

No quick fixes for developing world's solid waste management crisis

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As the world population, economy and consumption grows, a complex and multi-dimensional approach is needed to manage a rising tide of solid waste, researchers say in a study published in the journal *Waste Management*.

The research by Lilliana Abarca-Guerrero, now at the Costa Rica Institute of Technology, along with colleagues at the Eindhoven University of Technology in The Netherlands and Linnaeus University, Sweden, has been selected for an Elsevier Atlas Award.

The developing world's population, economy, and consumption are growing, and that means more and more solid waste. A complex and multi-dimensional approach - taking into account the environment, socio-cultural practices, legal issues and economics - is needed to solve these challenges of [waste management](#).

"I always say when I go to cities, if somebody comes with a magical solution for the waste management situation of the city, be scared about it," said Lilliana Abarca-Guerrero of the Costa Rica Institute of Technology and Eindhoven University of Technology in the Netherlands. "There are no magical solutions or quick fixes in waste management. There are paths to follow for the prevention, reduction, reuse, recycle and safe disposal of waste."

The solution is not simply to import modernized trucks and technologies or to improve roads. Abarca-Guerrero has come to this conclusion after

poring through the scientific literature, existing databases, and traveling to 22 countries all over the world on four continents.

Based on an analysis of the data, her study outlines the stakeholders to be considered and the basic elements and aspects that must be taken into consideration for a successful waste management system. Some of the key conclusions are as follows:

- Waste management involves many players and communication among them is key.
- A successful waste management system must consider technological solutions along with "environmental, socio-cultural, legal, institutional and economic linkages."
- Financial resources are required to obtain the skilled personnel, infrastructure, and equipment needed to implement waste management plans..
- Decision makers must be well informed with access to reliable data.
- Universities and research centers have an important role to play in preparing professionals and technicians with expertise in waste management.

Ultimately, the challenge is to move waste from one place to another and to address the many factors along the way that influence and potentially interrupt that flow. The awareness and involvement of citizens is an especially critical part of the equation.

"When the community participates together with municipalities, already a big part of the problem is solved," said Abarca-Guerrero.

The challenges are daunting - the World Bank's Urban Development department estimates that the amount of municipal [solid waste](#) will reach 2.2 billion tons per year over the next decade – but Abarca-Guerrero

remains optimistic that progress can be made.

"I've always said that if the developed world could manage the situation, we can in the developing world because they are not smarter than we are," Abarca-Guerrero added. With this she means that the developing countries can, using their own resources, face the challenges. Also, the developing world countries must not be tempted by the idea that their problems can be solved by buying modernized equipment as seen in other parts of the world.

"We don't need to apply technologies such as the ones used in the developed world, but we can see how the system works and develop our own best practices," she says. "Maybe in the U.S. or Netherlands, you can use mechanized trucks with totally automated arms picking up everything. We may need a horse and cart collecting the waste if that is what we have available."

The paper, which includes a questionnaire for characterizing waste management in any city, is freely available for download in English. Abarca-Guerrero says she plans to make it available in Spanish as well.

More information: "Solid waste management challenges for cities in developing countries" [DOI: 10.1016/j.wasman.2012.09.008](https://doi.org/10.1016/j.wasman.2012.09.008)

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