LAO PEOPLE’S DEMOCRATIC REPUBLIC
Lao People’s Democratic Republic is one of the poorest countries in South-East Asia. Mountainous and landlocked, it borders Myanmar, China, Cambodia, Thailand and Viet Nam. The magnificent Mekong River flows the length of the country and is an important source of drinking water as well as a major transport route. Some 80% of the country’s relatively sparse population of six million people are farmers who eke out a living on small parcels of land suitable for agriculture.

Cities in Lao People’s Democratic Republic tend to be small by worldwide standards and none have more than 100 000 people except the capital Vientiane, which has 750 000 residents. However, the government is preparing for change. The economy, fuelled by trade with neighbouring countries, is growing fast. Lao People’s Democratic Republic is rich in the natural resources needed by the expanding industrial might of China, Thailand and Viet Nam. The country boasts valuable deposits of coal, bauxite, tin, copper, gold and other precious metals. In addition, the abundance of water and the mountainous terrain enable it to produce and export large quantities of hydroelectric energy. Growing numbers of tourists are visiting too, attracted by the country’s heritage, dramatic scenery and relaxed pace of life.

Inevitably, towns and cities are expanding fast as the economy changes from subsistence agriculture to include these new activities and the infrastructure is struggling to keep pace. Some
water treatment plants and distribution networks date back to the French colonial era in the early 20th century and urgently need upgrading. The government is identifying key cities for growth and to meet such a surge in demand, it has to find ways to increase water supplies and distribution. But it has little money to invest itself. International donors are providing some funds, but not quickly enough to keep up with rising demand. Consequently, new ways to pay for the infrastructure that is required have been explored.

One solution in both Luang Prabang and Pakse is to seek private sector investment in water treatment and bulk water supply. In both cities the Nam Papas are pioneers in developing Water Safety Plans (WSP) and have identified that low pressure, due to a lack of capacity, is one of the biggest risks to health. Increasing the supply of treated water is a top priority. As the Lao economy is opening up to allow greater opportunities for the private sector, the government’s policy is to promote private sector participation in the development and operation of water supplies. The approach is providing urgently needed extra capacity. In addition, where local companies are used, such as in Pakse, there are spin-off economic benefits such as increasing know-how of local businesses and stimulating the local production of construction materials.

The arrangement is not without its risks. The Nam Papa buys the water in bulk and has to pay for it whether it uses it all or not. In addition, margins
tend to be low so any increase in distribution costs or reduction in tariffs could mean losing money. There can also be operational risks as under certain arrangements the Nam Papa runs the plant because only it has the staff with the necessary expertise.

The need for increasing safe drinking water supplies in Lao People’s Democratic Republic is acute and WSPs are helping the provincial Nam Papas to do just this. While in urban areas 72% of people now have access to improved drinking water sources, the proportion is just 51% in rural areas. For Dr Tayphasavanh Fengthong, the country’s Director of Environmental Health, the issue is fundamental to the country’s development. “Clean water is really important because it means people will have good health, will suffer less from waterborne diseases, can be more productive and have a good life. The WSP is a very important tool to help improve water quality in both urban and rural areas.”

Water supply has been decentralized and the 17 provinces each have a Nam Papa responsible for supply and distribution. Until recently, services did not stretch beyond provincial capitals but now there is an increasing focus on smaller towns and rural areas. This involves building new small town networks run by a branch office of the provincial Nam Papa. The Ministry of Public Works and Transport and the Ministry of Health encourage all water suppliers to have developed and implemented WSPs in all provincial capitals and half of all district towns by 2015.

That is a major step forward towards the goal of improving water quality across the country. The WSP journey for Lao People’s Democratic Republic began in 2006 when managers from the utilities in Luang Prabang and Pakse underwent training with government officials from the Ministry of Public Works and Transport. Together, they have spread the word across the country and have helped develop and adapt WSPs for the country’s particular context and challenges. Given the limited resources, WSPs are proving to be a vital framework in helping the country achieve the national target of supplying 80% of the population with safe drinking water by 2020.

The lives of Laotians are intimately linked with the country’s network of rivers
Luang Prabang was once the home of the Lao royal family and is steeped in history and tradition. Tourists flock to enjoy its calming atmosphere and see its many Buddhist temples and monasteries, which have made it a UNESCO World Heritage site. It is situated about 400 km north of the capital, Vientiane, where the Nam Khan River meets the Mekong and has a population of around 75,000 people.

It is one of the country’s success stories with regards to water supply. Luang Prabang Provincial Water Supply State Enterprise has about 8,550 domestic and commercial customers, and a connection rate of around 85%, the highest in the country. But maintaining safe supplies and increasing them to cope with growing demand, not least from the influx of foreign visitors, is a major challenge. The WSP developed by the Nam Papa identified three main risks to water supply: the contamination of water sources, increasing turbidity and lack of pressure during the dry season.

Luang Prabang is fortunate in that one of its main sources is spring water from Phoupheung mountain. The quality of this raw water is good, though it deteriorates in the rainy season. It requires relatively little treatment, allowing water costs to be the lowest in the country. However, the amount of water from this source is finite and therefore supplies from the Nam Khan and Mekong rivers have to supplement it.

It’s a team effort in Luang Prabang to address contamination of water sources, increased turbidity and lack of pressure in the dry season.

Raw water is becoming increasingly turbid because of lack of regulation and enforcement in agriculture and mining.
As with surface water sources across the region, intensifying farming and industrial activity is raising the risk of contamination. More land is being cultivated and use of herbicides, pesticides, insecticides and chemical fertilizers is becoming more widespread. Increase in pH of the raw water has been observed. And the Mekong River Commission’s water quality report card shows an increase in human impact on the river since 2003. Illegal mining has also been a major issue, leading to worrying levels of cyanide and heavy metals such as mercury leaking into rivers. To counter the threat of contamination, the Nam Papa has been liaising with other government agencies to prevent the excessive application of chemicals by farmers and to shut down illegal mines as well as those that fail to meet the required environmental standards.

Soulith Chindamany, the Director of Luang Prabang Provincial Water Supply State Enterprise, says a joint approach, which means the WSP team includes members from wide ranging government departments, is vital to their success. “We have the involvement of organizations which have concerns in areas such as the environment, sanitation and public health. It is important that we work together because it’s the best way to ensure water sources are preserved and we all get what we want, which is clean water.”

“The first step in a WSP is to have the right people,” says Buaphanh Viliasane, the Nam Papa’s WSP team leader. “If your people don’t have the right knowledge, they can’t implement a WSP. You also need to allocate the right people for the tasks. If you do this, you can achieve a WSP.”

The loss of tree cover in the catchment area through deforestation and agriculture has resulted in large quantities of soil being washed into the water during downpours. This has meant higher turbidity levels – up to 10 000 NTU in some cases – and water remaining turbid longer. As a result extra chemicals have to be added during treatment, and treatment time extended. The Ministry of Agriculture, liaising with the WSP team, is working with farmers to reduce run-off from cultivated land and to establish commercial tree crops, such as rubber and teak, to stabilize the ground.

The design capacity of the Phanom treatment plant, which takes water from the Nam Khan, is 6000 cubic meters a day, but when raw water is good that can rise to 1.5 times that. A new treatment plant is being built alongside the

Simple measures can go a long way towards reducing risk in supplying safe water to consumers.
existing one to help tackle the third major risk identified by the WSP - low pressure. The new plant is expected to improve the treatment of turbid wet season water and increase the pressure and reliability of supply in the dry season when some customers’ taps run dry. However, even this new plant is insufficient to keep up with demand, so the provincial administration has signed a deal with a Thai company to build another treatment plant to supply additional bulk water to the distribution network. In the first deal of its kind in Lao People’s Democratic Republic, the Nam Papa will buy treated water at a set price. The plant, which will have to prepare its own WSP, will be managed by the company for 40 years and then sold to the Nam Papa at the depreciated market price.

The developments in Luang Prabang have been closely watched by Phongnala, Head of Xieng Ngeun Nam Papa Branch Office. He sits on Luang Prabang’s WSP team and takes the lessons learnt back to his district, which lies 25 km to the south. All 16 villages there, which are home to 11 000 people, are due to have piped water by 2012—a major achievement for a small town. There is anecdotal evidence that cases of diarrhoea and other diseases are already dropping in the district.

“The lessons learnt from the WSP in Luang Prabang are very important for our branch office,” says Xaysithisouk. While we have always tried to improve quality, now we have the WSP we are being more thorough, are better prepared and can deal with problems before they happen. The key lessons have been to keep everything clean and well-maintained, to repair leaks as soon as possible and to be rigorous about testing. And we’ve also learnt that to be successful, a WSP has to be implemented on a daily basis.”

The examples of Luang Prabang and Xieng Ngeun show that even when resources are limited, innovative thinking and WSP implementation allow more and more people access to safe drinking water.
The building of privately funded treatment plants is gathering pace to meet growing demand for safe water.
Pakse’s five year old WSP is now being revitalized to cope with changing demands and risks, while a local businessman is investing in a new treatment plant for the district.

Pakse holds the distinction in Lao People’s Democratic Republic of being the first city to have a WSP. It was launched on 27 February 2006 by Champasak Provincial Water Supply State Enterprise in a first push by the government to improve drinking water quality across the country.

Pakse is one of 10 districts in Champasak Province and lies on the Mekong River in the south of the country close to the Thai and Cambodian borders. The city has been earmarked for expansion and is growing at around 3.5% a year. Building work can be seen everywhere, particularly around the central market where there are hundreds of stalls selling clothes, jewelry and household goods, a food market where fresh fruit and vegetables, meat and fish can be bought, and an enormous food hall serving meals from early in the morning and throughout the day. Of the 67 000 people living in Pakse, around 59 000 are connected to the piped water network, though low pressure means there are times when some have limited supply.
The first water treatment plant was completed in 1973 and draws raw water from the Mekong River through an intake tower. In 1992 a second treatment plant was built next to the first upping capacity to 15,000 m³/day. The Nam Papa estimates that peak demand now is around double that, leaving a huge gap in supply. Bids to donors have been unsuccessful, so the Champasak Provincial Administration has turned to the private sector.

A local businessman is now constructing a treatment plant on the Bolavan Plateau, a fertile plain to the east of Pakse, and this will meet demand by doubling current supplies. The Department of Housing and Urban Planning’s Deputy Director General Noupheuak Virabouth, who has been involved in WSPs in his country from the beginning, says such arrangements are currently the only realistic way to increase supply. “This plant will be the biggest ever built by the private sector in Laos,” he says. “Demand is greater than we can cope with and we hope that by mid-2012 we’ll be providing water to every citizen in Pakse.”

This new source addresses a key risk identified by Pakse’s WSP. The water intake for the existing treatment plant lies just 100 meters downstream from the city centre from where untreated waste water continuously flows into the Mekong River. The outflow from the market is of particular concern, as it contains large volumes of organic pollutants, including blood from butchers’ stalls, as well as waste from chicken and fish sellers.

“If other provinces come to us asking about a WSP I would say it is a model to improve water supply in a modern way. At the beginning it looks hard because it’s new but once we started we saw it was our usual work, only that we had to pay more attention to maintenance and increase the frequency of every task.”

Intong Phanthanivong, General Manager Champasak Nam Papa

The Nam Papa is in discussion with the urban authorities through the preparation of an urban development plan to find a long-term solution. In the meantime it has increased the level of monitoring at the plant and throughout the distribution system. Turbidity and residual chlorine levels are closely watched and immediately dealt with if they stray outside set parameters. Screens and filters are cleaned more regularly and the plant has built up its stock of spare parts. It is all indicative of another important outcome of the WSP – a general increase and awareness of preventative maintenance.

When mapping the whole supply chain – a process which took three months and which is a key element of a WSP – Champasak Provincial Nam Papa discovered that maintenance was being neglected. Many valves had been buried,
mostly due to the inconsiderate construction of houses and roads, leading to corrosion and a risk of failure. All 61 buried valves were excavated, eight were replaced due to damage, and all had concrete chambers built around them. It means that it is now easier to manage shutdowns and repair leaks. Access doors to storage tanks have been checked for corrosion and are now kept locked to reduce the possibility of contaminants entering. The intensified maintenance regime has helped reduce non-revenue water to under 20%.

As well as reducing the risks to safe water supply, Champasak Provincial Nam Papa has found that carrying out more maintenance has helped it save money over the longer term by extending the lifespan of equipment and reducing the need for costly replacements, important considerations when money is so limited. “If other provinces come to us asking about a WSP, I would tell them that it is a model to improve water supply in a modern way,” says Intong Phanthanivong, the General Manager of Champasak Provincial Nam Papa. “At the beginning it looks difficult because it’s new, but after we started we saw it was our usual work, only that we had to pay more attention to maintenance and increase the frequency of every task.”

Champasak Provincial Nam Papa is re-launching its WSP in 2011 to take account of changing circumstances and the need to reprioritize risks. In the five years since its launch, the pioneer of WSPs in Lao People’s Democratic Republic has come a long way in improving the quality and distribution of water and is confident that, with the new treatment plant to look forward to, people in Pakse will enjoy even better service in the future.
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