

# Rope Pump

The proven low-cost family water pump

## Product Sheet

The rope pump is a proven household level pump for drinking water and small scale productive use in areas with water tables up to 35m depth. It combines low-cost, high levels of on-site reparability and suitability for local production, making it a tool that users can invest in themselves.

### The context

In the many peri-urban and rural areas of less developed countries, crucial water access is with hand pumps and wells. Piston pumps are the most common pump type, with many high-end options for community use. However due to high costs of the installed pump and difficult maintenance, piston pumps are rarely affordable for individual families, and breakdowns are common.

The rope pump is a low-cost option when the water depth is between 8 and 35m. It can be produced in the community, increasing affordability and allowing for simple and cost-effective repairs and maintenance, with local spare parts available. User maintenance is simple. These factors often make the rope pump an attractive, sustainable alternative to imported high-end piston pumps.

### The technology

The technology of the rope pump is based on the ancient chain and washer system. A circular rope with pistons is guided into a PVC pump tube at the well bottom. The user turns a wheel at the surface, lifting the rope and pistons through the tube and bringing water to the surface. Unlike piston pumps, the rope pump can be produced with locally available materials and local skills. It is simpler to repair, has light and non corrosive parts and is cheap to produce. Disadvantages are that most rope pump models are not completely sealed and there is a slight delay before arrives at the surface. Also the rope pump is not suitable for lifting water to elevated reservoirs.

The design of the underground part of the rope pump is basically the same for all models: a PVC down tube, rope with pistons, and a turning point at the base. For the upper parts core elements include the supporting frame, wheel and rotating handle, although modifications can be made depending on local capacity, materials, and user needs. There are various models for different price points.

The facts	
<b>Application</b>	Household level or (extended) family water supply from open wells and tube wells (minimum inner diameter 100mm) up to 35m deep. Uses include potable water access and small scale irrigation and livestock support.
<b>Yield</b>	30 litres per minute at 10m water depth 20 litres per minute at 20m water depth 10 litres per minute at 30m water depth
<b>Costs</b>	70 - 150 Euro, depending on water depth, and local material and labour costs
<b>Numbers</b>	Over 1 million rope pumps installed world wide (est.)

### The application

Rope pumps are designed for use on household wells up to 35m deep. Standard models can be used by extended families up to 10 households for household water needs and small scale productive use like livestock support and irrigation. Rope pumps are suitable for open dug wells and (manually) drilled wells with an inner pipe diameter of at least 100mm.

PRACTICA helps partner organizations introduce and support rope pumps in their programs. This typically includes training and support of local manufacturers, field staff and end-users, as well as organizations support with branding, marketing, resource allocation and dissemination strategy.



### The experiences

The rope pump is a proven low cost pump that is being used in many different countries. Examples of use include:

- **Nicaragua**, where the rope pump first became a large scale success and rope pump are being produced and sold in self-sustaining businesses.
- **Ethiopia**, where JICA and PRACTICA worked together in training over 30 workshops and implemented a quality control system for rope pumps produced by these workshops. Through this programme, high quality rope pumps and spares are now for sale from small workshops on village level.

PRACTICA Foundation develops and disseminates low-cost appropriate technology in water and renewable energy in developing countries. We focus on technology that responds to local cultural contexts, can be locally produced and maintained, and leverages existing market systems.

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