Chapter 3
Waste-to-Energy Integration Strategies in the Tourism Industry: Evidence of Bangladesh

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ABSTRACT

The Bangladesh tourism industry faces a growing challenge in waste management, which poses a threat to environmental and public health. Despite economic growth, Bangladesh struggles with managing solid waste, with traditional landfilling polluting soil and water. Hospitality waste management is particularly challenging due to the unique types of waste generated by hotels, resorts, restaurants, and eco-lodges. This chapter examines waste-to-energy (WtE) integration in the country's hospitality sector using secondary research, academic journals, industry reports, and government publications. WtE technologies, such as anaerobic digestion,

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gasification, and incineration, can help reduce landfilling and provide renewable energy for hospitality facilities. The chapter explores the challenges of solid waste management in Bangladesh, focusing on organic waste, paper, plastics, and glass. It evaluates WtE technologies' potential for hospitality establishments, highlighting their significance in resolving waste management issues and ensuring sustainable tourism development.

INTRODUCTION

Tourism is crucial to the economic growth of many developing and growing nations, including Bangladesh. Tourism growth typically brings environmental issues, notably solid waste management issues (Joshi & Visvanathan, 2019). Developing countries seek sustainable development for present and future generations, but governments must balance economic growth with environmental preservation (Lehmann, 2018). This problem is especially severe in the energy sector, where dependable and sustainable power production drives economic growth (ADB, 2020). In this regard, Waste-to-energy (WtE) technology helps the tourist sector achieve sustainable development by turning waste into energy or power (Kabir et al., 2022). The Asian Development Bank (ADB) found over 2,450 WtE facilities processing 368 million tons of trash yearly by December 2018. According to ADB (2020), this number can exceed 2,700 plants by 2028. Southeast Asia, China, and India will increase significantly. Tourism can profit from WtE in many ways, and WtE facilities can boost a nation's competitiveness and industrial production while reducing the environmental effects of waste (Tun et al., 2020).

WtE technologies have potential advantages, but applying them involves solving solid waste management issues. Bangladesh struggles to manage its municipal solid waste (MSW), primarily organic trash, paper, plastics, and glass. MSW has a lower calorific value than developed nations due to poor waste separation (Joshi & Visvanathan, 2019). Limited landfill area and ineffective trash collection methods complicate matters (Kaur et al., 2021). Energy recovery is a realistic waste management strategy when disposal locations become scarcer (Kaur et al., 2021). Traditional WtE incineration technologies pollute the air by generating toxic pollutants and greenhouse gases (GHGs). Incineration also discourages garbage reuse and recycling, slowing circular economy advancement (Saveyn et al., 2016).

New WtE technologies, including anaerobic digestion (AD), gasification, and pyrolysis, are greener than incineration. Before conversion, trash must be sorted to promote resource recovery and circular economy principles (Saveyn et al., 2016). AD is ideal for controlling Bangladesh's large organic waste stream (Bachmaier et al., 2010). AD reduces GHG emissions compared to fossil fuel-based energy