Sustainability

an Open Access Journal by MDPI

CiteScore: 7.7
Impact Factor: 3.3

Special Issue Reprint

Wastewater Based Microbial Biorefinery for Bioenergy Production

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A rapid growth in various industries and domestic activities is resulting in a huge amount of wastewater. Various types of wastewaters, such as textile, municipal, dairy, pharmaceutical, swine, and aquaculture, etc., are produced regularly by respective industries. These wastewaters are rich in nutrient content and promote eutrophication in the ecosystem and pose a threat to flora and fauna. According to an estimate, eutrophication causes losses of almost 2 billion US dollars annually, affecting real estate and fishing activities. Treatment of wastewater is a costly process and recently wastewater treatment with simultaneous energy production has received more attention. Microorganisms can be used to recover nutrients from wastewater and produce bioenergy (biodiesel, biohydrogen, bioelectricity, methane, etc.). A better understanding of the composition of various types of wastewaters and the development of technologies like anaerobic digestion (AD), microbial fuel cell (MFC), and microbial electrolysis cell (MEC) can help to make wastewater-based biorefinery a reality. To provide an overall overview to students, teachers, and researchers on wastewater to bioenergy technology ten chapters are included in this book.

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