Australian Government
Australian Centre for International Agricultural Research

Water

Virtual Irrigation Academy (Phase 2) : From water monitoring, to learning, to guidance

Overview

African governments and international donors are increasingly investing in the smallholder irrigation sector. But return on investment has been disappointing, due to low yields from poorly managed and maintained schemes.

A suite of tools has been refined and tested to measure soil water, nitrate and salt using colours as thresholds for action. The aim was to build a people-centred learning system that could capture and document the experiential knowledge of irrigation farmers. The tools include the Chameleon sensor array and reader, the FullStop wetting front detector, the Chameleon conductivity meter and nutrient colour test strips.

The Chameleon reader is Wi-Fi enabled so that the information is both easily accessible to the farmer in the field and simultaneously uploaded to the cloud, where it is collated and the data visualised as colour patterns. This is called the Virtual Irrigation Academy.

Farmers have readily adapted these tools and demand for them is growing. The majority of farmers using the tools have reported large increases in yields, and reduced water use.

KEY FACTS

ACIAR Project No. WAC/2018/162
Duration: June 2019 to June 2023 (4 years)
Target areas: Malawi, Mozambique, Zimbabwe, Tanzania
Budget: A$2,637,478

Project Leader
Dr Richard Stirzaker, CSIRO Agriculture and Food

Key partners

- Malawi Department of Agricultural Research Services
- National Institute of Irrigation, Mozambique
- Department of Irrigation, Zimbabwe
- Solutech
- Rural Integrated Engineering
- Robinson Ryan

ACIAR Research Program Manager
Dr Robyn Johnston

Objective

This project aims to develop the system from its current function of monitoring water and solutes to a water learning and governance platform that can support the needs of smallholder farmers and address the information deficits from scheme to national levels.

The objectives are to:

- Develop and refine the Virtual Irrigation Academy tools and platform to make it more robust, cost effective and user friendly.
- Increase the capacity and reliability of the Chameleon production line in Africa, not only for this project, but also for the growing community of Virtual Irrigation Academy users worldwide.
- Build cost-effective ways to roll out the Virtual Irrigation Academy and obtain quality-controlled field data as it begins to operate at a larger scale.
- Develop the data analytics that capture the value proposition for each of the Virtual Irrigation Academy's five clients.
- Create the business models and organisational structures that can deliver the Virtual Irrigation Academy learning and governance platform.

Expected scientific results

- Identify availability of equipment designed to highlight the important information required for effective decision making in a user-friendly format.
- Integrate knowledge from the biophysical and social sciences used to simplify communication of a soil's water, salt and nutrient status to colours and patterns. This helps to bridge the knowledge gaps between farmers, extension workers, scientists and managers.
- Develop of data analytics to support learning and management for farmers, extension workers, scientists, government agencies and investors in irrigation infrastructure.

Expected impact/outcomes

- Establish a Virtual Irrigation Academy production facility in Africa delivering a reliable supply of high quality and cost-effective tools.
- Identify private sector companies that can produce and distribute equipment, deliver Virtual Irrigation Academy services on the ground and engage in public-private partnerships.
- Increase capability within all four countries, Malawi, Mozambique, Zimbabwe and Tanzania, to implement the Virtual Irrigation Academy as a system for on-farm monitoring, community learning and national governance of irrigation.
- Establish effective governance of water for food production as a result of information and knowledge about water and solute management being shared between the donors and investors responsible for financing infrastructure, the national agencies tasked with managing the water, the schemes responsible for allocating the water, and the farmers tasked with irrigating their crops.
- Increase water efficiency, more successful irrigation schemes and more profitable smallholder operations.

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