Solar PedalFlo™

Solar PedalFlo™ Benefits
Advantages Over Hand Pumps
A New Technology
The Solar PedalFlo™ Solution
General Information
Video*

MWI Moving Water Industries
CORPORATION
ESTABLISHED 1926

*In order to view the Solar PedalFlo™ Video, you will need the latest version of Adobe Reader (8.1.1). It is a free download and can be found HERE.

Back to Main Table Of Contents

MWI Moving Water Industries CORPORATION ESTABLISHED 1926 INTRODUCES

A Complete Solar Powered Water Delivery System

THE SolarPedalFlo™

PROVIDING WATER FOR RURAL COMMUNITIES

- No Electricity Required
- No Engines Required
- Solar Primary Power
- Human Secondary Power
- Improves Health
- Reduces Infant Mortality
- Village Level Operation and Maintenance

A COMPLETE WATER SUPPLY SYSTEM

A Potable Water Supply System in which water is lifted from boreholes, filtered, purified and pressurized for delivery anywhere in your community.

Back to SolarPedalFlo Table of Contents

MWI, Moving Water Industries, was established by the Eller family in Deerfield Beach, Florida in 1926. The company originally manufactured a variety of agricultural implements including water pumps.

Eventually, large water pumps became the most important product - and over the next seven decades, MWI produced more high volume propeller pumps than any other company in the United States - with over 12,000 installations in place. MWI has successfully introduced many unique, patented water pumps from small hand pumps producing 6 liters per minute (1.5GPM) to large pumps producing over 1900 cubic meters per minute (500,000 GPM). David Eller, the inventor of the SolarPedalflo has over 20 US patents. In 1989, MWI began producing hand pumps from its production facility in Nigeria, followed several years later with the introduction of the SolarPedalflo.

MWI has been operating internationally for over 30 years with representatives in over 40 countries in the Far East, Middle East, Africa and Latin America. Our representatives offer the full line of MWI products and provide service, spare parts and support.

REALIZING THE PROBLEM... OLD HAND PUMP TECHNOLOGY

MWI's experience in hand pump production, along with intensive interaction with rural communities, led our engineers to the realization that existing hand pump technology would never allow communities to solve their water problem.

Much good has been accomplished through public and private organizations' attempts to help rural areas meet minimum per capita water requirements. However, the old methods of water collection/distribution still prevail and continue to promote disease and lower the quality of life.

THE SPECIFIC PROBLEMS WITH HAND PUMPS

- One of the most popular hand pumps today is the "Mark II". To produce 15 liters of water per minute using this pump would require 40 consecutive strokes with 20 KG of force for each stroke in 60 seconds. This is the level of effort required for a 25M water depth; the effort increases to 30 KG of force per stroke for a 45M depth. An extremely strong man would have great difficulty keeping up that pace even for a short time. Throughout the Developing World, the task of operating the hand pump or fetching water usually falls to women and children. They cannot even begin to approach the rate of 40 strokes per minute with the required force, much less maintain it. If it were even possible to keep up that rate, with no stopping to change buckets or to rest, one could only produce 4,500 liters in five hours of non-stop pumping.
- Realistically, a hand pump will only produce 2,500- 3,000 liters of water per day. Human strength, fatigue and broken down hand pumps significantly limit the daily production rate.
- Studies in Africa have shown that, at any given time, 30% - 60% of all hand pumps are broken and completely useless. Consequently, there must be an alternative water source which requires women and children to spend several hours daily carrying water to homes, schools and clinics.
- Standard hand pumps can only pump water directly into open buckets. They are incapable of pumping water into an elevated tank or to provide pressure for distribution through a central piping system to multiple points.
- Water pumped into a bucket with a hand pump may already be contaminated with waterborne diseases and is susceptible to being exposed to additional airborne diseases when left in an open container. The consumption of contaminated water puts the entire community at risk of dangerous, life threatening, health consequences.

In some areas, many hours of labor are spent daily collecting water. Now there is a better way!

OUR SOLUTION IS THE SolarPedalflo™

Back to SolarPedalFlo Table of Contents

The SolarPedalflo... A New Technology

Complete Solar / Human Powered Community Water Delivery System

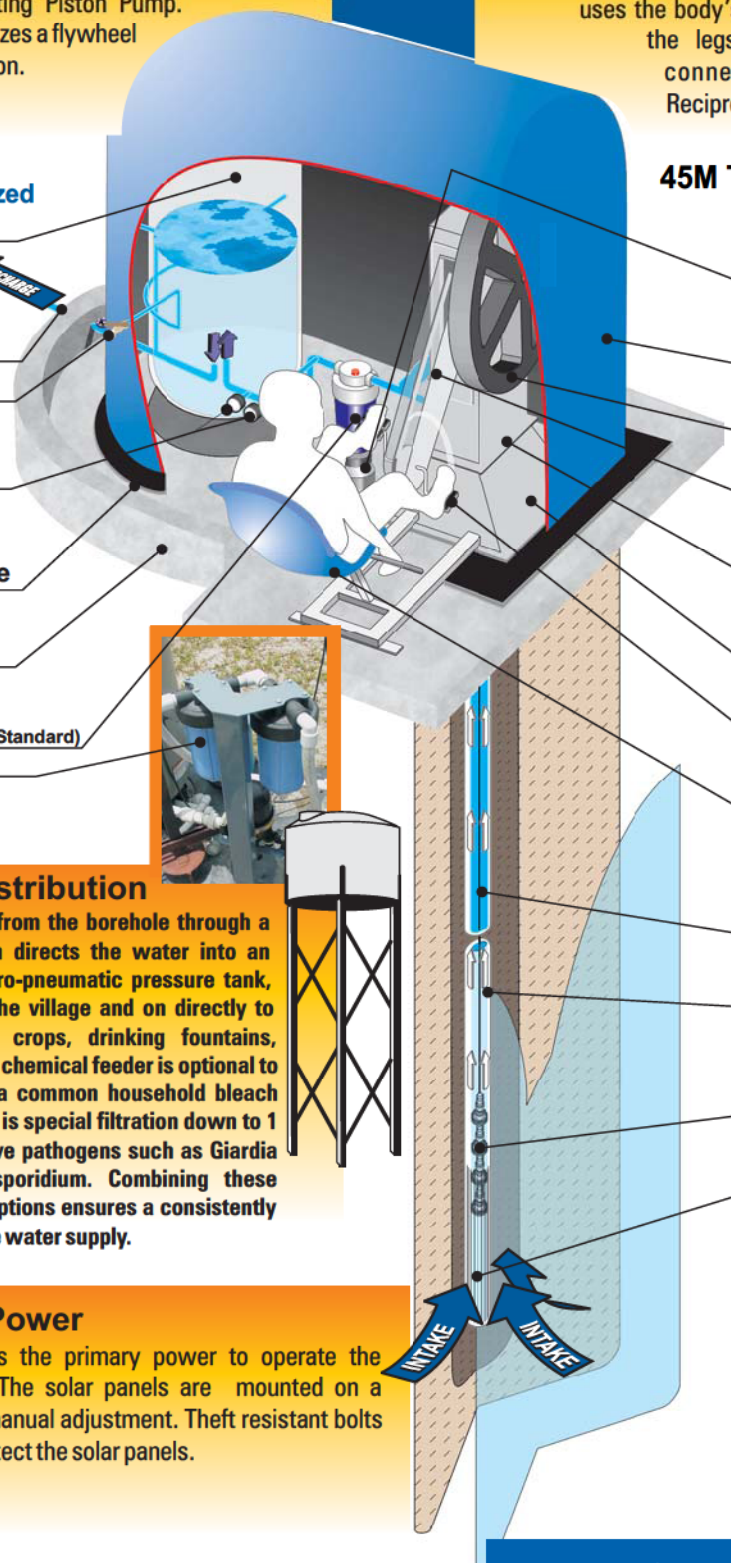
The SolarPedalflo Community Water Supply System is able to deliver treated potable water to virtually any location or doorstep in a rural community on a continuous basis.

1. MWI SolarPedalflo

The SolarPedalflo lifts water from boreholes using an MWI Borehole Reciprocating Piston Pump. The pump's design also utilizes a flywheel for uniform power conversion.

2. Human Powered

As a secondary power source the SolarPedalflo uses the body's most powerful muscles, the legs, to rotate pedals which are connected to an MWI Borehole Reciprocating Piston Pump.



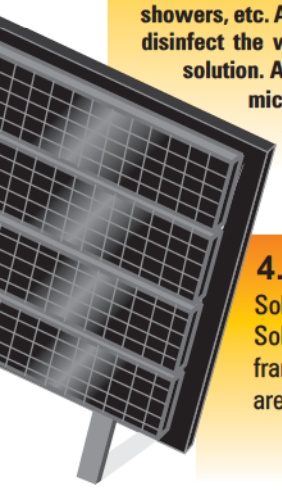
45M TDH is the Standard Model
60M TDH is Optional*

- Non-Corrosive, Pressurized Hydro-pneumatic Tank*
- Remote Location Outlet (or to overhead tank)
- Faucet
- Pressure and System Gauges
- High Density Polyethylene (HDP) Base
- Concrete Slab (supplied by others)
- Purification and Sediment Filter (50 Micron Standard) (1 Micron Optional)*
- Chlorine Feeder*
- HDP Weather Cover
- Flywheel
- Control Valve
- Pressurized Discharge Manifold
- Pump Discharge Head
- Heavy Duty Pedals
- Adjustable Seat
- Pump Connecting Rods
- Well Casing*
- Reciprocating Piston Pump
- Well Screen

*Optional Feature

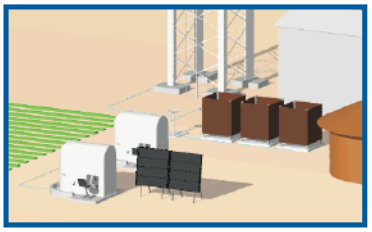
3. Treatment / Distribution

The water is first pumped from the borehole through a filter. A control valve then directs the water into an optional non-corrosive hydro-pneumatic pressure tank, or to an elevated tank in the village and on directly to clinics, schools, housing, crops, drinking fountains, showers, etc. An automatic chemical feeder is optional to disinfect the water using a common household bleach solution. Also optional, is special filtration down to 1 micron to remove pathogens such as Giardia and Cryptosporidium. Combining these treatment options ensures a consistently safe potable water supply.



4. Solar Power

Solar power is the primary power to operate the SolarPedalflo. The solar panels are mounted on a frame with a manual adjustment. Theft resistant bolts are used to protect the solar panels.



Multiple MWI SolarPedalflos can be installed in a network to supply water to communities of any size.

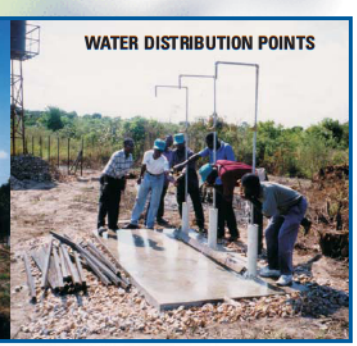
Back to SolarPedalFlo Table of Contents

The SolarPedalflo Solution

Typical Potable Water Distribution System

One SolarPedalflo on one well delivers as much as 4 hand pumps on 4 wells and delivers it purified and pressurized.

4 Hand pumps = 1 SolarPedalflo



Back to SolarPedalFlo Table of Contents

SolarPedalflo™ Advantages

- **Improves Health:** Adequate quantities of clean water are provided for drinking, hygiene and cooking. Water is less likely to become contaminated due to the SolarPedalflo's closed container water storage and automatic chemical feeder. Clean water results in healthier babies and a reduced infant mortality rate.

- **High Volume Discharge:** The SolarPedalflo can discharge over 20 liters per minute (5 GPM) with an average 40 meters of head. Therefore, on a typical day with 8 to 9 hours of usable sunshine, the SolarPedalflo can deliver over 10,000 liters (2,600 gallons) of potable, treated water using the sun as primary power. On overcast days, or when sufficient solar power is not available, the human power secondary system can be utilized so that good dependable water is always available. Where more water is needed, early morning and late afternoon users could pedal for their water; resulting in another possible 5,000 to 10,000 liters delivered for a total of 20,000 liters (5,200 gallons) per day made available to a community.

- **Pressurized Water:** A non-corrosive, hydro-pneumatic tank is optional to store pressurized water inside the SolarPedalflo. At a pressure of 2.7 bar (preset at the factory), it will store 40 gallons of water which provides highly pressurized water for distribution throughout the village. The factory precharge can be adjusted as needed. The positive displacement pump generates enough pressure to pump water to an overhead tank allowing storage of water and pressure for distribution. If an overhead tank is used, the pressure tank is not required.

- **Increased Efficiency:** The efficiency of the SolarPedalflo eliminates the cost of multiple hand pump installations and their maintenance. The effort required to collect water is very low. Just open a tap and fill the container.

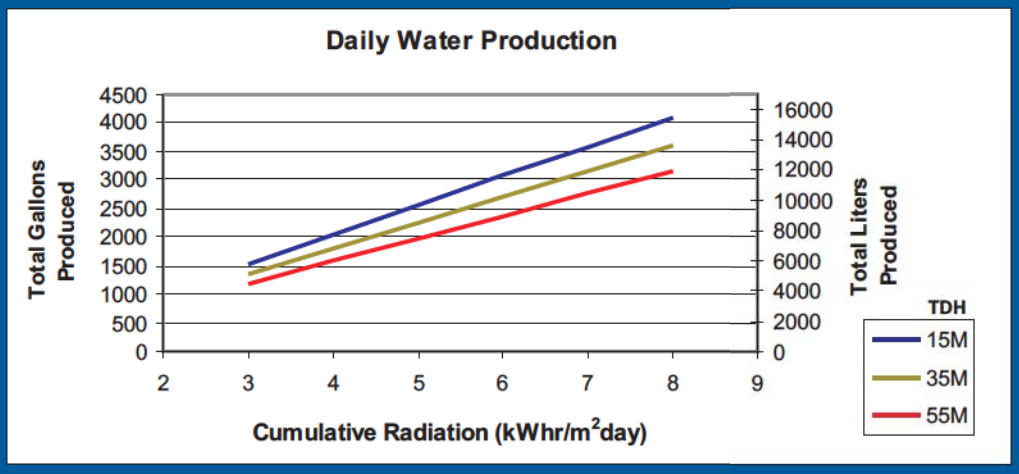
- **Improves Standard of Living:** Large quantities of clean, pressurized water improves the standard of living by reducing the energy and time necessary to fetch water allowing children to use their time for development and for women to engage in more productive activities.

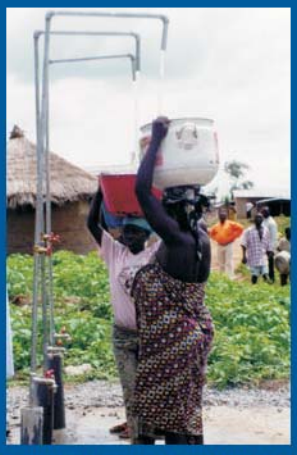
PERFORMANCE CHART

TOTAL DYNAMIC HEAD (M)	FLOW (LPM)	FLOW (GPM)
10	27 - 28	7.0 - 7.5
20	25 - 27	6.5 - 7.0
30	23 - 26	6.0 - 7.0
40	20 - 25	5.0 - 6.5
50	17 - 22	4.5 - 6.0
60	15 - 18	4.0 - 5.0

LPM= Liters per Minute GPM= Gallons per Minute

NOTE: The flow rates contained in the Performance Chart shown above are approximate and are based on 1kW/m2 of solar radiation. These flow rates, as well as the Daily Water Production shown below, assume the correct installation of the SolarPedalflo unit, as per the instructions in the O&M manual, the utilization of a fully-developed borehole with adequate yield and a 420 Watt solar power system.





Clean, pressurized water has been brought to these communities, as a result of SolarPedalflo Installations.

Dr. John L. Tarpley spent 15 years (1978-1993) in Ogbomoso, Nigeria as a surgeon in a Baptist Missionary Hospital. During David Eller's frequent visits he was inspired by Dr. Tarpley to help aid in delivering clean water to rural villages. This inspiration led to the SolarPedalflo technology.

Today, Dr. Tarpley is a Professor of Surgery at Vanderbilt University and has this to say about the MWI SolarPedalflo Pump and its benefits:

"Two out of five Nigerian children die by the age of five, in great part because of impure and inadequate water. The provision of adequate and safe water in the developing world will do more to prevent disease and promote health than any other single measure. The SolarPedalflo unit represents a needed marriage of modern engineering with appropriate technology. This is an exciting boon for millions in the tropics, especially children and particularly Africa."

- John L. Tarpley, M.D.

Community members setting up a fence and overhead tank for the SolarPedalflo.

Back to SolarPedalFlo Table of Contents

MWI's International Headquarters is located only four blocks from where the Eller family founded the business in Deerfield Beach, Florida USA in 1926.

MWI Deerfield Manufacturing Facilities are spread over four city blocks, totaling nearly 300,000 sq. ft. And including a 10,000 sq. ft. hydraulic testing laboratory.

MWI (Nigera), LTD, a modern facility located in Maiduguri, manufactures hand pumps, water tanks and other similar goods.

Villagers gather to collect water produced by their new SolarPedalflo.

A local woman pedals for water demostrating the SolarPedalflo's secondary power.

An MWI engineer explains how the solar panel works.

"The average African does not have a clean glass of water in his or her life." -AFICARE

"Infant mortality rates could be cut in half with global access to clean water and sanitation." -UNICEF

"The daily death count from unclean water is placed at 30,000. Two billion people lack safe water." -UNICEF

"Our experience with the SolarPedalflo in Mali has demonstrated that if used in combination with simple hygienic practices, the pump can dramatically reduce the incidence of diarrhea and cases of cholera." - Pamela White, USAID Country Director, Mali

SolarPedalflo® COMMUNITY WATER SUPPLY SYSTEM

The SolarPedalflo - Economical & Technological Breakthrough

"The SolarPedalflo out-produces hand pumps by a factor of four. According to studies done by international agencies, each borehole for a hand pump can cost between US$7,000 to US$8,000. To drill four boreholes and install hand pumps on them would cost between US$32,000 and US$36,000.

For significantly less money, a SolarPedalflo can be purchased and installed complete with borehole, overhead tank with stand, and multiple distribution points. The SolarPedalflo is an economic as well as technological breakthrough."

According to the World Bank and the UN, there are hundreds of millions of people whose health and life are threatened every day by lack of access to clean water. Let's work together to solve this problem and help meet the Millennium Development Goals. The SolarPedalflo is a quick, economical and modern technology solution which provides large quantities of clean, filtered, purified and pressurized water. Call, fax, email or write us today. Let our team of experts show you how the SolarPedalflo will improve the quality of life for rural and peri-urban residents.

Drill rigs will be needed for areas that cannot install the SolarPedalflo on existing wells. In this picture, MWI is demonstrating the process of drilling.

Back to SolarPedalFlo Table of Contents