

# Solar pumps are the hot new way to water plants



Mr Abdullah looks happy as he holds an armful of produce from his farm.  
[Photo: FAO/Essam Alkamaly]

## *SUMI THOMAS explains why these energy-saving pumps are a hit with farmers around the world.*

Without water, plants wither and die. Can you imagine how hard it is for farmers who cannot get enough water for their crops? In some places, water scarcity and high fuel prices were driving many farmers to poverty, causing years of suffering. Without fuel, they could not **irrigate** crops with the traditional pumps they had.

“At first, we sold off some of our animals to buy water, but the price just kept getting higher, leaving us with less money for food and medicine. Eventually, we could no longer afford, forcing the owner to cut off our water supply,” explains Rashed Abdullah, a 37-year-old farmer in Yemen.

Now, farmers in Yemen and in many other parts of the world are turning to solar energy to help water their crops. Solar pumps cost less and last longer than their old fuel pumps. Mr Abdullah is one such farmer who has benefitted from using the new technology. Solar pumps were introduced to farmers in his country by the European Union (EU) and the United Nations’ Food and Agriculture Association (FAO).

## Sharing one well

One day, Mr Abdullah was watching over his sheep grazing in a field when he noticed some animals gathered around a patch of green grass. He called for help to **excavate** the area. He described what they found as “an oasis in the desert”.

FAO and EU helped to develop the newly-found water source into a well. They built a network of water pipes to 40 nearby farms and installed 42 solar water pumps. The farmers were trained to improve their farming practices, and to use and maintain the pumps and the well.

These new pumps use solar energy instead of fossil fuel to water the crops. Energy from the sun is clean and abundantly available in countries like Yemen. Maintenance efforts and costs are also reduced, as solar pumps have fewer moving parts than fuel pumps. The cost of irrigation is thus reduced. In some countries, the government offers subsidies for these solar pumps.



[Photo: FAO/Essam Alkamaly.]

Solar water pumps have improved the lives of farming communities around world. Mr Abdullah is happy to be able to feed his large family again.

“Thanks to the project, we have now multiplied the size of my garden four-fold. In a good month, my eldest son helps me to sell our **surplus** vegetables at the market, and we make up to US\$500 (about S\$700) in profits. In the end, we still have plenty left over for

household consumption and my children can enjoy their favourite meal,” he says happily.

### VOCAB BUILDER

**irrigate** (say “i-ri-gayt”; verb) = supply water to crops.

**excavate** (say “ex-ka-vay’t”; verb) = dig a big hole.

**surplus** (say “ser-ples”; noun) = excess supply.

**aquifer** (say “ek-kwi-fer”; noun) = a body of porous rock that contains groundwater.

### HOW SOLAR PANELS WORK

The solar panels used in water pumping systems look very much like those we see on tops of houses and buildings here. A solar panel comprises many small units called photovoltaic cells. The solar energy absorbed by these cells causes electrons to move, creating an electric current. The electric current makes the motor pump work, pumping out water from a water source and pushing it through pipes to the crops.



Solar panels convert sunlight into electricity. [Photo: Colleen Taugher.]



## *Irrigation through the ages*



### **Underground canals**

Gently-sloped underground canals known as “qanats” channel water from an aquifer at the top of a hill across long distances. They were first developed in the Middle East several millennia ago. Many are still in use. There are even two-storey qanats such as the Qanat of Moon in Iran. [Photo: Ninara.]



### **Drips**

Drip irrigation allows water to drip or flow out slowly from several points in long pipes. Water is able to reach the soil and nearer to the roots. Evaporation is minimised, thus saving water in the process. [Photo: USDA NRCS Montana.]



### **Sprinklers**

Powered by a motor pump, water flows through pipes. When the water reaches the sprinkler head or rotating nozzle, it escapes with great pressure through small holes. The water rains down on the plants. [Photo: USDA.]



### **Dams**

In addition to controlling floods and producing hydroelectricity, dams allow water to be stored in reservoirs. The large amounts of stored water ensure a continuous supply of irrigation water to meet the demands of farms and plantations. [Photo: IFPRI-IMAGES.]

## *When rivers dry up*



This photo taken from the air in 2009 shows the Colorado River Delta, about 5 kilometers from where the river once reached the sea. The tree-like lines you see were carved by flowing water, which has since dried up.

[Photo: Pete McBride / U.S. Geological Survey.]

Some crops consume a lot of water. When there is little rainfall, farmers depend more on groundwater. They dig wells which then reduce the amount of groundwater reaching rivers. When groundwater refills rivers at a slower rate than the river water is used, rivers can dry up.

One of the world's most utilised waterways is the Colorado River. This big river runs its 2,300km course through the United States and Mexico. Water is diverted from it at many points along the way for farms and factories. At one stage, so much water was being taken from the river that its upstream water was not reaching the ocean.

In 2014, with the American and Mexican governments' efforts, the waters managed to reach the ocean for just four weeks. Then, the government efforts ceased. The Colorado's water flow into the ocean stopped once again. Now, the state governments are trying to limit the amount of groundwater farmers can take from such rivers.

Water is indeed a precious resource that must be carefully managed.