

Affordable Rainwater Catchment Systems for the Developing World



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Clean Drinking Water - An Increasingly Rare Commodity

All people need access to clean water for such basic needs as drinking, sanitation and hygiene. But according to the report of the Secretary General of the UN on global water resources, the world is facing a worsening series of local and regional water quantity and quality problems in the years ahead. The countries which will be worst effected are those which lack the necessary financial resources for sustainable development and management of water resources.

Today more than one-fifth of the world's population do not have access to safe drinking water and it is estimated that half of the people in developing countries suffer from water and food related diseases. The World Health Organisation estimates that five million people die each year from diseases caused by unsafe drinking water. Surprisingly, water contamination can be a bigger problem in regions where rainfall is plentiful. Excessive rain often causes pit latrines to overflow into water supplies which are used for domestic purposes. Micro-organisms found in human and animal wastes contain a wide range of bacteria, viruses, protozoa and other disease-causing organisms. Tropical and sub-tropical climates are favourable to mosquitoes which breed in water puddles and then spread malaria and a variety of other diseases.

Run-off from fertilizers and detergents causes excessive algae growth and leads to a decline in water quality. High nitrate levels in drinking water decrease the oxygen carrying capacity of haemoglobin in blood, which can threaten the health of infants. A UN study says that nitrate pollution will likely be one of the most pressing water quality problems in the coming decade. Heavy metals are found naturally in soil and water, but increased worldwide production and use by industry have released large amounts into the environment. Babar Kabir, a hydrologist with the World Bank, estimates that 18 million Bangladeshis are now affected by arsenic from underground water, with some estimates that more than 50 million people are at risk.

For more than 20 years tube wells have been a cheap and effective way of avoiding outbreaks of diarrhoea and cholera. The problem of underground water contamination, along with the fact that many underground water resources are now being drained faster than nature can replenish them, means it is now critical to rethink our approach. Underground water supplies 30 percent of the world's population and is the main or only source of water for rural dwellers in many parts of the world. Underground sources are being heavily overused and water levels have dropped by tens of metres in some regions. This makes it difficult and expensive for people to access the water. Where water levels drop many people are forced to turn to lower quality underground water sources, some of which contain natural contaminants, increasing their risk of disease.

It is also estimated that about half the water in drinking water supply systems in the developing world is lost due to leakage, illegal hookups and vandalism. The World Bank estimates that about \$600 billion needs to be invested worldwide to repair and improve water delivery systems.

Toward a Solution

Clearly the world urgently needs cheap, effective and sustainable systems to supply the world's growing demand for clean drinking water.

Rainwater harvesting has always been an integral part of life in rural Australia. The fact that it has been practical in Australia (the driest continent) is evidence that it is universally applicable. Economic factors have, however, made widespread rainwater harvesting unviable. This has been largely due to the cost and availability of galvanised iron which is used both in tank construction and roof catchment systems. Building practices throughout

A Solution

the developing world which are primarily dependent on utilising natural materials means that such a large cultural change is both impractical and unlikely. The cost of good quality galvanised steel and the cost of transportation to remote regions means that the wide-spread application of systems like those widely used in Australia is also impractical and unlikely.

However, the fact remains that in non-industrial regions the cleanest water is always that which falls from the sky. The natural water cycle is very effective in screening out contaminants and making water fit for human consumption.

Alternative Concepts has developed a simple and safe low-cost system for small scale harvesting of rainwater for drinking purposes. This was achieved utilising UV resistant foodgrade polyethylene plastics and a patented manufacturing technology developed by Southcorp Industrial Textiles. The compact nature of this system means that they can be mass-produced and distributed throughout the developing world, easing or eliminating demand on other water supplies. Various setup configurations means that the system can also be customised to allow for a range of circumstances and applications. Larger underground water containment and large scale catchment systems are also possible using similar technology. Alternative Concepts welcomes inquiries from development agencies for opportunities to test and develop these further. If the application of this technology is to be successful, there is a need to involve the users of these systems in the final development and application of this technology. Because of the cultural shift required to move towards rainwater harvesting, there is also a great need for education similar to that which was required when tube wells were first implemented.

The UN Secretary's report on global water resources stated that special "priority needs to be given to the African region, Latin America and South-east Asia. Recent estimates are that \$54 billion would be needed between 1990 and 2000 to provide universal [water] coverage only in the urban areas of the regions most in need." It went on to say that "There is no sign this amount of funding will be made available in the near future in the form of reallocation of internal government spending in nations, or in development assistance from abroad."

Rainwater catchment is yet an untapped and unexplored field. If the economic and political resolve can be found to explore and implement these systems, millions of lives can be saved and untold human suffering prevented.

Benefits:

- The Pelican system captures rainwater, thus delivering the world's cleanest water to the world's most economically disadvantaged.
- The Pelican Tank is an enclosed water containment system which prohibits the entry of contaminants.
- Pelican system is compact, lightweight and easily transportable.
- The Pelican System is a stand-alone system which doesn't require the installation of major infrastructure.
- The initial expense is minimal. With some initial help and subsidies from the international aid community, many of the world's poor will eventually be able to afford to buy their own systems as unit costs decreases with increased production.
- Larger scale systems will mean that larger systems can eventually be implemented on a community basis.
- Individual small scale drinking water supplies will bring about cultural change, educating users to value and protect their available water reserves and minimise wastage.
- Small local businesses can develop for the sale, distribution and repair and maintenance of the systems.

The Rainwater Catchment System

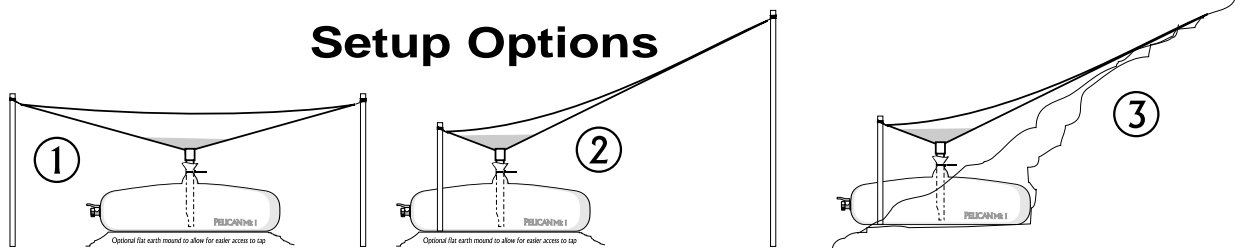
Description



The Pelican™ Rainwater Catchment System is an optional accessory for the Pelican™ Tank, and consists of a high quality UV resistant and tear resistant food-grade polyethylene sheet which is suspended by poles or ropes (not supplied) above a Pelican™ Mk I or Mk II Tank. Special fittings which pierce through the catchment sheet create a drain point for water gathered in the sheet. The water flows down into the tank through the inlet and once in the tank, is protected from contamination from the outside environment. See diagrams below.

The Rainwater Collection System can be setup in different configurations to suit different conditions and user preferences, and can be supplied in a 'ready to use' form or as components which require assembly by the importer or end user.

Setup Options



Remote Location
Rainwater Catchment
and Storage System

THE Original Australian ©
PELICAN
TANK

Rainwater Catchment Sheet

The tear-resistant (1800mm x 2400 mm) Catchment Sheet is supported by 4 poles (not included). Easy-release hooks allow for quick removal of the catchment sheet in high-wind conditions.

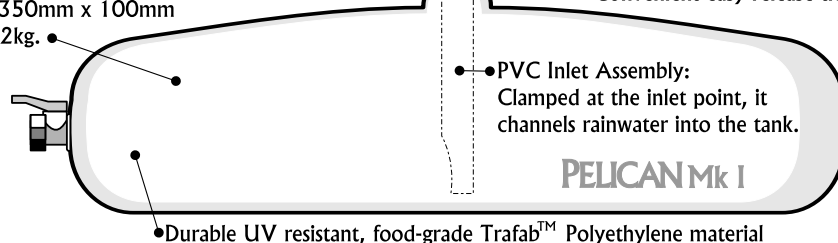
The rectangular Catchment Sheet is supported by 4 poles - one on each corner.

The 325 litre Polyethylene water bag conveniently folds up into a small and portable package approx 220mm x 350mm x 100mm and weighs only 1.2kg.

The special fitting punctures the polyethylene sheet to create a drain point.

Convenient easy-release tie

PVC Inlet Assembly:
Clamped at the inlet point, it channels rainwater into the tank.



Durable UV resistant, food-grade Trafab™ Polyethylene material

Tank Description

Technical Specifications

Size, Weight and Volume

The Pelican Tank™ is a low-cost water container that conveniently folds into a small package (approx 220 x 350 x 100mm) and weighs approx 1.2kg. The Mk II version weighs just over 2kg.

The Pelican Tank Mk I, when full, measures approximately 900mm x 1200mm x 300mm and holds approximately 325 litres.

The Pelican Tank Mk II, when full, measures approximately 1800mm x 1200mm x 300mm and holds approximately 650 litres.

Fittings

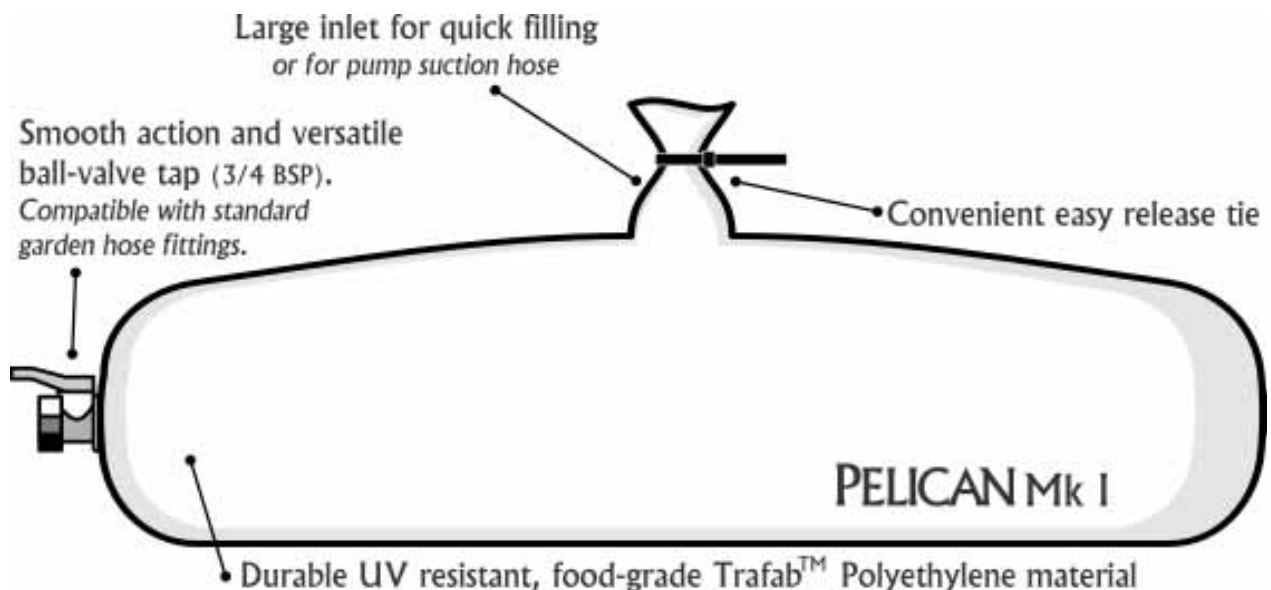
Both tanks have 3/4 BSP outlets on the corners - a plastic ball-valve tap on the 325 lt and a brass ball-valve tap on the 650 lt. Both have a large sleeve opening at the top centre which can allow for quick filling or for the insertion of a pump suction hose. It also allows arm access for cleaning or custom fitting other outlets. The opening pulls closed using a plastic releasable tie.

Material Characteristics

Pelican Tanks are made from Trafab™, which is a food-grade polyethylene and is approved by Australian standards for containing water for human consumption.

The strong and durable Trafab™ is a unique patented product which is made by *Southcorp Industrial Textiles* exclusively for *CE Bartlett Pty Ltd* - the manufacturer of the Pelican Tank™ for *Alternative Concepts*.

The Trafab™ material has an operating temperature tolerance between -40C and +70C and has been rated with UV resistance for 3 years in continual exposure to full sunlight. Impenetrable to light, the unique properties of Trafab™ discourages the growth of algae, making The Pelican Tank™ a reliable vessel for water containment.



Warranty

Manufacturer's Warranty

The *Pelican Tank™* is covered by a 3 month manufacturers replacement warranty. If during that time, the product fails due to faults in manufacturing, the product will be replaced free of charge when it is returned to *Alternative Concepts*.

The *Pelican Tank™* is durable, but is not designed to withstand harsh treatment. Common sense must be employed to prolong it's useful life. The *Pelican Tank™* should be protected from sharp objects and excessive heat. Failure to do so may result in the failure of the product. Replacement warranty expressly excludes failure of the product due to abuse and carelessness beyond it's intended use, and the combined liability of *Alternative Concepts, CE Bartlett Pty Ltd and Southcorp Industrial Textiles*, shall not exceed the value of the product.

Prices & Terms

Supply and Terms of Payment:

Current Export Prices* (October, 1999)

Pelican Tank Mk I (325 litre):	AU \$60
Pelican Tank Mk II (650 litre):	AU \$90
Rainwater Catchment System:	AU \$25

*At this price the Rainwater Catchment System comes in Kit form requiring assembly
Further discounts are negotiable for large quantities.*

**Note: Prices above are quoted in Australian dollars PFS FOB Melbourne Port.
Prices need to be confirmed at the time of orders being placed and do not include
shipping or insurance costs. Orders will only be accepted with an irrevocable letter
of credit, or advance payment. For agencies within Australia, terms can be arranged.*

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