

This article has been downloaded from the Down to Earth website. WASTE thanks the CSE (Centre for Science and Environment), India for the permission for using and publishing this article on their website.

This article is available at www.downtoearth.org.in, the online edition of Down To Earth magazine, a leading science & environment fortnightly published by Society for Environmental Communications.

Ecologically mindless

The flush toilet system and the sewage system, which goes with modern day personal hygiene and cleanliness, are part of the environmental problem and not the solution. Consider the huge amount of clean water that is used to carry a small quantity of human excreta, Sunita Narain writes about the political economy of defecation. Manoj Nadkarni analyses the flush and forget mindset, which is increasingly destroying our water systems

28/02/2002

SUNITA NARAIN



Preeti Singh / CSE

WHILE attending the Stockholm Water Symposium a few years ago, my colleague, Anil Agarwal, and I were invited to a banquet by the king of Sweden. But instead of dining in splendour we were checking out toilets in some remote parts of the city. I was not too convinced of our mission. We opened the hatch of "alternative" toilets bins, where the faecal matter is stored before composting. We were regaled with information about how urine could be separated in the toilet and used directly for agriculture. Our friend, Uno Winblad, toilet crazy like Anil, then took us to supermarkets in Stockholm city where there were a range of toilets - from water-saving to electric and of course, urine separating toilets. Anil, who hated shops, was delighted. And I began to understand the links.

The flush toilet and the sewage system - which I always believed embodied personal hygiene and environmental cleanliness - are a part of the environmental problem and not the solution. I

began to understand from our research that this technology is quite simply ecologically mindless.

Consider the large amount of clean water that is used to carry even a small quantity of human excreta. In India, flushes are designed to be particularly water-wasteful. So with each flush, over 10 litres of clean water goes down the drain. We build huge dams and irrigation systems to bring water to urban areas. This water which is flushed down the toilet goes into an equally expensive sewage system, all to end up polluting more water - invariably our rivers and ponds. Most of our rivers are today dead because of the domestic sewage load from cities. We have turned our surface water systems into open sewage drains.

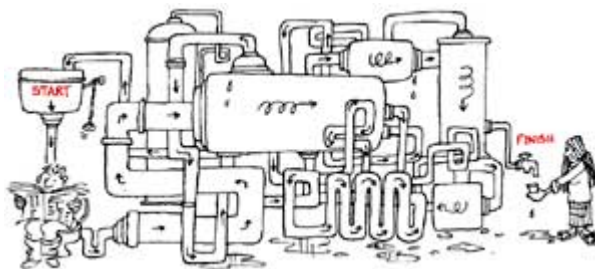
This heavy use of surface water is leading to growing conflicts between urban and rural users and also to overexploitation. Moreover, the discharge of domestic sewage is leading to heavy pollution of rivers and urban groundwater aquifers.

The present strategy is to invest in huge river clean up programmes like the Ganga Action Plan, the Yamuna Action Plan or the National River Action Plan to treat sewage. These expensive river action programmes are sanitary engineers' dreams. The aim is to divert sewage, which earlier flowed directly into the river, to a treatment facility. This sewage, incidentally, comes from the flush toilets of the rich, not the poor.

This is what Anil called the political economy of defecation. The more water you use, the more investment is needed to clean it up.

The political economy of sewer systems is simply atrocious for developing countries. Hardly any poor city is able to recover its investments in sewer systems. As a result, the users of these sewer systems get a subsidy. But almost all users in poor cities are the rich. Thus, sewers only lead to a subsidy for the rich to excrete in convenience. The poor always remain the 'unserved' in this waste disposal paradigm. In addition, the government has to invest in sewage treatment plants whose costs are again rarely recovered from the rich users of flush toilets.

Sewers cost the earth



Illustrations: Rustam Vania

Sewers: a subsidy for the rich to excrete in convenience

It is virtually impossible for governments to catch up with the targets of building sewage treatment plants. Government programmes chase targets hopelessly and remain miles behind

the volume of sewage being generated. In a rapidly urbanising situation, the city would soon outgrow the sewage treatment capacity created at a high cost. Further investments would be needed all over again.

Take Delhi, as a typical instance. Yamuna is Delhi's main sewage drain. Yamuna enters Delhi at Wazirabad - where the city draws its water supply - and after this an estimated 1,800 million litres per day (mld) of untreated sewage flows through 18 drains into the river. In the last four decades, the total sewage output has increased rapidly. Untreated sewage has grown even faster. In 1999, the Central Pollution Control Board estimated that Delhi produces over 2,547 mld of sewage of which only 885 mld is collected through the sewage network for treatment and the bulk - over 75 per cent flows into stormwater drains and then into the river. By late 2000, treated sewage had increased to 1,333 mld as had the quantity of sewage - still over 50 per cent of the city sewage was dumped into the river. By 2005, Delhi plans to triple its present sewage treatment capacity at a cost of Rs 750 crore. But this will still be less than what is needed. Paradoxical chase It is an ironic situation. Even if Delhi builds all the sewage treatment plants, it will still not have the sewage to treat. Why? The city's sewage drains are choked and silted. The government admits that the present capacity of the sewage treatment plants is not being utilised and when it builds new treatment facilities, sewage never reaches these plants.

On the other hand, sewage from these choked and broken lines is diverted to functioning lines and, as a result, the treatment plants at the end of these lines are overloaded leading to untreated sewage flowing into the river. While some plants are overloaded, others are underutilised. The bill to refurbish the sewers is around Rs 500 crore, according to the government. Over and above this is the capital cost of the new sewage treatment plants.

Moreover, this is the cost of maintaining and running sewage plants and ensuring that the released effluent meets quality standards. Even if the government were to bear the full capital costs of sewage treatment plants, few urban municipalities have the financial resources to bear the expensive operating costs. As a result, sewage treatment plants, even when built, often lie idle.

In urban areas, drinking water is a small component of the total water use. It is sewage and other waste disposal needs that require maximum water input. This huge demand for water for our cities comes at very high political cost as conflicts between urban and rural users for water are reaching flashpoint. Paying "full costs" Worse, the political economy of defecation is such that no democratic government will accept the hard fact that it cannot "afford" to invest in modern sewage systems for its citizens. Instead, it continues to subsidise the users of these systems, in the name of the poor, who cannot afford these systems in the first place. The cost to build sewage treatment plants is externalised through these environmental programmes. The logical policy would be to accept the cost and then to impose differential pricing so that while the rich pay for the cost of the capital and resource intensive sewage and waste disposal technology, the poor pay for the cost of their disposal system, which is invariably unconnected to the sewerage system and hence low cost.

But this is easier said than done. The "socialist" framework in our country forces political leaders to keep water and waste pricing affordable for large sections of urban populations. In this situation, private investment also looks for an easy way out. Their answer is to invest in water services and leave the costly business of cleaning up the waste to government agencies.

In the meantime, the use of sewer systems would have totally destroyed the aquatic ecosystems in the developing world, posing enormous threats both to public health and aquatic biodiversity. In India, we don't even have to look a few years ahead. We already see the signs of this hydrocide. Literally, no small or medium river today is clean. Every river that passes through a city or a town becomes a stinking sewer.

Dirty sewers

Sewage systems are built to protect public health but badly managed sewers can become a serious health hazard. There can be serious outbreaks of waterborne diseases from: ? River pollution because of sewage outfalls;

- Groundwater contamination because of leaky sewer lines;
- Contamination of piped water supply systems because of leaky sewer lines leading to infiltration of pathogens into drinking water pipelines, especially when they do not have water, which is the case in many cities in developing countries as they cannot provide water round the clock; and,
- Sewage backflows because of badly maintained and blocked sewers or because of increasing use of non-biodegradable materials like plastic bags.

In the Indian city of Aligarh, sewer lines overflow all the time. A study conducted by the Aligarh Muslim University for the Centre for Science and Environment found that 49-70 per cent of the households, depending on different localities, complained of seasonal or permanent waterlogging due to overflowing sewage drains. As a result, people have raised the plinth of their houses to keep the sewage from flowing into their houses. This has resulted in a huge market for earth - as much as 1,000 cubic metres per day - supplied today by numerous villages around the city, which is destroying precious agricultural land.

All this makes water-borne sewerage a waste disposal paradigm that is extremely expensive because of its high economic, environmental and public health costs. And as a result, it has very high political costs.

Going against the laws of nature

Sewer systems totally destroy nature's nutrient cycle in which nutrients collected from the land should be returned to the land. With the use of sewers, this "waste" gets dumped into our aquatic systems. Therefore, while nutrients in food come from agricultural lands, sewage systems dump the nutrients contained in human wastes into waterbodies. Over time, our agricultural lands get depleted of nutrients and need intensive artificial fertilisation. The lack of these micronutrients not only becomes a limiting factor in plant productivity but the resulting lack of these nutrients in human food becomes a threat to human health. By the early 1980s, Punjab had large tracts of land with zinc, manganese and iron deficiency. Ludhiana district, which records the highest yields of many crops, was also recording the highest deficiencies of micronutrients. Though scientists still have to figure out the health effects of consuming

micronutrient-deficient foodgrains, scientists at the Postgraduate Institute of Medical Sciences in Chandigarh have found that consuming zinc-deficient foodgrains can lead to retarded growth, defective wound healing and carbohydrate intolerance. Paradigm shift Clearly we need to look for a cost-effective and non-sewerage paradigm of human waste disposal. The capital-intensive, material-intensive urbanisation process of the West works only for rich countries, not poor countries.

While our scientists think about going to the moon, the toilet is not in their vision at all. There is absolutely no thinking about the need to find environment-friendly sewage systems in our countries. We will need massive investments in R&D for non-sewerage alternatives. While investments in sewers run into billions of dollars every year despite all the problems they create, research investments in non-sewage alternatives hardly exist.

But who will ask for an alternative paradigm? The entrenched interests and mindsets of our sanitary engineers being what they are, there is no demand for change from this community. But change, we must.

In this context we need to learn from what is happening across the world. There is a growing concern for ecological sanitation and this is giving rise to innovations from the concept of sewerless cities using new technological systems which use extremely low amounts of water or no water at all, and, in which all the wastewaters and the solid wastes are recycled.

These modern systems are built on the traditional science of recycling and composting human waste. But in a way that uses the best of modern science and technology to "sanitise" waste and match the convenience and public hygiene of the modern flush toilet.

Therefore, ecological sanitation is a paradigm that we must explore in all earnestness. But we must make sure that the new technologies take into account cultural constraints. Otherwise they are unlikely to succeed.

The most important issue is that these "alternative" technologies must be for the rich and not just for the poor. If ecosanitation technologies are "cost effective" technologies to serve the "unserved" poor, these will only be an interim alternative, one to be discarded as soon as people become rich. We have to remember that it is the rich person's flush that is the biggest environmental culprit today.

Related Story

A tale of two cities

The water culture of people is an important indicator of their level of civilization. Take the two ancient cities, Rome and the town of Edo, which grew into the mega-metropolis of Tokyo. The people of Rome brought their drinking water with the help of long aqueducts, which today are regarded as architectural marvels of the bygone Roman civilisation. But the people of Rome lived on the banks of the river Tiber. They didn't need to bring water from afar. Unfortunately,

they did not know to dispose of their human wastes and like the modern Western civilisation they ended up polluting the river, thus being forced to go far in search of clean water. This makes Roman aqueducts not a symbol of intelligence but one of great environmental stupidity.

On the other hand, Edo, which too was situated on several streams, ensured that all its human wastes were collected and returned to the farmlands. Its neighbouring rivers remained clean and it tapped its water from them through an extensive piped water supply.

But today we are all children of Rome and not Edo. We have turned our backs to our waterbodies and if we don't have money to clean our mess, then we will have nothing but polluted waters.

Story link

Copyright © 2002 Society for Environmental Communications

Down To Earth <<http://www.downtoearth.org.in/>> is a science and environment fortnightly published by the Society for Environmental Communications, India. Subscribe <<http://www.downtoearth.org.in/subscription.asp>> to Down To Earth to read some of the best articles on environment, sustainability and development.

Click here <http://www.downtoearth.org.in/advertise_with_us.asp> for information on advertising opportunities with Down to Earth online, or E-mail: advt@downtoearth.org.in <<mailto:advt@downtoearth.org.in>>