# Kushtia, Bangladesh

## City overview

| Population |
| --- |
| 102,988 (2015) |

| Total waste generated per day | Waste generated per capita per day |
| --- | --- |
| 40 tonnes | 0.39 kg |

| Waste-to-resource facility established |
| --- |
| Compost plant (2008) and co-compost plant (2012) |

| Capacity of waste-to-resource facility | 4 tonnes per day |
| --- | --- |

| Operator | Kushtia Municipality |
| --- | --- |

| Local partners |
| --- |
| Local Government Engineering Department, Waste Concern |

Source: Waste Concern.

# Introduction

Kushtia is a small city and capital of Kushtia District, in north-west Bangladesh. Due to fertile, flat alluvial soil in the delta of the Gorai and Kaliganga Rivers, the district is rich in rice and tobacco plantations. Kushtia city provides the market and distribution node for their crops. In addition to agriculture, education is a central economic activity for Kushtia city, with a number of universities and research and cultural institutions located there. The western railway line divides the city.

Approximately 40 tonnes of solid waste is generated in the city each day, 20–25 tonnes of which the municipality collects. The city's solid waste is around 80 per cent organic. Additionally, the city's residents generate some 180 cubic metres of faecal sludge each day. The municipality collects both faecal sludge and solid waste, making co-composting an appropriate technique for resource recovery in Kushtia. Co-composting involves mixing and compositing faecal sludge and organic waste together under aerobic, thermophilic conditions.

Prior to the project, faecal sludge was collected by vacuum trucks from septic tanks and pit latrines across the city and released directly into local waterways, which heavily polluted the ecosystem. The city lacked a clear alternative to such practices, with no formal or environmentally sound faecal sludge disposal system in place. The co-composting facility changed that situation.

# Promoting the IRRC model in Kushtia

The co-composting IRRC project was initiated in 2012 through a partnership between ESCAP, Waste Concern, the Local Government Engineering Department (LGED) and the Kushtia Municipality. This involved adapting and expanding an existing composting plant that had been set up in 2008 through a partnership between the Institute for Global Environmental Strategies (IGES) and the United Nations Centre for Regional Development (UNCRD).

The co-composting project depended on contributions from different partners. ESCAP provided the funds for the construction of the cocopeat filter system, through which waste water is filtered prior to release. LGED provided the funds for the construction of the new plant, the faecal sludge drying beds and the purchase of vacuum pump trucks for the removal of faecal sludge from septic tanks and pit latrines. Land for the project was provided by the municipal authority under the original project with IGES and UNCRD. Waste Concern contributed technical assistance to the municipality on the design and operation of the plant.

Under this scheme, collected sludge is transported to the treatment facility at the IRRC. The liquid faecal sludge is poured into a sludge tank, from where it is passes into the sludge drying bed. When the drying bed is full, the sludge dries over a period of 7–12 days. The percolate (liquid) that is produced during the drying process is transferred to a percolate tank and then filtered through the cocopeat unit. After filtration, the water is high in nutrients but compliant with national wastewater quality standards. As a result, it can be safely used on agricultural land for irrigation.

The revenue streams derive from the collection fees and the sale of compost and recyclables in the local market. To collect faecal sludge from a pit latrine, the Kushtia Municipality charges BDT350 ($4.50) per latrine. To collect faecal sludge from a larger septic tank, the municipality charges BDT500 ($6.43). The municipal authority covers the cost of the workers and management staff as well as the truck fuel required for the collection process. The collection fees offset the plant's operational costs.

# Results and impact

The project has achieved good results in a number of important areas. First, the amount of waste disposed through open dumping has reduced. The IRRC receives 2–3.5 tonnes of organic waste per day and 2–6 cubic metres of faecal sludge per day, equivalent to the volume from one to four households' septic tanks or pit latrines per day. The Kushtia Municipality services around 85 per cent of the city's households using the vacuum trucks; otherwise, approximately 15 per cent of households either call in workers to clean their pit latrine or do it themselves.

Second, the compost produced is of high quality. It complies with government standards and has cleared the first stage of licensing (see Box 11). As stipulated by these standards, a second stage of field testing, over a period of 9–12 months, is required before commercial production and marketing of the compost is permitted.

Third, the financial management of the operation has been successful, mainly due to strong support from the municipal authority. In addition, the Ministry of Local Government in late 2014 approved the application of a 12 per cent property tax in municipalities where faecal sludge collection takes place. This now greatly facilitates the cost-recovery of operations, including within the IRRC.

Fourth, the project has led to a rise in awareness within the local government on the importance of waste as a valuable resource. A range of on-the-job training has been delivered to relevant staff of the Kushtia Municipality. This training has covered different aspects of faecal sludge management, sanitation and conservation. Critically, the mayor of Kushtia Municipality is hugely supportive of the project and regularly monitors activities at the IRRC and within the broader waste collection operations. This political commitment has been vital for the project's success.

And fifth, the project has demonstrated that co-composting is a viable and affordable technique that can be adopted in other cities. Importantly, the capital costs of co-composting projects are much lower than those of conventional reticulated sewer systems, which greatly increases the attractiveness of co-composting as a solution to Bangladesh's sanitation challenges, particularly in small and medium-sized towns. To further promote this concept, however, widespread demonstration and expanded national government support are required.