

Biomass Conversion from Municipal Solid Wastes to Useful Products: The Case of Bahir Dar City around Lake Tana Basin

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Bahir Dar is a rapidly urbanizing city of the Amhara National Regional State in Ethiopia. Generation of municipal solid waste is increasing annually at anxious rate. The accumulation of hazardous wastes, shortage of available landfill sites, and lack of environmental regulations are the main problems concerning solid waste disposal. The federal and regional bureaus of the environmental regulations are forcing the Bahir Dar city administrator to search for possible landfilling sites. Diverting waste from disposal sites into useful products can generate income and employment opportunities for the urban poor youths living in the cities. This review study disclosed the possible treatment technology options that can be utilized for conversion of municipal solid waste into useful products of various forms of Waste to Energy (WTE) technologies, such as thermal processing technologies, biological processing technologies; and bio-methanation methods. The main feedstock requirements, process conditions and treatments of products are briefed and summarized. The challenges and trends in each particular technology and applicability in the cities in the context of low- and middle- income countries are discussed in detail based on a review of the literature and from the experts' experience. Therefore, this review study tries to reflect the WTE potential in the city together with the possible technologies, business and job opportunities, and at last keep the city environment clean and safe for the people living therein. More unbiased, well-structured and reproducible evidence from case studies at a scale could foster knowledge transfer to practitioners and enhance the exchange between academia, policy and practice. Therefore, the WTE policies of the city should be improved, evolved or modified to encourage the suggested WTE process industries along with a few recommendations. The actions in the WTE sector can support the WTE project developer, investors, suppliers, decision-makers and the policymakers for further betterment of the city waste management and planning.

Keywords: Biochemical conversion, hazardous wastes, municipal solid waste, treatment technology, useful products

Biography:

Biruk Abate is a PhD candidate, lecturer and researcher at Bahir Dar University. Mr. Biruk has published papers on the subject areas of waste management and water quality. He is a recognized in the waste management chapter from book of Social and Ecological System Dynamics Characteristics, Trends, and Integration in the Lake Tana Basin, Ethiopia and acknowledged by Bahir Dar University. After obtaining his Bachelor Degree in Chemical Engineering from Bahir Dar University in 2008, he started and completed his Master Degree in Chemical Engineering from Addis Ababa University in 2010; he started work at Bahir Dar University Bahir Dar Institute Faculty of Chemical and Food Engineering at lecturer position and Bahir Dar University Biotechnology Research Institute as a senior researcher. Mr. Biruk continued his PhD work in Post-harvest Technology in the area of perishables cold storage and processing with HGPP Program running by Bahir Dar Technology Institute, Ethiopia and KU Leuven, Belgium.