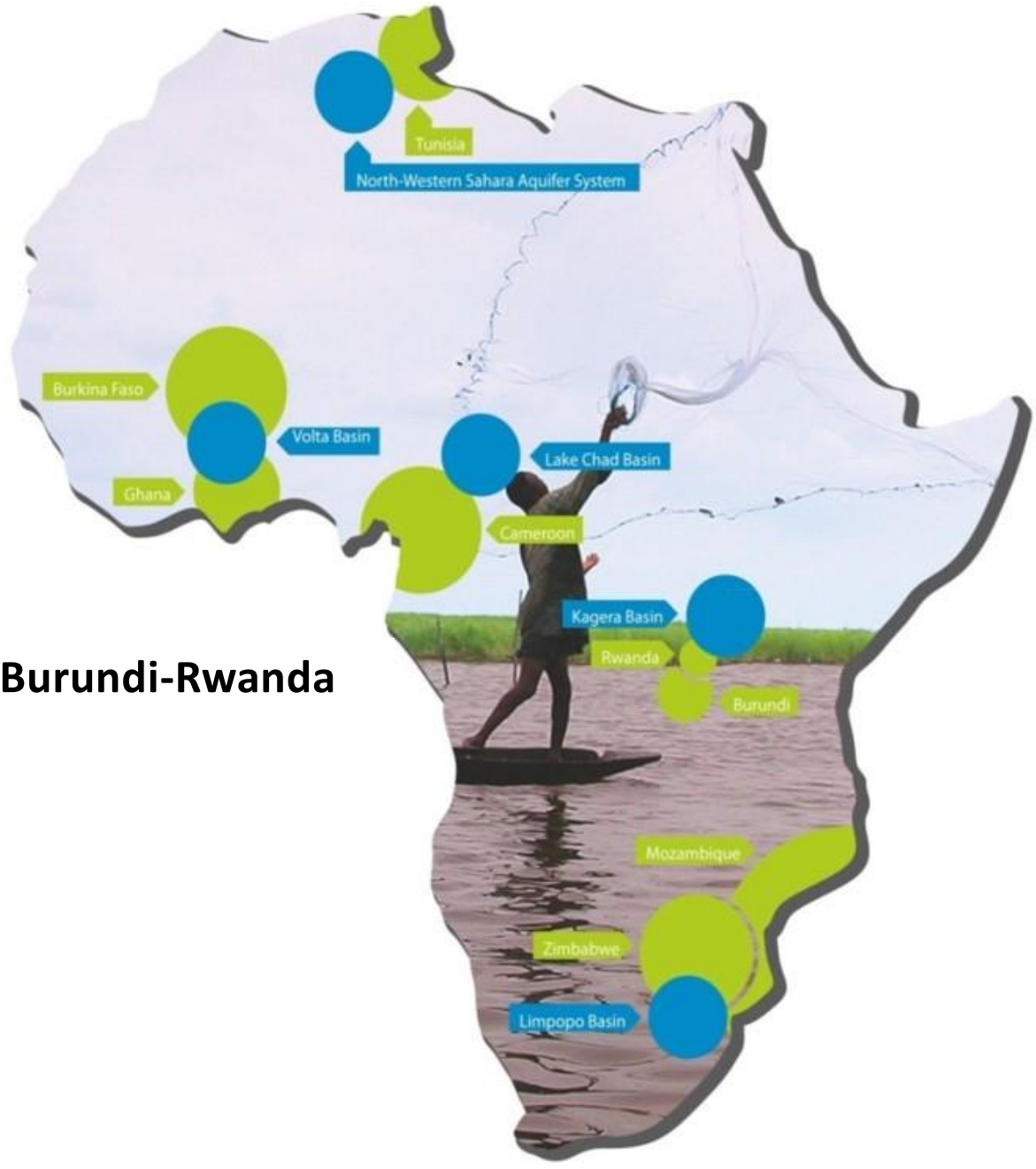
Global Water Partnership

Water, Climate and Development Programme (WACDEP) Case Study No. 1

Building Climate Change Resilience through Community Action: *A Transboundary Case of Lake Cyohoha in Bugesera*



Burundi-Rwanda

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Building Climate Change Resilience through Community Action: A transboundary Case of Lake Cyohoha in Bugesera

Burundi-Rwanda

Authors:
Kidanemariam Jembere - WACDEP Program Manager – GWP Eastern Africa
Kenge James Gunya – Knowledge Management Officer – GWPO

Editors:
Danka Thalmeinerova – Senior Knowledge Management Officer– GWPO
Mario Roidt - Knowledge Management Intern – GWPO

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About Global Water Partnership

The Global Water Partnership's vision is for a water secure world. Our mission is to advance governance and management of water resources for sustainable and equitable development.

GWP is an international network that was created in 1996 to foster the implementation of integrated water resources management: the coordinated development and management of water, land, and related resources in order to maximise economic and social welfare without compromising the sustainability of ecosystems and the environment.

The GWP Network is open to all organisations which recognise the principles of integrated water resources management endorsed by the Network. It includes states, government institutions (national, regional, and local), intergovernmental organisations, international and national non-governmental organisations, academic and research institutions, private sector companies, and service providers in the public sector.

The Network has 13 Regional Water Partnerships, 85 Country Water Partnerships, and more than 3,000 Partners located in 182 countries.

Global Water Partnership (GWP), Global Secretariat, PO Box 24177, 104 51 Stockholm, SWEDEN
Phone: +46 (0)8 1213 8600, Email: gwp@gwp.org, Facebook.com/globalwaterpartnership, Twitter@gwpnews

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1 Background

The Global Water Partnership (GWP) is tackling the challenges of climate change through the Water, Climate and Development Program (WACDEP). WACDEP includes a portfolio of programs and projects aiming to build climate resilience through better water management. The programs and projects are developed by GWP Regional Water Partnerships (RWPs) under the WACDEP Coordination Unit (CU) in collaboration with the respective governments, regional economic development communities and citizens. WACDEP was created to support the integration of water security and climate change resilience in the development planning and decision-making processes and to design financing and investment strategies.

The program came into existence in 2009, following the decision of the African Ministers' Council on Water (AMCOW) to fast-track the implementation of the Sharm el-Sheikh Declaration on Water and Sanitation. Its implementation initially started in eight countries: Cameroon, Ghana, Burkina Faso, Mozambique, Zimbabwe, Burundi, Rwanda and Tunisia, and in five transboundary basins: Volta Basin, Lake Chad, the Lake Victoria-Kagera basin, the Limpopo Basin and the western Sahara aquifer

In Eastern Africa, WACDEP implementation started in 2011 in the Kagera basin, specifically in the transboundary catchment of Lake Cyohoha in the Bugesera region that is shared by Burundi and Rwanda.

2 Introduction

The Lake Cyohoha transboundary catchment is located in the Bugesera region which is shared by Burundi and Rwanda and is part of the wider Lake Victoria basin. Its characteristic vegetation consists of dry savannas, and wetlands surrounding the rivers and the lake. Due to persistent drought and environmentally unfriendly human practices such as over-cultivation, deforestation and unregulated livestock rearing, the catchment faces problems of soil erosion, water pollution and water scarcity. In addition, both countries are challenged by food insecurity due to small plots of land, poor agricultural practices, land degradation and rapid population growth.

In terms of transboundary challenges, the environmental and water management systems in Burundi and Rwanda vary greatly.

Rwanda for example imposes much stricter environmental rules. The water resources are governed by Law No. 62/2008, which stipulates rules for the use, conservation, protection and management of water resources. According to this law, water is a good belonging to the state's public domain. Also, protecting and using water resources in Rwanda in the natural sense is of general interest and constitutes an imperative duty for all, including the state, the local communities, private sector, civil society, and citizens.

On the other hand, the Burundi Water Code is a general law providing the standards, the guiding principles and the legal and institutional frame of the water sector, to enable the good governance of potable water services for the Burundian population and sustainable management of water resources in the country.

The legal frame of water sector in Burundi evolved with time. It went through the status where water was a common asset, supposed to be abundant and inexhaustible that everyone could use as he wishes, up to the status where water reserves can only be accessed with the Governments authority. However, this legal frame was not complete and the existing legal texts remained non-operational as they were lacking by-laws and a wide dissemination to stakeholders. Shortcomings and inconsistencies have to be consequently corrected by the Water Code. It thus must be completed, brought to coherence and adapted to baseline data.

In summary, the environmental legislation and enforcement including water resources management vary greatly in Rwanda and Burundi. Rwanda is bound to very strict environmental laws in order to protect freshwater resources in its boundaries while Burundi on the other hand is still at low levels of managing its environment. In the current situation of resource scarcity and environmental degradation, conflicts are likely to arise. Limited management efforts by Burundi to protect the lake may compel Rwandans to take advantage of the lake's resources without considering issues of sustainability. Also, if the lake continues to shrink and wetlands dry up, conflicts over access to and use of resources could easily cause or aggravate social problems.

In this situation, the WACDEP program focuses on adaptation measures at community level aimed at integration of measures into wider policy frameworks with full stakeholder participation in both countries. To address the issues highlighted, the project started with a multidisciplinary group of experts from both countries that carried out a situation analysis and workshops with stakeholders were held to evaluate response measures. The stakeholders were mainly local government representatives, community representatives, technical government officers and the local implementing partners.

At catchment level, pilot project activities were implemented to enhance water security and climate resilience with such activities that include tree planting, promotion of biogas facilities, energy-saving cooking stoves and an expansion of water supply services. At government level, personnel from ministries and policy makers received training in water security and climate resilience to integrate the project measures into a wider framework of integrated approaches of water management.

3 Problem description

3.1 Geographical coverage

The Lake Cyohoha catchment falls within the Kagera sub-basin of the wider Lake Victoria basin which is part of the Nile Basin. The watersheds of Lake Cyohoha extend to an area of 508 km^2, of which 369

km^2 are located in Burundi and 139 km^2 in Rwanda. The lake is 27 km long and 5 to 2 km wide. It branches up to 9 km separated from the Akanyaru River by a series of swamps into the transboundary southern lake and the northern lake located in Rwanda (see figure 1).

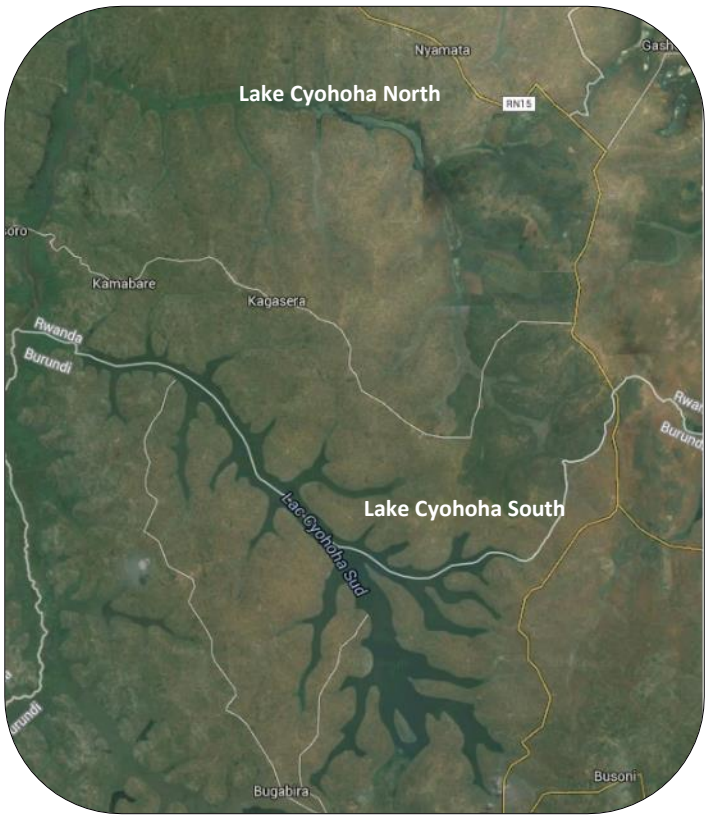

Figure 1: Lake Cyohoha Catchment

The dominant vegetation in the Bugesera region is dry savanna with short grasses, shrubs and short trees; a characteristic of arid and semi-arid areas. The shrubs and short trees also surround the undulating hills, valleys and along the rivers and wetlands. The extensive savannas and their drought resistant shrubs have historically provided grazing lands.

The main types of ecosystems found in Bugesera are wetlands, water bodies, agricultural landscapes, savanna woodlands and conserved rangelands. These ecosystems provide a variety of services for the people living in the surroundings of the lake.

Lake Cyohoha and its wetlands as well as the rivers are the principal source of water for humans, livestock and wildlife. However, as previously mentioned the lake and its wetland systems have been severely degraded due to agricultural expansion and settlement.

Consequently, with increasing population, most of the natural vegetation was converted into agricultural lands and over the period of time it disappeared. In terms of climate, the region is a low rainfall zone receiving an annual average of around 900 mm. Currently, the region is periodically faced with a persistent drought.

3.2 Agricultural pressures

Bugesera is one of the regions in both Burundi and Rwanda which are highly vulnerable to the impacts of climate change, thus the region is faced with drought as indicated earlier. This climatic change has not only affected the environment, land, water, or ecosystems in general but also the local economy and people's basic livelihoods in the region.

Land use in Bugesera and around the Lake Cyohoha catchment in particular, has changed tremendously over the last decades. Today, rain-fed agriculture is the most important livelihood for

90% of the population living in the Lake Cyohoha catchment. Because of this, a near total conversion of wetlands, forests and savanna woodlands into agricultural farms has occurred.

These changes have destroyed the wetlands and in doing so caused the micro-climate to change. Lake Cyohoha North depends on the surrounding wetlands for water which has shrunk significantly in the last couple of years. In addition to drought, water scarcity has become a persistent threat to the people in the region. Also, pesticides from agriculture are a major source of pollution for both the wetlands and Lake Cyohoha. More so, the area is also plagued by food insecurity caused by poor agricultural practices, land degradation and population pressure as well as small farming plots. This has been exacerbated by a legacy of civil wars and associated instability. Cross-border migration and unplanned settlements have increased and led to a further degradation of the environment and near depletion of available natural resources.

3.3 Water pressures

Kamabuye sector (an administrative unit lower than District in Rwanda) as an example is considered to show the challenge of water security in Bugesera. As of December 2011, Kamabuye sector's Population was 19,171 inhabitants with 9,106 men and 10,065 women (Kamabuye sector, 2012). In spite of this large number of inhabitants, the people of Kamabuye sector had only twelve public places from where they can fetch piped water. In general, the access to clean water is very limited.

There was only one person with piped water in the Biharagu cell (the lowest unit below sector). The majority of the people rely on water from Lake Cyohoha for both domestic and livestock use.

However,the lake water does not satisfy the standards of drinking water and most people do not boil their drinking water. This puts their lives at risk since the lake is also negatively affected by erosion as well as pollution. The locals used the wetlands for agricultural purposes causing a lot of soil erosion which ended up polluting the lake. Thus, the lake and its wetland systems, that provided local communities with various socio-economic and environmental services were seriously exposed to degradation.

3.4 Energy pressures

Soil erosion and deforestation in the catchment area are affecting the energy sector. At least 30 meters of lake shoreline have been lost to erosion. This is directly attributed to the impacts of cutting trees for firewood. Inadequate investments in alternative energy sources such as biogas or energy-saving stoves have been highlighted by the communities and local authorities and have resulted to use of wood or biomass for energy especially cooking. Due to forest degradation and intensive cutting practices, household members, especially women, youth and girl children have to travel further away to collect fuelwood which increases their vulnerability.

3.5 Climate change

Climate change trends threaten to exacerbate existing problems and severely impact the development and wellbeing of communities. Extreme weather events like the drought already taking place will become more frequent. The same is true for torrential rain which, due to the loss of the wetlands, is even more likely to cause floods in the area. Access to basic services such as safe drinking water, sanitation, health services and modern sources of energy is very low in the catchment area. The compounded effects of all these will only lead to extreme poverty in the Bugesera region if specific actions are not taken to address the problems.

4 Decisions and actions taken

4.1 Mobilisation of Stakeholders

As a first step to address the problems of the Bugesera region, an in depth situation analysis was carried out in November and December of 2012 by a multidisciplinary team of experts from both countries, supported by GWP-WACDEP Eastern Africa. The group used guided interviews, questionnaires, observations, document reviews and community consultations to generate data. They also identified possible response measures which were presented along with the results of the analysis during a workshop in July 2013. The expert workshop was attended by participants from Burundi and Rwanda, specifically community representatives, local implementing partners (government offices and NGOs) and policy makers at national level such as the ministries of water, environment, and agriculture. This way, stakeholder involvement was given from the start.

During the workshop, possible response measures were discussed and evaluated. Stakeholders from Burundi and Rwanda agreed on priority interventions for immediate action on the ground and specific sites for implementation were identified.

The agreed interventions included:

1. protection of buffer zones along the shorelines of Lake Cyohoha through enforcement of national environmental laws and the planting of trees;
2. improving water infrastructure through water supply facilities, rainwater harvesting and environmentally friendly irrigation measures;
3. improved fuel saving cooking stoves and promoting the adoption of biogas and solar energy facilities as reliable and climate resilient sources of energy for cooking and lighting;
4. building capacities of the beneficiaries on water security and climate resilience;
5. raising awareness through sensitization activities and media training.

A hydro-climatic and socio-economic assessment of the catchment was also carried out and the regions' challenges were identified as mentioned previously. In addition, the participants of the workshop also developed a detailed action plan for the years 2013 - 2014 that set a specific timeframe, identified responsible lead institutions and collaborators as well as mechanisms for implementation through the means of WACDEP demonstration projects. Long-term actions were also discussed and agreed upon for the maintenance and management of the WACDEP demonstration projects in both countries. It is in this capacity that local leaders emphasized the role of the communities in protecting and maintaining the buffer zone.

In summary, the main results of mobilizing stakeholders led to increased awareness-raising about sustainable water resources management and climate change adaption. A participatory catchment wide assessment, as well as agreed interventions were very vital in kick-starting the activities.

4.2 Land protection measures and food production

Due to human activities such as farming and grazing, at least 30 meters of lake shores have been lost. The WACDEP program aimed to prevent further soil erosion through buffer zone demarcation and protection, awareness raising and tree planting. Tree planting helps to curb soil erosion by providing the soil with a web or structure of roots that holds it in place and above ground growth that creates a cover to protect the soil surface from being washed away by direct rain. By the end of 2013, more than 30 hectares of land around Lake Cyohoha in Rwanda were planted with 36,000 drought resistant trees e.g cacia, jacaranda and other fruit trees. The youth got mobilized and especially the youth group of Rwanda played a key role in producing tree seedlings for the tree planting programme.

The tree planting activities were also extended to the residents in the Kirundo province of Burundi who planted 10,000 trees for up to 50 meters around the lake shores. WACDEP activities are also helping the Burundi government to reach their goal of 18% of forestry cover by 2025 in order to increase climate change resilience.

Figure 2: Tree planting by Burundi communities in the lake buffer zone (Photo: GWP- East Africa)

The Lake Cyohoha buffer zone is located in the Bugabira Commune of Burundi and the Bugesera District on the Rwandan side. They have become national protected areas. Thus, no one has the right to carry out any kind of activities that may destroy trees and the lake ecosystems in those zones. More so, after harvesting existing crops, the local farmers have been advised not to plant other crops in the protected buffer zone again. Further steps related to the planting of trees and the implementation of the buffer zone include:

- Maintenance by watering, mulching and replacement of dead trees;
- Establishing nurseries on the site to train local communities to plant trees on their own plots of land to create a green belt around the lake;
- Supplying 10,000 fruit trees (e.g. grafted avocado, mangoes) at household level. The involvement of the community from the start of the project enhanced ownership, compliance, availability and participation throughout the project;
- Maintenance of the buffer zone by land terracing and tree planting along the demarcation line;
- Promoting local associations for the protection of the buffer zone;
- Progressive ownership and maintenance of the area by local community committees instead of NGOs, under the guidance of the local administration;
- Sensitization of local communities against grazing cows and cultivation in the buffer zone in collaboration with the local administration.

Soil erosion was addressed through conservation structures and the growing of trees in the buffer area of lake Cyohoha. As conservation structures, 100 km trenches were built for erosion control and recharge.

4.3 Water infrastructure

New water supply points were constructed to decrease the pressure of the communities to face long walking distances to fetch water. In addition, 8 fully operational water points were rehabilitated and 2,500 m of water supply pipes from Lake Cyohoha's Ngenda were connected. Thus an estimated total of 3,000 people is now supported by these water points in the Biharagu and Nyakayaga cells. The expansion of the water supply services has eased the burden on women and children to collect water. Additionally, the communities were organized into water committees and trained on the management of the water points.

To address water shortage for the biogas digesters, WACDEP supported the development of roof water harvesting facilities. The roof water harvesting facilities are wooden tanks lined with polymer material making them a cheap solution that can easily be replaced at the owners own expenses. The project further provided water gutters to collect the water from the roof into the tank.

Figure 3: Roof water harvesting to support biogas digestion (Rwanda)

These tanks now effectively provide water for the mixing process in the biogas facilities as well as for domestic use of 11 households (see figure 3).

To address the issue of pricing water, the WACDEP facilitated training of the water management committee consisting of 5 members who are fully in charge of the pricing and maintenance in collaboration with the water utility "Water and Sanitation Corporation". The water prices range from 0.5 to 10 Rwandan Francs. It was unanimously agreed that this is fair and manageable within the incomes of the households.

4.4 Community biogas facilities

The practice of cutting trees for firewood and charcoal was identified as one of the major contributing factors to soil erosion during the situation analysis. So in an effort to reduce deforestation and arbitrary tree cutting in the Bugesera region the following measures have been introduced.

First, fuel saving stoves have been produced in households. As clay is used for insulation, heat is conserved in the stove leading to less energy demand, less cooking time and hence less fuel demand. Women groups were trained on how to produce and use these improved stoves. The production of the stoves creates additional income especially for women. Altogether 1,000 such stoves were produced and distributed to 1,000 families.

In 2013, the WACDEP program launched a biogas demonstration project in five villages of Tunda cell, the Kamabuye sector, the Bugesera district and the Eastern Province, Rwanda. Biogas is a cleaner and cheaper alternative to wood fuel and is becoming a widely used source of energy in the communities of the Bugesera District. Since its launch as an alternative source of energy, biogas use has led to a reduction of tree cutting in the Kamabuye Sector.

Figure 4: Biogas fueled stove

Community biogas facilities were installed as alternative sources of renewable energy. These facilities are fed with cow dung which are then converted to biogas. The biogas is used to fuel biogas stoves (see figure 4) while the slurry from digesters is used as manure in the gardens.

Initially, 11 households from Tunda Cell started using biogas digesters. The authorities in the area are optimistic that biogas systems will help to curb environmental degradation. The biogas initiative is also complementing the efforts of the governments of Burundi and Rwanda to realize their strategies on economic development and poverty reduction.

4.5 Technical capacity development and integration into existing policy frameworks

Through its capacity development program, WACDEP has provided capacity building for key people to enhance their technical, analytical and institutional capacities in sustainable water management. This way, actions taken on a local level can be embedded in a wider framework of IWRM consideration. The training among other things included five national training and experience-sharing workshops from November 2013 to December 2014, interspersed with field work, on the job training and country and regional discussions to share experiences. A particular focus during these trainings was on the economics of adaptation, water security and climate resilient development planning.

In Rwanda, the WACDEP capacity building program targeted government officials drawn from key institutions: Ministry of Agriculture, Ministry of Natural Resources, Ministry of Infrastructure, Ministry of Local Administration, Ministry of Economic Planning and Finance, Rwanda Environmental Management Authority, Rwanda Agriculture Board, Rwanda Meteorological Agency and Rwanda Natural Resources Authority. The aim of the capacity development program was to train the officials on aspects of enhancing climate change resilience in the water sector and integrate it into the existing policy frameworks. This includes assessing the effectiveness of policy contributing to recommendations to the line ministry for consideration.

In Burundi, a similar capacity building program was conducted for planners in key line ministries i.e. the Ministry of Water and Environment, the Ministry of Agriculture and Livestock, the Ministry of Energy and Mines together with the Ministry of Finance and Development Planning. It enhanced the participants' skills and knowledge to develop investment options for water security and climate resilient development. The main objective was to learn how to prioritize no/low regret options and to make a clear economic case for investment options and further to develop inter-ministerial/department linkages and promote networking and cooperation. Furthermore, the training focused on the analysis of alternative investment options.

In addition, the large scale development of local institutional and community capacity on more sustainable catchment management practices and climate change adaption, as well as the formal endorsement of the project itself, has succeeded in generating wider interest among communities and local governments in the region, thereby promoting the enforcement of regulations and encouraging replication of demonstrated solutions.

4.6 Media training and stakeholder sensitization

The success of climate adaptation and sustainable management of ecosystems in Lake Cyohoha inherently depended on the awareness of stakeholders (residents, fishing cooperatives, Bugesera district technical teams, women associations, youth and decision-makers) and on their ownership of the process as well as on solutions being implemented and maintained. The media plays an important role in making that happen.

As part of the WACDEP Communication Strategy Trainings, a media training was organized. To raise awareness on water security and climate resilience, over 45 journalists and communication officers from Rwanda and Burundi were trained about media as a key conveyor of messages on water security and climate change. This equipped media practitioner from both countries with an understanding of key concepts such as climate change, water security, climate adaptation, climate resilience, integrated water resources management and water and climate uncertainties. The training improved media reporting on issues of water security and climate resilience in the Bugesera region as well as in Burundi and Rwanda as a whole.

Journalists in both countries have developed an interest in covering water and climate change issues as evidenced by the increasing number of media articles and the evolving media, water and climate Network (MWCN). The training has also led to a strong working relationship with local journalists who now conduct regular field visits and training sessions to ensure continued coverage of water and climate issues.

4.7 Finance

The project was carried out as a demonstration project funded under WACDEP in Rwanda and Burundi with an initial planned budget of 500,000 Euros. However, due to the instable political situation in the region, the project had to be downscaled. Thus, the direct expenditures spent for the project implementation were 303,000 Euros.

The program funds were managed by the GWP Eastern Africa region. From the region, support was provided to both Rwanda and Burundi Country Water Partnerships to engage with key stakeholders to drive the water security and climate agenda as neutral platforms.

5 Outcomes

As a result of the WACDEP project, a catchment climate adaptation and water resources management plan has been developed for Lake Cyohoha. In the process of developing the plans, no/low regret investment strategies were conceived to enhance water security and climate-resilient development.

The water supply system for communities is anticipated to reach over 3,000 households to provide safe water and, therefore, change the quality of life of the people in the transboundary catchment area.

The construction of biogas digesters fed by cow dung and fecal sludge to produce biogas energy is reducing the dependency on natural vegetation for biomass energy thus curbing vegetation destruction. This has increased domestic energy sources and helped curb energy insecurity. Lighting has been installed in houses so that children are now able to do their homework in the evening which is expected to lead to better performance in schools. Improved energy saving stoves are preventing diseases associated with inhaling smoke and thus improving life conditions. The planting of trees in the Lake Cyohoha buffer zone improves vegetation cover there by curbing soil erosion and environmental degradation.

The training of media practitioners and communication officers has resulted in an increased coverage of climate change issues thus increasing the understanding of climate change impacts among communities, local government agencies and other stakeholders. This has strengthened the commitment of stakeholders and supported the successful implementation of WACDEP adaptation activities.

Relating to the WACDEP Communication Strategy trainings, insightful inputs were provided with an emphasis on the need for building on the existing linguistic assets between Rwanda and Burundi and use of community radio stations and other media for communication. A network has been established for the sharing of climate related information and knowledge with the public. This network has enabled the exchange of knowledge products and press information packs. It also helps to coordinate and monitor the activities on the ground. Journalists and experts alike have become enthusiastic about the importance of sharing knowledge and information regarding water and climate through various broadcasts and publications.

The WACDEP project is contributing to the overall goal of water security and further addressing vulnerability issues in the catchment which the governments of Burundi and Rwanda are struggling to address. In summary, the direct impacts of WACDEP include: increased climate resilience of 30,000 catchment inhabitants in both countries, improved living conditions through enhanced energy and water security, protection of Lake Cyohoha from further soil erosion and the establishment of a network for sharing and promoting knowledge on water and climate issues. The interventions have enhanced the adaptive capacity and resilience of the communities and the project has become a role model for the surrounding communities with regards to environmental and water resources protection. It has provided a way for people from both countries to collaborate in managing Lake Cyohoha water and other natural resources.

6 Lessons learned and replicability

During the process, the following lessons can be drawn:

- Linking policies with practice is useful in promoting water security and climate resilience. It provides communities with immediate solutions to their concerns and allows for a correlation of actions with policies.
- Water resources are shared resources within a hydrological boundary. Considering the catchment as a unit of management and establishing mechanisms for cooperation in the entire transboundary level increases conservation of resources.
- Communities need water for various uses, therefore it is important to integrate their concerns into the planned approaches and demonstration activities. This increases ownership of the activities on the part of the communities as access to water becomes easy.
- The success of the WACDEP can be attributed to the continuous and meaningful involvement of communities and all relevant stakeholders in both countries.
- Early participation and ownership by all stakeholders are needed for the sustainability of a project and provide lessons for future replication.
- Community catchment management structures are critical as they enhance empowerment and ownership and buy-in for tangible results.
- Solving water problems is not only a task for the water sector. It requires interventions in water-using sectors such as agriculture, energy, industry etc. All these sectors impact the quality and quantity of water resources. The connection and impacts between these sectors and how they can be tackled is key in successful implementation of projects like the these.

Lessons from WACDEP in Lake Cyohoha will be used to influence policies and practices. As the programme was implemented within the national frameworks of water management and climate change adaptation in Burundi and Rwanda, it will be much easier to scale up lessons. The WACDEP programme, in addition to demonstrations in Lake Cyohoha catchment, also had other components at national level. The management of the programme is very much linked to the national level programmes and mutli-stakeholder coordination arrangement. This arrangement provides an opportunity for scaling up or replicating experiences from the programme. Moreover, as Lake Cyohoha catchment is transboundary, the experiences from its management will inform management of other bigger transboundary basins in the East African region.