



Water and Sanitation Sector Road Map

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PALAU: Country Partnership Strategy (2009–2013)

Asian Development Bank

WATER AND SANITATION SECTOR ROAD MAP

A. Key Issues in the Sector

1. Despite some positive achievements in Palau's development, government, business, culture and community life, the changes in institutions, laws and capacity in the infrastructure sector have been inadequate to serve the national strategy of reduced government subsidies and involvement in the water supply and sanitation sector.¹ Government of Palau (GOP) revenue covers about 60 percent of total recurrent expenditure, but almost none of capital works costs.² The extremely limited GOP revenue in turn means that there is no local funding for GOP investment and little prospect of any over the medium term. So there is a need to develop alternative commercial arrangements for utilities. The general need is for governance and regulatory arrangements that will lead to improved commercial performance of public enterprises and an improved enabling environment for the private sector.

2. Generous Official Development Assistance has nullified or weakened market forces and market-sensitive decisions in infrastructure and other sectors. Assets to the value of approximately \$300 million have been built within the last 15 years. Older assets constructed when Palau was a Trust Territory of the US and earlier when Palau was under Japanese colonial rule are estimated to have a replacement value of about \$1 billion. Assets constructed within the past 15 years are generally in good condition while older assets are generally in poor condition.

3. The National water supply systems, including water treatment plants, have been substantially improved, and the water supply networks expanded, particularly in Airai State. Operations are still inefficient: losses are high (estimated at 50%), revenue is low, unmetered usage continues in many areas, and the tariff is inadequate to cover operating costs. Subsidies for the operation and maintenance of the Palau's public water supply systems are a major burden on the national budget. Revenue from water charges is less than 50% of the operating budget.

4. With the exception of the water supply for Koror and Airai, Palau's water supply systems are operated and maintained by state governments. The Koror-Airai water supply is operated and maintained by the Bureau of Public Works (BPW) and supplies water to approximately 64% of the country's population. Based on 2005 census data, the population of Palau is growing annually at about 1.4%.

5. All State operated water supplies are un-metered and the State Governments charge a flat-rate tariff for access to pipe water. Most States apply a flat-rate monthly charge of \$5 to supplement subsidies provided by the National Government for operations and maintenance. Water resource ownership is an issue in a number of States, particularly Airai State which is the source of water for the Koror – Airai water supply system. Each state believes that their community should benefit most from the water resources located in its state. In the case of the Koror – Airai water supply system, customers living in Airai State receive water from an un-metered connection at a subsidized rate of \$5 per month. The balance of customers serviced by the Koror – Airai water supply system are metered and pay a water tariff current set at \$0.85 per 1,000 gallons.

¹ PINZ. 2008. *Working Paper on Infrastructure Needs, Priorities, Maintenance and Regulations*. Koror.

² ADB. 2007. *Pacific Islands Economic Review*. Manila.

6. Water supply and sewerage services are governed under the *Utility Regulations 1986*. The main object of the Regulations is to make provision in relation to the setting of utility charges for electric power, water supply and sewerage services. These regulations also make provision for some aspects of the supply of water to residential and commercial customers. Water rates scheduled in the *Utility Regulations 1986* still currently apply. The Draft Palau Public Water Supply Bill 2000 and the Draft Water Supply Regulations 2000 were aimed at transferring the ownership of Palau's public water supplies to the National Government and to introduce a new schedule of water rates. The Draft Palau Public Water Supply Bill 2000 and the Draft Water Supply Regulations were not enacted due to opposition to the Bill in the Olbiil Era Kelulau (OEK).

7. Palau's drinking water quality standards are provided under the Environment Quality Protection Board Regulations, Public Water Supply Systems Regulations 1996. These regulations also make provisions for the development of new water supplies and design review, issue of permits for operation of water supplies, licensing certification of water supply operators, operation of private water supplies, and powers for enforcing the Regulations.

8. The National Government has recently expressed a desire to centralize the operation of all public water supply and sewerage systems in Palau under a State-owned water supply and sewerage corporation. Current laws relating to the operation of public water supply systems are generally insufficient to support current operations, and are not a sufficient legislative basis for any reforms to current water supply arrangements (particularly where such reforms involve the establishment and operational functions of a corporatized water supply entity). Tariff reform is urgently required as water rates and charges do not cover the water supply's operation, maintenance, and capital costs. The development and implementation of a transparent cost recovery mechanism is essential to ensure sustainability of Palau's water supply and sewerage services.

9. A recent review of legislative reforms to facilitate water supply infrastructure development and a institutional reforms for Palau's public water supplies include: (a) a comprehensive new law dealing with all aspects of public water supplies; (b) amendment to the Environmental Quality Protection (EQP) Act to provide a clear mandate for Environmental Quality Protection Board (EQPB) to regulate water abstractions based on an approved National Water Resources Management Plan, and to allow for the resolution of issues that involve the competing claims to rights of access to the water resources; and (c) new regulations made under an amended EQP Act to provide for (i) requirements for permits for water abstractions, (ii) powers of EQPB to issue permits, to set conditions applying to amounts, of water and rates of abstraction, and to vary such conditions, (iii) the adoption and application of a National Water Resources Management Plan, (iv) standards and other requirements for construction of water supply wells, (v) rights of public utilities to take water from water sources (and the imposition of some regulatory controls over these rights), and (vi) authority to consider and determine competing claims to take from water sources.³

10. The Koror - Airai water supply system currently produces an average of 3.8 million gallons (14.4 million liters) of treated water per day. This equates to a daily per capita production rate of approximately 230-240 gallons (approximately 870 liters). This rate is higher than any other Pacific country (typically 400 to 500 liters per day), considerably higher than Western countries, and higher than Asian countries by factors of 5-10. Even with the high estimated system losses, per capita demand for treated water is very high and is attributed to

³ GHD Pty Ltd. 2008. *TA 4977-PAL: Preparing the Babeldaob Water Supply Project Interim Report*. Manila.

limited consumer appreciation of the value of water and inadequate tariffs. Consequently, the Nation's public water supplies are a significant drain on Government finances and service standards are poor.

11. The demand for water from the Koror - Airai water supply system is forecast to increase from the current level of 3.8 million gallons per day to 4.4 million gallons per day by the year 2020 unless measures to reduce system losses and the high per capita demand are implemented.⁴ The existing production capacity of the Koror – Airai water supply system is 4 million gallons per day. Based on a medium demand growth scenario, demand for water from the Koror – Airai water supply system, if left unchecked, will exceed the existing production capacity by the year 2010.

12. Most water supplies in Palau rely on surface water sources including the Koror - Airai water supply system which rely on Ngerikill and Ngerimel River flows. There are currently 15 small water systems on Babeldaob Island. One system has a groundwater supply source while all the others use stream flow. Storage volumes in tanks and at the low head dams for stream intakes are small and not sufficient to substantially supplement shortfalls from stream sources during dry periods. As a result, the stream source must provide the full amount of consumptive use of the system on a day-to-day basis.

13. Experience over the past 20 years indicates that the reliable yield of the current water sources on the Ngerikill and Ngerimel is substantially less than the current demand of 3.8 million gallons per day. Analysis of the stream flow indicates that the reliable yield of the existing Koror-Airai water supply system is approximately 1.0 million gallons per day during a 1 in 25 year drought. Disruptions to the water supply, affecting approximately 14,000 people, are experienced during severe droughts, as in 1983, 1997 and 2003. The Government is concerned that the frequency of severe droughts may increase due to climate change, and it has identified a need to improve security of supply to the Koror - Airai area.

14. Sewerage and wastewater systems in Palau are predominately on-site systems with the exception of the Koror sewerage system. Palau's sewerage systems and on-site wastewater treatment and disposal systems are regulated through the Individual Sewage Disposal Act 1971 (administered by the Ministry of Health), Sewer Use Act 1984 (administered by the EQPB), and the Environment Quality Protection Board Regulations Toilet Facilities and Wastewater Disposal Systems Regulations 1996 (also administered by the EQPB).

15. The Koror sewerage system is currently being improved with the upgrading and enlarging of the Malakal treatment station in 2002-2006, and recently and on-going repair and upgrading of 38 out of 46 pump stations which service the Koror sewerage network. Frequent sewage overflows occur at a number of pump stations servicing the Koror sewerage system and the BPW reports substantial infiltration and exfiltration from sewers. BPW also reports that a number of key sewers within Koror sewage system require augmentation to meet load growth as well as a need to reduce electricity costs associated with pumping of sewage.

16. Maintenance of Palau's wastewater systems, including the Koror sewerage network, is reactive rather than planned. There is also an urgent need to increase funding for emergency maintenance of high-risk components, and development of a sewerage master plan through to 2035. Sewerage Master Plans are outdated with the last master planning study undertaken by Parsons Inc. in 1994. There is growing concern on the adverse impacts of the existing sewage

⁴ The forecast demand for 2020 is based on a medium-growth scenario for population and tourist arrivals.

collection and treatment practices on the Palau's fragile environment particularly in the Koror and Airai States. The Government has requested assistance for the development of a sewerage master plan for Koror and Airai for the period up to the year 2035. A National Sanitation Policy is also required to update waste collection and treatment standards and to identify and prioritize sanitation infrastructure.

B. Government's Sector Policy and Planning Framework

17. The Public Sector Investment Program 2002 (PSIP), Management Action Plans (MAP) in 2002-2003, and *National Policy on Population and Sustainable Development*⁵ provide the strategy for provision of efficient and effective infrastructure including water and sanitation. The Leadership Symposium and Education Master Plan in 2006, the National Economic Symposium, the Compact Review Commission (CRC) and the Tax Reform Task Force in 2007, show a search for a unifying and motivating vision. The near completion of most nation building projects and the responsibility for their use and maintenance sets a new challenge for the whole community. ADB is currently supporting Palau in meeting the challenge through its technical assistance for a Facility for Economic and Infrastructure Management (FEIM) which focuses on a medium-term development strategy.

C. Government's Institutional Arrangements and Capacity in the Sector

18. Capital Improvement Projects (CIP) is responsible for the planning and implementation of Palau's public infrastructure projects. CIP's ability to plan and implement new projects is constrained by small staff numbers. There is an immediate need to improve systems for monitoring, planning and selection of maintenance and assets.

19. With the exception of the water supply for Koror and Airai, Palau's water supply systems are operated and maintained by state governments. The Koror-Airai water supply is operated and maintained by the Bureau of Public Works (BPW). BPW also manages and maintains a wide range of other services including buildings and roads. Relative to its responsibilities, BPW budget is too small and too untimely and its productivity too low. For example, at the end of 2007, the 2007 annual Rural Sanitation Program was only 50% complete.

D. ADB Sector Experience

20. Palau, as a relatively new member of ADB, has only recently received ADB assistance. ADB is supporting the development of the medium-term development strategy through its technical assistance (TA) 4929: Facility for Economic and Infrastructure Management. ADB is supporting the provision of improved public water supply services through TA 4977-PAL: Preparing the Babeldaob Water Supply Project which is scheduled for completion in 30 June 2009.

E. Role of Other Development Partners in the Sector

21. Official development assistance (ODA) provides almost all the capital budget, supports improved facilities and services, and supports general economic growth. USA, Japan and Taipei,China provide substantial ODA to Palau. Other donors that have expressed interest in providing ODA to Palau including People's Republic of China and Republic of Korea, however it

⁵ Government of Palau. 2007. *National Policy on Population and Sustainable Development*. Koror.

is unclear whether such assistance would include investments in the water and sanitation sector.

F. Intended Sector Outcomes and Key Outputs Supported by the Asian Development Bank

22. ADB assistance to the water sector will focus on the water and sanitation and the power sub-sectors. ADB will assist the National Government finance high priority water supply and sanitation project including (i) the Babeldaob Water Supply Project which is currently being prepared and will improve the security of the water supply to Koror, Airai, and Aimeliik States and provide institutional reforms and strengthening of the water sector, (ii) the preparation of and sewerage master plan for Koror and Airai and an investment project to implement high priority components identified in the sewerage master plan, and (iii) the development of a National wastewater policy.

G. Links to CPS Outcomes and Other Sectors and Themes

23. A goal of the *National Policy on Population and Sustainable Development*⁶ is "to stimulate controlled economic development in balance with the carrying capacities of Palau's environment and infrastructure," which is consistent with the third element of ADB's strategic focus for assistance to Palau, "[to] deliver safe water and sanitation services to Palauans."⁷

H. Monitoring Mechanism

24. ADB will monitor the performance in the sector through project performance monitoring systems (PPMS) to be established under proposed projects. PPMS will also be established for performance monitoring of potential power sector projects. The PPMS framework will be updated regularly by the various project management units (PMUs) to confirm achievable goals and refine monitoring and recording arrangements and design and implement procedures to systematically generate data on inputs and outputs of the project components and the agreed socioeconomic and environmental indicators used to measure project impacts. Under the PPMS framework, baseline and progress data will be reported at the requisite time intervals by the PMUs, which will be responsible for analyzing and consolidating the data through its management information system. The PPMS will permit adequate flexibility to adopt remedial action for project design, schedules, activities, and development impacts.

⁶ Government of Palau. 2007. *National Policy on Population and Sustainable Development*. Koror.

⁷ ADB. 2009. *Palau (2009–2013) Draft Country Partnership Strategy*. Manila.

Water and Sanitation Sector Results Framework

Relevant CPS Outcomes		Sector-level Outputs		ADB Assistance	Risk
CPS Outcomes Relevant to the Sector	Key Opportunities and Constraints	Subsector Outcome/ Key Sector Outputs	Sector Milestone/ Tracking Indicators/ Interim Indicators		
Economic growth and great social inclusiveness through enhanced delivery of public infrastructure services.	<p>Institutional frameworks have limited capacity to implement water supply and sanitation services.</p> <p>Operations and maintenance budgets are inadequate to sustain water supply and sanitation infrastructure and services.</p> <p>Tariff structures and cost recovery mechanisms are inadequate to fund O&M and capital replacement programs.</p> <p>Water supplies are vulnerable to drought and climate change.</p> <p>Inadequate and poorly maintained sewage collection and treatment facilities result in frequent sewage overflows creating health hazards and degrading aquatic environments.</p>	<p>Secure, reliable, and affordable water supplies to communities on Babeldaob and in Koror.</p> <p>Improved collection and treatment of sewage in Koror and Aimeliik States.</p> <p>Reliable and affordable electricity services to communities on Babeldaob and in Koror.</p>	<p>The reliability of the water supply increases from the current 95%+ to 99.9%+ by 2012.</p> <p>Accounted-for-water losses from the Koror-Airai water supply network decreases from 50% (baseline 2008) to less than 30% by 2012.</p> <p>Average per capita consumption decreases from approximately 900 liters per person per day to less than 450 liters per person per day by 2012.</p> <p>The BPW is able to meet requests for all new connections in Koror, Airai, and Aimeliik by 2012, as currently the PWD is unable to provide connections to customers in Aimeliik.</p> <p>The number of sewage overflows from the Koror sewerage networks decreases from X in 2007 to Y by 2013.</p>	<p><u>2009 - 2013</u></p> <p>Development of up to 10 water supply wells in Airai and / or Aimeliik States to supplement surface water supplies during droughts.</p> <p>Rehabilitation of the water supply network incorporating replacement of up to 10km of distribution mains, replacement of up to 1,500 leaking service connections, installation of bulk supply flow meters, and installation of up to 1,500 new water meters.</p> <p>Rehabilitation of existing water supply service reservoirs in Koror and Airai States and construction of service reservoir(s) with a capacity of approximately 750,000 gallons in Aimeliik State.</p> <p>Design and implementation of an institutional reform program for public water and sanitation services.</p>	<p>- OEK and the State legislatures support reform of public water supply and sewerage services.</p> <p>- Civil society does not recognize Government's role in providing water supply and sanitation services.</p> <p>- OEK and State Legislatures fail to recognize need for adequate recurrent O&M budgets.</p>

Relevant CPS Outcomes		Sector-level Outputs		ADB Assistance	Risk
CPS Outcomes Relevant to the Sector	Key Opportunities and Constraints	Subsector Outcome/ Key Sector Outputs	Sector Milestone/ Tracking Indicators/ Interim Indicators		
				<p>Implementation of demand management programs to reduce per capita demand.</p> <p>Development of a sewerage master plan for Koror and Airai States.</p> <p>Implementation of high priority sewerage projects identified in the National sewerage master plan.</p> <p>Preparation of a National Wastewater Policy.</p>	

Source: Asian Development Bank.