April 30, 2024 / North America’s biggest city is running out of water

[HALF SECOND OF SILENCE]

[BILLBOARD]

SEAN RAMESWARAM (host): The other day I called Juan Rebollar.

*<CLIP> CDMX RESIDENT JUAN REBOLLAR: And I live in Atizapan de Zaragoza. That is a suburb of Mexico City.*

SEAN: I called Juan because he’s running out of water.

*<CLIP> REBOLLAR: And we receive water only on Mondays. But obviously it was not enough because in my house, for example, we live four people. And obviously there were some days we were not able to have water at all … We can’t shower. We can’t wash our clothes. The basic activities the human needs, we cannot fulfill.*

SEAN: Because Juan’s city, Mexico City, is also running out of water.

SCORING <KOS\_KOS\_0665\_03501\_Kind\_Of\_Hot\_APM-01>

*<CLIP> REBOLLAR: As we understand, the situation has not reached the peak.*

*<CLIP> NBC NEWS: More than 60 million people — half of the entire country’s population — without daily access to water.*

SEAN: We’re heading to the biggest city in North America to find out more about their water crisis on *Today, Explained*.

[THEME]

SEAN: It's *Today Explained*. I'm Sean Rameswaram, I'm standing in the center of Ciudad de Mexico, the capital of Mexico, with …

OSCAR OCAMPO (researcher): Oscar Ocampo. I'm a public policy researcher on the environment, water and energy. And we're here to talk about the water crisis in Mexico City.

SEAN: And where are we right now, specifically?

OSCAR: We are in downtown Mexico City, in front of the Bellas Artes Palace, Mexico City's main opera house, next to the Alameda Park, the city's, and the Americas’ oldest park, in the historical core of Mexico City.

SEAN: What are we doing here?

OSCAR: We're going to do a little tour around downtown Mexico City, specifically on the sinking of the city, because it was built on top of a lake…

SEAN: … and what's ironic about this city being built on top of a lake is that it is running out of water. Can you just tell us our listeners how desperate the water situation has become in Mexico City?

OSCAR: We're in a critical situation. Nowadays, most neighborhoods – we call them alcaldeas here in Mexico City – are rationing water because the water system in Mexico has two pillars. The first pillar is underground waters. They're responsible for more or less 70, 75 percent of supply, depending on the day and the month.

And the rest is supplied by a system of dams called the Cutzamala System, which comes from six dams located in, in, in neighboring states from Mexico. They supply from 25 to 30%, again, depending on the month. And those dams are slowly getting empty because during the rain season of 2023 rains were lower than, than usual, 50 to 60% – depending on the month – lower. If it doesn't start raining soon, as it is supposed to, these six dams will run out of water by the end of June.

AMBI <ORGAN GRINDER STREET>

SEAN: So we have just reached our second stop here. Uh, we're on a pedestrian walking promenade in the center of the city, not far from where we began. But you have shown me the monument that we are here to see. It is a lion's head and I was expecting something big, but it's actually just about twice the size of my own head. And it's on the side of a building here. Why did you want to show me this particular monument?

OSCAR: <chucking> Well, this is one of the least famous monuments in the city and maybe in the entire country. Millions of Mexicans see it every single day in the Madero Promenade, and they don't know about it, however, that lion marks the 1629 flood. That's the altitude of water during those times, the city was flooded for three years.

SEAN: Wow.

OSCAR: From 1629 all the way to 1632. And people had to leave Mexico City for three years. They even considered abandoning it permanently. After the conquest of the Aztec Empire, Tenochtitlan, which was the Aztec city, was built on top of a lake. The Spaniards, during the conquest, they decided to rebuild the city on top of the lake. But they had to deal with all the complexities that come by with building a city on top of a lake. The waters were dirty. It was, uh, unhealthy. And for centuries, the city had to cope with floods. And how did they do that? They drained the Texcoco Lake. In the end, we are sitting on top of a lake. The waters of the former lake are below us.

SEAN: It's funny to hear you talking about these historic periods where Mexico City had more water than it knew what to do with because of course now we're in a situation where there's a desperate shortage.

OSCAR: Well, first of all, it's demographics. Mexico City is one of the largest cities in the world with more than 22 million inhabitants in its metropolitan area. Second of all, there is no rivers or lakes in the city that facilitates recharging the aquifers because they are all underground. Where there used to be rivers, now we have highways. Third reason is The poor maintenance of pipeline infrastructure. Mexico City's pipelines are old, they might be as old as 50 years. And of course that has consequences because more or less, although there is no exact figure, around 40 percent of water is lost in the pipeline system due to the poor state of infrastructure. And finally we have climate change. Climate change has increased the frequency and the severity of droughts.   
  
SEAN: Hm!  
  
OSCAR: And now we're in 2024 and we are still experiencing a drought.

SEAN: We're gonna leave this watermark lion's head and I want you to show me what this looks like now – this water shortage, this sinking city. Can we go there next?

OSCAR: Let's do it.

<AMBI> CDMX STREET

OSCAR: This is the La Profesa Church, one of the most important Baroque churches in Mexico City. It is from the 18th century, but what is happening here is: it's tilting. It's tilting.   
  
SEAN: Ah, yes.   
  
OSCAR: If you see it from this perspective, the entire church is tilting towards the street.

SEAN: This tower here, you can kind of tell that it's pulling away almost from the church it looks like.

OSCAR: Exactly, the tower, but also the main body of the church, it's tilting towards the street there.

SEAN: And it's tilting because there's a water shortage.

OSCAR: It is tilting because the entire city is sinking, and just to put this in perspective, every year downtown Mexico City sinks. It's 10 to 12 centimeters. And I'm always terrible at converting, but it's around four inches each year. And you can see it in the old part of the city because these buildings have been sinking for centuries.   
  
SEAN: Mmmmm.  
  
OSCAR: And if you see, for example, the arch above of the door, it is cracking. So, so ...   
  
SEAN: Oh, that's right. You can see the cracks in the stone.

OSCAR: It's cracking, of course, because of the sinking. So this is a, a tremendous challenge for engineers because they have to, to reinforce, to strengthen the foundations of the church and of many buildings in this area because of the sinking. And how is this related to water? Well, because the reason of these sinkings is the over exploitation of underground water of Mexico City. We extract more or less 40,000 liters, which is 10-11,000 gallons per second.

SEAN: Every second. Every second Mexico City's 20 million plus inhabitants are extracting how much water out of this ground?

OSCAR: More or less 10, 10, 11,000 gallons. And that's more or less, say, let's say two thirds of Mexico City's water supply. The rest comes from the dams we're talking about. But what happens if you extract that much water and you don't recharge the underwater systems? It happens that materials compress and that compression causes sinkings.

SEAN: It causes the city to sink.

OSCAR: It causes the city to sink, and the city is permanently sinking, and ultimately there is nothing we can do against that. And if you see all of the streets here, they go up and down when at the beginning it was all flat.

<AMBI> CDMX STREET

SEAN: Okay, hold on, you're gonna have to help me understand why we're stopping outside of an OXXO. It looks like a 7-Eleven. We started at Palacio de Bellas Artes. We walked to a centuries old monument of a lion's head. And then a centuries old church. And now, we are here outside a convenience store. Why?

OSCAR: Well, we're going all the way to modern Mexico. And why a convenience store? Because Mexico is the world's largest consumer per capita of bottled water.

SEAN: Mexico City or Mexico the country?

OSCAR: Mexico the country.

SEAN: It's the largest consumer in the world!   
  
OSCAR: In the world.   
  
SEAN: Of bottled water. And someone's walking into this OXXO with a giant water cooler bottle of water.

OSCAR: That's a common scene in Mexican cities. Why? Because First of all, shortages in the supply, and second, mistrusting the quality of water. Mexicans don't trust the water systems to actually purify the water, so they drink bottled water on a regular basis.

SEAN: And this is where they come to do their refills?

OSCAR: Some of them come here to do their refills, some of them get it at home. These water trucks, you can find them in all the streets of Mexico. They go with the garrafones, this large, uh, bottled water, they take the, the empty one and they live at the door, the, the new one.

<AMBI> CDMX STREET - TRANSITION

SEAN: Okay. Oscar, you've given me a good tour here. We started with the floods. Then we got to the sinking city. Now we've been to the OXO where everyday Mexicans come to get their water. Tell me what this crisis looks like for everyday Mexicans.

OSCAR: To put it in an example, in most buildings there, after 10 p m., they'll shut down the water. Or, uh, I'm resume it probably at 6 a.m. Most Chilangos, most inhabitants of Mexico City are suffering from this kind of rationing.

SEAN: Is it just in poor neighborhoods or is it the rich, too?

OSCAR: This crisis has democratized the shortages of water, rich neighborhoods in the western parts of the city, which traditionally enjoyed a constant, reliable quality supply, now that they have spent days without water, and that has never happened in the past.

SEAN: And I guess the question I have to ask now is what is the government doing about this? Because I'm sure they don't want to have to constantly ration water for everyone, and I'm sure they don't want this city to sink beyond repair.

OSCAR: To solve the immediate crisis, they are drilling new wells to find water in northern Mexico City, and they are supplying from other states with pipes. And in the long term, what should be done is, first of all, modernize the pipeline system, although it is complicated, and costly, it has to be done. Second, to harness all of the available water we have. Rainwater, treated water, and find uses for that in order not to over-exploitate the dams or the underground waters. And finally, well, we need to nudge inhabitants, to nudge businesses, to have a much more rational use of this resource.

SEAN: How do Mexicans view this issue politically? Do they support conservation policies? Do they support government spending on new water projects?

OSCAR: We're electing a new mayor of Mexico City in June, and a new president of the country in June. And people want to hear, ‘Okay, how are you going to solve? How are you going to handle this issue? And what solutions do you propose? So now it's an electoral issue, and citizens will demand actions to the next government.

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SEAN: Well I wish you luck, Oscar, in your water crisis, and thank you so much for my tour today.

OSCAR: Thank you.

SCORING BUMP  
  
SEAN: Oscar Ocampo. He’s the Energy and environment coordinator at the Mexican Institute for Competitiveness. He’s also a heck of a tour guide.

Mexico City’s not the first to face a Day Zero water crisis. And it won’t be the last. What we can learn from the rest of the world when we’re back on *Today, Explained*.

[BREAK]

[BUMPER]

SEAN: *Today, Explained* is back. Long *lonnnng*time listeners of the show might recall we’ve talked about a Day Zero situation before. It was way back on the fourth-ever episode of *Today, Explained* in February 2018.

CASSETTE SFX

*<CLIP> EARLY TODAY, EXPLAINED EPISODE, SEAN: So there's this situation in Cape Town where they might run out of water, which sounds crazy, Peter!  
PETER: It is crazy. It's, um, unprecedented, one could say. We've never seen a major city have to literally turn off the taps before.*

CASSETTE SFX

SEAN: We talked about Day Zero in Cape Town when they were in crisis, but they averted that crisis! For our friends in Mexico City, we wanted to get a reminder how exactly they did that, so we reached out to Samantha Kuzma at the World Resources Institute.

SAMANTHA KUZMA (World Resources Institute researcher): So what happened is they got rain. Um, they, they got rain and, and that really, you know …

SEAN: <laughs> Classic solution.

SAMANTHA: Classic solution. The rain came through. So during the crisis, what Cape Town did well is they had a lot of consumer awareness, right? They had these campaigns. ‘Day Zero’ itself is a campaign to draw attention to this issue so that people can understand what's happening.

SEAN: Hm.

SAMANTHA: And so with that consumer awareness, you saw behavioral changes where people were changing the way they were using water, they were conserving it more. And that did help. create a longer runway until day zero, but ultimately it is the rain that helped alleviate that crisis.  
  
SEAN: And it wasn’t just Cape Town that had a crisis like this. It was Sao Paulo in Brazil. Chennai in India. We asked Samantha if these cities all just hunker down and pray for rain or if there are real, lasting solutions here.

SAMANTHA: So I love to point to Las Vegas as a great example of a good water steward.   
  
SEAN: Vegas!  
  
SAMANTHA: Vegas. And I think it surprises people. They're not what you think of when you think of like conservation, necessarily,

SEAN: No, people think of Vegas as, like, an unsustainable place, generally.

SAMANTHA: Yeah, yeah, they're in the middle of the desert. But the reality is they have to think about water. There is no Las Vegas without water. You've seen the fountains outside the casinos, right?   
  
SEAN: <chuckles>  
  
SAMANTHA: <chortles> So what they do is they invest heavily in recycling wastewater. So every drop that's being used is going back into the system and they're, they're finding ways to clean it and reuse it. And they've also invested in, in policies and regulations, things to curb, say like having a green lawn in Las Vegas, it's not a good use of water. They're receiving water from the Colorado River. And we've seen in the news how contentious that is. That river is over allocated, and so they realized they can't completely rely on that resource, and so they've thought about how to rely on other types of resources.

SCORING <Unfolding the Cat>

SEAN: Is there an international Vegas?

SAMANTHA: Yeah, Singapore, a country, city-state, is, is another shining example of, of water resource management. So similar to Las Vegas, this is a place that does not have a lot of water resources within their borders. So they receive a lot of their water from Malaysia.  
  
SEAN: Hm.  
  
SAMANTHA: So like Las Vegas, recycling wastewater is a huge resource that they're using to keep water within their system.

*<CLIP> TRT: Sewage is pumped from underground and purified. It's then sent above ground, where the remaining bacteria are filtered out through ultraviolet rays. The government says the recycled water has passed more than 150,000 scientific tests, and its quality meets the World Health Organization's guidelines.*

SEAN: Before we move on, sorry.

SCORING OUT

SEAN: When people hear “recycling wastewater”, I'm sure they wonder: recycle it for what?

SAMANTHA: It depends on the level of treatment. So you absolutely can take wastewater and treat it back to potable levels , where we could drink it like that, that technology exists.

SEAN: So ‘poop water’ is what you're saying, basically.

SAMANTHA: Yeah. Yeah. Come to a water conference and you will see like poop mascots. We're all about that water recycling.

*<CLIP> PATRICK THE POOP: Hi, I'm Patrick ! And I'm a piece of poop!   
SCARED PERSON: Oh…   
PATRICK: And I want to tell you all about what happens to me as I go through Eastern Municipal Water District's wastewater system!*

SCORING <Unfolding the Cat>

SEAN: So like at a water conference, People are all gung ho about poop water.   
  
SAMANTHA: Yeah.   
  
SEAN: But what about when you tell people, ‘Hey, by the way, that's treated sewage that you're drinking right there.’

SAMANTHA: I do think that the communications probably should be better than calling it poop water. There is the stigma, right? And so you also see examples where instead of using it for, like, drinking water, that water could be used to water our lawns or to be in the fountains, right?  
  
SEAN: Mm.  
  
SAMANTHA: So it's not necessarily going straight back into our faucets, into our Brita filters.

SCORING OUT

SEAN: Okay, what else is Singapore doing?

SAMANTHA: Other than recycling wastewater, they're implementing things like nature based solutions. So maintaining their wetlands, their marshlands. Having their rivers be surrounded by natural landscapes actually does a lot for managing our water resources. It can help clean our water. It can help store flood water, recharge our aquifers. We really just could never replicate that with human built systems. So as climate change is making our weather more volatile, we find that human built systems like dikes, levees, dams, aren't built to handle those conditions, right? They were built under very specific climate assumptions from our historic past. And that means that they're not really resilient to the problems that we'll be facing in the future.

For some reason, water is something that, that we take for granted. And as a result, we overexploit the resource, right? We use more than what is renewably available. And that is true all over the world and all countries and all economies, it's consistent. And the issue is that climate change isn't actually creating that crisis. That's a human driven crisis, but what climate change does is that it makes it more severe.

SCORING <These Circles Wear Us Down In Time>

SAMANTHA: In the case of Mexico City, climate change is literally turning up the heat on the water shortage. I read this great article by an organization called iSciences, where they compared this current drought to two recent droughts in Mexico City's history, uh, one that was about two years ago, one that was 10 years ago. And what they found was a major difference that we're seeing is heat, the intensity of heat. I believe like a week ago, Mexico City recorded its highest ever heat record. When it's hotter, we require more water. We're thirstier as people, our crops, our food are thirstier. They require more water, our electricity to power our ACs that requires water, right? So in all fronts, the demand for water goes up in high heat. But at the same time, we see less supply, right? There's more evaporation happening on our lakes and reservoirs, and that's a really big issue. The hope and our message is that it is always cheaper, more and more affordable to be proactive about these things to make those decisions now before the crisis, you're going to save so much effort, so much money. You're going to protect your economy and your people if you do that now.

SCORING OUT

SAMANTHA: What we find is it's typically the places that don't usually face water challenges that are most vulnerable to them because they have no mechanism for response. Right? So Seattle, I think, is a place that is normally seen as a very wet, climate. It's the Pacific Northwest. They're actually going through a drought right now. Just look at their electricity. Washington has massive hydropower, uh, that right now they can't produce because there's not enough water. And so they're having to turn back to fossil fuels to create that electricity.

SEAN: But in this Seattle example, you've got their sort of backs against the walls, and what do they do? They revert to fossil fuels. That's not necessarily where we want to see cities heading, right?

SAMANTHA: No, but I think it highlights the fact that water is so embedded in all of these other policy decisions that we're making. So, you know, the reason I think that sends alarm bells off is because like, ‘Wait! We're not supposed to be going back to fossil fuels, we're supposed to be going towards more renewable things!’ And so as we're thinking about renewable energy, we have to also be thinking about water and making sure we have the water to actually produce that renewable energy.

SEAN: You see that happening? Are we going to get there?

SAMANTHA: I hope it happens. I think it needs to happen. And we're starting to see some momentum that way. So last year, the UN held their first water conference in 50 years.

SEAN: Hm!

SAMANTHA: That’s a start. We need a lot more momentum behind it.

SEAN: Like a, like a big wave.

SAMANTHA: Like a big freshwater wave that doesn't hurt anyone.

SEAN + SAMANTHA: <chuckle>

SCORING <06 Neutral Brook (peaceful, watery, atmospheric, minimalist)>  
  
SEAN: Samantha Kuzma. She’s all about that high quality H20. She’s the aqueduct lead at the World Resources Institute.   
  
Our show today was produced by Jesse Alejandro Cottrell. We were edited by Matthew Collette, mixed by Patrick Boyd, and fact-checked by Laura Bullard with help from Anouck Dussaud.

For their help on this one we thank Adam Williams in Mexico City and Craig Sheridan in Johannesburg. An international effort today at *Today, Explained*.

[10 SECONDS OF SILENCE]