

New Non-Profit Laboratory Supports Sustainable Sanitation

Project name:	Setting up a non-profit water and nutrient-testing laboratory (under the framework project Enhanced Sustainable Sanitation Provision in Flooded Areas of India)
Location:	Patna city, Bihar, India
Partner:	Water, Sanitation and Hygiene Institute (WASHi), India
Funder:	Swedish International Development Cooperation Agency (Sida)

Key features:

- Non-profit facility offering high-quality independent laboratory analysis
- Verifies safety and nutrient content of “humanure” products for ecological sanitation pilot projects
- Demonstrates improvements in water safety resulting from pilot projects
- Supports civil society surveillance of water quality and contamination to protect vulnerable communities

Background

Much of Bihar State in northern India suffers from water scarcity. Infrastructure for clean water supply and for wastewater removal and treatment is underdeveloped, leaving most communities with little or no access. This makes natural groundwater and surface water resources critical, not only for agricultural production and ecosystem services but also for public health.

The water resources used by many rural communities in Bihar for drinking, cleaning and irrigation often fall below safety standards. Open defecation and mismanagement of wastewater are widespread, encouraging pathogens to enter common water sources. Seasonal flooding in parts of the state greatly adds to the problem. In addition, the water sources used by many communities in the state contain high levels of harmful chemicals from both natural and anthropogenic sources, particularly agricultural chemicals.

A collaborative project between SEI and the Water, Sanitation and Hygiene Institute (WASHi) in Bihar state piloted a range of approaches to end open defecation and introduce new sanitation solutions that are both acceptable to the communities and well suited to local conditions. A common element in all the pilot projects is ecological sanitation (ecosan), in which excreta are captured, stored and rendered safe for reuse as agricultural fertilizer and soil conditioner. A survey carried out under the initiative found high incidences of diarrhoea and other diseases typical of water contamination with faecal matter in communities in Bihar.

Water quality – both before and after the introduction of ecosan – and the safety and nutrient content of the treated “humanure” products are central to making the case for ecosan. For this reason it was decided that the initiative should set up a new water quality and nutrient testing laboratory in Bihar. The



Testing nutrient content at the new laboratory

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new facility could both serve the pilot projects and provide a valuable service to others in the state seeking to address water quality and related issues.

The implementing organization for the set-up of the laboratory is the Bihar-based Shree Krishna Gyan Mandir Society (SKGM), founded in 1962, which focuses on developing capacity and awareness in the fields of culture, environment, education, agriculture and human health.

The laboratory

The Shree Krishna Gyan Mandir Water and Nutrient Testing Laboratory and Research Centre opened in mid-August 2013. It is located in central Patna, in premises provided by SKGM. The organization covered the cost of refurbishing and preparing the premises. It has also taken responsibility for the general management of the laboratory, and is supervising the establishment of the programme and for staffing. Laboratory equipment was provided under the SEI/WASHi collaboration.

Two other laboratories in Patna supported the implementation phase: the Environment and Water Management laboratory of Anugrah Narayan (AN) College, and the state-level water testing laboratory of the Public Health Engineering Department (PHED), which offered technical advice.

Services provided by the new laboratory

The Shree Krishna Gyan Mandir Water and Nutrient Testing Laboratory and Research Centre is a well-equipped, state-of-the-art laboratory, capable of carrying out high-standard analyses. The laboratory caters to both community and

institutional needs. It follows National Rural Drinking Water Programme (NRDWP) guidelines for testing water quality and has the potential to implement other governmental and non-governmental protocols. It can currently carry out 30 analyses per day.

The laboratory supports the pilot projects under the SEI/WASHi collaboration by providing water quality analysis and ensuring the safety of various humanure products: treated urine, greywater (from laundry and bathing), and nutrient-rich liquid from composting toilets. One service offered by the new facility – nutrient testing – is unique in Bihar. In the pilot projects, these tests are used to show the nutrient composition of humanure products, which can then be compared with commercially available agricultural chemicals. The laboratory tests can also help to refine protocols and methods for treating the human excreta, to ensure both safety and optimal nutrient content.

Beyond their practical value for the pilot projects, the laboratory's services also support the larger aim of the collaboration, which is to have the ecosan models replicated and, ultimately, to see sustainable sanitation embedded in state policy. The high quality of analyses offered by the laboratory ensures that the test results add scientific credibility to the claims made for ecosan, which are supported by leading local agricultural scientists.

The laboratory also offers its services to civil society organizations, communities, schools and others. In this respect, the laboratory has fulfilled a significant expressed demand for a non-profit and independent laboratory to help protect the huge and rapidly growing population of Bihar (currently well over 100 million inhabitants).

Finally, the laboratory has a potentially important outreach role, raising public awareness about water conservation and water quality, and supporting community-level projects. In particular it can provide evidence to support communities' demands for government action to clean up polluted water resources. In order to supplement the income from testing, the laboratory offers training course for schools and other organizations.

Achievements and lessons

The new laboratory serves an important function in demonstrating the links between water quality, sanitation services and the safe application of the ecosan principles. So far, it has carried out tests on the quality of drinking water sources and analysed the nutrient content of treated urine for a pilot project. Water testing has confirmed the presence of arsenic in wells in communities around Bihar, underlining the need for action to protect people exposed to contaminated water.



Water sampling for quality assurance

A key lesson learned from setting up the laboratory is the need to recover the costs of expensive analyses, particularly of chemical reagents, while still keeping services affordable. The strategy decided on is to charge a tariff based on covering operational costs, and to supplement this income, as far as possible, with fees for courses for schools and other organizations. A two-week course on water testing for school students (10th to 12th grade) was carried out in January 2014.

The start-up phase also revealed the demand for accreditation of laboratory analysis among many of the potential clients. Consequently, acquiring statutory accreditation will be an important step to enhance the status of the laboratory, which would help to justify tariffs for cost recovery and to achieve a consistent flow of work so that personnel can be retained. This will support the long-term operation of the laboratory.

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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