



# Composting: A Better Solution for Managing Nepal's Increasing Solid Waste

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**Abstract:** In developing countries like ours, environmental factors are not given that priority while managing solid waste. Poor planning and management is continuously resulting to environmental degradation and ecological imbalance. Composting, which is a traditional yet sustainable and environment friendly way of managing solid waste is being neglected. In this article, I have first tried to put forward the existing situation of waste management and waste disposal practices in our county and then to explain about how composting is being practiced in today's scenario. I made field study in Sawal Bahal and Teku area and also referred to published information for this paper. I have tried to highlight the fact that composting, with a little effort from government side and each individual involved, it can prove to be a very effective means of managing solid waste. This practice will definitely help to boost the economic activities of the country. The later part of the paper explains the benefits of composting for each individual level to national level. Various factors whether it be environmental upgradation to new job opportunities or for best agricultural practices, composting can prove beneficial for all.

**Key words:** composting, solid waste management, dumping sites

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## 1. Introduction

In Nepal it had been a tradition of managing household wastes individually or in a small community. The types of wastes were usually organic in nature which was composted to use as manure in the kitchen garden and in fields. This practice was evident in the valley as well. However, in the later years when the city sprawled rapidly, and the government asked the residents to dump the waste in containers on the roads, the practice of composting declined. Serious problem regarding solid waste management then started. Lately, there is at least some awareness that the tradition of composting which was once followed must be retained for various reasons including solid waste management, environmental concerns and most importantly reducing dumping sites. Composting being a useful way of minimizing methane gas by decomposing the waste in proper way; it is now being practiced in many countries worldwide after the realization of the shortcomings of outcome of other waste disposal practices. It is the same in case of Nepal where environmental impacts are almost neglected while managing solid waste. Such poor planning and management is continuously resulting to environmental degradation and ecological imbalance.

## **2. Composting**

Composting is the breakdown of organic materials such as kitchen or garden waste by organisms that feed on waste and convert it into a dark, crumbly, earth-smelling mixture. This mixture can then be used as a soil conditioner, a fertilizer and as a natural pesticide for soil. However composting is not a new idea. It is simple and natural process that continuously occurs in nature, often without any assistance from mankind.

## **3. Benefits of Composting**

Composting is not just good for plants; it has many benefits to environment, economy and the society. It converts the organic waste to a useful end product which is absolutely essential for creating a sustainable environment. Composting has the unique ability to improve the properties of soil hence increasing agricultural productivity.

## **4. Composting Practices in Nepal**

Since more than 70% of the solid waste generated in Nepal is of organic origin, composting is one of the best ways to manage solid waste. Although there are no large scale compost plants in Nepal, some municipalities have small plants with a capacity to process about 6 tons of waste per day [2]. In 1984 with technical and financial assistance of GTZ, the government started composting of organic wastes at Teku (waste collecting center of Kathmandu) but due to the angry opposition of local residents on the ground with a complaint of bad odor, it stopped in 1991. Same problem also arose in another municipality of Bhaktapur but now it is being done in effective way by using windrow composting and manual composting method. Since then there is not any complaints of bad odor [5].

Several NGO's such as WEPCO (Women's Empowerment Preservation Committee), GEM/Nepal (Green Energy Mission/ Nepal), CWDC (Community welfare and development Society) are also practicing community composting. In these systems the waste is collected through door to door collection and then composted in piles in large chambers. The final compost is packed in bags and sold in the local market. The main targeted groups in such community composting are housewives, since most of the organic household waste is generated in the kitchens [2].

Different municipalities in Nepal also sell compost bins of various sizes at subsidized rates. They also give trainings to various groups. Such measures encourage households to reduce waste at source by practicing household composting. When done in large scale it can be a good source of income for many families as well. There are several individuals who collect tons of waste from the market every day, separates degradable from non-degradable waste for further processing. Some are inspired by community participation held by NGO's and municipality, some by awareness of bad impacts of such waste to the environment, while others seeing it being practiced in many other developed countries.

Although composting is being promoted by several NGOs and municipalities, it is still not enough. There still exists huge percentage of organic waste in the final garbage collected to be dumped at dumping sites. Community composting should be further encouraged. Motivating campaign programs should be organized to convince more people in household composting. Technical assistance is also necessary to speed up the task.

## 5. Can Composting be a Useful Practice in Context of Nepal?

As time passed, the population increased, new houses are built and there are more new settlements. Likewise the production of solid waste is also more. Composting is possible in these new settlements as well. It can be practiced in individual houses in the gardens or kitchen gardens. In the absence of gardens, composting bins are available in the market, which can be used instead that requires minimum space.



Fig. 1: A women putting organic waste in a composting bin [2]

In the present context, the municipality's trucks collect wastes from the courtyards, roads and alleys. This has made the public less aware in managing the organic waste in the traditional way through active community participation.

## 6. Benefits of Composting in Nepal

Composting has necessarily become important tool for reviving the old practice and solving many other problems related to solid waste. It can be an alternative for landfill which is a rising issue for the government. It can also prove to be beneficial for farmers and local people. The benefits are discussed under the following heads.

### 6.1 Environmental Benefits and Benefits for Nepal's Government

Composting helps to reduce the amount of organic waste that would otherwise find its way into landfill. It can be a better solution to the government managing solid waste as it saves money needed for constructing new landfill sites by diverting the organic waste and also in reducing the production of harmful greenhouse gases such as methane which would otherwise increase the problem of global warming [4].

Compost also helps in reducing the use of chemical fertilizer. Composting can be used as mulches. It acts as a sponge which holds water and reduces leaching loss and improves the drought resistance of plants. Compost contains humus which is glue like stable residue which helps to bind the soil particles together, making them more resistance to erosion. It absorbs odor and helps clean up damaged or polluted soil. Compost also binds heavy metals and prevents them from migrating to water resources or being absorbed by plants [8].

## **6.2 Solution for Farmers and best Agriculture Practices**

The use of chemical fertilizers, introduced present time. The government should take the initiative to gradually reduce chemical fertilizer imports and end dependency. With the mass production of compost, not only farmers' demand will be addressed, but also reduce dependency on chemical fertilizers and manage garbage in our cities.

Farmers can utilize their pet feces, dry leaves from forests, kitchen waste to make good compost for their farm land and cut down the expenditures in chemical fertilizers. Compost contains nutrients such as nitrogen, phosphorous and potassium that plant needs in order to grow well and stay healthy. There is a saying that if you feed the soil, the soil will feed the plants and the plants will feed you. Unlike most inorganic fertilizers, compost functions as a slow release store of these nutrients to the plant, so that the nutrients are available as the plants require them instead of in one intense flush. Compost also helps to minimize certain plant diseases and soil borne diseases. Research has shown that composts can help control plant diseases and reduce crop losses [3]. Use of chemical fertilizer may treat plant diseases but they do more harm to roots of plants. It can also kill the microbes that make soil fertile making its users to depend on it over and over again.

Compost encourages nature to work for us. When added to sandy soils, it increases the soil's water holding ability so that water is held in the root zone for plant use. It conserves soil moisture, reducing the need for irrigation in dry areas. When added to heavy clay soil, it improves the structure of soil by loosening it with organic matter. It also improves soil aeration and thus supplies enough oxygen to the roots. So soil structure is increased by extensive growth of plants root and effective drainage of surface water when compost is added. Compost is also biologically active, supplying a range of microorganisms that enhance the health of both soil and crops. Earthworm activity is encouraged, further enhancing soil fertility. Compost also acts as an insulator layer. Its dark color helps soil to absorb heat more quickly in spring and retain heat for longer time in fall.

## **6.3 Economic Benefits for Farmers and Government**

The price of chemical fertilizers seems to get higher every year due to rising oil and shipping cost. Compost can be a cheapest alternative to chemical fertilizer. As such, it will save money of individual farmers. As composting reduces the amount of waste that enters landfills each year, it will also save government's budget on waste management that is required in transporting waste to land fill. The more waste that a landfill receives, the quicker that it fills up [6]. Once it is nearly full, another landfill has to be built which again requires huge amount of money. One may argue that composting also requires space. We in fact need space to run any industry. Composting is an industry if it is done in a mass scale. But the space used for composting is not similar to that of landfill which cannot be reused later for other purpose. Organic wastes are brought, composted and sent over for use. So, the waste does not remain as is done in a landfill. Compost can also be a cheap alternative to landfill cover and can also be used as an alternative to natural topsoil in new construction, landscape renovations [7].

Organically grown foods fetch more prices, so farmers can get good return from it. Use of compost will reduce the need for water for irrigation in dry areas as it keeps the soil moist. It is also a less costly alternative for cleaning contaminated soil.

#### **6.4 Beneficial for Local People**

It's now time to treat our waste as something useful. The organic waste that we throw every day from our homes can actually make us earn out of it. We pay certain amount to the concerned authorities for managing our household wastes. Since, solid waste management system will be handled by private sectors in few years to come the cost will be even more expensive. By properly managing the 70% of our total waste which is organic by composting, we can actually save the money needed to spend over private sector and can even earn by selling the compost or even raw waste. So, it can be a cost saving policy to do composting also in household level. Composting reduces the increasing waste on the streets; as a result, spreading of diseases is also prevented.

#### **6.5 Creating Job Opportunities**

Lack of employment and other opportunities have forced people in the rural areas to migrate to the cities. This has put extra burden on the city's economy. Government has so far not been able to provide jobs to most of its citizens.

Nepal has agricultural based economy and most population survives as agriculture labors. This demands for lot of fertilizers most of which are till date being imported from other countries in the form of chemical fertilizers. Use of organic waste for producing compost will not only help to cut down this demands by higher percentage but also creates new job. Composting can create lot of new jobs for the citizens either done in household or community or municipal level. It can help solve the unemployment problem to some extent in developing countries like ours. Hence little initiation and training from the government will help provide lot of unemployed youths with a better job opportunity.

#### **7. Conclusion**

It is by far evident that, for a country like Nepal, solid waste management of organic type through composting is the most practical way. However, to achieve this in an efficient way, we all must work together collectively. Composting in individual level is the best possible option and will reduce a substantial amount of waste to be managed by the municipalities and local bodies. However, a mechanism must be developed so that the compost is used in the agriculture practices extensively. The government with the assistance of other stakeholders must formulate plans and policies and develop a mechanism to implementation. As responsible citizens, we must start composting our household organic waste right from today.

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