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Circular energy resource recovery from waste for sustainable and climate-resilient food systems in Africa

OPEYEMI ANTHONY AMUSAN

University of South Africa, Africa Center for Impact Development , Industrial Engineering and Engineering Management Department, CSET - Sustainability Engineering and Future Technologies , South Africa

Abstract

Organic waste constitute over 55 % of the waste generated in Africa. Poor waste management in Africa puts a huge pressure on the food systems , natural resources, environment, public health, and related governmental or institutional budgets. Population growth and urbanisation will only intensify this problem over the next decade, unless we support governments, institutions, utilities, farms and waste managers to address this problem.

The objectives of this study were to evaluate circular energy-resource recovery from waste for sustainable and climate-resilient food systems (in Africa) on one hand, and identity factors affecting their development on the other hand..A novel technique that combines energy-resource survey with socioeconomic analyses was adopted in the properties and waste. Environmental Kuznet Curve hypothesis provided theoretical framework. While relevant secondary data were sourced from the World Development Indicators, primary data came from field surveys and laboratories in Africa, for a mixed methods approach.

Energy-resource recovery from waste solved two problems at once: treating (non-) recyclable and (non-)reusable amounts of waste and generating new recycled products and energy for a circular sustainable and climate-resilient food systems. This circular waste-to-energy/resource (WTR) systems collect organic waste to produce and market sustainable clean renewable energy, green cooking fuels, climate-smart tech, organic fertiliser and organic farming in Africa. An extended monitoring evaluation system and theory of change were established to capture the activity, outputs, results, outcomes, impacts and the sustainable development goals realised. Low-income urban communities are now benefiting from the operations and services of organic WTR systems. Both urban and rural customers also patronize, buy and recycle organic products. The impact cut across clean environment, health, increased income, energy and food security. Ten (10) sustainable development goals (SDGs - 3, 5, 6, 7, 8, 9,11,13,14 and 16) were realised by this organic waste-to-resource technology.

By building and operating these locally-embedded organic WTR systems, we create long-term impacts on farm, public and personal health, carbon emission, climate mitigation, availability of sustainable energy-resource and food, for the SDGs achievement

Keywords: Circular economy, Climate protection, Organic waste, Theory of change, Waste-to-energy/resource

Contact Address: Opeyemi Anthony Amusan, University of South Africa, Africa Center for Impact Development , Industrial Engineering and Engineering Management Department, CSET - Sustainability Engineering and Future Technologies , Florida campus, 200013 Johannesburg, South Africa, e-mail: dropeyemiamusan@gmail.com