

Opportunities for innovative management of food waste at fresh markets

Photo by Fahad Kaizer, 2021

Informal workers separating waste from a collection point behind the Jurain Market in Old Dhaka, Dhaka South. Most of the city's waste is organic food waste, a lot of which accumulates in fresh markets. Due to the high costs of adequate disposal an estimated half of waste is left uncollected, causing environmental and health problems. Is there something else that can be done with the city's vast quantities of food waste?

This seventh special edition of the Situation Analysis series was prepared by the Dhaka Food System project, with support from the Kingdom of the Netherlands. This edition explores the potential to productively and profitably use the food waste generated by the city's fresh markets.

Each day in Dhaka City, an estimated 5,500 tonnes of waste is generated, collected and dumped in Dhaka's two landfills, Amin Bazar and Matuail. Nearly another 5,500 tonnes of waste is generated daily in the city, but goes uncollected. This unmanaged waste affects the health and well-being of the residents of Dhaka, polluting the air and water, creating foul odours, increasing the population of potentially disease-spreading rodents, causing traffic congestion, increasing the risk of fires and reducing property values. Because of population growth, industrial development and rising prosperity linked to increased consumption, the amount of waste generated in Dhaka is rapidly increasing and is expected to surpass the capacity of the city's landfills (both of which have already been expanded) within four to five years. Further expansion is deemed unfeasible, and without viable long-term solutions, the continuous flow of waste will end up being dumped elsewhere and will add to the existing negative impacts of unmanaged waste in the city.

Managing this growing waste problem is a major challenge for Dhaka's four city corporations, but it also presents potential opportunities too. Given the urgency of this situation, the Dhaka Food System project turned its attention to exploring innovative solutions to alleviate the problem, focusing on the city's fresh markets which, while small, produce enormous quantities of waste every day, almost all of it food waste. This prompted a study that aimed to understand the current waste management practices and the potential for introducing innovative waste

management solutions focused on food waste that could significantly reduce the amount of waste flowing into the city corporations' waste disposal systems while converting the food waste into useful resources and even generating income and jobs for the markets and associated stakeholders. Ten fresh markets in the Dhaka Metropolitan Area were included in the study. This special edition explores what can be done with food waste in fresh markets to both reduce the burden on the city government to manage and dispose of it, while also make use of its potential, such as to produce energy, jobs, and return nutrients into the soil.

Key Findings

Gazipur and Narayanganj urgently need alternative waste solutions

Unlike Dhaka North and Dhaka South, Gazipur and Narayanganj have no city landfills. They have not had the same level of foresight, planning or investment for developing sustainable waste management systems. The two markets surveyed in Gazipur dump waste directly into nearby ponds and burn plastic waste to reduce the volume of waste, creating a fire hazard and contaminating the surrounding air with toxic chemicals, affecting nearby residents. Only one market, Digu Babu Bazar, located in Narayanganj, sends a portion of its waste to a composting plant.



Photo by Fahad Kaizer

A man walks across an open area full of accumulated waste in Jalkuri, Narayanganj. Most of the waste from Narayanganj's fresh markets finds its way into lakes, ponds, and beside roads leading to the city, due to a lack of a dedicated landfill.

Dhaka North and Dhaka South have extremely high waste management costs, requiring alternatives as waste volumes continue to grow

Although two landfills are available for Dhaka North City Corporation (DNCC) and Dhaka South City Corporation (DSCC), the waste disposal costs are excessive. With the growing volume of waste generated in both cities, unless cost savings can be achieved, waste management will become an ever greater burden on the budgets of both city corporations. Furthermore, as the two landfills are approaching capacity, large-scale investments will be required and innovative, cost-cutting measures will be even more necessary.

a resource. This would reduce the amount of waste sent to the landfills or left to rot in the city and, in turn, lessen the current negative impacts of waste on human health and on the environment. Furthermore, the conversion of waste to energy would reduce the energy costs of the markets (and, in some cases, beyond the markets) and the wastes left over after the conversion process (nutrient digestate) can be sold as fertilizer to local farmers.

DNCC and DSCC estimated share of total budget spent on waste management (USD) between

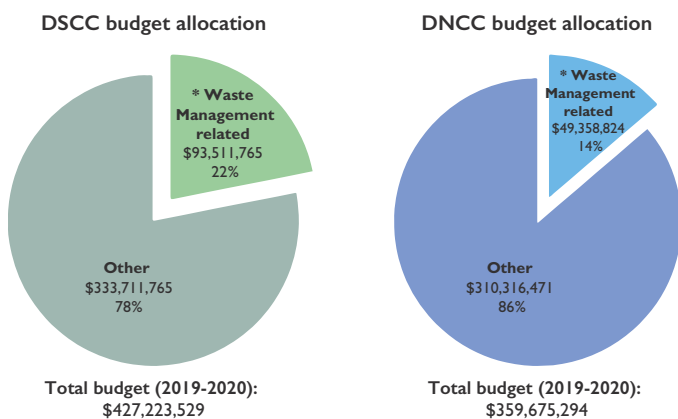


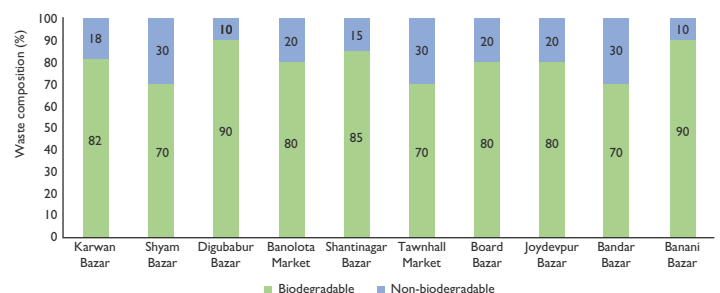
Photo by Fahad Kaizer

Mostly food waste is thrown out behind the Digu Babu Bazar in Narayanganj. Up to 90% of waste deposited by fresh markets is biodegradable waste which can be reused for other purposes such as composting, biogas production, or even creating animal feed.

Waste generated by fresh markets can be managed productively and profitably

The waste generated by the markets surveyed was found to be predominantly biodegradable (80 percent on average). By means of waste-to-energy technologies, such as anaerobic digestion, this organic waste can be used to produce renewable energy, turning the waste into

Percentage composition of estimated daily waste generated (m³) in the ten fresh markets surveyed



Alternative waste management practices can have positive local benefits

At markets that do not have coordinated and efficient waste management systems, waste is burned or dumped on the streets or in nearby lakes or ponds. All of these practices have serious negative consequences. Alternative practices that can add value, generate employment and reduce environmental impacts would be beneficial to local communities, customers, vendors and city corporations.

Alternative approaches to food waste management should integrate existing stakeholders

At some markets, individuals separate plastic and other recyclable wastes and sell them. This indicates that an informal economy exists around the re-use of recyclable wastes, generating livelihood opportunities for many people living near the markets. Any intervention that disrupts this practice would threaten the livelihoods of those involved, most of whom are poor. Thus, any such intervention must consider these stakeholders and integrate them into the new process.



Informal waste recyclers scavenge for reusable materials in the pile of garbage near the Hazaribagh Market in Dhaka South. Any alternative waste innovations should work with stakeholders already working with the city's waste.

Different sized markets may require different kinds of alternative food waste solutions

The right interventions in smaller markets, especially those where food waste is dumped in lakes, ponds or on the streets, and where there is little or no official waste collection, could generate income and benefit local communities. Medium-sized markets generate sufficient food waste to make small or medium-sized biodigester systems feasible, which can treat waste. Large markets would require considerable investment for implementing alternative waste management systems, given the high volumes of waste they generate, but also could have the most to benefit from them in terms of cost savings and generate significant environmental benefits locally.

Each market has its own waste management structure so changes need to be worked out with all stakeholders

Waste management systems in fresh markets can be very different from one another; they usually involve shop owners, cleaners employed by the city corporations and market committees. At some markets, all three parties are involved in managing the waste, but in others, it is handled exclusively by the market committee. It is generally found to be more effective when the market committee alone manages the waste. In either case, the market's waste management system only covers the collection of market waste and its transport to waste transfer collection points. Transportation to the final dumping site is handled by the city corporation. In order to introduce innovative alternatives the different stakeholders should cooperate closely and develop solutions together; otherwise they won't be sustainable.

Key takeaways

- ✓ **Gazipur and Narayanganj urgently need alternative waste solutions**
Current waste management practices are having significant negative effects on the environment and on the local population.
- ✓ **Dhaka North and Dhaka South have extremely high waste management costs, requiring alternatives as waste volumes continue to grow**
Economising the waste management process will result in significant monetary savings for the city corporations.
- ✓ **Food waste generated by fresh markets can be managed productively and profitably**
Food waste should be segregated at source and used to produce energy. This will result in positive health, environmental and economic benefits.

✓ **Alternative waste management practices can have positive local benefits**

Effective waste management will benefit a broad range of local stakeholders.

✓ **Alternative approaches to food waste management should integrate existing stakeholders**

Stakeholders involved in the informal collection, sale and re-use of recyclable waste should be included in any proposed interventions that affect their livelihoods. Additional thought is needed to ensure that benefits are shared with these stakeholders.

✓ **Different sized markets may require different kinds of alternative food waste solutions**

Markets must be assessed to determine the most appropriate intervention for each market, particularly considering the size of the market and the volume of waste generated.

✓ **Each market has its own waste management structure so changes need to be worked out with all stakeholders**

Any proposed initiative must be developed in close cooperation with stakeholders involved in waste management at the markets and with the city corporations.



Photo by Fahad Kaizer

A cleaner shovels food waste from the Karwanbazar Market in Dhaka to be transported and disposed of on a Friday morning. The quantity of waste produced at fresh markets that requires transportation and adequate disposal compels cities to reduce the cities' costs, while also providing opportunities to generate ideas that can have multiple benefits.



Photo by Fahad Kaizer

Saturday morning on the side of a road near New Market, one of the most popular fresh markets in Dhaka South. The market vendors dump garbage from their stalls out in the open due to an inadequate waste management system in the market.