Abstract

The current study aimed to assessment of environmental impact assessment and economic cost assessment of bio-fertilizer production from food waste. A case study was conducted on a compost production plant in Lahore city of Pakistan, that involved in raw material collection, transportation of waste and production of bio-fertilizer through a cradle-to-gate approach for environmental and economic examinations by life cycle assessment and life cycle cost methods. To assess the normalized results from the inventory data in Gabi software a midpoint method used for the that showed the key contributors like eutrophication water, ozone layer depletion global warming, terrestrial ecotoxicity, and to the total environmental impacts. The important phases results that regarding to environment the raw materials played critical contributions more than 52% of food waste compost (FWC) life cycle, while less than 20% by the transportation, energy and manufacturing phases. Individual value of methane and carbon dioxide identified as the key substance to increase the environmental impact of FWC production. In addition, cow manure was also one of key substance analyzed. The extraction of methane and carbon dioxide and alternate of cow manure should on focus for future plan to the development of FWC production. Sensitivity analysis results explained that for the environmentally friendly production controlling methane and carbon dioxide should be priority. Moreover, the analyzed economic the results explained that the total investment of 723.48 PKR/t for the production of bio-fertilizer, where worker and personal salaries contributed 60% over the most to total investment. In the light of these evaluations, some of possible recommendations were suggested, like improving raw material, green and food waste procurement technique and cow manure collection. Moreover, extending the FWC enterprises scale as well. This combined evaluation can be valuable to implement environmentally friendly project and in decision making to the stakeholders that are concern to tradeoff an environmentally friendly and economic feasible before execution.