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## Hippo Roller

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### What is a Hippo Water Roller ?



Millions of people worldwide are forced to walk long distances on a daily basis to collect their water requirements for the day. Traditional methods of collecting water include the use of 20-liter (5-gallon) buckets, which are laboriously carried on the head. Extensive suffering occurs in the process.

This method is very time and energy consuming and is also the cause of many serious health problems.

The drum is manufactured from UV stabilized Polyethylene and has been designed to withstand typical rural conditions such as uneven footpaths, rocks and even broken bottles. The large opening (135 mm / 5.3 inch diameter) allows for easy filling and cleaning of the interior. The sealed lid ensures hygienic storage of water and the steel handle provides firm control over difficult terrain while pushing or pulling the roller.

The innovative design allows water to be placed inside the "wheel" rather than carried above the wheel. The 90kg (200 pound) weight of water is borne on the ground resulting in an effective weight of just 10kg (22 pounds) on level ground. Children and the elderly can easily manage a full roller over most types of terrain. Extensive field tests over many years and various awards have proven the effectiveness of the Hippo Water Roller. Approximately five times the normal amount of water can now be collected in less time with far less effort.

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**CNN Coverage ( 16 January, 1996 )**

CNN Correspondent: **Mike Hannah**

***'New Invention Eases the Burden of Rural South Africans'***

CNN World News anchorman introduces the Hippo Water Roller Project in South Africa.

“It (water) is the nation’s most vital resource, and yet, for more than 15 million people it’s not on tap in the home. Nearly half the country’s population has to collect water. Some walking for up to six hours each day in doing so, but things are changing.”

“This is a Hippo water roller, astounding in its simplicity. Where people once had to carry small amounts of water over a long period of time, they are now able to collect and transport a day’s supply with ease.”

Louis Groenewald - Hippo Water Roller Project: --- “The intention is literally to touch hundreds of thousands of people’s lives from the very moment they get a Hippo roller. It’s a case of first world technology in a genuine third world environment.” world technology in a genuine third world environment.”

It’s changed this shopkeeper’s life in the most fundamental of ways. “I used to have to fetch water six or seven times a day,” says Victoria, “Now with the Hippo I do it once in every two or three days.”

“Ironically, the same engineers who created weapons of war in the Apartheid years have reinvented the Wheel.”

Clara Masinga - Community Leader: --- “After the Hippo Rollers, our lives changed.”

“For the first time community leader Clara has been able to grow a viable vegetable garden. She and her neighbours have more time to cultivate the crop as well as a means of irrigating it. And for those who have literally spent most of their lives carrying water, there is hope of better times.”

“With the financial assistance of others, there’s now the real possibility that a burden carried for so long can be set aside forever.”

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**Distribution**

People in many countries around the world are faced with similar circumstances with regard to inadequate access to water. The vast majority of communities in these regions are impoverished, requiring donor support.

All Hippo Water Rollers are currently manufactured in South Africa and the opportunity exists for local distributors to be appointed in other countries on two levels:

Level 1: Distribute Hippo Water Rollers in the country of representation by importing from South Africa

Level 2: Manufacture and distribute Hippo Water Rollers in the chosen country of representation

Exporting the manufactured Hippo Water Roller from South Africa is costly due to the large empty drums filled with air! A 20-Foot container takes 175 x rollers, and a 40-foot container takes 350 x rollers. We are also able to provide a complete manufacturing plant and training for anyone wishing to produce 'Hippo Water Rollers' under license in another country. Once a license agreement has been established and a plant has been purchased and installed, raw materials are then imported to the plant where manufacturing and distribution occurs.

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## **Health Benefits**

### **How Carrying Water Affects Women's Health**

One of the aims of the Water Decade was to reduce the social, economic and health consequences of carrying water by providing a safe water supply within reasonable walking distance. Many projects have been developed, but few are concerned specifically with the health effects of carrying heavy loads of water over long distances.

Women in many countries prefer buckets, tins or Jerry cans to traditional containers such as calabashes and clay pots. The weight of an empty container varies between 500g and 5 kg (1 and 10 pounds), depending on the material; plastic is the lightest. The average quantity of water held in a container ranges between about 12 and 25 liters (3 and 5 gallons). The most common method of carrying water is on the head, particularly in Africa.

Women sometimes carry several containers, increasing the weight of the load to 50-kg (110 pounds). Carrying water on the head requires strength in the neck and considerable skill, a skill often-acquired around nine years old.

#### **General health effects**

The task of carrying heavy loads over long distances requires a great deal of energy, which comes from metabolized food. The longer the distance and the more difficult the terrain, the greater the quantity of food needed. Women carrying water are frequently exposed to malnutrition, anemia and water-related diseases.

Women are most vulnerable to malnutrition at the end of the dry season when they have to travel even greater distances to fetch water. Women and children suffering from malnutrition are also more susceptible to other diseases.

Some 230 million people are estimated to be anemic, and pregnant women, in particular, are at risk. In Africa, 40 per cent of non-pregnant and 63 per cent of pregnant women are anemic. During pregnancy, the arduous task of carrying water can cause problems with the growth of a fetus. Women have to resume fetching water soon after giving birth, which can affect the quantity and quality of breast milk, making the baby vulnerable to malnutrition. Women collecting water from certain environments may be exposed to water-related diseases such as malaria, fiariasis and schistosomiasis.

## Effects on the skeleton

Carrying heavy loads over long periods of time can result in damage to the vertebral column. In normal physiological conditions, the vertebral column is resistant and can support great strains, but this changes as people age. A major problem arising from carrying water is the early aging of the vertebral column. This may be influenced by several factors, the most important of which is overwork. A hereditary factor may also exist in certain families, causing rheumatism.

Problems occur in the organic tissue: the disc decreases and becomes thinner. The nucleus becomes fibrous and no longer acts as a shock absorber. The vertebral bodies become more fragile and tend to change shape from rectangular to cuneiform. This may lead to a deformity called cyphosis.

At the same time, clinical symptoms appear in the form of pain, which increases with work, at the end of the day and in cold temperatures. Mobility often becomes limited: on waking up, considerable stretching is required before normal mobility can be achieved. As people move less because of pain, so their movements become more and more restricted until they may reach a stage where they cannot move at all. Because of modifications in physiological conditions, the vertebral column can no longer fulfill its functions.

Where children are concerned, the main problem associated with carrying heavy loads of water is the effect on the growth of bones. When children begin to carry water, they are still growing and a deformity known as scoliosis of the vertebral column may occur. Also, because of the development of the neck muscles, they may have problems with the thyroid gland. Other problems include fractures, slipped discs and damage to the knees.

Kerr, Charles, ed., (1990). *Community Health and Sanitation*.

Intermediate Technology Publications: London

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## Irrigation

### THE HIPPO FOOD SECURITY SYSTEM

*'incorporating efficient, low-cost and appropriate technology for improved food security'*





## **Sustainable Food Security**

The Hippo Food Security system is designed to meet the nutritional needs of an average-sized family. It is also suitable for many self-help projects, feeding schemes and other poverty reduction projects. All that is required is a small piece of ground. The drip irrigation system can be configured and sized to suit any available area of land (up to 50m<sup>2</sup>).

## **Water Supply?**

Healthy crops require a regular and sustainable water supply for good quality growth. In many communities, water sources are scarce and located far away. The Hippo Water Roller is used to bring water to the irrigation system from any available source with ease, 90 litres at a time. In addition the roller can be used to meet normal household needs too. Water used for washing (grey water) can be transferred to the reservoir for irrigating plants.

## **Why Drip Irrigation?**

Water is provided slowly to the roots of plants through drip emitters ensuring a high moisture level in the soil in which crops can thrive. Drip irrigation can be adapted to any farmable slope, suits most types of soil and is most beneficial when water is scarce. This method of watering plants is also very economical and simple to control.

## **Responsible Use of Available Water**

Vegetable crops require the right amount of water for good growth, not necessarily large amounts of water. Gravity fed (low pressure) drip irrigation is able to deliver water directly to the roots through small openings (emitters) in the drip lines at a very slow rate without losing large amounts to evaporation or to run-off on steep slopes.

## **Improved Health**

Eating a balanced diet from growing a variety of vegetables and fruit trees empowers communities to get access to good nutrients for improved health, which has the added benefit of retarding the effects of HIV/AIDS.

## **Income Generation**



The first harvest takes approximately 3 months to mature. Thereafter, there will be no need to purchase vegetables, which will help to reduce household expenses. Once a family has become self sufficient, they will have the means to grow and sell surplus crops, seedlings and flowers for additional income.

### **The Hippo Food Security System**

The complete pre-assembled package includes the following: (other variations are available)

- A 210-litre plastic reservoir (drum): for supplying water to the irrigation system. (this reservoir is optional)
- A 90-litre Hippo Water Roller: for bringing water to the irrigation system and for household use. (The Hippo Water Roller can also be connected directly to the feeder hose eliminating the need and cost of the larger 210-litre reservoir. A second screw cap with pipe adapter is required.)
- Eight x 6-metre length drip lines: will cover an area of 50m<sup>2</sup> (These can be expanded or reduced in quantity to suit individual requirements.)
- Tools and instructions: for creating drip emitters according to the required spacing for the different vegetable seeds to be planted.
- A starter pack: consisting of a variety of seeds for both winter and summer sufficient for a family of six.

### **Unique Drip Emitters**

The simple drip emitters were designed using low-cost appropriate technology to suit third-world conditions. They are easily manufactured, maintained and unblocked.

The spacing of the emitters will be determined by the choice of seed to be planted in each row. For example: Onions @ 15cm, Spinach @ 30cm, Cabbage @ 45cm, Pumpkins @ 1,5m, etc.

### **Pre-Assembly and Packaging**

The complete system is pre-assembled before packaging.

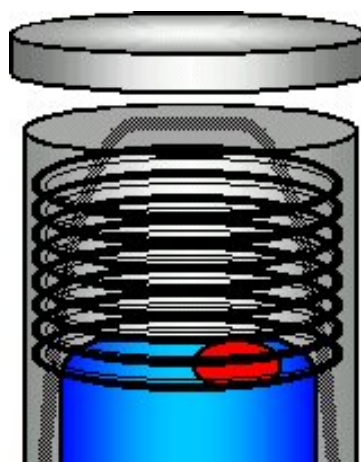
The Hippo Water Roller and handle are placed inside the large reservoir.

The individual drip lines are then rolled up and placed inside the reservoir on top of the roller.

The tools, instructions and starter pack are also placed within the reservoir, which is then sealed, ready for shipping.

Once delivered, the system is quickly unpacked, laid-out and emitters inserted.

After the reservoir (or Hippo Water Roller) has been elevated and filled with water, the Hippo Drip Irrigation system is ready.



**Further Options:**

Additional supply of gardening equipment and seed.

Start-up, implementation and subsequent training and consultancy on the control and operation of drip irrigation for growing vegetables. (Transfer of Life-Skills).

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**Landmines**

Many countries throughout Africa and other parts of the world are devastated by the impact of land mines. The cost in terms of human suffering and resultant dependency on the state by the maimed is crippling and extremely de-motivating.

Tests were conducted near Pretoria, South Africa using Hippo Water Rollers to establish what the impact might be on a person should the roller trigger an anti-personnel land mine.

A hippo Water Roller filled with 90 liters (20 gallons) of water was pulled over a land mine that had been planted in front of a soft cardboard model mounted on a steel frame.

The shock wave and incredible heat (3,000°C) generated by the blast were absorbed so effectively by the water that not even a yellow flame was noticeable. Very little damage was evident on the cardboard model.

In all three tests, indications were that no hospitalization would be required. Some bruising and lacerations may occur caused by bits of plastic from the roller.

Though not recommended as a de-mining device, the Hippo Water Roller will save both life and limb and at the same time alleviate the need for improved access to water.





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