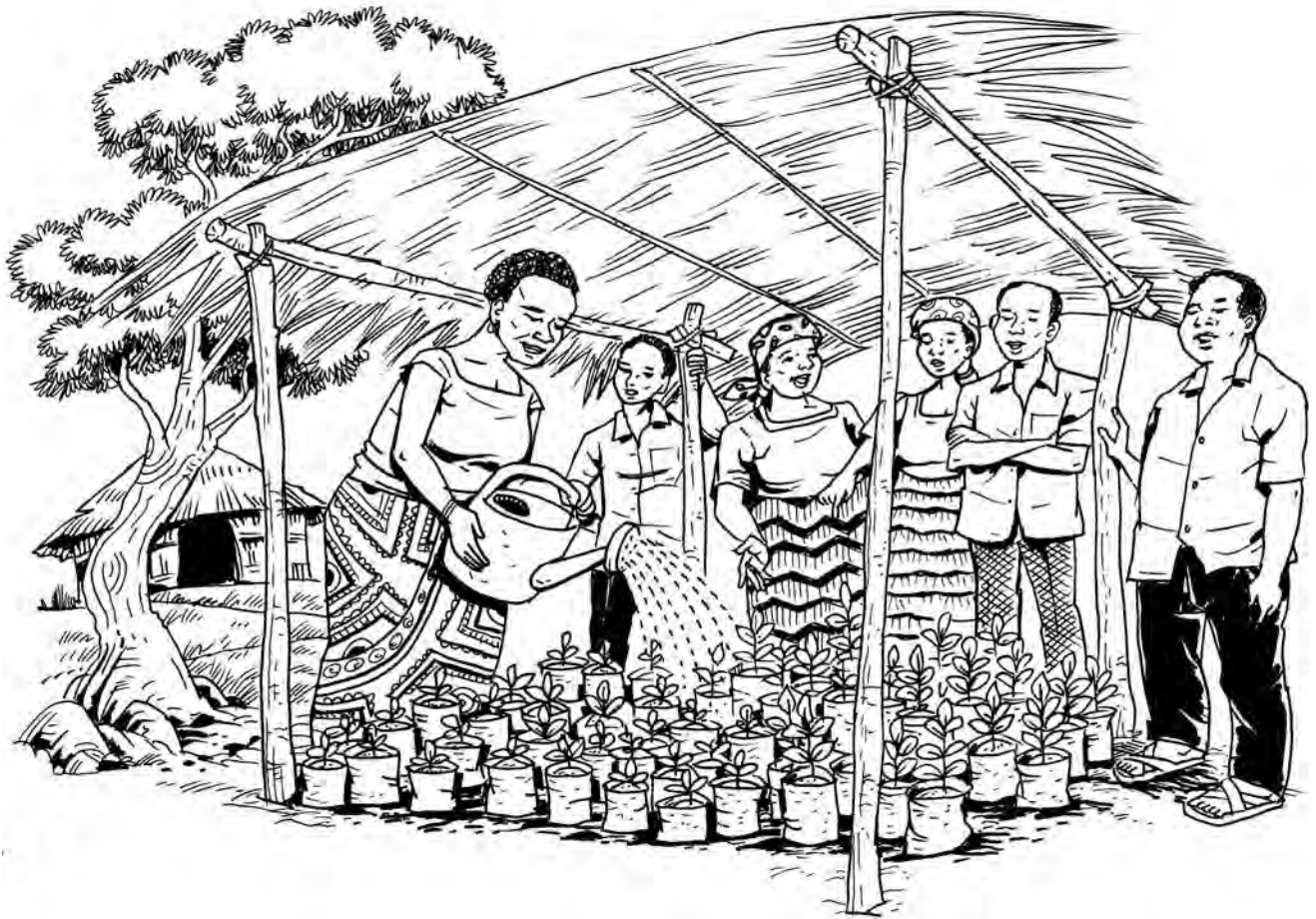


# Building Community Resilience to Climate Change through Water-Smart Agriculture



**K**DWSP is a faith-based organization (FBO) that has been providing sustainable water and sanitation services to the rural poor, and water has stressed the communities of Kigezi Diocese since its inception in 1986.

Rubaya and Butanda subcounties in Kabale District, southwestern Uganda, are heavily cultivated hills that range from 1,219 m (3,999 ft) to 2,347 m (7,700 ft) above sea level. Mean annual rainfall is 1,092 mm. The rainy seasons are from March to May and from September to November, with intervening light rains. The June to August spell is the main dry season, while from December to February, the rains

are usually light. About two million people live in the district, making it one of the most highly populated in the country.

The catchment area in the district comprises steep slopes, deeply narrow valleys of the Kigezi highlands, Lake Bunyonyi, River Ruhezagyende, and expansive swampy areas, 58% of which have been reclaimed for agriculture (NEMA, 2008).

In this area, pollution, urbanization, industrialization, and other challenges greatly affect water resources. Besides, low productivity, disease, malnutrition, slow economic growth, social instability, and conflicts

over resources have made the communities more vulnerable to degradation of environmental resources.

The main challenge to the water sector was in developing platforms for disseminating information on technologies, best practices, knowledge and experiences on water resources. It took great efforts to ensure that all stakeholders benefit and feel they are part of the process. The government's response to the challenge was seen in the Water Action Plan (WAP) released in 1993–94 to provide a flexible and dynamic framework for developing and managing Uganda's water resources.

KDWSP employed an integrated water resource management approach in a successful pilot project, thereby reaching 408 households (2,448 beneficiaries) in the two subcounties. This project promoted and coordinated development and management of water, land, and related resources. It aimed at equitably maximizing the resultant economic and social welfare without compromising sustainability of vital ecosystems. The project started in June 2011 and ended in December 2013.

Agriculture is the backbone of Uganda's economy, constituting about 42% of the GDP, more than 90% of export earnings, and employing about 86% of the labor force. However, the contribution of agriculture to total GDP has decreased from 45.7% in 1995–96 to 41.5% in 1999–2000.

## Problems

High population exerts lots of pressure on very scarce and fragmented land and its resources. This is so in the face of poor methods of farming, soil exhaustion due to destruction of soil structures, and deforestation for many economic and social reasons. The famous Kigezi terraces constructed during the colonial times have been heavily degraded and poorly maintained. As a result, landslides, floods, gullies, and erosion have brushed off fertile soils into lower streams.

Further, destruction, sedimentation, siltation, and pollution of water sources from floods and local gin effluents had compromised environmental and community health. More destruction of water projects such as gravity flow schemes of Kahungye and Muguli, gardens, homes, and latrines compounded the problem. Water sources were polluted by farmers

spraying crops and vegetables because the rains would wash the chemicals into the soils, which would then percolate into water systems.

More so, the rate of vegetation destruction was increasingly high with the rising population pressure and high poverty levels amidst limited alternative means of livelihoods. There was also pollution from local gin production plants with effluent discharges into water sources.

The community lacked appropriate technologies, best practices, and knowledge on the relationship between water and land resources, and how mismanaging one of them compromises the other. This inevitably affects the humanity that survives on such vital ecosystems. They could not systemically appreciate their problems.

## Implementation

To mitigate these problems, a participatory project analysis was conducted. This entailed resource mapping of vulnerabilities and assessing threats and severity of depletion from a cause-and-effect perspective. It also required capturing community attitudes and dynamics, re-engaging of traditional interventions and measures, and involving the concerned stakeholders. This approach helped in defining problems, setting priorities, action planning, capacity-building training and implementing the project.

KDWSP facilitated the formation and training of the catchment management organization and the resource user groups (charcoal burners, environmentalists, farmers, water user committees, and local gin producers). This strategically helped empower and put the community at the forefront of project implementation and sustainability.

Implementation involved the construction of conservation channels, energy-saving stoves, contour furrows and check dams, punctuated with soil-filled gunny bags constructed across formed gullies at intervals to trap the silt. All water resource banks were buffered with environment-friendly projects.

The communities were empowered to establish and manage nursery beds to improve green cover. Although replacing cut trees is good, it is not an effective method of recovering environmental benefits and, alternatively, an energy-saving stove

was devised to check this gap. This stove, crafted with a heating unit, a cooling chamber, and a slug channel leading to a soak pit, became an effective facility adopted, promoted, and widely used in the community to check negative pollution of the environment.

As well, there was need to create awareness in the community. The project established information and knowledge-sharing platforms for dissemination, learning, and training. Thematic messages were packaged in a video documentary, reports and music, and dance and drama pieces from farmer field schools. This strongly appealed to a wider audience, including mandated institutions and civil society at community, subcounty, district, regional, and national levels.

KDWSP monitored and supported the implementation processes of resources, whereas user groups and the community worked together to deliver these projects with external support. This helped the project extend technical support and review practices and activities during implementation.

## Methodology

The implementation was participatory as community members were involved in identifying and analyzing the problems, devising solutions, and training them how to implement and sustain the use of the technology.

The community mobilized locally available materials (resources) such as stones, sand, unskilled labor, and food contributions.

Equitably and inclusively, most interest groups, especially women, youth, and all institutions in the community participated, thereby bringing diverse stakeholders on board to capture wider interests and enhance project acceptability.

## Results

Five soil and water conservation (SWC) channels and 135 check dams were buffered and excavated of average capacity 2-6 m<sup>3</sup> punctuated with soil-filled gunny bags and elephant grass. These have helped retain water for recharge and re-use and healed many gullies.

A functional and effective catchment network of stakeholders was established for learning and relearning. This involved the district level water resources management body, mandated institutions, opinion leaders, political leaders, and representatives of resource users to capture the interests of all stakeholders.

Contact farmers in the catchment area planted 1,200 sugar canes, 900 seedlings of different tree species, 1,500 passion fruit, 200 tomato trees, and 600 grafted avocados. Four community-managed nursery beds were established to improve on the green cover while boosting their livelihood.

Twenty-three households were supported with energy-saving stoves. Five local distillery industries also received improved energy-saving stoves, each accommodating 24 heating containers. Energy consumption was cut to a quarter from what it had been previously, and firewood that previously lasted for only a single day now lasts 4 days.

Members of six water user committees were trained and refreshed; 179 artisans trained in rainwater-harvesting technologies have constructed 200 rainwater-harvesting ferrocement tanks (4,000 liters) and six institutional tanks (20,000–50,000 liters) to increase access to clean water for consumption, agriculture and environmental benefit, and to check water runoff.

## Challenges

The slow adaptation capacity and delayed shift in the mindset of farmers to help them move from traditional farming to conservation agriculture presented barriers to adoption.

Land fragmentation and scarcity were a challenge and a limitation to adaptation of best practices and resource bank protection.

## Lessons

Community-led initiatives that address problems in the community have defined themselves; these have provided a reliable premise for sustainability. Interventions that may contravene some values or policies should be well-defined to minimize conflicts.

Proper identification of real hot spots and devising appropriate technologies for intervention and agreeing on interventions have contributed to acceptability of the project and community participation.

The success of the project depends on the degree of the problem being addressed with alternatives and minimal interruption in people's livelihoods.

## Recommendations

Communities need participatory project analysis to achieve their full participation right from inception through implementation and sustainability of rolled-out project.

Conservation farming methods should be adapted to replace traditional means of farming to address issues of poverty as well.

Project commitments and promises must be made on realistic and sustainable interventions.

Local communities should be empowered to enable them to transform from being vulnerable beneficiaries to active stakeholders, who operate at the forefront of every intervention. This can bring multiplier effects to the community.

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