



Tropentag, September 18-21, 2016, Vienna, Austria

“Solidarity in a competing world —  
fair use of resources”

## Improving On-Farm Water Management by Introducing Wetting Front Detectors to Small Scale Irrigators in Ethiopia

PETRA SCHMITTER<sup>1</sup>, AMARE HAILESLASSIE<sup>1</sup>, YIGZAW DESALEGN<sup>2</sup>, AMENTI CHALI<sup>2</sup>, SEIFU TILAHUN<sup>3</sup>, SIMON LANGAN<sup>1</sup>, JENNIE BARRON<sup>4</sup>

<sup>1</sup>*International Water Management Institute (IWMI), Ethiopia*

<sup>2</sup>*International Livestock Research Institute (ILRI), Animal Science for Sustainable Productivity (ASSP) - LIVES Project, Ethiopia*

<sup>3</sup>*School of Civil and Water Resources Engineering, Bahir Dar Institute of Technology, Ethiopia*

<sup>4</sup>*International Water Management Institute (IWMI), Sri Lanka*

### Abstract

Smallholder irrigation to improve food security in the dry season as well as economic and demographic growth within Ethiopia is developing rapidly. However, the long term sustainability of increased irrigated production, together with degradation of soils (and associated water bodies) may be irreparably damaged by inappropriate watering schedules. In irrigation schemes, over-irrigation results in periodic water scarcity issues and in some cases sodicity. The aim of the study was to evaluate whether using wetting front detectors (WFD), a simple mechanical irrigation advice tool, would give farmers the right knowledge on when and how much to irrigate. Therefore, improving sustainable on-farm water management without negatively affecting crop and water productivity while fostering a more equitable water distribution within the scheme. The study, conducted in different regions of Ethiopia, covered various agro-ecological zones and soil conditions with over 200 farmers irrigating cereals or vegetables. Farmers and water user associations were trained on using the WFD to irrigate and distribute water within the scheme. Irrigation and crop performance was evaluated against control plots, having the same crop variety and management but traditional irrigation practices. Reduction in applied irrigation volume due to the WFD differed within and between sites due to furrow length, soil texture and farmer experience. Although yield increases were highly variable between farmers due to differences in farm management and crop variety cultivated, there was a positive effect of WFD on water productivity. Water productivity on average increased by 9 % whereas yields for the different crops increased between 13 and 17 %. In some cases the volume of water saved could double the cropped area. The reduction of irrigation events, when using the WFD, led to labour saving (up to 11 working days per ha) and fuel saving (between 50 and 150 US\$ per ha). In both sites, farmers positively evaluated the scheduling tool, acknowledging that they learned to save water without negatively impacting crop productivity. The study showed that by providing access to when and how much to irrigate, farmers can positively adjust their on-farm water management resulting in more sustainable usage of their natural resources.

**Keywords:** Ethiopia, irrigation, water management, water productivity, wetting front detector