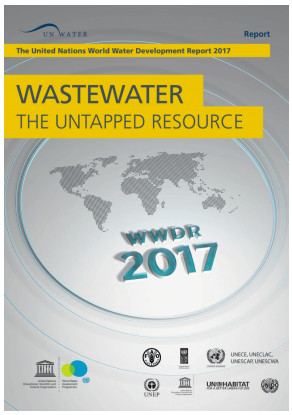
Future of Food: Journal on Food, Agriculture and Society, 5 (2)



The United Nations World Water Development Report 2017 Wastewater: The Untapped Resource

A book review by Permani Weerasekara

Published by United Nations Educational, Scientific and Cultural Organization(UNESCO)
Published year: 2017
ISBN: 978-92-3-100201-4

Presently in the world, fresh water is becoming a more important, yet more limited resource due to over-extraction, pollution and the effects of climate change. Therefore, the need for improved wastewater management is clear. Waste water is not just a water management problem. Waste water impacts the environment and all living beings, with consequences for human health, economic productivity and ecosystems. For the most part, human activities that use water end up producing wastewater. Thus, as the overall demand for water increases, the amount of wastewater also increases continuously worldwide. This report shows that improved wastewater management also entails the reduction of pollution at the source, the elimination of impurities in the sewers, the reuse of water, the recovery of useful by-products, and the potential use of wastewater as a sustainable resource. The 2017 edition of the United Nations World Water Report entitled "Wastewater: The Untapped Resource" shows how improving wastewater management offers social, environmental and economic benefits for sustainable development and is essential to the achievement of the 2030 Sustainable Development Goals (SGDs). This report is an excellent resource for students, policy makers, educators as well as researchers in the field of environment and sustainable management.

The demand for water is expected to grow significantly in the coming decades. In addition to the agricultural sector, which is responsible for 70% of the world's water use, a strong increase in water demand is expected for industrial and energy production. External factors that dictate future trends in water availability and quality will be the result of demographic dynamics and climate change. Climate change scenarios project a disturbance in the spatial and temporal dynamics of the water cycle, so that the meeting of water demand with supply is increasing challenging. The frequency and severity of flooding and droughts will also change around the world in many river areas. Additionally, the availability of water resources is also associated with water quality because water source pollution can prohibit several types of use. Increased releases of untreated sewage, combined with agricultural run-off and poorly treated industrial wastewater, have resulted in a deterioration of global water quality. Luckily, adequately treated wastewater is a resource that can be used to deal with water supply bottlenecks.

In this report, there are 18 chapters which discuss variable topics related to water, with a focus on wastewater issues, which has often been a neglected part of water management, receiving little social or political attention. The most important issues and challenges related to wastewater management are discussed, and the report highlights the importance of wastewater as a valuable resource, especially given water scarcity. Furthermore, this report discusses wastewater management under the Sustainable Development Agenda 2030, with a focus on efforts to promote synergies and address potential conflicts between the water target and other SDGs. Wastewater is directly addressed by SDG 6.3: “Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally” (United Nations Department of Economic and Social Affairs, 2015).

Other topics of discussion are the basics of water management, including the many stakeholders and their different roles, legal and regulatory instruments, financial opportunities and challenges, as well as social, economic and cultural aspects. Wastewater presents a unique challenge because,

ISSN-Internet 2197-411x OLCL 862804632

in many cases, wastewater discharged without treatment affects persons that are geographically or temporally removed from the polluter. For this and other reasons, society must act collectively to manage wastewater, and thereby promote human health and protect water resources from pollution. Governance challenges relate to legal, institutional, financial, economic and cultural issues, but the benefits to society in dealing with wastewater are of great importance to public health and the environment. Overcoming practical difficulties in the implementation of water quality control can be especially difficult. To achieve the objectives of improving water quality and the protection of water resources, individuals and organizations responsible for various aspects of wastewater management must comply and act in the collective interest. The benefits are only realized once all rules are followed in order to protect water resources from contamination. In this regard, the technical aspects of wastewater management are a very important issue. The consequences of the release of untreated or poorly-treated wastewater can be categorized into three groups: adverse effects on human health, negative environmental impacts, and adverse effects on economic activities.

Wastewater from domestic sources is less likely to contain hazardous substances, although we must be aware of the problematic long-term effects that can result from low concentrations of pollutants, such as commonly used drugs. Rapid urbanization in developing countries leads to sudden increases in the production of municipal sewage, posing a great management challenge. Therefore current and future urbanization models need to be critically examined to develop more sustainable approaches to wastewater management in the coming decades. In terms of industrial wastewater, its toxicity, mobility, and concentration of pollutants are more important factors than the sheer volume of wastewater being produced. A remarkable opportunity for the recovery and recycling of industrial wastewater is the cooperation between plants to create a type of symbiosis regarding wastewater production and use. This is best seen in the eco-industrial parks which locate industries side by side in order to optimize the use of different streams of wastewater which can be recycled to produce useful by-products.

In addition, this report examined agricultural water pollution when fertilizers (nutrients) and other agrochemicals are applied more intensively than crops can absorb. Optimized irrigations systems can both decrease the amount of water use by increasing efficiency and simultaneously decrease the leaching of fertilizer nutrients into the groundwater. In addition to crop production, concentrated livestock production and aquaculture are major sources of nutrient pollution to water sources. Agriculture can be the source of several other types of pollutants, including organic matter, pathogens, metals, and agrochemicals. However, there is an opportunity for agriculture near urban areas to make use of municipal wastewater. In cases where municipal wastewater is properly treated and deemed safe, it can then be used as a free and valuable source of irrigation water to nearby agricultural fields, providing nutrients as well as the water that crops need to grow.

This report also explains the critical regional challenges for Africa, the Arab region, Asia and the Pacific, Europe and North America, Latin America and the Caribbean by making use of several case studies. In Africa, leaders must be persuaded that the "cost of inaction" regarding wastewater management is too great, negatively affecting the human health, environment, and development. While in high-income countries, 70% of wastewater is treated, only 8% is treated in low-income countries, creating a great problem for future generations.

Improved wastewater treatment, increased water reuse and the capture of useful by-products favor the transition to a recycling economy by helping to reduce water abstraction and the loss of resources that affect economic activities. Therefore, the world needs appropriate legal and regulatory frameworks and appropriate financing mechanisms to improve wastewater management. Creating proper financial and legal incentives for wastewater management will encourage investment in this area. Locally-adapted approaches to wastewater management are likely to be the most effective.

In conclusion, this report can successfully inform decision-makers, government, civil society and the private sector of the importance of wastewater management as a source of water, energy, nutrients and other recoverable and underestimated products.

IInformation about the author:

Permani Weerasekara is a member of the Department of Organic Food Quality and Food Culture, Faculty of Organic Agricultural Sciences, University of Kassel, Germany and Rajarata University of Sri Lanka, Mihinthale, Sri Lanka.

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