

# TREASURES FROM TRASH: THE GOLDMINE IN YOUR GARDEN

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**With waste disposal problems gripping cities as well as towns and an increasing recognition of the role of organic fertilizers to combat the growing food crisis, how do we learn about the inter-linkages between these two? Can waste become a resource? In this article, the author shares insights on how her school adopted the time tested technique of recycling waste into food through composting.**

Population explosion, rapid industrialization and consumption - driven lifestyles have caused huge changes in the quantity as well as the composition of waste generated at both industrial and household levels. Finding sustainable and efficient ways of managing our waste has become a significant challenge. With an enormous increase in the amount of waste generated, we are quickly running out of energy, land and water for disposal, with most landfill sites already overflowing with accumulated and rotting waste. This is complicated by a significant increase in the use of non-biodegradable material,

like plastic and glass, in the last three decades. The percentage of plastics alone in household waste, for example, has risen from 0.7% in 1971 to 9.22% in 2005.

It is in this context that composting becomes relevant. Simply expressed, composting refers to the process of biological decomposition of organic waste, such as plant material, by bacteria, fungi, worms and other organisms under controlled aerobic (occurring in the presence of oxygen) conditions. Compost, the end result of this process, can be used as manure to replenish the fertility of garden soils and grow safe, healthy food. Thus, a system of decentralized



**Fig. 1. Landfills – polluting land and water.**

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**Fig. 2. Food 'waste' is a resource, not a waste at all!**

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### Did you know that modern methods of composting originated in India?

Interestingly, the seeds of composting were sown in India. Sir Albert Howard, a British agronomist, came to India in 1905, and spent almost 30 years experimenting with organic gardening and farming. He found that the best compost consisted of three times as much plant matter as manure, with materials initially layered in sandwich fashion, and then turned during decomposition (known as the Indore method). He published the results of his work in 1943, in a book titled, 'An Agriculture Testament'. This book renewed interest in organic farming methods, earning him recognition as the 'modern day father of organic farming and gardening'.

composting, coupled with efforts to spread general awareness on its necessity, has the potential to provide a more sustainable solution to tackle the organic, bio-degradable component of household waste.

Educational institutions have a key role to play in today's changing world. Teaching science is no longer sufficient in itself; there is a need for schools to also act as spaces for students to learn how to use this knowledge in more practical ways so as to build a more sustainable future for themselves and others. Involving them in hands-on composting efforts in school helps students arrive at an understanding of the interconnections between their actions and its impacts on their immediate environment. They begin to see, for example, how disposing



**Fig. 3. The composting process:** (a) Crates with aluminum meshes. (b) Bed of green coconut shells. (c) Soil with earthworms. (d) A cover of dried leaves.

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organic waste pollutes, but recycling it through composting generates a valuable resource. Students, often, also contribute to greater general awareness on composting by sharing what they learn from being part of this process at school with their families and communities that they are part of.

## Composting in the school premises

We, at Pawar Public School, Bhandup, Maharashtra, have initiated a vermicomposting project in the school garden using the green waste generated in the school canteen and the leaf litter from the school garden. This model has been successful, cost effective and, more importantly, sustainable.

We compost our waste in two crates – with aluminum mesh bodies (to allow

aeration) and metal lids. Within each crate, we prepare a bed with green coconut shells, layer it with some soil with earthworms, and cover it with dried leaves from the school garden. The crates are kept covered with a green cloth to prevent excessive drying of its contents in sunlight. In addition, a little water is added each day to the contents in the crate to ensure that the soil remains moist enough to allow microbes and earthworms to act effectively.

Composting is part of our daily routine. Each day's green waste (canteen waste as well as the leaves and flowers from the garden) is added to these crates, after it is weighed and the weight is recorded. We remove compost from the two crates in a staggered manner, again weighing and recording the amount of compost obtained in each cycle. By involving students in weighing green



### Role of Earthworms

Many of us know that earthworms improve soil structure, increasing its water and nutrient holding capacities. But that's not all! Did you know that they are also voracious eaters, consuming all kinds of biodegradable matter? Part of what they eat is excreted as partially digested matter, called vermi-castings. Turns out, these vermi-castings are rich sources of manure, providing plants with many growth-enhancing hormones and essential nutrients.

waste and compost, we provide them with the opportunity to see, first-hand, how the volume and weight of organic waste is reduced tremendously as a result of composting. For example, in our first phase, 250 kg of green waste was converted into 40 kg of chemical free, organic manure. In the next phase, we obtained 50 kg of compost.

As a result of this activity, our school gardeners no longer spend money on buying chemical fertilizers – they get superior quality manure, without any polluting effects, absolutely free of cost within the school premises. We've also started a 'Garden Club' where students, under the guidance of a gardening expert, use the compost prepared in the school to grow ornamental as well as food crops in the school garden. School staff and parents are also allowed to purchase this compost at the rate of Rs. 30 per kg. Staff members who have purchased our compost vouch for the enhanced quality – in terms of colour, size, flavor and taste – of the flowers and vegetables in their gardens. Parents often make a beeline to our compost-selling stalls on Open Day.

Above all, the knowledge that we've managed to recycle waste derived from food to obtain food again is most satisfying! As a community of students, teachers and parents, this initiative has made us realize that the organic waste that we generate daily is actually a resource and not 'waste'. Visitors are very appreciative of the fact that we have managed to set up a composting project in the meager

garden space available within our school premises. Added to this is the advantage that once the process of composting is initiated, it is very easy to carry it forward as the labour and the cost of maintenance involved is minimal. This self- sustaining model has given us a much needed impetus in organizing other ecologically-sensitive activities in school.



**Fig. 4. Students engaged in composting.** (a) Students, along with school gardener, adding green waste and flowers to the compost bin. (b) Weighing the compost.

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**Fig. 5. Compost – a gardener's delight!**

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**Fig. 6. Uses of compost.** (a) Using compost in the school garden. (b) Growing food crops from food waste.

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## FIVE REASONS TO RECYCLE AND COMPOST!

- 1. Recycle waste!** On average, each of us generates about 200kg of solid waste each year - that is a lot of garbage! Remember 40% of residential waste is made up of compostable matter. By composting organic waste, we help contribute to a more responsible and sustainable way of managing a significant bulk of the waste we produce.
- 2. Save money!** No need to buy chemical fertilizers. Compost is free!
- 3. Improve your soil!** Compost returns valuable nutrients to the soil to help maintain soil quality and fertility. As a mild, slow-release natural fertilizer that won't burn plants like chemical fertilizers, compost also improves texture and air circulation in heavier soils and water retention in sandy soils. By providing organic matter, compost improves plant growth and leads to better yields.
- 4. Reduce your negative ecological impact!**
  - Reduce green-house gases (GHG's) from: (a) vehicles used to transport waste to landfills emit carbon dioxide ( $\text{CO}_2$ ); and (b) anaerobic (without oxygen) break down of organic waste in landfills that produce methane gas, a greenhouse gas twenty one times more harmful than  $\text{CO}_2$ .
  - Reduce water pollution by: (a) runoffs of chemical fertilizers into rivers, lakes and streams; and (b) groundwater pollution by toxic leachates produced by the reaction of metals with buried organic wastes in landfills.
- 5. Save Resources!** By composting, you:
  - Reduce costs and fuel use for waste collection and transportation to landfills.
  - Keep valuable resources out of the landfill and extend the life of existing landfills
  - Return wastes back to the soil to help you grow more food!
  - Conserve water since compost helps with moisture retention in soil.



## Conclusion

Composting is an art and science in itself. Engaging students in the practice of composting at the school-level helps them develop into more responsible and ecologically aware individuals. In the world that we live in today, students can no longer say, "No, not in my backyard"; instead they must learn to say, "Yes, in my backyard!"



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