

# Promoting effective practices in water use for agriculture in Zambia

*Smallholder farmers are leading the push towards more efficient and sustainable water resource management practices in Zambia's most populated region.*

**COUNTRIES:** Zambia

**DONOR:** Federal Ministry for Economic Cooperation and Development (BMZ)

**CLIENT:** Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)

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At almost 1600 km, the Kafue is the longest river that runs wholly within Zambia. Flowing from the northern border of the country's northwestern province, it snakes its way around the centre of this landlocked nation, first through the mineral-rich region known as the Copperbelt, cutting across swamp and flatlands before merging with the Zambezi river in the south.

The Kafue river basin is central not only in topographical terms. Despite covering only 20% of the country's total land area, it is where over 50% of the country's population resides, with about 65% being urban dwellers. As such, the river is a significant source of water for domestic, agricultural and industrial uses.

Zambia has abundant water resources, but population and economic growth have greatly increased the demand for them. At the same time, climate variability and the seasonal nature of rainfall place additional strain on the availability of the resource nationwide. This is especially true in the region known as the Lower Kafue Sub-Catchment, which has been impacted by regular droughts and extreme weather events.



*Approximately 90% of farming is done by smallholder or family farmers*

## Building effective water resource management

Agriculture in particular is vulnerable to such conditions. In Zambia, approximately 90% of farming is done by smallholder or family farmers, who tend to grow staple foods such as maize, cabbage, tomatoes, eggplant and carrots on a subsistence level, with occasional surplus for the market. Many also participate in dairy production, collecting milk primarily for income. For the most part, their farming activities are heavily dependent on rainfall, putting their productivity at high risk from the effects of climate change.

To support the efforts of Zambian farmers, the European Union (EU) Delegation to Zambia and the German Federal Ministry of Economic Cooperation and Development financed the Accelerate Water and Agricultural Resources Efficiency (AWARE) programme, with the objective of enhancing sustainable and efficient agricultural water resource management for smallholders in the Lower Kafue Sub-Catchment. The Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), which implements AWARE, commissioned NIRAS to establish 32 demonstration sites to showcase new and effective technical water resource management practices in agriculture. We are also training smallholder farmers on efficient water use, harvesting and irrigation. The programme runs for three years, ending in August 2023.





## Better water practices for vegetable and dairy production

In Zambia, most smallholder farmers have a vegetable gardens near their homestead and grow produce for their own consumption or for sale on local markets. However, planting vegetables is not always done throughout the year. Instead, it follows the availability of water, which can be found through groundwater sources or rainfall from March to September, otherwise known as the growing season.

Dairy production is also dependent on the availability of water. Most farmers do not have cattle with improved genetics for milk production, and the cows are often left to roam during the day to find their own food, which ends up getting converted into more muscle than milk due to the exertion.

With the help of AWARE, effective water resource management practices increased yields of vegetables and dairy at their respective demonstration sites. For vegetable production, the availability of water storage and irrigation units, as well as improved gardening methods, helped to increase harvests and prolong the growing season. For dairy, strip-grazing units were introduced to reduce the exertion of cattle and give them more energy to produce milk rather than muscle.

**63%**

Are applying the new methods today

**94.5%**

Rated the training as "highly useful"

**70%**

Of the farmers reported an increase in yield following training

For both farmers and extension service providers, the demonstration sites also served as a learning opportunity on efficient agricultural water use. A total of 11,046 smallholder farmers were successfully given practical training in water resource management and supplementary topics, with 94.5% of this number rating the training as highly useful, and 63% applying the new methods that they learned in their own practice. In addition, 70% of the farmers reported an increase in yield after undergoing training.

To ensure the knowledge developed by the project would be carried through in a systemic manner, public agricultural extension service providers were also trained in water resource management and on the topic of resilient farming and climate change. This knowledge was further consolidated into a new training manual on water use in horticulture and an update to an existing training manual for dairy business.



## Rehabilitating water infrastructure

Apart from practicing effective water resource management at these demonstration sites, the NIRAS team also worked to rehabilitate water sources held by the involved communities for agricultural use, as a number of these were found to be in various states of neglect and disrepair. For example, one communal earth dam at one of the sites was well over 60 years old. The dam was heavily silted and bore damage from the traffic of cattle that used it as a drinking source. The team found contractors and procured the necessary materials to take on the work of fixing the dam.

All in all, six communal earth dams were rehabilitated, along with nine boreholes and one surface water collection pond. In addition to the construction of rooftop rainwater harvesting mechanisms on 17 houses, 15 shallow wells were rehabilitated or constructed. Shallow wells are an ancient but highly effective technique. The AWARE team taught people how to apply this technique as they are less expensive due to lower labour and material costs, and can be fixed by local communities.



## A model for better agricultural water use

On the local level, the AWARE programme has put smallholder farmers in the Lower Kafue Sub-Catchment at the forefront of the effort to promote better agricultural water resource management in Zambia. The knowledge and practical expertise developed over the course of this project will continue to be of benefit as issues of increasing water demand and the need for better climate resiliency become more urgent in the coming years.