

## Piloting Enclosed Long-Term Composting in an Indian Village

**Project name:** Pilot project to introduce and adapt enclosed long-term composting for India (under the framework project Enhanced Sustainable Sanitation Provision in Flooded Areas of India)

**Location:** Mohaddipur Hamlet, Nalanda District, Bihar, India

**Partner:** Water, Sanitation and Hygiene Institute (WASHi), India

**Funder:** Swedish International Development Cooperation Agency (Sida)

### Key features:

- Community-based sanitation and hygiene facility to stop open defecation and improve human health
- Introducing and adapting enclosed long-term composting (ELTC) technology in an Indian context
- Safe agricultural reuse of “humanure” to strengthen livelihoods and nutrition

This pilot project aimed to help a small rural community in India’s Bihar state to become open defecation free by installing a community sanitation complex and educating residents on the benefits of improved sanitation and hygiene practices.

The project broke new ground in being the first attempt to introduce to India enclosed long-term composting (ELTC) sanitation technology that has been developed and implemented in northern Europe and North America, and to adapt it for the Indian setting. The ELTC system facilitates the safe reuse of human excreta as agricultural fertilizer, in line with an ecological sanitation (ecosan) approach. The new facility thus brings the added benefits of boosting agricultural productivity at low cost and improving nutrition, alongside reducing morbidity and mortality linked to waterborne pollution and open defecation.

The project also seeks to empower women and girls by promoting menstruation hygiene management (MHM) and giving them safer, more private sanitation and hygiene options.



Inauguration of the new sanitation and hygiene complex

The pilot was initially funded (2012-14) under a Sida-financed action-research project implemented collaboratively by SEI and the Water, Sanitation and Hygiene Institute (WASHi), India. The local implementation partner is a local non-governmental organization, the Systematic Agro-based Research Institute (SABRI), known for its work with women’s self-help groups and income generation.

### Mohaddipur

Mohaddipur is a densely populated community of 21 households in Nalanda District, Bihar state. Most families are very poor and earn their livelihood through daily wage work. Most households do not have land tenure of the land on which their homes are built. The inhabitants belong to the disadvantaged “scheduled castes”.

At the outset of the project, there were no community sanitation facilities and open defecation was common, especially along the approach road to the hamlet. This disproportionately affected women and girls, making them vulnerable to sexual and emotional and complicating menstrual hygiene. Cases of waterborne disease were common, imposing significant financial costs on families.

### Sensitization

The first step in the pilot project was to build motivation for change among community members. This was done through both group discussions and personal interviews. Sensitization about MHM, specifically for women and adolescent girls, presented MHM not only as a health and hygiene issue but also as a way to overcome a common obstacle to girls’ education and a way of improving women’s livelihood opportunities. Children were also given special attention as potential “agents of change”.

Of the 21 households in Mohaddipur, 15 are led by farmers who barely manage to feed their families because of their low income and high outgoings. These outgoings include approximately INR 13 500 (€160) yearly on agricultural inputs such as fertilizer and insecticide, along with health care bills. For this reason, the economic benefits of using “humanure” fertilizer and reducing open defecation were a strong persuasive factor. Another SEI-WASHi pilot project in nearby Bind Block was carrying out comparative agricultural trials of treated urine and commercial chemical fertilizer, and visiting the trials helped to make the case for the potential of humanure in agricultural production.

After the sensitization the community expressed willingness to contribute labour, materials and a cash sum towards the building of the sanitation complex.

### Introducing and adapting enclosed long-term composting

The sanitation complex installed in Mohaddipur is divided into two equally sized sections for women and men. Each section has three toilets – two squatting pans and one seat riser – one bathing booth, two waterless urinals and one hand basin. Both faeces and urine are processed using ELTC, based on the CompostEra system (see [www.compostera.eu](http://www.compostera.eu)). All toilets have a drop hole into a single compost-processing chamber.

The main “humanure” product from the facility is a liquid locally named “fertila”. Urine and anal-cleansing water are directed into the compost-processing chamber, then run off into a starter/process bed. As the liquid seeps through this bed it undergoes bacterial oxidation (or nitrification), which should eliminate odour and pathogens. The resulting liquid is slowly drained into a separate storage container, where it is stored for subsequent use as a fertilizer. The solids remain in the chamber to decompose with the help of composting worms (*Eisenia foetida*). The chamber should not need to be emptied for over 30 years.

The main adaptations of the original CompostEra design for the Indian context were directing water from anal cleansing into the chamber and the replacement of peat in the starter/processing bed with locally abundant coconut fibre. As the effect of these modifications on the quality of the fertila is unknown, it will be tested in a new laboratory set up under the same SEI/WASHi collaboration to ensure that it is safe to use.

An elected village committee was established to boost the sense of community ownership of the new facility, and to ensure that it keeps being maintained and used after the project withdraws.

### Achievements and lessons

The project has given residents a functioning and socially acceptable alternative to open defecation. All 21 families are using the facility, with the exception of a handful of men and small children. While there was concern early on that elderly villagers in particular would accept the riser in the women’s section, they are using it and keeping it clean.

Interviews with villagers reveal the remarkable educational impact of the pilot. Women and adolescents in particular show a good understanding of the ecosan concept and have adopted the new sanitation and hygiene practices. Most bring soap to wash their hands after defecation.

Despite this, instilling a sense of ownership has been difficult. The community has only gradually taken responsibility for managing the new facility. A major unresolved issue has



A collection tank for the liquid fertilizer known locally as “fertila” (treated urine and washing water) outside the processing chamber of the sanitation and hygiene complex

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been how to fund regular cleaning and maintenance. There is concern that user fees could dissuade villagers from using the facility.

The pilot project has already attracted a lot of local interest. The inauguration of the community sanitation complex was made a major festive event and was attended by neighbouring villagers, political leaders and media. Many outsiders have since visited the complex and their questions and interactions with the villagers have helped to reinforce the concept and acceptance of ecological sanitation on both sides. Government officials have also shown great interest in this alternative sanitation system; it is already being replicated with state funds in a slum area in Bihar Sharif, the capital of Nalanda, at the instigation of the district magistrate, who saw ELTC as an innovative and efficient response to the community’s sanitation problems.

The adapted ELTC system will continue to be closely monitored for three years to ensure that the fertila is safe, demonstrate the positive effects of urine on agricultural productivity, and see whether any further adaptation is needed. Once the results of the pilot project have been thoroughly evaluated, large-scale promotion of this promising ELTC technology in the area may begin.

### For further information

To learn more about the SEI-WASHi collaboration visit <http://www.sei-international.org/projects?prid=2070> or contact:

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