Sick Water?

The central role of waste-water management in Sustainable development.

(based on UNEP and UN-HABITAT report, 2010)

A report completed by collaboration, led by UNEP and UN-HABITAT in partnership with members of UN Water, provides great insight into the importance of managing waste water in a local and global sense, given the extremely large volume of waste discharged into the environments waterways from sources such as sewage, industrial and agricultural. This document summarizes some of the key points made in the report:

- Approximately 90% of wastewater in developing countries is discharged untreated into rivers, lakes or the oceans causing significant negative impacts on fisheries, livelihoods and the food chain.
- Twenty-one of the world's 33 megacities are on the coast where fragile ecosystems are increasingly at risk from inadequate waste-water management. Over a fifth of the total global total of 1.6 Billion people live by the coast. Inadequate infrastructure and management systems for the increasing volume of waste-water are at the heart of the waste-water crisis.
- As water travels through the hydrological system, human activities result in the capture, diversion, extraction, treatment and reuse of water for the sustainment of communities and economies throughout the watershed (agricultural, industrial and domestic), as shown in Figure 1.

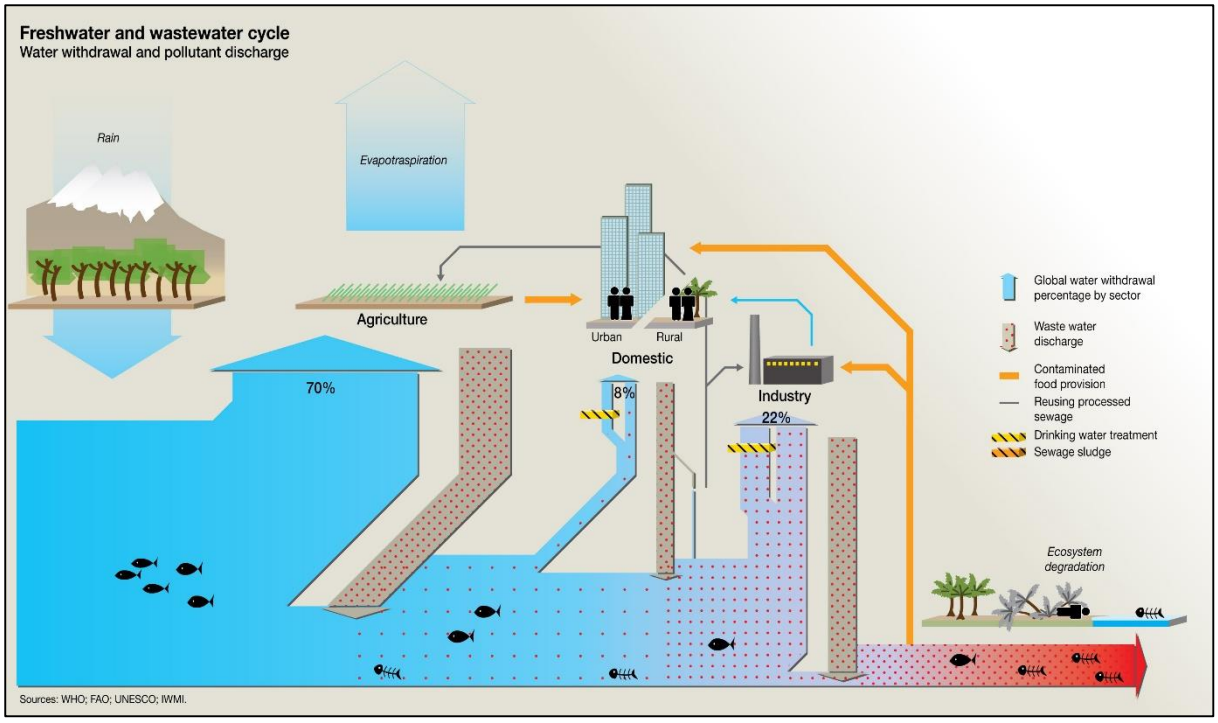

Figure 1: Freshwater and wastewater withdrawal and pollutant discharge

- Wastewater can be contaminated with many different components as shown in Figure 2. These components include pathogens, organic compounds, synthetic chemicals, nutrients, organic matter and heavy metals, which are carried along in the water either in solution or as particulate matter and affect water quality.
- Our food production uses 70-90 per cent of the available fresh water, returning much of this water to the system with additional nutrients and contaminants. This is made worse with the additional agricultural, human and industrial waste added is added downstream. This waste-water contaminates freshwater and coastal ecosystems, threatening food security, access to safe drinking and bathing water and providing a major health and environmental management challenge.
- Over half of the world's population faces water scarcity. Because it plays a vital role in the sustenance of all life, water is a source of economic and political power. And water scarcity is a limiting factor in economic and social development.

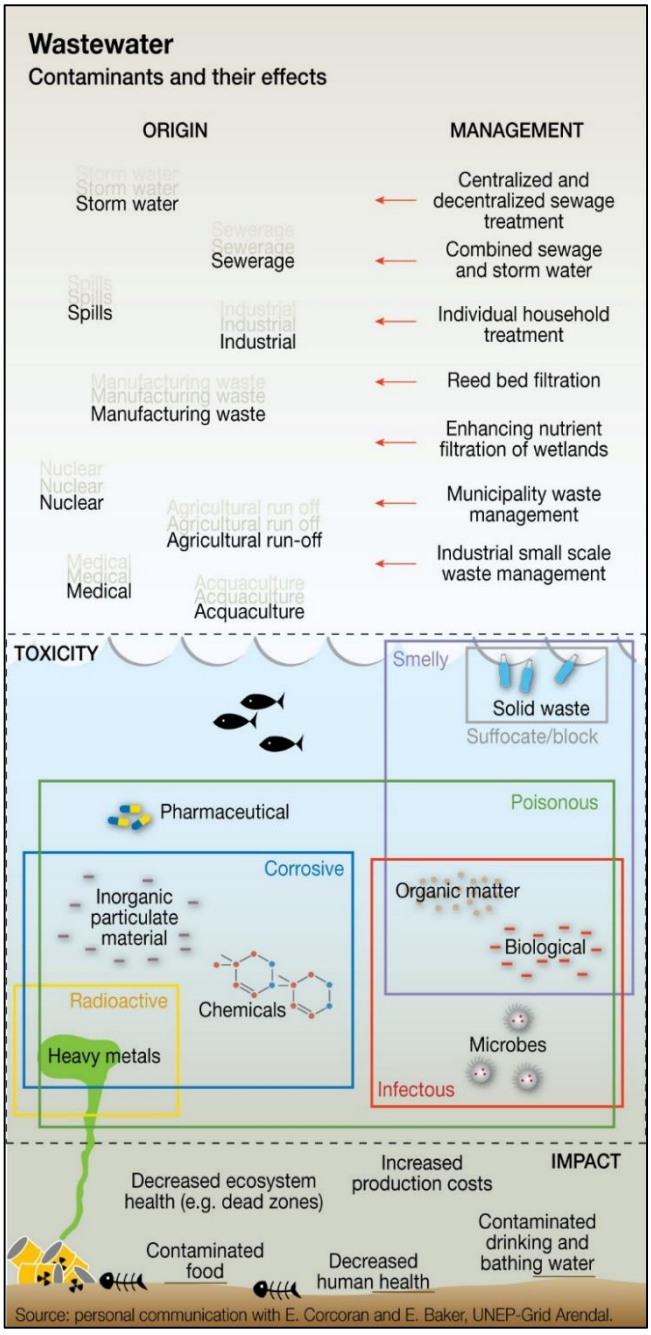

Figure 2: Sources, effects and management of contaminants in wastewater

- Continuous population growth, industrialization, food production practices, increasing living standards and poor water use strategies, will increasingly continue to disrupt the fundamental integrity of our life support systems, on which a wide range of sectors from urban development to agriculture and industry depend.
- Approximately 97.5% of all water on the planet is salt water, leaving 2.5% as fresh water. Of the fresh water:
    - 70% is frozen in icecaps.
    - Around 29% lies deep underground plus soil moisture
    - Only 1% of freshwater is available for withdrawal for human use.

- The FAO statistical database, 2009, indicates that the global per capita withdrawal and use of water per capita was around 440 cubic metres. Of this, approximately 40 cubic metres per capita was withdrawn for use by industry. With the global population reaching 7 Billion, then the global water withdrawn and used for industrial purposes was 280 Billion cubic metres in 2009.
- Global populations are increasing rapidly and will reach between 9 and 11 Billion in 2050. As population increases so does the production of waste-water and the number of people vulnerable to the impacts of severe waste-water pollution. As at 2010, 900 million people lacked access to safe drinking water, and an estimated 2.6 Billion people lacked access to basic sanitation (WHO/UNICEF, 2010).
- In many countries, the responsibility for industrial wastewater treatment falls on ordinary taxpayers. In the absence of a user pays system for pollution control, large volumes of contaminated industrial waste-water end up in municipal sewage treatment plants, which are expensive to construct, operate and maintain. The Netherlands introduced a series of incentives to polluters to reduce pollution at source, rather than opting for the more expensive end-of–pipe solution of public sewage treatment. This approach has been cost-effective in reaching water quality targets. In contrast other European member states who have not introduced a polluter-pays system or have been slow to adopt one have consequently not reached targets (EEA, 2005).
- In many instances waste-water from industry not only drains directly into lakes and rivers, it also seeps into the ground contaminating aquifers and wells. Remediation does often not occur as the source of the pollution needs to be addressed.
- Mining has traditionally been a source of unregulated waste-water discharge particularly in developing countries. Tailings from mining operations can contain silt and rock particles and surfactants. Tailings can also contain heavy metals like copper, lead, zinc, mercury and arsenic. The contaminants in mine waste may be carcinogenic or neurotoxic to people (e.g. lead and mercury) or extremely toxic to aquatic organisms (e.g. copper).
- The food and agriculture processing industry is also a major producer of waste-water particularly organic waste with high biochemical oxygen demand (BOD). BOD measures the amount of oxygen used by micro-organisms like bacteria in the oxidation of the waste material.
- Industrialized nations have generally recognized that it is simpler and more cost effective to tackle pollution at the source.