benefits of CCA options

CCA INTERVENTION	BENEFITS	PROJECT 1	PROJECT 2	COSTS/CONSTRAINTS	PROJECT 1	PROJECT 2
Soil and moisture conservation / gully treatment (soil bunds, half-moons, water diversion)	• Reduces soil erosion (crop land, rangeland)	X	X	• Investment of time (long-term effort)	X	X
	• Restores degraded lands (increased land area for crops and pasture)	X	X	• Need to mobilize community and help them understand that the land belongs to them and their lives depend on it	X	X
	• Increases productivity of soil	X	X	• Requires tools, skills and labor which communities don't typically have	X	
	• Reduces impact of floods (diverts rushing water; provides vegetative cover; roots absorb water)	X	X	• Poverty inhibits risk-taking with new technologies (e.g., micro-basins)		X
	• Livelihood support	X	X	• Cultural barriers, difficult to promote new technologies	X	X
	• Maintains healthy soils	X		• General lack of awareness about benefits and / or techniques	X	X
	• Protects assets (livestock, houses, farmland, natural resources)		X	• Requires government involvement (changing policies can undermine long-term initiative; "prevent work from being destroyed by changes in government")	X	
	• Promotes collective work among women and men		X			
Water point improvements/ management	• Saves lives of humans and livestock	X	X	• Requires large equipment (e.g., bulldozers, cement mixers)	X	
	• Improved health and nutrition (especially of children)	X	X	• Requires community cost-share, which is difficult for most communities	X	
	• Creates/strengthens social capital (providing water to social network)	X	X	• For large projects, requires tools, technical skills and knowledge (e.g., engineering), and labor; communities typically lack	X	X
	• Provides income from sale of water (1 liter=20 birr)	X	X	• Need to bring in water, sand, etc. (to mix cement)	X	
	• Reduces burden (time, safety) on women in collecting water	X	X	• For smaller, traditional water sources, cost of plastic sheeting (1 roll = 1,500 birr); loss of government provision of sheeting	X	X
	• Labor is primary requirement	X	X	• Opportunity costs of community members who provide labor to project	X	X
	• Saves money (don't need to buy water)		X	• Loss of life: children have drowned in ponds (Tigray)		X
	• One-time cost with long-term benefits (can provide water year-round)		X	• Initial time investment (can take 5-6 months for large, community ponds)		X
	• Technically feasible		X	• Increases mosquito problem		X

CCA INTERVENTION	BENEFITS	PROJECT 1	PROJECT 2	COSTS/CONSTRAINTS	PROJECT 1	PROJECT 2
Alternative/ diversified livelihoods	• Provides income HH would not otherwise have	X	X	• Need capital to get started (receiving social capital may be option); ongoing costs (e.g., fattening: molasses feed, vaccines, salt)	X	X
	• Reduces risks of loss of income/food security from climate-related shocks and stresses	X	X	• Takes time to learn new things; to "train your mind"	X	X
	• Expands social networks; strengthens kinship bonds/ cooperation; relatives are financers whether with cash or in-kind	X	X	• Relatives support each other; could be drain on HH resources to help start new IGAs	X	
	• Provides women with some control and decision-making about their own money	X	X	• Lack skills, knowledge; training program does not cover living costs; need support	X	X
	• Improves equity in household decision making and labor allocation		X	• Financial services (e.g. credit, savings) lacking at community level; time/transport costs for accessing in urban areas	X	X
	• Flexibility: with multiple IGAs, investments of time/ money can be adjusted in response to shocks to help stabilize income over time		X	• Some IGAs become less profitable at different times of year or when shocks are severe (e.g., honey production, micro-franchise during drought)		X
	• Increases self-reliance, confidence and status in the community		X			
Savings	• Reduces reliance on money-lenders		X	• Limited banks/MFIs in some areas; lack of access to financial services; time/transport costs for accessing in urban areas	X	
	• Long-term benefits		X			
	• Saves lives of humans and livestock	X	X			
	• Food security; "can purchase anything you need"	X	X	• Cultural barriers; importance of social networks	X	X
	• Provides women with some control over money/HH decisions; "don't have to rely on my husband for money"	X	X	• Lack of trust and transparency among leaders of savings groups; no accountability	X	
	• Builds social cohesion; trust in the group		X	• No "cost, but a sacrifice" / opportunity cost: forego consumption of "luxury" items; travel by foot instead of motorbike; reduce consumption.		X
	• Cash is liquid: savings used to deal with multiple shocks		X			
	• Increases self-reliance and confidence: "I can borrow from myself"		X			
	• Can be used to invest (e.g., start a business, purchase livestock; coupled with IGAs)	X	X	• Lack of awareness of benefits; "we have a poor mind"; "we need to learn how to save"	X	X
	• Prevent loss of assets	X	X			

CCA INTERVENTION	BENEFITS	PROJECT 1	PROJECT 2	COSTS/CONSTRAINTS	PROJECT 1	PROJECT 2
Improved seeds	• Higher yield in less time		X	• Specificity: very specific to moisture and soil conditions		X
	• Perceived nutritional benefits (e.g., improved sweet potato, maize)		X	• Reliability: need to first ensure suitability for local agro-ecological context / tested and proven on farm		X
	• Less risky than traditional varieties		X	• Cost of seeds and fertilizers, particularly for female-headed households ("expensive")		X
	• Combined with early warning information and adjustments in planting cycle to help ensure yield; even with minimal moisture produce "enough to feed our kids"		X	• If unexpected rainfall occurs with early maturing/ drought tolerant varieties, production is low		X
Fuel-efficient stoves	• Reduces fuel-wood consumption (by 40-50%) and consequently reduces deforestation		X	• Upfront cost around $50-70 (good for two years)		X
	• Reduces smoke inhalation to improve health, especially for women and children		X			
	• Can be shared among neighbors, used in community events –builds social cohesion		X			
	• Saves time for fuelwood collection and cooking		X			
	• Produced locally		X			
	• Stove design can be modified using stones and locally available materials		X			

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
Tel: (202) 712-0000
Fax: (202) 216-3524
www.USAID.gov