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A third of all illnesses suffered by Filipinos are water related

Philippine utilities invest for water-tight future

Water Safety Plans are vital to future-proof drinking supplies in the Philippines where the challenges include spiralling demand, contaminated sources and coping with typhoons

Fifteen years ago few people in the Philippine capital, Manila, had access to safe water. Before privatization only a quarter of the city's population of well over 10 million had a 24-hour piped supply. The remainder had access for just a few hours a day or had no safe drinking water at all. Most of those without access to water belonged to the low-income groups living in informal settlements and had no option but to buy water from private traders at exorbitant prices.

The situation was replayed elsewhere in the country – safe access for relatively few and high

costs for the rest. Part of the problem was the way water supply was organized. While regulatory reforms had gone some way to allowing water utilities to make independent decisions, they were still largely controlled by government. Overstaffing and artificially low tariffs were short-term measures which helped keep local politicians in office, but they starved the utilities of investment funds. Add to that a rapidly growing population with ballooning water needs and it became clear that dramatic changes were needed.

In 1997 the government introduced major reforms through the Water Crisis Act. In the capital, the service area of the Metropolitan Waterworks and Sewerage System (MWSS) was split in two and privatized, with the 25-year concession for the East Zone won by the Manila Water Company and the West Zone by Maynilad Water Services. The MWSS is now a regulator setting ambitious targets for water quality, increased distribution and leakage reduction.



More and more households in Manila are now hooked up to their own metered water supplies



Manila boasts one of the biggest water treatment plants in Asia

Outside Manila the Local Water Utilities Administration (LWUA) continues to oversee water supply in the country's 800 water districts. While 20 million people living outside urban centres (around 22% of the population) now have access to safe water, a similar number do not. Consequently, a third of all illnesses suffered by Filipinos are water related.

Back in the capital, Maynilad and Manila Water set about dealing with the twin challenges of creaking infrastructure and spiralling demand. Manila is one of the most densely populated and fastest growing cities on the planet, with the wider metropolitan area now home to over 20 million people. The supply and distribution system was never designed to cope with such numbers. The programme to modernize, repair and replace pipes, connect new customers and increase the volume of treated water is immense and continuous.

Water Safety Plans (WSPs) have helped both companies identify the key risks and prioritize investment through the system. Maynilad was

the pioneer, undergoing training in 2006 and launching its WSP in 2007. Manila Water followed in the second phase of WSP activities, completing its plan in 2010. Now, LWUA is helping water districts across the country develop plans of their own.

The WSPs have shown that securing future supplies is a top priority. In summer, demand outstrips supply, while in the typhoon season contamination and turbidity levels strain the system to breaking point.

However, there is a shortage of good quality water sources. Sampling shows that up to 58% of groundwater is contaminated with coliform. Of the 421 major rivers in the country, 50 are seriously polluted and 40 have been declared clinically dead through a combination of industrial pollution and untreated household waste. With only 7% of the population connected to a sewerage system, water providers are prepared for many years of investment and hard work to achieve and maintain the goal of safe drinking water for all.

Where conservation is good for business and water quality


Maynilad Water Services is working with local communities to change traditional livelihood practices that contaminate catchment water

The forest surrounding the Ipo Reservoir 50km north east of Manila can be a dangerous place. Visiting Maynilad staff are always accompanied by armed guards because of the threat of clashes with illegal loggers and charcoal-makers. In areas where the hillsides are stripped of trees by their activities, heavy rains cause mudslides and flash floods which not only contaminate water supplies, but have also swept away people and houses.

The Ipo Reservoir is a vital link in the chain that supplies Manila with over 97% of its water. Upstream, the Angat Reservoir and its catchment

area of around 600 km² on the edge of the Sierra Madre Mountains supplies water to the Ipo whose own catchment adds to the raw water supply. It is then channelled down to Maynilad's treatment plants at La Mesa on the outskirts of the capital's urban sprawl.

The company's WSP has highlighted that one of the biggest threats to water quality comes from deforestation. The steep-sided hills in the catchment area become unstable and large volumes of soil and other debris are washed into rivers and reservoirs, leading to turbidity levels regularly exceeding 1000 NTU. This means a significant and costly increase in the chemicals needed to treat the water and can lead to reduced throughput and therefore lower supplies to customers. With demand rising, this cannot be allowed. Raging floodwaters also dissolve manganese from the underlying rock, necessitating further treatment.

A photograph of Chief Rogelio Cruz, a man with a mustache wearing a blue and white striped polo shirt, standing in a lush green forest. He is holding two small tree saplings in black plastic pots. The background shows dense tropical vegetation, including banana trees, and a traditional wooden house with a thatched roof partially visible through the trees.

Chief Rogelio Cruz and his community grow saplings to replace trees lost through illegal logging to preserve the catchment area

“A WSP was something we had to do. Our business is water, and if you want to stay in business you must have a plan to protect the quality of water. If you lose the faith and confidence of your customers you’ve lost the business.” Francisco Arellano, head of Maynilad WSP team

The village of Sitio Anginan, nestled under trees on the shore of the Ipo Reservoir, is home to 43 families of the indigenous Dumagat community, who have traditionally made their living from farming, fishing and making charcoal. But now Maynilad is working with the community to reduce practices that are damaging water supplies.

Land cleared for growing crops is now located away from the shoreline, reducing the run-off of mud and soil. Charcoal-making has come to an end, with firewood now collected from fallen trees. This comes at a cost for the Dumagat, who have very limited sources of income. The company therefore employs the community to grow and plant saplings to replace lost trees and to maintain the integrity of the forest.

“It’s not been difficult changing our lifestyle as now we have a different way of making money,” says the village chief Rogelio Cruz, “and it makes us feel really good that we are helping people. I don’t like what the loggers or charcoal-makers are doing as they are destroying the place that we live in.”

The sapling business is doing well, with other companies now buying young plants from the Dumagat. Maynilad and the community are now looking at other ways to reduce pollutants. Like 10 million of their fellow Filipinos, the Dumagat have no access to sanitation, so the next step is



Security forces seize the products of illegal activities, mainly logs and charcoal, in the catchment area

for the company to invest in toilets and drains to reduce the risks to water quality in the reservoir.

Juan Gonzales is Head of Operations at La Mesa Treatment Plant no. 1, one of the largest in Asia. It is his responsibility to ensure that water leaving the plant is 100% safe, 24 hours a day, regardless of the quality of raw water being fed into it. Maynilad’s WSP plays a key role in this.

“We have formulated our WSP especially for emergency situations,” says Gonzales. “When we have typhoons and there is lots of rain, the water becomes very muddy. In the WSP we have the procedures to cover this particular type of



situation. Also there are occasions when we get lots of manganese dissolved in the water and there is a procedure in the WSP to address this problem.”

Maynilad has over 800 monitoring points throughout its distribution network, which supplies over 9.5 million people, to ensure consistent water quality. When the company took over the concession in 1997 nearly 70% of treated water was being lost through leaks and illegal connections. That has been reduced to 50% today, and through a programme of repair and replacement the company is hoping to cut it to 20%. But the leaks mean safe water entering the

distribution system can become contaminated and consequently only 80–90% of Maynilad customers currently receive potable water.

The discipline and rigour of drawing up and implementing a WSP is a huge commitment and something water suppliers may be reluctant to do. Francisco Arellano, who leads Maynilad’s WSP team, says his argument to senior bosses was simple. “I said it was something we had to do whether we liked it or not. Our business is water, and if you want to stay in business you must have a plan to protect the quality of water. If you lose the faith and confidence of your customers, you’ve lost the business.”

Wastewater treatment is vital to prevent further contamination of rivers, an important source of future water supplies





State of inter-dependence

Manila Water's six million customers are healthier and wealthier thanks to the much-improved water supply system devised in partnership with the community. With demand increasing the challenge is to tackle chronic river pollution

Maynilad and Manila Water share the same water source. Water flowing from the Ipo Reservoir is split between the two providers near La Mesa Dam, with 40% going to Manila Water and 60% to Maynilad, reflecting the proportion of Manila's population that each serves.

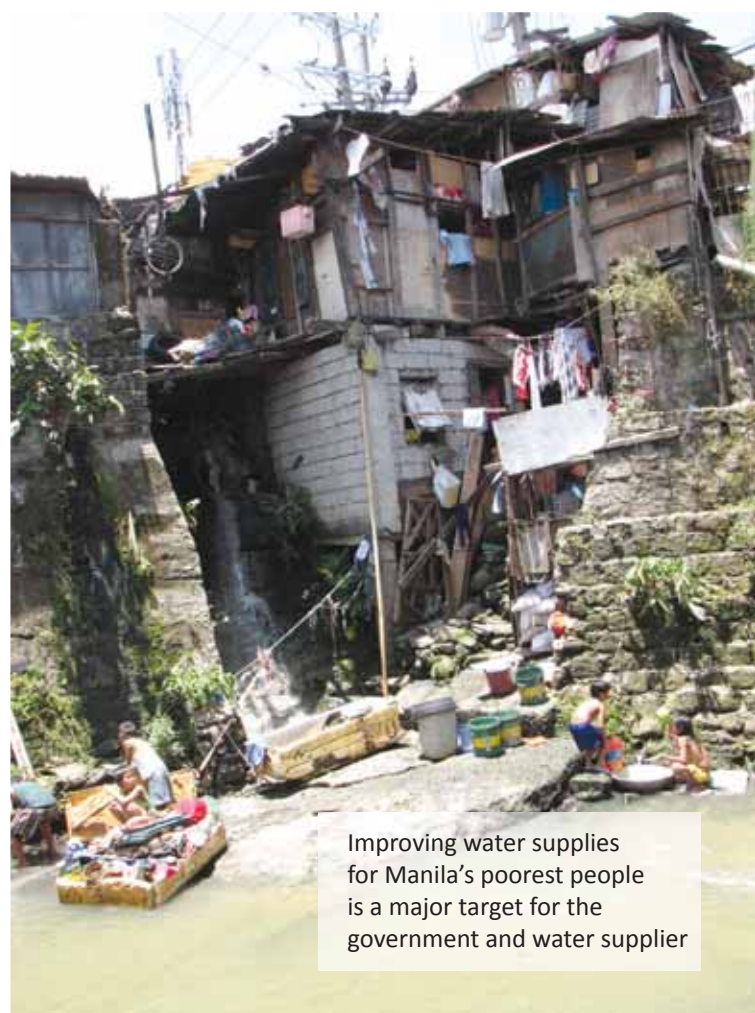
When Manila Water took over the East Zone concession in 1997, nearly two-thirds of the water that it treated was lost in the distribution system. The company recognized that this posed a major threat to water safety. Not only were customers being denied the water they needed but their supplies could be contaminated through leaks. It also hampered the company's ability to connect more people safely because higher demand further lowers the pressure in the system, heightening the chance of contamination by ingress. Leaks were repaired and new pipes laid – 3400 km to date. Faulty or inaccurate meters were removed and more reliable ones installed. However, tackling the losses caused by illegal connections proved more difficult.

Just as with Maynilad the solution came through working with local people. Manila Water entered partnerships with communities under its “Tubig Para sa Barangay” (Water for the Poor) programme, supplying safe water to individual households, who pay for their water consumption based on separate meter readings. This initiative

“We are mandated by the regulator to meet particular target for water service connections. But of course we also understand the plight of the poor. While we still make money we provide water that is safer, cheaper and easier (to access) than before.” Roy Gonzaga, Business Zone Manager

has resulted in community members paying significantly less than they were to private sellers. “It dramatically reduced losses,” says Manila Water’s Cubao Business Zone Manager, Roy Neil Gonzaga. “Before, syndicates would illegally tap into pipes and sell water for huge profit. They would do everything they could to delay a community’s application for a proper supply. However, by partnering with communities we were able to make them aware that illegal tapping can contaminate supplies and endanger health. Communities also realized they were paying far too much for water from illegal sellers and they could have a cheaper, more reliable and more convenient supply by working with us.”

Saving money, spending less time collecting water and being healthier have allowed communities to become more productive and has led to an increase in disposable incomes. “We used to pay around 200 Pesos a month for water,” says Ophelia Abante, a leader of the K-J Community in Quezon City, one of several cities in Metro Manila benefiting from the Tubig Para sa Barangay Programme. “We could spend as much as 20 Pesos in a single day if we were doing laundry. But now a typical family pays just 70 Pesos a month in total. It’s made a big difference to us as we no longer get tired having to fetch water and at the same time it helps that we’re paying less.”



Higher incomes mean more families are now able to pay the connection charge to have water piped directly into their homes, a luxury few ever imagined. Manila Water has doubled the number of customers since privatization to some six million people. The company allows customers to stagger connection payments and has secured subsidies to make fees more affordable. “We are mandated by the regulatory authority to meet particular targets for water service connections,” says Gonzaga, who spends several days a week liaising with the local communities in his business zone. “But of course we also understand the plight of the poor. While we still make money, we provide water that is safer, cheaper and easier than before.”

Piping water directly to people’s homes increases water safety by ending the necessity to store water around the house which carries with it a risk of contamination. Water losses have been reduced to just 12%, a feat that has brought Manila Water international recognition and envious attention from water companies around the world. Customers realize that stolen water reduces supplies, increases their bills and can

Summary of good practices

Working with local communities at the source to address illegal logging, erosion and increases in turbidity.

Preparation of emergency plans at the treatment plant to address extreme scenarios on water quality. Repairing leaks in the distribution line and working with communities to minimize leaks and illegal connections.

Taking action regarding wastewater treatment to protect water sources, prevent contamination of water supply and expanding options for new water sources in the future.

cause contamination, so communities are vigilant and readily report criminality.

Manila Water began developing a WSP in 2008. While the company had been implementing many of the ideas and practices of WSPs for a number of years, going through a formal process of review facilitated by international experts engaged by WHO highlighted gaps and inconsistencies. "Overall, the WSP helped us to take a holistic approach," says Environmental Compliance Manager Regina Tribaco. "It allowed us to look at the bigger picture of what improves water safety. What we try to do downstream can be ineffective or useless if upstream issues are not resolved and vice versa.

The WSP identified that a growing risk comes from stress on existing supplies. Demand is increasing and so new sources of water need to be found. But with so many rivers chronically polluted through household and industrial waste, options are limited. So while the emphasis of regulators and utilities has previously been on the delivery of safe water, increasing attention is now being paid to wastewater treatment. It's about expanding the sewerage network and increasing the treatment of sludge from septic tanks to reduce

the amount of raw sewage entering the capital's rivers.

"We primarily treat wastewater because we want to protect and rehabilitate our river systems," says Graziel Aranza Mendez, the Manager at Olandes Sewage Treatment Plant on the banks of the Marikina River. "If we have more customers then we'll have the problem of where we'll get water supplies from. By protecting all our river systems these could eventually become our new water sources. It is part of our sustainable development advocacy - we treat what we provide to our customers."

Antonio Magtibay, Luzon Area Manager of the Local Water Utilities Administration, which has been championing WSPs across the Philippines, says other water companies should follow Maynilad and Manila Water's lead: "A WSP should be implemented on a very specific basis," he says. "There should be a thorough analysis of the needs of a certain water utility, of a certain municipality, so that the plan can be customized to their needs and can be responsive to promote a healthy community through their water service. It means going to the specific parts of the water supply system – raw water, how water is transported, how it is stored and treated, and their practices in service delivery to households. That's a lot of things to be looked into. And the water utilities are not always the same – each one is unique."



Manila Water has laid and repaired thousands of kilometers of pipe to reduce leaks and contamination



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