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India Failing to Control Open Defecation Blunts Nation's Growth

By Jason Gale

March 4 (Bloomberg) -- Until May 2007, Meera Devi rose before dawn each day and walked a half mile to a vegetable patch outside the village of Kachpura to find a secluded place.

Dodging leering men and stick-wielding farmers and avoiding spots that her neighbors had soiled, the mother of three pulled up her sari and defecated with the **Taj Mahal** in plain view.

With that act, she added to the estimated 100,000 tons of **human excrement** that Indians leave each day in fields of potatoes, carrots and spinach, on banks that line rivers used for drinking and bathing and along roads jammed with scooters, trucks and pedestrians. Devi looks back on her routine with pain and embarrassment.

"As a woman, I would have to check where the males were going to the toilet and then go in a different direction," says Devi, 37, standing outside her one-room mud-brick home. "We used to avoid the daytimes, but if we were really pressured, we would have to go any time of the day, even if it was raining. During the harvest season, people would have sticks in the fields. If somebody had to go, people would beat them up or chase them."

In the shadow of its new suburbs, torrid **growth** and 300- million-plus-strong middle class, **India** is struggling with a sanitation emergency. From the stream in Devi's village to the nation's holiest river, the Ganges, 75 percent of the country's **surface water** is contaminated by human and agricultural waste and industrial effluent. Everyone in Indian cities is at risk of consuming human feces, if they're not already, the **Ministry of Urban Development** concluded in September.

Economic Drain

Illness, lost productivity and other consequences of fouled water and inadequate sewage treatment trimmed 1.4-7.2 percent from the gross domestic product of Cambodia, **Indonesia**, the Philippines and Vietnam in 2005, according to a study last year by the World Bank's **Water and Sanitation Program**.

Sanitation and hygiene-related issues may have a similar if not greater impact on India's $1.2 trillion economy, says **Guy Hutton**, a senior water and sanitation economist with the program in Phnom Penh, Cambodia. Snarled **transportation** and unreliable power further damp the nation's growth. Companies that locate in India pay hardship wages and ensconce employees in self- sufficient compounds.

The toll on human health is grim. Every day, 1,000 children younger than 5 years old die in India from diarrhea, hepatitis- causing pathogens and other sanitation-related diseases, according to the **United Nations Children's Fund**.

'Sanitation Crisis'

For girls, the crisis is especially acute: Many drop out of school once they reach puberty because of inadequate lavatories, depriving the country of a generation of possible leaders.

"India cannot reach its full economic potential unless they do something about this sanitation crisis," says **Clarissa Brocklehurst**, Unicef's New York-based chief of water, sanitation and hygiene, who worked in New Delhi from 1999 to 2001.

When P.V. Narasimha Rao opened India to outside investment in 1991, the country went on a tear. For most of this decade, India has placed just behind China as the world's **fastest- growing** major economy. Revenue from information technology and outsourcing jumped more than 300-fold to **$52 billion** a year as Tata Consultancy Services Ltd., **Infosys Technologies Ltd.** and other homegrown giants took on computer-related work for Western corporations.

Annual **per-capita income** more than doubled to 24,295 rupees ($468) in the seven years ended on March 31, 2008, before the full force of the financial meltdown kicked in. Even during the current global recession, India's economy will expand 5.1 percent in 2009, the International Monetary Fund projects.

Hygiene Breakdown

Yet India's gated office parks with swimming pools and food courts and enclaves such as the Aralias in Gurgaon, outside New Delhi, which features 6,000-square-foot (557-square-meter) condominiums, mask a breakdown of the most basic and symbolic human need -- **hygiene**.

Devi, who installed her neighborhood's first toilet, a squat-style latrine in a whitewashed outhouse, created a point of pride in a village where some people empty chamber pots into open drains in front of their homes. Like most of Kachpura's residents, **more than half** of India's 203 million households lack what Western societies consider a necessity: a toilet.

India has the greatest proportion of people in Asia behind **Nepal** without access to improved sanitation, according to Unicef. Some 665 million Indians practice **open defecation**, more than half the global total. In China, the world's most populous country, 37 million people defecate in the open, according to Unicef.

'It's an Embarrassment'

"It's an embarrassment," says **Venkatraman Anantha- Nageswaran**, 45, an Indian working in Singapore as chief investment officer for Asia Pacific at Bank Julius Baer & Co., which managed $234 billion at the end of 2008. "It's a country that aspires to being an international power and which, according to various projections, will be the third-largest economy in 20-30 years."

India has the highest childhood malnutrition rates in the world: 44 percent of children younger than 5 are underweight, according to the **International Food Policy Research Institute**.

"Malnourished children are more susceptible to diarrheal disease, and with more diarrheal disease they become more malnourished," says **Jamie Bartram**, head of the World Health Organization's water, sanitation, hygiene and health group. "If we collectively could fix the world's basic **water and sanitation** problems, we could reduce childhood mortality by nearly a third."

Half of India's **schools** don't have separate toilets for males and females, forcing young women to use unisex facilities or nothing at all. Twenty-two percent of girls complete 10 or more years of schooling compared with 35 percent of boys, a national family health survey finished in 2006 found.

Indignity, Infections

Devi says she was concerned that her 14-year-old daughter would suffer the indignity and infections she herself endured due to poor menstrual hygiene. That was a major reason she bought a toilet, taking out a 7,000 rupee, interest-free loan from the **U.S. Agency for International Development**, which enabled her to pay for her new latrine over 18 months.

The agency also gave her a 3,000 rupee grant and a 2,500 rupee-a-month job with its **Cross-Cutting Agra Project**, which promotes hygiene and sanitation in her village. Until then, she, like her husband, was unemployed. Her daughter's situation has also improved, Devi says.

"When she has her period, it's especially difficult for her to go out into the fields," she says. "It's better to have a toilet at home -- as it is for every female."

Girls' Education

Barriers that keep girls from equal education compromise the nation's future, says **Renu Khosla**, director of **CURE India**, a New Delhi group that works to improve water and sanitation for the poor, including in Kachpura.

"We will have a less skilled population of youth," she says. "Every year of schooling reduces household poverty by bringing down the family size and increasing skill levels."

So far, companies looking to locate in India haven't been turned off by the sanitation shortcomings, says Anshuman Magazine, chairman of **CB Richard Ellis Group Inc.**'s South Asian unit, which manages about 62 million square feet of property in the country. "India is a completely different planet," he says.

As such, employees know not to drink tap water, and employers provide clean washrooms.

"As far as offices are concerned, I have never come across anyone raising these concerns. Businesses run on making money and opportunities. Since 2004, we have seen huge interest from foreign investors and businesses."

Hardship Allowances

International corporations that set up branches in Mumbai and New Delhi compensate by paying hardship allowances of 20-25 percent of employees' salary compared with 10-15 percent in Beijing and Shanghai, says **Lee Quane**, the Hong Kong-based Asian general manager of **ECA International Ltd.**, a human resources advisory firm.

Some big Indian companies count on private utilities, bottled water and walled compounds with electric fences. Infosys's resort-style campus on the outskirts of Bangalore has manicured lawns, a Japanese garden, a swimming pool, a golf course and a Domino's Pizza in its multinational food court.

Unlike most households in the nearby city of 6.8 million, India's No. 2 software maker's headquarters doesn't suffer water or power interruptions, says Bhawesh Kumar, its facilities manager.

Poverty Trap

Infosys stores water from the public network in three underground reservoirs that can hold 2.2 million liters (580,000 gallons), or two days' supply. The water passes through sand and carbon filters and purifiers, making it cleaner than what's available to local people, he says. Attendants clean the brown- tiled bathrooms and refresh supplies of paper hand towels hourly during the business day. Infrared sensors ensure that toilets are flushed after each use.

Outside such compounds, dirty water and poor hygiene can trap communities in a cycle of disease, malnutrition and poverty, Bartram says. Worldwide, 18 percent of the population, or **1.2 billion people**, rely on open defecation and about 884 million drink unsafe water, according to Unicef.

Every year, more than **200 million tons** of human sewage goes uncollected and untreated, fouling the environment. Each gram of feces can contain 10 million virus particles, 1 million bacteria, 1,000 parasite cysts and 100 parasite eggs, the UN found.

Fetid Waters

In Devi's village, sewage and household wastewater flow along open drains that line both sides of narrow alleyways. The fetid water gathers in a shallow channel choking with plastic containers, discarded footwear and household trash. A woman carrying a folded mattress on her head steps deftly along a narrow bridge spanning the mire. A mechanical pump chugs on the bank, sucking up the liquid to dispense over a nearby vegetable patch. Children play around the edge, alongside tethered, cud- chewing water buffalo.

A man walks past, clutching a water-filled plastic bottle, presumably on his way to defecate. The rest of the slurry empties into a trench coursing along a feces-dotted path through a field of cauliflowers. A shoeless boy uses a long-handled spade to create a new sluice for the black sludge to ooze over the vegetable field.

What's not drained from the trench empties into a cesspool on the flood plain of the **Yamuna River**, which flows through Delhi and then Agra before joining the Ganges at Allahabad, 1,370 kilometers (850 miles) from its pristine source in the Himalayan mountains.

'Remorseless Drain'

"If you've got feces all around you, it will find its way into your mouth," Bartram says. "Cholera and typhoid are always dramatic because they come through as outbreaks, and outbreaks catch the news. The real burden is this long, remorseless drain of straightforward, simple **diarrheal disease**."

Like Devi's village, less than a fifth of **Agra** is connected to a sewage system. The 1.3 million people generate more than 150 million liters of effluent each day. The city has the capacity to treat 60 percent of the sewage. There are plans to build three more **treatment plants** by 2012 with funding from the state and federal governments and the **Japan International Cooperation Agency**, according to the Agra Municipal Corporation.

The U.S. Agency for International Development-funded **Cross- Cutting Agra Project** and other programs are trying

to bridge the sanitation gap. The project helped Devi and 39 other households in her village get toilets during the past two years.

Spurring Desire

The Indian government is also contributing. Rural families living below the poverty line are eligible for a 1,500 rupee subsidy to build household latrines under the **Total Sanitation Campaign**. The decade-old program focuses on educating people about the link between good hygiene and health to change behavior and spur their desire for toilets.

UN agencies such as **Unicef** provide technical information and recommendations on toilet systems.

Governments and aid groups have strived for decades to overcome India's sanitation challenges. **Mohandas Karamchand Gandhi**, who led the movement for freedom from foreign domination, grappled with the issue almost a century ago: "The cause of many of our diseases is the condition of our lavatories and our bad habit of disposing of excreta anywhere and everywhere," Gandhi **wrote** in 1925. "Sanitation is more important than political independence," he declared.

Taboo Topic

Gandhi focused on the Hindu **caste system** that subjugated the lowest social stratum to the unsavory realm of latrines. For some 4,000 years, so-called bhangis or untouchables earned a modest living by scraping "night soil" from the cavernous household toilet pits of higher castes and carrying it away in pans balanced on their heads.

"Culturally, it was taboo in Indian society to talk about human excreta, night soil and all these things," says **Bindeshwar Pathak**, who started **Sulabh International Social Service Organization**, a Delhi-based group whose name means "readily accessible." The organization has built public toilets and campaigned on human emancipation issues since 1970.

Pathak says the tradition of scavenging removed the impetus of society, and especially policy makers, to acknowledge and address the sanitation problem.

A.K. Mehta, joint secretary of the Ministry of Urban Development, says India's close-lipped tradition is changing.

"If you have a legacy of thousands of years, you don't expect it to go away in a decade or so," Mehta says. "Progress is significant and in the right direction."

Millions Waiting

Today, 59 percent of the people in India's countryside have access to a toilet, compared with 27 percent in 2004, the **Department of Drinking Water Supply** says. Ten million toilets have been built annually since 2007. More than 30 million households are waiting.

Urban dwellers aren't spared substandard hygiene. In Mumbai, Delhi and other cities where billboards advertise the latest mobile phones and trendy young women sport Prada handbags, the water that's piped into homes and apartments must be filtered before drinking. And in most homes it's available only a few hours each day.

"Even the biggest cities still have that problem," says **Vishwas Udgirkar**, 46, executive director of PricewaterhouseCoopers LLP's government and infrastructure division in New Delhi.

More unsettling, 17 percent of city residents, or 50 million people, don't have toilets. Fewer than 10 percent of Indian cities have a sewage system. About **37 percent** of urban wastewater flows into the environment untreated, where such pathogens as rotavirus, campylobacter and human roundworm can spread via water, soil, food and unwashed hands.

'Huge Challenge'

"Not attending to this has a cost," Mehta says. "Between 2001 and '26, we would be adding another 246 million people to the urban system. How would we meet that huge challenge is the issue."

India is still struggling to find the best way to clean up the mess.

"A lot of money has been given for constructing the infrastructure," says **Ajith C. Kumar**, an operations analyst with the World Bank's **Water and Sanitation Program** in New Delhi. "The predominant experience has been that none of this has worked."

The southeastern state of Andhra Pradesh is a good example. Earlier this decade, the state government helped build 2.95 million household latrines in rural areas. Residents got subsidies worth about $16 in cash plus coupons for 100

kilograms (220 pounds) of rice. Half the toilets went unused or were being used for other purposes, a February 2007 World Bank **report** found.

Roomier Than Homes

In the western state of Maharashtra, 1.6 million subsidized toilets were built from 1997 to 2000. About 47 percent are in use.

Many toilets are designed without thinking about who's going to use them, says Payden (who goes by one name), the WHO's New Delhi-based regional adviser on water, sanitation and health. Some of the new toilets were roomier than homes.

"The toilets were much stronger and safer, so they used them for storing grain instead," she says.

Now India is trying a different kind of cash reward to encourage toilet use. The **Nirmal Gram Puraskar**, or "clean village prize," gives 50,000-5 million rupees to local governments that end open defecation. Thirty-eight villages qualified in 2005. A year later, 760 villages and 9 municipalities got the prize. In 2008, more than 12,000 awards were presented.

Toilets That Pay

Santha Sheela Nair, India's secretary of drinking water supply, is assessing another monetary incentive. In a spacious New Delhi office with a white-tiled floor and white walls, Nair thumbs through a leaflet from a desk stacked with foot-high files and books on sanitation. She stops suddenly and points excitedly to a picture of a white toilet adorned with brightly- colored writing.

"This is the first toilet in the world -- in the world -- where you use the toilet and you get paid," Nair says.

The public toilet, in the town of Musiri in the southern state of Tamil Nadu, gives users as much as 12 U.S. cents a month for their excreta. Feces are **composted** and urine, which is 95 percent water and has already passed through the body's own filter, the kidneys, is collected, stored in drums and used as fertilizer for bananas and other food crops in a two-year research project by the **Tamil Nadu Agricultural University**.

"The day that I can use your toilet and you pay me instead of me paying you, that will be the day when we have really learned to reuse our waste," Nair says.

Menstrual Hygiene

Nair, India's eighth drinking-water chief in less than a decade, is passionate about her job. On this day in November, the sari-clad government veteran chimes in on baby feces, menstrual hygiene, the use of excrement as fertilizer and other topics few bureaucrats have dared to broach.

From 2001 to '03, Nair was responsible for the water supply in Chennai, formerly called Madras, southern India's biggest city. Then, as rural development secretary for Tamil Nadu, she helped in the aftermath of the 2004 tsunami.

Nair is challenging the accepted wisdom on everything from modern sewers to flushable toilets, to the value of human waste. She says Western-style toilets are inappropriate for India, especially in areas that lack fresh water and have limited funds for sewage treatment plants. Instead, she says, the country has to find cheaper, more efficient and environmentally friendly technologies.

Lunar Mission

Inspired by the successful landing in November of the **Moon Impact Probe**, India's first unmanned lunar mission, Nair is looking skyward for ideas.

"In space, you have the most vulnerable situations," she says, playing a 2-minute YouTube video of an astronaut explaining how to manage bodily functions 100,000 miles from Earth. "They are separating the urine from the feces and drying it," she says, pointing to her computer monitor. "The urine is processed for re-drinking because they just can't carry that much water."

Nair says modern sewers aren't the answer for India. The country can't afford to waste water by flushing it down a latrine. Instead, she's encouraging airplane-style commodes that are vacuum cleared or toilets that are attached to contained pits rather than systems that pipe the effluent miles away for treatment. In Nair's world, recycling human excrement for use as fertilizer is preferable.

'Our Own Devices'

"We need to invent our own devices which are cost- effective, environmentally sustainable and go with our people," she says. "We cannot afford the things which are simply things that some civil engineer learned somewhere."

Converting excreta that have been properly dried for 6-24 months into plant food uses less water than traditional sewage systems and is less likely to pollute waterways, Payden says.

Bartram says composted sewage that's been handled correctly can be used in agriculture and for other beneficial purposes with negligible risk to human health. The challenge is to sanitize it so that disease-carrying organisms are eliminated.

"Different pathogens vary widely in terms of inactivation," he says. "Large, robust parasite eggs like the human roundworm, **Ascaris**, tend to be the longest lived and can remain infectious for years in soil."

Closing the Gap

The government has a goal of eliminating open defecation by 2012. Nair says it might happen earlier.

"It's important for us to do it quickly," she says. Right now, the number of open defecators is roughly double the number of India's middle class. "This gap will keep widening," she says. "That is the challenge for us."

For the Devi family, one household in one of India's thousands of villages, the gap has narrowed. The health and dignity of five people have improved. More of Devi's neighbors are trying to emulate her example by installing a household latrine and washing their hands with soap.

"We have gone from home to home to talk about sanitation and cleanliness," Devi says, standing on the bank of the Yamuna River as cattle drink from its fetid waters. "The solution to a thousand household problems is getting a toilet."

As India strives to build on two decades of growth, the nation's sanitation struggle reveals how complicated Devi's goal remains -- and how damaging the failure to meet it may be.

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