Thailand

Thai Schools find the solution to turn Rainwater into clean safe drinking Water

Millions of children worldwide attend schools without access to clean, safe drinking water. This is not only true for schools in developing countries but also for some in industrialised and developed parts of the world.

The main reason for this is that networked water distribution systems are, particularly in rural areas, either nonexistent or inadequate. There is therefore a greater reliance on individual, private water sources. Rainwater Harvesting (RWH), despite its natural and sustainable benefits, is not used so extensively as tube wells, which are the most commonly used source of drinking water.

Over the past decade interest in the use of Rainwater, as a primary source of drinking water, has grown internationally. Various international organisations, such as WHO and NGO's, as well as national governments show increased interest in the potential for rainwater as a sustainable source of (drinking) water. An international movement has emerged for the promotion and development of Rainwater Harvesting. It includes such organisations as the IRCSA (International Rain Catchment Systems Association), established in 1989, the IRHA (International Rainwater Harvesting Alliance) and the International Rainwater Partnership. Internationally, nationally and regionally, organisations are active in promoting of and gaining recognition for Rainwater Harvesting as a major, sustainable source of water for household use and drinking.

Rainwater Harvesting: A Natural Opportunity for Schools

Rainwater Harvesting is a natural opportunity for schools to help improve their pupil's health by providing them with clean, fresh, safe drinking water. Schools are a natural opportunity for various reasons, including the fact that most school buildings have large roofs. There usually is a correlation between the number of pupils and the size of a school's roof. With the right storage and sufficient purification capacity a school can provide water throughout dry seasons. Rainwater, compared with water from a tube well and surface water, can be considered as relatively clean. It is a natural part of the water cycle and can be considered as pure distilled water. Organic and inorganic chemical contaminants, such as pesticides, insecticides, arsenic and fluoride are rarely present naturally in rainwater.

Annual rainfall in most countries, with the exception of arid and semi-arid regions, is between 250 to 3000 mm. But rainfalls are often not equally spread over the year, but concentrated in a relatively short rainy season. With adequate storage in tanks above or below ground, water can be made available throughout the dry season.

Large roof areas of most schools, using hard materials such as tiles and corrugated steel sheets make RWH a significant option for the supply of clean, safe water.

Providing a litre of drinking water to a child each day will require 250 litres a year. A school of 200 pupils therefore would consume 50.000 litres of harvested rainwater per annum.

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A roof area of 200 m^2 (20 x 10 m projected surface) and an annual rainfall of 500mm (approximately 0.8 x 200 x 500) would provide as much as 80.000 litres a year. When properly stored and efficiently distributed it will provide water for as many as 250 to 300 children, with some to spare for use by others.

Rainwater Harvesting: A Natural Opportunity for Schools Plation RainPC Turns rainwater into drinking water

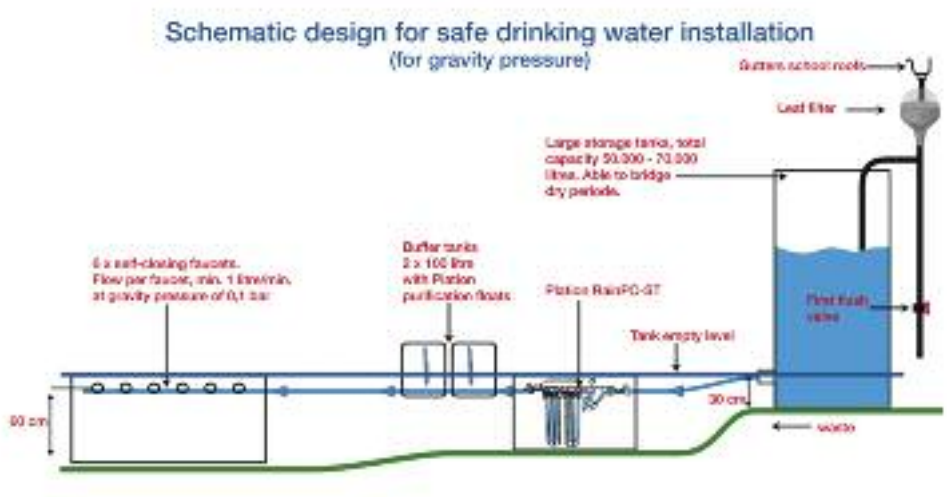
Microbial contamination, derived largely from leaves, bird droppings and other pollutants on the roof and in gutters, make rainwater unsafe to drink. The elimination of pathogenic bacteria and algae is essential for making rainwater safe to drink.

AquaEst Europe has developed the Plation RainPC to do just that: turn rainwater into safe, clean drinking water. It filters and purifies rainwater to a level, which complies with WHO Guidelines for E-coli, which must be less than 1/100 ml. At the heart of the RainPC is an ancient, revitalised technology: the application of silver ionisation. Silver coated ceramic balls gradually release silver ions into the water and eliminate bacteria. On top of that, special copper threads, embedded into an activated carbon filtration system, eliminate algae and work in combination with the silver ions to kill bacteria. This natural silver and copper ionization process ensures a durable and sustainable purification process and provides a residual disinfectant to preserve the water's purity while it is stored.

Incoming rainwater passes through a two-stage filter, from 80 to 10 microns, before entering the purification cartridge. A constant volume regulator (calibrated at 8 litres/hour) controls and slows the water flow so as to ensure the wa-

Pupils using water taps

Thailand



ter remains in contact with the purifying medium long enough to clean the water of algae and bacteria. The Plation RainPC requires minimal maintenance. It is suitable for both pump and gravity fed (using no electric power at all) systems of up to 6 bar pressure and is capable of purifying at least 100.000 litres of rainwater before cartridges need to be replaced. That is more than sufficient for delivering enough clean, safe drinking water for a school of up to 200 to 250 pupils over the whole year, provided sufficient storage capacity is available. A water meter shows when the purification cartridge and 10 microns filter needs replacing and when the 80 microns filter needs leaning.

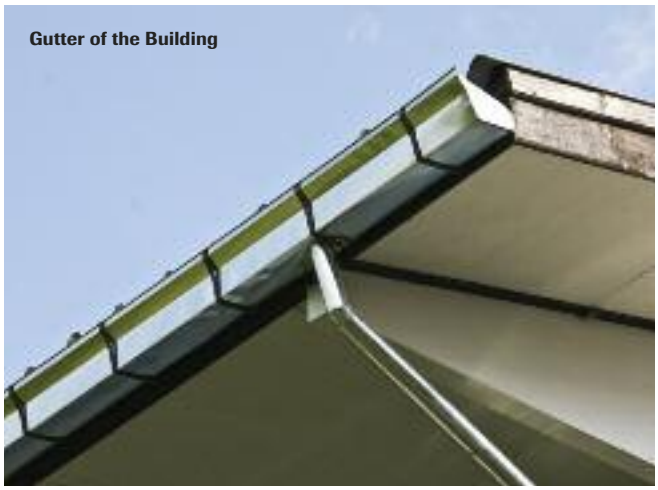
Plation RainPC. Proven economic performance

2008 was a milestone for AquaEst as HOAT, a Dutch NGO, installed complete Rainwater Harvesting systems, including RainPCs, in four rural Thai schools. The project has provided more than 1000 children with clean, safe drinking water.

One year on and tests have proven the water collected by all four systems to be compliant with WHO Guidelines for E-coli (<1/100ml) and the first filter cartridges did not need replacing. This pilot scheme's success has led to a plan for the installation of Rainwater Harvesting systems, using RainPC's in 10 more schools in Thailand.

Water tanks for rainwater

Plation RainPC



Gutter of the Building

Installing one RWH system cost € 4.500, which included the repair and cleaning of existing concrete water storage tanks, gutters, pipe materials, the RainPC and labour, of which 80% was spent locally. Purified water from these systems costs between €€ 0.002 - 0.005 per litre (€€ 2.00 - 5.00 per m^3) , depending on the size of school and the number of children. Head teachers of the schools all reported significant decreases in sickness rates amongst pupils and with a positive side effect of pupils helping to educate their parents on the importance of clean, safe water for health. These Thai School projects have shown that turning rainwater into drinking water to be a potential global solution to the problems of providing clean, safe water. After one year, independent testing confirms complete absence of pathogenic bacteria, while teachers report clear reduction of illness among the children.

More information is available at:
www.aquaesteurope.com,
www.hoat.nl and www.ercsa.eu.