

Open Dump to Resource Recovery: Shifting Paradigms for Sustainable Solid Waste Management in Municipalities of Nepal

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Abstract: Waste management strategies are shifting from waste disposal to resource recovery and are considering municipal solid waste (MSW) as resources with a great potential for materials and energy recovery. Therefore, this study presents a reference data of municipal solid waste (MSW) generation, characterization and resource recovery potential in municipalities of Nepal. Based on the recent waste generation and composition study, the average MSW generation can be estimated at 0.2 kg/day for the cities with population less than 50,000 and 0.32 kg/day for the municipalities of population more than 50,000. Based on these per-capita MSW generation figures and population for the year 2020, the total MSW generation of 293 municipalities of Nepal is estimated to be about 2.2 million metric ton/year. The data shows that content of major recyclable materials comprised of an average of 30% (0.66 million metric ton), which provides a great potential for material recovery and recycling in municipalities of Nepal. Since, the organic fraction of waste is about 62% (1.36 million metric ton), the highest fraction of MSW in municipalities of Nepal; there will be more emission of methane and other green house gases (GHGs) from the current waste management practices of Nepal. In this paper, author also discusses on current SWM practices, challenges, people's behaviour in Nepalese municipalities and lesson learned from other cities of developing countries for the selection of SWM technologies. Finally, author proposes different alternative options for the management of the wastes, which is technically feasible and economically viable for different municipalities of Nepal. Efficiency of each scenario in terms of waste reduction for final disposal, GHG emission and savings has been evaluated using the SWM-GHG calculator. Resource recovery from MSW not only reduce the use of virgin raw materials and energy, but also create fertilizers and renewal energy and reduces greenhouse gas (GHG) emissions by reducing the amount of waste to be disposed off at landfill.