

How Bangladesh turns toilet waste into high-value compost - in pictures

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- Farmers tend their cabbage crops in Manikganj district. Bangladesh has benefited from major improvements in rural sanitation with the spread of pit toilets – holes dug in the ground. These bypass the problem of installing sewerage infrastructure in densely populated rural areas, but the challenge is what to do with the waste when the pits are full. If treated carefully, this waste could provide a local source of organic matter and plant nutrients such as nitrogen, potassium and phosphorus. All photographs by Neil Palmer/IWMI

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- A researcher from the Bangladesh University of Engineering and Technology (Buet) checks plants grown with compost pellets made from treated faecal waste. The pellets are also being trialled with food crops such as tomato, spinach, chilli and bell pepper. The high-quality compost meets World Health Organisation safety standards. Other partners in the project are the [International Water Management Institute](#) (IMWI) in Sri Lanka and the NGO [Forum for Public Health](#)

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- Pit emptiers in Gazipur district collect waste from a village toilet. The process of transforming waste into compost begins when collectors empty pit toilets and transport the waste to a central composting site. Typically, rural households pay for their toilets to be emptied. But with few facilities for disposing of the waste after collection, it is often either buried or dumped into waterways. Collection and transportation of the waste is the most challenging part of the compost-making process, partly due to cost, poor roads and inadequate equipment

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- Collectors unload the waste at the composting site. Here, the waste is poured on to a drying bed containing rice straw. Transparent plastic roof panels help to raise the ambient temperature below and accelerate the drying process, which typically lasts 15 days

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- The dried waste is combined with other nutrient-rich waste materials such as rice straw, rice husk and cow dung in order to improve the nutrient mix. In trials, this has enabled producers to develop compost that is specifically suited to certain crops

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- Mominur Rahman, a researcher from Buet, takes a temperature reading of the composting mixture. After mixing, the material is left for four to five months. Keeping the pile moist and turning it intermittently help maintain optimum temperature and humidity levels. This step in the process destroys pathogens and creates the conditions for transforming the mixture into safe compost

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- A handful of freshly made pellets of organic fertiliser. After the compost is mixed with a binding agent such as starch, it is fed into a machine to produce pellets. Additional nutrients can be added at this stage. Safe to handle and use on food crops, the pellets are also easy to store and transport. Researchers are investigating whether the pellets can help stagger the release of nutrients, potentially reducing the number of applications by farmers

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- Rizwan Ahmed (left) of Forum for Public Health and IWMI's Soumya Balasubramanya discuss the project in Bangladesh. Scientists are trying to establish a system of converting waste into compost that is economically viable – one that is affordable for low-income households and profitable for producers. This might require new policies to support the expansion of the project, and a shift in farm subsidies to help promote the use of locally-produced, organic fertiliser

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- A pit emptier in rural Bangladesh. Creating a value chain for the collection and processing of what was previously considered a waste product could benefit multiple groups of people – and the environment. As part of the project, scientists are also investigating the possibility of using the compost as fish feed, and as an alternative cooking fuel

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