CASE STUDY

Twinning Works for Water PNG
TWINNING WORKS FOR WATER PNG

As the final session of the annual 2010 Pacific Water and Wastewater Association conference on twinning drew to a close, the then head of Water PNG (Papua New Guinea), Patrick Amini, turned to Jim Keary, general manager of Australia’s Hunter Water utility, and said “How about we twin?” And that was the beginning of another Asian Development Bank (ADB)-sponsored twinning initiative aimed at improving the performance of one partner by learning from the expertise and best practices of the other.

Water PNG provides water and sanitation services in rural PNG in 20 provincial towns, of which Lae is the biggest. Overall, Water PNG has close to 30,000 service connections and estimates the population served at about 350,000.

Water PNG has difficulties in fulfilling its mandate because of water availability, difficult hydraulic conditions, customer reluctance to pay, and weak management information systems. Consequently, in teaming up with Hunter Water, regarded as a leading water utility in Australia, Water PNG signaled its priorities, which were to achieve consistent water quality testing, reduce nonrevenue water, enhance asset management, and prepare a master plan for Lae. These challenges are familiar to many water utilities but the Water PNG situation was made tougher by having a country-wide mandate and operating several independent systems.

WATER QUALITY: TOP PRIORITY

Work began in earnest in July 2011 when Hunter Water sent Andrea Swan, the company’s water quality expert, to Lae. She mentored Water PNG staff of the Lae Operations Division on conducting a quick diagnosis of water quality practices, facilities, and results. One challenge was the need for a good laboratory, and the favored option was to build one—an expensive proposition. A breakthrough came in discussions with the local university (Unitech) testing laboratory in Lae. Unitech offered to move to full accreditation of their testing services so they could provide Water PNG with the services they needed.

With quality testing facilities in place, Water PNG has been able to implement a monitoring program compliant with World Health Organization (WHO) Guidelines and PNG Department of Health. They also carry out regular monitoring as required by regulators, report the results to regulators in a timely manner, and are responsive to any water quality issues raised.

Sampling methods and equipment used in the field by the operators were also assessed. It was found that, with updated equipment, field testing could be carried out more accurately. Subsequently, five field test instruments were purchased and commissioned. Now, field testing provides real-time results so operations staff can immediately fine-tune treatment processes.

TACKLING NONREVENUE WATER

The second priority was water losses or nonrevenue water (NRW). It was not practical within the time frame of the partnership to tackle this problem across all Water PNG’s locations; priority was given to the biggest—the City of Lae, where NRW was reportedly 30% of the total supply. More robust testing showed that NRW was, in fact, 46%. At least with a confirmed starting point, Hunter Water and Water PNG could embark on a remedial program. This involved:

- calibration of input flow meters,
- survey of existing meters,
- assessment of meters’ serviceability,
- replacement of failed meters,
- re-establishment of zone metering,
- upgraded operating procedures, and
- training and mentoring.

After only 3 months, NRW was cut back to 35%, but the chronic practice of illegal connections continues to plague NRW reduction efforts. Nevertheless, the NRW program in Lae demonstrated what was possible. Next, similar remedial programs were tried in Madang, Mount Hagen, and Wewak. Like Lae, the first step was to assess actual NRW levels. Madang was losing 32% of supply through NRW, Mount Hagen 54%, and Wewak 32%.

As in Lae, similar contributing factors—failed meters, illegal connections, and more—were encountered. NRW reduction teams were set up, an action plan drafted, and deadlines set. As a consequence of these actions, by December 2013 the NRW results in the three provincial towns began to noticeably improve, resulting in revenue gains for the utility and better service for customers.
MANAGING ASSETS BETTER

Hunter Water originally went to Lae with the intention of reviewing Water PNG asset management practices. But their priority became finding out why the assets were not performing as designed—all the reservoirs were empty and had not filled for many years. Initial investigations were complicated by a lack of data and instrumentation. Even pressure gauges were not working. They found that the operational practices at the main water pumping station were not appropriate, and the existing pumps could not meet demand. Pumps were also badly worn due to cavitation caused by the inappropriate operational practices and poor maintenance.

Fortunately new senior staff had been appointed at Lae, who were receptive to change and recognized that maintenance and equipment renewal were needed. Over time, new pumps were installed, some of the existing pumps were refurbished, and new pumping rules put in place. The outcome was that the major reservoirs serving Lae now operate properly and store water for supplementing supply in peak times. Customers enjoy an improved and more secure water supply. Storage of water in the reservoirs has allowed Water PNG to review the operation of its back-up generators and reduce power costs.

Not only have assets been replaced or rehabilitated but also all assets are recorded in Water PNG’s asset register. While the priority for the new maintenance staff has been to rectify defective equipment, they have started using the asset register to progressively schedule maintenance tasks for the new and rehabilitated equipment, based on advice from their suppliers and Hunter Water.

Safety issues identified during the twinning are also being addressed, such as replacement of switchboards and implementing improved work procedures for confined-space entry.

New staff were key to the improvements in asset management. Those appointed at Lae, like Raka Taviri, Imbu Palya, and John Wavimbukie, recognized the need for change and were prepared to lead the process.

MASTER PLANNING

Water PNG’s other priority in the twinning, a master plan for Lae, was long overdue. The last major upgrade of the water supply system had occurred a decade ago and parts of the sewer network were already operating beyond their capacity. With considerable growth in Lae, it was very important to plan for the future. Hunter Water, with Water PNG, prepared a brief for preparation of the master plan, composed of four parts: water sources, water distribution, wastewater collection system, and wastewater treatment.

Water PNG is now preparing the master plan. A hydraulic model of the Lae water supply system was developed, which aided the design of the water distribution component of the plan. Recommendations from that plan are already being implemented, such as the purchase of two new, larger low-pressure pumps. Water PNG has started work on the remainder of the master plan, which will deliver better services for the people of Lae in the years ahead.

BENEFITS OF UTILITY PARTNERSHIPS

The Water PNG–Hunter Water partnership has delivered tangible results that will live on well beyond the twinning period. These benefits not only accrue to the organizations but also to the individuals who took part. Here is what Raka Taviri, current CEO of Water PNG, had to say:

“Water PNG is facing major challenges and the twinning with Hunter Water has allowed us to make gains far quicker. The Hunter operations and technical specialists communicate easily with our staff and we will continue down this support path as it is the best way forward.”

Likewise, Hunter Water has demonstrated its community service commitment by contributing in a very constructive way to Water PNG’s service delivery. Hunter Water team members gained great job satisfaction from being able to share their collective knowledge in a quite different working and cultural environment. Alan Thornton of Hunter Water pointed out:

“The experience of working as part of the Water PNG team delivering services to people in PNG is a highlight of my long career and the best way to build capability, as real learning comes from a hands-on understanding of the situation on the ground and having work colleagues who trust you. Success helps a lot as well.”
SUCCESS FACTORS IN WATER UTILITY TWINNING

The success factors in water utility twinning are generally known. When the two potential partners first meet, the likelihood of those factors being present is assessed by ADB facilitators, which provides assurance that the relationship is worth pursuing. Both partners also sound one another out about their objectives and commitment.

The Water PNG–Hunter Water partnership confirmed some of these key success factors:

• Commitment from the respective leaders of the two utilities.
• Job interest of recipient utility staff engaged in specific targeted tasks with a keenness to learn, adopt, or adapt.
• Willingness of the mentoring utility to release experienced staff with both the technical and managerial experience, and able to handle cultural and operating differences.
• Realistic work program, allowing sufficient time to build trust, absorb lessons, and implement change.

• Setting improvement targets as a professional way of working together, with the added benefit that achieving targets verifies the value of the partnership to all stakeholders.

Implicit in this is the need for trust and respect between the two utility organizations. Hunter Water’s Jim Keary said:

“Understanding how Water PNG operates and getting to know the key people and win their trust so we could work together took time and is not something that is easily put into a work program of activities and deadlines.”

Trust depends in part on frequent communication. Water PNG visited Hunter Water operations on several occasions and Hunter Water went to PNG on six short visits during the work plan period. One well-received arrangement between them was video conferencing used as a disciplined way of reporting progress and holding discussions while maximizing the use of time.

TWINNING BENEFITS FOR WATER PNG

• Achieved consistent water quality testing
• Nonrevenue water reduced by 10%
• Defective assets replaced or refurbished
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• Preparation of a master plan for water sources, water distribution, and wastewater collection and treatment.

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A DB’S ROLE AS FACILITATOR

ADB established its program, Water Operators Partnerships in Asia and the Pacific, to share knowledge and build the capacity of water utilities. The approach is to bring together an experienced, efficient water utility (the mentor) and a utility needing help to deliver better services (the recipient). The goal is to enable the recipient to improve services, financial stability, and other critical aspects of its operational performance by adopting best practices of the mentor.

Both utilities in a partnership freely invest executive and staff time in an agreed work plan. ADB provides the out-of-pocket costs associated with the exchange—the travel and accommodation costs for face-to-face meetings and field visits.

ADB’s facilitators can give advice on work program feasibility and moderate expectations, and encourage the partners to develop ways of working together best suited to the circumstances. Since 2007, ADB has facilitated over 40 water utility partnerships.

CONTACT

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All photos courtesy of Jim Keary.