

A review of agricultural waste management, technology processing, and applications: approaches to the utilization of agricultural-based biochar in water filtration

ABSTRACT

Rapid economic development and population growth have led to high demand for food consumption ratio. To fulfill the needs, government and public policy played an essential role in evenly distributing the natural resources from the agricultural sector to prevent food scarcity. However, this also directly leads to the massive growth of agricultural waste. The major issues related to agricultural waste include water and air pollution, soil contamination, and hazards to human health. Therefore, the government has taken several initiatives to improve waste management efficiencies, such as strengthening the waste management policies, technologies advancing, and various application strategies. Biomass conversion to energy has been the primary solution to landfills and open combustion. Agricultural-based biochar implementation in wastewater treatment through filtration systems was another approach toward sustainable waste management that has caught many researchers' attention in recent years. Hence, this study is aimed to critically review the management, technologies, policy, and applications of agricultural wastes. The findings present agricultural wastes as alternate biochar adsorbents capable of removing different types of pollutants and treatment's effect on their efficiencies. Also, lignocellulose biochar produced from agricultural waste has an excellent adsorption mechanism that improves the removal efficiency of pollutants from contaminated water. Nonetheless, the production temperature and activation method mainly affect biochar characteristics such as surface morphology and carbon structure.