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IoT Technology Enables

RURAL COMMUNITIES

With Sustainable Electricity & Water Supply

sigfox south africa

Gwakwani, a remote village in South Africa's Limpopo province, embodies the challenges of rural living in Sub-Saharan Africa. With a population of approximately 100, the community's survival is primarily based on subsistence farming and government grants.

Isolated by geography, the village's access is limited, further compounded by the absence of cellular coverage, electricity, and municipal services. In partnership with the University of Johannesburg (UJ), Sigfox SA embarked on a mission to alleviate these hardships through innovative technology.

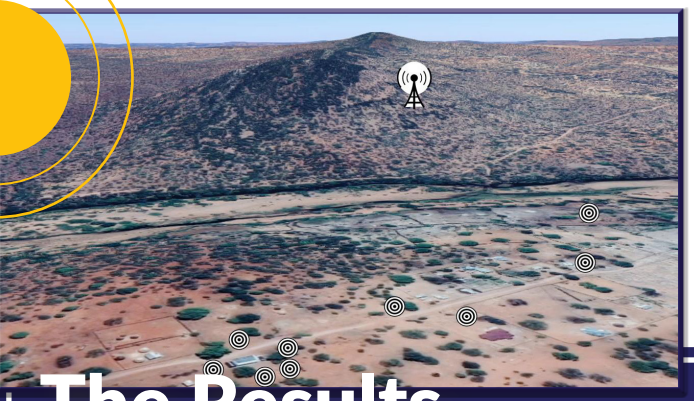
Challenge

Unsustainable Water Supply:

- The local municipality installed a diesel -powered borehole pump but the cost of the pump was financially straining on the village and was not reliable. This had a severe impact on agriculture and daily life, leading to food insecurity and health risks.
- The only water available for farming had to be collected from a distant river, whose flow was highly seasonal and posed the threat of crocodile attacks and malaria.

Location:

The village's remote location and lack of cellular coverage made monitoring and maintenance of critical infrastructure difficult.



Solution Overview

Phase 1

The Installation of:

- two solar borehole pumps
- a solar bakery
- a cold storage container

Phase 2

Sigfox-enabled sensors were connected to allow remote monitoring and evaluation of the village's infrastructure. These sensors monitored:

- Solar pump performance
- Bakery power usage and yield
- Cold storage temperature and power consumption
- Environmental conditions (humidity, temperature, light) in houses, bakery, and village center

These sensors provided crucial data for preventative maintenance and informed decision-making for future expansions.

The Results

The implementation of Sigfox technology allowed for predictive maintenance, ensuring the smooth operation of essential equipment like solar pumps and cold storage units. This led to:

1. A reliable water supply
2. Reduced maintenance costs
3. Improved food security

Additionally, the monitoring of energy usage and environmental conditions provided valuable data for future projects and expansions.

Through this initiative, Gwakwani Village saw significant improvements:

- 35 Households received lighting, aiding children's education
- A solar-powered bakery employing nine people was established, producing up to 140 loaves of bread daily
- The replacement of the diesel pump with a solar-powered pump resulted in an unlimited supply of fresh water, reducing malaria cases and enhancing food security through vegetable gardening and large crop farming.

Sigfox SA's technology played a crucial role in transforming Gwakwani Village, providing a sustainable solution to its water and energy challenges. The success of this project highlights the potential of IoT solutions in addressing the needs of remote and underserved communities.

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