BRINGING WATER TO THREE TOWNS

A water supply and sanitation project in Vietnam has won an engineering excellence award from Engineers Australia Victoria Division.
The Three Delta Towns (3DT) Water Supply and Sanitation Project has won the Environment and Sustainability award at the Engineers Australia Victoria Division Engineering Excellence Awards.

The project is an $80 million program funded by the Australian Agency for International Development (AusAID) and the Vietnamese government, and managed by engineering firm GHD and its Vietnamese partner WASE.

The project provided clean water supply, toilets and sanitation to the towns of Bac Lieu, Ha Tien and Sa Dec and developed the capacity of local institutions and residents to manage these systems on a sustainable basis.

These three towns were chosen because of their rapidly deteriorating environmental health conditions, growing demand for clean water supply and appropriate sanitation, and their potential for economic development.

AusAID worked with the Provincial People’s Committees to coordinate the project with provincial-level management provided by Provincial Steering Committees and Project Management Units in each town.

The 3DT team comprised more than 50 Australians, Vietnamese and international specialists in water supply, sanitation and community development.

Water

The bulk of the funding, $60 million, was spent constructing water treatment plants to deliver safe drinking water directly to homes. More than 140,000 people in the three towns can now access potable water 24 hours a day.

Before the upgrade, river or canal water was the main source of water for drinking and cooking for many residents. The communities of the three towns were supplied with intermittent, low-pressure water supplies and also relied on rainwater. In the case of Ha Tien, the nearest source of fresh water in the dry season was 25km away, meaning water had to be trucked in.

In Bac Lieu and Sa Dec, about a third of households had no toilets, while that number was more than half in Ha Tien. Pit latrines, “fish pond toilets” (temporary structures built over rivers or canals) or defecation in fields was common, leading to environmental and health issues.

The project improved access to water by constructing boreholes, raw water intakes, raw water transmission mains, water treatment plants, service reservoirs and town distribution networks.

This included 30ML/d of new treatment capacity, 8.5ML of water storage, more than 250km of pipes, and 22,500 new water meters. In all three towns, treatment and disinfection, new treated water distribution mains and local reticulation systems have been provided, replacing systems that were old, leaky and becoming unserviceable.

While there is still a preference for rainwater in the wet season, there has been an increase in the proportion of households using piped water. The proportion of people using canal and river water for drinking and cooking has fallen by as much as 24% in some areas since the project began.

The number of households with toilets has increased by more than 60%, with more than 22,000 people benefiting from a loans scheme to help them install septic tank toilets.

Public toilets have been provided at bus stations, markets and other public places and education programs have seen a large increase in participation.
increase in sanitary practices, such as households providing soap for hand washing near toilets.

A Schools Sanitation Program provided funding for schools to upgrade or install toilets, urinals, taps and sinks for hand washing, drinking fountains and water tanks.

This program was carried by a consultative group which included the Town Education and Training Office, school staff and parents. These groups were involved in the process, from identifying needs and setting priorities, through to design and approvals for construction.

Priority was given to schools in poor or disadvantaged areas. The program assisted 30 schools to improve their sanitation facilities, benefiting more than 30,000 children and teachers.

**Drainage**

In Sa Dec, the drainage works were completed in April, while work will continue in Bac Lieu until the end of the year.

Many areas of Bac Lieu and Sa Dec lie below high-tide or regular flood level. These areas, mainly occupied by poorer residents, were prone to flooding during the wet season because the town’s drainage canals were not adequate. That is, they were not able to evacuate enough stormwater during times of heavy rainfall. In addition, only about 40% of the urban areas in Bac Lieu and Sa Dec were served by formal drainage and, in many cases, these drainage channels were heavily polluted and clogged with rubbish.

In Bac Lieu, 6.45km of covered and 4.45km of open canals are being built to the north and south of the Bac Lieu River. The project has also seen the rehabilitation of existing canals in Bac Lieu and Sa Dec. These important waterways have been cleaned and stone-lined to improve their carrying capacity.

Pipe drains were also constructed in both towns to enable stormwater to be transported during heavy rainfall. Two pumping stations are being built in both Sa Dec and Bac Lieu to enable stormwater to be lifted into the towns’ rivers.

New sluice gates will allow canals to be flushed out regularly with river water. This alleviates a major environmental problem for both towns, which have suffered the visual and smell nuisances of polluted and stagnant water.

**Solid waste**

The three towns had limited facilities for solid waste collection. Domestic waste was deposited and collected from the streets, and frequently ended up in the sea or canals, or dumped on vacant land or into local waste dumps. As a result, leachate seeped into the groundwater and polluted local crops. The tips themselves attracted rats and carrion birds.

Solid waste collection has now been extended to the core urban areas of all three towns. The project has provided local authorities with the equipment to offer effective waste collection services, including compactor trucks, 60L plastic bins and collection pushcarts.

Existing, uncontrolled waste dumps are being replaced with new, sanitary landfills which will be large enough to meet the needs of the towns until 2020. These landfills have facilities for collecting and treating leachate so that it can be safely discharged into the local drainage system. This will help to protect and improve the environment around the landfill and the quality of the local groundwater.
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The new sites also allow for separation of hazardous waste from general waste. The new facilities in Sa Dec and Bac Lieu were commissioned last year and the landfill in Ha Tien is expected to be completed this year.

Sludge produced in septic tanks and at the water treatment plants is collected by vacuum trucks provided by the project and taken to new sludge treatment facilities located at the landfill sites.

In addition, medical waste incinerators have been provided to Bac Lieu Hospital and clinics in Ha Tien. Previously, potentially hazardous medical waste was dumped at the local tip. More than 90% of households now say that their area is cleaner than it was five years ago. Households are disposing of their waste in bins instead of on the street, and even before the landfill sites had been fully commissioned the number of people using the solid waste collection system had doubled. This has reduced the amount of rubbish that is burned or thrown into canals.

Reported benefits

The project has enhanced the wellbeing of more than 280,000 people in the Mekong Delta region of Vietnam. The benefits of clean water, good hygiene and sanitation are reflected in health statistics. In Ha Tien, the number of reported cases of diarrhoea fell by 270% between 2005 and 2007, and the incidence of diseases such as typhoid, cholera and malaria fell by more than five times.

The coverage of water supply in urban areas has risen to 75% with a target of 95% coverage by the end of this year. New connections have been installed to about 28,000 households, or 140,000 people.

Local water companies provided free or subsidised connections to assist the poorest and most disadvantaged households, including those headed by women.

The project has improved the environment and reduced the incidence of water-borne illnesses. A recent survey of households showed a 75% decrease in diarrhoea and eye and skin-related problems, a 90% decrease in women’s gynaecological problems and a 95% reduction in internal worm problems.

A growing region

Tong Kim Quang, chairman of the Sa Dec Town People’s Committee, said the project has allowed the town to meet the demands of growing industries. Water supply capacity has increased from 8ML/d to 20ML/d, and an expanded distribution network is delivering water to suburbs where agriculture is an important industry. “Without this capacity, the water demand could not be met,” Quang said.

Quang expects the population to increase from 110,000 to 150,000 by 2020. But he and others associated with the project agree that the true impact has been felt at the most basic levels of the community – in homes and communes where dirty water and fish pond toilets are now a thing of the past.

One of the most successful, and lasting, aspects of the project has been a micro credit loans scheme set up to enable households – particularly those in poor areas – to construct septic tank toilets. Established with less than $100,000, the Sanitation Credit Scheme, administered by the local Township Womens Unions (TWUs), has resulted in the installation of more than 4400 toilets in households across the three towns.

Le Thi Hao, the 3DT community development project officer, was involved in developing the Sanitation Credit Scheme,
in consultation with TWU representatives and members of the community. Families, some of whom earn less than $40 a month, were consulted on how much they could afford to pay. Following this, a framework was established to invest half of the interest earnings to increase the loan capital available, allowing the scheme to continue and expand independent of the project.

Under the scheme, households borrow about $210 and pay the money back to the TWU over one to two years at a rate of about 1% interest.

The scheme has also provided training to local tradespeople and small-scale enterprises to strengthen the supply of toilets. In Ha Tien, this scheme has been extended to assist poor households to meet the cost of water supply connections.

The Sanitation Credit Scheme also provided loans to households in Sa Dec to purchase biogas units to process livestock waste. The units turn waste – mainly from pigs – into a mixture of methane and carbon dioxide that can be used for cooking and lighting. The waste is channelled into a sealed tank where it ferments and is naturally converted into gas and compost, resulting in more sanitary conditions at home. More than 130 units have been installed in Sa Dec.

In other funding initiatives, the program provided grants for small-scale urban upgrading initiatives and funding for school facilities. The Vietnamese Government and the beneficiaries of the program each provided 20% of the cost of the initiative, with AusAID providing the balance. More than 450 projects resulted from these activities, including 40,700m² of neighbourhood pathways and 6km of drains.

Micro-activities were included as a way to get communities involved in making improvements at a local level, complementing the larger infrastructure works being provided by the project.

Community development

Town community advisory committees for improved community liaison and awareness were at the core of the community development program. These committees are all still operational. The program included the dissemination of health information; improved hygiene awareness and practices, particularly students’ knowledge on health and hygiene; development of environmental health micro-activities; school sanitation programs; and establishment of sanitation credit schemes for septic tank construction, and for biogas units in Sa Dec.

Achievements in institutional development included organizational strengthening; company development planning; financial planning; procurement of computers and software; strengthening of customer focus; improving management information systems; developing social awareness; improving facilities and equipment; increasing technical skills and operational efficiency; establishing septic tank management systems; and enhancing women’s roles and interests in the project.

Information, education and communication programs

Lastly, the 3DT project set up an Information, Education and Communication (IEC) Program to inform the residents about the costs and health benefits of clean water and sanitation.

IEC Core Groups were established in each town, comprising representatives from organisations including the TWU, Youth Union, Health Department, Town Education Office and Town People’s Committee.

The groups were responsible for planning, implementing and evaluating IEC activities in each town. Information brochures, posters and leaflets were produced about septic tank toilet opera-
The bulk of the project was spent constructing water treatment plants to deliver safe drinking water directly to homes.

A civil engineer with more than 40 years’ experience in the water sector, Povey found it satisfying to witness how the project has benefited the towns.

“This was a project about pumps, pipes and concrete, but the results are no better expressed than in the delight we saw among the children, their teachers and parents – you can’t beat that.”

This article is an edited version of GHD’s awards submission to the Engineers Australia Victorian Division Excellence Awards.