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: WASH Institute (WASHi)

Funder: Swedish International Development Cooperation Agency (Sida)

Duration: December 2010 to January 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 WASH Institute (WASHi) are collaborating on 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 is funded by the Swedish International Development Cooperation Agency (Sida).

The project conducts action-research at six pilot sites, mainly through WASHi’s large network of local partner organizations. These pilot projects create and develop, with their host communities, working examples of site-appropriate, gender-balanced sanitation solutions. They also support advocacy for policy reform that would see sustainable sanitation adopted more widely in Bihar and beyond.

The project brings together practitioners and researchers, communities and policy-makers, benefiting from a broad range of perspectives and expertise. It has 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, as water is scarce in many parts of Bihar.

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. This in turn can lower morbidity and mortality rates, especially among vulnerable groups such as infants, under-fives and women.

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.
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. The SEI/WASHi project therefore not only improves sanitation access but also helps to empower women, girls and other vulnerable groups, making it easier and safer for girls to attend school during menstruation; to reduce hunger and boost food security; and to protect 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.

**Pilot sites**
The project is developing and demonstrating solutions appropriate for a range of different settings at six pilot sites. In the interests of sustainability and knowledge-building, the pilots go beyond the technology 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 host numerous field visits and capacity-building activities for policy-makers and officials, scientists, farmers and others. All of the pilot projects give special attention to the needs of girls and women.

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**A gender-balanced approach**
Another central element of the project is addressing gender-specific sanitation needs and providing training in menstruation hygiene management. 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.

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Two of the pilot projects take place in highly flood-prone areas: Rupauliya village, West Champaran district and Sonvarsha village, Sitamarhi district. Urine-diverting dry toilets have been installed in individual households at both sites. These toilets are raised and waterproofed to make them more flood-resistant. Low-cost urine-harvesting urinals have also been installed, and the harvested urine is collected for use as fertilizer for crops, some of which are sold commercially. Private washing facilities have been built for women and small children.

Another pilot project, in the densely populated Mohaddipur village, Nalanda district, centres on a community sanitation complex. This complex includes 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 has been adapted to local conditions and preferences. It produces a nutrient-rich liquid fertilizer. The project aims to further optimize the system for use in water-scarce and flood-prone areas. Furthermore, urine is collected for agricultural application, while greywater from the hygiene facilities 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 non-governmental organization.

Urine-diverting dry toilets and waterless urinals have also been installed at the ‘Bio-reserve’ established by Tarumitra, a local environmental organization, in Digha, Patna district. 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. Being an environmental education centre, the Bio-reserve is influential in promoting enhanced sanitation, personal hygiene and ecosan principles.

Another pilot project is running a comparative trial to demonstrate the value of urine as a fertilizer. Urine from two harvesting units in Bind village, Nalanda district – one at a state-run high school and one at a local administrative centre – is collected and applied on part of a demonstration field with a mix of crops. Chemical fertilizer is applied to the other part. Both have shown almost equal yields despite the difference in cost. 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 results of the trial will be published and should help build wider support for urine harvesting.

The sixth pilot project is at Prakash Elementary School in Maner, Patna district. The focus is on the operation and maintenance of the toilet facilities, generation of long-term ownership, and educating children about the importance of good hygiene practices and the value of ecosan. A challenge has been to encourage the school authorities to use humanure on the school’s kitchen garden. Workshops have been conducted at the site by SABRI and Tarumitra members.

A new water-testing laboratory for Bihar
The project has 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 these services in Bihar and also makes them available, 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. It is hoped that this engagement will help lay the groundwork for scaling up implementation. Some replication of activities is already in progress, largely thanks to the involvement of government officials.

A significant boost to the project’s objectives came from a recent 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.

A full project report will be published after the project ends in January 2014.