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GROUPE DE LA BANQUE AFRICAINE  
DE DEVELOPPEMENT



# Investing in Climate Resilient Livelihoods

## Making a Difference in People's Lives



1  
Light up &  
power Africa



2  
Feed Africa



3  
Industrialise Africa



4  
Integrate Africa



5  
Improve  
the quality of life  
for the people of Africa



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Irrigation Kits in Manenge,  
Massagena District, Gaza Province

# **The Sustainable Land and Water Resources Management Project**





Alberto Manguambe  
Community Leader

“ We used to live facing great difficulties because we lacked water.  
We used to use wells opened manually on the banks of the river  
and each family would open their own well. ”

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Earth Dam infrastructure financed by the SLWRMP,  
Mabalane District, in Gaza Province

# What is the Sustainable Land and Water Resources Management Project?



Mozambique has been suffering from volatile weather patterns consisting of longer and more frequent cyclones and droughts. This has affected the country's agriculture sector, which employs 70% of the population, through reduced production, strained subsistence farming, and limited opportunities in the agricultural value chain. In an effort to aid the Government of Mozambique (GoM) in overcoming this challenge, the Sustainable Land and Water Resource Management Project (SLWRMP) was approved in 2012 by the African Development Bank in Mozambique, co-financed by the Climate Investment Fund (CIF).

The project is linked with the Pilot Program Climate Resilience (PPCR) investment through promotion of adaptation activities that improve the management of the watershed and sustainable land management practices. The activities built the capacity of the local communities to manage their natural resources, ensure the continued productivity of the land and provide alternative livelihoods through food systems. They require a change in land management

and cultivation practices to adapt to climate variability. The practices can be disseminated to other arid and semi-arid areas such as central Mozambique.

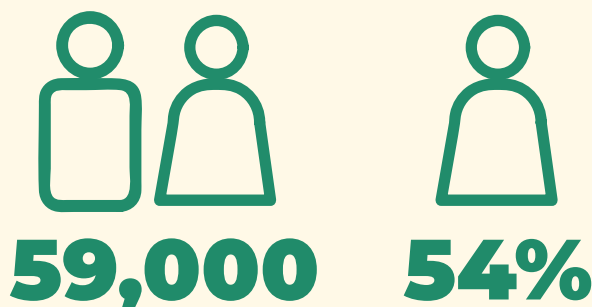
The main objective of the SLWRMP was to reduce poverty through increased agricultural productivity, as a result of improved water and land management practices. The project provided enhanced irrigation infrastructures, market infrastructure for agro-processing and promoted farm diversification, increased production and food security. It also aimed to strengthen the capacity of communities to address the inter-linked challenges of adverse impacts of climate change, rural poverty, food insecurity and land degradation.

The project was implemented in five drought-affected districts of the Gaza province: Guijá, Mabalane, Chicualacuala, Massagena and Mapai. The total cost of the project was estimated at \$21.5 million, comprising African Development Fund (ADF) \$4.9 million; Climate Investment Funds (CIF) \$15.9 million and GoM \$0.5 million.

## Project Sponsors

Sustainable Land And Water Resources Management Project (SLWRMP)		
Sector	Agriculture and Rural Development	
Funding	\$ 21.5 million	
Funding Partners	Government of Mozambique	\$ 0.5 million (2.4 %)
	ADF Loan	\$ 4.9 million (23.2%)
	Climate Investment Fund (CIF)	\$ 15.9 million (74.4%)
Time-Frame	2012 - 2019	

## Project Beneficiaries



The proposed interventions benefitted approximately 59,000 people, of which 54% are women.

The direct beneficiaries of this project were the communities in the selected sites of the five Districts namely, Guijá, Mabalane, Chicualacuala, Massagena and Mapai - that were supported through the proposed interventions benefitting approximately 59,000 people, of whom 54% were women.

The project was designed to have a demonstrative effect for stakeholders to draw lessons from the implementation, hence allowing for replication

and scaling up in other districts. The lessons learned from SLWRMP have already informed the design of another African Development Bank's (AfDB) project, namely the Drought Recovery and Agriculture Resilience Project (DRARP).

The project also provided training on climate adaptation policies to staff within various ministries and public services, to build capacity in policy development.

## Project Components

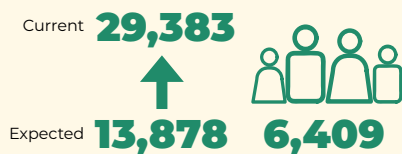
- Agriculture and Water Infrastructure Development consisting of the construction of small earth dams, boreholes and the installation of irrigation kits;
- Restoration of Natural Habitats and Landscape Management comprising forest nurseries and the polyclonal camp<sup>(1)</sup>;
- Project Management.

<sup>(1)</sup> The polyclonal camp is a place of cashew tree multiplication, distribution, diffusion and incitement of local communities and neighboring districts for the appreciation and cultivation of cashew nuts.

# Project Outputs



80 families and 5,000 livestock have survived on the water that was collected during the abundant rainfalls in 2016 at the small earth dam in Sangue



Increasing the number of beneficiaries from the expected 13,878 inhabitants to the actual 29,383 made up of 6,409 households.



21 small earth dams were built, exceeding the initial target of 18.



The closest river/water source was at a distance of 20-30km.



Sprinkler Irrigation Systems

## Irrigation Kits Beneficiaries



The project reached its completion dates in December 2019 with a number of important achievements: 21 small earth dams were built, exceeding the initial target of 18, increasing the number of beneficiaries beyond the expected 13,878 people to the actual 29,383 - of whom 18,294 are direct beneficiaries and 11,089 are indirect beneficiaries, all of them from 6,409 households. The number of cattle that drink water in these small earth dams also grew from the expected 14,580 to 55,000 units in the 21 communities that directly benefited from these dams.

The provision of this infrastructure has resulted in a significant impact on the targeted rural populations, especially for beneficiaries that are located in particularly remote areas where the severe droughts of the past two years have made access to water a very big challenge. A clear example of the above is the earth dam located in Sangue (locality of Nhatimamba), where around 80 families and 5,000 livestock have survived on the water that was collected during the abundant rainfalls in 2016. Since then, no relevant rainfalls have occurred, and the dam has continued providing access to water to the communities of Chimunwane, Mcoboda, Mungige, Nwamandzele and Ndzindzine – going beyond its foreseen carrying capacity, now absorbing communities that were not initially planned as regular users of the dam's water.

The feedback from the local farmers was very positive. While facing a number of challenges in relation to collecting and managing the individual contributions for monthly water access, and the subsequent lack of funds to immediately deal with maintenance issues, the community has been positively impacted, being able to rely on a source of water that has served as a water point for five communities.

The next closest river/water source was said to be approximately 20-30km away. Moreover, construction of water troughs for animals, aimed at promoting livestock, has been completed. In total, there were 10 cattle water troughs and 14 multi-functional boreholes built.

These boreholes and cattle water troughs benefit a total of 19,031 people and 16,863 heads of cattle.

Overall, the infrastructures built for water supply (small earth dams and boreholes) now benefit approximately 59,000 people and 55,000 livestock.

The irrigation kits have contributed greatly to improving the lives of the rural families of Massagena, Mapai, Chicualacuala, Mabalane and Guijá. The SLWRMP project has managed to install all the 56 sprinkler irrigation systems indicated during the design phase. The sprinkler irrigation systems were allocated in the following locations: Guijá 12 kits, 9 of 5 hectares (ha) and 3 of 10 ha; Mabalane 20 kits, 17 of 5 ha and 3 of 10 ha; Chicualacuala 4 kits, 2 of 5 ha and 2 of 10 ha; Massagena 12 kits, 8 of 5 ha and 4 of 10 ha; and Mapai 8 kits, 4 of 5 ha and 4 of 10 ha.

This activity was largely appreciated by the farmer groups and their smallholder members. The project targeted the aspired number of female farmers, as visible in the case of the Green Revolution farmer group, in the locality of Caniçado (Guijá) – composed of 12 women and eight men – in which the experiences of two female farmers were captured in more detail. In the local markets of these arid zones, it was interesting to find vegetables such as cabbage, onion and tomato for sale at any time of the year. The increased availability of these crops throughout the year contributes to food security not only among the 720 families who directly received the kits but for all the surrounding communities.

These kits have directly benefited 720 households, 3,600 people of whom 3,000 were women. All the beneficiaries of the irrigation kits were trained to make proper use of them. In all committees, they have a structure with a greater representation of women to empower them socially.

The project also benefited the government through the rehabilitation of the Provincial Directorate of Agriculture and Food Security (DPASA) offices.

## Cançado Community



“

*Our farmer group is composed of 20 smallholder farmers, of whom 12 are women. Despite some challenges with pests over the past season and having to absorb the high cost of fuel to run their pumping system, all the farmers in the group were positive about the impact of the irrigation kits.*

”

Morgado Ubisse, President of the Green Revolution Farmers Association

In the district of Guijá, more specifically in the locality of Cançado, a group of farmers known as Green Revolution have been benefitting from the provision of irrigation kits supplied by the SLWRMP project. This farmer group is composed of 20 smallholder farmers, of whom 12 are women. Despite some challenges with pests over the past season and having to absorb the high cost of fuel to run their pumping system, all the farmers in the group were positive about the impact of the irrigation kits.

By working on small plots, many of them have been able to generate other financial surplus that they have reinvested either in income generating activities or in other aspects of their lives.

Most farmers have made improvements to their homes and invested in school fees for their children, whilst all contribute to the monthly collection of participation fees within the group. This may be for general maintenance for the pumps or their operating costs. Most of their production is related to horticulture, given their now regular access to water that is pumped from the Limpopo river.

The most common agricultural products grown by the group are maize, green beans,

pumpkin, kale, lettuce, onion and green pepper. A lot of the selling happens within their local market, though some of them mentioned collaborations with “maguevas”, or local traders, who off-load part of their production.

The irrigation kits were shared on a rotational basis, with three farmers per day accessing them. Morgado Ubisse, the president of the Green Revolution farmers' association, mentioned that their highest cost is still related to the fuel for the pumping system – which can cost approximately \$ 15 per day, consuming anything between 10 to 15 litres of fuel. Assisting this group from the government side is the District Economic Activities Services (SDAE) officer, Crimildo Nhalungo.

His presence was described as very important by the farmers' group members, illustrating that extension officers in rural settings can provide important technical and advisory services. On a recent visit, the community had in fact just received technical advice from Mr. Nhalungo on how to deal with the very aggressive pest that had been attacking their maize crops, the fall armyworm.

# Guezanes Maluleque

Farmer, 53 years old  
Two households with 22 family members



“My goal is to someday supply to the big manufacturing companies in the area.”

Guezanes Judas Jonas Maluleque, a 53-year-old farmer, lives in Mapai District and owns 30ha of land. He is a leader of the Limpopo project in Mapai Rio village. Mapai is another district in Gaza province that has experienced adverse climate variability with frequent droughts and floods in the past, with severe negative impacts on the livelihoods of the population.

Guezanes is the head of two households with 22 family members. None of the family members work at his farm because he prefers to hire four permanent workers, consisting of two men and two women, while his wives work on their own plots that are closer to where they live.

Guezanes is currently using 10 ha out of the 30 ha, he has Land Use and Utilization Right (DUAT) for the horticulture that he trades.

Once selected as a beneficiary to the Sustainable Land & Water Resources Management Project (SLWRMP), he received a total of 150 cashew trees and 60 mango trees. In the first season of cashew fruit, Guezanes was able to produce 50 kg of cashew and sell to traveling vendors (maguevas) at a price of approximately \$1 per kilo. “My goal is to someday supply to the big manufacturing companies in the area,” he said.

## Rute Bila

Farmer,  
Mother of four children



“I bought a goat, which I paid approximately \$ 38 for, and I hope to expand into a flock of goats that I can sell”

Rute Bila is a widow and mother of four children. Since participating in the SLWRMP project activities, she said she has been able to increase her production, is no longer at the mercy of erratic rainfall that occurs in the Gaza region, and has a system in place that allows her to easily access water from the nearby river. With her earnings, she has decided to invest in starting up what she sees as a new business:

Furthermore, she is able to afford school fees for three of her nephews and has been able to pay the monthly fees needed to participate in the farmers’ group.

“I bought a goat, which I paid approximately \$ 38 for, and I hope to expand into a flock of goats that I can sell”.

## Alberto Mutasse

Farmer, 47 years old  
Five households with three wives and a total of 19 members



*Another positive consequence was the expansion of my farm as I've had more time to work on the farm, and a change in nutrition as now I am able to produce vegetables such as lettuce and onions.*

Alberto Mutasse is a 47-year-old man living in Sangu Village, district of Mabalane. The district, in Gaza province, is one of the areas most prone to adverse climate variability with frequent droughts and floods recorded over the recent past, challenging the ability of the people to feed themselves.

In this village, Alberto is the head of five households, three of which are his wives', and a total of 19 family members. He owns a farm, 26 cows and 32 goats. He feeds his family through subsistence farming and the work of preparing the land, seeding, watering and harvesting is carried out by his own family members, as is commonly done in the village.

The most difficult activity, he pointed out, was watering

the farm because water sources were approximately 30 km away from his village. To obtain water, he had to travel by car, which had to be constantly repaired, costing him a lot of money.

With the construction of an earth dam in 2016, through the SLWRMP, he was able to delegate three of his family members to collect water, given that it is now a shorter distance away. The money he has saved has allowed him to open a bank account, which he did not have prior to 2016. Another positive consequence is the expansion of production and a change in nutrition, as he is now able to produce vegetables such as lettuce and onions. He hires seasonal workers, providing employment to other people.

## Felicidade Machava

Farmer, 60 years old  
Single mother of four boys and a girl



*In 2017, I was able to focus strongly on the production of green beans, which allowed me to buy an additional plot of land for approximately \$ 83 and start to build a new home – which I hope to complete with the earnings of the next agricultural season.*

Felicidade Machava (60) has one child and also takes care of her four nephews. She was keen on telling the story of how she “filled a small truck with my maize harvest, with the kit working”. In 2016, her first harvest had been largely kept for personal consumption, as she mentioned rainfall had been particularly low that year, leading her to decide to keep most of her produce.

In 2017, she was able to focus strongly on the production of green beans, which allowed her to buy an additional plot of land for approximately \$ 83

and start to build a new home – which she hopes to complete with the earnings of the next agricultural season.



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Nurseries in construction for agro forest plants production of reforestament in Chinhacanine, Guijá District, Gaza Province.

# Reflections and Conclusions

The experience of the Green Revolution farmer group is one of building resilience and capacity. The provision of kits for irrigation has allowed farmers to access water in a different way, as they are now able to pump water from the river, enabling them to plan for their farming season ahead. This comes at a cost, and the SLWRMP experience was also an opportunity to fine-tune how kits were brought into communities, and to work out how to guarantee that they function in the longer term. With the high costs of fuel being cited as a challenge across all user groups, together with that of general maintenance costs, further solutions such as (i) solar panels to run the pumps and (ii) additional training on generating group savings for maintenance (iii) Subcontracting services providers to work on maintenance and supply fuel while the farmer pay them at the end of farm season, have been identified as three simple measures that could be included in future projects.

Smallholder farmers were fully equipped with bulk infrastructure, including a pumping system and drip irrigation kits, allowing farmers to structure their production in a more stable way. In feedback, farmers noted that regular access to water allows them to plan their production cycles more easily. Groups in the schemes generally appear to be well structured, with good knowledge related to costs and group roles and responsibilities. Respondents voiced satisfaction with what they described as constant and useful support from the SDAE officer working with them.

Moreover, the World Bank's Development Impact Evaluation (DIME) Research Group, that has closely followed the farmer groups' experiences, and provide a set of quantitative and qualitative in-depth data analysing the impacts of the irrigation kits on farmers' livelihoods. The study demonstrated that the kits increased 3 times the production of the farmers.

In conclusion, the SLWRMP is a project that embodies the African Development Bank's missions and goals. Access to water is one of the most important foundations of development, and drought has become a regular challenge for farmers in the targeted areas. The earth dams, with the multi-functional boreholes, have proved to have had a significant impact on beneficiaries' lives.

The project has been important in delivering improvements in the lives of rural populations in Gaza and Maputo Provinces. It has also provided a framework for parallel investments from other donors (such as the IFAD-financed PROSUL), which have implemented similar programmes in neighbouring districts and have followed up on the design of climate-resilient infrastructure such as multi-functional boreholes, first piloted under SLWRMP. The project has proven to be an important learning platform, one that has sought to understand the challenges farmers face, even after the infrastructure is provided – for example the maintenance and operating costs. In the recently inaugurated Drought Recovery & Agriculture Resilience Project (DRARP), lessons from SLWRMP have proved useful, including the idea of substituting fuel-based water pumps with more sustainable, solar-powered ones.

Lastly, SLWRMP has shown that focusing on multiple approaches in resilient infrastructure development allows for the testing of different technologies and encourages innovation. It has also highlighted the need for context-specific project design, as agricultural and ecological environments can differ vastly even within the same province and district.



Ernesto Paulino  
Provincial Director of Agriculture and Food Security

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*The construction of 21 reservoirs and 12 functional water holes reduced the impact of climate change on more than 20,000 families in Massagena, Chicualacuala, Mabalane, Mapai and Guijá districts.*

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A water tap running from the small earth Dam in Sangue,  
Mabalane

# Acknowledgements

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Our gratitude goes to the National Institute of Irrigation (INIR), the Gaza District Economic Activities Services (SDAE) and the Provincial Directorate of Agriculture and Food Security (DPASA).

Special recognition goes to community leaders, who have taken the project to their hearts, and also to the members of the management committees responsible for maintaining project infrastructures, which will guarantee the continuity of project activities.

To all the entities of the local state administrations, including Traditional Authority Administrators, Permanent Secretaries, Heads of Post, Heads of Locality and Community Leaders, who agreed to help implement the project.

To all who have made the success of the Sustainable Land and Water Resources Management Project possible.



Vasco Bonzo  
Beneficiary Farmer - Massagena

“With the distribution of the kits, the production conditions have improved greatly. Today we do not rely on the rain to produce crops, we are producing permanently.”

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Irrigation Kits Project in Manenge, Massagena District,  
Gaza Province

## Project Sponsors



## Project Implementing Agency



REPÚBLICA DE MOÇAMBIQUE  
MINISTÉRIO DA AGRICULTURA E DESENVOLVIMENTO RURAL  
**Direcção Provincial de Agricultura  
e Segurança Alimentar de Gaza**

## Project-executing Agency



REPÚBLICA DE MOÇAMBIQUE  
MINISTÉRIO DA AGRICULTURA E DESENVOLVIMENTO RURAL  
**Instituto Nacional de Irrigação**





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