

ADVANCING GREEN ENERGY IN AFRICA



Adequate access to drinking water in Africa is determined by proper management of water sources. Up to 30% of initial investment into water supply infrastructure is wasted because sources are not properly managed and stop delivering water to users a short time after construction. Modern technologies have a potential to make water schemes more sustainable and replace old-fashioned diesel generators that are widely used to pump water from boreholes to users. In many water scarce areas, complex technology is needed to deliver water to remote communities from great depths. Technical reliability and operational know-how is crucial for long term functionality.

Until recently, solar technology has been overlooked for its complexity and high initial investment costs. Producers and distributors of solar powered systems were unable to provide necessary services and spare parts to repair malfunctioning components. This view is changing quickly as governments start to recognise the value of photovoltaic energy to work on an off-grid basis and provide an independent and de centralised power source. The price of solar systems decrease rapidly. The cost of photovoltaic modules has fallen 99% since 1976 and 80% since 2008¹. Today, initial investment costs of solar powered pumps is 20% more expensive than diesel powered

¹ 2016 Bamford, Zadi. *SCALING UP SOLAR POWERED WATER SUPPLY SYSTEMS: a review of experiences*. UNICEF publication

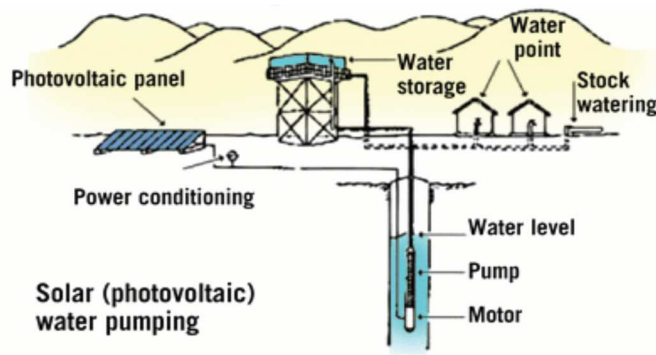


Diagram of typical solar powered water supply © Practical Action

systems². However, whereas operational costs of solar systems are near zero, diesel generators must be fuelled and maintained on a regular basis. Solar systems become more cost efficient after 5 years of use. Moreover, photovoltaic distributors open local offices and are able to supply spare parts quickly. Modules are being simplified and the replacement of one component is a matter of minutes. Solar pumps are more durable as well. According to a UNICEF study, about 64% were always functional in a five-year time span³. This fact has a great influence on user fees, which are much lower thus making water available for low-income families.

Ethiopian pastoralists become resilient to drought

Recurrent drought periods have made Ethiopian South Omo a protracted crisis zone. Seasonal open water sources have become more saline over the past decade and thus unusable as a drinking source for livestock; the main livelihood in the area. Water trucking has become a regular activity for local government and aid agencies.



In 2017, Czech NGO People in Need focused on reliable water sources for local pastoralists. Deep boreholes have been repaired and extended to serve large numbers of livestock as well as local communities.

Zegerma is one of the remote communities of Hamer Wareda in South Omo. This district is popular with tourists for its picturesque tribal customs but is also infamous for its scarcity of water sources. Weito river plains, a traditional source of water and fodder become unusable because of increasing levels of minerals in water. There are some deep boreholes but the area is difficult to access by trucks and supplies of diesel and spare parts for maintenance is irregular.

² *Ibid.*

³ *Ibid.*

PIN rehabilitated an existing shallow well originally fitted with a hand pump. The pump was insufficient to lift water from a depth of 50 meters and efficiently utilised to discharge 6,7 litres per second. Lack of stable water sources makes Zegerma borehole a strategic point for pastoralists on their seasonal migration for pastures.



The borehole was fitted with 60 solar panels that produce enough energy to run a 5,5 kW electric pump. Storage tanks provide 100 m³ of water for 3 500 pieces of cattle and 800 people living in neighbouring villages. Users pay a 15,-ETB monthly fee (0,5 USD) instead of 60 – 100,- ETB (2 – 3,5 USD), normally paid at diesel powered schemes. Investment cost were 48 000,- USD which is almost equal of the cost of diesel powered systems.

Remote locations like Ethiopian Zegerma are suitable for off grid solar powered water schemes and provide a reliable and sustainable solution for local communities. Innovative, yet affordable and scalable systems are also climate smart and help to reduce greenhouse effects and make arid areas resilient to drought.

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