



BY CHEONG SUK-WAI
 SENIOR WRITER

WHEN he was a boy, Dr Seetharam Kallidaikurichi Easwaran would sometimes follow his grandfather to the river in the latter's village in Tamil Nadu every morning to take a dip. He would then help the elderly man haul back a few pails of river water by bicycle which they would later pour into mud pots and lace with herbs, from which their whole family would drink. Along the way, the boy would see villagers defecating openly in fields. Dr Seetharam, now 49, says: "So I can understand what those without toilets are missing and we have not yet invented a big-picture solution to help them."

Today, this engineer is helping to do just that as visiting don and director of the National University of Singapore's Institute of Water Policy (NUS' IWP) and director of its Global Asia Institute. Last Monday, he launched the Temasek Foundation Water Leadership Programme, which will run for 10 years and train 70 government and water policy leaders a year to manage their water systems better.

The married father of two and alumnus of the University of Tokyo is here on secondment from the Asian Development Bank, where he was its principal water supply and sanitation specialist. I sat down with him last Wednesday to learn how he thinks the world could overcome its water woes and why a billion people still do not have proper toilets at home:

■ **What is the biggest problem that you are trying to solve?**

That we are using a 200-year-old technology for sanitation that uses very clean water to flush our toilet waste away without realising that it can be the beginning of a problem because we end up having to treat all that waste water we create. So we now need to invent a new paradigm in which we will use less water, or no water at all, and separate the waste from water in a clean and safe way that also uses less energy because, currently, we use energy to create clean water and then also use it to pump out our waste and filter waste water.

■ **How far have we managed to stop such Sisyphean endeavours?**

Recently, my colleague Ng How Yong won a US\$100,000 (S\$127,000) research award from the Bill and Melinda Gates Foundation for trying to reinvent the toilet. How Yong, the director for the Centre of Water Research at NUS' Division of Environmental Science and Engineering, is pushing the aeroplane toilet further to find a way to extract the calorific value from waste.

■ **How cost-effective would that be, though?**

The costs have come down... but people have to be taught that waste will have to become drier because when they dilute waste with water, that creates complications because that would make it difficult to remove energy from the waste. But inventing a toilet that draws energy away from waste is for rural areas because in cities, you need proper sewage.

■ **But don't overcrowded cities need such innovation the most?**

The big fear everybody has is that if the



Dr Seetharam says the problem with current sanitation technology is that it uses clean water to flush toilet waste away, creating waste water that then needs to be treated. ST PHOTO: LAU FOOK KONG

TABLE TALK WITH SEETHARAM
 KALLIDAIKURICHI EASWARAN

Rethinking the 200-year-old flush toilet

collecting of waste water is not controlled properly, it can lead to disease. But out in the country, you have space. Maybe the toilet of the future will have no drain and waste from it will be collected like how one wheels away garbage bins today.

■ **Why don't thinkers ask the man in the street what he needs instead of coming up with elegant solutions on their own?**

Inventors are trying to do so in many countries, including China and France. There was a competition in France recently where someone designed a toilet that was like a paper bag that you could open and use as a toilet. The challenge in doing all that is that it has to become a system that can be networked and functional, which means that the entire value chain has to be worked out. If we know how to reduce this pollution load in waste water, fresh water will be easier to manage.

That would help a lot, given how pricey it is to treat waste water.

Yes, treating waste water costs about three times more than it would to buy fresh water. Now, the cost of treating

waste water has come down from US\$1 per cubic metre to between 50 US cents and 70 US cents but people are still not willing to pay so much for it because they think, "I will pay only up to 10 cents for fresh water because it comes from the sky". They do not understand that after they use fresh water, they create polluted water, which nobody wants to pay to clean except perhaps in Singapore, which prices water and sanitation together as a package... We have not come up with a way to capture the value of waste yet and, anyhow, it's poo, which, in many places, is still taboo to talk about.

■ **So what's the way forward?**

I have learnt that many communities actually don't have enough water for their needs because they do not have the ability to filter waste water.

■ **But isn't clean water just a case of filtering dirty water?**

Exactly. The issue is how do we distribute all that filtered water? Putting water in a package other than a pipe will mean that the packaging is more expensive than the

water because water is only about 10 cents per cubic metre and so it's correct to send water by pipe... but if you don't fix sanitation first, having clean water would solve only part of the problem.

■ **What are the main stumbling blocks to doing so?**

I don't have all the answers but I've settled on two: The first is that people need to rise to a certain income level before they can really appreciate proper sanitation. When you're making, say, at least US\$1,000 a month, you will value personal hygiene and demand a proper toilet. This brings us to the second point: Are people willing to pay to use a toilet? Someone in India tried to champion this idea, even making celebrities of people who operated such pay toilets and trying to hold community meetings in front of such toilets to emphasise how clean they are. I admire such efforts to bring about social awareness but for every success, there have been many failures.

■ **So where might the future successes be in this field?**

It will be in the new urban populations

which make up about half of Asia today. Do you know that there are upper-income apartments in Bangalore and Chennai that don't have piped water? The people living in these apartments will not want to keep buying bottled water. They also want better sanitation. For all their needs, the current 200-year-old flush toilet will not do because it requires a lot of water to operate. So a new value chain is going to be created from the river and back to the river; usually, we start at the higher end of the population.

■ **But shouldn't research focus on helping the poor first?**

I admit that there is a disconnect here. We worry about the bottom of the pyramid which will give you learning but not profits. But the revenue comes from the top of the pyramid, so I'm for sanitation becoming a fashionable industry.

■ **Won't that make the poor even more disenfranchised?**

I don't think so; in fact, they might even benefit from it. Everybody used to fear that the poor would have to pay a lot for water. But, actually, they are already doing so. They cannot afford the water connection fee and monthly tariff for piped water. So they pay for only what they use - at rates which are up to 10 times more than what rich people pay for piped water (because there are many risks, like vandalism, to piping water to the poor in rural areas)... Still, the World Health Organisation has estimated that if someone pays US\$1 for sanitation, he gets back between US\$5 and US\$28 of empowerment in terms of not falling ill and so being healthy enough to work.

The real problem with water and sanitation today is the lack of committed leadership. A study of water management in eight countries from 1998 to 2008 done by the IWP has proven that leadership makes a difference in solving such problems, from ground level to someone like former Singapore prime minister Lee Kuan Yew... just champions at even the lower levels would help a lot.

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The answer to sanitation problems? It's not rocket science

GARRULOUS and very focused, Dr Seetharam Kallidaikurichi Easwaran believes strongly that sanitation globally will improve only when the poor learn to value toilets in their homes as much as they do their mobile phones. Here he is on:

Singapore

"It's an advantage for water leaders to be trained here because Singapore is where the real story of water leadership in action is unfolding, from prime ministers to PUB officials to Newater to the Marina Barrage."

Singapore's unique selling proposition
 "Its cutting-edge knowledge in treating waste water; Newater is Singapore's greatest prize."

How anyone can help better the lives of others

"You have to be like the lotus, which grows in mud and filth."

How easy the solution to sanitation problems can be

"It's not rocket science; an aeroplane toilet is foolproof because if it were not, you and I would have a real mid-air problem, right?"

Why people think sanitation is like rocket science

"That's because telling them 'a billion people are without toilets' is too big a number for them to relate to when they all have their own toilets."

The real reason why many women are still poorly educated

"It's not so much the school curriculum as it is the availability of toilets for girls in schools; if there aren't any, parents won't send their daughters to study."

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