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Challenges, Regulations, and Case Studies on Sustainable Management of Industrial Waste

By: [Srivastava, RR](#) (Srivastava, Rajiv Ranjan) ^[1], ^[2]; [Rajak, DK](#) (Rajak, Dilip Kumar) ^[3]; [Ilyas, S](#) (Ilyas, Sadia) ^[4]; [Kim, H](#) (Kim, Hyunjung) ^[4]; [Pathak, P](#) (Pathak, Pankaj) ^[5]

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Abstract:

Incessant generation and mismanagement of industrial waste, resource scarcity, and environmental degradation have created non-sustainability in human life. Though industrial wastes are hazardous or non-hazardous in nature based on their source, open dumping disposal is commonly done for both types of waste. The adversity associated with waste enhances the environmental and health impacts. However, this waste has the potential to recycle and minimize resource scarcity. The circular economy works on the concept of reuse, recycling, and recovery to convert waste into a resource. Thus, industrial waste can benefit the environment and economic growth to build industrial ecology. However, the opportunities and challenges associated with industrial ecology for the reuse and recycling of waste have to be identified and preserved. Therefore, this study has identified challenges associated with waste, analyzed their impact, and industrial regulations, prioritized their criticality, and developed solution strategies to alleviate them. Two case studies on industrial byproducts, i.e., fly ash and red mud, based on different income groups are discussed in this study. It highlights the circular economy has minimized waste generation and enhanced the