



Parched Empire

The Water Mafia in a Booming Bangalore

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>FOREFRONT



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Anuj Pratap Singh has a water problem. He didn't have it when he came to Bangalore 10 years ago. He didn't have it when, four years later, he moved to the outskirts of town, closer to his work as an engineer. He still didn't have it when he discovered that his new home, while technically within the city's bounds, wasn't connected to the city's water system. The complex, then home to around 20 families, had four borewells funneled to the ground. Potable water was plentiful.

Then, about six months ago, his problem struck: The borewells ran dry.

With no utility or groundwater, Singh and others in his complex did what many residents of Indian cities now must do. They found a mobile number and called the water mafia.

Arriving shortly thereafter was one of thousands of “tankers” — private trucks with cylinder tanks attached and water in tow, its source a mystery. Once, when the price ticked up, Singh and his neighbors tried another vendor. A second deliveryman showed up for a couple days and then suddenly stopped. Somehow, the first had dissuaded him. Tankers are territorial. To Singh, this is hardly a solution for his problem.

Actually, Singh has two water problems. A native of the Andaman and Nicobar islands, a sparse patch of 300,000 in India's far northeast, he pined for open space. Whitefield, the suburban enclave where he moved, had it in spades. Yet once he arrived, the open space vanished quickly, and services did not keep up. Not only is he bereft of pipes that bring water in, but also ones that take water out.

To send their wastewater out the complex calls in another tanker specializing in sewage, which also operates in unregulated shadows. All 160 families that live behind the gates pay 1 lakh rupees a month together, for a total of around \$1,800, to bring water in. Then they pay 1.5 lakh rupees, about \$2,700, to send it out.

Across all of Asia, millions face problems like Singh's as they watch a once-abundant natural resource disappear. Global warming and soil erosion have pushed sea levels near Asian coastal cities to alarming heights, with devastating death tolls waiting in the wings. Water, many have claimed, may be the flash point of the next continental war.

But in Bangalore and its suburbs, water is not a geopolitical conundrum. It is an economic one. While Singh — highly educated, productive and relatively affluent — may be a rarity in some parts of Asia, he is one among many here. Bangalore is the Asian megacity to come: It is full of the region's most promising feature (new, eager middle-class workers and consumers) and its most dreadful (explosive, unplanned, chaotic sprawl). And it is heading squarely into a crisis. For, in little time, the metropolis known as the Garden City could become an enormous urban desert.



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In Bangalore, the price of trucked-in water varies with the season. During the hot summer months, people pay double what they pay in colder months. No matter the time of year, the cost is 16 times what people would pay if they bought water through a public system.

THE FIELD OF WHITE

On April 27, 1882, the lofty vision of David Emmanuel Starkenburgh White became a reality. The Maharajah of Mysore, the regional governor, granted White, founder of the Anglo-Indian Association of Madras, around 3,900 acres of land. By that time Anglo-Indians, the progeny of two colonial halves and not fully Indian nor fully British, had made social and political progress. But they were still part of a persecuted group that strove for a place of its own.

White's acres rested east of the military town of Bangalore. He imagined a small, insular community for his nearly 200 members where they could sustain their own food and lives. It would resemble an English town: Circles of farm homes surrounding a village green. He named it Whitefield.

His agrarian utopia never materialized. The community splintered, but Whitefield remained. On his visits to the subcontinent, Winston Churchill would frequent the Waverly Inn, one of its central homes, to visit, rumor has it, the innkeeper's daughter. For decades after independence, Whitefield sat on Bangalore's distant outskirts, relatively uninhabited.

Then, starting 20 years ago, the trickle of technology companies arriving turned to a steady flow. Land grew pricey. Corporate offices sprung up closer and closer to Whitefield. In a few short years, the city absorbed it.

In fact, the city has subsumed nearly everything around it. From 1971 to 2011, Bangalore grew by nearly 7 million. Mapped on a chart, its population explosion is a steep 60-degree line. But its density maps to a minor incline. The city grew not up, but out. In 2006, its eight Urban Local Bodies (miniature municipalities) merged with 111 villages in the surrounding areas. By one estimate, Bangalore's domain, now at 460 square miles, has grown tenfold since 1949.

And where it has added land, people followed. According to [data from the Stockholm Environment Institute](#), the three wards that touch David White's English village have all nearly doubled in population in the past decade. One grew by 185 percent.

In 1981, when he was a teenager, Madan Kumar's family moved from the city's center to a home in Indiranagar, a neighborhood eight miles west of Whitefield. He remembers maybe three other houses on the road. His backyard was an open field.

Kumar, like many of his peers, took off to the U.S. for schooling. He stayed for over 20 years, working for technology and solar companies in Silicon Valley. Lean and with salt-and-pepper hair, he speaks and dresses like a Berkeleyite. Two and a half years ago, he and his family moved to Bangalore. The city he returned to was unrecognizable.

"Growing up, to me, it was the best city in the world. You never had this much traffic. It was cool throughout the year," he told me. "When the IT boom kicked in, the government, instead of laying infrastructure to support the boom, took the boom, took the money that came with it and said, 'We'll deal with the issues later.' And the government has never turned around and dealt with the issues."

We sat near his childhood home in an upscale cafe at the center of a commercial strip. Next door was a Gold's Gym. Behind us, as always, was the inescapable din of the streets: Revving engines, spinning motorcycle, a sea of honks.

By one estimate, congestion costs Bangaloreans a numbing \$3.8 million a day.

Yet for some urban observers, like Kumar, traffic is a lesser ill — an annoyance, yes, but not at all the most worrisome byproduct of the city's unyielding growth. The Indian Institute for Human Settlements, a local university, recently launched an interdisciplinary program devoted to tackling the nation's urban challenges. "We experience traffic every day," its director, Dr. Aromar Revi, said. "But the real constraint that Bangalore faces is not traffic. It's water."

With each dried borewell in Bangalore, the number of tanker customers ticks up. As does the price. Some residents pay upwards of 100 rupees (around \$2) per thousand liters, nearly 16 times the price of public water. Prices will fluctuate with demand. During the dry summer months, complexes can pay almost twice that amount.

Kumbera remembers windsurfing on a lake about 20 years ago “that is today bone dry.”

The natural resource, as scarcity grows, begins to mimic oil.

Outside the city, farmers have let their land sit fallow. They’ve found a better source of income: A tanker comes in, siphons a farm borewell and takes its contents out; another arrives to drop off sewage. “Land sharks,” speculators that look to sweep in real estate on the quite realistic assumption that its values will skyrocket, besiege many farmers.

If these rural lands remain moist, their value could indeed shoot up very soon.

RK Misra, a member of the city’s **infrastructure task force**, has long tracked the city’s appetite for water. At the current rate of consumption, he said, the city could exhaust its groundwater in a decade’s time.

A PARCHED CITY

Karun Kumbera is another Bangalore native returned after time abroad. For several years, he practiced architecture in Europe. His interests turned to large-scale urbanist projects, which required sifting through intricate cartographic maps of European cities.

One day, he decided to pull up a recent view of his own. It prompted one word: “*Shit.*”

Almost all the lakes he recalled from his youth, both natural and man-made, had disappeared. One estimate suggests that Bangalore’s 262 bodies of water, as of 1961, dwindled to 81 in less than 25 years, victims of an enveloping urban sprawl. Kumbera remembers windsurfing about 20 years ago on a lake “that is today bone dry.”

The parching of Bangalore is not unique in India. By 2025, the entirety of freshwater withdrawal is expected to send the nation into severe water stress. Meanwhile, water demand in its exploding cities is projected to leap up by 80 billion cubic meters — roughly 20 times the water consumption of New York City today.

Not only is the water supply shrinking, but it is also growing filthier. A 2009 report from World Bank researchers found that most groundwater in Indian cities exceeded recommended limits of contaminants, like arsenic, fluoride and ammonia. Water-borne diseases regularly plague the most crowded, poorest parts of urban India. In the city of Kolkata, close to 90 percent of water for residential buildings had excessive amounts of fecal matter.

In patches of northern India, arsenic pollution is approaching an epidemic. Reports on Bangalore's region show some levels of arsenic in drinking water, but the far more prevalent pollutants are nitrate and fluoride. Cruelly, those areas with the highest groundwater contamination are where people depend on it the most. As groundwater depletion rises and more residents turn to tankers, the tankers plunge new depths. And the health risks of the water become more unknown.

When water arrives to Singh's complex, he and his neighbors ship it to lab to test its levels of total dissolved solids. It cost them 200 rupees, around \$4 — or the average daily income of Bangalore.

In gated apartments and communities across India, expensive filters are commonplace. They purge the water of any contaminants. They also reveal stark social fissures. "That's only if you're rich," said Nisha Thompson of Arghyam, an NGO focused on water issues. "If you're not, then you're just drinking poor-quality water."

Yet Bangalore faces its own special complications. Landlocked and high, 930 meters above sea level, the city sits mostly on a layer of granite. It is, by population, the 18th largest city in the world. And it is one of the globe's only megacities through which a body of water does not run.

Instead, it must turn some 100 kilometers south to the Cauvery, a river that divides its state, Karnataka, from its neighbor, Tamil Nadu.

THE MOB NEAR BOREWELL ROAD

On Saturday, October 6, the streets of Bangalore were eerily empty. The ruling party of Karnataka had declared a public strike (*bandh*) after a Supreme Court verdict demanding that the Cauvery River Authority release additional water to Tamil Nadu.

Only a third of Bangalore residents are Karnataka-born, leaving the pan-Indian city devoid of the parochial politics dominant elsewhere. Yet water issues still run



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The unregulated market for water employs a large and growing sector of invisible laborers and entrepreneurs. Most people in India know very little about the origin of their water or the businesses procuring it.

deep. Among the few motorists on the street that Saturday were caravans of cars and rickshaws, their passengers waving the state flag feverishly but nonviolently. It was the closest the city comes to a regional skirmish.

Every day, around 900 million liters are directed from the Cauvery to Bangalore. More than a third never make it. En route to the city, it leaks through holes both physical and political. It becomes “non-revenue water.”

The utility agency, the Bangalore Water Supply and Sewage Board (BWSSB), officially marks the leakage estimate at 37 to 40 percent. “Privately, they say it’s over,” explained Rajesh Shah, founder of [Peer Water Exchange](#), a non-profit that Kumar partners with. The snag is not limited to the Cauvery. Estimates blame inadequate storage and faulty management for wasting roughly two-thirds of the water supply nationwide. Shah said the amount lost in the Cauvery pipes might approach 55 percent, thanks largely to theft and graft.

Much of the piped water that does arrive comes to Bangalore’s center, which until recently contained the entire city and still holds its political bases. Older neighborhoods vote. Pipes pump there. With less need to tap into it, their groundwater remains relatively fertile.

Yet at least a fifth of the city cannot access the utility pipes. It is in the swelling outskirts, where the pipes cannot or do not stretch, that this infrastructure problem is starkest. And it is perhaps most severe in one region: David White's lapsed utopia.

A stroll through a Whitefield subdivision can be disorienting, as if you've stumbled into suburban California or Florida. Inside, the homes are massive. Sloping roofs, lush gardens and ample yards stand behind rising gates, the driveways filled with luxury sedans. The complexes have names like Rainbow Drive, Raindrops Keep Falling on My Head and Palm Meadows, where Kumar's parents now live.

He walked me through Dodsworth Layout, a complex near the still-standing Waverly Inn. The carless streets were practically empty, save for the reed-thin drivers, gardeners and construction workers. For residents, it is a respite from the endlessly bustling city, a rare patch of quiet full of modern amenities and creature comforts.

With one hitch. "They've got no water," Kumar said flatly.

Today, several places across the city have reportedly dug a thousand feet or more, only to find nothing. Recently a neighbor across the street from Kumar, near his parents' home, began drilling a borewell on his property. For weeks, the sound reverberated around the block until the neighbor surrendered, waterless.

Next to Dodsworth Layout is Borewell Road, a boulevard that has cut through Whitefield since its founding. Eleven borewells pit the road. They are all empty.

Without piped supply and with groundwater scorched, residents have little choice but to turn to the tankers for drinking water. Tankers pass through neighborhoods across the metropolis: Beside a row of shops; in front of a high-rise; parked outside a restaurant on MG Road, the main commercial strip, its black tube plunged in an open sewer. Coated in bright paint, they always have a telephone number sketched on the side, often next to scripts in Kannada, the local language. Several tankers have Hindu gods or symbols decorating their rear. They usually pass through unnoticed.

On the road to Whitefield, it is tough to notice anything else. Tankers proliferate. Tractors pull some, their tails always leaking a small trail behind. The road in their wake is littered with saturated potholes.

Many residents I spoke with conceded that challenging the mafia was futile. When his complex was constructing its rainwater harvesting system, Singh said, the water mafia snuck in at night and tore it apart. In Gurgaon, a booming city in the north, the water mafia is widely faulted for the death of a 4-year-old, who fell into one of the many dug and uncovered borewells. The "oil mafia," a similar cartel that ships petroleum, is reportedly behind the murder of a journalist investigating its ties with politicians in Maharashtra, a neighboring state.

In Bangalore, several elected officials and bureaucrats gain considerably from water mafia profits, Misra said. They have the power to regulate its presence, for fair pricing and safety, yet don't. At best, they're complicit; at worst, they're running the show. "The business goes into the hands of the politicians."

Accounting for this business is immensely difficult. Even its size remains a mystery. Shah once tried to track down how many tankers operate in his complex, Laughing Waters, but his search was futile. He could not find "even a pattern of four companies" that served the gated community. People call a tanker based on word of mouth, in the dark about its operations. "Nobody wants to know," he lamented.

People call a tanker based on word of mouth, in the dark about its operations. "Nobody wants to know."

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A 2011 report from the government's Ministry of Water Resources estimated that 2,800 tankers operate in the city, delivering 8.4 million liters a day, around a tenth of the BWSSB supply. The report pegged the number of borewells at 150,000, although another study suggested it is possibly three times the size. Misra believes the number of tankers, too, to be much higher. His taskforce has proposed legislation to rein in the industry, including limiting the number of borewells individuals can tap.

Yet doing so, Shah said, requires taming an underground private sector bent on seizing an unrelenting demand for water: "You can't regulate that beast."

CAR WASH FLOOD

Two years ago, Harvard economist Edward Glaeser arrived in Bangalore. He dubbed it "a gateway where knowledge moves from east to west and back again." Glaeser, a celebrated urban booster, came away impressed with the city's ability to attract and converge talent in its IT sector. It was, he wrote, "a model of how an urban agglomeration can bring prosperity to a poor country."

The prosperity it has brought is, by and large, new. Beyond IT, India's thriving business sectors are still marked by nepotism and insularity. But Bangalore, where IT reigns, is home not only to some of the nation's wealthiest but also to much of its emerging middle class.

The mounting resource scarcity is colliding with a central aspiration of this new class: 24-hour water supply.

“They live in these big apartments,” Thompson said, before correcting herself. “I’m not different, right. We live in these big apartment buildings. And you have a gate. And you have a place to park your car and a little lawn where your kids can play. And your trash gets picked up. You don’t know where it goes, you don’t care.”

I’m not different either. Every day, around four in the afternoon, a tanker pulls into the alley behind my small five-story building. A pipe from the back of its cylinder fits into a sewer in the ground floor garage. The driver attaches the pipe, flips open the valve, fills one of our tanks, and departs for the next place. He may return the next day for the morning delivery. Or another driver will, or another tanker from a different company, depending on the day.

The exact cost of the water is hidden, heaped into maintenance fees paid with the monthly rent. Some apartment owners end up losing money with the rising cost of providing water, Thompson said.

From the tank the water flows up to the taps in my top-floor apartment. A portion of it goes to a compact filter tacked to my kitchen wall. Its spout delivers drinking water, while a thin blue tube spits the unfiltered water out into the sink.

In Kumar’s Whitefield complex, overlooking a pleasant lake, this whole process is repeated writ large. The developer, hoping to sell a luxury hotel-like experience, installed a reverse osmosis filter for all 50 apartments. Each tap flows as it does in the West. The water intake, pumped from a borewell on site, softened then sheened, nears 40,000 liters a day. Then, like my blue tube, as much as 20,000 liters are pumped back out, seeping into the earth. “In a crude way,” Kumar said, “we’re actually replenishing the lake.”

Tales of further excess abound. “I know one person,” Shah told me, “who got a whole truckload of bottled water to fill out his pool.”

Yet overall, the appetite for water in India pales next to the thirsty West. The target demand for its big cities, an approximation of its consumption, is 150 to 175 daily liters per person, about a fifth of U.S. rates.

I asked Shah if his opulent pool owner was the exception rather than the norm. “Absolutely,” he responded. “But it’s the exceptions that are driving the status.”

Since moving back, Kumar has had at least one familiar experience in the now unfamiliar city: That flooding of his childhood basement. More than once, he has returned home to see water streaming out of the complex’s parking garage. All the cars were being washed.

Murky Flow

Not only is the water supply in India shrinking, but it is also growing filthier. India's aging infrastructure does not have the capacity to clean and treat its wastewater flow. This means millions of people relying on dirty water with few, if any, other options.



29 billion liters

Sewage generated daily



6 billion liters

Daily treatment capacity

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VIRTUOUS VILLAINS

The heightening severity of the water crisis has prompted the city government to take notice. Three years ago, the municipal authority mandated that all new buildings over 200 square feet have rainwater harvesting, installed systems that exploit the two rainy seasons to replenish water supply. A number of commercial and public enterprises have popped up offering similar systems for existing homes.

Yet despite complaining about tankers, many residents don't transition to the cheaper harvesting option.

Chennai, a city about 300 kilometers from Bangalore, levies a fine for failing to harvest. The policy isn't corruption-proof; some complexes opt for a familiar Indian recourse, multiple people told me. It costs around \$18,000 to install the harvesting system. The official sent to check in on the system can be bribed for a third of the price.

Wealthier Indians have yet to feel the price pinch of the tanker supply. "It's not exorbitant yet," said Shah. "As far as I'm concerned, it's still free water."

In Bangalore, "the true cost of water," a reflection of the supply chain prices, is 35 rupees (around 65 cents) per kiloliter, explained S. Vishwanath, director of **Biome**, an environmental design and rainwater harvesting consultancy based in the city. Piped water comes in at six rupees per kiloliter. City taxpayers are subsidizing utility bills down to roughly a dime.

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If data on use are blurry, those on quality are a black hole. And the hole deepens, as homeowners and tankers dig lower and farther for sources of water.
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Vishwanath's mission is to find viable solutions to the urban water crisis, which must, he believes, stitch together the government, private and informal sectors. And his pet peeve is the notion that tanker operators are unruly partners.

"The private tankers are very quickly labeled as villains," he said. "Actually, they're plugging a gap where the state fails to supply water." Some inflate prices and, particularly in Chennai, behave as a cartel, he admitted. Yet he insisted that most don't.

Cast as vultures, tankers are denied the assistance other informal sectors receive. "No one supports them with a loan from micro-finance," Vishwanath continued.

"They take the risk completely. And they're not actually making too much profit." A few tankers will enter the city's slums and deliver water for free. "They retail water sometimes at a loss to low-income communities because they feel it is their duty to give water."

Near a tanker hub in Whitefield, I passed two blue barrels on the sidewalk, about four by two feet each. As the tankers fill up at the borewell, they will quickly dump the excess into the barrels. They drop them off at some of the abundant small shops lining the city's streets. Residents don't notice the missing supply. "A wealth tax," Kumar quipped.

It's also a type of creative surcharge that millions use to survive in the city. As Glaeser noted, Bangalore's IT money has not spread evenly — for every engineer that arrives, many more menial laborers come as well. The IT sector is still, relative to the total workforce, negligible. Despite the city's wealth, a fifth of its residents live below the poverty line; about a million are illiterate.

As these migrants pour into areas like Whitefield, the tension between the city's ongoing economic boom and its environmental frailty is most apparent.

Yet many find work in the field that may be the city's strongest asset in tackling the imminent crisis. India's informal economy, robust and sprawling, has proven that it can ably reach all corners of ballooning cities. Vishwanath wants the tankers to be incorporated into a city-level association, a position that could protect its workers, police health standards and put a check on price gouging.

And the nascent state of utility systems here can be a strength. It means the country can avoid a disastrous slide to Western models, where all domestic water comes from one source and must be of top-notch quality.

“We are still a growing city,” Vishwanath said. “We have not locked ourselves into a certain form of infrastructure.”

A DEARTH OF DATA

In 2005, Rohini Nilekani started the foundation **Arghyam** in Bangalore. Nilekani was a journalist, author and philanthropist. She was also the wife of Nandan, former CEO of Infosys, the outsourcing pioneer, and one of India’s wealthiest, most famous new sons.

Coming with the fresh wave of IT wealth in the subcontinent was a tide of philanthropy. These new outfits, like Arghyman, started out focusing, as many older NGOs do, on rural India, where most of the country still lives.

Yet as rural Indians rapidly urbanize, Arghyam is now turning its eye to cities.

With this shift comes a dire need to decipher the realities on the ground. But if the informal sector is a “beast,” the entirety of urban India is a jungle of unknowns. For Arghyam, the central, nagging question is this: Do data on water even exist?

“The answer is yes,” said Thompson, the project manager of Arghyam’s India Water Portal. “But no one really knows where it all is.”

Some data are stacked in state government offices; some are buried in reports from municipal agencies; and others are collected by non-profits or private firms. Thompson’s task is to build a central clearinghouse for water data, to pull it all together.

This is far easier for rural areas than urban ones, she told me. India’s government is still particularly fond of the Gandhian reverence for the village. And state governments, considerably more powerful than municipal ones, have also been criticized as reticent to command resources into confronting urbanization.

For Bangalore, one of the widest knowledge gaps is in its groundwater structure, explained Vishal Mehta, a researcher with the Stockholm Environmental Institute. In an upcoming paper for *Economic and Political Weekly*, he and four co-authors attempt to unearth the ties between social and ecological flows of water.

The city’s water system, its “urban metabolism,” they write, faces an “inherently spatial problem.” The sprawl has overpowered the system. Areas on the city’s fast-growing periphery are caught in a vicious cycle, where the need for water keeps pushing the search outward. The public utility’s water supply infrastructure is scarce here, and residents must rely more on pumping groundwater and water tankers. The

researchers found that some of the groundwater depletion in the outskirts comes solely from domestic demand. Much more could be coming from the commerce and industries, the new restaurants, malls and tech parks settling further and further from the city's center. For now, it's a best guess: Figures of each sector's consumption are still unavailable.

Prior research has only peered beneath the surface in select sections of the city, like the area below the year-old metro. It is not a comprehensive probe. "If you give a snapshot, that's pretty much better than what we have now," Mehta told me. "But it's still a snapshot."

Rise above the surface, and the picture is still hazy. Unlike homes in the U.S., very few Bangalore residencies have meters that track their water intake. Indian cities lag terribly behind even their neighbors. According to [a recent study](#) from CEPT University in Ahmedabad, nearly 100 percent of utilities in Southeast Asian cities are connected to meters. In India, the total is less than a quarter. Apart from utility-supplied water, Mehta explained, "There is no central record of how much water people are pumping out and how much tanker water is being consumed."

Existing records do show that, for most of the city, the public provision is inadequate. The minimum daily water needed for sustenance, per the World Health Organization, is 100 liters per person. For the fifth of Bangalore in its central wards, nearly half of the total utility costumers, the piped water consumption is less than that. Even they need groundwater and tankers.

If data on use are blurry, those on quality are a black hole. And the hole deepens, as homeowners and tankers dig lower and farther for sources of water.

"THE ONLY THING WE HAVE"

In the house Shah shares with his wife and two sons, water flows through several paths. They have a small borewell that delivers it from below; a rainwater harvesting system on the garden roof captures it from above. Some is pushed past a UV filter, out into drinking taps. Laundry water is piped down to the toilets. Shower water feeds into the gardens. None arrives from tankers.

This is the sort of water system — varyingly sourced, reused and recycled — that experts insist the government must implement to address the crisis. Shah remains skeptical.

"The public sector in India," he said, "has shown no propensity to replicate anything." A beat later, he added, "Nor has the private sector."

Tapped Dry

Without the public infrastructure for clean water, most Indians have to pay for it out of pocket. The cost of this basic resource that many Americans take for granted quickly adds up.

PERCENTAGE OF INCOME **SPENT ON**
WATER BY AVERAGE INDIAN



PERCENTAGE OF INCOME **SPENT ON**
HOUSING BY AVERAGE AMERICAN



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In India's trip down an infrastructure path, one model appears to be outpacing others. State and local officials are settling on large-scale, often privatized solutions. In May, the state announced it was setting up seven sewage treatment plants in a public-private partnership with domestic companies. In October, the BWSSB signed papers with the Temasek Foundation, an investment arm of Singapore, to explore further wastewater recycling factories that rely on reverse osmosis.

Detractors pan them as energy intensive and inefficient. It's a particularly unwarranted approach, argued Shah, when the public utility, the Cauvery delivery system, is so faulty. "I would not increase any capacity until we fix every damn leak that we can fix," he said.

Across India, the term *jugaad* is deployed regularly. It loosely translates to the ingenuity and innovation in the face of inert bureaucratic obstacles. On water, like so many other issues, Indians are practicing *jugaad*.

According to Vishwanath, around 50,000 homes now use rainwater harvesting mandated by the city. Just as many homes have installed their own. Often, these are less affluent residents, whose wallets feel the sting of high tanker prices. In a neighborhood in the south, the BWSSB runs a small rainwater harvesting center, equipped with tools and how-tos for installing a system.

Several hundred homes are now using Biome's greywater recycling products, Vishwanath said. Bangalore's corporate titans are moving to water recycling, too. The sprawling campuses for Infosys and Wipro, two of the largest outsourcing companies, have recently inaugurated harvesting and wastewater cycling operations.

"They're waking up," Vishwanath said.

Singh told me things are improving at his complex. Tankers come reliably, no longer as saboteurs. Two weeks ago, the apartments installed a functioning rainwater harvesting system, whose wide buckets, when the rains are good, can provide a bulk of their water needs. And the complex has managed to procure a piped line, equipped with a meter.

"Getting Cauvery water wasn't easy," Singh said. It required dogged persistence and resources that only a few, prosperous residents may have. As the city is now trying to stretch its reach into its accelerating domains, like Whitefield, it will also require patience. At this point, pipes are laid and meters installed. "It's all there," Singh noted. "It just doesn't have water."

As I sat with Shah in his living room, our conversation veered again and again to grim terrain. He vented about his neighbors. Highly educated — the 100-family complex has around 15 Ph.D.s — and affluent, they grumble about the costs of tankers but refuse to make changes. Thirty new houses went up since Shah's, each aware of his recycling system in place, of the money he saves by not relying on tankers. He broadcasts it widely. Yet none have taken similar steps.

At times, he sounded like David White: Another idealist, furnished with an ambition to remake this patch of land in south India. I asked Shah if it was his vision for homes across Whitefield and Bangalore to replicate his domestic system.

His response was brisk. "It's not a vision," he said. "It's the only light. Here, there's no water. There's no choice. It's not a vision. That's the only thing we have."➤



ABOUT THE AUTHOR

Mark Bergen is a journalist formerly from Chicago and now based in Bangalore, India. He writes the Econometro blog for Forbes.com and has covered politics and policy for *GOOD*, The Atlantic Cities, Tablet Magazine, Religion Dispatches and the *Chicago Reader*.