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The challenges of wastewater and its management

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Abstract

Water is crucial for all aspects of life, the defining feature of our planet. Ninety-seven and a half percent of all water are found in the oceans, of the remaining freshwater, only one percent is accessible for extraction and use. At the beginning of the 21st century, the world faces a water crisis, both of quantity and quality, caused by continuous population growth, industrialization, food production practices, increased living standards and poor water use strategies. Water that has been adversely affected in quality by pollutants is called wastewater. this report has taken a broad perspective, and defined wastewater as "a combination of one or more of domestic effluent consisting of blackwater (excreta, urine, and faecal sludge) and greywater (kitchen and bathing wastewater); water from commercial establishments and institutions, including hospitals; industrial effluent, stormwater and another urban run-off; agricultural, horticultural and aquaculture effluent, either dissolved or as suspended matter. Wastewater management or the lack of, has a direct impact on the biological diversity of aquatic ecosystems, disrupting the fundamental integrity of our life support systems, on which a wide range of sectors from urban development to food production and industry depend. It is essential that wastewater management is considered as part of integrated, ecosystem-based management that operates across sectors and borders, freshwater and marine. This paper focuses on wastewater and its relationship to challenges and management, food security and production, industry, health and human well-being, ecosystem function, global change, realising the opportunities, managing wastewater effectively, the wastewater treatment technologies to remove contaminants from it, and the last policy recommendations.

Key words: Wastewater, Water crisis, Pollutants, Treatment technologies

1. Introduction

Water is crucial for all aspects of life, the defining feature of our planet. Ninety-seven and a half percent of all water are found in the oceans, of the remaining freshwater, only one percent is accessible for extraction and use. Functioning and healthy aquatic ecosystems provide us with a dazzling array of services–food, medicines, recreational amenity, shoreline protection, processing our waste, and sequestering carbon. Fresh, accessible water is a scarce and unevenly distributed resource, not matching patterns of human development. Over half 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