



COVALENCE ANALYST PAPERS

The Blue Gold: problems, predictions and possible solutions

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Nowadays the problem of the water is becoming more important than ever before. After the World Water Day on 22th March 2007 many international organisations such as United Nations, WWF and others launched an alarm for the scarcity of water in the world and they made catastrophic predictions for the near future.

In fact, many animal species are in danger of extinction and 1/3 of the global population risk to not have water in 2025. But the scarcity is not the only problem linked with water. There are also the pollution of water and the wrong use of it.

Water, water everywhere but not a clean drop to drink

Water is fundamental to survival. Although 71% of the earth's surface is covered with water only 2.5 percent of the earth's water is fresh and approximately 2/3 of that is locked up in glaciers, permanent snow cover and icebergs.

The 98% of the global water is salt water so only the 2% of it can be drunk. Moreover this 2% is often polluted or lost in the countryside.

The distribution of water in the world and its use

Water is used for an uncountable number of activities and in every economic sector. According to the World Resource Institute only the 8% of water is used by families. 23% of water is used by the industry sector and the 69% by the agricultural sector.

In fact, the agricultural sector needs more water than the others but it is often wrong utilised. Many gallons of water are lost every year in the desert or in the environment because of inadequate water systems. It is estimated that 50% of water evaporates during the stock operation in the developing countries and 50% of water is lost every year in the developed countries because of ancient and inadequate irrigation water systems.

Another problem is the distribution of the water. In fact, there is a disparity between the North and the South. According to the Water Resources Institute 26 countries in the world have to deal with scarcity of water. Today 9 out of 14 countries in the East have a lot of problems with water where it is almost rare. This is also the cause of many internal conflicts for its control.

It is estimated that on average, one person consumes 40 litres every day. In the world there are a lot of disparities. For example in the USA the average consumption of water is 425 litres per day, in Europe 380 litres per day and in Africa 20 litres per day.

In the next years people will cope with scarcity of water everywhere, also in the developed countries.

The pollution of water and the problems of dirty water

Another serious problem is the pollution of water made by companies around the world. This is a big problem and people are now very sensible and aware of it. It is also for these reasons that companies began to do environmentally friendly actions in order to keep the planet safe and clean.

The major problem in the developing countries is dirty water and its consequences. According to the World Health Organization the 20% of the global population don't have safe drinking water and 1.3 million of children, under 5 years, die every year of diarrheal disease caused by contaminated water. Safe drinking water is not available to over 1.7 billion people (28 percent of the world population) and more than twice that number lack access to adequate sanitation, which is part of the problem. Approximately 10 percent of those living in the developing countries are infected with intestinal worms. 4 billion cases of water-born diarrhea occur annually. 6 million people are blind from trachoma. Large numbers of people are subjected to cholera and typhoid fever epidemics. And millions of people are adversely affected by the arsenic and other contaminants found in unsafe water. All told, water-related diseases, which are usually easy to prevent or to treat and are rarely seen in the affluent world, account for 80 percent of illnesses and deaths in the developing world.

Suitable solutions to these problems: purification systems

Today there are many solutions to purify water but they still cost too much for a family in a developing country. In those countries salaries are very low and people can't spend it all, or even a part of it only for purified water even if they need these methods in order to prevent diseases and illnesses of their little children.

Apart of the price, the purification systems have another problem: many of them don't transform the water in a crystalline and transparent one and people don't believe that the water is safe to drink because they look only at its colour. In fact, the water is still dirty and does not have a good taste except for a new product produced by Procter & Gamble: PUR. This product makes the water crystalline, safe to drink and does not have a bad taste.

Here you can find a comparison between some of these purification systems:

NAME	COMPANY/ ORGANISATION	PRO	CONTRA
Individual Sand Filter	Pure Water for the World, Inc.	1. Ideal for rural and poor populations	1. Not crystalline and transparent water
		2. Removes 97% of dangerous bacteria	
		3. The equipment can be constructed from materials readily available in-country	
		4. Does not need maintenance	
Living Water Solar System (LWSS)	Lodestone Engineering	1. Works with solar power	
		2. Does not need maintenance	
		3. Removes all the toxic bacteria	
		4. The water is crystalline and transparent	

NAME	COMPANY/ ORGANISATION	PRO	CONTRA
Lifestraw	Vestergaard	1. Small and comfortable	1. Not crystalline and transparent water
		2. Does not need electricity	
		3. It can be used also by children	
		5. Removes all the dangerous bacteria and viruses	
UV Lamps	Philips	1. The water is crystalline and transparent	
		2. Removes all the dangerous bacteria and viruses	
		3. Easy to install and to use	
		4. Does not need maintenance	
PUR	Procter & Gamble	1. The water is crystalline and transparent	1. Each sachet costs \$0,10
		2. Removes all the dangerous bacteria and viruses	
		3. Reduces pesticides	
		4. With one sachet you can purify 10 litres of water	

Other methods to purify water are currently under studies especially in universities and specialised centres.

An article posted by Duncan Graham Rowe on the Technology Review said that the Rice University of Huston is studying an unusual way to purify water with nano-magnets. According to this study the nano-particles of rust can be used to remove arsenic from water because of their electro-magnetic characteristic. In fact, the arsenic attacks the rust, the rust tends to be magnetic so the arsenic can be removed simply with a magnet.

This method can be useful to purify thousands of wells in the developing world that are contaminated by the arsenic also because this technique does not need computers or a large amount of electricity. During an experiment on arsenic contaminated water, the University has discovered that the amount of arsenic particles were considerably below the levels judged sure from the Environmental Protection Agency.

Other ways to produce pure and safe drinking water

Currently there are not so many techniques to produce water except for the transformation of salty water from seas and oceans into safe drinking water. But this is still very expensive and we will adopt it only when we have consumed all the safe drinking water on the earth.

Another simple method is to recycle it. Recycling is today used in countries where water is rare for example in Israel where there are reductions of 30% of total water and where 30% of the 70% remained are recycled for agriculture and drinking purposes.

Predictions

Today there are many catastrophic predictions like the ones by the United Nations or by the WWF and probably these predictions can be reality in the near future. In fact, the water available is not unlimited, the global population is increasing and the consumption of water today is rising from 30% to 85%.

Moreover, nowadays there are already some kind of disputes and wars between countries, especially in the Middle East, for the possession of water and these situations risk to get multiplied within the next years.

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