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Mismanagement of waste could increase global warming

by [Shraddha \(/profile/shraddha\)](/profile/shraddha)

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As the “Clean India” initiative picks up, the one big hurdle in the way is that of effective waste management. Ill managed waste not only makes cities untidy, it also adds to global warming and pollution, finds new research.

Bangalore generates around 3000–4000 tonnes of solid waste every day. The growing population of the city has increased the pressure on the required waste management system. Residences, hotels, restaurants, commercial premises, slums and parks contribute to the generated waste. The household waste contributes about 55% of the total waste while hotels and eateries generate 20%. It is essential to understand how the composition and quantities of waste affects our environment.

Dr T.V. Ramachandra and his ‘Energy and Wetlands Research Group’ at the Centre for Ecological Sciences (CES) study solid waste management and its environmental impact. They studied composition of waste according to various factors. According to their research, 72% out of all the waste generated in the city is organic or biodegradable. Organic waste includes vegetable and fruit peels, food waste and garden waste. It is a rich resource of nutrients and can be treated to make compost. The inorganic waste consists of material like plastic, paper, glass, metal etc. These materials can be recycled to make other products if obtained separately.

The amount and type of waste produced have changed in the last few decades. Currently, a Bangalore citizen generates around 580 gram of waste per day on an average. This is a significant increase from 160 gram in the last few decades. Low income groups use unprocessed vegetables and products with minimal packaging while the high income group use more packaged foods and produce more food waste. Similar variation is observed between urban and rural areas. People in rural areas use less packaged food products and generate lesser waste.

When waste is not disposed properly, it creates problems. The major issue we face today is that the waste is not segregated properly. The ways to dispose various materials are different. So when the waste is not separated properly, it cannot be disposed properly. Some of the waste is also dumped on roadsides and open plots or is burned in open air causing health hazards and incomplete decomposition.

There is a significant increase in the amount of plastic waste due to the use of more packaged food in the recent years. “The plastic waste is a worrying phenomenon. The use and unsystematic disposal of plastic waste is choking storm water drains leading to floods in the city areas, entering the food chain through animals or directly affecting human health due to contact with cancer causing materials”, says Dr. T. V. Ramachandra.

From the total waste generated in Bangalore, roughly 21% is made up of materials like paper, plastic, glass and metal that can be recycled. The recycling of materials that have an economic value is done by rag pickers and individual

vendors. However there is a need to develop a system to collect the sorted waste regularly.

In this regard, for an effective segregation at sources suggestions were to implement incentive based segregated waste collection system. This involves (i) mobile vans with the provision to collect segregated waste and unsegregated waste, (ii) Bangalore lane friendly mobile vans with GPS facility, (iii) incentive mechanism - residents who segregate to be given an incentive of Rs 1-2 per kg of organic waste, which is accounted electronically and transferred to the respective household owner's bank account (with Aadhaar, etc.), (iv) those who give unsegregated waste need to pay Rs 5 per kg. These suggestions implemented effectively, would generate revenue to the BBMP, if the present trend of unsegregated waste continues.

When biodegradable waste is composted effectively there is a very little amount of GHG's (greenhouse gases) emissions. For effective decomposition, sufficient oxygen is required to convert waste into compost. However when biodegradable waste is mixed with other non biodegradable materials, less oxygen is available for decomposition. As a result, high quantity of methane is released instead of limited quantities of carbon dioxide. Methane, a potent greenhouse gas, is one of the causes of global warming. Unscientific dumping of organic waste in dumping sites also results in huge quantities of methane released in open air.

Dr. T.V. Ramachandra and his research group have estimated the carbon dioxide and methane gas emitted from the waste sector by theoretical as well as experimental methods. Total methane emission from Bangalore solid waste using the experimental methods is about 32 kg/day, whereas carbon dioxide is 404 kg/day.

The researchers suggest segregation of waste at source as the most important way to better waste management. Households, restaurants, commercial premises should separate waste into categories like plastic, paper, food waste etc. This will ensure that biodegradable waste is efficiently treated and plastic and paper can be recycled. Burning of waste in open air should be stopped as it releases harmful gases in the air. The organic fraction of the waste contributes majorly to the release of Green house gases in the air, mainly methane. However if the organic waste is treated in biogas plants and if the methane gas is captured, it can be used a good source of fuel.

Some residential colonies that have started operating composting units to process the biodegradable waste produced by the residents. The city needs more such local initiatives to cope up with the problem of growing waste.

About the author

Dr. T. V. Ramachandra is the coordinator of Energy and Wetlands group and a faculty member at CES (Centre for Ecological Sciences), and Associate Faculty at Centre for Sustainable Technologies (astra), and Centre for infrastructure, Sustainable Transportation and Urban Planning (CiSTUP), Indian Institute of Science.

Contact information

Dr. T. V. Ramachandra, Energy & Wetlands Research Group, CES, Indian Institute of Science, <http://ces.iisc.ernet.in/energy> (<http://ces.iisc.ernet.in/energy>), https://www.researchgate.net/profile/T_V_Ramachandra/publications (https://www.researchgate.net/profile/T_V_Ramachandra/publications)

Email: cestvr@ces.iisc.ernet.in (<mailto:cestvr@ces.iisc.ernet.in>)

About the paper

It was published in November 2014 in the book 'Assessment of Carbon Footprint in Different Industrial Sectors, Volume 1

https://www.researchgate.net/publication/275017534_Carbon_Footprint_of_t... (<https://www.researchgate.net>

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