

Adapting Water Management to the consequences of climate change (focusing on rainwater harvesting and other technologies) The Diocese of Kigezi Rainwater Harvesting Case

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Background:

Diocese of Kigezi – Water Programme is a faith-based programme working with the Diocese of Kigezi under Planning and Development Department. The Diocese covers the entire Kabale District, in Southwest Uganda near Uganda-Rwanda border. Kigezi is a hilly area with mountains ranging in heights from 1,800 to 2,000 meters above sea level and is characterized by heavy rainfall (average 1000mm) spread over three wet seasons. KDWSP has been in operation since 1986, providing a sustainable health improvement to over 22,780 beneficiaries per year in the district, through provision of improved and sustainable water supply and sanitation services and hygiene practices through projects (construction of Gravity Flow Schemes, rainwater catchment structures, protection of springs); health, hygiene and sanitation and maintenance trainings.

The churches in the district are wide spread and reach all the corners. Because they are in the community and know the real needs of the people at the grassroot, they are good at mobilizing people for development projects. However, not many churches in Uganda are involved in the areas of water development. The few that are there have had tremendous contributions and success.

The Diocese of Kigezi – Rainwater Harvesting:

Until 1995 most of the construction was in GFS and protection of springs but it was evident that most places in Kigezi could not benefit from such technologies as most of the households stay on hill tops leaving the bottom fertile areas for cultivation. KDWSP could not fully meet its objective of reducing distance to water points and time spent in water hauling. It is against this background that the programme adopted the technology of rainwater harvesting.

Rainwater harvesting started with construction of institutional tanks in communities and at schools, health centres and churches. For some years water harvesting option in the eyes of key players in the water sector had been regarded uneconomical disregarding its efficiency and convenience but the many stories we have received from people that have the tanks at household level are very encouraging.

Our experience in rainwater harvesting has currently been shared with over 6 districts in Uganda. Exploring teams come to us and arrangements are made to send artisans in those districts to train other groups. Where it has taken root the results are worth.

Institutional rainwater tanks: These are brick masonry tanks at institutions varying in size from 15,000 to 100,000 litres and are installed at institutions like churches and schools to serve communities in the neighbourhood. During construction the communities provide all local materials like stones, coarse aggregates, sand and unskilled labour.

The equitable distribution of water amongst the beneficiaries, Maintenance and sustainability of these facilities at community level became a problem and the solution to this was to have the facilities for the communities at the household level; the jar and ferrocement tanks and this has worked very well.

The Rainwater Jar:

The rainwater jar is a low cost technology solution to inadequate and distant water sources in the rural communities, and is an initiative of the programme. It has a capacity of 420 litres. Typically, these serve at households with a number of six people and less. Each household contributes a specified amount of money per jar, sand, mud plus food and accommodation for the skilled labourers. A jar is made out of only one bag of cement using a wooden mould which is removed after the cement layer has set. The advantage of this jar is that it can easily be replicated at household level as demand for more water arises.



The Ferrocement Tank: The ferrocement tank provides a better solution for rainwater harvesting than the ‘jar’ but its initial cost is much higher than that of the jar. It has a capacity of 4,000 liters and are constructed by Community Based Organisations (CBO’s) after acquiring the skill of construction. These are already established groups with by-laws, common goals and objectives) and as such have a culture of working together.

The groups are followed up and monitored after the initial training to ensure that the skill has been mastered before the group members are allowed to go out to train other groups. These groups help in the dissemination of skills



and scaling up of programme activities. Each member of the group (usually a household) contributes a specified amount of money per tank, plus aggregate, sand and skilled labour. The figure shows a beneficiary collecting water from a ferrocement tank built at her household. Basing on Kabale Districts rainfall data collected over a period of 12 years, its design ensures that its users have water for 95% of the year. The design parameters are shown in the table below.

Roof Area (m ²)	64 m ²
Fraction of rainfall caught	90%
Daily abstraction (litres)	60 litres (10 l/p/d)
Percentage empty days	0.5%
Volume of tank	4,000 litres

These facilities are fully operational after the construction. The construction goes with the fixing of gutters, overflows, collection taps, and washouts.

KDWSP has been involved in rainwater harvesting for the last 11 years. It has evolved from construction of brick masonry tanks at Institutions, through household 420-litre jars, then to the 4,000 to 6,000-litre ferrocement household tanks. So far, about 9,000 jars and 120 institutional tanks have been constructed and 435 tanks constructed by women groups within the district. Through this multiplier effect enabled by the programme, other CBO's and individuals have been able to meet the full cost of rainwater tanks. This training has also been adopted by some rainwater jar communities. In one sub-county (Muko), for example 7 men were trained in rainwater jar and tank construction in 2002. They have so far constructed 160 jars and 65 brick tanks for a number of individuals at full cost.

Summary of contributions from beneficiaries

Technology	Cost	Contributions	
		External	Local
Institutional Tanks (20,000-litre)	\$2,700	77%	13%
Household Jars (420-litre)	\$77	66%	34%
Household Tanks (4,000-litre)	\$320	51%	49%

KDWSP approach to communities

Planning and Identification

- Written request to Diocese is received from community directly or via local Government, church or CBO - Some requests are passed on directly from District Water Office. Main CBOs are stretcher groups and funeral groups, which are very powerful.
- Planning with District Water Office – The programme sits with the District Water and Sanitation Committee where the requests are shared and discussion is held on different areas of work to avoid duplication of services
- KDWSP visits to assess the need, demand and technical potential - Community meeting to spell out community and KDWSP responsibilities. Community contributions

include locally available materials, unskilled labour, food and accommodation for skilled labour.

- KDWSP draws up a short-list of potential projects - Short-listing criteria: poverty and disease levels; distance to, and quality/ quantity of water source; history of other development projects; willingness to participate.
- KDWSP Management Committee selects projects for particular financial year - At this level, site selection attempts to spread programme benefits throughout the Diocese. New work takes place in one of four geographical zones annually in order to work towards critical mass of good practice, as well as for logistical purposes and to avoid spreading the programme too thinly.
- Selected community is visited by Programme Coordinator or Health Promotion Officer - The programme modus operandi is set out in a community meeting. Community election of Water and Sanitation (WATSAN) Committee for all community aspects of co-ordination of project software, including future sustainability and scheme management then follows. Scheme Attendants then elected (for gravity projects) for scheme hardware maintenance. Commitment fee paid after signing agreement between all stakeholders. Designated Health Promotion Trainer (HPT) introduced to community, and identified as the channel of communication between community and KDWSP.

Design

- Health Promotion Trainer moves into community - Occurs as soon as possible after community is informed of programme assistance. Community provides food and accommodation for HPT.
- Baseline survey carried out - Carried out by HPT's and WATSAN. Minimum 50% of houses visited. WATSAN trained in issues involved in surveys. Within 6 weeks a community meeting is held to discuss the results, and an action plan is drawn up.
- Design is carried - Mapping by the community used to plan water facility locations. Poverty focus: facilities specifically located closer to disabled and elderly. (For rainwater catchment schemes, up to 10% of jars allocated free of charge by community to poorest/ most vulnerable).

Implementation

- Construction commences - Community provides all locally available materials (sand, stones, mud), storage of materials, unskilled labour, and food and accommodation for skilled labour.
- Hygiene promotion continues throughout construction, through informal and formal means - Focus on building strong relationship between HPT and community (especially women), enhancing both informal, opportunistic training and formal large and small group training, the latter including women's groups, schools, WATSAN, and stretcher & funeral groups.

- Community trained in maintenance and WATSAN trained in record keeping and financial management - Guidelines given to community on establishing by-laws, bi-annual re-election of WATSAN. Communities generally address problems (repairs, maintenance and WATSAN performance) as they arise, rather than having a set programme.

Monitoring and evaluation

- Monitoring Team elected and trained - Upon completion of construction, community elects a Monitoring Team (MT). Trained in monitoring and surveys (developing their own checklists, collecting their own data, analyzing it and drawing their own action plans) in addition to same training as for WATSAN.
- Follow-up monitoring by MT, evaluation and action plan - Monitoring of households included in original base-line survey every 3 months. Checking out of gutters to see if they are broken or twisted, whether down pipes are functional, covers in place, water facilities washed and taps functional. Feed-back to Ongoing Monitoring & Advocacy Officer who analyses with MT and visits community to agree action plan to address problems (if any). It is from this that refresher trainings are carried out hence promoting the sense of ownership that fosters sustainability.

Lesson learning/ information dissemination

Competitions between households (both inter water facility and inter house health competitions) and these are carried out in order to create an enthusiasm to work and sustain their water and sanitation facilities as everyone will work hard to win, hence promoting sense of ownership. Judging is done by a combination of WATSANs co-opted individuals, Government health extension staff, and members of other communities.

Collaboration with the community leadership and other working agencies

The program recognizes the importance of working with all stakeholders not work in isolation. It works through committees like the water and sanitation committee (WATSAN), monitoring teams and other existing groups such as stretcher groups (burial groups), mother's union, Religious institutions, and Government extension workers. The different stake holder's work together in mobilization, sensitization, training, monitoring and evaluation of sanitation practices during and after program intervention. This promotes a spirit of responsibility and ownership, which has led to improvement and maintenance of hygiene activities during and after the Program's intervention. The committees involved work on a voluntary basis.

The South-Western Rainwater Centre;

The programme has set up a rainwater centre on the outskirts of Kabale town, The overall aim of the centre is to equip people with life skills in construction of rainwater harvesting facilities in 8 Districts of South

Western Uganda; Kabale, Ntungamo, Kisoro, Kanungu, Rukungiri, Isingiro, Kiruhura and Bushenyi. This resulted from a UWASNET (Uganda Water and Sanitation NGO Network) working group session, which identified that although Uganda is blessed with abundant rainfall and opportunities for the utilization of rainwater harvesting, there is a major shortage of skilled personnel to provide services to communities, Government and NGOs. This is limiting the uptake of rainwater harvesting technologies nationally and preventing Uganda from utilizing local labour and resources to reach the national targets for access to safe water (100% coverage by 2015). District and sub-county government demand for skilled personnel in rainwater harvesting is high. The centre will be available for other organisations to use.

The project is intended to train and equip 80 artisans from the 8 Districts annually with both construction and entrepreneurial skills in rainwater harvesting technologies (rainwater jar, ferrocement and brick masonry tank construction). The trained artisans will then go back to their respective communities where they will market their skills and shall be engaged by individuals and the private sector at full cost.

This is just the beginning but the rainwater will serve to help other districts and countries. We are happy to share what we have with others.

Domestic Rainwater Harvesting Pilot Project:

The Government of Uganda is convinced that rainwater harvesting technology is a suitable technology for most communities in highlands. We have been given funds to construct 270 ferrocement tanks of 4,000 litre capacity in two sub-counties as a pilot project. This too, will create a multiplier effect, the trained artisans can train others.

Artisans can now confidently market themselves in the construction sector and sell their skills – they are professionals in their own way and this has already boosted their household incomes.

This project is almost complete and Kigezi Diocese – Water and Sanitation Programme is willing to share her experiences with the rest of the country/other countries.

Advantages of rainwater harvesting:

1. It is a cheaper option compared to other technologies.
2. The facilities do not provide enough water year around, although they can be replicated by the beneficiaries without the programme involvement. The household can instal one unit at a time as and when able; one can have the facility even with very little investment.
3. The facility is owned by the household unlike the case with the community tank or tap stand. The attention attached to the facility at the household level is much higher than the communal one.
4. This option reduces the distance to the collection point more than any other source option.

5. The technology can be applied in any part of the district. It is not limited by altitude and terrain.
6. Once installed, the maintenance costs are very low compared to other options.
7. Rainwater is free from dissolved minerals and may have minimal waste. The content of unwanted dissolved minerals in bore holes, and other sources in most places is very high.
8. Rainwater water harvesting is a technology friendly to conservation of our environment.

Challenges:

1. We still have people with grass thatched houses and this takes us back to thinking of community tanks or advising them to install their facilities at neighbours' houses.
2. Availability of sand and the type of sand in some communities has become a problem and this increases our operational costs. In some places you can not find sand and in other places the type of sand available does not give good results.
3. Quality of cement sometimes is questionable although the factories are certified by International Standards. Some times the quantity is compromised yet the capacity of the jar is based on 50kg of cement.
 1. Skilled artisans are not many especially in water jar construction. Jar construction unlike other construction calls for well trained artisans. However, the number of artisans is growing gradually; it may take longer but we shall reach.
 2. Some households still find it hard to raise financial contributions. Poverty levels are still low in most communities and this becomes hard for the people to raise resources towards the facilities.

Conclusion

Technologies in rainwater harvesting have been tested in many countries and different options exist. We need to move forward and adapt these to our different environments.

Apparently rainwater harvesting is being considered as the one of the suitable technologies as far as provision of water for domestic consumption is concerned. By rainwater harvesting the benefits are more than water supply itself. Why then don't we mobilise resources and go for rainwater harvesting?

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