



Technical Assistance Report

Project Number: 39152
November 2006

Democratic Republic of Timor-Leste: Dili Water Supply Performance Improvement (Financed by the Japan Special Fund)

Asian Development Bank

CURRENCY EQUIVALENT

Timor-Leste uses the US dollar as its currency.

ABBREVIATIONS

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
CSPU	–	country strategy and program update
DNAS	–	National Directorate of Water and Sanitation (acronym from Portuguese translation)
DUWSP	–	Dili Urban Water and Sanitation Project
EA	–	executing agency
GIS	–	geographic information system
JICA	–	Japan International Cooperation Agency
MDG	–	Millennium Development Goal
MoNRMEP	–	Ministry of Natural Resources, Minerals, and Energy Policy
NDP	–	National Development Plan
NRW	–	nonrevenue water
O&M	–	operation and maintenance
TA	–	technical assistance
watsan	–	water and sanitation

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification	–	Targeted intervention
Sector	–	Water supply, sanitation, and waste management
Subsector	–	Water supply and sanitation
Themes	–	Inclusive social development, environmental sustainability, capacity development
Subthemes	–	Human development, urban environmental improvement, institutional development

NOTE

In this report, "\$" refers to US dollars.

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I. INTRODUCTION

1. A capacity-building technical assistance (TA) project¹ for the National Directorate of Water and Sanitation (DNAS, abbreviated from the Portuguese language name) is included in the Asian Development Bank (ADB) country strategy and program update (CSPU) for 2006–2008. The proposed TA is associated with the proposed Dili Urban Water and Sanitation Project (DUWSP), currently being prepared. The TA Fact-Finding Mission visited Dili from 24 to 31 August 2006. The Minister of Natural Resources, Minerals, and Energy Policy signed the fact-finding mission memorandum of understanding, which included a draft TA paper. The TA design and monitoring framework is in Appendix 1.

II. ISSUES

2. **National Water Supply and Sanitation.** The Millennium Development Goal (MDG) target for water supply in Timor-Leste is to increase from 44% to 78% the proportion of people with improved access to water. The target for sanitation is to increase from 19% to 46% the proportion of people with improved sanitation. Only about 13% of families have connections to piped water in their homes, and 16% are served by community taps.² Most East Timorese live in rural areas where access to safe water sources and sanitation is the worst. Because success in rural areas is vital for achieving MDG 7 targets, most water supply and sanitation (watsan) development assistance in Timor-Leste targets rural communities. Meanwhile, Timor-Leste is experiencing significant rural–urban migration and Dili’s population is expected to increase from an estimated 160,000 in 2006 to about 311,000 by 2020. While rapid urbanization in developing countries typically brings growth and poverty reduction, it can also trap the urban poor in unhealthy and demeaning living conditions. Poorly managed urban development, resulting in backlogs of infrastructure and services, can stifle economic growth. A shortage of clean water is a frequent chokepoint.

3. **Water Supply in Dili.** Despite significant capital investments since 1999,³ only 25–30% of the population of Dili city is covered with 24-hour safe water supply. This proportion is well below the Government’s National Development Plan (NDP) sector target of 80% of the urban population with access to safe piped water supply by 2020 (recently revised to 2015). More than 50% of the Dili water supply system experiences high leakage, low or variable pressure, and intermittent supply, i.e., water available for only 10–16 hours per day. Complaints of no water and low pressure make up one third of consumer complaints. Water sources, treatment plants, and transmission mains have sufficient capacity to meet Dili city’s water needs for several years. The primary and secondary distribution networks are now in good condition. The poor service levels and low coverage of DNAS piped water are largely caused by (i) lack of tertiary pipes, (ii) poor condition of tertiary pipes and service connections, and (iii) poor demand management. Although an appropriate tariff policy for urban water supply is in place, revenue generated from water sales in Dili city covers less than 5% of water-supply-system operation and maintenance (O&M) costs.

4. **Dili Urban Water and Sanitation Project (DUWSP).** The DUWSP Fact-Finding Mission in June 2005 established the rationale for an ADB-supported watsan project for Dili. So long as DNAS is unable to deliver a reliable supply of piped water in Dili, (i) DNAS will

¹ The TA first appeared in *ADB Business Opportunities* on 25 September 2006.

² United Nations Development Programme. 2004. *Timor-Leste Human Development Report: Paths out of Poverty*. Dili.

³ \$30 million has been invested in water production, primary and secondary distribution, and connections; \$5 million has been spent on establishing and strengthening DNAS.

fail financially and technically, (ii) DNAS will be unable to support watsan services in district centers, (iii) benefits from capital investments will not be protected, and (iv) the Government will have no means of sustaining its urban and rural NDP watsan targets. On this basis, the Government and ADB approved a project preparation TA for DUWSP, which is ongoing. The proposed DUWSP would commence in 2007 and by focusing on tertiary distribution and demand management it would complement Dili water supply improvements financed by the Government of Japan. DUWSP aims to improve water supply infrastructure and reduce nonrevenue water (NRW) through leak detection and associated physical works in one to three of Dili's 10 water supply zones. DUWSP will apply a "zonal approach", i.e., subdivide the network into smaller, more manageable, hydraulically isolated zones and subzones, controlled by valves and meters. It will focus on improving water supply—mainly tertiary pipes, meters (initially for commercial, institutional, formal housing, and communal/bulk customers), valve and pressure management, revenue collection, and customer relations in one to three selected zones, which will serve as models for replication in other zones.

5. DNAS Performance. Staff shortages⁴ and low skill levels hinder DNAS from managing its Dili water supply system efficiently, and contribute to low levels of service and poor organization performance. Staff shortages are evident in most areas of DNAS operations, particularly operation and maintenance of engineering infrastructure, customer services, financial management, metering, and water quality testing. DNAS lacks accountability to the Government, to customers, and to the public. Neither DNAS nor the Government adequately monitors the organization's performance. Dili city water operations data are not collated, analyzed, and reported in a systematic way, and are often outdated.

6. The Government of Japan implemented the Project for Improvement of Water Supply in Dili in 2005, providing capacity development and training to DNAS staff in (i) planning of distribution and service pipes, and (ii) preparation of customer logbooks. The project helped DNAS to update the pipe network and customer logbook information for Zone 1, prepare a customer database for most of Dili city in geographic information system (GIS) format, and provide GIS training and technology transfer to five DNAS staff. The work, however, is incomplete. GIS maps, GIS software, and data files are not yet available to operations staff. Likewise, the project's AutoCAD engineering drawings covering most of Dili water supply infrastructure are not yet standardized or systematically registered on networked computers. Follow-up support from the Government of Japan will enable DNAS to finish this work by March 2007, but DNAS will need ongoing help to sustain these systems.

7. Even before the April-May 2006 crisis, DNAS's attempts to meter, bill, and collect from its Dili customers were not succeeding. The number of paying customers fell from about 900 in January 2006 to 195 in March 2006. Customers were deterred from paying by the time-consuming bill payment procedure and other disincentives. Payments from larger commercial customers had increased during 2005 but DNAS was unable to sustain the effort. Metering, billing, and collecting from commercial, institutional, and formal housing customers should be a crucial early component of any strategy to improve DNAS performance in Dili.

8. Strengthening DNAS to Sustain Benefits from DUWSP. Organization capacity development in Timor-Leste is particularly challenging because managers are inexperienced and few staff are skilled or 'trainable'. With its current management, staffing, and resources, DNAS by itself cannot expand and sustain watsan services in Timor-Leste—the Government cannot achieve

⁴ In 2005/2006, DNAS had 161 permanent staff, including 29 staff dedicated to Dili city water supply operations. In 2006/07, DNAS is proposing a budget for 171 permanent staff and 56 temporary staff. These numbers include 29 permanent water supply operational staff and 41 temporary operations staff for Dili water supply.

and protect its NDP targets. Therefore, through DUWSP, DNAS will recruit contract staff and technicians to help operate and maintain Dili's improved water supply network, facilities, and systems. Contract staff would be retained by DNAS after the project. The capacity of DNAS management must also be strengthened. In the short term, the TA project will provide an experienced water utility executive and technical managers to work alongside DNAS management. Later, a management contract may be a possible option for DNAS. The Minister for Natural Resources, Minerals, and Energy Policy cited the management contract procured for Timor-Leste's electricity supply utility in November 2003 as a precedent. The Minister believes that DNAS and the Ministry of Natural Resources, Minerals, and Energy Policy (MoNRMEP) do not need more "advisors".

9. Good governance and adequate operating revenues are crucial prerequisites for improving urban watsan services, especially for the underserved urban poor. These conditions also apply to DNAS, but the way forward is complicated by the social and economic disruption still widespread in Dili. Improving water supplies in Dili will need to reflect post-crisis political, technical, financial, and social realities. A conventional strategy to install meters and to bill and collect payment from all customers will not be immediately practical in post-crisis Dili. The political will to immediately improve DNAS governance is strong, but improving revenue performance requires a more gradual and selective strategy. Since metering, billing, and collecting are important demand-management elements, the post-crisis environment in Dili poses special challenges for improving DNAS performance. Consumer and public satisfaction are important for success.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

10. The expected impact of the TA project is improved water supply for households, businesses, and institutions in Dili city. The expected outcome is improved performance of DNAS in managing and operating its Dili city water supply services. The TA project will have a primary focus on improving demand management, including nonrevenue water (NRW) reduction,⁵ and will be delivered around two components: (i) improving demand management and reducing NRW; and (ii) improving business planning, management, and reporting.

B. Methodology and Key Activities

11. The TA will be associated with DUWSP. The TA consultants will help MoNRMEP and DNAS management (i) confirm staffing and systems requirements for Dili water operations; (ii) recruit, assimilate, and manage additional staff and contract staff; (iii) design capacity-development programs; and (iv) deliver on-the-job and in-house training. The TA consultants will be experienced water utility executive and technical managers and will provide management support.

12. **Component 1: Improving Demand Management and Reducing NRW.** A demand management task force will be established within DNAS to focus and drive change, particularly for NRW reduction. Consultants from the TA project and DUWSP will provide training and continuous technical and management support to the demand management task force and to DNAS operating sections. The TA will help DNAS recruit, establish, and train three permanent leak detection teams (18 staff) who will work with the DUWSP implementation team. The TA will upgrade the capacity of DNAS's Planning and Design Division and the Dili O&M Section in water supply network analysis,

⁵ NRW is a key indicator of overall organization performance as it integrates management, commercial, and technical performance.

AutoCAD drafting, and GIS. It will also (i) upgrade Dili city engineering infrastructure drawings, (ii) strengthen the drawing registration/record system, (iii) install new networked computers and software, and (iv) develop and run the Dili city hydraulic network model. Activities designed to strengthen network analysis and GIS would complement those funded by the Government of Japan. The TA will help (i) DNAS develop meter management policies and (ii) Support Services Section implement the program (using contractors). The TA will also help (i) DNAS develop customer services policies and procedures and (ii) Customer Services Section carry out customer registration, customer surveys and relations, customer awareness, connection policies, meter reading and billing, and installation of new billing software and computers. Metering will focus initially on commercial businesses, institutions, households in 'formal' neighborhoods, and communal/bulk customers. The current urban water supply tariff will be reviewed and alternative charging arrangements will be designed for lower-income households and groups.⁶ The TA will help DNAS establish bill payment centers in the east and west of Dili city. The TA and DUWSP will help the Planning and Design and Dili O&M Sections develop distribution planning, zone management, valve and bulk meter management skills and technical standards, and will provide training and ongoing support. This will enable DNAS staff to identify subzones, valve and meter locations for the DUWSP leak detection work. The TA will also help DNAS to recruit and train permanent subzone caretakers (approximately 10 caretakers, maximum one caretaker per 1,000 connections) for the DUWSP target areas.

13. The TA project and DUWSP designs will incorporate measures to sustain NRW reduction beyond project completion: (i) the demand management task force will have the mandate to continue NRW reduction work in other Dili water supply zones after DUWSP is completed; (ii) planning, work plans, and targets for NRW reduction will be prepared for the next target zones; (iii) leak detection team members will be retained as permanent DNAS staff; (iv) procurement contracts will be let, DUWSP implementation members retained, and funding committed for NRW reduction work in the future target zones; (v) consultants will be engaged by the Government to assist with future NRW work; and (vi) permanent subzone caretakers will carry out NRW monitoring and control after the projects are completed.

14. **Component 2: Capacity Development for Improved Business Planning, Management, and Reporting.** The TA consultants will provide training and ongoing management support for capacity development. The TA will upgrade the capacity of DNAS senior managers in strategic and annual business planning, human resources management and development, staffing needs analysis and organization structure, financial management, management information systems, and performance benchmarking. It will assist DNAS (i) to develop formats for a strategic business plan with annual rollovers and a monthly management report; and (ii) to identify and implement required data collection, business process, and information system changes. The TA will include a comprehensive and detailed assessment of DNAS staffing needs (i) to support the DUWSP, and (ii) to carry out the Dili city water supply business. The assessment report will confirm staffing and skills deficiencies, recommend a costed recruitment plan, and outline a training program. The TA would be consistent with an eventual ministerial capacity-development action plan⁸ for MoNRMEP.

⁶ Many European and United Kingdom cities do not meter residential customers. Instead, they charge flat rate tariffs, without encountering profligate water usage. Water "literate" customers make this possible. The same approach in Dili would not by itself contain profligate water consumption, including irrigating urban crops. The tariff could be revised to encourage domestic consumers to choose metering. As is typical in many low-income cities, the broad lifeline tariff in Dili is resulting in the non-poor capturing subsidies.

⁷ Procurement contracts cover (i) pipe, valve, and meter supply; (ii) leak repairs; (iii) pipe replacement; (iv) pipe installation; (v) valve and meter installation; (vi) valve and meter chamber construction; and (vii) service connection and customer meter installation.

⁸ Ministerial capacity-development action plans are planned for all ministries, guided by the Capacity Development Coordination Unit, Office of the Prime Minister.

C. Cost and Financing

15. The total cost of the TA is estimated at \$1,200,000. ADB will provide \$1,000,000, while the Government will provide \$200,000 in kind to cover mainly office accommodation and remuneration of counterpart staff. The TA will be financed on a grant basis by the Japan Special Fund, funded by the Government of Japan. The detailed cost estimates are in Appendix 2.

D. Implementation Arrangements

16. MoNRMEP will be the Executing Agency (EA) for the TA, providing day-to-day implementation counterpart support through DNAS. The DNAS Director will be the Government's TA project director, and the DNAS chief of urban water supply will be the day-to-day counterpart of the TA consultant team leader. The TA consultants will work alongside the DUWSP implementation team (consultants, DNAS staff and contract personnel). The Corporate Services Division of MoNRMEP will provide monitoring and oversight support and will report to the Minister. The TA is expected to begin in June 2007 and to be completed in December 2009.

17. ADB will select and engage a team of international consultants (50 person-months) in accordance with ADB's *Guidelines on the Use of Consultants*. The international consulting firm will be recruited using ADB's quality-based approach to guarantee that the consultants and proposed approach can deliver the specialized capacity-development support required. The simplified technical proposal format will be used to invite and evaluate proposals from international consulting firms. The water utility management specialist will be the team leader. Other international consultants will be (i) a systems accounting specialist, (ii) a water utility technician (meter management), (iii) a water utility drafter (drawing office systems), and (iv) a network modeling engineer. Appendix 3 gives the outline terms of reference for the consultants. Equipment for the TA will be procured in accordance with ADB's *Procurement Guidelines* and procedures acceptable to ADB and will be retained by the EA after the TA. Equipment costs are in Appendix 2. To facilitate implementation, the TA will use an advance-payment facility for training, seminars, conferences and surveys. The amount of the advance and its liquidation will be arranged in line with ADB's *Guidelines for Disbursement of Technical Assistance Grant*.

18. ADB's water team in the Regional and Sustainable Development Department will help document and disseminate the results, experiences, and lessons learned from the TA's demand management and NRW reduction work.

IV. THE PRESIDENT'S DECISION

19. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$1,000,000 on a grant basis to the Government of Timor-Leste for Dili Water Supply Performance Improvement, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p>Impact Improved WS services for households, businesses, and institutions in Dili city</p>	<p>Percentage of the population of Dili city with 24-hour piped water supply increased from 25% in 2006 to 80% by year 2015</p> <p>Customer satisfaction with Dili city piped WS services improved, with less than 180 complaints per 1,000 customers per year by 2015</p>	<p>DNAS customer registration, consumption records, and field surveys</p> <p>DNAS customer complaints records</p> <p>Structured customer surveys</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • Government replicates new WS infrastructure improvements in all 10 Dili city WS zones. • Government allocates DNAS revenues to finance DNAS operations and system improvement and/or expansion. • Government remains committed to strengthening DNAS.
<p>Outcome Improved DNAS organization performance in its Dili city WS business</p>	<p>NRW ratio for Dili city reduced from 95% to 40–50%, citywide, by month 30</p> <p>Monthly water sales revenue for Dili city reaches \$20,000, by month 30</p> <p>Operating cost coverage is 40%, citywide, by month 30 (early focus on commercial, institutional, formal housing, and communal/bulk customers)</p> <p>Procurement contracts let, NRW targets set, and work plans in place for ongoing leak detection and NRW reduction work in future target zones, by month 30</p>	<p>DNAS customer, billing, production, and consumption records (see Note 3)</p> <p>DNAS monthly billing records and CFET/MPF monthly records of water sales (see Note 4)</p> <p>Procurement contracts and monthly NRW task force reports (see Note 5)</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • Government is committed to develop DNAS Dili city WS operation into an efficient, commercially focused WS business. • MoNRMEP monitors and holds DNAS accountable for the performance of its Dili city WS business. • Upgraded skills and systems will be applied in target zones and citywide, as appropriate.
<p>Outputs 1. Demand management task force and leak detection teams are established and operating effectively as part of DNAS ongoing Dili city WS operations</p>	<p>NRW ratio for target zones reduced from 95% to 25–30% by month 30</p> <p>Demand management task force established with agreed mandate by end of month 1 and retained for ongoing NRW reduction work by month 30</p> <p>Three leak detection teams established by month 2 and team members retained by DNAS as permanent staff by month 30</p>	<p>DNAS customer, billing, production, and consumption records</p> <p>Demand management task force mandate (i.e., objectives, composition, functions, and operating time frame) and operating procedures</p> <p>Leak detection team member employment contracts and DNAS staffing records</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • The TA Project complements and supports the DUWSP, which is implemented concurrently. • MoNRMEP and DNAS give authority to demand management task force over DNAS operating sections to ensure timely execution of their assigned NRW reduction work plans and targets. • MoNRMEP and DNAS recruit 18 new permanent leak detection staff and 13 new permanent subzone caretakers.

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p>2. Management, HR and reporting skills, and systems are upgraded and integrated with Dili city WS operations</p> <p>3. Technical staff apply newly acquired skills to update and maintain new network model and drawing record systems</p> <p>4. Support Services Section staff apply newly acquired meter management skills and systems</p> <p>5. Customer Services Section staff apply newly developed customer management, billing and collection skills, systems and policies</p>	<p>Monthly management reporting system implemented in DNAS by end of month 6 and incorporated in DNAS mandatory reporting by month 30</p> <p>Monthly KPIs for Dili city WS published and submitted routinely to MoNRMEP by end of month 6 and incorporated in DNAS mandatory reporting by month 30</p> <p>Upgraded duty statements for Dili city WS operations staff by month 30</p> <p>Hydraulic network model covers all of Dili city water supply distribution system (including tertiary level pipes) by month 30</p> <p>Computerized water supply record drawings and drawing registration system cover all of Dili city water supply system by month 30</p> <p>Service connection record drawing system (GIS) covers 90–100% of customers by month 30</p> <p>Metering level of all commercial, institutional, formal housing, and communal/bulk customers is 90–100% by month 30, citywide</p> <p>Billing of registered customers (metered and unmetered) is 90–100% by month 30, citywide</p> <p>Collection ratio is 60–80% by month 30, citywide</p> <p>Number of registered customers are 14,000–16,000 by month 30</p> <p>Unauthorized connections are reduced from 4,000 to less than 500 in target zones by month 30</p>	<p>DNAS monthly management reports</p> <p>DNAS monthly KPI reports 'Free Balance' Financial Management Information System of the MPF</p> <p>DNAS Dili city WS staff duty statements</p> <p>DNAS hydraulic model output reports</p> <p>DNAS water supply drawings and register</p> <p>DNAS GIS service connection records output and customer database</p> <p>DNAS Support Services meter database and customer services records</p> <p>DNAS Customer Services billing records</p> <p>DNAS monthly billing records and MPF monthly receipts for water sales</p> <p>DNAS customer register</p> <p>DNAS leak detection team field survey of target zones</p>	<ul style="list-style-type: none"> • MoNRMEP and DNAS recruit 1 permanent HR/training staff, and a half-time business planning and management reporting staff. • MoNRMEP and DNAS recruit 1 permanent network analysis staff. • Government sets fair, efficient WS tariffs and connection charges that account for prevailing economic conditions and consumers' willingness to pay. • DNAS adopts and enforces appropriate connection/disconnection policies with MoNMREP and Government backing. • Customers in target zones are willing to pay WS tariffs and connection charges. • MoNRMEP and DNAS recruit 4 meter managers, 13 meter readers, 2 meter testers, 3 customer relations staff, 2 customer services staff, and 1 computer billing staff. <p>Risks</p> <ul style="list-style-type: none"> • There are in-country disturbances or other uncontrollable impediments to TA implementation. • DNAS loses its focus on NRW reduction and is distracted by plans to make new connections in areas outside the target zones.

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
<p>6. Technical staff apply newly acquired skills in distribution planning and management</p>	<p>Planning of leak detection work completed in target zones by month 4 and in future target zones by month 30</p> <p>Subzone caretakers recruited, trained, and operating in target zones: maximum 1 manager per 1,000 customers (in subzone) by month 30</p>	<p>Leak detection team progress reports and work plans</p> <p>DNAS staff records and subzone caretakers' duty statements</p>	
<p>Activities with Milestones</p> <p>1. Demand Management and NRW Reduction</p> <p>1.1 Conduct project orientation workshop for MoNRMEP and DNAS managers and for demand management task force members by month 1.</p> <p>1.2 Establish a demand management task force in DNAS, including mandate and operating procedures by month 1.</p> <p>1.3 Assist the task force and DNAS section managers to prepare and submit budget and obtain funds for NRW reduction program by month 2.</p> <p>1.4 Prepare duty statements for, recruit, and establish three leak detection teams by month 2.</p> <p>1.5 Provide NRW training to the task force and leak detection teams by month 3 (will complement UFW training by UFW/distribution consultant engaged under DUWSP).</p> <p>1.6 Provide ongoing management support to leak detection teams, DUWSP implementation staff, and consultants over months 1–30.</p> <p>1.7 Provide ongoing management support to the task force over months 1–30.</p> <p>2. Management, HR and Reporting Skills and Systems</p> <p>2.1 Assess business and management skills levels of managers of Dili WS and MoNRMEP Corporate Services Division; assess business and management systems by month 3.</p> <p>2.2 Design upgrading programs for business and management skills and systems by month 4.</p> <p>2.3 Conduct formal (in-house) and on-the job skills training programs covering human resources management and development, staffing needs and organization structure, business planning, financial management, organization performance, management information systems, and benchmarking by month 6, reaching all senior managers of Dili WS business and MoNRMEP Corporate Services Division.</p> <p>2.4 Develop strategic business plan, annual rollover indicators and format as well as associated monthly management report formats by month 6. Identify and implement required data collection, and business process and information system changes.</p> <p>2.5 Review and update duty statements of key Dili city WS staff by month 6.</p> <p>2.6 Provide ongoing management support and on-the-job training in commercial water utility management to senior managers in Dili WS and MoNRMEP Corporate Services Division over months 4–30.</p> <p>3. Network Model and Drawing Record System</p> <p>3.1 Assess technical skills levels of Planning and Design Section and review drawing record practices and systems by month 1.</p> <p>3.2 Design network modeling and WS record drawings upgrading programs and install new networked computers and software by end of month 2.</p> <p>3.3 Conduct formal (in-house) and on-the job skills training programs covering basic WS network analysis, basic AutoCAD and GIS, and drawing registration/record system by end of month 3, reaching at least 60% of staff in Planning and Design and Dili O&M Sections.</p> <p>3.4 Conduct intensive on-the-job training in WS network analysis to selected technical staff, establish and run network model by month 4.</p> <p>3.5 Establish water supply drawing register and recording system and provide intensive training to selected technical staff by end of month 4.</p> <p>3.6 Provide ongoing support and on-the-job training in network analysis and drawing registration/record system to selected staff over months 5–30.</p>			<p>Inputs</p> <p>ADB - \$1.00 million</p> <ul style="list-style-type: none"> • Consulting services (50 person-months) - \$0.71 million • Equipment - \$0.07 million • Training - \$0.08 million • Miscellaneous - \$0.09 million • Contingencies - \$0.05 million <p>Government - \$0.20 million</p> <ul style="list-style-type: none"> • Office and transport - \$0.08 million • Personnel - \$0.07 million • Other - \$0.05 million

<p>Activities with Milestones</p> <p>4. Meter Management</p> <p>4.1 Assess skills levels of Support Services Section and review meter management practices, systems, and policies by month 1.</p> <p>4.2 Agree meter management policies and procedures with DNAS and MoNRMEP and design meter management upgrading programs by month 2.</p> <p>4.3 Assist DNAS to install and commission existing meter test bench by month 3.</p> <p>4.4 Conduct intensive formal (in-house) and on-the job skills training programs in meter and service connection installation and meter management by month 4.</p> <p>4.5 Provide ongoing technical and management support and on-the-job training in meter management over months 4–30.</p> <p>5. Customer Services</p> <p>5.1 Assess skills levels of Customer Services Section and review customer services practices, systems, and policies by month 1.</p> <p>5.2 Agree appropriate customer services policies and procedures with DNAS and MoNRMEP (e.g., regularizing unauthorized connections, new policies for connection and disconnection) by month 2.</p> <p>5.3 Design customer services upgrading programs by month 3.</p> <p>5.4 Install new billing software and conduct intensive formal (in-house) and on-the job skills training programs for billing staff by end of month 3.</p> <p>5.5 Conduct intensive formal (in-house) and on-the job skills training programs in customer registration, customer relations, customer awareness, connection policies, meter reading, and billing by month 4 to key Customer Services Section staff.</p> <p>5.6 Establish regional bill payment centers by month 6.</p> <p>5.7 Provide ongoing technical and management support and on-the-job training in customer registration, customer relations, customer awareness, connection policies, meter reading and billing over months 4–30.</p> <p>6. Distribution Planning and Management</p> <p>6.1 Assess technical skills levels of Planning and Design and Dili O&M Sections and review distribution planning and management practices and systems by month 1.</p> <p>6.2 Design distribution planning and management upgrading programs by month 2.</p> <p>6.3 Conduct formal (in-house) and on-the job skills training programs covering distribution planning, zone management, valve and bulk meter management, and technical standards by end of month 3, reaching at least 60% of staff in Planning and Design and Dili O&M Sections.</p> <p>6.4 Provide ongoing support and on-the-job training in distribution planning and management over months 4–30.</p>	
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ADB = Asian Development Bank; CFET = Consolidated Fund for East Timor; DNAS = National Directorate of Water Supply and Sanitation; DUWSP = Dili Urban Water and Sanitation (Investment) Project; GIS = geographic information system; HR = human resources; KPI = key performance indicator; MoNRMEP = Ministry of Natural Resources, Minerals, and Energy Policy; MPF = Ministry of Planning and Finance; NRW = nonrevenue water; O&M = operation and maintenance; WS = water supply; UFW = unaccounted-for water.

Notes:

1. "Target zones" will be included in the DUWSP, which will be implemented concurrently with the TA project during 2007–2010; "future target zones" will be improved after the DUWSP.
2. Milestones apply to the end of month unless noted otherwise.
3. NRW ratio for Dili city is achieved by NRW reduction activities in target zones as well as NRW reduction on a citywide basis, e.g., metering and billing all authorized connections.
4. "Monthly water sales" was chosen as the indicator for the project outcome because total revenues would be affected by the increased number of connections from DUWSP. Monthly sales were proposed because recent annual figures do not provide a reliable indicator.
5. Procurement contracts cover pipe, valve and meter supply, leak repair, valve/meter installation, chamber construction, and service connections.
6. DUWSP will improve water supplies in selected target zones. The TA project will also focus on the target zones, as well as citywide improvements to service connections, metering (starting with commercial, institutional, and formal housing customers), and billing.
7. The DUWSP design and monitoring framework includes the month-30 targets for water supply access, whereas the TA targets include only relevant DNAS performance benchmarks.

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Total Cost
A. Asian Development Bank Financing^a	
1. Consultants	
a. Remuneration and Per Diem	
i. International Consultants	660.0
ii. National Consultants	0.0
b. International and Local Travel	10.0
c. Reports and Communications	40.0
2. Equipment and Software	
a. TA management	10.0
b. DNAS – Engineering	26.0
c. DNAS – Billing	32.0
3. Training, Seminars, and Conferences	
a. Training and Workshop Facilitators/Interpreters	27.0
b. Workshops and In-House Group Training	55.0
4. Miscellaneous Administration and Support Costs (including vehicle costs)	90.0
5. Contingencies	50.0
Subtotal (A)	1,000.0
B. Government Financing	
1. Office Accommodation and Transport	80.0
2. Remuneration and Per Diem of Counterpart Staff	70.0
3. Others (including Advertising)	50.0
Subtotal (B)	200.0
Total	1,200.0

^a Financed by the Japan Special Fund, funded by the Government of Japan.
Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The Dili Water Supply Performance Improvement technical assistance (TA) aims to improve the performance of the National Directorate of Water Supply and Sanitation (DNAS) in managing and operating its Dili city water supply services. The TA will be focused primarily on improving demand management, including nonrevenue water (NRW) reduction,¹ and will be delivered around two components: (i) improving demand management and reducing NRW; and (ii) improving business planning, management, and reporting. The TA will be implemented in association with the Dili Urban Water and Sanitation Project (DUWSP).² With its current levels of management, staffing, and resources, DNAS by itself cannot expand and sustain water supplies in Dili. So, through DUWSP, DNAS will recruit contract staff and technicians to help operate and maintain Dili's improved water supply network, facilities, and systems. Contract staff will be retained by DNAS after the project. To strengthen management capacity, the Government may consider a management contract in the medium-term. In the meantime, a TA package is needed to supplement DNAS management. DNAS needs an experienced water utility executive and technical managers who can work alongside DNAS managers.

2. The TA is expected to be implemented over 30 months beginning in 2007, and will be associated with DUWSP. The TA consultants will help the Ministry of Natural Resources, Minerals, and Energy Policy (MoNRMEP) and DNAS management (i) confirm staffing and systems requirements for Dili water operations; (ii) recruit, assimilate, and manage additional staff and contract staff; (iii) design capacity-development programs; and (iv) deliver on-the-job and in-house training. TA consultants will be an experienced water utility executive and technical managers and will provide ongoing management and technical support. The scope of consulting services will cover both TA components (para. 1). International consultants will be engaged to provide a total of 50 person-months as follows.

A. Scope of Consulting Services

1. Supporting Demand Management and NRW Reduction (42 person-months)

3. The TA consultants will:

- (i) undertake a comprehensive assessment of the skills levels, systems, and practices of DNAS Dili city operating sections;
- (ii) design capacity upgrading programs in collaboration with MoNRMEP and DNAS managers;
- (iii) assist DNAS to establish a demand management task force with agreed objective, mandate, and operating procedures;
- (iv) assist DNAS to recruit three leak detection teams (18 staff) and subzone caretakers (approximately 13 staff) with agreed duty statements;
- (v) provide ongoing management and technical support to the demand management task force and DUWSP implementation team; and
- (vi) provide on-the-job and in-house training, together with ongoing management and technical support to DNAS operating sections, to support NRW reduction and ongoing operations in the following areas: (a) hydraulic network modeling, engineering drawing and record systems, computer and software upgrades for

¹ NRW is a key indicator of overall organization performance as it integrates management, commercial, and technical performance.

² DUWSP is a proposed investment project to be funded by a grant from the Asian Development Bank and a budget allocation from the Government of Timor-Leste.

DNAS technical operations (network analysis, AutoCAD, and GIS software); (b) meter management including meter database, management practices/policies, test bench installation and commissioning, meter and service connection installation; (c) customer services including customer services policies and procedures, customer registration, customer surveys and relations, customer awareness, connection policies, new billing software and hardware, meter reading, and billing, and new bill payment centers in the east and west of Dili city, and (d) distribution planning and management, including zone and subzone planning, zone management, valve and bulk meter management, and technical standards. Because Dili city experienced major social and economic disruption during much of 2006, it would be impractical to implement a mass meter installation program across all classes of customers. The TA will initially focus on metering commercial, institutional, formal housing, and communal/bulk customers. All registered customers should be billed, but probably not all can be metered by the conclusion of the TA.

2. Management, Human Resources, and Reporting (8 person-months)

4. The TA consultants will:

- (i) undertake a comprehensive assessment of the skills levels of DNAS Dili city senior managers;
- (ii) assess business planning, management, and reporting systems;
- (iii) design capacity upgrading programs in collaboration with MoNRMEP and DNAS managers;
- (iv) provide on-the-job and in-house training, together with ongoing management and technical support to DNAS senior managers, in the following areas: (a) human resources management and development, staffing needs, and organization structure; (b) business planning; (c) financial management; and (d) management information systems and benchmarking;
- (v) assist DNAS to prepare its strategic business plan and annual rollovers;
- (vi) assist DNAS to develop a monthly management reporting system, implement routine data collection activities, prepare monthly management reports, and ensure integration with 'Free Balance', the whole-of-government financial management information system administered by the Ministry of Planning and Finance;
- (vii) assist DNAS to review and update duty statements of key Dili city water supply staff to reflect their new functions and responsibilities; and
- (viii) assist DNAS to undertake a detailed staffing needs analysis and report for Dili water supply operations.

B. Implementation Arrangements

5. MoNRMEP will be the Executing Agency for the TA, providing day-to-day implementation counterpart support through DNAS. The DNAS Director will be the Government's TA project director, and the DNAS chief of urban water supply will be the day-to-day counterpart of the TA consultant team leader. MoNRMEP is planning to establish a whole-of-sector project management operations unit covering all capital works programs in the water supply and sanitation (watsan) and power sectors. This project management operations unit will be located within the new Corporate Services Division and will handle all aspects of project management, including procurement and contract management, for all capital programs in the watsan and power sectors. The unit will support and oversee both TA and DUWSP implementation and will offer a reporting mechanism to

the Minister. The TA and DUWSP teams will work towards common outputs under the demand management and NRW reduction program.

C. Reporting Requirements

6. The consultants will prepare:

- (i) an inception report by the end of week 6 covering the following: (a) confirmation of TA rationale and design; (b) proceedings of the project orientation workshop for MoNRMEP and DNAS managers and demand management task force members; (c) technical skills assessment of Support Services, Customer Services, Planning and Design, and Dili O&M sections; and (d) assessment of practices and systems in these sections;
- (ii) quarterly progress reports;
- (iii) a first annual report covering the following: (a) consolidated progress against activities and milestones; (b) confirmation of validity of TA assumptions, and impact of risks; and (c) progress against TA outputs;
- (iv) a second annual report combined with a draft final report covering the following: (a) consolidated progress against activities and milestones; (b) confirmation of validity of TA assumptions, and impact of risks; (c) progress against TA outputs and assessment of TA success; (d) recommendations for follow-on capacity development; and (e) lessons learned from the TA; and
- (v) a final report that incorporates comments on the draft final report from the Asian Development Bank and the Government.