

# Water for Life

## Introduction

Water consumption varies greatly among regions due to differences in economic development. The average municipal use in the United States is about 150 gal (568 l) per person per day, though the **rate** can be higher than 350 gal (1324 l) in some locations. This includes home use for bathing, waste disposal, and gardening, as well as institutional and commercial usage. Per capita (per person) water usage in **Asia** is only 85 l per day, and just 12 gal or 47 l in **Africa**. In Singapore, per capital (per person) water usage in 2006 was 158 l per day.

According to the World Health Organization (WHO) of the United Nations, people have a minimum water requirement of about 20 l per person per day. This is the minimum amount needed for physiological rehydration, cooking, washing and other subsistence requirements. However, the WHO estimates that nearly two billion people consume contaminated water. This carries a significant risk of developing such water-borne diseases as **cholera**, **dysentery**, polio or typhoid, which kill about 25 million people per year. Both conservation and sanitation are obvious necessities in meeting the huge demand for freshwater.

According to UNICEF, 70% or 9.7 millions of Cambodian inhabitants do not have access to clean, uncontaminated drinking water. Measuring by any standard, water in Cambodia is contaminated and undrinkable without proper treatments. This is typically true in the rural areas where people drink water from rice paddies, ponds, and shallow wells (surface water). This surface water is contaminated with chemicals in fertilizers, insecticides, animal feces, and human waste. The lack of clean drinking water contributes to health problems.

Many NGOs including Rotary International have invested in Cambodia to bring clean water to the population. They have dug water wells, introduced pumps, built tanks and filtration plant as well as harvested rainwater. All these wonderful efforts have brought relief for many impoverished communities in Cambodia but despite such, there are still many remote villages that are living without adequate access to water especially the children.

In Cambodia, 1 in 7 children die before the age of five from preventable diseases such as typhoid, malnutrition, malaria, dengue. The common denominator in many of these is waterborne illness. Often when a child gets sick, the parents will self administer local traditional medicine due to poverty and distance to the clinic. Even if they make it to the health clinic, it is often out of proper medicine. By the time the desperate parents bring the child to the hospital in the city, it is already too late to save the child's life. Thus it is most relevant and vital that villagers must have accessible to clean water to prevent child mortality.

## **Sasarsdam – An Impoverished Commune in Siem Reap**

During the peak of the Khmer Empire centred in Angkor (now Siem Reap), it supported a population of over 1 million people. Employing hydraulic engineering system, advanced during such times, rice was cultivated year round through accessibility of water by irrigation channels from the large reservoirs (barays) built by the Khmer kings. However due to the intense silting of the rivers into the channels, the city was eventually abandoned and left to ruins. Fields turned into dry dusty land during the dry, hot season from April – June and the farmers were unable to grow any crops to support their livelihood. With lack of clean water, many especially children succumbed to water-borne diseases with poor chances of survival.

Sarsadam Commune is located about 2 hours from Siem Reap city with a population of around 200 households (around 1000 people). It is a typical Cambodian rice farming community with traditional thatched and zinc-roofed houses raised on stilts. The villagers do not have access to electricity, sanitation facilities and piped water except for 2 water wells. During the wet season from July - October, the fields are flushed with clear rushing water and worked by buffalos in growing the new crops. Then the paddies are harvested in December with smaller crop harvest in February before villagers celebrate the Buddhist New Year (April) and brace for next dry season.

Every year the cycle repeats and the commune suffers worst during the dry months of April and May. Villagers have to walk about 10 km to and from a temple pond to collect water using pails. The water quality at the open pond which is shared with other villages is usually turbid.

## **Proposed Project – Concrete Water Storage Pond**

### **Inspection**

In August 2007, a team of Rotarians led by Rtn Jimmy Ooi of D3310 visited the site to understand the problem faced by the villagers. The outcome of the visit resulted in a 2-prong strategy

Land area: 34 m x 34 m provided by village community.

Proposed construction of a concrete water storage tank shall be 25 m x 25 m x in area. The min depth shall be 2.6m and max depth shall be 3m.

Average capacity of water based on this provides 1 750 000 litres

Based on population of 1 000 for usage over 2 months (Apr – May), average water consumption allowed shall be  $1.75 \text{ mil} / 1000 / 60 \text{ days} = 29.16 \text{ litres pp/day}$

Less 5% wastage / retention, the average figure shall be 27.70 litres pp/day

If projected growth of population is allowed based min water requirement by WHO, current capacity should be able to support up to 1 500 people

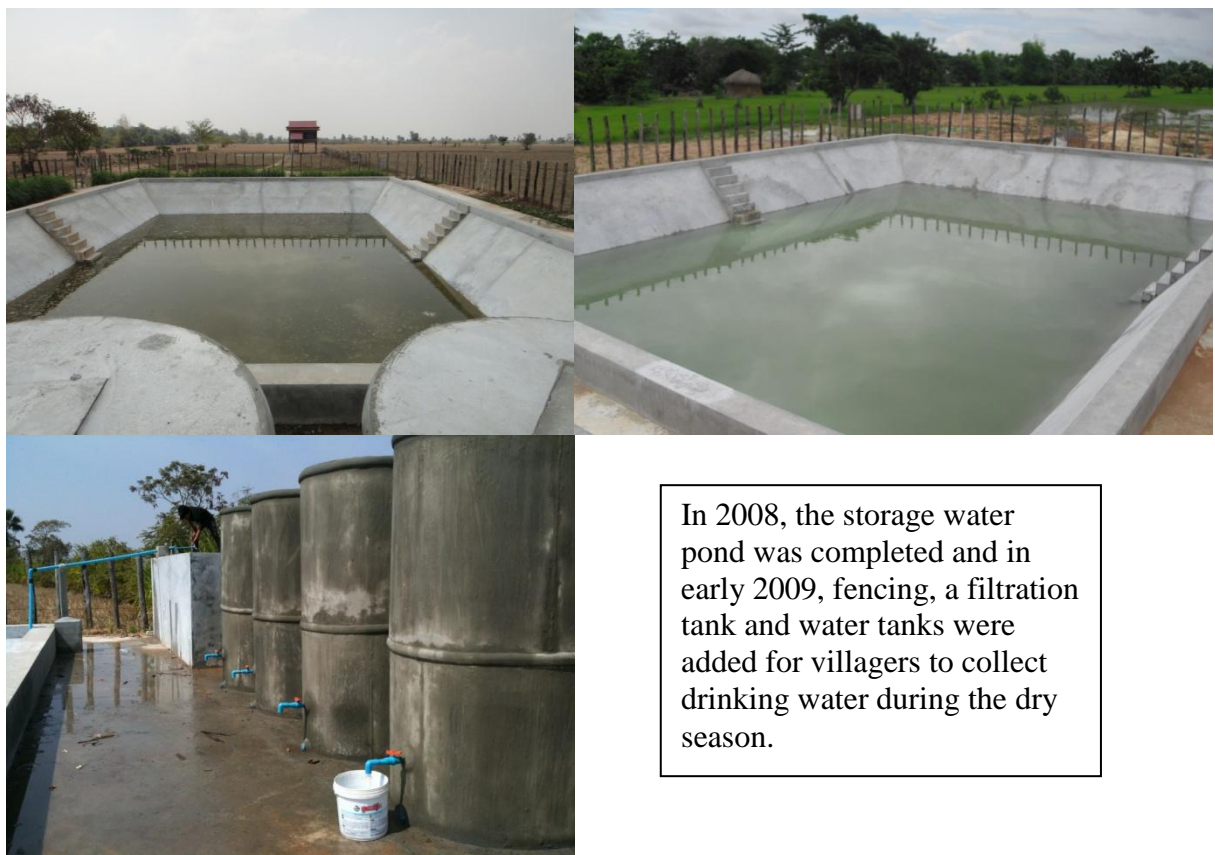
### **How does it work?**

1. During the rainy season, the pond fills up through harvesting and stored
2. Water is diverted by hand pump to a series of clay filters or the ultra-violet light filtration system employed to further purify the clean water
3. Clean water is now available year round! Rate of child mortality and water borne diseases is reduced!

### **Conclusion**

**PROS:** Stores huge volume of low-risk drinking water through rain harvesting; gives access to entire community to what would be wasted high quality water. During wet months, fish rearing can be cultivated as additional income to be used for education, medical and training programme for villagers.

**CONS:** Mosquito larvae and solids may enter and contaminate the pond (food source for fish); sunlight allows algae growth and increases food supply for dangerous pathogens (eliminated by presence of controlled fish quantity). Without enclosure it is susceptible to vandalism (responsibility of village in educating community).



In 2008, the storage water pond was completed and in early 2009, fencing, a filtration tank and water tanks were added for villagers to collect drinking water during the dry season.