

Smart irrigation systems using artificial intelligence and robotics, complemented by ecological reconnection strategies.

ARGENTINA, BOLIVIA, COLOMBIA, PARAGUAY



Webstory



Technological solution

Water is lost from a fruit orchard along two different paths, and until now only one was addressed. Agricultural expansion has fragmented tree cover across landscapes in Colombia and Paraguay, so soils infiltrate less, hold less moisture, and leave crops exposed to climate variability. On the farm, irrigation is scheduled by habit rather than by actual soil conditions. Ecological reconnection acts on the first path and AI-assisted irrigation on the second. Both are measured through the same variable: soil moisture.



Technological description

The technology works on a landscape-level through Sentinel-2 and Landsat satellite imagery, participatory mapping, and systematic conservation planning software (Marxan). These measure tree cover fragmentation, calculate connectivity indices, and prioritize where to reconnect. On the farm, a network of Internet of Things (IoT) sensors monitors soil, plant, and atmosphere, feeding an automated irrigation system driven by artificial intelligence that runs remotely, supported by an irrigation robot and a chatbot that guides the producer.



Impacts and results

The project will deliver a spatial prioritization model with at least one reconnection scenario per landscape, and a catalog of five landscape management tools (riparian corridors, live fences, and scattered trees, among others) chosen with producers in co-design workshops. Over two production cycles, technology plots will be compared against control plots to measure water use efficiency, yield, emissions, and return on investment. Training is expected to reach 2,500 people in digital agriculture, and two scientific articles will be submitted.



+ 2

AgTech 5.0 pilot systems implemented



+ 2

Territorial diagnostics



+ 2

Participatory workshops with producers, associations and environmental authorities



+ 2500

People trained in digital agriculture technologies



+ 1

Manual with scalable regional model



+ 1

Mobile irrigation app



+ 1

Robotic Irrigation Module



+ 2

Scientific articles to be submitted

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