



Figure 1: Capacity Building in UNFCCC process. Adopted from UNFCCC, 2015.

1.1 Research Objectives

1.1.1 Overall research objective

To enhance knowledge and capacity of institutions in Nakasongola District of Uganda in carrying out strategic planning and target setting to better adapt to climate change impacts, *through identifying knowledge gaps and capacity needs in assessment of climate change impacts, vulnerabilities and risks in Nakasongola District, with emphasis on gender.*

1.1.2 Specific objectives

- **Objective 1.** To update / establish standard capacity and knowledge requirements for assessing climate change impacts, risks, and vulnerabilities in Nakasongola District through identifying the capacity and knowledge required to undertake assessment of climate change impacts, risks and vulnerabilities;
- **Objective 2.** To support institutions in Nakasongola District in assessing climate change impacts, risks, vulnerabilities, community coping strategies, district adaptation efforts, and targets, among gender categories, using the institutional assessment capacity and knowledge existing in the district;
- **Objective 3.** To provide recommendations on capacity and knowledge for institutions in Nakasongola District regarding assessment of climate change risks, vulnerabilities and adaptation, among gender categories, through assessment of existing capacity and knowledge in Nakasongola District in reference to standards methodology.

based consultation to obtain information that complements outputs from desk reviews and other approaches, and (d) additional analyses and modelling.

Procedures for Vulnerability Assessment as outlined in *National Climate Change Training Manual for the Inter-Institutional Climate Change Desk Officers and Relevant Stakeholders for Uganda* include (MWE, 2017):

(1) Preparing for the vulnerability assessment: This step involves understanding the context or condition in which the assessment is being conducted, for example, the type of sector (e.g., Agriculture, which in Uganda includes the subsectors of crops, livestock, and fisheries), the adaptation planning stage, and the available resources. This step also includes defining the purpose of the assessment and outcomes expected at the end of the assessment. It is also important to define the scope of the assessment during preparation, in terms of time frame, sectors (or subsectors), impacts (e.g., heavy rain-related) and areas to be covered, and then, prepare an implementation plan with clear tasks and responsibilities of who does what within a specified time period;

(2) Developing impact chains: An impact chain explains the links, relationships and consequences of climate change impacts, focusing on cause-effect relationships of direct and indirect impacts, for example, how one particular impact leads to another impact. A Ugandan example is the temperature rise increasing the spread of malaria parasites in the highland ecosystem in Uganda thus increasing the number of malaria infections amongst people which in turn leads to increased deaths as a result of malaria. Another way in which an impact chain can be looked at is that it explains how physical, natural and societal factors link to various vulnerability components and finally to vulnerability or a sequence of events resulting from a direct climate change impact. Developing impact chains mainly involves determining vulnerability of a system through determining potential impacts, exposure, sensitivity and adaptive capacity. Thereafter, one can brainstorm adaptation options that could be helpful in reducing the vulnerability of the system;

(3) Identifying and selecting indicators: This step involves identification and listing of sufficiently specific indicators for the various vulnerability components (i.e., exposure, sensitivity, and adaptive capacity), for example, Uganda's GDP is used as an indicator for poverty which is used to determine the climate change adaptive capacity and vulnerability. A good indicator should be valid and relevant, reliable and credible, have a precise meaning, and be clear in its direction, practical, affordable and appropriate;

(4) Data acquisition and management: This step involves various aspects related to data, namely, how data is acquired, reviewed and prepared for vulnerability assessment. Furthermore, this step concerns gathering the data, checking if it is of the quality expected and relevant for the assessment, and finally data management which focuses on how data can be transformed into readable information and documents. During this step, one needs to keep in mind the list of indicators generated in step 3 and have knowledge of available resources and data;

(5) Normalization of indicator data: 'Normalization' refers to the transformation of the data sets for the indicators from units into unit-less values. The transformations make it easy for the data to be easily aggregated into readable meaningful information such as formulating a scale of: high-to-low, for example, if the units are in Uganda shillings (UGX), UG 10,000 may be high and UGX 2,000 may be low. This makes aggregation of data simple. The unit-less value with a common scale may be arranged, for example "0" to

represent optimal condition in the system (i.e., does not require improvement); and the other end of the scale e.g., “1” to reflect “critical state” in the system (i.e., non-functional);

(6) *Weighting and aggregating of indicators:* Some indicators for a specific vulnerability component, that is, exposure, sensitivity or adaptive capacity may have more influence than others. This necessitates weighing individual indicators and combining them into one composite indicator for each vulnerability component;

(7) *Aggregating vulnerability components to vulnerability:* This includes linking sensitivity and exposure to potential impact, and then use potential impact and adaptive capacity as indicators for vulnerability. If there are various vulnerabilities, they are combined into a composite vulnerability. This is important in choosing suitable adaptation measures;

(8) *Presenting the outcomes of your vulnerability assessment:* After completing all the above steps, it is important to summarize and present the findings of the assessment keeping in mind the objective of conducting the assessment and the target audience to whom the findings are directed. Communicating of results of the Vulnerability assessment to stakeholders and decision makers is necessary to facilitate action and gather support. Early communication of the purpose, and intermediate results, of the assessment helps to increase buy-in for final assessment results. Results may be communicated through Reports, Vulnerability index, Qualitative ranking (e.g., High, Medium, and Low), Maps, and Profiles (MWE, 2017).

Table 3. Institutional approaches used in carrying out climate change vulnerability assessment

Conduct PRA in the sampled villages/ communities, using standard tools (questionnaire/checklist)	50.0%
Drawing from reports of LG departments and UNMA for seasonal weather updates and impacts	12.5%
Development of disaster reduction maps & action plans	12.5%
Seasonal data collection, analysis and interpretation on production, food security	6.3%
Zoning the district in sub AEZs	6.3%
Use extension workers to assess affected/susceptible communities	6.3%
Present report to District Technical Planning Committee for consideration and incorporation into the district annual work plan	6.3%
TOTAL	100.0%

4.2.3 Relationship between factors considered and the institutional approaches for carrying out climate change vulnerability assessment.

The study also investigated possible relationships between the factors considered for vulnerability assessment, and the institutional approaches used for carrying out climate change vulnerability assessment. Regarding “Nature of climate change hazard, geographical area most affected and frequency of occurrence”, this was considered as the number one factor considered for vulnerability assessment (Table 2), the majority (75%) of respondents related it with use of PRA tools as the approach used for carrying out vulnerability assessment (Figure 4). Twenty five percent (25%) related it with use of local government & UNMA reports, and development of disaster reduction maps & action plans. On the other hand, 12.5% related with seasonal data collection, analysis and interpretation on production, food security; zoning the district in sub–Agro Ecological Zones and use of extension workers to assess affected/susceptible communities.

With available knowledge, skills and exposure to climate change adaptation options as a factor considered in vulnerability assessment, 50% of respondents related it with use of PRA tools; 25% related it with Development of disaster reduction maps & action plans, while 12.5% related it with use of local government & UNMA reports; seasonal data collection, analysis and interpretation on production, food security and zoning the district into sub–Agro Ecological Zones (Figure 4).

Respondents also reported Community income levels as a factor in assessing vulnerability assessment. The majority of respondents (75%) related it with use of PRA tools, 25% associated it with use of reports of local governments (LG) departments and Uganda National Meteorological Authority, while 12.5% related it with Development of disaster reduction maps & action plans; Seasonal data collection, analysis and interpretation on production, food security; Zoning the district in sub–Agro Ecological Zones (AEZs) and use of extension workers to assess affected/susceptible communities (Figure 4).

With Gender category most likely to be affected as a factor in vulnerability assessment, 62.5% of respondents related it with use of PRA tools; 25% associated it with Development of disaster reduction maps & action plans; while 12.5% related it with use of reports of local governments (LG) departments and Uganda National Meteorological Authority (UNMA); seasonal data collection, analysis and interpretation on production, food security; Zoning the district in sub–Agro Ecological Zones (AEZs) and use of extension workers to assess affected/susceptible communities (Figure 4).

4.6.3 Relationship between the identified knowledge needs and gaps for climate change-related assessment(s)

Figure 11 presents an analysis of the knowledge needs identified to respond to the issue of limited knowledge on climate change issues (vulnerability assessment, planning, adaptation and mitigation), which was the number one challenge (Table 8). A synthesis of the knowledge needs identified for other knowledge gaps is presented in Appendix 4. Respondents (37.5%) identified the need to train staff in climate change issues, sensitise communities on climate change adaptation and mitigation, and develop an interactive knowledge management and communication strategy. Other needs such as training staff in appropriate climate change adaptation technologies and practices, training staff in research methods among others, were mentioned by 12.5% of the respondents. Some respondents mentioned more than one need. There were 25% of respondents who expressed the need for sensitisation of communities on climate change adaptation and mitigation as well as the need to develop an interactive knowledge management communication strategy. The 12.5% that mentioned combining three factors identified: the need to train staff in climate change issues (including those who were trained earlier), the need to train staff in research methods, and the need to train staff in critical in-depth analysis. Overall, these training needs respond to the identified number-one challenge of limited knowledge on climate change issues.

Figure 11. Knowledge needs in response to limited knowledge on climate change issues

4.7 Experiences from previous climate change adaptation pilots in Nakasongola district

During the FGD, respondents identified the need to have role models who can promote the best measures and practices in climate change adaptation. In addition, there is a need to study the income status of the households to check whether they can afford the good technology and practices that we are promoting (Box 3). Past experiences can also be a basis for adoption of adaptation technologies and practices (Box 4).

Box 3. Appropriateness of climate change adaptation & coping strategies

“...we need to look at which adaptation and coping strategies will work in community B and which will work in community A because I think the problem, we are having is taking coping and adaptation strategies across the board, to think that they will work across all communities”.

Mr. Henry Kaweesi, *Senior Agriculture Officer Nakasongola district.*
20th July 2022

Box 4. Past experiences as a basis for adoption of climate change adaptation

“We normally fail to learn from the past like for instance in Nakasongola we had a very serious dry season and there is a man who lost over 8 animals because of shortage of pastures. When rain came, I advised him to establish pasture gardens. The man told me, I have my native grass now. This man is now calling me let us establish the pastures”.

Mr. David Nsamba, *Nakasongola District Forestry Officer Nakasongola District,*
20th July 2022

5 CONCLUSIONS AND RECOMMENDATIONS

Climate change increasingly affects many regions of Uganda, especially the cattle corridor where Nakasongola district is located. However, the district has inadequate institutional, human capacity and knowledge for vulnerability assessment, to facilitate planning of adaptation and mitigation measures. This study has shown that with regard to vulnerability assessment, Nakasongola district leaders make use of the nature of climate change hazard, the geographical area most affected and frequency of occurrence. They also utilize available knowledge, skills and exposure to climate change adaptation, possibly to devise appropriate intervention measures. Income levels of the affected communities are also considered, as this would influence to some degree, the nature of interventions to be introduced.

On the institutional approaches used in carrying out climate change vulnerability assessment, respondents indicated that they conduct participatory rural appraisals (PRA) in the sampled villages/ communities, using

standard tools (questionnaire/checklist). They also draw from reports of LG departments and UNMA for seasonal weather updates and impacts, and development of disaster reduction maps & action plans. These approaches fall short of the standard procedures for vulnerability assessment as presented in USAID (2014) and the *National Climate Change Training Manual for the Inter-Institutional Climate Change Desk Officers and Relevant Stakeholders for Uganda* (MWE, 2017).

Gender issues: Although the district does not have a gender action plan *per se*, gender issues were mainstreamed in all action plans. The most common measures put in place to involve women include: ensuring participation of at least 30% of women and youth in all their activities; involving women and youth in sensitisation and training; promotion of Government and NGO programs involving women and youth as well as conducting needs assessment and supporting the identified needs.

Regarding institutional capacity for climate change-related assessment(s), most respondents identified inadequate funding and poor infrastructure for data collection, followed by the absence of a climate change office to develop a climate change action plan that would galvanise planning and response, and inadequate capacity for data collection, analysis and dissemination. There is a need for improvement in infrastructure for data collection, storage and retrieval by digitizing weather stations, purchasing computers of higher capacity and improving internet access. There is also a need to build capacity for climate change action & adaptation planning, and the need to recruitment of more staff (e.g. climate change officer) in key departments e.g. Natural resources.

On human capacity for climate change related assessment(s), respondents identified: very few staff members with skills for climate change-related issues as the number one capacity gap, followed by lack of a climate change officer who galvanises planning and response. To address these gaps, respondents identified: Training in climate change vulnerability assessment & participatory planning; and the need for training in climate change action planning, adaptation & mitigation. Generally, most respondents indicated the need for training in climate change assessment and PRA to address few staff with skills and lack of climate change officer.

On knowledge for climate change assessment, the majority of respondents identified limited knowledge on climate change issues (vulnerability assessment, planning, adaptation and mitigation) as a major gap in the district, followed by insufficient knowledge on research methods, data analysis, interpretation & reporting. There is a need to train district and lower-level Government staff in climate change issues; sensitise communities on climate change adaptation and mitigation, train them in research methods and develop an interactive knowledge management and communication strategy.

Needs and gaps	Recommendations
1. Inadequate capacity for climate change planning	Need to build capacity of the district in climate change action, planning & adaptation (establish a climate change office to galvanise planning and response).
2. Inadequate funding and poor infrastructure	Infrastructural support and financial resource mobilisation to facilitate planning, data collection, storage and retrieval (digitise weather stations, improve computers, internet) and transport for timely response interventions.
3. Very few staff have skills in climate change vulnerability assessment and development of climate change adaptation and mitigation plans	Training in climate change vulnerability assessment and participatory planning, climate change action planning.
4. Approaches used for vulnerability assessment fall short of the nationally recommended standards, as outlined in the <i>National Climate Change Training Manual for the Inter-Institutional Climate Change Desk Officers and Relevant Stakeholders for Uganda (MWE, 2017)</i> .	Refresher training for using the updated training manuals on vulnerability assessments.
5. Refresher training for staff previously trained in vulnerability assessment.	Capacity enhancement in gender mainstreaming, specifically in climate change-related actions.

6 REFERENCES

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7 APPENDICES

Appendix 1: Summary Questions Checklist

1. Is your institution involved in climate change-related actions (e.g. policy, technical, adaptation, mitigation, etc)? Y/N
2. Among the climate change actions is “assessing how vulnerable a (system/entity/community is” to impacts of climate change. Is your institution involved in climate change vulnerability assessment? Y/N
 - a. If yes, what factors does your institution consider in carrying out climate change vulnerability assessment?
3. What are your institutional approaches in carrying out climate change vulnerability assessment?
4. Does your institution have a gender action plan? Y/N
 - a. If yes, does the gender action plan take into consideration climate change vulnerability?
5. What measures do you have in place to involve women and youth in implementing climate change-related actions?
6. What gaps and needs have you observed in your institution, regarding climate change-related assessment(s) in relation to each of the following:
 - a. institutional capacity,
 - b. human capacity and
 - c. knowledge

Appendix 2. Stakeholder Consultation

No	Name	Designation	Subcounty
1	Ms. Nankabirwa Jalia	Agriculture Officer	Nabiswera
2	Ms. Nabisaso Mastullah	Agriculture Officer	Kalungi
3	Mr. Muwonge L Robert	Agriculture Veterinary Officer	Kalungi
4	Mr. Sebwato Joshua	Agriculture Officer	Wabinyonyi
5	Mr. Semwanga Richard	Agriculture Officer	Nakitoma
6	Mr. Sarah Nakamya	Actg. District Production Officer	Nakasongola Government Local
7	Mr. Mukooza Henry	Senior Community Development Officer	Nakasongola Government Local
8	Dr. Kitaka Gerald	NADIFA	Nakasongola
9	Mr. Bakwesani Juma	VCO	Nakasongola Government Local
10	Mr. Nsamba David	District Forestry Officer	Nakasongola Government Local
11	Mr. Kaweesi Henry	Senior Agriculture Officer	Nakasongola Government Local
12	Mr. Muwonge Hussein	District Water Officer	Nakasongola Government Local
13	Mr. Seggayi Vicent	Agricultural Officer	Nakasongola Government Local
14	Prof. John B. Kadu	CHAI	CHAI
15	Mr. Milton Waiswa	Manager, Station Networks	Uganda National Meteorology Authority
16	Mr. Patrick Kibaya	CHAI	CHAI
17	Mr. Paul Nkata	CHAI	CHAI
18	Ms. Saudah Mwangale	CHAI	CHAI

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