

TEMBO Africa

Transformative Environmental Monitoring to Boost Observations in Africa

Commercial Microwave Links for rainfall estimates



Overview

TEMBO Africa Commercial Microwave Links use the signal between the cell towers of the mobile network to provide rainfall estimates. Specifically, when rain falls along the link, the signal is attenuated, and the companies adjust their power output accordingly. Thus, by monitoring these changes, it's possible to estimate rainfall in real time.

Where?

A mobile operator in Ghana is engaged, and an operational rainfall map is generated from CML data. After this pilot deployment, the initiative will be extended to cover not only Ghana, but also Zambia and Kenya.

For whom?

Ideal for dam reservoir managers, stakeholders interested in providing Flood Early Warnings, and crop insurance providers.

From CML towers to valuable insights

⚙️ **Low complexity** hardware solutions, with easy to replace parts, that can be maintained locally, as much as possible.

💧 **Accurate** rainfall measurements, addressing the sparse coverage of meteorological networks in sub-Saharan Africa, where rainfall intensity and amounts can vary significantly over short distances.

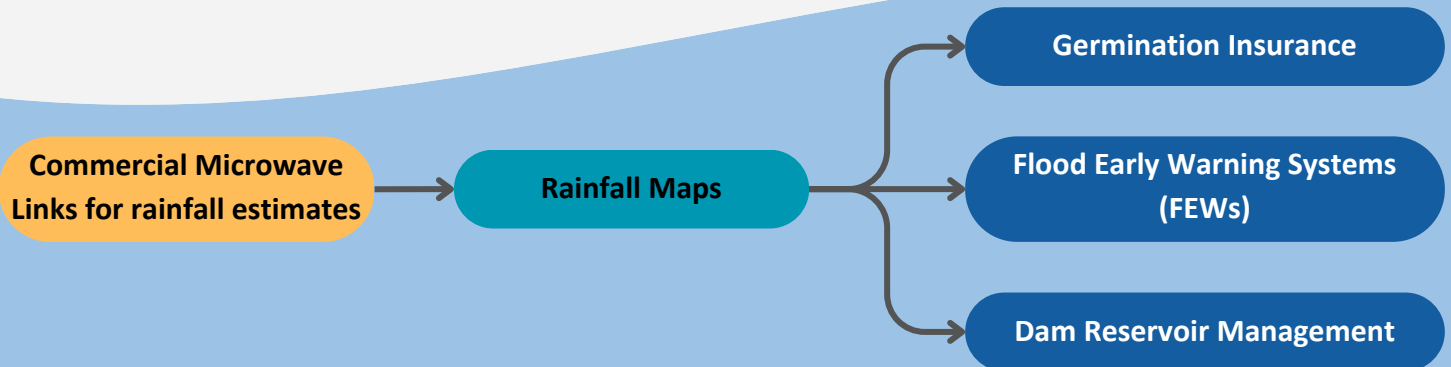
💡 **More accurate** and **cheaper** than rain gauges and satellite data.

📈 Useful for **calibrating** rainfall maps (from satellite data) and hydrological models, leading to improved forecasts.



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A **sensor** that can be used for one of the TEMBO **products**, while it can be leveraged by all **services**, thanks to a broader “Lego®-ised” approach!



How it works

Signal transmission between towers

Microwave signals are continuously transmitted between pairs of telecom antennas (cell towers).



Rainfall causes signal attenuation

When it rains along the signal path, raindrops weaken (attenuate) the signal strength.



Power adjustment by telecom operators

Telecom companies automatically adjust the signal power to maintain quality, responding to the rain-induced loss.



Data collection & monitoring

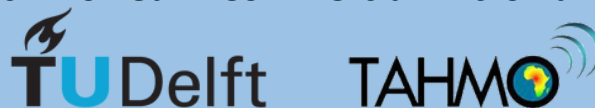
TEMBO Commercial Microwave Links sensor collects this power adjustment data and monitors how much the signal was attenuated.



Rainfall estimation

Using known relationships between signal attenuation and rainfall rate, the system estimates how much rain has fallen along a specific area.

Partners involved in Commercial Microwave Links



Contact us and learn more!

