

Action research on the development of a monitoring tool on local climate change adaptation

Can we monitor the contribution of small-scale Integrated Water Resources Management interventions on the Climate Change Adaptation of a local community in the landing site of Kayinja, Western Uganda?

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The monitoring of the contribution of local Integrated Water Resources Management (IWRM) measures to Climate Change Adaptation (CCA) is challenging and difficult. Climate Change (CC) is a long-term process, uncertainties are inherent, and the effects vary from one place to another. A monitoring tool should therefore be flexible, locally adapted, and developed with participation of the local communities who are impacted by CC. Protos implements an action research in the fishing community Kayinja in Western Uganda that focuses on how a tool, that monitors the contribution of IWRM measures to local CCA, can be developed with participation of the local community. The action research is still on-going, but the intermediate results are promising, and the process up to now can inspire other organisations in the CCA sector.

This article is based on the project study of Löwe Janina "Action Research on the Development of a Monitoring Tool for Climate Change Adaptation ; A report of findings from Kayinja, Kamwenge District, Western Uganda (2015)".

1. Introduction

1.1. Introduction

Climate change adaptation refers to how people and systems adjust to the actual or expected effects of climate change (IPCC – Intergovernmental Panel on Climate Change) Global efforts on climate change adaptation are likely to be scaled up with considerable additional funds. As these developments take place it will be vital to ensure that monitoring and evaluation is built. A systematic monitoring tool for climate change will help non-governmental organisations and stakeholders operating within the water, environmental and development sector to improve their work, to account for their actions and to advocate for more funds. Protos has taken the initiative to quantify the outcomes and monitor its IWRM interventions in the River Mpanga catchment in Western Uganda, using action research. The aim is to develop a monitoring tool, which allows measuring the effectiveness of the IWRM-program at local scale. The research started in October 2014 and is still ongoing. This article describes the approach, the process and the intermediate results up to now.

1.2. Action Research

In 2013 Protos adopted action research as the central approach for its programmes. Action research is an approach that integrates research in the action. Through action research, Protos wants to

acquire a better understanding of the problem, to develop adequate solutions. Through the implementation of this solution Protos wants to contribute to the resolution of the problem. The aim of this approach is to develop, implement and disseminate innovative solutions for the challenges in the water sector.

1.3. Study Area

Protos and JESE work since 1999 in the River Mpanga catchment in Western Uganda. This catchment area extends along the 200-kilometre-long river and starts at an altitude of 1,700m in the Rwenzori Mountains and opens into Lake George at an altitude of 914m. Mpanga crosses 3 different districts (Kabarole, Kyenjojo and Kamwenge). Large-scale deforestation in the Mpanga source area leads to large erosion at the steep mountain slopes, with a high risk of landslides.



Map of Uganda – source UN Cartographic Section

In 2014, Protos and JESE decided to focus intensely on the landing site Kayinja in the catchment area, in order to develop a model site that can document on the methods for the improvement of the livelihoods in changing climatic conditions, by working on WASH (water, sanitation and hygiene) and IWRM.

The landing site or fishing village of Kayinja, situated in Bukurungo Parish in Mayhoru Sub-County, is a village on Lake George. 1,068 persons live there permanently and there is an important migrating fishing community (approximately 320 persons), which makes the social context special.

The situation before the intervention of JESE and Protos was as follows: the majority of the population was directly reliant on the lake: 35% of the population were fishermen, 27% were farmers and the others were reliant on the informal economy. 97% of the population used the lake as their only drinking water source. People had access to the sanitary infrastructure: 90% had a latrine, but due to the high water table, this was not a reinforced drain, unstable and it could easily collapse. Almost 50% of households did not wash their hands after defecation and most households were not in the habit of using a water tank and water hygienically. This caused many diseases such as diarrhoea and typhus, especially in the youngest children. (*Protos, 2013*)

2. Determination of the problem, hypothesis and research question

2.1. Determination of the problem

The link between water and the impact of CC is obvious. CC threatens to put further pressure on water resources due to a possible increase in the already high variability in rainfall and river flows and changes to the geographical distribution of water resources, some areas possibly becoming drier, and others becoming wetter (*Kundzewicz et al., 2007*). Through management of the resource at the most adequate level, the organization of participation in management practices and policy development, and assuring that the most vulnerable groups are considered, IWRM instruments directly assist communities to cope with climate variability (*GWP- Global Water Partnership*)

IWRM is a process which promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (*GWP*).

According to the strategy of Protos, IWRM occurs in a holistic framework, dealing with:

- All water in a watershed;
- All stakeholders with their different interests, responsibilities and at different levels;
- All water uses;
- Sustainability.

In Kayinja Protos focuses on identifying practical small-scale IWRM interventions at household level that enhance the adaptive capacity or resilience to CC in a sustainable way. This focus was chosen in a dialogue with the DWRM (*Directorate Water Resources Management*), that emphasizes the need for practical examples of IWRM as a tool for adaptation to climate change. But Protos still lacks proof that what has been done in its IWRM program is indeed contributing to local CCA (*Climate Change Adaptation*). In order to be able to evaluate the success of the interventions on CCA in the water sector at local level, there is need for a tool that can measure the impact of these interventions.

2.2. Hypothesis

When trying to predict or assume the contribution of IWRM measures on CCA, one will have to deal with different challenges. Some of these challenges are (*Bours, Collin and Pringle; 2014*) :

- Climate change is global, but adaptation is local. Effects of climate change vary from place to place, and also the IWRM measures and their impacts will vary from place to place. A monitoring system has to take into account these local factors.
- Adaptation is not an end-point, but a process of continual adjustment to a changing environment. It is not possible to compare the obtained results with an end-point, so there is

no clear indication that a program is “successful”. When one wants to evaluate the success of a programme of CCA, he will have to rely on proxy indicators¹.

- CC is a long term process and uncertainties are inherent to CCA. CC stretches over many years, much longer than the programme duration. The impact of the programme should ideally be evaluated in the far future, which is impossible. This future is also uncertain, because it depends on many factors e.g. greenhouse gas emissions but also on political decisions etc, which are also unpredictable. To cope with these uncertainties, planning and evaluation have to be flexible.
- Monitoring CCA is like tracking a moving target. Natural and socio-ecological systems are continuously changing. A baseline, drawn up at the beginning of a programme, may lose its relevance after some time, which makes it difficult to compare “before” and “after”.

From these considerations, one can conclude that monitoring of CCA will be difficult. Although, by setting the right indicators that are locally adapted, that are flexible in time and that can be measured beyond program cycles, it is possible to predict and simulate the contribution of small-scale interventions to local CCA.

2.3. Action research question

This action research focuses on how a tool, that monitors the contribution to local CCA, can be developed with participation of the local community of Kayinja.

To understand this action research question correctly, it is important to be precise about the terms “local CCA” and “contribution”.

Local climate change adaptation refers to how people and systems adjust to the actual or expected local effects of climate change. The aim of CCA is to moderate harm (PMD = prevent or minimize damage), or to exploit potential benefits (TAO = take advantage of opportunities). (SEA Change) Protos focuses on community-based adaptation, which emphasizes on participatory approaches and community involvement.

Attribution versus contribution : in the case of attribution, the link between cause and effect is direct and visible. In more complex and long term processes, such as CCA, attribution to outcomes is difficult to demonstrate. Not only the small scale interventions may have an impact on CCA, other factors will also influence CCA. We can only speak of a contribution to CCA. (SEA Change)

3. Methodology

3.1. Theory of Change and Contribution Analysis

After a literature review by Protos, and a peer review by other NGOs (JESE and Broederlijk Delen) it was agreed that the Theory of Change (ToC) approach would be tested as a monitoring tool for the impact of small-scale IWRM interventions on local CCA. A ToC is a comprehensive description of how and why a desired change is believed to happen in a particular context. It is a representation of how and why complex change process will succeed under specific circumstances.

¹ Proxy indicator : indirect measure or sign that approximates or represents a phenomenon in the absence of a direct measure (*businessdictionary.com*)

According to SEA Change, a “consensus is emerging among monitoring & evaluation experts that ToC is one of the more robust approaches to designing and evaluating CCA, which is inherently complex, multifaceted, and long-term in scope”. A ToC emphasis on a local contextual analysis. It is iterative and flexible, and has to be reviewed regularly. It encourages an open dialogue between stakeholders and promotes participation. It also shows the contribution of the different elements of the ToC to long-term changes.

Protos decided to complete the ToC with a contribution analysis. To assess the performance of a programme, it is needed to study the link between cause and effect. The ToC gives a description of the changes, but doesn’t give an answer to the question to what extent the observed changes are due the Protos interventions or to other factors. A contribution analysis helps to come to reasonable robust conclusions about the contribution being made by programmes to observed results (*John Mayne, 2008*). This is done by verifying if the planned activities are being implemented, by verifying if the chain of expected results occurred and by assessing other influencing factors with regards to their contribution to the CCA.

3.2. Participatory Community Meetings on Climate Change Adaptation

After developing the ToC outcome chains, the next step was to identify key outcomes for CCA in Kayinja. Key indicators had to be defined to measure the impact of these key outcomes .

Furthermore, the ToC had to be shared with the beneficiaries in order to guarantee the acceptance and to involve the community in the monitoring process during community meetings. The objectives of the participatory community meeting were :

- To compare the ToC with subjective and common perceptions of the local situation;
- To involve the community from the beginning to guarantee the local relevance, the acceptance and the sustainability of the monitoring strategy for CCA;
- To identify priority or so called “golden” sectors that are both articulated by the community as relevant and are part of the Protos programme;
- To ensure that the communities’ priorities and opinions about possible measures of CCA are taken into account;
- To identify possibilities for community involvement in monitoring of CCA.

On basis of these objectives, four areas and questions for the community were identified in a participatory way :

| Area | Questions |
|--------------------------------|--|
| Knowledge & Awareness about CC | What is CC? |
| Felt impact of CC | How does CC affect the community in terms of nutrition, income, productivity and health? |
| CCA actions | How can negative impacts of CC be reduced in the community ? |
| CCA monitoring | How can we monitor CC and its CCA measures? |

Table 1 : Questions for community meetings

Each question was split up in sub-questions that were put into guidelines to be used in the community meetings. Three sessions with the community were organised.

4. Results of the community meetings

4.1. Knowledge and awareness about CC

The aim of the first session in Kayinja was to answer the first of the four identified questions: to bring everybody to the same level of knowledge and understanding about CC. The results of this session showed that there is already a certain level of knowledge. The community members named mainly negative impacts that they feel in their daily life, especially in water availability. Some people also mentioned causes, but these causes concern rather local human activities with a negative impact on the environment, such as cutting vegetation, than activities that are directly related to CC. The emission of greenhouse gases was cited only once, but the link with CC could not be explained.

After the community members had given their own definitions and explanation of what is CC to them, a commonly understood, rather scientific definition was given by the CC expert of the Mountains of the Moon University.

| |
|---|
| Climate Change is a significant, but lasting change of our weather over sustained periods of time. |
|---|

4.2. Felt impact of CC

In the second session, the focus was put on the two following areas: the identification of major impacts of CC and the possible strategies to cope with them.

Based on the ToC for Kayinja, four domains of impact were already identified : nutrition, income, productivity and health. The communities were asked to identify impacts related to these 4 domains, so to assure sufficient coherency with the ToC.

| Nutrition and health ² | Income | Productivity (agriculture) |
|-----------------------------------|--|----------------------------|
| Unsafe water | Reduced fish catch | Poor & low yields |
| Diseases (e.g. malnutrition) | Flooding in roads limiting transport | Low pasture & water |
| ... | Destruction of property (houses & livestock) | Planting season shifted |
| | | |

Table 2 : Examples of felt impact of CC on the community

4.3. CCA actions

During this first session, the participants were asked to give some examples of local adaptation measures in Kayinja. Afterwards, the answers were listed according to PMD and TAO. By doing this, it was shown that CCA can both prevent damage but also create new opportunities for the community. Many participants just listed interventions that already had been undertaken by JESE and Protos in Kayinja. The question remains if these answers were influenced by the fact that JESE and Protos were facilitating this session, and if facilitation by a person who is not involved in Kayinja would have led to other propositions.

In the second session, the community members were again invited to propose measures that can reduce the negative impacts in the community. The identified measures during this session did not only concern the activities already implemented in the Protos program, but the community suggested also new measures. This is probably the result of the discussion on what is CC and what is the felt impact. On the other hand, participants were also asked to identify new measures.

- 💧 Organize ourselves into groups to sensitize community members on conserving the environment and natural resources, e.g. not cultivating on lake shores and change behaviors
- 💧 Storing food during seasons of plenty (more sensitization on food security)
- 💧 Diversity into other businesses, e.g. brick making in the dry season
- 💧 Rainwater harvesting

Table 3 : Examples of identified measures

4.4. CCA monitoring

The results of the previous exercises were used to identify the key sectors of negative or positive impacts of CC in Kayinja. There was a particular attention to have an overlap between what was identified by the community as 'relevant regarding CCA' and what was part of the ToC and fitting in the IWRM program of Protos in this community. The identified sectors were: access to safe water, food security, waste management, income, energy saving, farming methods, sensitised community, soil erosion control, wetland & waterbodies protection, flood control and hygiene & sanitation.

² Nutrition and health were taken together

Sector : Hygiene and sanitation

- 💧 There is 100 % latrine coverage at household level in Kayinja
- 💧 In Kayinja, at the landing site there is a public sanitation structure in use and it is well maintained
- 💧 In Kayinja, people are selling and cleaning fish in a hygienic way (fish cleaning units, slabs and market stalls are in use)
- 💧 Human-animal interaction is controlled: there are no animals in the landing site and the animals in the village are not freely walking (defecating) around

Table 4 : Outcomes for the sector hygiene and sanitation

During the third session with the community these key sectors were translated in local language, presented to the local community and discussed to enhance the understanding of each sector. Then the participants were asked to choose the three most important sectors in CCA that should be focused on and be monitored. The selected sectors were : **income, sensitised community and farming methods.**

Afterwards, the community drafted for each chosen sector a “*future dream scenario*”, i.e. “*How should the sector look like if we adapt successfully to CC ?*”. For each sector not more than 5 indicators were formulated. The indicators were given by the ToC, but the community members could add some. By doing a transect walk, a clear picture was drawn of the current situation on the indicators. A transect walk involves walking with community members through the village from one side to the other, observing, asking questions, and listening. The results of these walks were summarized in a monitoring sheet that forms the base line for further monitoring activities.

| Sector | | | | |
|--------------------------------------|---|---|--|---|
| Scoring about (date) | PAST / PRESENT: | | | |
| Scored by (name + contact) | | | | |
| Indicator | | | | |
| | This is not at all in place, not seen (0) | Some aspects are there, but still a lot of work to reach the goal (1) | Many aspects are there, only a few things to work on to reach the goal (2) | This is completely in place and seen all over the place (3) |
| Tick the score | | | | |
| Explain why you chose for this score | | | | |

Table 5 : Monitoring sheet

The results of all monitoring sheets were presented in a monitoring overview table for each sector. Each table gives a quantification of the past situation and the current situation. Regular up-dating of these tables will show a trend in adaptation. Full CCA (i.e. the dream scenario) for all indicators will never be possible. The monitoring table focuses rather on the trend than on the achievement of communities’ ideal of CCA, the dream scenario. If the table indicate that the trend for the different indicators is positive, then one can conclude that the community has enhanced its adaptive capacity and reduced its vulnerability. In this case, we can speak of a contribution to CCA by the program.

| Sector | | | | | | | | | | | | |
|---------------|------------------------|---|---|---|-------------------------|---|---|---|-------------------------|---|---|---|
| | Past, before programme | | | | Today, during programme | | | | Future, after programme | | | |
| Ind. 1 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| Ind. 2 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| Ind. 3 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| Ind. 4 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| Ind. 5 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| Sum of scores | /15 % | | | | /15 % | | | | /15 % | | | |

Table 6 : Monitoring table

5. Feedback by other stakeholders and lessons learnt

An essential part in the action research on the development of the monitoring tool on CCA is the involvement of other stakeholders. The aim of this involvement is twofold:

- Sharing the process of development tool for CCA with other stakeholders from the water and environmental sector;
- Valuing feedback in this stage of development in order to improve the tool.

A round table meeting was organized with stakeholders from different levels of intervention : governmental structures, partner organizations and other experts from the development and academic sector. Although the development and the improvement of the monitoring tool is still ongoing, the following lessons could be drawn:

- The followed methodology stimulated an involvement at two levels:
 - At stakeholders level (..) through the peer review, the construction of the ToC and the round table meeting
 - At community level through the community meetings, especially in the identification of the needs and the further use of the monitoring tool.

There is as strong interest commitment at both levels, due to the participatory methods, which is a pre-condition for the further development and use of the tool.

- ToC is a useful tool for setting outcomes and indicators. It is a very interesting instrument to analyse the set-up of programmes. A good ToC helps to make the link between single activities and the success of the program. The outcomes chain makes it easy to explain the programs logic, but ToC as method did not seem useful for community involvement for us. A ToC is often too theoretical and abstract for community members.
- It is a challenge to involve the community in the process of defining the indicators. Very few or no community members have a scientific background and don't have the scientific knowledge to determine what is most effective in CCA. In the actual methodology there is an overdependence on the communities perceptions and knowledge. This is where a combination of expert knowledge and local knowledge is needed. CC experts should sensitise the community, and take them through the process of understanding CC and its effects.

6. The way forward

The aim of this action research is to develop a tool that can measure the impact of small-scale IWRM measures on CCA of local communities, and to disseminate this tool in Uganda. Although, before disseminating this tool, some parts of the tool need to be overhauled and improved. Possibilities for improvement are :

- Developing strategies to ensure the sustainability of the monitoring by local monitoring agents;
- Putting more emphasis on the link between impact and adaptation measures;
- Strengthening the participation of the whole community, by including children, schools, disabled persons ... ;

In the next phase of the action research, these possibilities will be investigated to improve the tool.

Although the development of the tool is not yet finished, the process as far may help other organisations in the CCA sector applying AR as well as ToC, and inspire them to collaborate with Protos.

7. Conclusion

It is impossible to develop a monitoring tool that can be used in all contexts. It should be locally adapted, so that it takes into account all local aspects.

The tool is not only used for monitoring, but through its participatory development, it also stimulates a reflection on CC and its effects, and it motivates the local community for CCA.

Proofing the attribution of an intervention to CCA is not an exact science, but relies on local perception. The meaning and perception of the local community is crucial, both in the sustainability of the CCA interventions but also in the reliability of the monitoring tool.

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