



VIET NAM



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WSPs include ensuring treatment plants are safe places to work in

Keeping up with the pace of change

Viet Nam's boom is posing major challenges for safe water supply

For the last decade Viet Nam's economy has grown at an average of 7% a year, a rate which many predict is set to accelerate. Industry and services now account for over 80% of GDP. This rapid growth and change has brought immense benefits, but has caused big problems for water supply.

Water companies struggled to keep pace with the volume of demand and the desire for new

connections created by massive urban expansion and suddenly found themselves overwhelmed.

Today, four out of 10 families in Viet Nam's biggest cities are not connected to a central water supply system and only one in three towns in the country of 87 million people has piped water. Even where there are piped networks, 30–40% of water is typically lost through leaks. With no sign of urban migration slowing, water companies are under immense pressure to deliver more water, of better quality, and quickly.

Much of Viet Nam's recent economic success can be attributed to liberalization, with the socialist state's highly-centralized planned economy of the 1980s giving way to a left-leaning market economy. Water companies have become more autonomous and, while still government-controlled, are more innovative and flexible. They can seek finance and investment from banks as well as donors and make independent decisions based on local needs. They are run as stand-alone businesses and are not a burden on central government resources.

The quality of raw water is deteriorating as rivers and groundwater become increasingly contaminated and polluted

There are 68 water supply companies in Viet Nam, 30% of which are designing and implementing Water Safety Plans (WSPs). The government has issued regulations to make WSPs mandatory, with each company having to form a multi-disciplinary committee to engineer the plan as well as committees to tackle leaks and losses in the distribution system.

The regulations are part of a raft of legislation covering the environment, agriculture, industry, natural resources and health, which have a direct impact on water quality. However, enforcement is weak and government agencies' actions are not always coordinated or in step with the pace of change. The quality of water is deteriorating as rivers and groundwater become increasingly contaminated and polluted.

The Government reports that only 105 of the 260 industrial parks in the country have systems to treat wastewater and it plans to crack down on those violating environmental protection laws. However, with many factories pumping waste into rivers using outflows hidden beneath the surface, often under the cover of darkness or heavy rain, finding the culprits can be difficult. And there

is no great incentive for companies to reform as penalties tend to be relatively small.

Hundreds of thousands of smaller industrial sites around the country have no treatment facilities at all. At a domestic level only 10% of wastewater is treated with the remainder discharged into channels and rivers, while few hospitals and clinics, even in the biggest cities, have facilities to treat waste safely, making them potentially a major risk to public well being.



Pollution is destroying rivers and compromising raw water quality. Many fishermen have lost their livelihoods, residents endure a foul stench and crops grown on once fertile riverbanks are contaminated. In recent years there have been regular outbreaks of cholera and diarrhoeal disease across the country which have been traced back to unsafe food.

The issue of deteriorating raw water quality makes WSPs all the more important. The ability to identify risks and prioritise investment to manage those risks means that despite the challenges, water companies are winning the battle to supply more safe water to increasing numbers of people. Companies are spending or planning to spend billions of dollars to improve drinking water and sanitation – a scale of investment that is beyond government resources.

The Asian Development Bank, for one, recognizes that companies that have gone through as rigorous a process as a WSP are likely to be well managed and have a clarity of purpose, so investments will achieve maximum impact. In May 2011 the bank announced US\$ 1 billion of funding to improve clean water access for three million families living in cities in Viet Nam, including support for half a million poor households to enable them to receive a piped water supply.

The government's aim is that 90% of the population will enjoy piped water by 2020, with everyone in the country covered five years later. It is an immense challenge, but one that water supply companies are tackling head-on to bring life-changing results for Viet Nam and its people.





State of the art technology means water quality can be precisely measured at every point in the system

Dealing with massive demand

Changing times call for dynamic thinking and decisive action

Located between Hanoi and the main northern port of Hai Phong, Hai Duong is experiencing exponential growth thanks to its steel processing, car assembly and paper industries.

Four years ago the Hai Duong Water Supply Company (HADUWASUCO), was delivering water to every household in the city and surrounding area, but this has dropped to just 70% coverage as people and industry flock to the area. The company plans to connect 90% of households by the end of 2011 – upping it to 100% shortly afterwards - as it launches more treatment plants and increases its distribution network.

“The Water Safety Plan has enabled us to gain control of water quality,” says Tran Quoc Khanh, who is Vice Director and head of the WSP team at the company. “We can control the quality of source water from the river, the quality of processing, the quality of output and the quality in the pipes. It’s all thoroughly documented so the management board can track progress and develop a strategy.”

The source water probably represents the chief challenge. The source water of HADUWASUCO is mainly from the Thai Binh River, a busy shipping route suffering the same quality issues (high levels of chemical fertilizer and pesticides from agriculture, animal waste from intensive farming, increased turbidity levels from sand and gravel mining and high concentrations of untreated household and industrial waste) as many other rivers in the country.

The authorities have only just started to take this pollution seriously following lobbying from the company, complaints from residents and reports in the media. Provincial leaders have now issued decrees against the dumping of wastewater and government agencies are now starting to act.

Although the escalating pollution compelled the company to close down its first treatment plant on the banks of the Sat River, 17 km from the center of Hai Duong, the firm is now rapidly expanding to more than double the number of households served nine years ago to 70 000 today and upping its annual treatment capacity from six million m³ to 15.6 million m³. By the end of 2011 capacity is expected to reach 18.5 million m³ when a US\$20 million state of the art treatment plant and improved distribution system is launched.

“It has been a wish for many generations and many staff to have a modern facility to guarantee the water supply to Hai Duong City. We call it a once-in-a-century construction project for the city,” says HADUWASUCO Chairman and General Director Nguyen Van Doan.

Planning for the new facility began around 2006, when the company was the first in the country to be invited by the WHO for WSP training. “Before we implemented the plan our focus wasn’t always on water quality and our strategy could lack direction,” says WSP team head Tran Quoc Khanh. “But now there is much greater clarity and coordination, with checks and safeguards to maintain quality and ensure our growth is sustainable.”

“Before the WSP there were several instances where water quality was below standard, perhaps due to broken, leaking pipes or low pressure. Since implementing it we’ve had no such problems.” Dr Dang Van Nhang, Preventative Medicine Center



Keeping pipework above ground makes maintenance easier

One example of greater coordination is the inclusion of a representative of Hai Duong’s Preventative Medicine Center on the WSP committee to help ensure water quality remains consistently high. When cholera has broken out each summer for the past four years in Hai Duong, the health authorities have secretly tested water supplies across the distribution network and received negative results, subsequently tracing the outbreaks to contaminated food. Dr Dang Van Nhang from the Preventative Medicine Center believes the



WSP has been instrumental in ensuring water supplies remain safe at such critical times. “Before the WSP there were several instances where water quality was below standard, perhaps due to broken, leaking pipes or low pressure,” he says. “Since implementing the WSP, we’ve had no such problems.”

Fixing leaks is one of the main tasks the company has set itself. In 2000, non-revenue water (water that is lost or unaccounted for) stood at 45%. Today, that is down to just 16%. It is an ongoing battle, with pipes regularly

damaged by widespread construction work. Until this year, technicians were only able to spot leaks in underground pipes when water rose to the surface, but now they are using technology to detect problems. As a result of the WSP pressure gauges were installed throughout the distribution system to provide alerts to potential hazards, helping the company find many more broken pipes which, once fixed, reduce losses even further.

As well as improving water quality, reducing leaks has the added benefit of increasing revenues, especially in the summer months when demand for water increases by up to a third.

What’s more, simple measures to mitigate risks identified by the WSP, such as placing a boom and screen across water intakes to catch oil, animal carcasses and general debris have helped the company to reduce chemical usage. Constant monitoring of water quality throughout the treatment process has enabled it to optimize dosing levels. These measures have helped reduce costs, which along with the increased revenues, have enabled further investment in improving water treatment and distribution.

Pham Minh Cuong, WSP Team Secretary and Sales Department Manager, says that five years since its implementation, the impact of the WSP can be summed up in three points. Firstly, water quality has been improved by consistent monitoring and control. Secondly, all staff know the importance of managing the entire water supply system and thirdly, the WSP continues to identify shortcomings. In such fast-changing and unpredictable times, it will not be long before the WSP enables the company to supply everyone in Hai Duong with clean, fresh and safe water.





Step by step towards safe water for all

Tackling risks in a coordinated fashion and seeking long-term, progressive change is at the heart of HueWACO's plan to ensure safe drinking water.

Hue City is the old imperial capital of Viet Nam and is located in the center of the country on the banks of the Perfume River. As well as providing safe water to its growing number of residents as it undergoes rapid industrialization and urbanization, it needs to guarantee safe water for the increasing numbers of tourists visiting the UNESCO World Heritage site.

More than half (700 000) of Hue province's 1.2 million residents can drink water safely from the tap. The local water company, HueWACO, operates 16 water treatment plants with a daily capacity of 160 000 m³ and is developing further capacity to extend safe water supply into rural areas and the mountains. The company was introduced to the WSP concept in 2008 and quickly recognized it as the best way to achieve its goals, despite the high demands a WSP puts forth. "The challenges are many," says HueWACO Director Truong Cong Nam, "and the biggest is the shortage of funds. But by using the strengths we have and by taking a step-by-step approach, we are determined to overcome those challenges. If you don't start walking you will never get to your destination. So we have started walking."

Regular testing throughout the treatment plant is a key part of the WSP

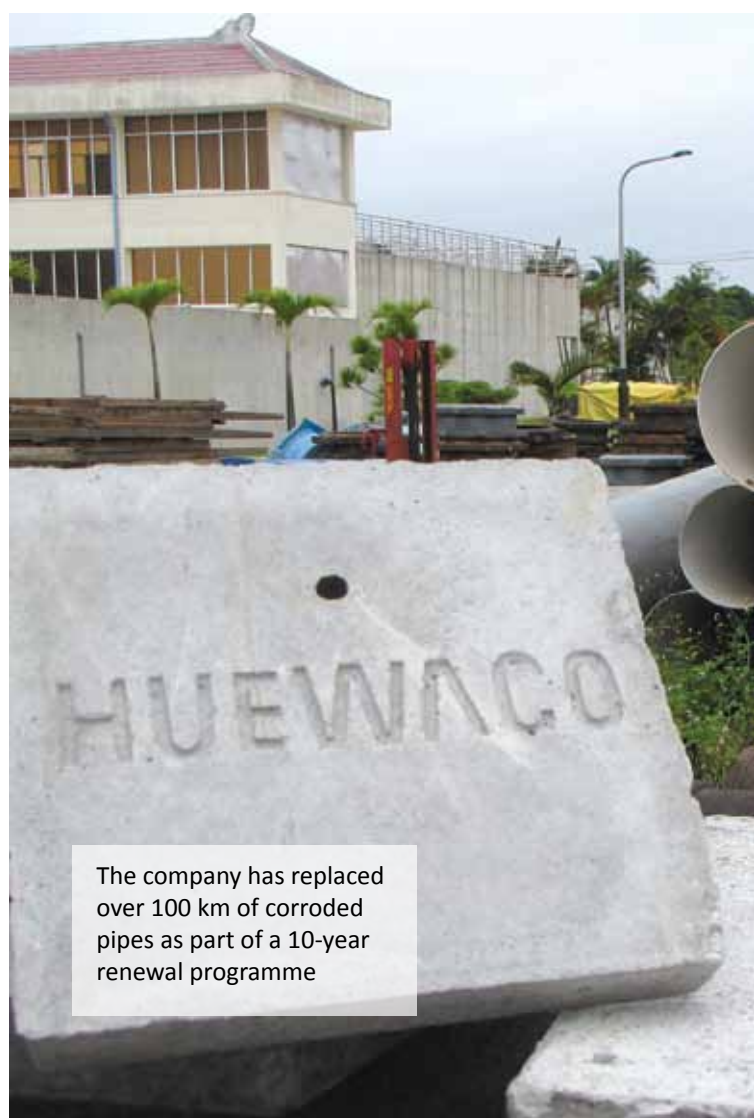
For instance, the company has embarked on a 10-year pipe replacement programme, so far removing 100 km of cast iron and low-grade steel pipes which were identified by the WSP as a potential source of contamination and leaks. In the process of designing and implementing its WSP it realized that setting clear objectives, laying out a long-term roadmap and being patient and steady was the best approach for improving water safety.

Again increasingly polluted water sources, growing demand and unpredictable future raw water supplies are the main challenges, but health burdens of the past are driving the company to find solutions. In the 1990s worms and diarrhoea were commonplace and in 1993–1994 a cholera epidemic made over 1000 people severely ill and resulted in a number of deaths. This led to demands for safer water and while there have been recent cases of waterborne disease in Hue, the source was poor sanitation in food preparation rather than HueWACO's water supply. But the company recognizes that while it appears on top of the situation, there is no room for complacency.

“We are particularly concerned with water quality in the summer, when water levels are low, and in the rainy season, when we have floods and water sources are easily contaminated,” says Hong Ha Tu, Deputy Director of the local Preventative Medicine Center and member of HueWACO's WSP committee. “Our solution is to check water sources and foresee any problems during treatment. We also enhance monitoring across the province and distribute chemicals to community health stations so that villages can treat their own water sources. If we find problems we can deal with them straight away.” Simple actions like these to prevent risks highlighted by the WSP help prevent the outbreak of disease, control its spread and keep treated water safe.

Water tariffs in Hue, which are among the cheapest in the country, mean that the company has to be very careful in the way it manages finances. By introducing a holistic approach to identifying, prioritizing and managing risk throughout the network, the WSP has helped HueWACO reduce costs, maximize income, increase investment and improve water quality. Non-revenue water is down to 14% and the company aims to reduce that to 10% by 2015. Despite electricity prices rising at around 15% a year, it has cut energy consumption without affecting water quality.

Chemical usage has also been cut thanks to better monitoring throughout the treatment process



The company has replaced over 100 km of corroded pipes as part of a 10-year renewal programme

and investment in new laboratory facilities. “We have an online system that checks water quality every 10 minutes in five treatment plants,” says Tran Thi Minh Tam, Head of Water Quality Control. “Our central lab analyses the data so that we can immediately understand water quality at different points and at different plants and can treat any problem immediately.” The company is also piloting an innovative system involving smaller, remote treatment plants sending in monitoring data via mobile technology to enable a comprehensive overview of quality across the entire system.

HueWACO encourages visitors to tour treatment plants to learn more about what it takes to



make water safe and about the dangers of polluting water sources. It gives regular talks in schools and distributes leaflets showing the waste caused by dripping taps and the potential dangers of storing water in tanks and containers. The company is the first in Viet Nam to have built public water fountains in parks and busy squares, which have created a buzz about the value of clean water.

Educating the public to change its ways is an important part of the company’s WSP and has helped to cut operating costs as well as played a key part in ensuring water sources remain viable and supplies safe in the future. Such tactics also aim to lower the burden on health services by having fewer people becoming ill and reduce domestic energy costs by persuading more people to stop unnecessarily boiling water, an old habit which is proving difficult to change. “I know that it is safe to drink from the tap,” says Tiuong Thi Thuy, a typical consumer who lives in a modern house with her daughter’s young family. “But if we boil water we just feel safer. The water company tells us the water is safe, but it takes time for people to change their ways.”

HueWACO will persevere, acknowledging that long-term, incremental change is as important as one-off major projects for ensuring water safety. So, for instance, efforts to help fishermen and their families move from living on boats to living on land, so reducing levels of untreated waste entering the Perfume River, will go hand-in-hand with building dams to reduce sea water intrusion into fresh water supplies. Consistently supplying safe water in a dynamic and rapidly changing environment is a challenge HueWACO is overcoming thanks to its WSP.



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