



**The Global Water Initiative**  
A Partnership Funded by the Howard G. Buffett Foundation

## **Climate Vulnerability and Capacity Analysis (CVCA) and Community-Based Risk Screening Tool: Adaptation and Livelihoods (CRISTAL) Tools**

### **Training Workshop for the Global Water Initiative-Uganda**



**September 9<sup>th</sup>-13<sup>th</sup>, 2009**  
**Lira, Uganda**

**By**

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## **Executive Summary**

The Howard G. Buffet Foundation Global Water Initiative was developed in September 2006 with the aim of “ensuring that vulnerable populations world-wide have reliable access to clean water in such a way that their dignity, rights, culture and natural environment are not negatively impacted”. The initial focus of Empowering Poor People to Manage Water in Arid and Semi-Arid Lands in Uganda is on provision of improved water, sanitation and hygiene in Lira, Amuru and Gulu Districts where internally displaced peoples (IDPs) are settling and water/sanitation infrastructure is at a minimum. Within this context it was decided to carry out a climate change vulnerability assessment using a combination of adaptation and participatory tools including CRISTAL (Community-based Risk Screening Tool - Adaptation & Livelihoods) and the Climate Vulnerability and Capacity Analysis (CVCA) methodologies. Results of these assessments are found here and detail the climatic hazards anticipated for the region, the resources community member have at their disposal, and the expected impacts to these resource from climate change. Finally, current project activities are reviewed within the context of climate change, and revised project activities are proposed to mitigate further impacts to livelihoods within the region. Feedback on the process and a way forward for the region are included as guiding documents on further activities.

## **TABLE of CONTENTS**

<b>1</b>	<b>Introduction .....</b>	<b>5</b>
<b>1.1</b>	<b><i>Workshop opening .....</i></b>	<b>6</b>
1.1.1	Expectations .....	6
1.1.2	Ground Rules.....	6
<b>2</b>	<b>Climate Change and Vulnerability Assessment Tools.....</b>	<b>7</b>
<b>2.1</b>	<b><i>Introduction to Climate Change .....</i></b>	<b>7</b>
2.1.1	Discussions on climate change .....	8
<b>2.2</b>	<b><i>Integrating Climate Change Adaptation into Projects and Programmes</i></b>	<b>9</b>
<b>2.3</b>	<b><i>Climate Change Assessment Tools.....</i></b>	<b>10</b>
2.3.1	The Climate Vulnerability and Capacity Analysis (CVCA) Tool.....	10
2.3.2	The Community-based Risk Screening Tool: Adaptation and Livelihoods (CRiSTAL) .....	11
<b>2.4</b>	<b><i>The Rain Calendar and Vulnerability Matrix.....</i></b>	<b>12</b>
2.4.1	Rain Calendar .....	12
2.4.2	Vulnerability Matrix.....	13
<b>2.5</b>	<b><i>Review of Field Guide.....</i></b>	<b>14</b>
<b>3</b>	<b>Project information .....</b>	<b>14</b>
<b>3.1</b>	<b><i>Project description and context.....</i></b>	<b>14</b>
<b>4</b>	<b>Climate Change Context.....</b>	<b>15</b>
<b>4.1</b>	<b><i>Regional Notes.....</i></b>	<b>15</b>
<b>4.2</b>	<b><i>Country Notes.....</i></b>	<b>15</b>
<b>4.3</b>	<b><i>Ecological Zone Notes.....</i></b>	<b>16</b>
<b>4.4</b>	<b><i>Rain calendars.....</i></b>	<b>17</b>
<b>4.5</b>	<b><i>Climate-related Hazards, Impacts and Coping Strategies .....</i></b>	<b>20</b>
4.5.1	Hazard 1 – Drought .....	21
4.5.2	Hazard 2 – Floods.....	21
4.5.3	Hazard 3 – Strong winds .....	21
<b>5</b>	<b>Livelihood Context .....</b>	<b>22</b>
<b>5.1</b>	<b><i>Overview of Livelihood Resources Framework .....</i></b>	<b>22</b>
5.1.1	Livelihood resources - Lira .....	22
5.1.2	Impacts of Climate-related Hazards to Livelihood Resources.....	23
<b>6</b>	<b>Analysis of project activities.....</b>	<b>26</b>
<b>6.1</b>	<b><i>Revised Project Activities.....</i></b>	<b>27</b>
<b>6.2</b>	<b><i>Synergies and Barriers.....</i></b>	<b>28</b>
<b>7</b>	<b>Feedback on climate change vulnerability assessment tools .....</b>	<b>31</b>
<b>7.1</b>	<b><i>Testing of tools .....</i></b>	<b>31</b>
<b>7.2</b>	<b><i>Feedback on Field exercise .....</i></b>	<b>31</b>
<b>7.3</b>	<b><i>Application of CRiSTAL Tool and data analysis .....</i></b>	<b>32</b>
7.3.1	Feedback on data analysis.....	32
<b>7.4</b>	<b><i>Feedback on the training .....</i></b>	<b>32</b>
<b>8</b>	<b>Way Forward.....</b>	<b>33</b>
<b>Appendix 1. Workshop Program.....</b>		<b>37</b>
<b>Appendix 2. Field form (with translations into Lango).....</b>		<b>40</b>

**Appendix 3: Supplementary materials ..... 51**

**TABLE of FIGURES**

Figure 2.1. The Greenhouse Effect ..... 8  
Figure 2.2. Example of Rain Calendar ..... 13  
Figure 4.1. Rain calendar – Old Women’s group ..... 18  
Figure 4.2. Rain calendar – Young men’s group ..... 18  
Figure 4.3. Rain calendar – Young women’s group ..... 19  
Figure 4.4. Rain calendar – Old men’s group ..... 19  
Figure 4.5. Rain calendar – Merged ..... 20

**TABLE of TABLES**

Table 4.1 Climate context –Obanga ngeo and Odike Alimok ..... 20  
Table 5.1. Summary of livelihood resources–Odike and Obanga..... 23  
Table 5.2, Resources strongly influenced by hazards ..... 24  
Table 5.3. The influence of livelihood resources on alternative coping strategies under drought ..... 24  
Table 5.4.The influence of livelihood resources on alternative coping strategies under floods ..... 25  
Table 5.5. The influence of livelihood resources on alternative coping strategies under strong winds..... 26  
Table 6.1Summary of revised activities–Odike and Obanga ..... 27  
Table 8.1.Way forward ..... 35

## **1 Introduction**

The Howard G. Buffet Foundation Global Water Initiative was developed in September 2006 with the aim of “ensuring that vulnerable populations world-wide have reliable access to clean water in such a way that their dignity, rights, culture and natural environment are not negatively impacted”. The objectives of the initiative are to support integrated water management programs in identified countries, to develop a water constituency in those countries and regions, and to influence beyond this initiative for wider scale-up.

The initiative is being implemented in three geographic clusters namely: Central America (El Salvador, Guatemala, Honduras and Nicaragua), West Africa (Burkina Faso, Ghana, Mali, Niger, and Senegal) and East Africa (Ethiopia, Kenya, Tanzania and Uganda). In Kenya, the HGBF-GWI program is being implemented by CARE, Action Against Hunger, and Catholic Relief Services.

The GWI programme in East Africa has three strategic objectives:

SO1: Good Governance- Improved local and community governance and the enabling policy framework.

SO2: Sustainable Multiple Uses of Water - Efficient, effective and equitable domestic and productive uses of water, sanitation, hygiene, and watershed management.

SO3: Risk Management - Vulnerable rural communities and their environments have increased resilience to water-related shocks.

The results under SO3 include:

IR3.1 Community and local stakeholders’ capacity to plan, organize, manage and adapt to water related shocks and conflict over scarce water resources have improved.

IR3.2 Risk management initiatives are in place at regional and national levels to address water-related shocks in the context of global climate change.

Within this context it was decided to carry out a climate change vulnerability assessment using a combination of adaptation and participatory tools including CRISTAL (Community-based Risk Screening Tool - Adaptation & Livelihoods) and the Climate Vulnerability and Capacity Analysis (CVCA) methodology to fulfill the results under SO3, as the tools enable project planners and managers to: (a) understand the links between local livelihoods and climate; (b) assess a project's impact on livelihood resources important for climate adaptation; and (c) devise adjustments to improve a project's impact on these key livelihood resources.

A workshop was convened in Lira as a follow up to a climate change vulnerability assessment training of trainers’ workshop held in Lira in September 2009. The Lira workshop involved mainly CARE staff along with representatives from government and local NGOs. The objectives of the workshop were:

1. To create awareness and share knowledge on climate change among participants.
2. To gain understanding and skills to carry out climate vulnerability assessments at project sites using CVCA and CRISTAL Tools.
3. To apply the vulnerability assessment tools to project sites to identify climate change impacts and adaptation options.
4. To facilitate a workplan for a way forward in integrating adaptations to climate change into the project sites.

This report covers the information provided in the workshop (sections 1-2) and the results from the climate change vulnerability assessment in including field data and data analysis (sections 3-6). Feedback from the workshop is summarized in section 7 and section 8 plots a way forward for the project in applying the information gained from the process to ensure project activities are more resilient to climate change impacts. A list of participants can be obtained on request and a program for the workshop can be found in Appendix 1.

## **1.1 Workshop opening**

### **1.1.1 Expectations**

Workshop participants were from CRS, CARE, Joy Drilling and Action Against Hunger. Others were from the District Local Government of Lira (Wetlands and Environment officers). Participants' expectations were as follows:

- Integrate climate change in WATSAN projects
- How the tool can be used in CC adaptation
- Deeper understanding of adaptation to CC
- Clear list of activities to include in planning
- Learn about CRISTAL tool
- Have confidence and skills to apply to project
- How to assess and manage risks
- Know opportunities to access resources for activities
- Better understanding of risks and disaster
- To learn from and share experience with each other

### **1.1.2 Ground Rules**

To facilitate good coordination of the process, it was agreed that everyone would keep phones on silent mode, listen to each other and give everyone a chance to speak, participate fully but aim for major item completion by Friday (day 3) and observe punctuality.

### **1.1.3 Workshop Objectives**

The following objectives were discussed for this training:

- Gain understanding and skills to carry out climate vulnerability assessment at project sites
- Apply vulnerability assessment at project sites
- Inform and facilitate work planning for a way forward
- Team building

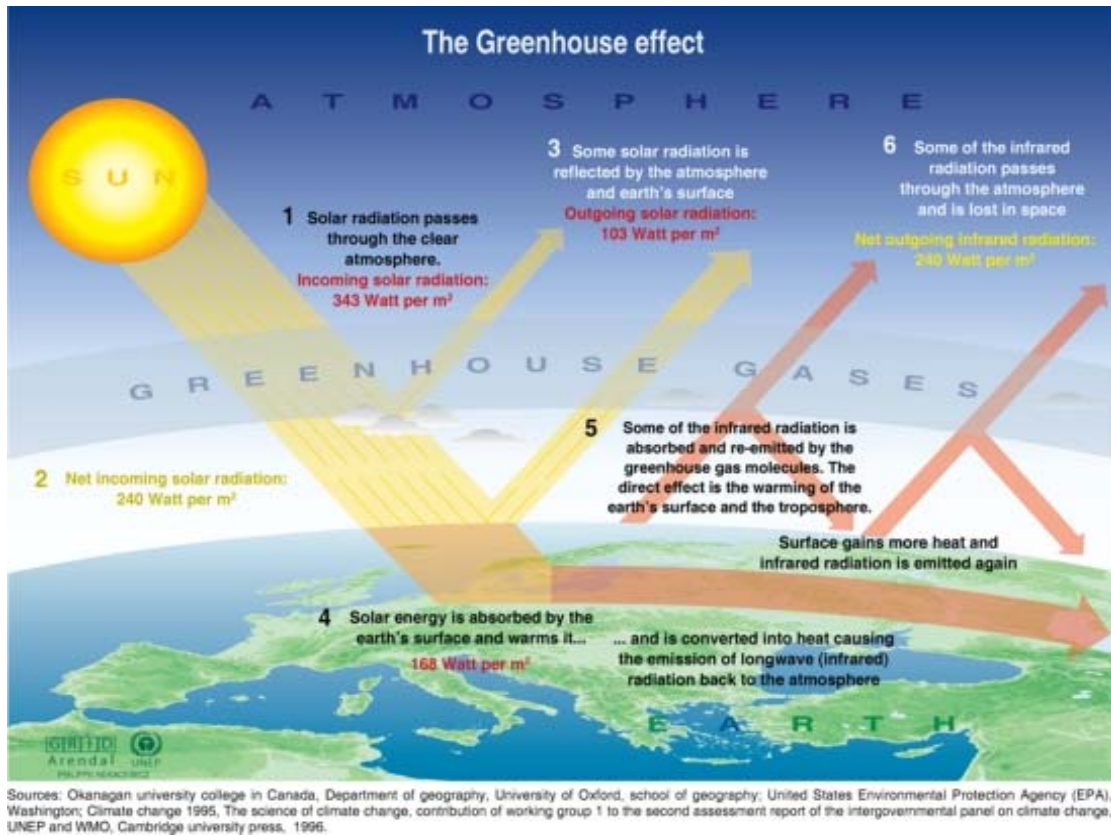
## **2 Climate Change and Vulnerability Assessment Tools**

This section provides background on climate change and the assessment tools used during the workshop.

### ***2.1 Introduction to Climate Change***

Climate change is defined as any change in climate over time due to natural variability or human activities. Climate change is the gradual warming in the earth's average temperature due to increasing concentrations of greenhouse gases that may result in significant impacts on local climate and people. These gases include carbon dioxide, methane, nitrous oxide, Hydro fluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulfur hexafluoride. Human activities that exacerbate climate change include burning of fossil fuels, deforestation, and land degradation among others. Climate variability is the change that is seen from season to season and climate change is the change observed over an average of 30 year blocks.

A description of the greenhouse effect can be found in **Figure 2.1** below. This is a process which maintains the earth's surface temperature at levels most suitable to existing life and ecology. Increased greenhouse gases are thought to exacerbate the greenhouse effect, thereby contributing to increased warming of the earth's temperatures.



Source: UNEP, obtained from <http://maps.grida.no/go/graphic/greenhouse-effect>

**Figure 2.1. The Greenhouse Effect**

### 2.1.1 Discussions on climate change

In Lira district a local example was used to illustrate the impacts of a changing climate. In 2008 there had been intense rainfall resulting in flooding and crop damage. Details of current trends in Uganda along with predicted impacts were discussed and illustrated that temperatures are on the rise and rainfall is decreasing. Additionally, it was stated that the El Nino Southern Oscillation (ENSO) current is expected to influence the rainy season during 2009. Further expected impacts to the country and region were discussed and can be found in Section 4 (Climate Change Context) of this document.

In subsequent discussions, it was noted that climate change is an ongoing phenomena and whether the situation could still really be reversed, or if we just need to adapt and cope. One recommendation was that institutions need to be established in Uganda to address the climate change situation.

The District Wetlands Officer indicated that there are actions within institutions to address climate change but the impacts can also be addressed at local scale, specifically in terms of adaptation strategies. Within the Ministry of Water and Environment there is a climate change unit for the planning of adaptation activities. He urged participants



and communities to plant trees to absorb carbon, especially those that will sequester carbon for many years. As the population has grown over time, ecosystems can no longer continue to support the increased pressure on resource and this is why the concern is greater today than in the past. Additionally, he felt that climate change has become a political issue worldwide.

## ***2.2 Integrating Climate Change Adaptation into Projects and Programmes***

Integrating climate change adaptation into development activities is important for increasing the sustainability of such activities. For example, if crops are failing consistently due to climate hazards (e.g. extreme drought and rain) and a community does not alter their agricultural practices they will continue to suffer from the impacts of climate change. If the hazards are properly analyzed, the community will be more adequately prepared to deal with the expected impacts. Additionally, integrating adaptation allows for project activities to be avoided that inadvertently increase vulnerability to the hazards and impacts from climate change. This might arise from development projects that require large financial or temporal investments from the local community, which may lead to a decreasing capacity to cope with climatic variations (decreased resilience). For example, if there is large financial investment into a high yield monoculture, but the crop is destroyed then the community is worse off than when they started. Finally, integrating adaptation into development activities lends to a direct reduction in the target community's vulnerability. This may be done through the education that takes place with that target community/population, through the incorporation of adaptation measures, as well as through the increased awareness of climatic variation on a regional and local scale that can aid in driving future development practices.

As a first step however, it is important to consider whether or not a particular project would benefit from or require the integration of adaptation measures. In order to do this, the project context must be considered; including local livelihoods, resources, and socio economic activities. Essentially, the project needs to be examined holistically in order to determine if there are direct or indirect links with climate change. All climate sensitive projects such as agriculture, pastoralism, water resource management, etc. should integrate adaptation. Non-climate-sensitive projects may not need to integrate adaptation, however implementers should be aware of the impacts climate change may exert in their project population and maximize their contribution to empowering target communities in areas of adaptation.

To assess whether a project is climate sensitive, the project team should answer the following questions:

- Does the project take place in a climate-sensitive location?
- Are the target groups for the project particularly vulnerable to climate change?
- Are the project activities sensitive to climate change?

The recent conflict in the north of Uganda has put added pressure on the population. Resettlement in villages can take time, and key agricultural and livelihood skills have been lost after years of conflict where people are in internally displaced people (IDP) camps. This means that the population is already highly vulnerable in the project area. Furthermore, women in developing countries are generally considered to be more vulnerable to climate change, due to their roles in society. In the case of Uganda, women are the ones who have to fetch water and often work in the fields. Men tend to migrate to urban centres, leaving the women to ensure there is sufficient food to feed the children from subsistence farming. Projects aimed at involving or impacting women therefore, should consider climate change adaptation measures to ensure the vulnerabilities experienced women are not increased unnecessarily.

Projects that are not directly impacted by climate change still need to consider the implications of climate change on their target populations and investments. Consider the example of an HIV/AIDS project, where the target population or project area is experiencing extreme weather events. The people who are affected by HIV/AIDS may have compound effects from the flooding or drought due to their already diminished health status and the associated reduced resilience. Within such a project, project activities could aim to help the vulnerable groups adapt through access to, and use of early warning information to prepare accordingly. Other help may come in the form of disaster relief or relocation prior to an expected event.

### **2.3 Climate Change Assessment Tools**

Currently, the majority of development projects are not designed with an explicit consideration of climate risks and how they can affect local livelihoods. Even less common are projects that take into account the longer-term implications of climate change and how project activities might (a) be affected by those impacts, and/or (b) influence local adaptive capacity. The following sections summarize two tools being utilized by GWI – Running Dry Partners in an effort to determine where vulnerabilities persist within project areas, as well as identify potential climate-related hazards to more appropriately direct project activities.

#### **2.3.1 The Climate Vulnerability and Capacity Analysis (CVCA) Tool**

The Climate Vulnerability and Capacity Analysis (CVCA) Tool was developed by CARE International and is a methodology to assist in analyzing the implications of climate change for target communities and populations.

The main objectives of the CVCA are to:

1. Analyze vulnerability to climate change and adaptive capacity at the community level.
2. Combine local information with scientific data to yield greater understanding about the expected impacts of localized climate change.

The CVCA toolkit has a variety of approaches that can be used to obtain information on climate change and how communities might adapt. It can be used to conduct analyses at the individual/household, local government/community, or national levels. Information is obtained through:

- Secondary research
- Institutional mapping
- Policy analysis
- Key informant interviews
- Participatory tools (e.g. hazard mapping, seasonal calendars, historical timelines, rain calendar, vulnerability matrix, and the Venn diagram)

The CVCA process guides participants through questions on different areas related to climate change adaptation including resilient livelihoods, disaster risk reduction, capacity development, and addressing the underlying causes of vulnerability. It focuses on climate change, communities and the enabling environment, and emphasizes multi-stakeholder analysis, collaborative learning and dialogue through hazard and capacity analysis. A copy of the CVCA handbook can be found at [www.careclimatechange.org/cvca](http://www.careclimatechange.org/cvca).

### **2.3.2 The Community-based Risk Screening Tool: Adaptation and Livelihoods (CRiSTAL)**

The Community Based Risk-Screening Tool – Adaptation and Livelihoods (CRiSTAL) was developed by IISD, IUCN, SEI and Inter-Cooperation to aid in analyzing vulnerability assessment information gathered through the CVCA process or other methods. It is a decision-support tool with the goal of promoting integration of risk reduction and climate change adaptation into community-level projects. The tool helps users to understand the links between livelihoods and climate, and assess the impacts of projects on a community's ability to adapt. The tool can also be used to identify possible adaptation approaches based on input from the community and facilitators.

It is a decision-support tool that aims to provide a logical, user-friendly process to help better understand the links between climate-related risks and peoples' livelihoods. In so doing, successful adaptation strategies can be developed and better supported at the local and regional level.

There are 2 modules in the CRiSTAL tool; the first examines what the climate change context is. It looks at impacts and coping strategies as well as the livelihood context. The second module looks at the impacts of projects (or proposed adaptation activities) on livelihood activities, and how project activities can be adjusted to reduce vulnerability and enhance adaptive capacity. While the process is not specific to resource management, the spreadsheets enable investigators to specify how livelihood, resources and community resilience may be affected by projected climate change.

The CRiSTAL Tool and handbook are available at [www.cristaltool.org](http://www.cristaltool.org).

## **2.4 The Rain Calendar and Vulnerability Matrix**

Participants were taken through the field form (please see Appendix 2) which outlines how to undertake the vulnerability assessments using the rain calendar and vulnerability matrix that are contained in the CVCA.

The first step in any field activity involving local communities is to introduce the project and facilitators. It is important to explain the exercises that will be carried out as part of the vulnerability assessment, how long it will take (about 3 hours depending on familiarity of the facilitators with the tools) and that the community would be split into smaller focus groups for the assessment.

### **2.4.1 Rain Calendar**

Once the project and facilitators have been introduced, the next step is to complete the rain calendar. The rain calendar helps users to gather rainfall and temperature information for specific local areas from the communities. The objectives of this tool are: to enable facilitators to understand what is “normal” and “abnormal” rainfall and temperature from the perspective of community members; to examine changes in rainfall and temperature patterns; to brainstorm on future rainfall scenarios and potential responses; and to evaluate the use of weather and climate information for planning. The key information to be gathered in the rain calendar includes: the onset and cessation of rainfall; the duration, distribution and quality of rainfall; unusual temperature increases and decreases; the major impacts of observed changes on livelihoods; and any major weather-related events experienced by the area of interest. The exercise usually takes one hour to complete and while gathering information for the calendar, it is important to take notes on issues such as coping strategies, health, cultural and socio economic impacts.

When developing the rain calendar, the first step is to decide on symbols that will represent “normal” and “abnormal” conditions. Then, ask the group about rainfall and temperature over the past few years and find out what the perceived impacts to their livelihoods are for these conditions. The rain calendar is a good way to raise awareness on, and present climate change, and can aide in guiding later CVCA and CRiSTAL activities.

The rain calendar was presented as meaning the distribution of a rain phenomenon in time and space, especially in terms of time for purposes of the calendar. It was discussed that when drawing a rain calendar with a community, perceptions of weather patterns may vary, even among the same group (or community groups), but they have to come to consensus/agreement over the general rain phenomena, which can then later be cross-checked with local meteorological data for validity.

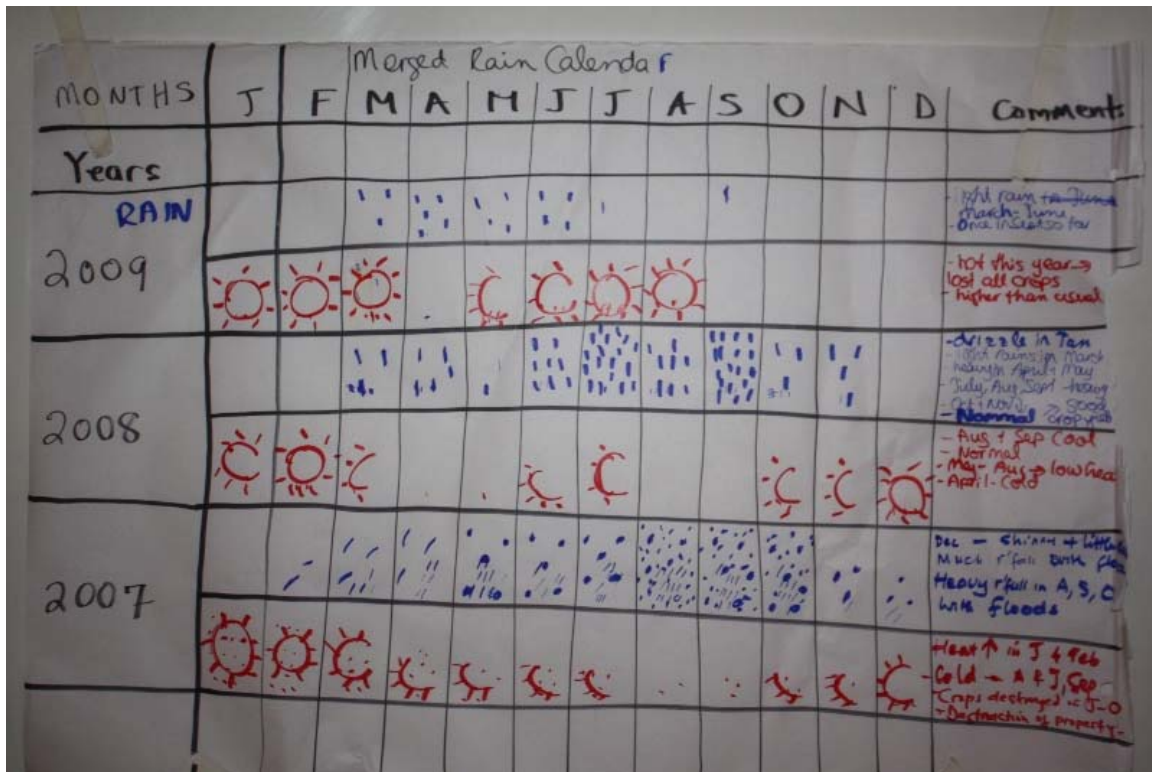


Figure 2.2. Example of Rain Calendar

### 2.4.2 Vulnerability Matrix

The next step is to gather information on the main livelihood activities and the natural, physical, financial, human and social resources that support these activities. The top three resources under each category (natural, physical, financial, human and social) are then ranked. This is followed by identifying the top three climatic hazards, followed by the top 3 impacts of each hazard. The most significant coping strategy that is currently being utilized is then recorded for each impact. The participants are asked whether the coping strategy is working and if they feel the strategy is sustainable. If it is not considered sustainable, an alternative coping strategy, and the resources needed to implement that strategy, is recorded. If there is time, then the groups are asked to rank the level of influence of hazards on the livelihood resources. Further discussion questions can be also asked including: who has access and control over identified resources in the community; what are observed changes in the environmental conditions, hazards and livelihoods; and other questions regarding socio-political or other issues that affect vulnerability.

At the end of the exercise, facilitators summarize the process, outline the next steps and take time to ask the group what they learned. It is important to manage time, schedule the visit at an appropriate occasion (i.e. not during harvest season), provide refreshments, and energize the community.

Participants were advised not to make community meetings too long when completing the vulnerability matrix. It was clarified that the alternative/revised coping strategies are suggested by the community members, and facilitators during the community meeting should desist from suggest suggesting responses to the community members.

Participants were advised to ensure community members identify coping strategies for each impact arising from the hazard identified, and especially how the hazards influence resources for their livelihood. The interest is to collect data, and then later feeds into decision support and guide communities better.

At completion of the matrices, participants were advised not to make promises they cannot meet. For instance, if the activity is building cattle troughs for climate adaptation, yet the project budget cannot be adjusted, clarity should be made that the information gathered can be useful to other organizations e.g. the district local government, to plan for community support. They were advised to be clear on what they are going to do with the data they collect from the communities using the matrices.

## **2.5 Review of Field Guide**

Information should be provided on key issues to take into account during planning for data collection in the field. Emphasis is placed on: the need to plan carefully; obtaining support from community leaders; adequate preparation; provision of relevant field research materials; management of community expectations and potential conflicts; balanced participation by all; creation and maintenance of trust; and finishing gracefully. This should be followed by logistical preparations for field visits to the specified communities.

The sections below provide a summary of the analysis highlighting the information collected through application of the CVCA in the field, and entered into the CRiSTAL tool. Additional information to support the analysis including presentations from the workshop, CRiSTAL worksheet, field forms, photos and background information are available in Appendix 4.

## **3 Project information**

### **3.1 Project description and context**

*Project Description:* The initial focus of Empowering Poor People to Manage Water in Arid and Semi-Arid Lands in Uganda is on provision of improved water, sanitation and hygiene in Lira, Amuru and Gulu Districts where internally displaced peoples (IDPs) are settling and water/sanitation infrastructure is at a minimum.

*Project Context:* The main goal of the program in Uganda is to see improved access to safe water and improved hygiene/sanitation practices in the North region of Uganda

where IDPs have limited access to these resources and poverty is pervasive. The program will work with District Disaster Management Coordinators, District Water Offices, local leadership and planning committees to identify sites for water and sanitation infrastructure and target interventions appropriately. Key activities under this project will involve:

- Construction and protection of water points;
- Installation of boreholes with non-motorized hand pumps;
- Support to households in latrine construction;
- Training water and sanitation committees in the operation and maintenance of the water and sanitation systems;
- Holding hygiene awareness sessions on water and sanitation practices; and
- Active participation in relevant coordination forums aimed at exchanging lessons learned and best practices.

## **4 Climate Change Context**

### ***4.1 Regional Notes***

Current observations of climate change impacts from 1900 to 2005 in East Africa demonstrate increasing temperatures. Rainfall patterns show high spatial and temporal variability across the region. There are currently no records of significant trends in rainfall for the region. However, it has been generally observed that in the last 30 years, the frequency, intensity and severity of droughts have increased e.g. from 7 years, to 5 years to almost every other year (especially in the 1990s and 2000s). Future climatic projections for the region indicate that mean temperatures will increase further. In addition, it is *likely* that the region will have an increase in average annual rainfall. However, the southern part of East Africa (from the Equator) is expected to experience reduced rainfall, while the northern part is expected to receive increased rainfall (that is likely to fall intensely over short periods). It should be noted that there are uncertainties in climate projections for East Africa's rainfall, since the seasonal weather in the region is highly influenced by the El Nino Southern Oscillation (ENSO) phenomenon. Therefore it is likely that high inter-annual variability will continue to be observed in the region.

### ***4.2 Country Notes***

In Uganda, mean annual temperature has increased by 1.3°C since 1960, with an associated increase in frequency of hot days. Additionally, the frequency of cold days has decreased and the frequency of cold nights has decreased even more drastically. Trends across Uganda show a decrease in annual rainfall of about 3.4mm per month (3.5% per decade). Extreme rainfall events are not seeing a statistical increase or decrease, with rainfall events varying of region and season. Projections for the country indicate further increases in the number of hot days and nights and decreases in the number of cold days and nights. Precipitation projections are consistent and show an

increase in annual rainfall, particularly in the short-rain season (OND), with increasing proportion of rain falling in heavy rain fall events.

### **4.3 Ecological Zone Notes**

Lira District falls in Uganda's Northern system, characterized by annual crop planting of tobacco, cotton, cassava and sorghum as well as communal cattle grazing. Historic rainfall has been bimodal with some areas experiencing severe drought during the dry season.

In 2009, the North Eastern area of Uganda was currently experiencing moderate rains punctuated by short-lived dry spells which were expected to continue up to late September when steady rains are likely to set in. The peak of the rains was expected mid/late October and cessation early/mid December.

The expected impacts were as follows (Ministry of Water and Environment, 2009):

#### **Agriculture and Food Security Sector**

The coming El Nino related rains are expected to improve agricultural activities. The farmers are therefore advised to make use of this season by optimizing crop yield through appropriate land-use management. They should be encouraged to plant enough food that will also cater for the drought stricken areas.

#### **Disaster Management Sector**

There are high chances that flooding will once again occur in flood-prone areas of central, eastern and western Uganda. People are also advised to shift to higher grounds to avoid such floods. In case of people being displaced by floods, relief food and materials should be made available. Other disasters may arise from possible landslides mostly in mountainous of western, south-western and eastern Uganda, strong and gusty winds, and lightening etc. Appropriate measures should be taken to avoid loss of life and destruction of infrastructure.

#### **Energy Sector**

The expected rains are likely to enhance the levels of water in the dams which are currently low. The energy sector should plan for optimization of power generation and distribution as the situation is monitored.

#### **Transport Sector**

The anticipated rainfall patterns are likely to be occasionally accompanied by intense rainfall events that may lead to flooding in some areas. Motorists are advised to take utmost care whenever such events occur. Municipalities need to clear the drainage systems to forestall water run-off in streets and pavements occasioned by downpours and blocked drainage systems in towns and city.



## Health

Water-borne diseases such as Malaria, Cholera and typhoid may emerge in most parts of the country. Health authorities are, therefore, expected to be on the lookout and equip hospitals with necessary drugs to deal with such situations as they arise.

### 4.4 Rain calendars

The information for the vulnerability assessment was gathered from community members from Obanga ngeo and Odike Alimok villages in Ating Parish, Orum sub county.

#### 4.4.1 Rain Calendar –Odike and Obanga

Information on rain and temperature patterns was gathered from the different age and gender groups and is provided below in **Figures 4.1 to 4.4**. Rain calendars from the four working groups (young men/women and old men/women) were merged to give a representative view of recent climatic activities and weather-related patterns (**Figure 4.5**). Consensus showed decreasing rainfalls over the last three years and a greater number of very hot days. For 2009, it was noted that crops had been lost and there had been less rainfall than usual. It should be noted due to conflict in the areas, community members did not return to Obanga ngeo and Odike Alimok until 2006 and 2007 so information was only available from these years,



Figure 4.1. Rain calendar – Old Women’s group



Figure 4.2. Rain calendar – Young men’s group

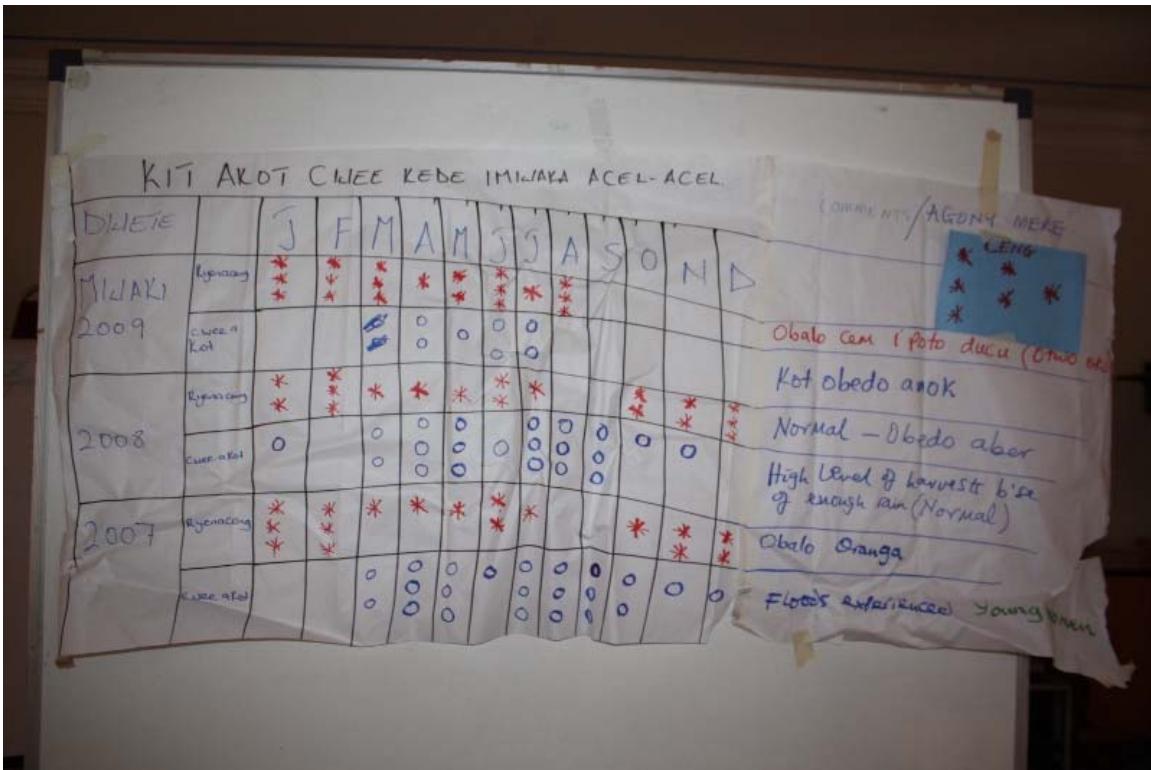
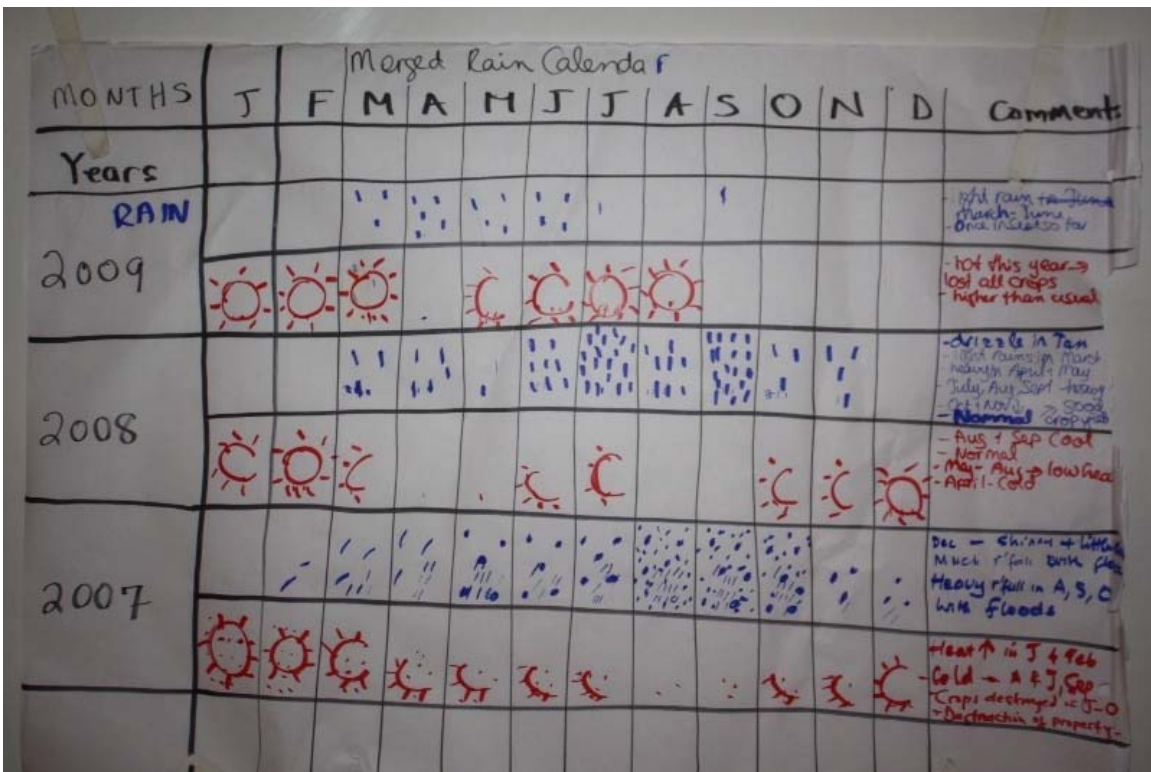


Figure 4.3. Rain calendar – Young women’s group



Figure 4.4. Rain calendar – Old men’s group



**Figure 4.5. Rain calendar – Merged**

**4.5 *Climate-related Hazards, Impacts and Coping Strategies***

Developing a summary of climate-related hazards, their impacts on the community and existing coping strategies for these hazards is crucial in developing a community adaptation strategy. Additionally, the efficacy and sustainability of each coping strategy must be determined in order to identify where progress can be made for sustainable adaptation. The main climate-related hazards, their impacts and key current coping strategies identified in Odike and Obanga are indicated in **Table 4.1**.

**Table 4.1 Climate context –Obanga ngeo and Odike Alimok**

<b>Hazard</b>	<b>Impacts</b>	<b>Current coping strategy</b>	<b>Alternate Coping Strategy</b>	<b>Notes</b>
Drought	Famine	Food rationing	Alt. income generating activities (brick making, growing vegetables, labour)	Other coping strategies include going to market
	Water shortage	Using alternative water sources (wells, other sources, etc.)	Drilling boreholes	Some sources are not sustainable as they can dry up
	Low crop yields	Cultivating in Wetlands	Irrigation	Other impacts include land degradation, pests, loss of income. Other coping strategies - buying to store and planting early maturing
Floods	Waterborne disease	Treatment of diseases by traditional and modern methods and vaccination	Traditional medicine	
	Destruction of houses	Relocating to higher ground	Improving building design	Soil conservation upstream
	Famine	Planting early maturing crops	Improve storage	Selling animals, borrowing money

Hazard	Impacts	Current coping strategy	Alternate Coping Strategy	Notes
Strong Winds	Destruction of houses	Reconstruction	Planting wind breaks	
	Destruction of crops	Buying of food	Agroforestry to protect crops	Replanting of crops
	Diseases (airborne)	Go to hospital	Use traditional medicine	

In Odike and Obanga, the three main climate-related hazards were **drought, floods and strong winds**.

#### 4.5.1 Hazard 1 – Drought

The primary impacts from drought are famine, water shortage and low crop yields. Other impacts identified include land degradation, increases in agricultural pests and loss of income. Current coping strategies consist of food rationing, using alternative water sources (wells, other source, etc.) and cultivating weeds. While all current coping strategies are perceived to be working by the community, none of the strategies are perceived to be sustainable. In order to prepare for future impacts, alternative coping strategies proposed by the community include alternative income generating activities, drilling boreholes and irrigation projects. Additionally, going to the market, rationing of water, buying food and planting early were mentioned as possible coping strategies.

#### 4.5.2 Hazard 2 – Floods

Floods are expected to increase the prevalence of waterborne diseases, contribute to the destruction of houses and increase the risk to famine within the community. Currently, community members utilize traditional methods as well as modern medicine/vaccinations for the treatment of disease, relocate to higher ground during flooding and have been planting early-maturing crops. Again, all coping strategies are thought to be working, with relocating and changing planting practices are thought to no be sustainable. In order to cope in the future, continuing to utilize traditional medicine, improving home and building design, and improving the storage capacity for food are practices that could be adopted. Other potential coping strategies would be to implement soil conservation efforts upstream from the village, borrow money or sell animals for income.

#### 4.5.3 Hazard 3 – Strong winds

More frequent destruction of houses and crops, and an increase in prevalence of airborne diseases have been seen with an increase in strong winds in the area. In order to cope with these impacts, community members have re-built their homes, bought food and have gone to the hospital for diseases. These strategies are seen as efficacious, with going to the hospital for treatment of airborne diseases being a



sustainable coping strategy. Reconstruction and buying food is not thought of as sustainable however and alternative coping strategies are proposed. These included planting wind breaks and promoting/implementing agroforestry to protect crops. Additionally, using more traditional medicine and re-planting of crops were thought to be other potential coping strategies.

## **5 Livelihood Context**

### ***5.1 Overview of Livelihood Resources Framework***

When analyzing a community's vulnerability to climate change, it is important to find out what resources are important to peoples' livelihoods in the project area. This will allow for better focus in determining which coping strategies are most important, and in what sequence to address the variety of potential climatic risks. To this end, the Livelihood Resources Framework places specific resources into five resource categories as described below:

*Natural Resources:* These are the natural resource stock upon which people rely both directly (i.e. for income or medicine) and indirectly (i.e. flood control or protection from storms). These should come from the surrounding environment such as trees or land.

*Physical Resources:* Those resources that make up the basic infrastructure and productive capital for transport, buildings, water management, energy and communications. Differing from natural resources, physical resources should come from man-made aspects of the surrounding environment.

*Financial Resources:* Encompassing not only the stocks or monetary savings of people within the community, financial resources also account for flows of money such as income and how that income is generated. This includes savings, cash, jewelry or remittances.

*Human Resources:* The skills, knowledge, capacity and good health that are important to the pursuit of positive livelihoods are the key aspects of Human Resources. They include traditional knowledge, education level and folk knowledge in arts and crafts.

*Social Resources:* Social Resources are those of the formal and informal relationships and institutions within a community, from which people draw upon support and knowledge. Examples would include church groups, farmer associations and political organizations.

#### **5.1.1 Livelihood resources - Lira**

For Empowering Poor People to Manage Water in Arid and Semi-Arid Lands in Lira District, the specific resources identified in **Table 5.1** were most important to peoples' livelihoods in the Odike and Obanga communities:

**Table 5.1. Summary of livelihood resources–Odike and Obanga**

<b>Natural Resources</b>	<b>Physical Resources</b>	<b>Financial Resources</b>	<b>Human Resources</b>	<b>Social Resources</b>
Water Land Forest products (trees)	Farm tools (hoes and ploughs) Bicycles Food storage facilities	Liquid assets (chickens, goats, produce, etc.) Market transactions Community savings	Traditional knowledge (ability to predict seasons) Agricultural skills Good health	Farmer groups Marwa groups Church groups
<b>Additional resources identified</b>				
Animals Sunshine Wild animals	Seeds Vehicles Oxen for ploughing Fertilizer Wheelbarrow Roads Boreholes	Loans Access to markets	Formal education/knowledge Children Knowledge (education) Artisans (Blacksmithing) Carpentry Ability to predict seasons (rain or sunshine) Pottery Handcraft	Political groups Village saving schemes

**5.1.2 Impacts of Climate-related Hazards to Livelihood Resources**

Upon identifying the climate-related hazards and the relevant livelihood resources within the project region, the next step is to determine the impact of these hazards on the livelihood resources in order to more effectively analyze current and possible coping strategies. **Table 5.2** indicates the resources which are strongly influenced by different hazards in Obanga ngeo and Odike Alimok villages

**Table 5.2, Resources strongly influenced by hazards**

	<b>Drought</b>	<b>Floods</b>	<b>Strong winds</b>
<b>Natural resources</b>	Land Water	Land Water	
<b>Physical resources</b>		Food storage facilities	
<b>Financial resources</b>	Liquid assets (goats, chickens, produce, etc.)	Liquid assets (goats, chickens, produce, etc.)	
<b>Human resources</b>		Good health	
<b>Social resources</b>	Farmer groups	Farmer groups	

Within Odike and Obanga communities floods have the greatest impact across multiple sectors of livelihood resources, with the most significant impacts seen on water resources, good health and food storage facilities. Drought shows the greatest impacts to natural resources (such as water and land), with some important impact also being seen on farmer groups and liquid assets. Strong winds appear to have less influence on the community and livelihood resources, with the greatest impacts in areas of natural resources (land, water and forest products), as well as agricultural skills and food storage facilities.

### 5.1.3 Importance of Livelihood Resource on Implementing Coping Strategies

For each of the livelihood resources detailed earlier in this report, an analysis of their importance to implementation of sustainable coping strategies (existing or alternate) was done. **Table 5.3 to 5.5** below details these analyses within the context of each hazard for Odike and Obanga.

**Table 5.3. The influence of livelihood resources on alternative coping strategies under drought**

	Alternative coping strategies		
	<b>Alternative income generating activities (brickmaking, growing vegetables, labour)</b>	<b>Drilling boreholes</b>	<b>Irrigation</b>
<b>Natural resources</b>	Land Water Forest products (trees)	Land Water Forest products (trees)	Land Water
<b>Physical resources</b>	Farm tools (ploughs and hoes)		Farm tools (ploughs and hoes)



	Bicycles		
<b>Financial resources</b>	Liquid assets (chickens, goats, produce, etc.) Market transactions Community savings	Liquid assets (chickens, goats, produce, etc.) Community savings	Liquid assets (chickens, goats, produce, etc.) Market transactions Community savings
<b>Human resources</b>	Traditional knowledge (ability to predict seasons) Agricultural skills Good health	Traditional knowledge (ability to predict seasons) Good health	Traditional knowledge (ability to predict seasons) Agricultural skills Good health
<b>Social resources</b>	Farmer groups Church groups	Marwa groups	Farmer groups Marwa groups

The information above shows that social and natural are key requirements for successful implementation of irrigation, alternative income generation and the drilling of boreholes. The natural resources would provide key raw materials while the social resources are important for community mobilization into action and coordination. The existing human and financial resources were seen to play a somewhat important role as well, and should be kept in mind in project modifications.

**Table 5.4. The influence of livelihood resources on alternative coping strategies under floods**

	<b>Traditional medicine</b>	<b>Improving building design</b>	<b>Improve storage</b>
<b>Natural resources</b>	Land Water Forest products (trees)	Land Forest products (trees)	Land Forest products (trees)
<b>Physical resources</b>			Food storage facilities
<b>Financial resources</b>			Liquid assets (chickens, goats, produce, etc.) Market transactions Community savings
<b>Human resources</b>	Traditional knowledge (ability to predict seasons) Good health	Traditional knowledge (ability to predict seasons) Good health	Traditional knowledge (ability to predict seasons) Agricultural skills Good health
<b>Social resources</b>	Church groups		Farmer groups

The preceding information clarifies that the good health, traditional knowledge and land are all crucial to implementing the three coping strategies for adaptation to floods. The natural resources appear to be very important for maintenance of traditional medicine as well. Understandably, farmer groups and agricultural skills were identified as important for improved food storage.

**Table 5.5. The influence of livelihood resources on alternative coping strategies under strong winds**

	<b>Planting wind breaks</b>	<b>Agroforestry to protect crops</b>	<b>Use traditional medicine</b>
<b>Natural resources</b>	Land Water Forest products (trees)	Land Water Forest products (trees)	Land Forest products (trees)
<b>Physical resources</b>			
<b>Financial resources</b>			
<b>Human resources</b>	Agricultural skills Good health	Agricultural skills Good health	Traditional knowledge (ability to predict seasons) Good health
<b>Social resources</b>	Farmer groups Church groups	Marwa groups Farmer groups Church groups	Church groups

Good health, forest products and land are all identified here as important for all coping strategies to deal with strong winds. Specific to implementing agroforestry to protect crops, water, agricultural skills and social groups are all also seen as important. Church groups and traditional knowledge were seen as important to the use of traditional medicine as well. Finally, church/farmer groups, water and agricultural skills were most important for planting wind breaks.

## **6 Analysis of project activities**

This section highlights the revisions made to incorporate climate change adaptation into GWI activities being implemented in the project areas. The aim of these revisions is to make project activities resilient to current climatic variability being observed in Odike and Obanga, and to increase project sustainability. It is important to conduct similar assessments in the future to help monitor progress towards increasing resilience, as well as to identify and appropriately deal with emerging climatic issues.

### 6.1 Revised Project Activities

Project activities identified for the GWI project in Lira District were screened to assess their impact on livelihood resources that are both strongly influenced by climate-related hazards and important to implementing sustainable coping strategies. The level of impact was rated as positive, negative or neutral and could be both positive and negative. For example, construction of low cost pit latrine's can have both a positive and negative influence on water as it can improve water quality by reducing the spread of waste but it could decrease water quality, through contamination if sited in a bad location. Project activities were revised in order to strengthen positive impacts from current project activities, minimize negative impacts from current projects and move currently neutral impacts (where appropriate) toward positive impacts. The second column of **Table 6.1** shows how activities were revised according to this analysis. These revised project activities were then screened to determine whether they were sustainable with the impacts of climate change. This is summarized in column 3 of Tables 6.1.

**Table 6.1 Summary of revised activities–Odike and Obanga**

Original Project Activities	Revised project activities	Revised Project Activities to reduce climate change impacts
Construction of animal water troughs at new water points.	Construction of cattle trough using traditional knowledge and building capacity in constructing and maintaining cattle troughs.	Construction of a cattle trough that allows drainage of excess water during floods. Better siting of water source so that the cattle trough is located on high ground near water point. Build cattle trough from stones.
Technical support to build capacity of water user committees for awareness on IWRM.	Technical support to build capacity on IWRM for water user committees and farmer groups with a catchment approach	Include different scenarios (floods, drought or higher evaporation rates) in the awareness programs. Advocate for integration of the approach into district and broader catchment planning and management processes, and have exchange visits for learning.
Using wastewater and water for alternative income generating activities including vegetable gardening, tree planting and brick making.	Using spill water and pumped water for alternative income generating activities including vegetable gardening, tree planting and brick making. Incorporate and build capacity in traditional knowledge for	Promote adoption of local tree species that are more resistant to drought and involve local government/extension staff to build capacity. Link the producers to markets and produce what is demanded.

Original Project Activities	Revised project activities	Revised Project Activities to reduce climate change impacts
	locating and selecting species of trees, and practicing soil conservation	
Building and maintaining ecological sanitation (arborloo) structures.	Building and maintaining ecological sanitation (arborloo) structures in an area that has been surveyed to not impact water quality. Follow up with monitoring of water quality. Build capacity and team building of farmer groups to manage arborloo (financial and water management)	Alternatively ecological sanitation in areas where flooding is a problem (e.g. skyloo).
Improve building design	Improve building design that uses locally available materials and incorporates drainage to collect water and replanting of trees	Plant appropriate tree species (e.g. drought resistant), using local knowledge to select them.
Improve irrigation	Design an irrigation system after undergoing a feasibility study. Ensure the irrigation project includes best practices and builds capacity in areas such as use of agroforestry, organic fertilizers and waste management, and incorporates local knowledge and involvement of agricultural extension officers	The feasibility study should include climate change scenarios, e.g. building water storage facilities.
Agroforestry to protect crops	Planned agroforestry with appropriate species, that uses knowledge of agricultural extension staff and local knowledge	Put up centers for collecting, multiplying and availing local seed/seedlings

## 6.2 Synergies and Barriers

The analysis in this section examines why the activities were revised and the synergies and barriers that could facilitate or hinder implementation.

**Revised Activity 1.**Construction of cattle troughs using traditional knowledge and building capacity in constructing and maintaining cattle troughs. This activity is not thought to be sustainable with climate change due to the potential for a higher rate of evaporation which could affect amounts of water to be retained in a cattle trough. Construction of a cattle trough that allows drainage of excess water during floods and better siting of water source so that the cattle trough is located on high ground near to the water point may assist in making this strategy more sustainable. Additionally, troughs should be built of stone only.

Barriers to implementing this revised strategy revolve around the availability of water and access to water. Essentially, there may be competition for the allocation of water which needs to be considered in siting activities and managed in maintenance activities. Local capacities need to be guided to manage timing of water access in order to minimize impact on water point as well as the potential for destruction of crops (from cattle) near to where the cattle trough is placed. Fencing or compensation will be necessary in these instances.

**Revised Activity 2.**Create technical support to build capacity on IWRM for water user committees and farmer groups with a catchment approach. This is considered to be a sustainable activity within the context of climate change because it raises awareness on how to adapt in case of extreme climate conditions. Further revision of the strategy would be to include different scenarios (floods, drought or higher evaporation rates) in the awareness programs, to advocate for integration of the approach into district and broader catchment planning and management processes, and to have exchange visits for learning opportunities.

Potential barriers to this activity are the necessary involvement of all levels of government for technical support and the need to create ownership within the community. This can be facilitated by water user committees trained at the village and parish level, and linked with governmental departments. Initiation at the local level and scaling up through the parish, sub-county and district levels will aid in keeping the ownership within the community.

**Revised Activity 3.**Using spill water and pumped water for alternative income generating activities including vegetable gardening, tree planting and brick making. Incorporate and build capacity in traditional knowledge for locating and selecting species of trees, and practicing soil conservation. This activity is considered sustainable with climate change as it protects the watershed, minimizes any further water wastage, recycles water, improves water use efficiency, and generates alternative sources of livelihood even with CC. Additional revision to the activity could promote adoption of local tree species that are more resistant to drought and involve local government/extension staff to build capacity, as well as to link producers to markets and produce what is demanded.

Barriers include local capacity to identify roles and responsibilities, cultural considerations when planting and choosing tree species (e.g. umbrella tree), and the possibility that new income generating activities may result in the abandonment of traditional practices.

**Revised Activity 4.** Building and maintaining ecological sanitation (arborloo) structures in an area that has been surveyed to not impact water quality. Follow up with monitoring of water quality. Build capacity and team building of farmer groups to manage arborloo (financial and water management) structures. Sustainability for this activity in the face of climate change is considered high because the site/location selected can mitigate water contamination and flood conditions at the same time. In the case of destruction by floods, they are easy to re-construct and use locally available materials.

Potential barriers to arborloo construction in this manner include aversion to eating fruit from trees grown from arborloo planted trees. There is a need to sensitize communities on the subject of eco-sanitation toilets. Other potential issues that may arise with regard to sanitation concerns include early emptying of the eco-sanitation toilet, resulting in microbiological contamination potential. Cultural contexts such as the use of toilets by Muslims (require washing facilities), the discouragement of pregnant women to use latrines, and the use of ash in the latrine were all raised.

**Revised Activity 5.** Improving building design that uses locally available materials and incorporate drainage to collect water and replanting of trees. Due to the fact that this activity has built-in coping strategies that mitigate against flooding and drought (tree planting), it is considered sustainable with climate change. Additionally, planting appropriate tree species (e.g. drought resistant), and using local knowledge to select them can aid in the success of this strategy.

Termites may prove to be a barrier to this improving building design, as these materials are locally produced woods that can be consumed by termites. Tree planting of species that are resistant to termites (e.g. shea butter trees) can add sustainability to these projects and prevent the use of pesticides for termite control, which can contaminate surface waters. Land ownership should also be a primary consideration to tree planting as this could prevent successful siting of new trees.

**Revised Activity 6.** Design an irrigation system after undergoing a feasibility study. Ensure the irrigation project includes best practices and builds capacity in areas such as the use of agroforestry, organic fertilizers and waste water management; and incorporates local knowledge and involvement of agricultural extension officers. This proposed coping strategy is considered sustainable as the feasibility study determines water availability as compared to water demands for irrigation. Agroforestry improves catchment capacity for groundwater recharge and builds capacity of local people and government. The feasibility study should include climate change scenarios (e.g. building water storage facilities), in order to achieve greater success.

Barriers identified through the CRiSTAL process include hesitance on the part of local farmers over utilizing new technologies (e.g. drip irrigation or rain fed agriculture), this can be mitigated by focusing on recognized farmers who can show the efficacy of these technologies. Waste management must be considered where non-biodegradable products (e.g. PVC, metals) are used in the development of the system.

**Revised Activity 7.**Planned agroforestry with appropriate species, which uses the knowledge of agricultural extension staff and local knowledge. This method is seen as sustainable because the species proposed resist droughts, are selected based on local and technical knowledge, and because agroforestry modifies micro-climatic conditions. Further modification of this coping strategy would be to put up centers for collecting, multiplying and availing local seed/seedlings.

Potential barriers were seen in the form of financial limitations to facilitating involvement of extension staff. Additionally, limited access to seedlings, resistance to using certain species because they take a long time to grow, and the need to raise awareness on benefits of local tree species through local leaders were seen as crucial to success of this strategy. Lastly, the use of a mixture of trees, as long as they are not detrimental to the environment, could prove beneficial.

## **7 Feedback on climate change vulnerability assessment tools**

This section highlights the feedback provided, based on participants' experience with applying the CVCA and CRiSTAL tools.

### **7.1 Testing of tools**

During the workshop, participants tested the tools using local information. Specific feedback was provided on the process and is outlined below.

### **7.2 Feedback on Field exercise**

Participants visited the communities of Odike and Obanga in Lira. The outputs of the field exercise are provided in Section 4 and 5 under the climate and livelihood context. Participants gave feedback on their experience collecting information using the CVCA tools in the community, and provided ideas on how to improve the assessment. Specifically, active participation and patience were noted as beneficial in the process. Adherence to timeframes is also important to ensure all material is covered in the time allotted. Group involvement was very facilitative for the process, including eating together, working with governments and merging organizations. This was assisted by trust and rapport however, and the ability of communities to give their own views. While the questions were related to the project and climate variability is well explained by current weather conditions, it was felt that there was insufficient time allowed for thoughtful responses and that the matrices were restrictive. The separation of the community into groups worked well as it allowed for greater participation as well as

more diverse perspective from the different experiences of the different groups. Energizers were helpful in keeping the activities moving.

### **7.3 Application of CRISTAL Tool and data analysis**

The participants worked together to merge the information gathered in the community. They then analyzed the data to determine how to improve project activities and community vulnerability to climate change impacts.

#### **7.3.1 Feedback on data analysis**

General feedback on the data analysis process included the requirement of analysis while inputting information into the modules. Some aspects may be repetitive, and this may stem from too much detail within the modules. Much of the tool may not be inherently intelligible to participants due to complexity and therefore requires detailed explanation. The data gathered in the tools should also be validated from other sources. Some positives were that the tool initiated conversation on resources and increased the knowledge of the participants. The tools also bring consideration to future eventualities which may otherwise not be considered. There is potential to use other PRA tools for adaptation, and the process could be used for investigation and planning around climate change.

### **7.4 Feedback on the training**

Finally, three questions were asked of participants in order to capture what changes might be made in future trainings:

What did you like about the training?

- Partnership building
- Intellectual capability of the facilitators and to participants
- Good facilitation
- Knowledge on data analysis
- Generated new knowledge for incorporation into projects
- The training is very practical of project related (builds on capacity of staff in climate change
- Involvement of everyone
- The training was well timed for GWI as they enter in the next year of the project
- The training explored latent knowledge of both GWI staff and communities on CC and coping methods

What did you not like about the training?

- Time
- Working on weekend (long hours)
- The timing. It came at a time when partners are winding up activities for year 1.
- Too much movement by the participants
- Too many hours, tiresome



- It included weekend which made the attendance/concentration to be poor
- Program extending into the weekend
- A lot of information compacted into a short time

What could be improved?

- More time should be given to understand the details of the tools
- Training to be arranged for weekdays not weekends
- Needed more days for the exercise
- Lack of vegetables in menu
- Involve more than 1 trainer
- To start and finish program within weekdays
- Weekend to be always planned out
- Fieldwork should commence early morning (time)
- CRiSTAL training should come before project for implementation so that issues of climate change are catered for

## **8 Way Forward**

The final step in the CRiSTAL process is to complete a way forward assessment in which the efficacy and lessons learned from the CRiSTAL process are determined and documented for the particular project area. This will aid in future implementation of the CRiSTAL process as well as provide a summary of key points for the project area in question. For the Uganda program, Empowering Poor People to Manage Water in Arid and Semi-Arid Lands in Odike and Obanga, the way forward has been developed as follows:

### **Do we have current activities whose intended results may be affected by climate change and variability impacts?**

Multiple activities were brought up when asked this question. Tree planting in school may be affected by drought due to drying of planted seedlings, or flooding may affect the planted seedlings too. Shallow well and deep borehole construction may also be impacted by flooding as it is impossible to construct these during flooding. Drought will lower the ground water table, shallow well construction more expensive, and cause overuse of deep boreholes. Soils may become heavy and collapse during latrine construction if the area is flooded and drought will require the latrine to be dug deeper. Improving traditional springs have accessibility issues during flooding and may dry up during droughts. Strong winds may contaminate these with soil and wastes. Access and damage to facilities from flooding and strong winds may affect the ability to train personnel or to establish school sanitation clubs. Other activities may be affected such as initiation of irrigation programs, construction of Ecosan toilets, cattle troughs and traditional latrines, as well as using spill water for alternative income generating activities.

**Do we need to do anything to make these activities effective?**

Several improvements were discussed such as improving housing design and drainage. Planting trees for protection of home and crops and careful selection of tree species will assist as well. Siting of boreholes, cattle troughs and latrines above flood heights will protect these improvements. Agro-forestry may prove effective in crop protection and crops near water points can be surrounded by fence. Training of water user committees will aide in the proper timing of other activities such that labor is available and activities occur when most beneficial, e.g. diverting run-off before flood seasons.

**Are there barriers to effect these changes?**

Specific barriers identified include the acceptance of new technologies, availability of desired tree species seedlings, lack of political will, financial limitations and time constraints. Additionally, benefits from local tree species take too long to accrue to beneficiaries and it is difficult to access technical support from certain partners e.g. government extension staff.

**Do we want to do things differently in future? What can we do differently?**

Future activities would benefit from drawing workplans together with other partners (e.g. government extension workers) and other stakeholders to improve ownership and involvement. Climate change studies could be conducted to guide future projects. Development of a multi-disciplinary and integrated approach to project will facilitate project modification. Demonstration projects preceding full scale activities will help to prevent failures as will incorporate feedback (during mid-year reporting) from donors on project activities that need to be changed or done differently from the original project design. Finally, moving beyond the water points to protect the watershed will provide sustained project success.

**Can undergoing a vulnerability assessment (CRiSTAL and CVCA) help us achieve the changes we want?**

It was thought that these tools helped to gather information and provide input into existing decision support systems, and can give an idea of what the community knows about resources and hazards. This helps to clarify how they are coping with impacts of hazards, and what their plans will be for the future.

**What do we want to do this year with CRiSTAL and CVCA and for which on-going, planned, or to be planned project?**

It was discussed that project participants would apply information from Odike village to other project villages with similar livelihoods as well as use the tools in future activity planning.

**Table 8.1** below provides a work plan of how GWI partners plan to move forward with the information derived from the vulnerability assessment.

**Table 8.1.Way forward**

<b>What Do we want to do?</b>	<b>How do we want to do it?</b>	<b>When do we want to do it?</b>	<b>Who will do it?</b>	<b>Where?</b>	<b>Resources/ Requirements</b>
Creating awareness/Advocacy on CC	Collaborating with government officers and other stakeholders. Integrate CC messages in awareness programmes	1 <sup>st</sup> quarter of Year 2 of project	GWl partners, District Environment & Wetlands Officers with IUCN support	Sub-county level	Human resource (The technical officers), funds for meetings
Adopting the catchment approach to WRM	Creating awareness about the catchments as the source of water Forming a union of water user committees at sub-county/catchment level	Now onwards	GWl partners, government officers at all levels, with technical support from IUCN	The sub-catchment in the project area	Human resources, skills, finances
Adjust project activities based on CRiSTAL analysis (apply information to other villages)	Review adjusted project activities during planning meetings	During planning meetings starting Monday 14 <sup>th</sup> September 2009	GWl partners	Partners' offices during planning; and subsequently at project field sites	The CRiSTAL data, the Human resource (the trained staff)
Review alternative coping strategies as project activities	Look at the coping strategies and see how they fit into the GWl project	During planning meetings starting Monday 14 <sup>th</sup> September 2009	GWl partners	Partners' offices during planning; and subsequently at project field sites	The CRiSTAL data, the Human resource (the trained staff)

**NB:** Government officers include the sub-county chiefs, District Environment, Wetlands, forest, agricultural and other technical officers from district and national levels

## Appendix 1. Workshop Program

<b>The Climate Vulnerability and Capacity Analysis (CVCA) &amp; Community-based Risk Screening Tool: Adaptation and Livelihoods (CRiSTAL) Training Workshop</b> <b>September 9<sup>th</sup>-13<sup>th</sup>, 2009</b>		
<b>September 8<sup>th</sup>: Participants Arrival and Registration</b>		
<b>Day 1: September 9<sup>th</sup></b>		
<b>Time</b>	<b>Activities</b>	<b>Facilitator(s)</b>
8:30-9:00	- Participant Introductions - Participants' Expectations - House Keeping	Robert (GWI)
9:00-10:00	- Introduction to Climate Change, CVCA & CRiSTAL Tools	Katharine
10:00-10:30	Tea/Coffee break	
10:30-11:15	- Introduction to the Rain Calendar and Vulnerability Matrix (includes an overview of the field form)	Katharine
11:15-12:00	Group break outs- Rain Calendar	Katharine/Robert (IUCN)
12:00-1:00	Group break outs Vulnerability Matrix	Katharine/Robert (IUCN)
1:00-2:00	Lunch	
2:00-4:00	Group break outs continued	
4:00-4:30	Feedback on process	Katharine
4:30-4:45	Tea/Coffee	
4:45-5:30	Plans for the Field Work & logistics	Robert (GWI)
Evening	Free	
<b>Day 2: September 10<sup>th</sup></b>		
7:30-9:00	Travel to the field Site	All

9:00-11:00	-Introduction of the group to the community & purpose of our field visit -Introduction to climate change, the field exercises & next steps - Group Breaks outs (4 Groups)	Government representative (TBC) - Robert (GWI)
11:00- 12:00	Community consultations-rain calendar	Katharine
12:00-1:00	Community Consultations- Vulnerability Matrix	Katharine
1:00-2:00	Lunch	
2:00-4:00	Community Consultations- Vulnerability Matrix Cont. & Discussion questions	Katharine
4:00-4:20	Debrief with the community	Government representative (TBC)/Robert (GWI)
	Plans for Day 3	Katharine
4:20	Travel back	All
Evening	Free	
<b>Day 3: September 11<sup>th</sup></b>		
8:30-9:30	Assessment of the Field Exercise Guidance on Merging information on the Rain Calendar and Vulnerability Matrix	Katharine to facilitate this day with support from Robert (IUCN)
9:30-10:15	Merging the Rain Calendar	
10:15-10:30	Tea/Coffee break	
10:30-11:30	Merge the Vulnerability Matrix	
11:30-1:00	Data Analysis using CRISTAL	
1:00-2:00	Lunch	
2:00-3:45	Data Analysis using CRISTAL	
3:45-4:00	Tea/Coffee	
4:00-5:00	Data Analysis using CRISTAL (until entry of Project Activities)	
5:00-5:10	Plans for Day 4	

5:10-6:00	Team building	Robert (GWI)
<b>Day 4: September 12<sup>th</sup></b>		
8:30-9:00	Rapid Assessment of the CRiSTAL Process (plenary)	Katharine to facilitate this day with support from Robert (IUCN)
9:00- 10:15	Data Analysis using CRiSTAL	
10:15 – 10:30	Tea/Coffee	
10:30-1:00	Data Analysis using CRiSTAL	
1:00-2:00	Lunch	
2:00-3:45	Data Analysis using CRiSTAL	
3:45-4:00	Tea/Coffee	
4:00-5:00	Feedback on the process and tool and plans for Day 5	
5:00-6:00	Team Building	Robert (GWI)
<b>Day 5: September 13<sup>th</sup></b>		
8:30-10:00	Action Plan for Application of CVCA & CRiSTAL in GWI Programme Sites in Uganda	Katharine to facilitate this day with support from Robert (IUCN)
10:00-10:15	Tea/Coffee	
10:15-11:15	Action Plan for Application of CVCA & CRiSTAL in GWI Programme Sites in Uganda	
11:15-12:15	Workshop Evaluation and follow up steps	
12:15-12:30	Workshop Conclusion	Robert (GWI)
12:30	Lunch and departure	

**Appendix 2. Field form (with translations into Lango)**

**CONSULTATIONS FIELD REPORT**  
**COK AYA ITAM AME ORAO**

**1. Introduction NYUTE / ANYUT**

- a. Brief of who you are, your organisation and why you have come to the community

Nyuteanonokngaame yin ibedo, iyrongetniikedengoomioityeikinlwak me kanoe.

- b. Brief on what climate change is (with the use of visual aids is preferable)

Lokikomngoamealokalka me wiyamoobedo ( kun itiokedeaporemogo amen , en twaratwara)

- c. Introduce the project

Nyutuprojek

- d. Explain how you are going to collect information

Niangjo yore angoameame yin iwot ray kedengec.

- e. Explain why you are asking people to split up into groups (i.e. young men, young women, old men, old women)

Naignjongoomio yin ityeikwayogi me pokere I gurup ( nia; coo atino, monatino, coo adongo, monadongo)

**Facilitators / opwonye / joatelo tic man / joacukurukor tic man**

1	
2	
3	
4	
5	

**Group Information / ngecayaa I gurup**

<b>District / distrik</b>	
<b>Village / wang tic</b>	
<b>Group interviewed(e.g. young men or</b>	



women) <b>Apeniyigurup (apor: coo atinoonyomon)</b>	
No. of participants <b>Weljoametyeiye</b>	
Date <b>Nino dwe</b>	

**2. Data collection in groups / Rayongeciigurup**

a. Explain what are we doing very briefly and how the outputs will be used

Nianggiaceceknogame wan otyeotimekede yore angoameadwogimere / kop ayyaiyeobino tic kede

b. What is your main livelihood (i.e. agriculture, livestock keeping, etc)?

Ngo twatwalameitimo me pitenii (nia: pur, gwokoleyi , kede en okene)

c. Seasonal calendar (see below)

alokaloka me wiiyamaiyakinedweteiyimwaka/ mwaki ( nenitere)

i. Rain days / ikare me kot

ii. Floods / ikare me aluka / abwalpii

iii. Temperature / Ngicoonyolyeto me piny onyoginoro

**RAIN CALENDAR**

KARE ME KOYT IYI AKINA DWETE ME MWAKA ONYO MWAKI

MONTHS DWETE														Notes on Rainfall and Temperature Cokikomkotkedelyeteonyongico me pinyonyoginoroni
YEARS MWAKI														


### 3. Livelihood resources – name them then rank them immediately

**Jami ameoromo tice kede pi kite me pite / gwokere – co nyinggiiteketogioyore -iypre**

*Livelihoods Brainstorm*

*Tamoatamaiwic, yore apapat me pite*

**Natural Resources** (Forest products, water, land, wetland systems)

Jami ameoromo tic kedeameobanga en omioonyo nit ye kene ( jamiyaaibung, pii, lobo, yiikulu)

**Physical Resources** (Agricultural implements, bicycles, Ploughs, Roads, Water pumps, Water tanks, Wells, Wheelbarrows)

Jami ameotiokede me miyojamiameobangaomiobedoatioonyoapiretek / jamiamekonyokor en ameobangaopio (nyony me tic I pur, gali, kweyi, yoe, jami me bukupii, pipaadongo me pii, akong, gadigadi)

**Financial Resources** (Access to markets, Credit systems, Insurance, Liquid assets (livestock, etc.), Loans, Pensions, Remittances)

Jamiamekonyo me loko en ameobangaomiokede en amekonyokore, medokolim/cente ( kite me tunucuke, yoreapapat me banyikedemagoba, kite me gwokereikomangolngolakunibeibadiryoneteamegwokojaminiikakari te culu ka obalenwongicululim bot gi kareikare, lonyoameitiokede me nwongolonyookene (leyi, kede en okene), kwayolimibotiryongeteamemiokunidwokokedemagoba, cente me culiameinwongoikare me weoame dong peitic, centeame oculi kedepyenabedomegi / myeroiwongialuberekedecik)

**Human Resources** (*Traditional knowledge, weaving skills, education*)

Danocalo gin ameiro mo tice kede me dongo/ danocalolonyo ( ngec me tekwaro, diro me cweyoonyokwoyojami, kwan)

**Social Resources** : (Church groups, farmer associations, political organisations)

**Lonyo/Jamianotolwak /gurup/iryongete :**

(Tic iyigurup/iryonget / bedokaracelacalolonyo (jobere/gurup me kanica, jobere /gurupopur/iryonetopur, gurup/jobereowibye)



#### 4. Name climatic hazards and rank them (just choose top 3)

Co nyingjamiangoleturaacaloadwogi me alokaloka me wiyamoameotimereiyongengiyo pi karealac, iteketogiiyoreiyore ( yerkakom 3 owieolanyo)

Explain that climatic hazards are caused by the weather.

Niangjonijamiangoletureiwiya moniobedocaloadwogi me alokaloka me wiyamoiyongebedoneno pi karealac.

**Hazard** - Potentially damaging physical events or phenomena that result from weather or climate conditions (example: Desertification, drought, strong winds, floods, extreme cold, extreme heat)

#### Angola ngolaarac-

Angola ngolaadongoamebalojamiamepirgitek amen en kanaler, ongonianenameyaaiyalokaloka me wiyamoiyikareacokonyoiyongekarealac balamwaki 35.

#### 5. Identify the impacts of each hazard on the livelihood(s) and rank them (choose the top 3).

Donyokede / nwong kop ameyaaiyi Angola ngolaacel ace ikom kite me kwo/ piteekaiteketogiiyoreiyore (yer 3 olanyiwie)

**Impact** - The consequences of hazards on natural and human systems, and can include crop damage, income losses and reduced soil fertility.

**Adwogi/ Kop ayaaiye:** kop ayaaiyi Angola ngolaaraco magi ikop gin acweakedeakubakuba me kwo/ tic a dano, dang dokromobedoiyebalocem, rweonyolim a me binoicaokededwokocenrwom me roc a lobo

#### 6. Identify the coping strategies of each impact for hazard 1 (just choose top 1)

Donyokede kite angoame dong ogengere/ ogwokere/ obedeokede Angola ngolaaraco man apotoaturaniika dong tyeiyiakinawaa, man pi Angola ngolaarcanambaacelocakoiwie)

**Coping strategies** - Methods for using existing resources to achieve beneficial ends during abnormal or adverse conditions (Casual labour, Crop shifting, Food rationing, Food storage, Gathering of wild food, Income diversification, Tree/Crop replanting, Water rationing)

#### Yore me kwokede Angola ngola magi aracoiyiakinawa:

Yoreapapat me tic kedejami/ lonyo ame tyeiyiakinawa me nwongadwongiaber ame konyokorwaikare ame pe tyekakare, onyo ame pe pore, onyadwogiaraco (otic me malo malo, puruwitecemapapatkagi mogo apapat, kanocempikareokenekedepokobotjoikare me kec, gwokocemidero, rayo witcem ame dongoibung/ itim, bedekedeyoreapapat me kelolimite cao, pito yen onyocem, pokopii me tiyo tic apapat)

#### 7. Is the coping strategy working and is it sustainable? What is an alternative coping strategy and what resources are needed to implement these coping strategies?

Yore apapatameitiowunukede me bedokede Angola ngolaaraco magi iyiakinawunii, tyeatickede dang rii pi karealaconyo dang nikato kit

amenwongwunonwongoigokedeitamwu ? Yore meneokeneamedokdangoanyoiromo tic wunukedekaityewunikede Angola ngola man iyiakinawu, kede dang, jamiangoamite me keto yore magi titc?

**8. Are there other causes of the impact (i.e. conflict, population changes)?**

Onyotye dang dokijamiokeneamekelo kop ameyaaityangolangola magi (nia:atubatuba/ lwenyogoatinotinoiyiakinawaa,dongo a weljo)

**9. Repeat steps 5 to 9 for hazard 2 and 3**

**Now rwomenamba 5 nakaiyi 9 pii Angola ngola 2 kede 3**

<b>Hazard (Top 3) Angola ngolaarac (3 olanyoiwie)</b>	<b>Impacts on the Livelihood (Top 3 for each hazard) Adwogi mere ikop yore me kwo/ pite (3 ameolanyoiwie pi Angola ngolaacelacel)</b>	<b>Coping Strategies (choose top 1) Yore me kwokede Angola ngola magi (yernamba 1 olanyoiwie)</b>	<b>Working? Tyeatic? Sustainable? Binorii pi karealaconoakato kit ameotamokede?</b>	<b>Alternate coping strategies and how it can be achieved Yore okeneameoromokwokede Angola ngola magi aracoiyiakinawaakede yore angoameoromomiyekedekedeitictecobere</b>



\*If there is enough time continue with:

Kacawatyeorimo, medekede:

### 10. Influence of hazards on Key Resources (0-5)

**Kit ame Angola ngolaaraco magi diokedeadwogi me lonyo/ jamiakelolonyo (1-5)**

**0** = Hazard has no influence over the livelihood resource

= Angola ngolaaracpediojamiameotiokede pi kwo / pite a dano

**1** = Hazard has minimal influence over the livelihood resource

= Angola ngolaaracdioanonokjami/lonyoameotiokede me kwo/ pite

**3** = Hazard has some influence over the livelihood resource

= Angola ngolaaractyekedekitoroamediookedejami/ lonyoameotiokede me kwo /pite

**5** = Hazard has a very strong influence on the livelihood resource.

= Angola ngolaaracdiokomaatekatekajami/lonyoameotiokede me kwo/pite

	HAZARDS ANGOLA NGOLA ARAC		
RESOURCES JAMI/LONYO			
<b>Natural</b> En ame Obanga okete			
<b>Physical</b> En ameitiokede me keto en ame Obanga omioitic			
<b>Financial</b> En amekonyo me loko en Obanga omiokede en akonyokore me dokolim/ cente			
<b>Human</b> Danodano			
<b>Social</b> En anotolwak/ gurupe / iryongete			


**11. FURTHER DISCUSSION – If there is time**

**NYAMO LOK AME AMEDE- kacawatye**

- a. Who has control of resources and access to facilities and services?  
 Ngaameloyolonyo/ jamikede kite me tunuijiamiacwakokorekedejamiametio  
 ked calolwak?
  
- b. Changes in environment, conditions, hazards, livelihoods  
 Alokalo I kanameorimowaa, jamiakeloalokalo magi, angolangolaaraco, yore  
 apapat me kwo / pite
  
- c. Social or political and other issues that may have implications for  
 vulnerability  
 Jami aribojokaracelonyootiokedekaracel, tim me wii bye  
 kedejamiokeamearomobedokedeadwogi pi/ ikombedoalala bot angolangola

**12. Conclusions / me cegotere**

- a. Ask group what they learned  
 Penygurupngoame gin opwonyo
  
- b. Summarise the process and tell them the next steps  
 Jung dong acekjamiamenentyeatimerducuekaite kobo  
 igirwomokeneameadonyoiye

### **Appendix 3: Supplementary materials**

Supplementary material to support this report contains the following information:

- CRiSTAL decision support tool for Obanga ngeo and Odike Alimok villages
- Field forms for community groups representing Obanga ngeo and Odike Alimok villages
- Presentations
- Photos
- Background on climate change and tools