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Integrated e-waste management adaptation by LCA and system dynamics model approach: case study of yaoundé, Cameroon**Esopere Yannick***University of Tsukuba, Japan*

Residual components of electronic and electrical devices are technically classified as waste electrical and electronic equipment (WEEE). Commonly known as E-waste, they are among the fastest-growing waste streams globally. E-waste has become a major global environmental issue. In developing countries, it is crucial to implement sustainable end-of-life treatment policies and suitable infrastructure to prevent and mitigate imminent environmental and human health impacts from e-waste treatment and disposal. This study proposes an integrated E-waste management scheme with policy incentives to enhance formal E-waste collection and recycling in Yaoundé. Firstly, the study investigates Cameroon's current E-waste management system, identifying key processes of environmental and human health impacts in the E-waste treatment processes. Key impact-contributing processes were identified as high-impact processes within the study scope. Secondly, the study evaluates the policy efficiency of a proposed integrated E-waste management scheme. A life cycle assessment (LCA) identified the high-impact processes in the E-waste treatment processes. Additionally, a policy efficiency simulation by System Dynamics Model (SDM) examined the proposed policy's economic and environmental viability. The LCA results identified 14 high-impact processes from the current E-waste treatment system. Meanwhile, only 5 high-impact processes were identified for the proposed E-waste management scheme. Policy 1 with levies on producers/importers was more efficient in improving the processing fund and reducing informal recycling within the proposed integrated E-waste management scheme. The study outcome will provide Cameroonian decision-makers with information in implementing initiatives to formalize informal E-waste recycling. Thus, reducing environmental and human health impacts from the current E-waste treatment practices.

Biography

Esopere Yannick Esopere is currently a doctoral student in Environmental Studies at the Faculty of Science and Technology at the University of Tsukuba. He has an MSc. degree in Environmental Sciences and holds a Professional Master's degree in Industrial and Environmental Risk Management and a Professional Bachelor's degree in Risk and Environmental Management. His professional experience encompasses internships at ENEO Cameroon, Global Water Partnership – Central Africa, and the Ministry of Mines, Industry, and Technological Development, where he contributed to various environmental management activities. He also worked in environmental consultancy as a field engineer at Irina Environment.