

Water Wisdom: How Sensors and Data Are Ending Guesswork for Malawi's Farmers

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A single water drop on cracked, dry ground

Image: Dreamstime.com

irrigate.

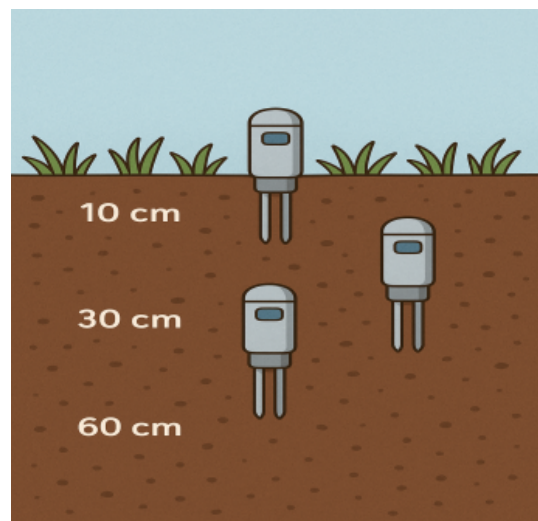
My research is about giving farmers a voice for their land. We're using low-cost sensors and artificial intelligence to listen to the soil at different depths. It's like a stethoscope for Earth, predicting exactly when and how much water is needed. We listen to the soil through tools like the sensor profile shown – tracking moisture across the root zone and revealing how long it takes for the water to transpire and evaporate, and when to irrigate.

The sensors send real-time data to a central system, where AI algorithms analyse soil moisture trends, temperature, and crop growth patterns. The AI learns how quickly water is used by the plants and predicts the optimal irrigation timing and amount needed for each field. It transforms complex data into simple, actionable insights – so even smallholder farmers can make data-driven irrigation decisions through their phones or local extension services.

Soil has a voice; it can tell us it is thirsty. It has a story to tell. And in Malawi, where most people depend on rain to grow their food, listening to the story is the key to our future.

The rains are becoming unpredictable. Let's practice irrigation. When do we water? How much is enough? Too little, and crops fail. Too much, and we waste our most precious resource.

That's why this research focuses on making every drop of water count. I'm using data to help farmers decide *when* and *how much* to



Soil moisture sensors at different depths

Image: Created using ChatGPT OpenAI



The goal isn't just technology, it's a more resilient harvest. Using less water to grow more food. Building a system that doesn't just survive the climate, but thrives.

Data-driven irrigation

Image: Created using ChatGPT OpenAI