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INDIA'S SILICON VALLEY IS DYING OF THIRST. YOUR CITY MAY BE NEXT



As groundwater wells run dry, the task of supplying Bangalore's residents and office parks has been taken up by privately operated tanker trucks.  MAHEEN BHANTERAM

On the outskirts of Bangalore one morning last summer, a sullen young man named Manjunath stood high atop a cocoa-colored 1,850-gallon tanker truck, waiting for its belly to fill with water. The source of the liquid was a bore well, a cylindrical metal shaft puncturing hundreds of feet down into the earth. An electric pump pulled the water up from the depths and into a concrete cistern; from there, a hose snaked across the mud

and weeds and plugged into Manjunath's truck. As the water gushed into the tanker, a muffled sound emerged, like rain on a tin-sheet roof.

Once the tank was full, Manjunath disconnected the hose, climbed down, and settled into the truck's cab. Then he drove out through a web of newly tarred back streets in the suburb of Whitefield. He passed rows of half-finished buildings, still gray from raw cement, and he honked often so that motorcycles and pedestrians could scurry out of the way. Whitefield's roadways are almost always coagulated with traffic. Over the past two decades, the area has become home to major outposts of Oracle, Dell, IBM, and GE, as well as countless IT parks—proud, gleaming edifices that Uber drivers here recognize as major landmarks. When people describe Bangalore as India's Silicon Valley, they're really talking about White-field. From the altitude of the truck's cab, though, Whitefield looked somewhat less impressive—smaller and flimsier, even more starved for space than it already was.

After a quarter of an hour, Manjunath turned through a back gate of the campus belonging to Huawei, the Chinese telecommunications firm known for its sleek, inexpensive smartphones. He made his way to a corner of the parking lot. By the wall, under some plants, he found a metal water pipe that poked up out of the soil. A length of rubber tubing had been affixed shoddily to the pipe's inlet valve, and Manjunath spent a few minutes using a handy rock to hammer the tubing tight over the valve's mouth. Then he fastened the other end of the tube over his tanker's outlet, turned on the spigot, and sat down near his truck to pick his teeth as his cargo unloaded.

Water tankers await their turn at a filling station near the Bangalore suburb of Whitefield.

Mahesh Shantaram

Bangalore has a problem: It is running out of water, fast. Cities all over the world, from those in the American West to nearly every major Indian metropolis, have been struggling with drought and water deficits in recent years. But Bangalore is an extreme case. Last summer, a professor from the Indian Institute of Science declared that the city will be unlivable by 2020. He later backed off his prediction of the exact time of death—but even so, says P. N. Ravindra, an official at the Bangalore Water Supply and Sewerage Board, "the projections are relatively correct. Our groundwater levels are approaching zero."

Bangalore, once famous for its hundreds of lakes, now has only 81. The rest have been filled and paved over.

Every year since 2012, Bangalore has been hit by drought; last year Karnataka, of which Bangalore is the capital, received its lowest rainfall level in four decades. But the changing climate is not exclusively to blame for Bangalore's water problems. The city's growth, hustled along by its tech sector, made it ripe for crisis. Echoing urban patterns around the world, Bangalore's population nearly doubled from 5.7 million in 2001 to 10.5 million today. By 2020 more than 2 million IT professionals are expected to live here.

Through the 2000s, Bangalore's urban landscape expanded so quickly that the city had no time to extend its subcutaneous network of water pipes into the fastest-growing areas, like Whitefield. Layers of concrete and tarmac crept out across the city, stopping water from seeping into the ground. Bangalore, once famous for its hundreds of lakes, now has only 81. The rest have been filled and paved over. Of the 81 remaining, more than half are contaminated with sewage.

Not only has the municipal water system been slow to branch out, it also leaks like cheesecloth. In the established neighborhoods that enjoy the relative reliability of a municipal hookup, 44 percent of the city's water supply either seeps out through aging pipes or gets siphoned away by thieves. Summers bring shortages, even for those served by the city's plumbing. Everywhere, the steep ascent of demand has caused a run on groundwater. Well owners drill deeper and deeper, chasing the water table downward as they all keep draining it further. The groundwater level has sunk from a depth of 150 or 200 feet to 1,000 feet or more in many places.

The job of distributing water from an ever-shifting array of dying wells has been taken up, in large part, by informal armadas of private tanker trucks like the one Manjunath drives. There are between 1,000 and 3,000 of these trucks, according to varying estimates, hauling tens of millions of gallons per day through Bangalore. By many accounts, the tanker barons of Bangalore—the men who own and direct these trucks—now control the supply of water so thoroughly that they can form cartels, bend prices, and otherwise abuse their power. Public officials are fond of calling the tanker owners a “water mafia.”

That term, water mafia, conjures an image straight out of Mad Max—gangs of small-time Immortan Joes running squadrons of belching tankers, turning a city's water on and off at will. When I first started to hear about Bangalore's crisis, that lurid image

was hard to square with the cosmopolitan city I knew from a lifetime of frequent visits. The prospect of Bangalore's imminent collapse from dehydration, and its apparently anarchic response to the threat, seemed to offer a discomfiting preview of a more general urban future. As Earth warms, as cities swell, as resources become more scarce and vexing to distribute, the world's urban centers will start to hit up against hard limits.

In the moment, though—well before the apocalypse—there was Manjunath. When his tanker had emptied itself, he chucked away his toothpick, climbed back into the cab, and set off once more for the bore well. Huawei's reservoir would swallow many more loads before it was full.

Kundalahalli Lake, adjacent to the Huawei campus, is being drained and dredged to remove accumulated sewage.

Mahesh Shantaram

I was first told about Thayappa, the water baron of Iblur, by one of his clients. Iblur is an area on Bangalore's southeastern periphery, about 9 miles from Whitefield. Fifteen years ago, it was a village; now Iblur is a suburban enclave, full of condominiums with names like Suncity Apartments and Sobha Hibiscus, which sprang up to supply homes to some of the hundreds of thousands of people who flooded into Bangalore to staff its tech firms. Thayappa's client was a woman who lived in one of these vast complexes, a thicket of residential towers with tennis courts, genteel ornamental ponds, and 1,500 apartments.

As a member of the apartments residents' association, the woman's duty was to deal with tanker truck owners, and she'd invited me over to hear her tales of battle. But while I sat in a little room off the lobby waiting for her, I could see her, just outside the glass door, arguing with another association member. Heads shook furiously. Hands cut through the air. When they joined me, the man—a former local Yahoo employee—insisted that the tanker owners behaved perfectly. Every time the woman started a story, he cut her off. They had no complaints, he said obstinately, none at all.

In 2011, a man identified only as Kabeer had his ribs broken for calling out an alleged boss of the local water mafia.

“I’m so sorry,” the woman said when I called her later that day. “He was afraid that if our names appear in a magazine, the tanker owners will cut off our water. We have no choice, we’re dependent on them.”

Thayappa is one of six Iblur tanker operators who keep the taps running at this apartment complex; the residents rely entirely on them. For convenience, the six operators divvy up the apartments into six rough clusters—a cluster each—but there’s no doubt that Thayappa is the ringmaster of this cartel, the woman said. Every time she has tried to haggle with the supplier of her own cluster, he has said “Thayappa won’t agree.”

The woman’s cluster alone buys more than 42,000 gallons of water daily—25 tankers’ worth, all drawn from bore wells within driving distance of Iblur. In January 2015 she and her tanker operator had informally settled on a price of \$7.50 a tanker, but six months later the cartel had—at Thayappa’s urging—unilaterally jacked up the rate to \$8.25. Over a year, that works out to an addition of more than \$6,800 to the cluster’s water bill. One of the smaller apartment clusters was being forced to pay for a minimum number of daily tanker-loads, even though it didn’t require that much water. If the apartments had been hooked up to the heavily subsidized civic system, a tanker’s worth of water would cost them as little as 70 cents.

In an attempt to source its own water, the complex had dug 22 bore wells of its own, but they rarely work; even though they reach 900 feet or more into the ground, they return only air. In 2015, out of desperation, the woman worked the phones to find suppliers further afield. One operator agreed to a rate of \$6.75 per tanker but then backed out, wary of another cartel’s turf. “He called and said he couldn’t take the job. He said, ‘You didn’t tell me your apartment lies in Iblur.’”

Sometimes the stories are bloodier and grimmer. In 2011, in a different neighborhood, a man identified only as Kabeer had his ribs broken for calling out an alleged boss of the local water mafia. Some municipal councilmembers and local politicians own tanker fleets themselves or allow these illegal businesses to operate in return for kickbacks. In a block of apartments in Bommanahalli, not far from Iblur, water board officials kept shutting off the piped supply altogether, insisting that their connection had been illegally installed. Weary of paying nearly \$1,250 in monthly tanker dues, the residents, in 2011, decided to dig a new bore well. Just as work commenced, their tanker operator arrived with two colleagues—“just regular--looking guys,” says Padma Ravi, a filmmaker who lived in the building at the time, “except that they had really big machete-type things. They said, ‘You can’t dig.’” The excavation had to be finished under police supervision.

Shortly after I learned his name, I rang Tha-yappa and asked to meet him. The first time he stood me up, I waited for four hours. “Stay at the main intersection and I’ll come get you,” he had told me on the phone, sounding bored and drowsy. So I occupied a stone bench between a fish stall and a tea shop, on a corner where two slender roads crossed. To pass the time, I counted the tanker trucks that rolled by. On occasion, a tanker nozzle’s cap was loose, and water lapped out and slid down the truck’s torso. If the trucks were empty, they gave out hollow rumbles as they headed back through Iblur for a refill. By the time I gave up, having grown tired of calling Tha-yappa’s number and receiving no response, I had counted 57 tankers.

A water tanker makes a delivery to an IT campus in Whitefield.

Mahesh Shantaram

When titans of the tech industry like IBM and Sun Microsystems began drifting into Bangalore in the mid-1990s, the city’s geography had been part of the allure. Sitting atop a series of ridges, Bangalore lies more than 3,000 feet above sea level—an elevation that affords the city month after month of moderate temperatures, nippy evenings, and clement afternoons. But this topography also permits Bangalore’s 33 inches of annual rain to flow instantly downhill. Hauling water from the nearest major river—the Cauvery, 53 miles to the south—is a formidable and inefficient affair.

For generations Bangalore stood out for its foresight in devising ways to manage its water. The founder of the city, a 16th-century chieftain named Kempe Gowda, dug the first of the city’s lakes, to trap and hold rainwater. Subsequent kings and then the British dug more, so that a census in 1986 counted 389 lakes, spread like pock marks across the face of Bangalore. As early as 1895, Bangalore deployed steam engines to pull water from its reservoirs; a decade later, it became the first Indian city to use electric pumps. In the 1930s, the first water meters in India were installed here.

The water tankers embody the market’s brawny, uncouth response to Bangalore’s public failure.

When the IT industry exploded, though, the planning seemed to seize up. Or perhaps it simply couldn’t keep pace. In 2004 it was a trip to Bangalore that inspired New York Times columnist Thomas Friedman’s wide-eyed epiphany that “the world is flat.” The city—having raced from obscurity to compete handily with American tech hubs—became Friedman’s go-to mascot for globalization in overdrive. The question of

stressed resources, however, rarely factored into Friedman's columns, and it seemed to figure only casually in the city's own calculus. Roads and tech parks were permitted to encroach onto lake land; industries dumped chemicals and debris into water bodies. The most vivid image associated with Bangalore today is not of its software engineers arrayed neatly within their cubicles but of its largest lake, Bellandur. The runoff of toxic chemicals into Bellandur is so dire that, periodically, the lake catches fire. Dense clouds of taupe smoke lift off the water and sail toward the condominiums of Iblur or toward the IT offices of Sarjapur Road.

Neglect, not surprisingly, gave rise to scarcity—and then collided with the volatility of climate change. The water tankers embody the market's brawny, uncouth response to Bangalore's public failure. But they have also reinforced the dysfunction of the old machine, says R. K. Misra, who sits on a government task force to improve Bangalore's infra-structure. "No illegal business can run without the patronage of the politicians and the police," he says. Misra deploys the word mafia easily when talking about the tanker barons. The business bears several of the hallmarks of organized crime, he says: unlicensed operations, occasional violence, and collusion with political networks. Politicians up and down the ladder, from municipal officials to state legislators, receive payoffs. "The tanker mafia funds their campaigns during elections," Misra says. As a result, "there has not been a concerted effort to contain the water tanker mafia."

The Suncity Gloria apartments, on the outskirts of Bangalore. New developments like this one largely serve IT workers for nearby multinational companies like Cisco, Intel, and Walmart.

Mahesh Shantaram

The day after Thayappa stood me up, I returned to Iblur and called him again. "Why don't you come tomorrow at noon?" he said. Obediently, I went back once more, reclaimed my stone bench between the fish stall and the tea shop, and waited. After about 90 minutes, Thayappa drove up on his motorcycle, a silver-gray Royal Enfield Bullet that shone in the sun.

I introduced myself and pointed in the direction of the old village, where he lived. "Maybe we could go to your house to talk?"

He was reluctant. "Let's just stay here," he said. We walked into the shadow of a tarp roof over a coconut stall. The coconut vendor, recognizing Thayappa, got up from his own chair, dusted it off, and offered it to him.

“If there’s no running water, what will all these people do? You can say what you want about the mafia, but people need water to drink.”

Thayappa, a middle-aged man with a hairline in retreat, wore a lemon-yellow shirt and gray polyester trousers. He had on glasses with brown photochromic lenses; in the shade, these were caught midway in a muddiness between opacity and clarity. His right eyelid, I could just make out, was swollen, as if from an insect bite. He had a mustache, a faint sheen of white stubble on his chin, and an aura of cool, taciturn authority, even when he was being flexible with the truth. At one point, Thayappa said he was getting out of the water business altogether and that he now ran just one tanker; then he said his fleet had shrunk from four tankers to two; then he said he owned two small tankers and a larger one.

Back in the day, all this was agricultural land, Thayappa said, his arm describing an expansive arc around him. There was nostalgia in his voice. Iblur had been a village of farmers, and Thayappa’s family a locally prominent one. Then Bangalore swallowed the village whole. Thayappa was one of the first Iblur entrepreneurs to enter the water tanker business in 2003 or 2004, when the condos around the village, filled with new residents, began to exhaust their wells. “There were once 20 bore wells in the village,” Thayappa said. Now there are only five that still work. So Thayappa sends his fleet out farther afield to find water.

When the conversation turned to the details of his business, Thayappa grew guarded and evasive. I recounted the story that the woman in the apartment complex had told me, and I asked if he forced clients to buy a minimum number of tanker loads every day. He did nothing of the sort, he said. I wondered if there were battles over turf, fights over customers. “What fights?” he said. “With whom would we fight?”

I asked if he had an understanding with the other tanker owners in Iblur—if they set prices in unison. He denied this too.

“A person can only eat however much he’s able to eat,” he said cryptically. “If I want to eat everything—well, how’s that possible?”

“They call this tanker business a mafia,” I said.

“But if there’s no running water, what will all these people do?” he said. “You can say what you want about the mafia, but people need water to drink.” And Bangalore was growing more parched by the day, Thayappa said.

“This summer, the temperature got up to 40 degrees Celsius [104 degrees Fahrenheit], which has never happened here, in all these decades. They’re closing all the lakes up and building over them.” He swept his arm across the horizon again, but this time the gesture suggested not nostalgia but imminent defeat. “Where will the city possibly find water for all these -people? In two or three years we’ll run out, and then all these apartments will be empty. They’ll have to vacate and leave.”

Bhaskar Gowda, the proprietor of Himalaya Water Supply, at his filling station in Whitefield.

Mahesh Shantaram

According to one theory, this parched apocalypse is avoidable, but only if Bangalore makes some dramatic changes to the way it manages its water. S. Vishwanath, an urban planner who has become the city’s chief evangelist for sustainable water use, believes this implicitly. A lanky man with long hair and a beard that he refuses to tame, Vishwanath discusses Bangalore’s water crisis in the style of a minor prophet proclaiming the road to redemption. On Instagram, as @-zenrainman, he posts photos of water: wells and lakes, puddles and rivers, all in surroundings so bucolic and pristine that they feel like they must date from a bygone India.

If buildings across Bangalore installed rainwater harvesting systems; if the city recycled its wastewater; if it pared back its husk of concrete and revived its lakes so that they could, in turn, recharge the water table, then Bangalore would have enough to drink, Vishwanath argues.

Maintaining the trucks is expensive; these large volumes of water, forever shifting within their containers, wear down vehicles quickly.

The challenge lies in getting any of these reforms to stick. In 2009, for instance, Bangalore passed a law demanding that buildings capture and reuse rainwater. But compliance has been spotty. Only half of the buildings governed by this rule now follow it. Inspectors can be bribed; rules can be bent. As with the tankers, this law too has melded into the chaotic, jury-rigged, malformed mechanisms by which Bangalore deals

with its water. Fending off climate change is, famously, a problem of collective action; so too is mitigating its damage.

As for the armadas of private water tankers, Vishwanath actually sees a place for them in his vision of the future. “Why is there a notion in our head that water has to come in pipes?” he wonders. The trucks, he believes, ought to be regulated—no small challenge in itself, given the bureau-crazy’s taste for graft—but not outlawed. There should be more of a market for water, he says, one in which the state oversees distribution but does not serve as the only supplier. In India there still is “a left-liberal, namby-pamby” dependence on the government to provide subsidized water, Vishwanath says, and as a result, “no one asks what the true cost of water is.”

For tanker barons and their customers alike, the true cost of water is climbing. In Whitefield, I met Bhaskar Gowda, who with his brother owns Himalaya Water Supply, the company that employs Manjunath and helps keep Huawei’s reservoirs full. Gowda is not among the industry’s major, or even medium-size, water barons; he is one of the hundreds of operators who fly solo, running two or three trucks apiece. He lives in a village called Hoskote, 10 miles farther out of Bangalore, where his family’s 6-acre farm once suffered as its water table declined from 300 to 1,200 feet. A decade ago, Gowda used his savings to buy the first of his three tanker trucks. For an office, he rented a matchbox of a room on a roof in a neighborhood buried deep within Whitefield. A small television was parked in a corner, amidst hillocks of clothes; more clothes hung from pegs on the wall.

On a June morning blessed with rain, Gowda sat me down on the floor of this room and gave me thimble--sized cups of tea and lessons in the difficulties of his business. “The money you make from water,” he said, “is like water itself”—thin and insubstantial, he meant, and swift to leave your hands. A burly man with a mustache and a soul patch, he wore a chain and earrings of dull gold. When he lit a cigarette, he held it in the manner of a dart, pinched between his thumb and first finger.

Gowda owns three tanker trucks, two of them holding 1,850 gallons each and the third nearly 4,000. Purchasing these required bank loans of \$10,500 to \$27,000 apiece. He pays his own water supplier \$3 a load—\$3.75 in the summer, when the electricity fails several times a day—and sells them for \$7.50. His staff consists of five salaried drivers. Maintaining the trucks is expensive; these large volumes of water, forever shifting within their containers, wear down vehicles quickly, Gowda said. The trucks are not easy to maneuver on Bangalore’s narrow, crowded roads, and when they scrape up against BMWs or Toyotas piloted by rash young drivers, he has to handle the police and pay for the damage. The margins aren’t extraordinary; an urban researcher at the

Massachusetts Institute of Technology found that a tanker will earn a median profit of just \$350 to \$440 a month.

S. Vishwanath, an urban planner, has become Bangalore's chief evangelist for sustainable water use.

Mahesh Shantaram

Clients call Gowda around the clock. He showed me, on his Samsung smartphone, the calls he'd received well past midnight, from companies looking to replenish their tanks before their employees filed in the next morning. If a driver wasn't available, Gowda drove the truck himself. "What do people mean, 'mafia'? This is a job full of tension," he said. "The employees in all these IT companies, they shower every morning. I shower only when I can find the time."

The tanker barons pass their expenses on to their customers, sending signals about the real price of water.

Thayappa too had grumbled to me about the arduous character of his work and about the high expenses associated with it. Inevitably, these expenses will rise further still, as wells sink deeper and deeper into the earth, biting past loam and clay and into rock. To drill the first 250 feet, one bore-well digger told me, costs only 83 cents, but beyond 1,100 feet, each additional foot costs \$6.75. The tanker barons pass these expenses on to their customers, performing, in a back-handed way, the valuable service of sending signals about the real price of water. It's possible that when the price finally starts to hurt too much, customers will accelerate their rainwater harvesting, campaign to revive their lakes, and follow the rest of Vishwanath's advice. If so, Bangalore could become a model for water-stressed cities. If not, the world could watch it wither.

Gowda invited me to ride alongside his tanker truck drivers through a morning of water deliveries, so I returned to Whitefield a few days later and walked up to Himalaya Water Supply's office on the roof. Gowda had managed a shower that morning, I could see. His hair was still wet, and he sat on the floor, with only a pink towel around his waist, poring over his accounts in an exercise book. When I arrived, he got dressed, we hopped on his motorcycle, and he drove me down the road to set me up with Manjunath.

For the next couple of hours, Manjunath and I shuttled back and forth between Himalaya's bore well and Huawei. Each time we returned to Huawei's back gate, the road leading up to it was a little more crowded—with dawdling Ubers and the cars and motorcycles of employees, but also with tanker trucks from other water-supply firms. The tankers came in a range of sizes; the smallest, pulled by a tractor and holding perhaps a few hundred gallons, looked like a jerrican on wheels next to the 4,000-gallon monsters. Some of them looked new; most were older and had sprung tiny leaks out of rust holes. They formed a long, patient queue, their exhausts smoking, their water running out in drips onto the road.

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