



# Life Cycle Assessment for Integrated Sustainable Waste Management

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## DESCRIPTION

Sustainable waste management strives to keep materials in use as long as feasible while reducing the amount of solid waste disposed in landfills or incinerated. However, waste begins even before products are manufactured in current linear economy, and a more comprehensive approach to sustainable waste management must focus on the entire lifecycle of a product to reduce the negative environmental, social, and financial impacts of 21st century consumption.

It is important to refine and improve the current existing waste management systems. New waste management strategies are required to successfully deal with existing waste streams while simultaneously lowering the quantity of garbage produced, whether focused on waste reduction at end-of-life or designing waste out of the production cycle at the conceptual stage.

## Significance of sustainable waste management

A circular economy is an essential component in sustainable waste management. It is a systemic approach to economic development that opposes the take-make-waste model and tries to detach growth from finite resource usage. Sustainable waste management not only addresses the broader concerns of a linear consumption society, but it also provides more direct remedies to the numerous issues that garbage is created.

## Types of waste

**Food squandering:** food waste is the second-largest component of municipal solid trash, accounting for 21.59%, and has significant social, financial, and environmental consequences. Food waste in the United States amounts to around \$161 billion per year, or nearly 40% of the entire food supply.

**Plastics:** Plastics are the third largest component of MSW, and they have become the poster child for the risks of a linear economy, with single use products strangling land and sea.

## Effect of garbage on food chain

The waste management hierarchy which focuses on avoidance, reduction, reuse, recycling, energy recovery, and finally treatment or disposal, it is the foundation for sustainable waste management. Its goal is to prioritize behaviors that maximize resource efficiency with renewable and less wasteful methods at the top of the pyramid. The primary aim is to avoid and reduce the amount of waste produced and this can be accomplished by increasing efficiency while lowering consumption. To begin businesses, consumers should select products that take the least amount of resources to manufacture (including the packaging). Additionally, wherever possible, single-use or disposable commodities should be avoided, these materials are the essence of linear waste in which resources are harvested, processed, and disseminated only to be discarded.

## Recycling and reusing

If consumption of a product cannot be avoided, then an emphasis on acquiring things that can be reused or repaired, as well as education on how to reuse waste products should be prioritized because it can be done without processing new materials which requires money, energy, and often other resources, reusing is preferred over solutions lower down the hierarchy and it is one of the core aspects of the zero-waste concept that can be reused, which can take the form of having shoes repaired, giving clothes and objects for others to use, and even finding recipes for food leftovers rather than tossing them away. Energy recovery is the following phase, which involves in converting waste into useable heat, power, or fuel, such as biogas. This is accomplished using a variety of techniques including incineration (with energy recovery), gasification, pyrolysis, anaerobic digestion, and landfill gas (LFG) recovery, which has some overlap with waste management's last stage.

## Disposal or treatment

Treatment or disposal is the final and least desirable step in the hierarchy. This usually refers to landfills or incinerators that do not recover energy. This may obviously happen to some waste,

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but it should be avoided as much as possible by using sustainable waste management practices. There are a few things you can do to start making your trash management more sustainable. There are a few basic measures you can take to start adopting sustainable waste management in your home or business, and following steps are few pointers to figure out how and where garbage is generated:

- Single-use products should be discarded;
- Reusable products should be used instead of single-use things;
- Get mugs or glasses instead than cardboard coffee cups.

It is also worth noting that even at professional composting facilities; many supposedly green things such as compostable coffee cups cannot be composted and must be disposed in landfills. Switching to a greener option can save both the environment and money. As previously stated, paper products account for the majority of MSW. Switching as much paperwork as possible to digital forms is a reasonably simple strategy for organizations to improve sustainable waste management. This could include sending and receiving bills electronically rather than in person, storing meeting minutes in a shared document rather than printing them, or converting to online banking.