Promoting Sustainable Sanitation to Reduce Human Vulnerability in Bihar, India

Geographical focus: Bihar State, India

Project name: Enhanced Sustainable Sanitation Provision in Flooded Areas of India: Researchers and Practitioners Collaborate for Policy Reform and Millennium Development Goals Fulfilment

Partner: Water, Sanitation and Hygiene Institute (WASHi)

Funder: Swedish International Development Cooperation Agency (Sida)

Duration: 2010 to 2014

Bihar state in north-western India is one of the most flood-prone regions in the country. It is home to 22% of India’s flood-affected population and includes 16% of its flood-affected area. At the same time, access to sanitation in Bihar is half the national rate, only 27% of households have their own toilet and only 13% have their own bathroom. This combination brings a range of problems for local people, not least the health risks associated with widespread open defecation.

SEI and the Water, Sanitation and Hygiene Institute, India (WASHi) collaborated in a three-year project seeking to reduce human vulnerability in Bihar by increasing access to, and improving the functionality of, sanitation and hygiene facilities. The project was funded by the Swedish International Development Cooperation Agency (Sida).

The SEI/WASHi initiative conducted action-research at five pilot sites, mainly through WASHi’s large network of local partner organizations. These pilot projects created and developed, with their host communities, working examples of locally appropriate, gender-balanced sanitation solutions. The collaboration also supported the establishment of a new water- and nutrient-testing laboratory in the area. The pilot projects and the laboratory provide a valuable evidence base for advocacy for policy reform that would see sustainable sanitation adopted more widely in Bihar and beyond.

The project brought together practitioners and researchers, communities and policy-makers, benefiting from a broad range of perspectives and expertise. It also built strong links with civil society organizations and international actors.

Sustainable sanitation and the Millennium Development Goals

The sanitation systems developed by the project are based on an ecological sanitation (ecosan) approach, in which human excreta are collected and treated for use as agricultural fertilizers and soil conditioners. All the toilets and urinals installed are dry systems, well suited to the water-scarce conditions found in many parts of Bihar. Some designs were also adapted to make them more flood resistant.

While Millennium Development Goal (MDG) target 7.C specifically addresses access to sanitation, ecosan and the hygiene facilities and practices also being introduced by the project could help Bihar reach many other MDG targets if taken to scale. For example, “humanure” provides a low-cost – and potentially marketable – alternative to agricultural chemicals, helping to boost production and reduce hunger and malnutrition. Ecosan and good hygiene practices also protect drinking water quality, reduce the transmission of disease and minimize the leaching of excessive nutrients into ecosystems, improving human and environmental health.
Project activities
As one of its first activities, the project carried out a study of sanitation conditions in Bihar, looking at five sample panchayats (an administrative level comprising a group of villages). The report was presented to state officials and influenced state planning regarding drinking water supply and sanitation.

The pilot projects
The SEI/WASHi collaboration developed and demonstrated sanitation solutions appropriate for a range of different settings at five pilot sites. In the interests of sustainability and knowledge-building, the pilots went beyond the sanitation technologies to look at social aspects such as promoting acceptance of, and creating demand for, ecosan and improved hygiene practices in the host communities; generating local ownership and creating functioning local mechanisms for operation and maintenance; and exploring the agricultural utility and commercial potential of different types of humanure, as well as humanure-fertilized crops.

The pilot sites also continue to host field visits and capacity-building activities for policy-makers and officials, scientists, farmers and others. All of the pilot projects gave special attention to the needs of girls and women.

A gender-balanced approach
A survey conducted at the outset of the project showed menstruation hygiene to be one of the most critical issues confronting adolescent girls and women of reproductive age in Bihar. Without access to enclosed, private facilities, around 87% of the girls and women surveyed only had the option of washing at a public pump. Further, many were unable to change their padding regularly, often waiting until night and risking their safety by seeking secluded places to do it. Unsurprisingly, around three-quarters reported menstruation-related health problems.

For these reasons, a central element of the project was addressing gender-specific sanitation needs and providing training in menstruation hygiene management.

One of the pilot projects took place in highly flood-prone community: Rupauliya village, West Champaran District, particularly the hamlet of Burmi Tola. This pilot involved the construction of individual household urine-diverting dry toilets (UDDTs) that were modified to keep functioning and avoid overflow (and consequent health and environmental risks) during flooding. The project took a collaborative
approach such that the project supported the installation by professionals of a high-quality substructure while households built the superstructure (the toilet cubicle) according to their means and preferences. This not only kept project costs low but also helped to promote a sense of ownership. The implementing partner is a local non-governmental organization (NGO), Water Action.

Another pilot project took place in the densely populated Mohaddipur village, Nalanda District. This centred on the construction of a community sanitation complex including urinals, washing facilities for men and women, and composting toilets based on an imported Swedish system called CompostEra (see www.compostera.org). The original CompostEra design was adapted to local conditions and preferences. It produces a nutrient-rich liquid fertilizer, locally called “fertila” by oxidation/nitrification of urine and anal-cleansing water that has run over the collected faeces. The aim is to further optimize the system for use in water-scarce and flood-prone areas. Greywater from the facility is filtered and then channeled to irrigate a nearby field. A village committee has been set up to oversee operation and maintenance. The project is supported by the Systematic Agro-based Research Institute (SABRI), a local NGO.

UDDTs and waterless urinals were also installed in a new facility at the Tarumitra Bio-reserve and Ecology Centre in Digha, Patna District. As this is a respected and popular local environmental education centre, Tarumitra staff can explain ecosan and its benefits to the numerous visitors. Harvested urine is used as fertilizer at Tarumitra’s nearby organic farm, and an agricultural scientist based at the Bio-reserve is researching the use of urine as a pesticide. The well-maintained and innovative facility, and Tarumitra’s support to this and other pilots, have been invaluable in garnering interest in and acceptance of ecosan and improved hygiene practices at many levels.

Another pilot project ran comparative agricultural trials to demonstrate the value of urine as a fertilizer. Urine from two harvesting units in Bind Block, Nalanda District – one at a state-run high school and one at a local administrative centre – was collected and applied on parts of a demonstration field with a mix of typical local crops. Commercial NPK fertilizer was applied on the other parts with the same crops. Local farmers, agriculturalists and leaders were invited to visit and inspect the results, which showed that the urine-fertilized plots gave equal or better yields. The pilot is supported by SABRI and has established a relationship with a leading agricultural science centre, Krishi Vigyan Kendra (KVK), providing access to KVK’s wide network of local farmers and agricultural researchers.

The fifth pilot site is Prakash Elementary School in Maner, Patna District. Male and female sanitation and hygiene facilities were installed for students, along with an incinerator to help girls dispose of sanitary padding. The focus is on the operation and maintenance of the facilities, generation of long-term ownership, and educating children about the importance of good hygiene practices and the value of ecosan. The facilities proved popular with the children, and the school has benefited from ongoing support from SABRI and Tarumitra experts.

New water- and nutrient-testing laboratory for Bihar

The SEI/WASHi collaboration also supported the establishment of a state-of-the-art laboratory to test drinking water quality and the safety and nutrient content of products from the urine-diverting and composting toilets and urine harvesting at the pilot sites. This is the only laboratory offering nutrient-testing services in Bihar. The laboratory also carries out tests, on a cost-recovery basis, to other non-commercial actors, including schools and communities. These actors can use the results to request remedial action.
from the government if their drinking water is contaminated. The laboratory is centrally located in the state capital, Patna, in premises provided by the implementing organization, Shree Krishna Gyan Mandir (SKGM). SKGM has also made numerous in-kind contributions including reconstruction work and long-term management of the laboratory.

Outreach and advocacy: from pilots to policy
To achieve the project’s ultimate aim and have a real impact on human vulnerability in Bihar, new policies will be needed to support the widespread adoption of sustainable sanitation. The project has a major outreach and advocacy component that aims to build confidence in the ecosan approach among policy-makers, as well as among non-project communities and others who could influence adoption.

Already, all of the pilots have had considerable impact beyond the host communities – garnering interest among key government officials, media, politicians, experts and practitioners in such varied fields as water and sanitation, agriculture, health and education. Field visits to the pilot projects have played an important role. To support outreach and capacity building, key SEI sustainable sanitation publications have been translated into Hindi and provided to practitioners and policy-makers in the region.

A significant boost to the project’s objectives came from a two-day national workshop in Patna on Sustainable Sanitation with Special Focus on Ecological Sanitation, which attracted nearly 200 participants. It was organized by WASHi and supported by the national Ministry of Drinking Water and Sanitation, PLAN India, the State Government of Bihar, SEI, Water for People, and Population Services International. One session focussed on the SEI/WASHi action-research project and three of the pilot projects. A field visit was made to the Tarumitra Bio-reserve.

It is hoped that this engagement will help lay the groundwork for scaling up implementation. It is hoped that this engagement will help lay the groundwork for scaling up implementation. Replication of pilot project activities and models has already started, largely thanks to the involvement of government officials and other local influential figures, and the good work of the residents and local implementing partners in the pilot communities.

For further information
To learn more about the SEI-WASHi collaboration visit http://www.sei-international.org/projects?prid=2070 or read the following SEI fact sheets:

- New Non-Profit Laboratory Supports Sustainable Sanitation, www.sei-international.org/publications?pid=2496

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