

LIFE CYCLE ASSESSMENT PROBLEMS AND PROSPECTS IN BANGLADESH: A CASE STUDY OF HEALTHCARE WASTE MANAGEMENT OF CHITTAGONG METROPOLITAN CITY

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Currently, municipal solid waste (MSW) management has become a challenge to the urban authorities, wherein healthcare waste (HCW) is a major contributor of hazardous wastes fraction and redoubling problems, especially in developing countries. Lately, to estimate and evaluate environmental and health impacts from MSW treatment and disposal program, life cycle assessment (LCA) has stood most popular tool. But its application is restricted in HCW sector hereto; therefore, it was planned to conduct such a study in Bangladesh. Hence, the study was conducted to explore current problems and prospects for implementing an LCA study on HCW in Chittagong Metropolitan City (CMC). Primary data was collected by surveying two separate predesigned questionnaires for healthcare entities (HCEs) and HCW management organizations. Besides, three scenarios were developed focusing existing HCW management in CMC and one proposed. Later, all the calculated values of each scenario were put in LCA database. Finally, data was analyzed by adopting Simapro 7 software to calculate global warming (GW), human toxicity (HT) and terrestrial ecotoxicity (TET) potential for HCW management system. This study revealed that conducting a preliminary LCA study in Bangladesh based on current scenarios is very tough task. There are manifold problems to conduct LCA study on HCW sector viz. dissimilarity amidst different authorities & HCEs, defective implementation of law, no data record, unwillingness to share data, and lack of database. Contrary, there is a good prospect to conduct LCA study if appropriate implementation of law and technical support can be ensured. Further, analyzing four scenarios, it was found that source segregation, disinfection, and incineration with energy recovery by involving private initiative in HCW handling and disposal can minimize GW, HT, and TET impacts. According to field observation and data analysis, unfair and illegal disposal of HCW in CMC area is triggering environmental pollution including health hazards. Inversely, introducing proper HCW handling and disposal guidelines can be reduced such adverse impacts. Finally, this study will facilitate new researchers by providing baseline data to conduct more details LCA on HCW.