

# Groundwater irrigation in Africa

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## Groundwater use for irrigation in Africa

Today, only about 1% of cultivated land in Africa is irrigated using groundwater - compared to about 14% in Asia (Altchenko and Vilholth 2015). Irrigation - using groundwater or surface water - can lead to significant advances in food security and improvements in livelihoods.

In some parts of Africa, large scale groundwater irrigation schemes do exist, particularly in north Africa. Some of these use groundwater resources that are essentially non-renewable - the groundwater was recharged thousands of years ago when local climates were wetter. But many large groundwater irrigation schemes are based on renewable use - the groundwater abstracted is replaced through recharge.

For example, in South Africa, commercial irrigation produces between 25 - 30 of the country's agricultural output, although it uses only 10 percent of cultivated land and less than 2 percent of all agricultural land (Schur 2000). The fruit industry in particular, which provides direct employment to nearly 600 000 people, depends almost entirely on irrigation water for the production of its crops. Groundwater irrigates about 25% of the irrigated area in South Africa (Monteiro et al. 2010). Groundwater irrigation schemes are almost entirely privately owned (Schur 2000).

However, across most of sub-Saharan Africa, most farmers who are using groundwater for irrigation are doing so in a small scale, informal way - often irrigating only a few fields, using relatively low-cost technologies. Where hydrogeological conditions allow this - for example, where groundwater is available at shallow depths and in aquifers that can be exploited with relatively low cost interventions - there is significant potential for groundwater to support increased food production and security. However, if groundwater is to be used most effectively, it is important to have a good understanding of the groundwater systems - the location and depth of aquifers and groundwater levels; the groundwater quality; and the renewable resource - i.e., recharge.

## **[Case Study: Small scale groundwater irrigation in northeast Ghana](#)**

An example of how small scale, informal use of groundwater for irrigation supports farmer income, and how different groundwater technology choices by farmers affect economic efficiency.

## **[Case Study: Land cover changes and impacts on groundwater in southwest Niger](#)**

An example of where increases in groundwater recharge due to land surface changes are driving an increase in groundwater use for small-scale irrigation.

### **References**

Altchenko Y and Vilholth KG. 2015. [Mapping irrigation potential from renewable groundwater in Africa – a quantitative hydrological approach](#). Hydrol. Earth Syst. Sci. 19, 1055–1067. doi:10.5194/hess-19-1055-2015

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