

Project Proposal

Topic: Drinking Water – Water Supply for Small Communities

Introduction

In many parts of the globe, clean water for drinking and personal hygiene is a very limited resource. The availability of clean and save water is the basis of a secured, sustainable development of remote communities and also plays a major role in many small, especially food-related industries.

Where it is lacking, it deprives people of the opportunity to realise their full personal and economic potential. Very often dirty and insufficient water results in decreased health status and is the reason for the spreading of many diseases. Particular babies and children suffer from water shortage and bad water quality – very often their personal development is hampered with permanent effect.



Setting up solar water systems for drinking water in remote rural areas in Asia and Afrika

Where water is available, it is often located far from the domiciles of its consumers who have to spend a large proportion of their time walking to and fro the location of the water source, wasting time and energy that could be spend on other productive activities.

Water is one of the most important factors for healthy and good living conditions of human beings besides a balanced nutrition. Particular for the development of children clean and sufficient water is very important. Water is also needed for hygienic proposes.

Water Supply and Pumps

Providing a stable water supply is at the core to ensure good living conditions as well as the framework for successful business and agricultural development. Two sources are common:

1. **Rivers and ponds** can provide water, but the availability of water can change during season and the time of the year – and sometimes dwindle in summer, when it is most urgently needed. Also, these sources might be at considerable distance from people’s dwellings or the pasture of the animals.

2. **Drilled wells** are costly to develop, but give a more stable water supply. Ground water is normally fresh and no contaminated.

Pumps are used to lift and transport the water to where it is needed – sometimes over substantial distances. Earlier wind and hands pumps were used, but their applications are very limited and not reliable. They cannot be transported easily and need regular maintenance of the mechanical parts. Later diesel-operated pumps came into use, but their popularity is in decline due to rising fuel prices, the cost of spare parts for maintenance, the need to transport fuel to the system’s location and the noise and pollution they cause.

Since the 90s solar pumps have been developed and reached technological maturity. They are successfully tested and used for many years in various parts of the world. Despite their higher initial cost, solar-operated pumps are an economical alternative to the widely used diesel-operated pumps. The breakeven point is usually reached after 2-4 years only.

Especially solar-operated submersible pumps have proven to be the solution for remote areas with no connection to the electrical grid. The electric energy is produced by a set of PV modules during daytime. This renewable, cost-free energy powers the submersible pump which is controlled and optimized by a pump controller on top of the well. With a battery system attached, the pump can also run at night and provide electricity for some small lamps, a radio and a telephone charger by the side. The whole system operates automatically. It is protected by a tank float switch as well as a low water well probe.



Simple installations provide stable, efficient water supply

Solar pumps can push your water through plastic pipes over long distances. A combination of lift and pressure pumps powered by sun are common. The water is normally stored in a reservoir or tanks. With gravity-feed pipes you can serve several outlets with only one pump. If your flock is moving – and with it the location of your water demand –, you can make your solar pump system mobile, e.g. on a small transporter or trailer, and cover your needs with only one pump set. This also allows you to put the system aside in winter or for protection.

LORENTZ Solar Pumps

All LORENTZ solar pump systems are designed to serve your need for a stable water supply in remote and rural areas. Motors and pump ends are made for operation far away from streets and roads, where experts are not available for setup and frequent service. LORENTZ provides rough and reliable tools with a high life expectancy that are easy to install and need no maintenance.

LORENTZ solar pumps are highly efficient and especially constructed for solar operation – they work as long as there is some daylight, also on cloudy days. They do not need full sun shine. Rather than stopping, they still provide water at a reduced flow rate. Pumping time is approximately 8h per day or more, depending on season and latitude of the system location.

LORENTZ solar pump system consists of three components only:

1. solar generator
2. pump controller
3. submersible pump

For easy repair and service all parts are interchangeable. The cabling and pipe connections are straight forward – no need for an expert for installation. Refer to your manual, available in e- & print form, besides English also in other languages.

The sizing of the solar generator and the pump selection follows a standard procedure using simple tables and diagrams as well as a software programme. The LORENTZ team supports you in choosing the right device for your individual situation.



LORENTZ systems are installed in more than 100 countries all over the globe

Examples for a LORENTZ Solar Pump System

Like all other pumps, LORENTZ solar pumps are also defined by the vertical lift [H, measured in meters] that must be coped with and the water volume pumped up [Q, measured in m³/day]. The following examples show standard demands and pumping solutions for drinking water supply.

Example A

Model:

PS 1200 HR-07 with a 660 W(p) solar generator
(fixed mount, no tracker)

Output:

Volume [Q] = 8.5 m³/day at a lift [H] = 60 m



With 8,500 l per day at 30 l/person/day, you can provide water for approx. **300 people**

Example B

Model:

PS 1800C SJ5-12 with a 2,100 W(p) solar generator
(fixed mount, no tracker)

Output:

Volume [Q] = 30 m³/day at a lift [H] = 60 m



With 30,000 l per day at 30 l/person/day you can provide water for approx. **1,000 people**

The water consumption varies significantly depending on region and social standard. The range starts from 30 l/person/day. UNICEF recommends consumption figures from 90-120 l/person/day.

About LORENTZ

Since more than a decade, LORENTZ successfully produces solar pump systems and solar tracking systems. In R&D, LORENTZ pays special attention to the maintenance-free long-term service of its products. The success of this concept is proven by the daily performance of LORENTZ pumps and trackers in more than 100 countries all over the globe.

Contact

Bernt Lorentz, GM
bernt.lorentz@lorentz.de

LORENTZ
Krögerskoppel 7
24558 Henstedt-Ulzburg
Germany

www.lorentz.de