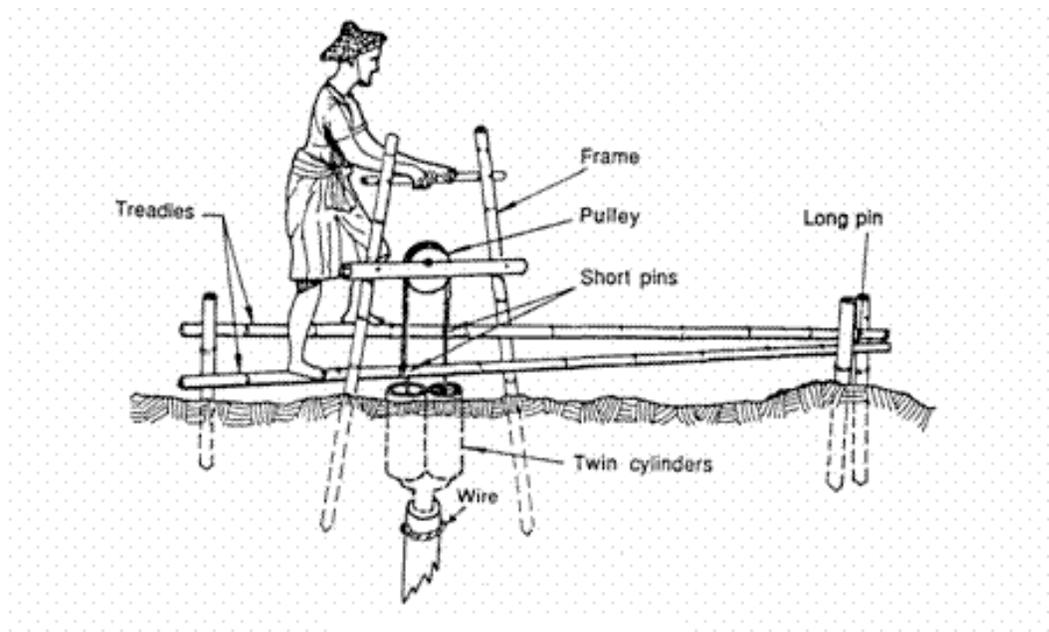


## **Treadle Pump -- Pedaling Out of Poverty**

The Treadle pump (also known as Pedal pump) is a water-lifting device similar in principle to the hand pump. The difference lies in the fact that a hand pump consists of a single barrel or cylinder and requires arm and upper body motion to operate, whereas the treadle pump comprises two cylinders and is foot operated. Because leg muscles are stronger than arm muscles, this design is less tiring to use than other human powered water lifters. One person, whether a man, woman or even a child, can operate the pump by manipulating his/her body weight on two foot pedals or treadles while holding a frame for support.

Two major types:

1. Suction Treadle Pump: The suction treadle pump lifts water from an underground or lower level source and delivers it at the elevation of pump. It does not pressurize water to lift it above the pump. The suction treadle pump can be installed at higher elevations—a platform or earth mound—to enable gravity flow through field channels or a pipe.
2. Pressure Treadle Pump: The pressure treadle pump lifts water from any water source and brings it to the surface. Water is discharged from the pump under pressure so it can pump water to an elevation above the pump. It can be connected to sprinkler or drip system for system irrigation. It can also be connected to a long delivery pipe to move water to whatever point required for irrigation.



**Figure 10 : Treadle Pump**

## **Applications**

The pedal pump is ideal for areas where the water table is high, ranging from 10 feet to 25 feet below the ground. It can be installed on tube wells (made of GI, PVC or bamboo), ponds, canals, streams and dug wells.

One pedal pump is appropriate for irrigating up to one hectare of cultivable land. It is ideal for vegetable cultivation. The treadle pump is well suited for small and marginal farmers.

The introduction of the treadle pump for irrigation has been shown to have a positive impact on household income. In Africa where treadle pumps cost between US\$50-80 additional income rises to between US\$200 – 500 each year.

### ***Why Treadle Pump for Small Farmers?***

In the past small farmers used locally built water lifting devices, such as *tenda*, *dhekuli*, *sena*, *tar* and *don*, to irrigate their small land holdings. Drawing water manually from rivers canals and wells with these devices has been in practice for ages, and is prevalent even today. These traditional irrigation methods have many disadvantages, the main being that they are very laborious and time consuming; and restricted to surface water or open wells.

For small farmers diesel and electric pumps are too expensive to purchase, operate, and maintain for irrigating a small plot. Compared to the traditional water lifting devices and the costly diesel and electric pumps, treadle pumps have the following advantages:

1. **Low-Cost and Affordable.** It is cheaper than diesel and electric pumps. Besides, there is no need for diesel, electricity or battery to operate the treadle pump. The operating cost is household labor. A marginal farmer in the Gangetic basin can easily get full return of his/her investment within three to four months of purchase and usage.
2. **Easy to Operate.** One just has to pedal to lift water from a tube well. It is so easy that even a child, a woman or even an old person can operate the pump. Adults can operate for hours at a time. It is possible to pedal while in a sitting position. In addition to being easier to operate the treadle pump delivers much more water for an equal lift and pumping period than a hand pump.
3. **Easy to Install on any Well.** The treadle pump can not only be installed on a 1.5” tube wells but also on 3” and 4” tube wells that are meant for installing electric and diesel pumps.
4. **Light and Portable.** A farmer can easily carry the treadle pump (except the concrete model) on his/her head or shoulder or can transport it in a cycle carrier. This is important for farmers who have a number of small plots in different locations. They can buy one pump, drill a bore on each plot and shift the pump from one plot to another for irrigation.
5. **Sturdy and Durable.** The barrels of both the metal and bamboo treadle pump models are made of sheet metal and hence are sturdy. The concrete pump is sturdy because of its weight.

Adapted from International Development Enterprises report on “Affordable Small-Scale Irrigation Technologies” <http://www.ide-uk.org/IDE-small-scale-irrigation-technologies.pdf>