

Water, the Greatest Gift

Water, all are dependent on this miraculous substance for our shared existence. And being so you'd think it would be treated with respect and reverence that it rightly deserves. In fact, quite the contrary! Water ranks as one of the most abused and contentious natural resources on Earth.

Fresh water accounts for less than half of one per cent of the planets total, the remainder is either seawater, or is locked up in the polar caps or soil. The world's human population increases by 80-85 million per year while our only supply of fresh water the continental rainfall remains constant. In the USA the average person uses 4000 litres per day compared to 10-20 litres in India. Worldwide, 5 million people die every year, mostly children, from lack of access to clean drinking water. The world's burgeoning megacities and industries are guzzling water at a horrific pace and the consumption of water at present rates will double in the next 20-25 years. This will lead to ever increasing shortages worldwide, especially in the Sub-Saharan region. 24 countries, mainly in Africa, will not have enough water to meet projected 2025 requirements. As demand intensifies for depleted sources many believe the possibility of conflict will move in lock step with these shortages. Libya's Colonel Gaddafi warned that, "The next war in the Middle East will be over dwindling water supplies." This echoes the well-published statement of the World Bank several years earlier. Many cite the inequalities created by globalisation that force many developing countries into import/export economies to meet loan requirements, which dramatically affect access of the world's poor to water, one of the most basic human rights.

Water Pollution

It is now believed that there is not an unpolluted body of water left on the Earth. The pandemic use of agrochemicals, dumping of industrial waste into rivers, the sea, landfill sites, and the air have more or less put an end to finding a truly clean unpolluted source of fresh water.

The thick layer of pollution in the atmosphere that bands the Earth is made up of a collection of smoke, dust, lead, strontium and a whole stack of chemicals that are picked up by rainwater as it falls. This has made it impossible to account rainwater as a clean and natural source as we did only a couple of generations ago. This sadly applies to most natural sources such as mountain streams, rivers, wells and springs.

In China 80% of its rivers are polluted to such a degree that they can no longer support fish. Many Eastern European rivers run yellow with industrial poisons. This waste eventually enters the sea and causes algal blooms that choke the oxygen and life out of the water creating dead zones where nothing can live.

Agricultural chemicals, toxins from landfill sites, the huge amounts of human and animal excrement dumped on farmland seep down to underground aquifers polluting a once pure source of fresh unadulterated water with heavy metals, various chemicals and even radioactive substances.

In the US alone, over one billion pounds of agricultural chemicals are used per year, and most of it ends up in the nation's groundwater, lakes and rivers. 40% of US lakes and rivers are now unsafe to swim in or to fish. According to Nature Conservancy the Great Lakes, the world's largest fresh water body, have lost over 98% of their native species and two thirds of its wetlands. In 1999, Britain applied over 25,000 tons of agriculture chemicals to the land, and virtually polluted all ground water and rivers and devastated its bird populations and other wildlife.

Industry, Cities & Sewers

In developing countries cities continue to swell, blistering into megacities with unrestrained industrialisation, the demands on water is further exacerbated, with aquifers and rivers being further polluted with toxic industrial and human waste. Already these demands have forced the way water is used with precedence going to cities and industry and away from agriculture land use. The situation is most critical in China that, according to the World Watch Institute, will have to restructure its whole economy in response to water scarcity as well as severe grain shortages because of this shift to cities and to industry.

Human excrement has been a problem that societies have been trying to resolve for centuries. Treated properly it can be a natural and beneficial fertiliser known as night soil that returns all the nutrients back to the soil and be largely kept out of surface water. This practise still continues to a limited extent in developing countries, as it has for thousands of years, however, 90% of their untreated sewage is still discharged directly into rivers and streams. Thousands have died and still continue to die worldwide from cholera and typhoid.

Due to thousands of deaths in Europe, for instance in Paris in 1832, 20,000 died, more stringent methods of dealing with sewage were developed in the West. But the systems we have decided upon for dealing with

human waste and industrial waste are but a bandage wrapped over a gapping festering wound that has to be redressed.

As the West rapidly industrialised (as the developing world is now), industry needed a cheap method of dealing with its burgeoning mountains of chemical waste. As a sewer system already existed and one that the public was paying for, it was the obvious place for industry to dump its waste. As industry grew so did the need to deal with greater loads of industrial waste and so industry allocated vast sums of money to combine home and industrial waste into a centralised sewer system. Bearing in mind, sewers were only ever designed to deal with nothing more than natural human excrement and not with the rivers of industrial toxic waste now in the system.

The dumping of raw sewage into open bodies of water has been prohibited for several years so the sewage went to treatment plants. Modern plants use filtration to remove flotsam (plastic, bottles, and dead animals, etc.) from the wastewater and energy intensive oxygenation to speed up biological decomposition of wastes before it is discharged. However, this process by no means removes all nutrients and toxic chemicals before the water is discharged. This two-stage process creates a new problem in the form of the waste or sludge it creates, which has to be dealt with. This sludge may contain any amount of volatiles, organic solids, nutrients, disease causing pathogens (bacteria, viruses), heavy metals, toxic organic chemicals, radioactive waste, household chemicals and pesticides from the thousands upon thousands of chemical dumped down drains from homes, industry, abattoirs, hospitals, etc.

The mountains of toxic sewage sludge have to go somewhere but where? With bans on dumping waste at sea in place the great minds that work in government departments such as the EPA (Environmental Protection Agency) in the US, decided that after all, this toxic sewage sludge is in fact "night soil" a harmless fertiliser! It has been redefined, as "beneficial biosolids" despite the fact this sludge may contain pesticides, dioxins, heavy metals and radioactive waste. To start to dump it on farmland as fertilisers is lunacy beyond imagining. It does not take much figuring out to see how desperately dangerous this is, or that this waste will not need to seep down into our aquifers to poison us, just eating up your greens will be enough.

Agriculture

Agricultural still accounts for around 70% of all water usage worldwide. Irrigation for crop production is the prime reason rivers are diverted or water is drawn up from underground aquifers. Large-scale irrigation methods are horrendously wasteful with water lost in evaporation from reservoirs, leaking pipes, unlined channels and poorly directed spraying. Roughly 60-85% of the water used doesn't actually reach the plants' roots. It's this type of irrigation that is primarily responsible for the most serious problem that characterises the state of the world's fresh water today; the depletion of underground aquifers.

The world over, farmers are pumping up ground water faster than precipitation can replenish it, causing a steady drop in water tables. A process referred to by hydrologists as groundwater overdrafting.

With the introduction of hybrid seeds and monoculture farming practises in the 60's, part of the Green Revolution, the developing world has seen the use of small pumpsets and ground water wells explode to meet the needs of this thirsty technology and is held in great part responsible for depletion. India has more land irrigated by pumps than by all the other surface irrigation systems combined. Extracation of water from aquifers exceeds recharge by a factor two or more.

The situation is dire in the states of the Punjab, Harayan, Maharastra, and Gujarat where water tables are dropping 0.5 to 0.7 metres per year. When water tables drop, farmers are forced to compete with each other in digging even deeper and expensive tubewells, pushing water tables even lower and farmers ever deeper into debt.

North China is running a chronic water deficit, extracting from aquifers 30 billion cubic metres per year more water than is naturally recharged. Across the region that produces 40% of China's grain, water tables are dropping on average 1.5 metres per year. Since 1965 the water table in Beijing has fallen by 59 metres.

In the USA, ground water is being recklessly mined in California's Central Valley and across the High Plains from West Texas to South Dakota where the mighty Ogalla aquifer lies. The Ogalla alone waters one fifth of the US irrigated land and is being depleted 8 times faster than it can replenish itself. Irrigation does not only deplete ground water but reduces surface flow too, with dams and diversions that cause downstream desertification and the loss of wetlands and fresh water fish stocks. Worldwide, the number of large dams has mushroomed from 5,000 to 38,000 in 50 years.

China's Yellow River for instance has failed to reach the sea every year since 1985. Excessive river irrigation has shrunk Russia's Aral Sea by 50% destroying the majority of its wetlands and fish. Though water irrigation can cause water levels to drop, it can also cause the water tables to rise. When the irrigation is

intensive and the soil is not well drained or does not drain well waterlogging causes the water table to rise .The surface water then evaporates leaving an accumulation of salts that basically renders the soil and land useless for cultivation. This problem afflicts a quarter of all irrigated land and is most acute in Pakistan where 2 million hectares have been lost to salinity.

Half of all water in the West is used to irrigate crops to feed livestock. A kilogram of lot fed beef requires 18,000 litres of water and one battery produced egg, 180 litres. Waste unprecedented! In the US alone, animal excrement is equivalent to the waste of half the world's human population. Most waste is not returned to the land but finds its way into surface water or leaches down into groundwater polluting it with nitrates, phosphates, steroids, hormones and antibiotics, causing 5 times more water pollution than people do and twice that of industry.

Sustainability

The fresh water situation in short is horrendous but even so the situation can be reversed if the will is there. The first step is clearly reducing consumption and this is always easier and immediate when started at a personal level of simply being aware of how we use water, what we use in water and what we eat.

Addressing the greater causes of water depletion be it agriculture or industry will not happen just because all the signs are there showing clearly the shortages and degradation of our fresh water and environment. It is a question of priorities, one of the environment or of money. Governments are ever reluctant to bring in legislation especially if it threatens industries' profits who hold incredible influence over our elected governments.

Some of the ideas put forth to save on water are already in use such as drip irrigation that has enormous potential. Consisting of a network of perforated tubing laid on, or a few centimetres below, the surface that feeds water directly to the root system of plants. This system unlike spraying or flooding loses very little to evaporation or misdirection. Studies have shown drip feed irrigation can save up to 70 per cent in water lose and improves yield by as much though at present only accounts for a meagre 1 per cent of all irrigated land worldwide.

The traditional method rainfall harvesting could make a real difference to rural life throughout the developing world where conditions permit, as it has in the village of Gopalpura in Rajasthan. The local wells and river had run dry; a result of the implementation of so-called economic development, and the village was all but deserted. With the support of a local NGO working closely with the elders of the village, the use of the johad (a small semi circle pond) made from local materials and crafted into hillsides to collect and store rainwater was reintroduced. Now the village has water to irrigate fields and to water livestock, moreover, the village is once again a thriving community brought back from the brink of death.

Dealing with human waste is something we need to urgently rethink. The present systems were not designed to produce useable products and that in itself is what has brought our present problems. Sewer avoidance is not possible for most of us at present, however, government, national or local, support could promote on-site low-cost recycling technologies such as composting toilets that don't pollute water and can be used as night soil. Pricing water higher would certainly make the market want to keep it clean.

The dumping of any chemical waste into the environment should be banned along with the vast majority of chemicals found in household cleaners. Companies should be accountable by law to take total and full responsibility for any chemical manufactured. No chemical should be permitted on the market until it has been proven to be needed, safe and biodegradable in water/soil, leaving no toxic residues whatsoever.

Governments need to give more support to sustainable agriculture whose farmers at present receive a mere drop in the ocean of subsidies compared to what is given to conventional farmers. Intensive monoculture and livestock practises should be limited, capped and charged to reflect the true costs of removing agrochemicals from the environment. A ban would be even better on the use of such environmental poisons. Preference should be given to smaller sustainable landholdings that are more environmentally friendly, for the most part chemical free and certainly less water intensive with greater bio-diversity, compassion and certainly more labour intensive creating work for beleaguered farming communities the world over.

History shows any civilisation that fouls its own fresh water, squanders natural resource and that lives contrary to natural laws is one destined to extinction, therefore the need to act swiftly and decisively is paramount to our survival for like water, time is running out.

Reference: Blue Gold by Maude Barlow ~/~ Nor Any Drop to Drink by Ed Meltdafe ~/~ Excrement Happens by Peter Montague ~/~ Back to the Future In Rajasthan by Zac Goldsmith ~/~ Violence of The Green Revolution by Vandana Shiva ~/~ Diet for a Small Planet by Frances Moore Lappe