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Implementation of circular economy concept in the world's second largest refugee camp: Zaatari biogas plant

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Refugee camps are taken as temporary solution to existing circumstances. And their temporariness usually prevents the implementation of numerous vital concepts like sustainability, environmental impact, and circular economy among many other. But temporariness is not always the case some refugee camps exceed several years while some eventually turn to permanent living conditions, Jordan's fourth biggest city "Zaatari" as an example. The lack of sustainability in running refugee camps impacts the quality of life in the camps and the cost to run them amid many other aspects. Furthermore, Zaatari being located in Jordan where the gap between the landfill capacity and the total volume of waste produced on a daily basis was found to be 1,698 tons per day (indicating that 19 per cent of solid waste will not be landfilled due to lack of landfill capacity) further stresses out the need reconsider the running scheme at the camp. The main scope of this paper is to study the potential benefits of the application of circular economy in terms of biomass at Zaatari camp. A representative MSW sample was provided by the camps representatives. also, sludge samples from Zaatari wastewater treatment plant. Then MSW samples and sludge were mixed in different ratios and analyzed for potential biogas yield. For the next step analysis of digestate will be performed to determine its adequacy as fertilizer. While carrying out numerous calorific tests for an improved assessment of the best track to harness the full potential biomass produced in the camp. The 80,000 inhabitants of Zaatari consume over 500,000 \$ worth of electricity each month, that accompanied by the growing deficit in landfill capacity and Jordan's high dependency on foreign energy sources all contribute to the necessity in implementing circular economy concept for the refugee camp, and for Jordan in general.

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