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Sanitation

A toilet or safe drinking water? The stark choice facing many people in rural India

India's ambitious sanitation drive has created a health hazard, with many toilets built cheek by jowl with family water supplies

The Guardian

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A hand pump with a cracked base in Dhenkenal, Odisha. Poorly maintained pumps are vulnerable to contamination from above ground as well as from nearby leach pits. Photographs: Priyanka Pulla

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Priyanka Pulla in Puri

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June in Odisha state's Puri district, and the mercury is hitting 39C. The monsoon is still days away but, when it comes, the Mahanadi river could flood low-lying villages, as it often has done. One such village is Aaruha, a network of congested huts surrounded by vast rice fields.

Chaibi Swain, 52, lives here with her husband, a rice farmer. Her home is little different to the rest of Aaruha's low-rise dwellings, but it has a toilet, which puts her among a small minority in rural Odisha. Eight out of nine people in Odisha's villages do not use toilets, instead defecating in the open, leaving them vulnerable to diseases. The Swains, with their tiny toilet, which empties into a leach pit – a hole in the ground used to compost faeces when there is no sewage system – are the face of progress.

There is a problem, however. The leach pit is next to the household's drinking-water source, a tube well. Water so close to a leach pit is vulnerable to contamination from faecal germs, since bacteria, viruses and protozoa can travel through soil. Worse, when the monsoon comes and the Mahanadi overruns its banks, the groundwater levels in Aaruha rise, making the contamination worse. The Swains' toilet could actually be a health risk.

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This toilet with a leach pit in Puri has been built next to a hand pump, making contamination likely

They aren't the only ones whose backyard toilet is a threat to the water supply.

As the [Swachh Bharat Mission \(SBM\)](#) – India's [ambitious campaign to stop open defecation by 2019](#) – gains pace, about 1.3m leach-pit toilets have been built in Odisha alone.

In districts such as Ganjam, Balasore and Puri, these pits are often built without safeguards against contamination, say the NGOs working with the government. “It is quite alarming, because if this problem is not addressed at this time, we are building sites of contamination all around,” says Devdeep Saha, a research associate at the sanitation NGO [Friend in Need Trust](#).

The safeguards in coastal districts such as Puri, which have high groundwater tables and are prone to flooding, include keeping a 10-metre distance between water sources and leach pits, raising the top of pits above the ground so that flood water does not enter, and sealing the bottom of pits to prevent pathogens escaping. But villagers who build their own toilets in return for funds from the mission often ignore these safeguards.

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The reasons are many. First, many households in congested villages do not have the space to build toilets and tube wells far apart. Harendranath Pradhan, a government sanitation engineer in Odisha’s Balasore district, says this is the main reason for guidance being ignored. Even though his job is to ensure toilets are properly built, Pradhan says this isn’t always possible. “We

tell the beneficiary to maintain a distance from the water source. But they say they don't have the land. So we build the toilet, because we have to meet targets," he says.

India is not yet meeting its mission goals. Only about [19m toilets have been built](#) across rural India, meaning another 92m are needed over the next three years [to meet the 2019 target](#). Vivek Sabnis, who previously worked for the Bangalore-based sanitation NGO [Arghyam](#), says: "Unfortunately, everybody is pushing for quantity over quality."

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The characteristic pink toilets built across rural Odisha under the Swachh Bharat Mission

Odisha isn't the only state that faces a threat to its water supplies from new toilets. Bihar, Uttar Pradesh and Jharkhand also have badly built toilets, according to Saha. This means that, as coverage grows, contamination may worsen.

[A study](#) in the journal Environmental Science and Technology in April found that certain diarrhoea-causing protozoa can travel 150 metres or more in the

high groundwater of Puri to contaminate even deep tube wells, which are thought safer than shallow tube wells and open ponds. The study says full latrine coverage in high water table areas would reduce contamination in open ponds, but increase it in tube wells.

Marion Jenkins, lead author of the study and an environmental health researcher at the University of California in Davis, says recommended safeguards may reduce contamination a little, but won't eliminate it.

“Drinking-water aquifers are already seriously polluted with faecal protozoal pathogens from the existing stock of latrines in rural Puri,” she says.

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This means that unless the existing latrines are pulled down, and new ones built differently, pollution will remain.

[Another study](#), published in January, found tube wells in Bihar to be contaminated by faecal pathogens about 18% of the time, when they weren't far enough from pit toilets. This study was done in summer, and the authors predict contamination would increase during monsoon.

None of this means [India](#) should panic and abandon pit toilets, says Sandy Cairncross, an environmental health researcher at the London School of Hygiene and Tropical Medicine. Improved toilet coverage is likely to benefit people much more than it hurts them, he points out, adding that it would be better to provide piped water to villages, instead of relying on tube wells and ponds.

Another solution is to train villagers to monitor the quality of their toilets, instead of relying on government officials to do so, says Sujoy Mojumdar, a former SBM director who is now with Unicef India. The system of a government official inspecting toilets before disbursing money doesn't work because toilet users do not feel ownership, he argues. Village teams already exist in some states, he says, "but it is still a rare example and not widespread".