



## Solar-powered irrigation and improved cooking stoves for communities in the Bugesera district

The project executed by ACTION POUR LA PROTECTION DE L'ENVIRONNEMENT ET LA PROMOTION DES FILIERES AGRICOLES (APEFA)

COPE WITH DROUGHTS AND INCREASE AGRICULTURE PRODUCTION

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- ✓ **Improve agricultural production and create new opportunities for security and prosperity.**
- ✓ **Strengthen the resilience of communities to climate change.**
- ✓ **Reduce Food insecurity and improve nutrition, especially among mothers and children.**



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# ► INTRODUCTION

Solar-powered irrigation and improved cooking stoves for communities in the Bugesera district is a project financed by GIZ through IKI Small Grants. It is implemented by APEFA in Ngeruka and Mareba Sectors of Bugesera District.

## IKI

IKI is the German Federal Government's International Climate Initiative. IKI's main objective is to promote small-scale organisations for climate action and biodiversity worldwide. Since 2008, the country offices of GIZ support the selected small-scale projects and funding initiatives, providing them with intensive support in professional and administrative capacity building, in countries that receive public funds for development cooperation. It is in this context that APEFA received a fund GIZ through IKI to implement the project of the Solar-powered irrigation and improved cooking stoves for communities in the Bugesera district.

## APEFA

ACTION POUR LA PROTECTION DE L'ENVIRONNEMENT ET LA PROMOTION DES FILIERES AGRICOLES (APEFA) is a National Non-Government Organisation founded by people concerned with environment degradation in Rwanda and food security. It is legally recognized as an Organization working on environmental education, public awareness, Climate Change, sustainable development aspects and promotion of sustainable agriculture in Rwanda.

APEFA'S Areas of intervention are:

- Soil conservation and landscape restoration;
- Integrated water management
- Sustainable agriculture;
- Climate change adaptation & mitigation;
- Green mining promotion, Monitoring and traceability of minerals



*The farmers working with APEFA are APEFA grouped into cooperatives, and they benefit from some training, including one on Climate smart agriculture*



*APEFA'S strategy is to empower and facilitate communities through cooperatives, in order to reduce human pressure on natural resources through livelihood improvement activities.*

# ► Solar-powered irrigation and improved cooking stoves for communities in the Bugesera district Project

The activities of this 18 months project are mainly located in Ngeruka and Mareba Sectors of Bugesera District. The two sectors were chosen due to their large number of vulnerable people. However these sectors have potential natural resources, which, while preserving bio-diversity, can be used to improve the living conditions of the population. This edition will focus on the relevance of the Solar-powered irrigation for Ngeruka famers.

## Bugesera socio-economical background

BUGESERA District covers a total surface area of 1,337 Km<sup>2</sup> of which arable land is estimated at 91,930 ha. The average size of land cultivated per Household is 0,59ha. The district is composed of 15 Sectors, 72 Cells and 581 Villages with a total Population of 363,339 people-177,404 males and 185,935 females.

The climate of this region is dry with temperature varying between 20 and 30°C. Agriculture is the main economic activity and the leading sector that provides nearly 79% of employment to the District's population.

Droughts have recently become cyclical and persistent. Crop failure during the drought meant that the entire region had to depend on external food supplies.

Jean Marie Vianney Niyibizi, One of the farmers supported by APEFA, explains how their region used to experience severe droughts.



Jean Marie Vianney NIYIBIZI  
Farmer /member of KOJYAMUNGE cooperative

Jean Marie Vianney Niyibizi says:  
« *Bugesera was hit by a severe drought. Because of that, in 2000, residents of Bugesera were called an abusive name of "hungry people". That was all due to the effects of climate change. Today that abusive name is no more. This lake had dried out. But it was restored thanks to training provided by APEFA. The organization made us realize how our agricultural activities were encroaching on the lake* »

Mayange and Ngeruka sectors have a total population of 63,000 people of which 9,812 households are under poverty.





## Why Solar-powered irrigation



The project was conceived by APEFA in response to issues that were observed in Ngeruka and Mayange sectors. The APEFA field officer in the two sectors says: « In 2000, a severe drought displaced several families in Bugesera.»



Gilbert UMUNYURWA  
APEFA field officer in Bugesera District

Umunyurwa Gilbert goes on saying that «As we implemented projects in Bugesera, we observed a desire among residents there to develop agriculture but lack of irrigation infrastructure hindered them. Bugesera is naturally bestowed with several lakes which constitute potentials for development of irrigation. It is in that framework that APEFA came up with a project of using solar powered irrigation systems. The system will pump up water to irrigate crops of farmers from three cooperatives based in Murenge and Ngeruka sectors.

*The cooperatives are:*

- KOJYAMUNGE (Cooperative for the Development of farmers in Ngeruka sector),
- KOTEMUNGE (Cooperative for the Development of farmers in Ngeruka sector),
- KOPABINGE (Cooperative of maize growers in Ngeruka).

*The cooperative owns 80 ha farm land. Our project aimed at installing an irrigation system for 10 ha. The solar system has a capacity of KW 7.5; it has a submersible pump housed in a tank connected to the lake.*

*We expect the project to make an impact because we want the irrigated 10 ha land to be a model for horticulture. Local farmers grow vegetables but their harvest is low because they relied on traditional methods of irrigation. They were using jerry cans and hand-held watering cans or petroleum powered pumps that polluted the air.*

*We are showing them that there exist climate smart solutions using solar powered systems which do not contribute to climate change and thus protect their crops from effects of climate change. We want this project to serve as a model of how to use solar powered irrigation systems.*

*Water will be distributed through a network of tubes with output spots where water sprayers are connected. The 10 ha land will be connected permanently to the irrigation system. Farmers will not anymore need to encroach on the buffer zone. The encroachment was leading to the reduction of water levels in the lake, thus contributing to climate change»*



## Does Solar-powered irrigation come ontime?



*Due to lack of access to water, local residents rely on lake water for irrigation and household activities. The access points through which they pull water from the lake are bare of grass that would protect biodiversity.*



*Fetching water from the lake involves risks. Getting water from the lake into fields is a time consuming and tiresome process.*

*As they wait for the solar powered irrigation system to start, farmers use watering 6 cans. It takes them several hours to irrigate crops on even a small field.*





300 vulnerable small farmers households will benefit from the irrigation system. Farmers benefiting from the APEFA project for solar powered irrigation expect a bumper harvest. It is based on their past experience whereby they relied on traditional irrigation methods. Their harvest was low because it was impossible for them to grow crops on a large land but still the methods were energy consuming. Devota Uwamariya, a member of KOTEMUNJYE cooperative, affirms:

« The project by APEFA relieved us of back-breaking irrigation tasks. We watered crops using watering cans and jerry cans. You would spend a whole day and a lot of energy irrigating only a few square meters. We were provided with small solar powered pumps but they could not match with the demand. Consequently, we had to rotate the pumps among members which did not prevent our crops from being damaged by the dry season.

*We welcomed this project with enthusiasm because it is a sustainable solution. We had a lot of land that was lying idle because we had no suitable irrigation system. We exploited a small amount of land and got a poor harvest. We expect a bumper harvest because we are going to grow crops on a bigger land. The use of light water pumps or watering jerry cans was very tiresome particularly for a woman. I felt like abandoning. After any irrigation session, I was too tired that I was not willing to talk. Once back home, I immediately went to bed, could not find time to prepare children for school, get ready their meals or wash them. My children would go to bed unclean. Now I hope that we are going to use a stress-free irrigation system and will get a good harvest. The irrigation session will take me a shorter time which will allow me time to do household chores.»*



Devota UWAMARIYA  
Farmer/Member of KOTEMUNGE cooperative  
and project's beneficiary



The farmers testified that they were incurring losses because the returns were meager compared to invested resources. Upon learning about the new project, they started preparing their fields. One of these farmers is Nehemie Kwizera, a member of KOJYAMUNGE cooperative. He shares his experience and expectations saying:

*« I grow various varieties of vegetables. We were working in difficult conditions. Very low income farmers used watering cans for irrigation. The rest of us, used foot-controlled irrigation systems donated by our partners. We made a step forward and started using diesel generators. This had challenges as well because of the high cost involved in operating the generators. Using them was also tiresome. »*

*This is a historical day because we are welcoming this new project in Ngeruka. We are ready to partner with the project, because it will relieve us of the burden of buying diesel.*

*We have never had the capacity to pump irrigation water at a distance of more than 100m. With the new project by APEFA, water will be distributed to a large area. This will enable farmers to irrigate and grow vegetables on fields that were not exploited before. Irrigation water will be distributed to a wide area and more farmers will access it.*

*I have already started preparing this very field. I am planning to grow tomatoes because I am assured of access to irrigation water. We lacked access to irrigation water. Now, that issue is becoming history. »*



Nehemie KWIZERA

Farmer/Member of KOJYAMUNGE cooperative and project's beneficiary



## Social and Behavioral Change Communication(SBCC) and reduction Green House Gaz(GHG) Emission

Among other activities, APEFA will implement those related to the social and behavioral change communication (SBCC). SBCC activities will aim to transform gender relations by building awareness and confidence to catalyze behavioral change actions among women, men, youths and the community at large around equality and empowerment.

But over the top the project of Solar-powered irrigation, will enable APEFA to contribute to the reduction of GHG Emission through introduction of a new climate smart agriculture practices. That is what the APEFA field officer in the two sectors says : *«In the dry season, we could not grow crops on hillside fields. Now, farmers will be growing crops in seasons A, B and C. Farmers from various cooperatives based in Ngeruka were used to irrigating fields adjacent to the lake.*



Gilbert UMUNYURWA

APEFA field officer in Bugesera District

Thanks to support from various projects targeting hillside irrigation, the farmers realized that it is possible to grow crops on hillside fields.

*They believe it is possible to exploit these fields in the dry season. We urge farmers to grow vegetables because they bring about returns in a relatively short time. We hope that APEFA in collaboration with farmer cooperatives and local leaders will convince farmers to embark on hillside farming because the exploitation of wetlands encroaches on the lake. We will have several training sessions. We thank GIZ for having funded the project activities.»*

Nehemie Kwizera from KOJYAMUNGE cooperative says: *«We have already started receiving training on the importance of the project by APEFA. It is unique because it offers climate smart solutions. We will no longer rely on the air-polluting diesel powered generators for irrigation. Moreover, the project will give us improved cooking stoves.»*



Nehemie KWIZERA

Farmer member of KOJYAMUNGE cooperative

Nehemie concludes saying : *«Thanks to the projects like this one, drought related famine will become history and Bugesera will become the country's food basket.»*



## ► CONCLUSION



The project activities have already started. The Solar-powered irrigation will enable farmers to achieve more reliable, profitable and sustainable production, increase their resilience and better adapt to the impacts of climate change. The system will be able to irrigate around 10 ha of land owned by farmers. The agriculture lands are located near the water source and water will be stored in a dam sheet which can also collect rainwater. Thus the technic used to irrigate does not use much water which can affect the ground water.

**COPE WITH DROUGHTS AND INCREASE AGRICULTURE PRODUCTION**





We handle the creation, managing, using, conserving, and repairing forests, woodlands, and associated resources for human and environmental benefits.



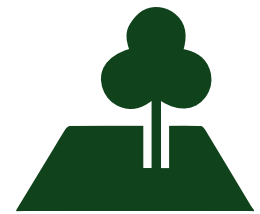
## Forestry



## Green Mining

We focus on technologies, best practices and mine processes that are implemented as a means to reduce the environmental impacts associated.

We engage in active process of implementing and managing preferred systems of land use and production in such ways that there will be increased yields.



## Land Husbandry



## Watershed Management

We implement land use practices and water management practices to protect and improve the quality of the water and other natural resources within a watershed.

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