

# Fifth Progress Report on Timor-Leste



*Timor-Leste and Development Partners Meeting  
9–10 December 2002  
Dili, Timor-Leste*

The ADB logo consists of the letters 'ADB' in a white, serif font, centered within a solid black rectangular box. The background of the entire page is a faded, light green image of several flags flying, with some text visible on them, such as 'TIMOR-LESTE' and 'OF EAST TIMOR & ENCLAVES'.

**ADB**

**Asian Development Bank**

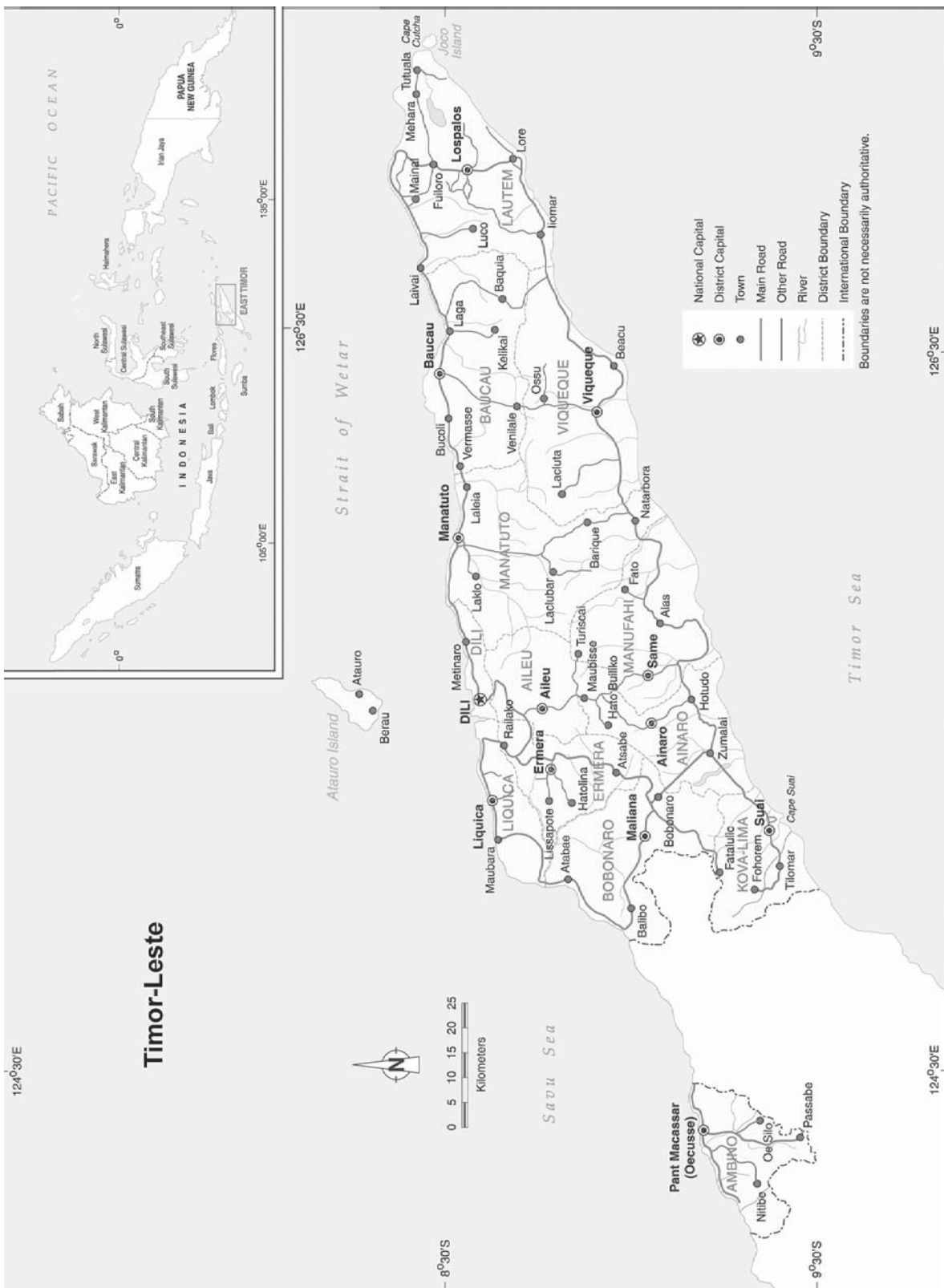
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***“...Because Asia is home to two-thirds of the world’s poor,  
the fight against global poverty must be won here in this region...”***

Tadao Chino  
*President*  
*Asian Development Bank*



## Abbreviations

ADB	Asian Development Bank
ARP II	Second Agricultural Rehabilitation Project
AusAID	Australian Agency for International Development
BPA	Banking and Payments Authority
CFET	Consolidated Funds for East Timor
CUF	Credit Union Federation
EDTL	Electricidade de Timor-Leste
EIRP	Emergency Infrastructure Rehabilitation project
EIRP2	Emergency Infrastructure Rehabilitation project, Phase 2
ETPA	East Timor Public Administration
FAO	Food and Agriculture Organization
MCTPW	Ministry of Communications, Transport and Public Works
MFIET	Microfinance Institution of East Timor
NGO	nongovernment organization
PMU	Project Management Unit
SEP	Small Enterprises Project
TA	technical assistance
TFET	Trust Fund for East Timor
UN	United Nations
UNDP	United Nations Development Programme
UNTAET	United Nations Transitional Authority in East Timor
WS&S	water supply and sanitation
WSS	Water and Sanitation Services
WSSRP	Water Supply and Sanitation Rehabilitation Project
WUG	water users group

**NOTE:** In this report "\$" refers to US dollars.

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# Executive Summary

## Development Progress

The Trust Fund for East Timor (TFET) was established to address the emergency humanitarian needs of the early postconflict period. That part managed by ADB focused on rehabilitation of infrastructure with initial efforts directed at the urgent needs of roads, ports, and water and power supply. In all activities, Timor-Leste's capacity was severely damaged in the conflict and project implementation necessitated comprehensive support for capacity building.

Much has been achieved by the projects but much work remains to be done. The focus of assistance has shifted from emergency response to more normal development activities. This is reflected in the Hera Fisheries Port Facilities Rehabilitation and Microfinance Development projects which, though consistent with infrastructure rehabilitation, are focused more on long-term poverty reduction and economic and social development rather than on emergency humanitarian and security needs.

## Supported Interventions

TFET funds have supported six projects managed by ADB in Timor-Leste with grants totaling \$52.8 million. Most projects are at an advanced stage of implementation and disbursements as of 31 October 2002 are 69% of the total value of the grants.

Grant Amount		Contracts Awarded		Disbursed		Available for Commitment	
\$52.800 m	100.0%	\$38.686 m	73.3%	\$35.844 m	69.1%	\$14.085 m	26.7%

- **Emergency Infrastructure Rehabilitation Project** – for \$29.8 million to provide access to humanitarian relief and facilitate peace and security by (i) repairing main roads to facilitate transport of aid and security cargo; (ii) inducing revival of economic activity; (iii) reducing port congestion to enable effective logistic services for humanitarian and economic goods; (iv) contributing to power supply restoration; and (v) employing local labor and skills to initiate income generation. Most works are complete, and remaining power supply restoration activities will be completed by end March 2003.
- **Emergency Infrastructure Rehabilitation Project 2** – for \$9 million to support long-term road sector development by strengthening the local contracting industry, instituting operational and maintenance systems, and providing capacity building for sector management. The project is starting with completion scheduled in 2004.

- **Water Supply and Sanitation Rehabilitation Project** – for \$4.5 million to provide the people of Timor-Leste with adequate, affordable and sustainable water supply and sanitation (WS&S) services using appropriate technology and management systems. Work was successfully completed in June 2001; the grant was closed in December 2001.
- **Water Supply and Sanitation Rehabilitation Project 2** – for \$4.5 million to ensure the communities of Timor-Leste have access to clean WS&S services as these are considered essential for public health, protection of the environment, and for promotion of economic growth based on appropriate technology and management systems. Implementation is ongoing with physical completion expected in April 2003.
- **Hera Fisheries Port Facilities Rehabilitation** – for \$1 million to contribute to sustained food security for the East Timorese. A parallel goal is to achieve responsible fisheries management by promoting offshore pelagic fisheries and thus ease the inshore fishing pressure. This will be achieved by rehabilitating the necessary harbor infrastructure facilities at Hera port for larger offshore fishing vessels. Construction is ongoing and physical completion will be in March 2003.
- **Microfinance Development Project** – for \$4 million to reduce rural poverty by developing a sustainable rural microfinance system responsive to the needs of the rural poor, particularly women. Performance of rural lending operations will be improved with a focus on establishing an appropriate policy and regulatory framework and capacity building. Three microfinance branch offices are operating. The Project will be completed in December 2003.

## Development Impacts

The Emergency Infrastructure Rehabilitation Project (EIRP) addressed the humanitarian and security issues of Timor-Leste by restoring access to roads and increasing the port capacity for humanitarian and military transport.

Social dimensions of project impacts extend and deepen the initial humanitarian benefits. Road rehabilitation under the EIRP provided access to places that would otherwise be isolated. The EIRP2 will maintain access and improve transportation through reduced road closures and lower costs of maintenance and vehicle operation. Rural electricity will provide basic services to many and multiply the potential for more social benefits from increases in availability and duration of supply.

Up to 240,000 people in rural areas and 15,000 in Dili benefited from TFET-funded water supply projects by improving access to safe water supply, thus freeing women and children from many hours spent collecting water. Beneficiaries include 31,500 in the Oecussi enclave and 1,750 on Atauro Island.

Promotion of offshore fisheries at Hera port will increase fish protein supply and bring down prices, which will lead to improved nutrition and health. It will also ease

pressure on inshore fishery resources. Easy access to microfinance is enabling the formerly resource-poor population to start their own small businesses. Market vendor loans are evenly split between men and women but microfinance group loans have a strong gender bias, with some 90% of loans to women.

Employment generation is a pressing need. Road maintenance by community groups and national contractors created employment throughout the country, especially in rural areas, estimated at over 300,000 persondays. Water supply projects are estimated to have created up to 90,000 persondays of work. Increased fisheries production will directly employ fishers and indirectly create jobs in marketing, processing, distribution, and supporting services. Microfinance loans will support employment on farms, in households, and small trading businesses.

After the destruction of assets and systems and the withdrawal of Indonesian staff, the reestablishment of institutions and their capacity to operate and manage projects was an urgent need. TFET-funded projects also addressed institutional and capacity development.

**Government capacity** was developed under each project:

- road projects created core staff experienced in maintenance, and reestablished engineering depots, road asset management system, and a system of contractor classification for quick, effective contracting;
- water supply capacity building activities and implementation experience equipped increasing numbers of WS&S staff with management, technical and planning skills; and
- microfinance developed the policy and regulatory framework and internal systems and procedures for microfinance institutions.

**National contractors** were encouraged to tender for road works and were helped in the classification and prequalification system. This experience increase the ability of local contractors to bid, win, and implement contracts. International and national contractors employed Timor-Leste nationals, increasing the pull of local technical expertise.

**NGOs** were engaged in water supply projects, developing their capacity to implement participatory community development, including mobilization of beneficiary groups, training, and physical implementation.

**Community Groups** have acted as implementers as well as beneficiaries of TFET projects:

- in roads, community contractors provided maintenance in a cost-effective manner for work that could not be undertaken otherwise;
  - in water supply, water users groups helped communities become more self-reliant in addressing shared needs and in implementing agreed solutions;
  - in microfinance, beneficiary groups underwent a socialization process to inculcate in them sound principles of credit and their responsibilities as borrowers.
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## Continuing Needs

TFET-funded projects have made a great contribution to restore essential infrastructure and services in Timor-Leste. However, much remains to be done to continue the rehabilitation of the country and to go on to development of the national potential. Financial sustainability is an issue that cuts across all sectors, and will continue to require policy action and supportive technical assistance over the medium-term. In sectors addressed by ADB-managed projects, specific capacity development needs can be identified.

Power	<ul style="list-style-type: none"> <li>• Assistance is needed to establish efficient management systems and sector planning capacity.</li> <li>• Capacity development for management and operation of district and subdistrict systems is needed and a review of local power management capabilities may also require further technical assistance support for institutional and capacity development.</li> </ul>
Water Supply	<ul style="list-style-type: none"> <li>• Water resources databases were lost in postreferendum violence. Technical assistance may help data collection to reestablish databases and improve analyses.</li> <li>• With TFET project support, WSS has created a core of experienced staff, but National Development Plan aspirations for better health, environmental protection, and quality of life require more staff to extend geographical scope and new skills for such tasks as billing of user charges and improved financial management.</li> </ul>
Roads	<ul style="list-style-type: none"> <li>• There is a continuing need for capacity building and EIRP2 will identify human resource development needs for which additional funds are expected to be necessary.</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>• Donor support may assist development of the legal framework and regulations for sustainable natural resource management.</li> <li>• Further assistance to carefully monitor catches may be needed as a tool to implement the precautionary approach to fisheries utilization.</li> </ul>
Microfinance	<ul style="list-style-type: none"> <li>• The regulatory and legal framework, especially for credit union operations, needs to be finalized and practical operations reviewed to assess performance and the need for refinement of regulations and laws.</li> <li>• Nationwide expansion of MFIET will necessitate further external assistance.</li> <li>• Effective credit unions are not yet in place and continuing support, perhaps through development of capacity in the Credit Union Federation, is needed.</li> </ul>

## **ADB Technical Assistance**

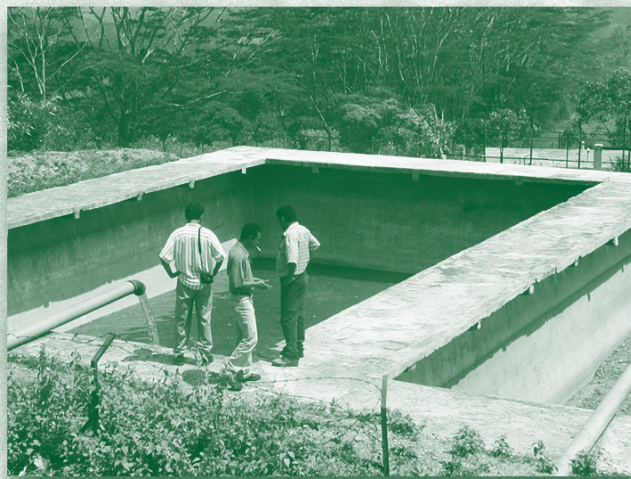
In parallel with implementation of TFET-funded projects, ADB has approved a total of 20 TAs for \$8.7 million, of which 11 are substantially complete and 9 are ongoing.

Many of the TAs have supported implementation of TFET-funded projects either as project preparation or addressing specific capacity building and institutional issues. Related work has included development of regulatory and legislative framework, analysis of policy issues, and sector-specific capacity development. Wider support has also been provided to sectors not addressed by TFET, such as posts and telecommunications, Timor Sea Office, and for general capacity and institutional development requirements.

# Part 1

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## Project Progress



## Project Progress

### Summary Project Matrix

ADB manages a total of six projects funded by TFET grants. The total value of the grants is some \$52.8 million. Only one project, the first Water Supply and Sanitation Rehabilitation, has been closed but most of the other projects are approaching the final stages of implementation. The exception is the Second Emergency Infrastructure Rehabilitation Project, which only became effective on the 18 May 2002 and accounts for \$9 million of the available balance of \$14.085 million. The status of each grant is summarised in Table 1.1. Tables 1.2–1.7 give a brief description of each project.

Table 1.1: Summary Project Grant Matrix

Project Name	Grant		Contracts	Disbursed	Available for
			Awarded		Commitment
Portfolio of TFET projects managed by ADB	\$m	52.800	38.686	35.844	14.085
	%	100.0	73.3	69.1	26.7
Emergency Infrastructure Rehabilitation Project, Phase 1 Grant 8181-ETM(TF)	\$m	29.800	28.987	26.267	0.813
	%	100.0	97.3	88.1	2.7
Emergency Infrastructure Rehabilitation Project, Phase-2 Grant 8198-ETM(TF)	\$m	9.000	–	–	9.000
	%	100.0	0.0	0.0	100.0
Water Supply and Sanitation Rehabilitation Project Grant 8185-ETM(TF)	\$m	4.500	4.472	4.472	Cancelled
	%	100.0	99.4	99.4	0.0
Water Supply and Sanitation Rehabilitation Project-2 Grant 8189-ETM(TF)	\$m	4.500	1.658	1.658	2.841
	%	100.0	36.8	36.8	63.2
Hera Port Fisheries Facilities Rehabilitation Project Grant 8190-ETM(TF)	\$m	1.000	0.769	0.647	0.231
	%	100.0	76.9	64.7	23.1
Microfinance Development Project Grant 8186-ETM(TF)	\$m	4.000	2.800	2.800	1.200
	%	100.0	70.0	70.0	30.0

The current status of each project is summarised in the following pages and a narrative of the implementation progress in each sector is presented in Section 2.

Table 1.2: Emergency Infrastructure Rehabilitation Project

Long-Term Development Objectives				
Sector Goal: Provision of access to humanitarian relief and facilitate peace and security.				
Targets:				
1. Repaired main roads to facilitate transport of aid and security cargo;				
2. Induce revival of economic activity;				
3. Urgently reduce port congestion to enable effective logistic services for humanitarian and economic goods;				
4. Contribute to power supply restoration; and				
5. Employ local labor and skills to initiate income generation.				
Basic Data				
Project Name	Project No.	Implementation Progress	Poverty Classification	Thematic Classification
Emergency Infrastructure Rehabilitation Project	8181-ETM(TF)	Satisfactory	Poverty Intervention	Economic Growth
Key Dates				
Approval	Signing	Effectivity	Project Progress	
13 April 00	19 April 00	19 April 00	90%	
	Closing	Physical Completion	Elapsed Loan Period	
Original	30 November 02	May 02	97%	
Revised	30 June 03		79%	
Grant Utilization				
Grant Amount	Cumulative Contract Awards	Cumulative Disbursements	Available Balance for Commitment	
\$29.800 m	\$28.987 m	\$26.267 m	\$0.813 m	
Project Outputs				
Output		Progress to 31 October 2002		
Emergency road repair 1. Emergency road repair of main arteries 2. Labor-based causeway construction and Bailey bridges.		Implementation of the roads component was successfully completed by mid-2002.		
Emergency Port Rehabilitation 1. Wharf extension at the Dili Port 2. Restoration of landing craft slipway 3. Upgrading of container yard at Dili Port 4. Beach matting at Baucau, Betano, and Suai 5. Third berth at Dili Port 6. Oecussi Shipping Study		All works were completed by July 2002 with the exception of item 4, which was undertaken by the private sector. Project activity was cancelled.		
Reinstatement of Power Supply 1. Utility financial management developed 2. 15 power stations rehabilitated 3. Distribution line rehabilitated 4. Power station water treatment and cooling system rehabilitated 5. Tools, instruments, equipment, radio, and repeater system installed 6. Comoro power station high voltage switch gear replaced		This component had mixed results and consulting services have been evaluated by ADB staff as unsatisfactory.  Rehabilitation of power stations will be undertaken by the end of March 2003 to complete project implementation within the revised completion date.		



Table 1.3: Emergency Infrastructure Rehabilitation Project 2

Long-Term Development Objectives				
The EIRP supports long-term sector development by strengthening the local contracting industry, instituting operational and maintenance systems, and providing capacity building for sector management.				
Basic Data				
Project Name	Project No.	Implementation Progress	Poverty Classification	Thematic Classification
Emergency Infrastructure Rehabilitation Project 2	8198-ETM(TF)	Satisfactory		Economic Growth
Key Dates				
Approval	Signing	Effectivity	Project Progress	
18 May 02	18 May 02	18 May 02	10%	
	Closing	Physical Completion	Elapsed Loan Period	
Original	31 December 03	December 03	28%	
Revised				
Grant Utilization				
Grant Amount	Cumulative Contract Awards	Cumulative Disbursements	Available Balance for Commitment	
\$9.0 m	\$0.0 m	\$0.0 m	\$9.0 m	
Project Outputs				
Output		Progress to 31 October 2002		
The EIRP-2 will provide sustainable road works that reduce annual emergency rehabilitation requirements and support for the establishment of a road maintenance regime. The EIRP2 scope includes:		The Government established the required Steering Committee in July 2002. The Steering Committee has processed a procurement plan ready to begin project implementation.		
1. preventive civil works and periodic maintenance;				
2. support for the establishment of a routine maintenance regime;				
3. detailed engineering; and				
4. training and project management.				

Table 1.4: Water Supply and Sanitation Rehabilitation Project

<b>Long-Term Development Objectives</b>				
To provide the people of East Timor with adequate, affordable and sustainable water supply and sanitation (WS&S) services using appropriate technology and management systems.				
<b>Basic Data</b>				
Project Name	Project No.	Implementation Progress	Poverty Classification	Thematic Classification
Water Supply and Sanitation Rehabilitation Project	8185-ETM(TF)	Satisfactory	Pro-poor growth	
<b>Key Dates</b>				
Approval	Signing	Effectivity	Project Progress	
31 July 00	24 August 00	24 August 00	100%	
	Closing	Physical Completion	Elapsed Loan Period	
Original	31 December 01	June 01	159%	
Revised				
<b>Grant Utilization</b>				
Grant Amount	Cumulative Contract Awards	Cumulative Disbursements	Available Balance for Commitment	
\$4.5 m	\$4.472 m	\$4.472 m	Cancelled	
<b>Project Outputs</b>				
Output		Progress to 31 October 2002		
Component 1 - WS&S Sector Management and Implementation Program		Completed as scheduled		
Component 2 - Capacity Building and Institutional Development Program		Completed as scheduled		
Component 3 - WS&S Implementation Program		Completed to the extent possible within this first project, some items have been deferred for later implementation, such as the installation of meters procured but stored pending approval of metering and tariffs.		

Table 1.5: Water Supply and Sanitation Rehabilitation Project 2

<b>Long-Term Development Objectives</b>			
To ensure the communities of East Timor have access to clean water and sanitation services as these are considered essential for public health, protection of the environment, and for promotion of economic growth based on appropriate technology and management systems.			
<b>Basic Data</b>			
Project Name	Project No.	Implementation Progress	Poverty Classification
Water Supply and Sanitation Rehabilitation Project 2	8189-ETM(TF)	Satisfactory	Core Poverty Intervention
<b>Key Dates</b>			
Approval	Signing	Effectivity	Project Progress
13 July 01	27 August 01	27 August 01	30%
	Closing	Physical Completion	Elapsed Loan Period
Original	30 April 03	April 03	72%
Revised			
<b>Grant Utilization</b>			
Grant Amount	Cumulative Contract Awards	Cumulative Disbursements	Available Balance for Commitment
\$4.5 m	\$1.658 m	\$1.658 m	\$2.841 m
<b>Project Outputs</b>			
Output	Progress to 31 October 2002		
1. Establishment of PMU within WSS	Completed in October 2001		
2. Capacity building technical assistance	Partially completed, some activities such as MIS and FIS cancelled. Remaining activities ongoing.		
3. Information technology and communications equipment	Partially completed to meet project and PMU needs but the balance deferred pending wider decisions on government network.		
4. WS&S Quick Response facility	Ongoing but activity being limited in future due to high demands on management for small-scale works.		
5. Dili Water Supply Rehabilitation and Improvement	Ongoing in coordination with Japanese Government aid.		
6. District Town (Public) Water Supply Rehabilitation and Improvement	Ongoing. Individual systems at stages between calling bids and completion.		
7. Community Water Supply and Sanitation Rehabilitation and Improvement	Ongoing. 16 NGOs awarded contracts to serve 39,200 beneficiaries		
8. Urban Sanitation Improvement	Ongoing for drainage and wastewater but solid wastes and equipment procurement deleted.		

Table 1.6: Hera Port Fisheries Facilities Rehabilitation Project

<b>Long-Term Development Objectives</b>				
To contribute to sustained food security of marine protein for the East Timorese. The goal is to achieve responsible fisheries management by promoting offshore pelagic fisheries and thus eases inshore fishing pressure. This will be achieved by rehabilitating the necessary harbor infrastructure facilities at Hera port for larger offshore fishing vessels.				
<b>Basic Data</b>				
Project Name	Project No.	Implementation Progress	Poverty Classification	Thematic Classification
Hera Port Fisheries Facilities Rehabilitation Project	8190-ETM(TF)	Satisfactory	Poverty Intervention	Economic Growth
<b>Key Dates</b>				
Approval	Signing	Effectivity	Project Progress	
17 Oct 01	27 Nov 01	27 Nov 01	30%	
	Closing	Physical Completion	Elapsed Loan Period	
Original	30 Nov 02	Nov 02	93%	
Revised				
<b>Grant Utilization</b>				
Grant Amount	Cumulative Contract Awards	Cumulative Disbursements	Available Balance for Commitment	
\$1.000 m	\$0.769 m	\$0.647 m	\$0.231 m	
<b>Project Outputs</b>				
Output		Progress to 31 October 2002		
1. Repair core breakwater structures with additional material.		Contractor selected in August 2002. Contractor mobilized in September 2002. Initial disbursements in November 2002. Work in progress with expected completion in March 2003.		
2. Place rock armor on all seaward sides of breakwaters according to specifications.				
3. Pile driving for precast concrete slabs support for all port basin face walls.				
4. Build wharves and adjacent aprons in accordance with normal vessel operations.				

Table 1.7: Microfinance Development Project

Long-Term Development Objectives				
Reduce rural poverty by developing a sustainable rural microfinance system more responsive to the needs of the rural poor, including women. Performance of microfinance system will be improved with better focus on policy and regulatory framework.				
Basic Data				
Project Name	Project No.	Implementation Progress	Poverty Classification	Thematic Classification
Microfinance Project	8186-ETM(TF)	Satisfactory	Poverty Intervention	
Key Dates				
Approval	Signing	Effectivity	Project Progress	
6 December 00	18 December 00	18 December 00	48%	
	Closing	Physical Completion	Elapsed Loan Period	
Original	31 December 03	December 03	62%	
Revised				
Grant Utilization				
Grant Amount	Cumulative Contract Awards	Cumulative Disbursements	Available Balance for Commitment	
\$4.000 m	\$2.800 m	\$2.800 m	\$1.200 m	
Project Outputs				
Output		Progress to 31 October 2002		
1. Institution building and strengthening		Ongoing. Legislation and regulations development supported and Microfinance Institution of East Timor established, opening Dili branch and Head Office in May 2002, Gleno Branch in September, and Maliana Branch in November.		
a. Establishment of a financially and organizationally sustainable microfinance bank		Credit unions found less viable than expected and need greater strengthening especially gaining larger membership for sustainable operations.		
b. Rehabilitation and strengthening of credit unions to provide microfinance services				
c. Strengthening the Credit Union Federation				
2. Rural finance for productive microenterprise of income-generating activities		Ongoing		
3. Effective project management		In place		

# Part 2

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## Sectoral Development Progress



# Roads

## Sector Status

Timor-Leste has an extensive paved network of rural main and district roads and secondary gravel and earth roads. The road network is a crucial asset for Timor-Leste that could be irreparably damaged if regular maintenance was not reestablished as a matter of urgency. Road access is an essential requirement of economic growth and delivery of social services with agriculture, forestry, fisheries, commerce, tourism, healthcare and education all requiring road transport services.

The road network of 5,000 kilometers (km) of main and secondary roads, of which half have bitumen surface, is lightly constructed and somewhat narrow. The roads have had little to no maintenance since 1997, and the combined effects of this, the passage of military vehicles, and one bad year (2000) of flooding caused damage. The Emergency Infrastructure Rehabilitation Project (EIRP), together with bilateral assistance from Japan and the efforts of the United Nations Peacekeeping Force (UNPKF), went a long way to stabilizing the condition of the roads, such that it is timely to consider a longer term plan. The focus of this work has been mainly at restoring road drainage structures together with short lengths of resurfacing at washouts and areas of land instability. A regional maintenance capability was also developed through four regional depots and, centrally, a road asset management system is being progressively implemented.

Of the 5,000 km, some 1,200 km form a core network of main roads, 2,000 km are district roads and 1,800 km are feeder roads connecting to the network. The road network was established to meet the needs of military control and to provide access for transmigration projects and to coffee growing areas. The changed needs of independent Timor-Leste can be substantially met by the 1,200 km of core main roads. Particularly in the context of constrained resources, the roads budget affords only a concentration on maintaining the core network and leaving much of the rest to be maintained by local communities as farm and village tracks.

There is a well-developed urban street and traffic system in Dili and smaller urban road networks in district capitals. Commercial road freight and passenger transport services are predominantly owner/operator and are unregulated. Public passenger transport consists mainly of minibuses and, in Dili, taxi services. Both are mainly owner-driver operation, the buses being mainly small van-body vehicles, with 9–15 seats and, out of town, light trucks with passenger seating. Buses operate within the urban area and are the main form of passenger transport in the rural areas. So far, there are no bus cooperatives or bus operators association. Bus routes and fares are unregulated. There is an informal bus terminal by the market at Taibese, Dili.

Traffic volumes outside of Dili, excluding motorcycles, which form up to 50% of the traffic flow on some routes, vary from 1,000 vehicles/day on the Dili to Tibar section down to 20 vehicles/day on the lower volume main roads. Heavy vehicles form about 5% of this traffic volume on the coastal routes east of Dili to Baucau, and up to 20% on the Batugade to Dili route. The roads across the island carry few heavy vehicles. Commercial road freight outside of Dili is mainly carried by two-axle vehicles, either pickups or small trucks. Movements of ISO containers are predominantly local to Dili and are direct movements between the port and consignee or freight forwarder's yard. The principal export, coffee, is grown in the highland areas inland from Dili and cherry or green bean is carried in pickups or small trucks to the coffee factory for processing. Heavier three-axle and larger vehicles operate on the north coast road. Buses contribute up to 45% of the traffic on some routes.

The high density of roads per unit of area and in relation to population made it necessary to define a core road network of about 1,200 km whose maintenance could be afforded and would be essential for commerce and social welfare. Road maintenance costs comprise agency costs (overheads) including staff, equipment, and facilities. The annual recurrent routine maintenance of the core network would require a total of \$8.8 million, of which \$3.9 million would be for routine and emergency maintenance. This needs to be complemented by a periodic maintenance budget. The periodic maintenance requirement was estimated at about \$7.5 million per annum. Under highly constrained budget conditions similar to those in Timor Leste, governments tend to capitalize this requirement into externally financed rehabilitation projects, a second best option and a more expensive way to funding periodic maintenance from the recurrent budget.

The Government is expected to finance the administration and routine maintenance costs to upkeep the core road network essentially necessary for commercial and social activities and to facilitate poverty reduction and economic development. Road maintenance, under best practices, would need to be expended in accordance with the road asset management system. This would prioritize road maintenance needs based on an annual road maintenance cycle that incorporates annually updated data on road conditions, preparation of road maintenance schedules that focus maintenance on the priority road sections, and implementation of road maintenance schedules by the regional depots of the Ministry of Communications, Transport and Public Works (MCTPW).

The periodic and emergency maintenance requirements are exacerbated in Timor-Leste by the young geology and the weather conditions. Much of the island is composed of sedimentary rocks, which are a fragile basis for roads and when combined with monsoon weather results in roads of fundamentally high maintenance requirements and costs. A number of large braided rivers that change their primary channel through the valleys frequently and unpredictably further deteriorate road erosion. These have interrupted road links during the monsoon season and have caused substantial damage to the river valley crossings.



The approach adopted by the EIRP2 aims to reduce the vulnerability of the network. This program includes geotechnical assessment of the soil conditions and proposes realignments and embankment strengthening works as well as bioengineering action along sections that can be stabilized with these technologies. These programs will have a long lasting impact on the road network and would lead to a reduction in annual road maintenance costs.

## Development Interventions

### 1. Projects

In 1999 and early 2000, immediate, emergency postviolence restoration work was undertaken by the United Kingdom's Department for International Development (DFID), to keep essential roads open until a broader road rehabilitation effort was in place. Subsequently, the Trust Fund for East Timor (TFET)-funded and Asian Development Bank (ADB)-administered EIRP coordinated road rehabilitation activities funded from several sources:

- **the Government of Japan-funded and United Nations Development Programme (UNDP)**-administered project rehabilitated the Dili-Aileu-Ainaro-Cassa road;
- **UNTAET** budget funded road repair and bridge restoration projects; and
- **UNPKF** undertook small works on roads including bridge restoration and gabion construction.

The primary objective of the EIRP supported humanitarian assistance by restoring transport, power, and port infrastructure. Of the three components, the road component was the largest, and accounted for \$20.6 million of the total project cost of \$29.8 million. Implementation of the road component of the EIRP was completed in mid-2002. The roads component objective was to undertake emergency road repair works to facilitate efficient transport of humanitarian aid and security cargo and to induce a revival of economic activity. The EIRP2 was approved to continue the work commenced under the first phase, particularly to strengthen the regional maintenance organization and to stabilize the core road network, where technically possible, to reduce the recurrent maintenance costs.

The EIRP road activities included road repair, equipment for road repair, labor-based and employment generating road and causeway restoration, and rehabilitation and reinstatement of bridges and depot facilities. These diverse actions were undertaken through a number of subcomponents:

- **Bridging Contracts** – continued DFID's emergency maintenance work between the end of DFID's program until the formal commencement of the EIRP's contracts. Work orders were issued for emergency opening of major routes. Though this work was often temporary in nature it served the critical purpose of maintaining access for humanitarian and security services in the early postviolence period. Work involved some 48,000 labor days.

- **Emergency Infrastructure Rehabilitation Contracts** – these 5 EIRCs implemented from June 2000 required the contractors to clear any closures of specific road subnetworks within 48 hours during the rainy season in 2000. The contracts covered the districts of Baucau, Viqueque, Manatuto, Natarbora, Aituto, Same, Maliana, Zumalia, and Oecussi. The contracts operated in conjunction with military engineers to repair and reopen roads so that emergency access and critical social and economic links were maintained. This required a flexible, responsive approach to assign resources to priority activities in a timely manner.

Some 71 km of eroded road, 52 landslips, and 45 failed road benches were repaired; 86 km of drainage were cleared; 6,360 m<sup>3</sup> of gabion walls were constructed; 4 bridges, 7 bridge approaches, 7 bridge protection sites, and 3 river training stations repaired; and 82,000 labor days of paid employment were generated.

- **Road Maintenance, Rehabilitation, and Supervision** – This major subcomponent of the EIRP disbursed over \$12 million, or about 60% of the total roads intervention under the EIRP. A total of 66 maintenance and rehabilitation contracts were awarded from December 2000 to July 2002 to address the maintenance backlog and slip repairs throughout the main network and some district roads. The smaller size of contracts facilitated the revival of the local contracting industry and reestablishment of its capacity to undertake such work. All of the contracts were completed by July 2002.

This work ensured that the core network was accessible throughout its length and that extended road closures could be avoided during the 2001–2002 monsoons.

Associated with the road maintenance contracts a total of 39 supervision contracts were also awarded. In addition to ensuring quality of the main civil works contracts the supervision work helped to develop capacity of national engineers to undertake supervisory work. Half of the work was undertaken by national contractors. In addition, international contractors also employed Timorese engineers so that 70% of the supervisors were Timor-Leste nationals.

- **Pilot District Roadworks** – From August 2000 to January 2001, the assistance of three district administrators was secured to identify and implement priority works on district roads. These constituted pilot cases that focused on labor-intensive community engagement for routine road maintenance. This experience provided the basis for later and more substantial community maintenance. The pilot program repaired 40 km of eroded road, 20 landslips, and 15 failed road benches; cleared 300 m of drainage; and built 900 m of gabion walls. Lessons from this experience were incorporated in the larger community road maintenance activity.
- **Community Road Maintenance** – Following the completion of the three pilot cases in January 2001, the main community activity began in May 2001

with the first community engagement contracts. Communities organized themselves as labor contractors rather than participants in management and decision making. Generally, the opportunity was viewed with enthusiasm and the response was positive. The EIRP developed several alternative models for community engagement. The most appropriate model, along the lines of lengths-man principles, was adopted for a nationwide application. In addition to the about 300,000 labor days generated under the EIRP, benefit was received in terms of access to markets and to social services. By the end of June 2002, about 355 villages were engaged to maintain 1,200 km of roads, a substantial proportion of Timor-Leste villages along the core road network. The funding of the routine maintenance program was adopted during the implementation of the EIRP by the Government's recurrent budget. This program to be sustainable requires additional strengthening of the depot engineers' skills for managing the scheme. This support will be implemented under the EIRP2. Community engagement along the adopted lines is sustainable as the communities can benefit from the income-generating employment opportunities offered under a routine road maintenance program that the Government implements on an annual basis. The scheme also provides an affordable method for implementing routine maintenance.

- **Refurbishment of Regional Depots** – Post referendum violence destroyed all field organizational capacity in Timor Leste. This subcomponent aimed to establish the regional maintenance capacity and a field oriented maintenance regime. Regional depots were established by October 2001 in Dili, Baucau, Mailiana, and Same with Timorese regional engineers employed by the Government and assisted by international engineer-trainers under the EIRP. Refurbishment, organized in collaboration with Consolidated Fund of East Timor (CFET) resources, included restoration of the depot offices and yards. All depots were provided with the minimum plant and the associated training by the EIRP. The Government assumed responsibility for recurrent funding of the depot operations since June 2001.

The component successfully established a field organization for the roads functions of MCTPW and to facilitate effective road maintenance. The regional depots are essential for planning road maintenance and managing and monitoring the community road maintenance program that covers 1,200 km of roads.

- **Capacity Building** – the EIRP PMU undertook activities to reestablish capacity in the Government to plan, implement, and maintain road maintenance (Box 2.1).

The rationale for continuing the work of the EIRP under the EIRP2 recognized the relatively high density of the road network and the vulnerable physical conditions combining to make a high maintenance network. The works under the EIRP had addressed emergency maintenance needs resulting from adverse weather conditions and heavy security and humanitarian traffic. It also aimed to support income generation for the returning refugee population.

The EIRP2 acknowledges the strong link between road network condition and commercial activities. Inadequacy of past maintenance is recognized and permanent engineering solutions are suggested to reduce annual maintenance costs, and importantly, to reduce the annual event of weather-related road closures of sections built on unstable soil conditions.

The EIRP2, therefore, focuses on extending the EIRP objective to restore the road network to a condition in which recurrent maintenance can effectively be carried out and the economic life of the road network can be extended through routine maintenance. The objective of the EIRP2 is to contribute to stabilization of the road network and to enable it to be left in a condition from which it can be maintained with the relatively modest budget available to the Government. The EIRP2 will also continue programs initiated under the EIRP to establish a viable and efficient maintenance operation through capacity building for the road service, national contractors, and community road maintenance. The scope of work to achieve these objectives (Box 2.2) includes

### Box 2.1: Road Sector Capacity Building

- **Road Asset Management System** – A basic road inventory and asset management program was developed and installed in the road services division of MCTPW. The program provides an effective basis for routine maintenance planning and commenced such work in September 2001. Data has been verified and the program used in budgeting for 2002/2003 and the Ministry has proposed to establish a planning unit for using the system.
- **Contractor Classification and Prequalification** – A prequalification system was established and transferred to the road service division of MCTPW. This system assigns contractors to works categories commensurate with their capacity and enables prequalification of domestic and foreign contractors on the basis of technical and financial capability. This has contributed to the reestablishment of the national road construction industry as the system for a transparent procurement of civil works and enables work to be tendered domestically among appropriately qualified contractors. This action enabled the EIRP to facilitate the recovery of the construction industry and generate employment. Using the small, national contractors is estimated to have created almost 300,000 labor days of employment.
- **Contractor Training** – In parallel with the prequalification, the EIRP provided training to national contractors in bid preparation, estimation, cost control, contract procedures, and management. This enhanced the contractor's ability to prepare bids for the tenders, promoted a more competitive tender environment, and helped revive the Timorese construction sector.
- **Consultant Training** – In order to supervise contracts let under the EIRP, local Timorese consultants were engaged to provide supervisory services. The work of the local consultants was supervised by PMU and international contract Resident Engineers. This facilitated development of local engineers thus promoting capacity building among private sector consultants.
- **Technical Assistance** – Short-term international consultants were engaged to provide advice on river training and geotechnical matters. Advice was used to help design of economic and efficient solutions to problems of bridge abutment damage and landslides.

- (i) preventive civil works and periodic maintenance,
- (ii) support for the establishment of a routine maintenance regime,
- (iii) detailed engineering, and
- (iv) training and project management.

The EIRP2 notes that the infrastructure sectors, and most pressingly roads, suffer from immediate needs that require funding beyond the Project. While the EIRP2 contributes to the backlog and stabilization work required by the core road network, planning for the sector given in the Draft National Transport Masterplan incorporates government funding of the recurrent road sector budget, and civil works under immediate and long-term requirements. Implementation of the Government's recurrent maintenance works in light of the forthcoming rainy season will be critical—in 2003, as well as on an annual basis. A significant success of the EIRP was its establishment of road maintenance capacity in the Government, national contractors, and community maintenance teams, which the Government's maintenance program can now utilize for its road maintenance program.

## 2. Technical Assistance

The main technical assistance (TA) has been provided through the EIRP PMU and project-funded short-term consultants. Broader transport sector issues, including roads, have been proposed to be addressed in two TAs:

- TA 3401-ETM: Transport Sector Restoration, undertaken between March 2000 and March 2002, addressed transport sector issues, and prepared a draft multimodal transport plan that included road transport issues and was developed into the May 2002 Draft Transport Sector Masterplan for East Timor (Box 2.3).
- TA 3731-ETM: Transport Sector Improvement was approved in 2001 addressing sustainable operations and management in the transport sector, including road administration. Implementation of the TA has been deferred due to the presence of alternative sources for advisory services, particularly from UNMISSET and UNDP.

## Development Impacts – Current and Prospective

### 1. Poverty Impact

As an emergency intervention, the EIRP addressed the humanitarian and security needs of the whole population. The beneficiaries included the poor for whom, as the most vulnerable members of the communities, the project critically facilitated delivery of humanitarian aid that was essential for survival. The poor were also able to share the benefits of access to social and economic services and employment. The community maintenance active and national contractors generated a large amount of employment

### Box 2.2: Technical Content of Grant 8198-ETM: Emergency Infrastructure Rehabilitation Project (Phase 2) – EIRP2

A grant of \$9 million has been approved for EIRP2, and will be allocated as follows:

Description	Total Cost
<b>A. Civil Works</b>	
1. Backlog and Earthworks	4.02
2. Slip Rehabilitation	1.35
3. Routine Maintenance Program	1.35
<b>Subtotal (A)</b>	<b>6.72</b>
<b>B. Consulting Services</b>	
1. Project Management and Training	1.02
2. Detailed Engineering	0.33
<b>Subtotal (B)</b>	<b>1.35</b>
<b>C. Contingencies<sup>a</sup></b>	
1. Physical Contingency	0.77
2. Price Contingency	0.16
<b>Subtotal (C)</b>	<b>0.93</b>
<b>Total</b>	<b>9.00</b>

<sup>a</sup> Physical (10%) and price (2%) contingencies are included.  
Source: Staff estimates.

- **Backlog and Earthworks** – the largest component, recipient of \$4.02 million, 45% of the total project cost.
  - **Earthworks.** The earthworks rehabilitation will support the reconstruction and minor realignment of short road sections that have become unstable and have potential for technical correction. The soils, topography, and climate combined render the road network vulnerable to landslides. Clearing and repairing these is a major component of the recurrent maintenance activities. Annual repairs cannot effectively and economically reinstate the extensive landslip sites. More permanent solutions are required through improved alignment and fully engineered slope stabilization works and bioengineering techniques. This component will initiate a strategy for preventive civil works for bench failures<sup>1</sup> that are currently absorbing an unacceptable proportion of the recurrent budget. A preliminary list of roads has been identified and includes sections on roads from Baucau to Viqueque Border, Viqueque Border to Viqueque, Tibar to Ermera Border, Ermera Border to Ermera, Maliana to Hauba, and Batugade to Maliana. Detailed design and geotechnical study due to commence in the second quarter of 2003 will support identification of the specific sections.

<sup>1</sup> A bench failure is a slip of the ground beneath the road, where the road was originally formed by a cut into the hillside, caused commonly caused by a slide in the landfill placed on the sloping hillside to create a level bench for the road.

### Box 2.2: Technical Content of Grant 8198-ETM: Emergency Infrastructure Rehabilitation Project (Phase 2) – EIRP2

- **Bioengineering.** Bioengineering techniques will be used to enhance slope stability. Under these techniques, indigenous plants will be identified that will effectively reduce soil moisture, resist surface erosion, and bind surfaces with strong and deep root systems. Once appropriate plants are identified, small nurseries will be established, and optimum planting and care strategies identified, demonstrated, and implemented.
- **Backlog Maintenance.** Periodic maintenance requirements cost about \$12 million per annum. This reinstates road surfaces damaged by traffic abrasion and wet season erosion. Most roads have lost the integrity of their wearing surfaces. Consequently, they deteriorate too rapidly for routine maintenance to be effective, and have become impassable in wet weather. While an ideal periodic maintenance program would resurface about one seventh of the network each year, periodic road resurfacing is required at intervals of 5–10 years. However, no such program has been implemented during the past 4 years, and as much as 60% of the network is overdue for resurfacing treatment. Sites needing work most urgently will be identified and this treatment strategy initiated. A small bridge replacement program will undertake the backlog of repair and replacement needs of substandard and vulnerable major drainage structures on the main roads.
- **Support to Routine Maintenance Regime.** Steep slopes, erodible sedimentary materials, and intense rainfall characterize the road network environment. Under these conditions even minor slips and drain blockages result in road sections becoming impassable after heavy rainfall. Under the EIRP, village groups are responsible for maintaining the road drainage system; eventually, funding for this will be transferred to the recurrent budget of the East Timor Transitional Administration. The EIRP2 provides technical support to establish the community-based maintenance program and related technical capacity in the field organization.
- **Training.** Significant skills upgrading is needed to enable the East Timorese to assume managerial and technical responsibility for implementing the routine and periodic maintenance regime, bio- and other engineering techniques, and financial and administrative accountability for the sector. Under the EIRP, immediate, and medium- and long-term training requirements are being identified under a comprehensive human resource development assessment, which will determine the specific skills required for the planned institutional arrangements for the sector (para. 24). The EIRP2 will provide the technical training to establish the technical capability of the road maintenance organization. However, this program is likely to require additional resources, and the Project Management Unit (PMU) of EIRP2 will make all efforts to identify cofinancing for this purpose.
- **Project Management.** The EIRP2 will be implemented through a Project Management Unit with local and international experts. Gradually, the Ministry of Communications, Transport, and Public Works will integrate project management with the regular operations of the road functions. The PMU will engage geotechnical and design engineering services and other short-term specialists, as required.

### Box 2.3: Draft Transport Masterplan for East Timor

The assistance financed by the Trust Fund for East Timor through the Emergency Infrastructure Rehabilitation Project, in conjunction with the road and port sector projects funded by the Government of Japan, involved 2 years of sustained effort to restore the transport infrastructure of Timor-Leste to an operable and maintainable condition, and to assist in developing government administrative structures, legislative framework, sector policies, and investment planning for the transport sector. Additionally, ADB provided technical assistance for Transport Sector Restoration that aimed to (i) prepare a comprehensive transport sector study covering the three transport modes in Timor-Leste, and (ii) develop an integrated plan for an efficient and effective multimodal transport system to support long-term development and growth potential of the territory. The Multimodal Transport Sector Master Plan was one of the many outputs of the planning work, produced as a final report in May 2002.<sup>1</sup>

The aim was to consolidate a multimodal transport sector strategy and agenda of policy and institutional recommendations that contributes to the Government's planning and preparation of the National Development Plan and sector development framework. The strategy covers physical planning for the transport sector, and also considers institutional development, legal framework, cost recovery, and other policy issues. The report has been organized into three sections, Part A covering general and cross-modal issues, Part B dealing with physical development of the road network and the roads administration, and Part C with land transport, maritime and aviation sectors.

<sup>1</sup> UNTAET/Asian Development Bank, Transport Sector Restoration Project ADB TA3401-ETM, Multimodal Master Plan, Final Report, October 2001.

throughout the country. The timing of the EIRP activities increased the social and economic benefits as employment opportunities, especially in rural areas, were then very few. As expected under its objectives, the EIRP facilitated humanitarian aid and security by restoration and maintenance of roads access in the postviolence period and helped sustain communities and the social fabric.

As a result of the EIRP, many of the aid-funded measures were able to access places that would not have been possible at all without the project.

## 2. Institutional and Capacity Development

When the EIRP commenced there was no effective road maintenance capacity in Timor Leste and road maintenance has been grossly neglected since 1997. The PMU was established as the executing agency, and had to act, effectively, as the roads department in order to undertake project activities. During implementation of the EIRP, significant capacity has been established:

- **The Government** now has a core of staff implementation of road maintenance projects and has benefited from the reestablishment of five engineering depots, a road asset management system, and a system of



contractor classification. Technical and managerial training is, however, still required to enable effective road agency operations. The EIRP2 would continue to upgrade management and technical skills under its human resource development component.

- **National contractors** have been encouraged to tender under transparent and clear procurement processes for construction and supervision contracts individually and in joint-ventures. The classification and prequalification system has made it easy for the Government to include them in invitations to tender and contractor training has increased their ability to prepare bids, and win and implement contracts. Transparent tender processes need to be continued and actively supported.
- **Community engagement** has employed communities to provide routine maintenance in a cost-effective manner for work that could not be undertaken otherwise. Community-based maintenance is sustainable and provides a source of income generation that carries a considerable poverty reduction impact. The EIRP2 will strengthen and further regularize this community engagement model.

### 3. Lessons Learned

Lessons learned from the implementation of the EIRP suggest:

- Flexibility in project design is important in conditions of uncertainty, particularly in the initial, emergency phase when humanitarian and security needs were not predictable. Subsequently, changeable weather, unknown geological conditions, landslides, and road closures determined priorities at short notice and could only be addressed through a flexible and responsive process.
- Capacity building for local contractors and communities necessarily involves risks of inexperience and resulted in the need to redo work. To mitigate these risks a program of training in procurement, work management, and quality control needs to be undertaken from the outset. Early establishment of a contractor prequalification system and monitoring performance with full supervision improves both implementation capacity and the quality of work done.
- In an immediate postconflict situation unconventional project implementation arrangements are necessary in view of the absence of capacity and facilities of the recipient government. Substantial executive responsibility was assumed in project management that allowed successful implementation and supported both donors and government in budgeting, coordination and capacity development. As normal conditions are being reestablished and government capacity is being created, the implementation arrangements need adjustment.

#### 4. A Way Forward

The National Development Plan (NDP) promotes development of an integrated system of road infrastructure and road transport services that supports the sustainable development of Timor-Leste and favors the more disadvantaged social groups. This involves development of infrastructure and services for land, air, and sea transport to create sustainable conditions for other areas of the economy and to promote employment opportunities in the areas of land, air, and sea transport and to develop technical and scientific specialization and knowledge in the sector (Box 2.4).

**Road Maintenance.** Road maintenance comprises routine tasks that can be accomplished through community labor such as drain clearing and grass cutting, and spot surface and shoulder repairs. Included in the routine maintenance cost budget is the clearance of and repairs of slips. This has been a very large item over the past 2 years, in part due to one very wet season in 2000, during which a lot of damage occurred. The drain clearing and grass cutting tasks should be accomplished within a budget of \$600/km/year. The pavement repairs double this to around \$1,200/km or \$2.2 million for the main road network. An allowance for slip clearance on top of this should be based on an average over several years but, allowing for the steep terrain and runoff characteristics, an allowance for slip clearance at 75% of the routine maintenance tasks is advisable. This makes the cost of routine maintenance over the whole network \$3.9 million.<sup>1</sup>

Road maintenance has been funded mainly from TFET, the Government of Japan, and UNPKF until mid-2002 with the bulk of the expenditure channelled through the EIRP. CFET funds were directed mainly at the district level network over this period. Increasingly, however, the Government's recurrent budget would be required to fund the national roads.

The road infrastructure suffers from immediate needs that require funding beyond the EIRP and the limited bilateral funding. Government resources alone are not able to meet recurrent requirements, leaving an ongoing need for financial support of maintenance work. While the national contractors and communities can do most of the routine and periodic maintenance work using local materials, international inputs will be needed for major works that include geotechnical and major earthworks. External funding will be required to support major works in the future. Bilateral resources, particularly from Japan, have made significant contributions and are expected to continue to support the sector.

In addition to the need for civil works and equipment, there is also a continuing need for capacity building for the Government. The EIRP2 will identify human resource

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<sup>1</sup> Estimating the future costs of road maintenance is complicated by the artificial cost environment that has been created during the period of restoration. Unit rates for materials and labor have been driven up, compounded by dollarization. Consequently, experience from this period should not be assumed to continue into the future.

### Box 2.4: National Development Plan Policy Actions for the Road Sector

- Formulate legal provisions for vehicle weights and dimensions; vehicle construction, inspection and use; and a Road Code.
- Introduce a fiscal system for roads and vehicles, in conjunction with the Ministry of Finance.
- Introduce a legal framework for the commercial carriage of goods.
- Formulate a policy and legal framework for entry to the road transport industry, passenger and heavy goods service vehicle licensing, and taxi services.
- Formulate a policy and legal framework for public passenger transport—urban, suburban and interurban, defining the licensing regime for operators and imposing minimum regulations for safety and quality.
- Analyze the need to create an urban public passenger transport company for the city of Dili, in the form of a public company or of a concession.
- Organize and improve public passenger transport terminals in the city of Dili.
- Develop an integrated road safety policy and its legal and institutional framework.

development needs and, though it will address some of those needs, additional resources are expected to be necessary.

Periodic maintenance covers the full overlay of the road surface at intervals to provide one or more of the following: strength improvement, smoothed running surface, and rejuvenation of the existing surface layers. The whole road surface needs a periodic treatment about every 5 years for a low volume gravel road and every 10 years for a low volume sealed road. Periodic treatment can be done in large sections of gravel resheeting or overlay, or piecemeal as the needs become apparent, which is perhaps less efficient but more conserving of materials. In the case of periodic maintenance, there is no real expectation that it can be met from government recurrent expenditure. The estimate would fund the national road periodic maintenance requirement, and once all of the restoration works are complete, district roads be left unfunded and only about half of the sealed network would receive periodic treatment. Overall, a shortfall in both the routine and periodic maintenance budgets is expected over the next 5 years unless external assistance is provided. Road maintenance costs are shown in Table 2.1.

**Short-Term Road Improvements.** A short-term plan was developed under the Draft Transport Sector Masterplan with the objective of restoring roads that have deteriorated. It also identified specific improvements, such as short lengths of realignment, to reduce loss of service and to decrease future maintenance requirements. The short-term plan covers 1,170 km of national roads and involves expenditure of \$46.5 million over 6 years, or \$7.8 million per year, in selected upgrading, split evenly between road and bridge works. The short-term plan assists in reducing the longer

Table 2.1: Funding Needs for Road Maintenance, \$ million/year

Road Category	Length (km)	Maintenance (\$ million)		
		Routine	Periodic	Total
National Roads	1245	2.6	5.0	7.6
Main District Roads	632	1.3	2.5	3.8
<b>Main Network</b>	<b>1,876</b>	<b>3.9</b>	<b>7.5</b>	<b>11.4</b>
Other Roads				
Paved	780	1.2	2.3	3.5
Gravel	514	0.9	0.8	1.7
Earth	1,989	1.6	–	1.6
<b>Subtotal</b>	<b>3,283</b>	<b>3.7</b>	<b>3.1</b>	<b>6.8</b>
<b>Total Network</b>	<b>5,159</b>	<b>7.6</b>	<b>10.6</b>	<b>18.2</b>

term maintenance costs as well as providing lower vehicle operating costs, improved journey times and induced agricultural production benefits and was calculated to give a rate of return of 17% overall. Recognizing short-term budget limitations, a realistic plan for short-term improvements based on the assessed benefits and capital costs are shown in Table 2.2. This requires a capital expenditure of \$1.3 million/year to fund the highest rate of return projects, which are improvements on the main roads from Dili to the west as far as Batugade and south to Ermera. For an expenditure of \$4.5 million/year improvements to the road from Dili to Manatuto to Baucau to Lautem to Los Palos are the next highest priority, together with the road south from Dili to Aileu and as far as Maubisse, and the route from Ermera to Hauba. This plan will be funded only in part under the EIRP2.

The short-term improvements do not consider urban roads, particularly the needs of Dili, and some provision in the short-term capital works plan is highly desirable. Recognizing that there will be limited budget available, a total of \$2 million over 6 years, or an average of \$0.33 million per year, should be sufficient to arrest the deterioration and make progress toward restoration of the paved urban road network. While this would include a small provision for district towns, the majority of the expenditure would be in Dili.

Additionally, the Natabora and Cassa bridges require a relatively minor percentage of their total cost to complete and so gain all of the benefits. For this reason, if capital funds become available from an international or bilateral source either as grant or at attractive concessionary rates, then completion of these two bridges should be considered. A further small allowance should be made for support to the Road Safety Plan, which should primarily be driven from MCTPW. Road safety improvements are generally found to be highly beneficial in terms of savings in medical costs, and the social costs to victims and relatives. A small allocation of initially \$50,000/year was proposed under the Draft National Transport Masterplan.

Table 2.2: Priority Short-Term Improvements Over 6-Year Period

Priority	Route	Road Link		Short-Term Improvements \$M			Internal Rate of Return Total
					Roads	Bridges	
1	A3	Tibar	Liquica	1.0	0.2	1.2	52.2%
2	A3	Dili	Tibar	0.6	0.2	0.8	33.7%
3	A4	Tibar	Ermera	1.5	0.5	2.0	27.7%
4	A3	Liquica	Batugade	2.5	1.4	4.0	25.0%
5	A1	Dili	Manatuto	1.5	0.7	2.2	24.8%
6	A2	Dili	Aileu	1.7	0.1	1.8	23.3%
7	A12	Hauba	Zumalai	0.9	0.0	0.9	23.0%
8	A10	Ermera	Hauba	3.0	1.1	4.1	22.3%
9	A1	Manatuto	Baucau	2.6	0.2	2.8	21.1%
10	A1/A8	Baucau	Los Palos	3.9	1.9	5.8	20.6%
11	A2	Aileu	Maubisse	0.9	0.2	1.1	20.1%
							\$M/yr
Total	> 20% IRR			20.3	6.5	26.7	4.5
Total	> 25% IRR			5.7	2.3	8.0	1.3

Source: Multimodal Master Plan.

The short-term capital budget estimated under the Draft National Transport Development Plan is shown in Table 2.3.

**Medium- to Long-Term Investment Planning.** In the long term, the ability of Timor-Leste to implement improvements to the road network will be constrained by revenue, the share of government revenue allocated to the transport sector, and the country's capacity and willingness to take advantage of concessionary funding from multilateral and bilateral donors. Also, as a first principle, available funds should go into maintenance and improvement tasks in the following priority order:

- **Routine Maintenance** is relatively low cost and very important in preventing, particularly, flood damage; prompt patching of potholes avoids accelerated degradation that is more expensive to repair later. The conclusion is that a roads appropriation of at least 10% of the recurrent budget is required to fund maintenance alone on the main national and district network. The revenue position would be improved by the establishment of a Road Fund and with fuel excise and annual licensing fees set to levels that recover at least part of the cost of maintaining the road system. The Draft National Transport Plan estimates that an aggressive introduction of road user charges could raise about \$15 million over a 6-year period, equivalent to about 65% of the routine maintenance expenditure requirement.
- **Periodic Maintenance** - The policy of overlaying full sections of roads when they start to exhibit distress from vehicle loading or embrittlement, but before

Table 2.3: Short Term Capital Budget<sup>a</sup>

Item	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	Total
<b>Budget</b>							
Selected Road Upgrading		1.00	1.10	1.21	1.33	1.46	6.10
Urban Roads	0.20	0.40	0.44	0.48	0.53	0.59	2.64
Road Safety Projects		0.05	0.05	0.05	0.05	0.05	0.50
Cassa, Natabora Bridges	0.90	0.90					1.80
South Coast, Oecussi bridges			0.45	4.00	4.45		8.90
Oecussi Roads FS				0.10			0.10
<b>Subtotal</b>	<b>1.10</b>	<b>2.35</b>	<b>2.04</b>	<b>5.84</b>	<b>6.36</b>	<b>2.10</b>	<b>20.04</b>
<b>TFET</b>							
Ossu – Viqueque	0.50	1.00					1.50
Maliana – Bobonaro	0.30	0.70					1.00
<b>Subtotal</b>	<b>0.80</b>	<b>1.70</b>					<b>2.50</b>
<b>Total</b>	<b>1.90</b>	<b>4.05</b>	<b>2.04</b>	<b>5.84</b>	<b>6.36</b>	<b>2.10</b>	<b>22.54</b>

<sup>a</sup> Note: Excludes periodic maintenance, shown under the maintenance budget but part of the CFET capital budget submission; TFET is capital project costs only, excludes PMU costs and support to regional engineers, training and design services and contingencies

they deteriorate so far as to need more extensive rehabilitation or reconstruction, may be difficult to achieve within the funding constraints. It will be important to preserve the pavement strength and life by protection from axle overloads, and a reduced load limit on the cross-island (north/south) roads. It would also be necessary to consider whether low cost treatments for surface rejuvenation are possible, where ageing is the primary deterioration mechanism. Over the short to medium term it may be necessary to accept a higher proportion of patching and a rougher surface than is normally desirable, so that periodic maintenance funds are conserved.

- **Unstable and Flood Damaged Sections** – a large proportion of the expenditure in the past 2 years has been directed at repairing flood damage at stream and river crossings and in areas of unstable geology. In the case of land instability, there is an urgent need for geotechnical inspection and testing of difficult sections, so that solutions can be designed that are cost-effective. Geotechnical and detailed engineering design study will be conducted under EIPR2. In some cases, however, it may be cheaper to accept the instability and continued maintenance, possibly leaving sections unpaved, rather than invest in expensive realignment or stabilization works that have a risk of failure.
- In the case of river crossings, there is a need to evaluate the catchments, concentration of runoff and stream bedloads, before deciding on design solutions. In some cases, a higher capital cost solution (longer span or realignment) may be warranted rather than constantly rebuilding temporary or inadequate lower cost works. However, inadequate design and poor

construction quality appears to have been as much responsible for premature failure of structures installed in the past 2 years. While this may have been, to some extent, understandable in the prevailing conditions, future works should have tighter design and construction control. The EIRP2 will address the most imminent abutment, major culvert, and small bridge failures.

- **Upgrading and New Construction** - while improvements to the national road network are desirable, and may in some circumstances be economically justified, upgrading and new construction should be undertaken only from funds remaining once maintenance work has been adequately funded. This may require MCTPW limiting the extent of the network that it attempts to maintain, so that this can be done adequately, rather than spread funds too thinly.
- At present the 1,200 km of national and possibly an additional 600 km of main district roads are regarded as the core network. Currently, however, there are insufficient funds to maintain this extent of network from the Government's budget. It is possible that unit rates for maintenance will fall once the inflationary effects of the international presence are removed. Also there may be scope for cost-efficiencies in the techniques employed. However, the Government should be prepared to reduce the size of the core network if necessary, noting that road access to all district capitals from Dili could be maintained with a network of less than 1,000 km. As an alternative to reducing the extent of maintained network, the Government could also look to international funding on a grant or concessionary loan basis to bridge the gap over the short to medium term.

**Implementation Capacity Constraints.** The capacity to implement road maintenance and improvement work is also constrained by the Government's capacity to administer programs and of the contracting industry to undertake them. The current road functions of MCTPW has had some difficulty in disbursing its appropriations and could be read as a constraint on implementation capacity. However, it does point out the need for MCTPW to build its internal management over the next 18-month period, so that it can assume a larger program as the TFET-funded program runs down.

## Ports

Transport internal to Timor Leste is all by road on the mainland, with the exception of offshore islands and Oecussi enclave which, since 1999, has been supported by a free coastal ferry and a UN-provided air service. Oecussi could be served by land-route through West Timor, given cooperation of the Indonesian Government. The islands of Atauro and Jaco are accessible only by sea, but have no regular commercial transport service. While there are a number of small coastal wharves and landings (Box 2.1), there is no coastal shipping service and limited demand. Road distances and travel times are generally too short for sea to offer a competitive alternative for general goods transport, although the light construction of the road system, and costs of strengthening, may provide a case for moving heavy and bulky loads by sea. Overall, there is relatively little competition between modes of transport. However, some scope exists for coastal shipping and internal air transport to be operated as an extension to international transport services.

### Box 2.5: Ports of Timor Leste

**Dili Port.** The wharf face is 300 meters (m) long and 20 m wide and can accommodate three small or two larger vessels at one time, with draft up to 7.2 m, the third berth having been completed under the Emergency Infrastructure Rehabilitation (EIRP). Restoration of the wharf rubber fendering has been carried out under Japan bilateral aid. An inspection of the underside of the wharf has indicated the need for some remedial strengthening works. A barge landing ramp area at the southeast end has been repaired, and a break in the seawall at the western end is used as a beach landing by smaller landing barges. A slipway has also been completed under the EIRP.

Covered storage consists of a trans-shipment shed immediately behind the wharf, 56 m x 21 m, and four warehouses (two at 20 m x 40 m and two at 15.3 m x 37 m), all with concrete floors. The eastern open yard has been extended under the EIRP and the surface leveled and compacted; the surface is to be paved with concrete blocks under a current contract. The required western yard surface leveling and paving is being implemented with funding from the Government of Japan.

Container storage was summarized in the MMP at 15,575 square meters (sq m) made up of 9,000 sq m in the eastern yard (225 m x 40 m), 4,590 sq m in the western yard and hardstand, and with a further 3,000 sq m available through a western extension.

The sea approaches to Dili port involve navigation through one of two narrow passages and the navigation aids have been restored to a high standard under Japanese grant aid.

**Hera jetty,** 14 kilometers (km) east of Dili on the eastern side of the lagoon, was constructed in 1990 for fishing use, and is 80 m long with a 30 m width L-shaped head, reinforced concrete deck on steel piles. Fendering, bollards and navais are all deteriorated, as have the sea defense works protecting the boat harbor. The wharf is leased to a private



### Box 2.5: Ports of Timor Leste (cont'd.)

operator (Curtain Bros) until at least mid-2002 who provides support to the Peace Keeping Forces, and as part of the lease agreement has undertaken some repairs to the wharf facilities: water supply, paving, reproofing and refurbishment of buildings, fencing and ice plant. The western side of the lagoon at Hera, where there is deeper water, has been suggested as a possible site for a future relief port to Dili to handle container shipping, should demand outstrip the capacity of Dili wharf.

**Tibar** wharf, 12 km west of Dili, has a concrete jetty with timber deck, and has also been suggested as a possible future container port site, but the costs and environmental acceptability of clearing a passage through the bay are likely to be too high.

**Com** is located 70 km east of Baucau. There is an 80 m length T-head jetty linked by an L-shaped causeway to the road. There are no storage or handling facilities. Navais exist but are not operational. The deepwater approaches would allow relatively large vessels to berth, although there is no obvious anchorage. With no nearby center of population or other export-based development, the immediate uses for Com port are limited. It has been suggested for private leasing as a support to the petroleum industry, but the lack of shore infrastructure and poor road connection to Dili does not make it an attractive prospect for development.

**Caravela** is a solid concrete pier 100 m x 9 m, located on the north coast midway between Manatuto and Baucau and built as a RoRo terminal to serve the Indonesian transmigration program. The water depth is shallow and the fendering on the two mooring dolphins has deteriorated. An adjustable ramp at the landing point is not operational. Shore facilities are limited to an administration building and roadway. The wharf would only have a future if a coastal landing barge service were to be introduced.

**Oecussi** is currently served by a 15 m wide concrete landing yard, located close to the town center. An unpaved open storage area of 100 m x 60 m is used for all forms of cargo. There are no passenger facilities for the passenger ferry service when it is reinstated.

The original wharf at Oecussi, not currently in use, is a T-pier 50 m long x 8 m wide, linked to a paved open storage area by a 4.5 m wide concrete roadway. When last inspected, the wharf was reported to be structurally sound with good fendering. There is no shore-based cargo handling equipment. Buildings include a port control room and storage buildings all of which were damaged.

**Atauro** island is served by an 80 m long concrete jetty near Beloi, suitable only for small boats, and dry at low tide, although there appears to be scope for extending the jetty into deeper water and berthing larger vessels.

There are another 10 or so beach landings around the coastline.

## Dili Port

### 1. Sector Status

The main port at Dili provides the interface between sea and road transport. Being located close to Dili's business and government center and on a confined site creates some conflict between city traffic and the needs for heavy vehicle access and (de)consolidation of cargo. This is a situation that urban planning will need to confront in future. Dili is served by liner services from Australia and Singapore on a weekly and fortnightly rotation carrying container and break-bulk cargo. Direct shipping services operate to Darwin, Malaysia (Kota Kinabalu, Sabah), Singapore, and Indonesia (Surabaya). Small coastal vessels also operate between Indonesian ports and Dili, carrying break-bulk cargo. Trade has been heavily weighted toward imports over the restoration period.

Projections of cargo tonnages and 20-foot equivalent units (TEUs) through the port of Dili in Figures 2.1 and 2.2 were estimated based upon short-term forecasts of the components of import and export trade and, beyond 2004, are based on GDP growth. During the restoration period, trade through the port has been boosted by the presence of international personnel and the materials imported to support the reconstruction efforts. In the short term, there is expected to be a decline in cargo volumes due to the completion of the emergency restoration efforts and withdrawal of the international staff. In the longer term this will be made up by import and export trade growth. However, it is expected to be some years before the port is called on to handle cargo

Figure 2.1. Cargo Projections, 2000–2030

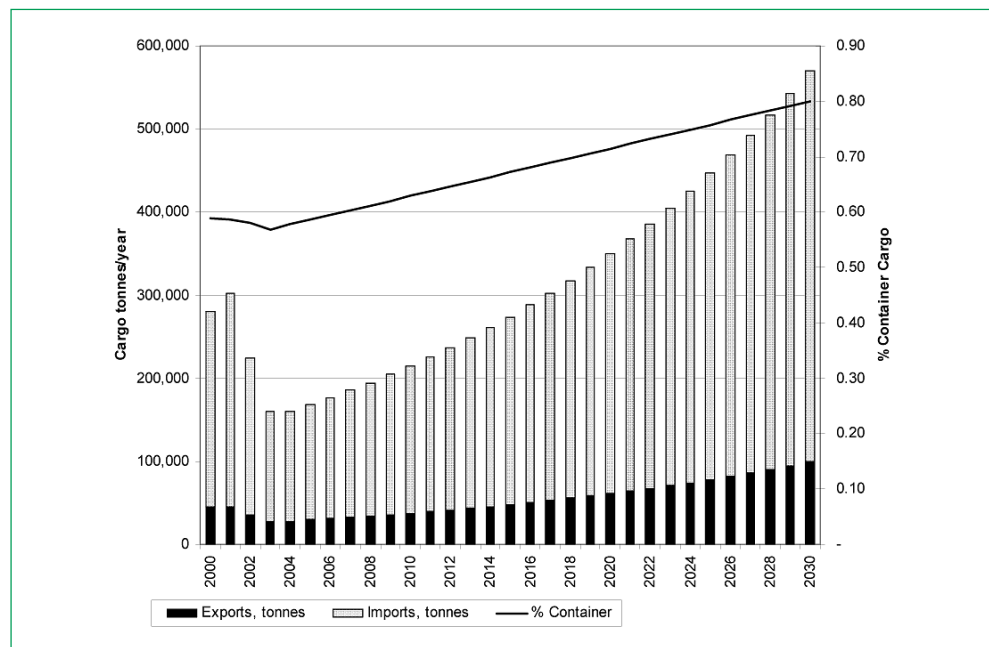
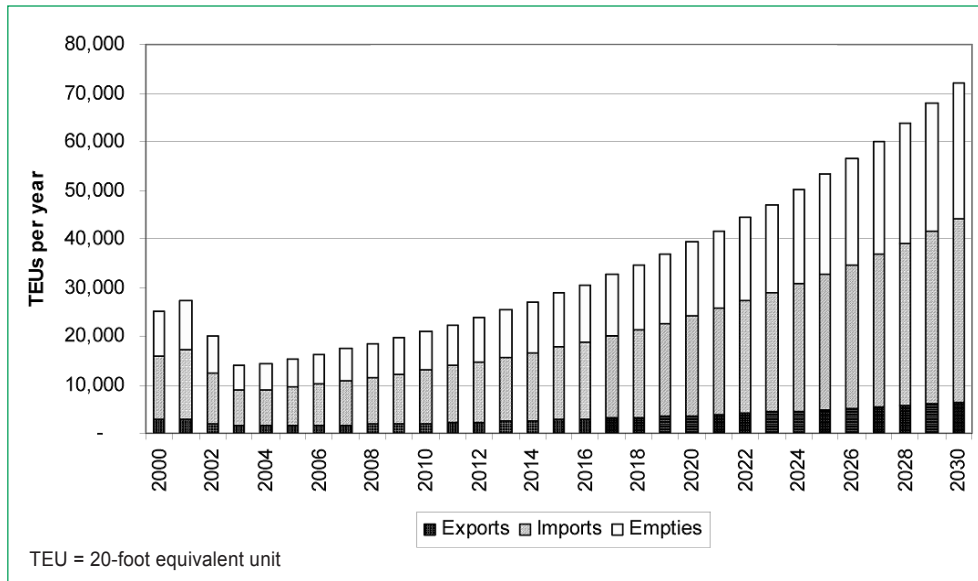


Figure 2.2. TEU Projections, 2000–2030



volumes greater than that in 2000-2001. The division between container and break-bulk cargo was estimated to be 60% in 2000 and is assumed to have increased over time. Empty containers are assumed to equal the balance between imports and exports with a 10% reduction factor to allow for losses.

A free ferry service, since 1999, connecting Dili with the Oecussi enclave in West Timor, provides an essential coastal link. The islands of Atauro and Jaco are also accessible by domestic, private, maritime services, though there is no regular commercial service. Cargo port facilities in Timor-Leste are limited to the single container port at Dili, three small wharves, and a number of small jetties and landings.

Dili was formally a coastal port, but is now the main and only international port of entry to East Timor. Built on the foreshore close to the center of town, the port is constrained in depth of port land behind the quayside by the main road. The layout of buildings and cargo sheds is more suited to its previous function of a coastal wharf handling mainly general cargo rather than for international container shipping. Work by the Peace Keeping Force, then under the EIRP and bilateral aid, has been aimed at repairs and adaptation of the port to handling increased volumes of container cargo. There are no shoreside cranes, so all cargo transfer is by load-on-load-off geared vessels with a small proportion of cargo being landed using roll-on-roll-off vessels. All stevedoring is undertaken under private contract between the shipping operator and stevedoring companies.

## 2. Development Interventions

In addition to the major physical improvements at the Dili port that were undertaken under the TFET-funded EIRP project and the Government of Japan funding,

UNTAET funded small works to restore the essential lighting and communications. The Government of Japan funded work that restored the wharf fenders and navigation aids. A second phase of the Japanese program will seal the western container yard of the port among other civil works for the improvement of cargo handling.

The EIRP originally included provision for cargo-handling equipment at Dili port and minor works at landing sites at Suai, Betano, and Baucau. These were, however, cancelled as redundant as the private sector proved able and willing to provide these. This allowed EIRP to focus on its primary objective of reducing congestion at Dili port, reduce long queuing time for ships and, thus, increase the effectiveness of delivery of aid and goods. The civil works included:

- **Eastern container yard** – installation of a gravel compaction of the soft container yard east of the port. As an emergency measure, the gravel compaction completed in September 2000, allowed more effective storage and handling of containers, thus increasing the capacity of the yard. The yard was further improved with sealed pavement with lighting, security wall, and fire fighting equipment during the first half of 2002. All work was completed by 30 June 2002.
- **Completion of the third berth** – construction of a third berth was suspended in 1997. Decking and strengthening was installed in September 2000 but use of the berth required confirmation of concrete quality, which could not be done in Timor-Leste at that time. The need to use foreign test laboratories and then undertake remedial works resulted in formal completion only in July 2001. In the interim, the berth serve the Japanese port restoration program as a service area.
- **Slipway repair** – a concrete landing ramp at the port was repaired and became operational in September 2000. The slipway serves barges handling goods, particularly humanitarian aid and military cargoes.

At the request of the Transitional Government, a study was undertaken of a tugboat operation at Dili port. This concluded that a commercial operation could be viable provided that the appropriate port regulations were promulgated.

Also at the Government's request a transitional study was also undertaken of domestic shipping services. This resulted in proposals to engage private sector operators for the Dili-Oecussi and Dili-Atauro routes under a minimized subsidy bid. The ADB-funded technical assistance for Transport Sector Restoration Project<sup>1</sup> prepared tender documents for the minimum subsidy franchise. The study also proposed opening of Oecussi as an international entry port. The Government, however, was gifted a vessel and opted to operate the Oecussi route, providing a fully subsidized weekly service.

Finally, the structural condition of the Dili wharf was inspected by the EIRP in association with work on the container yard. Specific areas for remedial action were

<sup>1</sup> TA No. 3401-ETM: Transport Sector Restoration Project, approved for \$1.0 million, in February 2000.

identified. These works were proposed for the sector recurrent maintenance budget and did not qualify as emergency repair works.

### **3. Development Impacts – Current and Prospective**

#### ***a. Poverty Impact***

The port restoration under the EIRP and the bilateral program had an indirect poverty impact as the poor shared the social and economic benefits of the improved security and humanitarian conditions as a result of economic, safe, and timely landing of cargo including food supplies. Improved port capacity helped increase the effectiveness and availability of both humanitarian and military activities during the emergency period, thus helped sustain life. By increasing the efficiency and reducing the unit costs at the port, the project produced economic benefits. Import costs were reduced allowing lower prices and greater availability of imported goods, both for consumption and as inputs to domestic production. Lower port costs, achieved under the restoration projects, should also allow better farm and factory gate prices for goods that are exported and thus encourage exports.

#### ***b. Institutional and Capacity Development***

The EIRP was primarily concerned with physical restoration of the port operations rather than building institutional capacity. However, it was recognized that the port sector has potential for financial self-sufficiency and could be organized as a statutory authority with independent financial statements and autonomy. To promote cost recovery, ADB engaged consultants services in February 2000 under TA 3401-ETM: Restoration of Transport Sector Project to identify appropriate port dues. These were adopted by UNTAET later in that year.

The same TA assisted with the first port asset inventory. Also, a proposal and documentation was prepared for a comprehensive technical assistance program for the port sector through a competitively selected port management contractor that would have (i) managed the port efficiently; (ii) established the sector under a statutory and self-financing authority; and (iii) trained the East Timorese port managers in all tasks involved. Port management through individual international managers was, however, opted for managing the sector with UN support.

A Transport Sector Improvement technical assistance (TA 3731-ETM) was approved by ADB in October 2001 to establish a statutory port and airport authorities and their regulatory functions and to develop a road administration for implementing road asset management. This TA would have addressed institutional and capacity building in, among others, the port sector providing cargo management instruments and improving efficiency of the port services. In light of other resources made available for capacity building from the UN resources, this TA has not been implemented.

### *c. Lessons Learned*

Implementation of the EIRP involved coordination between donors and operators working on the same site. The laboratory testing of the concrete quality used in the restoration of the third berth demonstrated the benefits of diligent project management. The concrete quality was approved and the berth entered in use in November 2001. In hindsight, the berth provided for physical coordination of the works allowing the Japanese restoration program to be completed in time. To date, material testing laboratory facilities are provided by the private sector contractors and are being used in the Hera port project.

### *d. A Way Forward*

The National Development Plan (NDP) promotes national and sector vision to 2020, and a program of action for the period 2002–2006. The ADB-funded TA 3401-ETM: Transport Sector Restoration Project prepared a draft National Transport Master Plan in conjunction with the government staff as an input into the NDP. The NDP's vision for the national maritime transport and port system is to create conditions for economic development and sustainability for external commerce. Strategies outlined in the NDP for the sector (Box 2.6) include preparation of key legislation.

## **Hera Fisheries Port**

### **1. Sector Status**

In 1997, under the Indonesian administration, the inshore fisheries included 630 fishing vessels with outboard engines and 1,387 canoes. There were over 9,000 fishers and an annual marine catch of 2,423 tons. Offshore fisheries were closed to East Timorese and those waters, which are expected to form part of Timor-Leste's exclusive economic fishing zone, were harvested by Indonesians, primarily from Sulawesi.

After the postreferendum violence a substantial part of the fishing gear and vessels had been lost. Indonesians engaged in fisheries administration also left. The postreferendum catch has been estimated at some 950 tons.

The coastal zone is characterized by a narrow continental shelf, some fringing coral reefs, and a number of fragile ecosystems, such as mangroves and sea grasses. These areas support limited marine resources and increasing demand with economic recovery will put potentially unsustainable pressure on these resources. Moving to the offshore fisheries will allow a higher level of sustainable catches and reduce the pressure on the coastal zone. The offshore resources contain many fast-growing fish species and is judged to be robust.

Estimates suggest that the marine waters of Timor-Leste can provide a sustainable annual catch of about 15,000 tons. Based on FAO recommended per capita

### Box 2.6: Strategies Outlined in the National Development Plan for Maritime Sector

- Development of the principal maritime legislation including: establishment of the port administration as a semi-autonomous self-financing authority; definition of port limits and regulatory controls therein; a code of maritime law.
- Review and revise the port tariff structure.
- Tender, on a competitive basis, an operational concession for providing, as a public service, a tug for the port of Dili to assist in the maneuvering of ships entering and leaving the port, for fire fighting and marine rescue services.
- Develop, as a first phase, basic port services at the ports of Suai and Oecussi; as a second phase, extend basic port services to the ports of Caravel and Com. The development of regional ports will be linked to the development of the maritime coastal transport between national ports.
- Complete, with current Japanese bilateral and multilateral assistance, the current projects with the aim of complete rehabilitation of the port installations at the port of Dili.
- Training and qualifications for Timorese in specialist maritime studies.
- Sign and ratify on behalf of Timor-Leste the principal international conventions on maritime safety and transport and the Law of the Sea.
- Create a Timorese Register of Shipping.
- Support the creation of public passenger transport service linking Dili and Atauro and Dili and Oecussi.
- Develop a policy of support for national coastal trade, as part of multimodal policy for the movement of passengers and goods.
- Create a national capacity, in basic terms, for condition survey and certification of ships. Prepare an agreement with a recognized classification society.

fish consumption, such a catch can meet Timor-Leste's annual requirement for some 9,400 tons. In addition to meeting food requirements, fisheries development has potential not only for employment generation for fishers, but also in related services such as marketing, processing, and provisioning.

The strategy of the Fisheries and Marine Environment Service is that the private sector should lead in the practical and commercial aspects of fisheries development while the Government focuses on establishing sustainable management, legislation, policies, and enforcement regimes. The Government seeks to provide an enabling business environment and framework within which the private sector can operate.<sup>2</sup>

Hera port was developed under a previous ADB project<sup>3</sup> and completed in 1993. During that time effective supervision of projects in the area was not possible and construction standards used were inadequate, resulting in rapid deterioration of

<sup>2</sup> This strategy is consistent with ADB's fisheries strategy given in "The Bank's Policy in Fisheries." Manila, 1997.

<sup>3</sup> Loan No. 693-INO: Fisheries Infrastructure Sector Project for \$50 million approved in September 1984.

facilities. The port provides an essential support to offshore fisheries as the larger boats, typically 11 m long and with gross capacity of 5 tons, require harbor facilities and cannot be safely beached as the smaller boats can. Rehabilitation of the port is, thus, a necessary requirement for restoration and development of the offshore fisheries.

## 2. Development Interventions

Several donors have supported restoration of fisheries capacity:

- **the Government of Australia**
  - has a small boat building project and training program for engine maintenance, both based at Hera port;
  - is helping deploy fish-aggregating devices in the vicinity of Hera port;
  - has pledged support for initial stock assessment of the inshore waters; and
  - has expressed interest in supporting necessary legislation for a new fisheries act;
- **the Government of Iceland** is supporting a canoe building training project;
- **the Government of the People's Republic of China** has supplied fishing gear, iceboxes, and outboard motors, for which ADB provided a consulting input to support distribution of the equipment;
- **the World Bank** is supporting inland aquaculture through its agriculture rehabilitation program; and
- **ADB** has provided technical assistance support for the fisheries sector for collection of baseline data to support negotiation of an exclusive economic zone.<sup>4</sup>

The TFET-funded and ADB-administered Hera Port Fisheries Facilities Rehabilitation Project is part of the World Bank's Second Agricultural Rehabilitation Program (ARP II) administered by ADB at the request of the International Development Association due to its infrastructure nature.

The overall objective is to contribute to sustained food security of marine protein for the people of Timor-Leste. Responsible fisheries management will be promoted through development of offshore pelagic fisheries to reduce pressure on inshore fisheries.

Civil works will be undertaken in a single contract which will rehabilitate or strengthen

- three breakwaters totaling some 140 meters (m) in length which were poorly constructed and have subsequently been damaged so that they are now submerged at high tide and provide little protection for the harbor;
- rehabilitation of some 400 m of wharf faces and of the working apron alongside the wharves to create a secure mooring site for easy on- and offloading of vessels.

<sup>4</sup> TA 3654-ETM: Exclusive Economic Zone Demarcation, approved 17 May 2001.



The port also includes an ice factory; a training facility; a repair and maintenance facility for marine engines and other fishing equipment; and boat building and repair facilities. After rehabilitation of the harbor, expected to be completed by the end of March 2003, Hera Port will be a dedicated fisheries harbor with a wide range of support facilities.

When the facilities are operational it is expected that they will attract the present, privately owned fleet of larger boats, including boats currently operated by fishers on Atauro island, without benefit of a harbor or market access. This will give early benefits from increased utilization of the existing fleet of some 24 boats.<sup>5</sup> It is expected that the fleet will then grow as marketing and support services develop.

### **3. Development Impacts – Current and Prospective**

#### ***a. Poverty Impact***

The poor will share the social and economic benefits, including better diet from increased supply of cheaper fish and increased employment opportunities.

The poor will particularly benefit from the reduced pressure on the coastal zone and consequently increased sustainability of the inshore fisheries as these are the basis for subsistence fisheries which the poor are able to access.

Appraisal of the project estimated the Poverty Impact Ratio—the discounted net benefits to the poor as a percentage of the total discounted net benefits—to be 76%, indicating that the benefits are focused on helping the poor.

#### ***b. Social and Economic Impacts***

Development of offshore pelagic fisheries will allow a substantial increase in the sustainable catch. This will increase the supply of cheaper fish protein and allow recommended fish protein consumption levels to be achieved for the first time,<sup>6</sup> producing quality of life benefits in the form of improved nutrition and health.

The present low level of catch (about 950 tons per year) combined with demand from large numbers of expatriate staff has resulted in prices rising from about \$0.8/kg to \$5.3/kg. These high prices are unaffordable for many Timorese. With the number of expatriates already reduced and as the catch is increased prices are expected to fall substantially and be affordable by most ordinary Timorese.

The increased production will directly increase economic activity and employment and will provide the basis for indirect economic and employment benefits through downstream marketing, processing, and distribution and upstream provision of supporting services.

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<sup>5</sup> Including boats built under the Australian boat building project at Hera,

<sup>6</sup> The inshore catches in the 1990s provided about a third of the required fish protein.

### ***c. Institutional and Capacity Development***

The previously cited technical assistance has provided data related to the exclusive economic zone to help the Government negotiate and plan the use of the country's living marine resources.

Implementation of the civil works is funded by a fixed budget allocation from ARP II with little scope for feasibility studies and designs to be included in tender documents. The project has, thus, adopted a design and construct contract which is novel in Timor-Leste and may provide a model for subsequent use in similar budget constrained construction.

## **4. Key Issues**

### ***a. Sustainability***

Sustainability of the inland fisheries will be increased through reduction in the pressure upon them.

Financial sustainability of the fishing boats will be improved through better access to support services and markets. Boats which are currently idle will be utilized and economies of scale from their larger size and the richness of the pelagic fisheries will allow them to operate in a viable manner despite the lower prices of fish projected.

Costs of port operations will be recovered in charges for landing fees, mooring fees and the like. Estimates suggest that, in addition to recurrent cost recovery, the revenue should produce a modest financial return.

### ***b. Lessons Learned***

Design of the project and the FMES strategy of which the project is part have allowed for lessons learned on previous fisheries projects. However, at the early production stage this project has not yet generated lessons to be learnt.

### ***c. Continuing Needs***

Physical development of the fishing fleet, supporting and marketing services is the province of the private sector. Donor support may usefully be used to assist FMES in developing the legal framework and regulations that will enable the private sector to function in a responsible manner consistent with the needs of sustainable natural resource management.

Further assistance to carefully monitor catches may be needed as a tool to implement the precautionary approach to fisheries utilization.

# Power

## Sector Status

In 1998, the power sector in Timor-Leste comprised 60 power stations with a total operable capacity estimated at about 26.5 MW. Slightly more than half of the operable capacity (14.7 MW) was located in the two power stations serving Dili. In this context, the rural electricity system at district and subdistrict level included some 58 stations as small as 25 kW and on average only about 250 kW. Total gross generation in 1998 was reportedly 77 GWh, total electricity sales were 68 GWh, and total connected customers in all power centers numbered about 43,000, of which over 90% were residential, accounting for over 60% of energy sales. The transmission system consisted of some 700 km of 20 kilovolt line and the distribution system of another 700 km of line of 230/400 volt capacity.

During the postreferendum violence much of the rural electricity system was destroyed. Buildings were burnt or made unusable. Diesel generators were damaged beyond repair or removed. Control panels, wiring and fuel systems were destroyed. Auxiliary items such as batteries and starter motors were removed. Transformers were drained of insulating fluid and exposed to corrosion. Computer and communications equipment, customer records, design drawings and other data were destroyed. Management and technical staff, principally Indonesian, left Timor-Leste.

The physical damage to generation and distribution plant in Dili and the larger district centers was relatively light, which enabled restoration of these facilities to proceed quickly under immediate bilateral assistance from the UK Department for International Development (DFID). In total, approximately 85% of power capacity was restored. With this support and UN resources, the United Nations Transitional Authority of East Timor (UNTAET) created a rudimentary utility organization to organize power restoration efforts throughout the country, under the leadership of expatriate managers. In addition to on-the-job training in operation and maintenance of the generation system funded from the national power utility of Portugal, Electricidade de Portugal (EDP), UNTAET financed the costs of mechanical and electrical engineering assistance. This is now continued through long-term advisors funded under the 100 UN positions. In addition, the Asian Development Bank (ADB) prepared a detailed tariff review that provided the basis for the initial metering and billing program.

When the violence was ended in 1999, the World Bank-coordinated Joint Assessment Mission identified priority reconstruction activities to restore the electricity systems. The objective of rehabilitating the power infrastructure was to reestablish power supply in Timor-Leste to

- enable recommencing of economic lives,
- improve humanitarian conditions, and
- facilitate peace and security.

The focus of restoration work was on the resumption of basic services, with substantial restoration of supply in Dili and reestablishment of a basic level of supply in some district and subdistrict systems. In addition to the support under the Trust Fund for East Timor (TFET), the principal donors in the power sector from 1999 to 2001 were Portugal, and Japan. The Portuguese and Japanese projects were administered by the United Nations Office for Project Services (UNOPS), with the United Nations Development Programme (UNDP) as the Executing Agency. TFET funding to the power sector was administered by ADB through the Grant No. 8181-ETM: Emergency Infrastructure Restoration Project (EIRP).

### Development Interventions

In addition to the ADB-administered TFET projects, several bilateral donors provided support to the sector:

- **In 1999 and early 2000, the Government of the United Kingdom** provided urgent assistance in the immediate aftermath of the violence to return 21 of the 57 power stations to an operational condition by early 2000.
- **In 1999, the Government of Australia** provided 4 months of specialist expertise in mechanical and electrical engineering to the Comoro power station in Dili.
- **In 2000 and 2001, the Government of Portugal** rehabilitated power stations in 4 subdistricts and established the first billing system that relied on Lisbon-based generation of electricity invoices.
- **From 2000 to 2002, the TFET-funded EIRP** was involved in rehabilitating 14 rural power stations including 12 subdistrict stations and 2 district stations (Gleno, Ainaro). These were implemented together with community participation program in collaboration with UNDP that assisted the communities to arrange payment for fuel and consummables (including routine spare parts) for the rehabilitated subdistrict stations.
- **In 2001, ADB** approved TA 3748-TIM: Power Sector Development Project that provides for preparation of a long-term power sector development plan to minimize future capital and recurrent costs and maximize the economic and social benefits of power development.
- **In 2001 and 2002, the Government of Japan** restored 13 subdistrict power stations, with 7 of these awaiting for rehabilitation of the distribution systems by the Government's power service. Funding from the Government of Japan has supported engine overhaul work in the Comoro power station and supplied transformers and spare parts to the station.
- **In 2002, the US Support Group for East Timor (USGET)** undertook generator repairs in Oecussi, Manatuto, Los Palos, and Baucau with assistance from the EIRP in the form of spare parts.
- **In 2002, the Government of Norway** agreed to finance technical assistance

for the development of hydrology data supporting identification of hydropower potential.

- **In 2002, the Government of Japan** reviewed sector needs and indicated interest in providing support, particularly to the Comoro station.
- **In 2001**, the EIRP provided technical assistance for designing the appropriate management, financial control, and performance measurement systems and for training local staff in the use of these systems.

## 1. EIRP Rural Power Restoration Component

Consistent and coordinated with the bilateral interventions, ADB mobilized consultants in October 2000 under TFET to prepare detailed designs for 15 rural and subdistrict power stations that had been either totally destroyed or severely damaged. Security concerns in border areas delayed the program as well as caused 6 additional stations to be transferred from the Government of Japan program to the TFET project.

Although the restoration assessment was completed in November 2000, budget constraints and the sustainability concerns expressed by the Transitional Government limited the EIRP to restoration of 12 subdistrict and 1 district station. A contract for the project was awarded in February 2002. Physical completion of the rural power restoration component is expected by April 2003.

The original design of the EIRP and the bilaterally-funded rural electricity projects focused on generating capacity. Transmission and distribution networks were largely intact after the events of 1999. These, however, became a target for vandalism, and rehabilitation of the distribution systems subsequently became imperative. In April 2002, savings in other components of the EIRP were reallocated (Table 2.4) to extend the scope of the rural electrification program to include

- rehabilitation and expansion of the medium and low voltage distribution lines associated with the selected stations;
- rehabilitation of Gleno District Power Station by the addition of 3x300 kW generators and 1x1250 kVA step-up power transformer and related equipment, (Box 2.7) with transmission and distribution lines connecting villages to Ermera and Letefoho subdistricts;
- increase in generating capacity from 1x50 kW to 1x100 kW for the unit in Betano subdistrict power station;
- adding 1x100 kW containerized generating unit in Maubisse subdistrict power station, with related instruments and equipment for parallel operation;
- training of two additional operators at national level; and
- supply of workshop tools and instruments.

This revision addressed the need to connect generating capacity to consumers to ensure that the power restoration achieves its objectives, particularly that of poverty reduction in the rural sector. Additional funds were allocated to rehabilitate and expand

*February 2001-  
April 2003*

*To restore 13 rural power stations, EIRP funded and ADB administered a civil works cum equipment contract*

*(Strolin of Italy contracted)*

*and availed of the consulting services of Valter Galvan (Supervisor), Carlos Nevis (distribution cabling), and Pedro Soares (community engagement program/counterpart services).*

Table 2.4: EIRP Rural Power Restoration – Revised Scope

No.	Power Station	District	Intended Capacity Installed	Rehabilitation of 20kV Distribution Lines
1	Ainaro	Ainaro	3x300 kW	No
2	Gleno (V.O.1)	Ermera	3x300 kW	No
3	Balibo	Bobonaro	1x50 kW	No
4	Batugade	Bobonaro	1x100 kW	Yes
5	Betano (V.O.1)	Manufahi	1x100 kW	Yes
6	Bobonaro	Bobonaro	1x50 kW	Yes
7	Lequidoe	Aileu	1x100 kW	Yes
	Letefoho (V.O.1)	Ermera	Deleted	
8	Lolotoe	Bobonaro	1x100 kW	Yes
9	Manelima	Manatuto	1x50 kW	No
10	Maubisse VO.1)	Ainaro	2x100 kW	No
11	Nitibe (Baoknana)	Oecussi	1x50 kW	No
12	Oesilo (Bobometo)	Oecussi	1x50 kW	No
13	Passabe	Oecussi	1x50 kW	No
14	Turiscai	Manufahi	1x50 kW	No

### Box 2.7: Gleno District Power Station

Gleno is a district capital of Ermera District, an administrative center and market place in the coffee growing area. In the violence

- station buildings were severely damaged;
- three generators were put out of use, of which two were beyond repair;
- wiring, control panels, and the like were destroyed;
- transformers were drained, riddled with bullets, and left open to the elements to make them beyond repair;
- many of the transmission and distribution lines were removed.

The EIRP project rehabilitated the remaining 800 kW generator and installed necessary new equipment, including a transformer. Supply to the subdistricts of Ermera and Letefoho were restored through 20 kV transmission lines. The generator, at present, supplies power for 6 hours each evening. The rehabilitated system in Gleno was inaugurated by the Asian Development Bank President, Tadao Chino, on 19 May 2002.

the medium and low voltage distribution lines associated with the project and to establish the low voltage consumer connections from the original \$0.46 million to \$1.6 million. Priority was given to provide residential connections, where technically feasible, to

- increase the number of consumers/beneficiaries to increase benefits and to increase the customer base and load factor of power stations to improve sustainability, particularly for the three subdistrict power stations in Oecussi (Baoknana, Bobometo, and Passabe) and Manelima;
- rehabilitate the distribution network associated with the Project to restore supply to homes supplied in 1999 in Ainaro, Betano, Batugade, Balibo, Lequidoe, Lolotoe, and Bobonaro.

The second priority was given to extension of the distribution system to supply new consumers situated within a technically feasible distance from the medium voltage network fed by the project. This will increase the number of customers and, thus, the benefits and sustainability of power stations through a larger customer base and higher load factor.

The impact of the rural power restoration program on the poor is likely to be immediate once the restored subdistrict stations are commissioned to supply power. The power station rehabilitation will restore electricity supply to areas that previously had supply and that had developed social and economic uses for electricity that benefited the poor; as a result, restored centers are likely to see relatively quick resumption of business activity and job opportunities, as well as resumption of social services that use electricity, such as education and health facilities. The project will also connect households and villages that did not enjoy power supply in the past. It will, thus, provide for long-term socioeconomic objectives of the power sector, including poverty reduction. A rough number of rural household consumers of electricity outside of Dili, prior to the violence of 1999, is estimated<sup>1</sup> at a low of 6% and, due to the violence, can be considered less. Given the pervasiveness and depth of poverty in Timor-Leste, this indicates that the potential scope for electrification in Timor-Leste to improve the quality of life in rural areas has scarcely been tapped. The greater potential for assisting the recovery and long-term development of the Timor-Leste lies in extending an economically justified level of electricity services to nonelectrified areas, rather than simply restoring damaged power supplies to their previous condition.

The rehabilitation and expansion of the distribution system resulted in connections for 2,421 existing consumers and 4,573 new households, and thus added 6,994 households to the rural electricity system (Table 2.5). This significantly increased the number of beneficiaries and also the possibility of sustainable and affordable power station operation through the increased customer base and load factor. However, more than 2,000 additional households could be connected to the restored power supply if additional resources were available.

<sup>1</sup> Estimation: Number of residential customers connected to PLN's supply systems, 1998: 38,000. If virtually all households residing in Dili prior to the 1999 violence were connected to the electricity supply, the number of residential Dili connections was [168,166 (Dili population in Dec 1997), divided by 5 (approximate average household size, 1997)] = 33,633, or about 30,000, leaving approximately 8,000 residential connections outside of Dili. [8,000 connections times the 1997 average household size of about 5] = 40,000 household consumers of electricity outside of Dili.

Table 2.5: Phase 2 – Planned Expansion of Distribution Systems

Item	Power Station	Phase 2 – Planned Rehabilitation and Expansion Activities
1	Gleno	<ul style="list-style-type: none"> <li>- Rehabilitation of MV/LV distribution network and expansion of LV network (urban area, Mangeiro, Poeana, Gombei, Laulala, Falimano, Fatada, Matata, Colaco, Titibuti, etc.) to rehabilitate approx. 519 existing consumers and to connect about 498 new consumers;</li> <li>- Extension of LV network to connect about 471 new consumers located in the Suco of Poetete, Talimoro and Letefoho; and</li> <li>- Completion of rehabilitation of pole mounted substations (installation of new LV distribution panels) restored under the urgent intervention for 20 May 2002 celebrations and LV consumer home connections in Urlete Poho.</li> </ul>
2	Balibo	<ul style="list-style-type: none"> <li>- Rehabilitation of existing section of MV distribution network and pole mounted distribution substation Balibo urban area and upgrading of the system to MV by installing one (1) 160 kVA step-up power transformer, etc.; and</li> <li>- Extension of the MV/LV network to connect about 24 new consumers located in Suco Fatukakae.</li> </ul>
3	Batugade	<p>Expansion of MV/LV network to connect new LV consumers and increase sustainability, in the following Sucos/Aldeias:</p> <ul style="list-style-type: none"> <li>- Batugade (Lotan, Cacu, Palaka, and Subalesu) to connect about 220 new consumers;</li> <li>- Betano (Loro, Lalica, Raifusa, Leoai, and Sesurai) to connect about 355 new consumers;</li> <li>- Bobonaro (to be evaluated);</li> <li>- Lequidoe (Daulalan and Urupadan) to connect about 85 new consumers; and</li> <li>- Lolotoe (Oba Mape, Deodet/Oelaca, and Deodet/Boutal) to connect about 159 new consumers.</li> </ul>
4	Betano	
5	Bobonaro	
6	Lequidoe	
7	Lolotoe	<ul style="list-style-type: none"> <li>- Expansion of LV connections to increase sustainability;</li> <li>- Necessary upgrade of the existing obsolete LV distribution system to MV/LV distribution network and installation of MV/LV pole mounted distribution substations close to load centers (Areas 1 to 6); and</li> <li>- Expansion of LV network to connect approx. 1,438 new potential consumers (to be evaluated).</li> </ul>
8	Maubisse	
9	Passabe	<ul style="list-style-type: none"> <li>- Upgrading of the distribution system from LV to MV/LV; and</li> <li>- Implementation of pole mounted substations to supply about 194 new consumers located in Metak and Haemnanu.</li> </ul>
10	Turiscai	Expansion of LV network to connect more consumers (to be evaluated).



Table 2.5: Phase 2 – Planned Expansion of Distribution Systems (cont'd.)

Item	Power Station	Phase 2 – Planned Rehabilitation and Expansion Activities
11	Fatululik	Rehabilitation of rural power station, associated MV/LV distribution system, and consumer home connections.
12	Fatumean	Rehabilitation of rural power stations, associated LV distribution system, and consumer home connections.
13	Fohorem	Rehabilitation of rural power station, associated low voltage distribution system, and consumer connections
14	Tilomar	Rehabilitation of rural power station, associated low voltage distribution system, and consumer connections

Access to electricity services can enhance the life of the poor in many ways:

- electric lighting extends the day for reading or work;
- refrigeration allows clinics to keep needed medicines and fresh food to be stored without waste; and
- productivity and the quality and range of goods can be increased and lead to poverty reduction from increased and higher value employment.

The power sector restoration program is contributing essentially to the quality of life of the poor. In the medium term, the installation of capacity for generation and distribution creates the opportunity for substantially greater poverty reduction benefits. Realization of this potential requires development projects that will increase the number of poor households connected to the system, increase the hours of supply per day, and increase affordability through both lower unit costs and quality of supply.

## 2. Community Participation Program

A community consultation joint task force comprised of the EIRP Project Management Unit (PMU) and the UNDP OPS. In May 2001, the task force visited rural communities in the western areas of Timor-Leste, all of which were affected by subdistrict power station restoration programs. The objective of the task force was to assess the priority of electricity, the ability to pay, the existing community leadership structures, and extent to which community participation would be feasible for funding recurrent power supply costs. Overall, the task force gained the strong impression that communities (i) place high importance on electricity supply and (ii) recognize that their direct involvement in operating, maintaining, and paying for the supply will be required. All communities visited in the course of the survey accorded high priority to electricity and demonstrated adequate local capacity and leadership to assume responsibility for managing a village-based diesel power supply. The village consultations continue to support the established village-based power committees to administer collection of funds and determine the affordable operating hours for each case.

The affordable costs of supplying diesel-generated electricity to rural villagers, as seen by the villagers, excludes capital cost, cost of major overhauls, and operator's wages, but includes fuel, lubrication and spare parts for ordinary maintenance providing for 6 hours/day power supply calculated for the range of engine sizes (50–100 kW). An example is given in Table 2.6 for a 50 kW generation unit that is capable of supplying electricity to approximately 330 households. The example assumes that each household has an average load of 144 watts equivalent to 4x36 watt fluorescent lamps, a reasonable expectation of average domestic loads in the subdistricts, based on interviews. Under a single-engine diesel power system, where all costs including fuel are virtually fixed, the lowest cost per household, about \$3.64/month, would be possible under the maximum feasible number of connections for a 50 kW plant, or 330.

### 3. Institutional and Capacity Development

Efforts to build a sustainable power infrastructure and institutional framework have been less successful. Though the generators at the Comoro power station are being overhauled, power demand in Dili has outstripped available capacity. Power demand in Dili accounts for 83% of the total. Hired generators produced more than half of the electricity supplied in Dili in January 2002, and much of the distribution system is overloaded, weak, inefficient, and prone to breakdown. While work is underway to restore power stations in about 30 rural villages, the larger district stations outside of Dili have not been upgraded and power supply is intermittent.

Institutional responsibility for the sector rests with the Electricidade de Timor-Leste (EDTL)—a government department within the Ministry of Communications, Transport and Public Works responsible for power generation, distribution, and financial management of the sector. Failed efforts to build management capacity and self-sufficiency, including under the EIRP, have left EDTL financially insolvent and unable to sustain operations with present resources. EDTL lacks trained staff to carry out critical supervisory functions. In Dili, though the majority of electricity consumers are receiving bills under a tariff introduced in August 2001, revenue collections have reached only about 30% of the sector's recurrent costs. All funds available to EDTL are expended on fuel and wages. The sector requires a significant subsidy from the budget that remains largely donor-funded.

Prior to 1999, the power system was operated by a branch of the Indonesian national power utility, PLN, under an area manager in Bali. All customers were metered and billed for power consumption under the PLN administration, but at a highly subsidized rate. Tariff for households during the Indonesian times included a significant cost-side subsidy as fuel supply to the sector was subsidized by the Indonesian Government, and a cross-subsidy among consumer groups financed a lifeline subsidy for low-level household consumption. Table 2.7 presents the all-inclusive Indonesian tariffs charged to a residential consumer:

Table 2.6: Calculation of Electricity Costs to Communities under Diesel Electrification in Subdistrict Power Stations

GENERATING PLANT SIZE		50 kW
<b>BASIC ASSUMPTION</b>		
Operating cycle (hours/day)	6.0	hours/day
Equivalent number of operating hours per year	2,160	hours/year
Fuel consumption (at 100% prime power)	210.00	g/kWh
Lubricating oil consumption	0.97	g/kWh
Cost of fuel (estimated)	0.35	US\$/liter
Cost of lubricating oil (estimated)	4.50	US\$/kg
Cost of Spare parts for Ordinary Maintenance (2 years/6h/day operation)	7,462	US\$ Equiv. to 4,380 hours
No. of operators	2	No.
Salary of Operator (estimate)	-	US\$/month
Total salary Operators	-	US\$/month
No. of fluorescent lamps (1x36W) for each home	4	Unit
Fluorescent lamp rating power	36	Watt (each)
Total installed load for each home	144	Watt
Loading factor	0.95	
Losses (estimated)	5	%
Contingencies	10	%
<b>FUEL CONSUMPTION</b>		
Fuel consumption (100% prime power) =	210.00	g/kWh
Specific fuel density	0.84	kg/litre
Fuel consumption	250.00	ml/kWh
Fuel consumption to generate 1 kWh	0.250	litres
kWh generated per liter	4.000	kWh/liter
Operating hours per month	180.00	hours/month
kWh per month generated	8,550.00	kWh/month
Fuel consumption / day	71.25	liters/day for given hours of operation
Fuel consumption / month	2,137.50	liter/month
Cost of fuel at site (estimate)	0.35	US\$/litre
Total cost fuel/month	748.13	US\$/month
<b>LUBRICATING OIL CONSUMPTION</b>		
Oil consumption	0.97	g/kWh
Oil consumption /month	8.29	kg of oil/month
Cost of oil (estimate)	4.50	US\$/kg
Cost oil/month	37.32	US\$/month
<b>ENERGY DELIVERED &amp; LOSSES</b>		
Energy generated	8,550	kWh/month
Estimated Losses	5	%
Total estimated Losses	427.50	kWh/month
Energy delivered	8,122.50	kWh/month (kWh generated - losses)
<b>SPARE PARTS, MAINTENANCE</b>		
Cost of spare parts per hour of operation	1.70	US\$/hour
Cost of spare parts per month of operation at given hours/day	306.66	US\$/month
<b>HOUSEHOLD CONNECTIONS</b>		
Household load at given No. of 36W fluorescent lamps	0.144	kW
Household average load at given hours of operation	24.62	kWh/month
Max. number of household to be connected	329.86	Home connections
<b>SUMMARY OF COSTS</b>		
Fuel	748.13	US\$/month
Oil	37.32	US\$/month
Wages	-	US\$/month
Spare parts for Ordinary Maintenance	306.66	US\$/month
Sub-Total	1,092.10	US\$/month
Contingencies	109.21	US\$/month
<b>TOTAL RUNNING COSTS</b>	<b>1,201.31</b>	<b>US\$/month</b>
Cost of kWh delivered	0.148	US\$/kWh delivered (only recurrent costs)
<b>Total cost fee for each household connection</b>	<b>3.64</b>	<b>US\$/month/household/max. No. homes 330</b>
Cost of one (1) additional hour of operation per day/month	200.22	US\$/month
Cost of one (1) additional hour of operation per day/month/household	0.61	US\$/month
Increase in cost for each additional lamp 1x36W per given hours/month	0.91	US\$/month
Increase in cost for each additional 100W lamp per given hours/month	2.53	US\$/month
<b>PROJECTED COST FOR No. OF HOUSEHOLD CONNECTIONS (at given No. of lamps)</b>		
	Number of household connection	Cost
	50	24.03 US\$/month
	75	16.02 US\$/month
	100	12.01 US\$/month
	125	9.61 US\$/month
	150	8.01 US\$/month
	175	6.86 US\$/month
	200	6.01 US\$/month
	225	5.34 US\$/month
	330	3.64 US\$/month
	250	4.81 US\$/month
	275	4.37 US\$/month
	300	4.00 US\$/month
	325	3.70 US\$/month

Table 2.7. Inclusive Electricity Charge in East Timor under Indonesian Administration

Cost Item	Amount (Rp)	Amount (\$)
Rental for the meter	Rp1,000	\$0.13
Base fee that varied by need for power	From Rp7,425/450 Watt to Rp250,800/13.2 Kilowatt	From \$0.95/450 W to \$32.15/13.2 KW
Consumption less than 54 kWh	Rp96.5/kWh	\$0.014/kWh for consumption <54 kWh
Consumption in excess of 54 kWh	Rp172.5/kWh	\$0.022/kWh for consumption >54 kWh
Tax	10%	For a bill of 25 kWh: \$0.143
Total bill for a consumption of 25 kWh		\$1.57
Current cost of 25 kWh/month		\$1.00 in Dili and Districts

**February 2000**  
**To support cost recovery, ADB arranged technical assistance to prepare the initial tariff.**

*Robert Thompson, Staff Consultant, was engaged to prepare an interim tariff (adopted).*

In recognition that the power sector in Timor-Leste should be financially self-sufficient to be sustainable. ADB arranged for technical assistance in February 2000 to identify the cost of power production and to specify a tariff based on marginal cost. This study recommended that a tariff be charged to the nonresidential power consumers with the objective of introducing a cost recovery orientation. UNTAET issued a corresponding Notification of Electricity Charges in late July 2000 that took effect on 1 August 2000. This notification ordered that commercial (nonresidential) consumers of electricity be metered and billed, beginning with the largest and extending in descending order to all nonresidential consumers using at least 2,000 kWh per month. Metering and billing of the nonresidential customer category was to be completed during that financial year. The tariff to be charged to metered customers was set at \$0.123/kWh,<sup>2</sup> the rate recommended in the ADB tariff study for implementation during the first billing year.

This interim tariff represented a significant increase to the tariff that had prevailed under the PLN (Indonesia) administration prior to 1999. However, it was not sufficient to recover the utility's full operating costs including depreciation, and in the absence of a fuel price adjustment mechanism, the tariff was inadequate to cope with the fuel price increases since 2000. A review of the tariff level and structure was undertaken by technical assistance that commenced in February 2001 under the EIRP.

<sup>2</sup> Calculations indicated that the *average* tariff adequate to recover depreciation and reasonable allowances for management overheads, including training, management salaries, computers and communications, etc., but with no return on assets would be in the vicinity of \$0.15 per kWh at the level of energy sales expected in 2001/02 and 2002/03. For comparison, the average tariff charged by utilities of similar capacity to PAET in the Pacific island countries was about \$0.17/kWh in 1998 (source: *Forum Island Country Power Sector Tariff/Cost Study*, South Pacific Forum Secretariat, May 1998).

Until mid-2001, all expenses for power sector operation and maintenance were supported by direct budgetary allocations from the Transitional Administration. Resources from the user charges were received only from August 2001. Very few customers were registered with the power service, and their numbers, characteristics, and even aggregate consumption were unknown.<sup>3</sup> Under the provisions of a Cabinet Tariff Directive issued in November 2000, identification and metering of consumers in Dili using more than 300 kWh/month began in February 2001. No other metering program has been implemented to date, with the next significant development being the current meter installation program (primarily for the small 5 ampere meters) expected to begin in December 2002. No metering has taken place in the district centers.

The Transitional Government's November 2001 Tariff Directive provided for a fuel-price related fluctuation factor and a revision in the electricity tariff. The new tariff contained a lifeline tariff for the residential consumers up to 25 kWh at \$1.0 with each subsequent kWh to be charged at \$0.235/kWh. A rate of \$0.235/kWh was charged for all consumption of commercial consumers in Dili. The Cabinet directive of 10 May 2002 provided a formula for adjusting the tariff, extended this tariff to the districts, provided the Government with powers to cut off electricity supply to delinquent consumers. Table 2.8 provides the current tariff applicable to Dili and the districts.<sup>4</sup>

Table 2.8. Current Electricity Tariff in Dili and Districts

<p><i>For residential customers:</i>            First 25 kWh (considered lifeline tariff) – \$1.00            Balance units in \$/kWh calculated as below</p> <p><i>For all other customers:</i>            All units in \$/kWh as calculated below</p> <p>The tariff is adjustable, based on the price of fuel in Dili, and using the formula:            Tariff in \$/kWh = \$0.117 + (\$0.0986 x CFP/BFP), Where,            CFP= current fuel price in US\$ delivered to Comoro power station            BFP= Base Fuel Price (reckoned as \$0.26/liter)</p> <p>The present price of fuel is \$0.31/liter and the tariff \$0.235/kWh.</p>
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**February 2001–  
February 2002**

**Under EIRP, ADB administered technical assistance for development of the power sector utility and its financial management system**

*KPMG (Australia) contracted. Prepared a revised tariff (adopted) and an interim billing system (adopted by UNTAET as permanent system)*

<sup>3</sup> A consumer survey was carried out in Dili by the EIRP Project Management Unit in December 2000, leading to estimates of the numbers and electricity consumption of domestic and commercial consumers in the capital, combined with revenue and other financial estimates for the power sector. For details see *Brief Power Sector Business Plan: Consumer Survey Report and Revenue Forecast With Financial Projections, FY 2000/01 – FY 2002/03*, February 2001.

<sup>4</sup> DRET Government Tariff Directive, 2002/07 of 10 May 2002.

In its small, well dispersed, largely rural population, and its relatively undiversified economy and prominent subsistence sector, Timor-Leste is more characteristic of a Pacific island country. Similarities with Pacific countries are even more pronounced in the power sector. Timor-Leste, like its Pacific neighbors, has a relatively low rate of urbanization (30–40%), many widely dispersed rural load centers that are difficult to interconnect, and low load densities in all areas that testify to the importance of the domestic sector in overall consumption, and the lack of significant industrialization (or even a significant commercial agriculture sector). As in Timor-Leste, the most common generation technology in use in the Pacific is diesel, which has low capital but relatively high recurrent costs. Larger Asian countries generally have higher load densities that permit them to use a wider range of fuels in larger thermal and/or hydropower plants that are less costly to run per unit of output.

The costs of supplying electricity in Timor-Leste are therefore high compared to large Asian and developed countries. The higher costs also arise from the necessity of continuous expenditure on fuel and spare parts, which constitute a high proportion of total costs (typically greater than 50%), and are thus largely structural. The scope for reducing costs even in the long term could be limited, short of achieving higher load densities that might permit diversification to other generation technologies. Renewable energy technologies such as geothermal, solar, mini-hydro, and wind have reduced in cost in recent years due to the technical advances, and these offer genuine scope for diversification in small power systems. However, unit costs in a small market like Timor-Leste are not likely ever to fall by enough to equate to unit costs in larger markets like Australia or the larger Asian countries. The electricity tariff in Timor-Leste falls in about the middle of the range of tariffs typical of Pacific island countries with installed capacities and loads similar to Timor-Leste's, such as Tonga, Samoa, Kiribati, and Vanuatu. Other Pacific island countries, such as PNG and Fiji Islands, have much lower tariffs, as these countries have higher load densities and scope for large centralized hydropower stations.

The tariff of \$0.235/kWh in Timor Leste, thus, should be compared with similar power sector conditions. It cannot be related with the electricity tariff of countries that

Table 2.9. Cost of Power Supplied and Residential Tariff Charged

Country	Cost of kWh Sold	Residential Tariff
Papua New Guinea	0.08	0.12
Solomon Islands	0.14	0.11
Tonga	0.30	0.32
Tuvalu	0.40	0.27
Vanuatu	n/a	0.40
Cook Islands	0.26	0.22

have abundant access to hydropower or nuclear energy. Table 2.9 provides the tariff across the Pacific island countries.

Lifeline tariffs provide a cross-subsidy from the consumer groups affording a higher level power consumption than that afforded by the low-income residential consumers. In many countries, these higher income consumer groups cross-subsidize the low-income consumers' consumption. This policy typically alleviates the impact

Table 2.10. Lifeline Tariffs and Cost of Residential Power Consumption, per kWh upto 25 kWh

Country	Residential Lifeline Tariff US Cents/kWh	Share of Timor-Leste Lifeline Tariff, %
Cook Islands	12.45	311
Marshall Islands	11.00	275
Micronesia (Chuuk)	6.00	150
Micronesia (Kosrae)	6.40	160
Papua New Guinea	6.43	160
Solomon Islands	8.19	204
Vanuatu	16.31	407
Timor-Leste	4.00	100

of a power tariff on the poor. Cook Islands, Marshall Islands (Majuro only), Micronesia, New Caledonia, Papua New Guinea, and Vanuatu offer lifeline tariffs for low consumption customers. Table 2.10 compares the lifeline rates for a typical low-income household consumption of 25 kWh/month.

Under a longer-term view, the Timor-Leste power sector had a history of chronic subsidization that has now come under severe pressure for change. It is clear that the subsidies of the past are unsustainable, either by the Transitional Administration or by the Government of Timor-Leste.

The major challenge facing the sector is to manage the transition from a subsidized public service to a truly user-supported power system. It is also clear that the past subsidies to the sector accomplished little to spur the economic development of the country.

In January 2002, in view of the failure (Box 2.8) of the technical assistance funded under the EIRP for establishment of a sector institution and a viable financial management system, ADB assisted the Transitional Government with the preparation of a strategic options plan. Principles for sector operations and target objectives were agreed. These migrated to the Transitional Support Plan Matrix.<sup>5</sup> The Government requested for the EIRP resources to be used to assist with timely accomplishment of

*January 2002*

*To support preparation of strategic options for the sector, ADB arranged for consulting services to (i) determine options and short- and medium-term action plans and to (ii) review the content of the KPMG contract.*

*Chris Cheatham, Staff Consultant.*

<sup>5</sup> World Bank Program Appraisal Document, Report No. 24532-TP for a Proposed Postconflict Grant in the amount of \$5.0 million to the Democratic Republic of East Timor for a Transition Support Program, 22 July 2002.

### Box 2.8: Utility Development and Financial Management System KPMG Contract Under EIRP

The terms of reference of this component under the EIRP cover assistance to establish a power utility with its financial management system. The Consultant, KPMG (Australia), mobilized in May 2001 and issued the following reports: Scoping Report (16 May 2001), Inception Report (25 May 2001), Monthly Report (June 2001), Monthly Report (July 001), Monthly Report (July Rev 1.0 (2001), and Monthly Report (August 2001). In October 2001, ADB noted that the steering committee intended for guiding this assistance was not convened and that the reports had not received adequate review by the Government. Under the terms of the TFET grant agreement between ADB and UNTAET, any variations in the contract between UNTAET and the consultant require prior ADB approval. However, during the period of the contract, several significant variations were introduced, despite strong objections from ADB. ADB informed UNTAET that variations had been enacted bilaterally between UNTAET staff and the Consultant without consultations with ADB, including conversion of the contract to a lump sum equal to the maximum contract payment (\$799,132). These variations reduced the scope of the terms of reference to approximately one third of the original scope without commensurate reduction in the budget. In spite of objections by the PMU and ADB, UNTAET authorized payments to the Consultant. As the contract was between UNTAET and the Consultant, ADB was not in a legal position to stop the payments. This issue was discussed in various donor meetings and at the highest levels of UNTAET. However, all payments were made to the Consultant including those for equipment that were not delivered. Consequently, ADB undertook a separate review in January 2002 of this technical assistance component to determine the actual outputs delivered and costs incurred. The review made the following recommendations:

#### What has been accomplished

- Customer database for Dili created, identifying approximately 18,200 customers (about 1,200 commercial and about 17,000 domestic), of which about 13,500 are metered. About 4,700 or 25% of customers are still to be metered.
- Conditions of Electricity Supply and Tariff Directives prepared and adopted (with modifications) by the East Timor Transitional Authority in mid-August 2001.
- Metering/meter reading staff of Timorese trained (about 30).
- Recommended manpower and salary structures for EDTL specified.
- Three billing and customer service centers in Dili established and staffed by 13 trained Timorese clerks (no supervisors).
- Three Timorese data entry operators trained to support the billing system (no supervisor).

#### What was expected but not provided under the project

- Preparations for the establishment of an independent power authority in East Timor.
- Assessment of options for private sector participation in the power sector and recommended agreements and/or a framework for assessing or soliciting proposals for private sector services or investment in the sector.
- Analysis or recommendations for operations and management in any power center outside of Dili.
- Power sector cost and pricing study to either justify the current tariff or form the basis for a new recommended cost-based tariff.



### Box 2.8: Utility Development and Financial Management System KPMG Contract Under EIRP *(cont'd.)*

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Billing system software developed and installed as the permanent billing system.</li> <li>• Accounting system software selected and installed (software, MYOB, is inexpensive but inadequate for the sector).</li> <li>• Specifications provided of the computer equipment required to operate the billing and accounting systems.</li> <li>• A human resource development (HRD) plan prepared; staff technical competencies assessed; and a training strategy proposed.</li> <li>• An extensive set of recommended Key Performance Indicators for EDTL prepared.</li> </ul> | <ul style="list-style-type: none"> <li>• Assessment of consumers' ability and willingness to pay for electricity.</li> <li>• Purchase and installation of new computer equipment for the billing and accounting systems.</li> <li>• Arrangements for implementing the proposed HRD plan.</li> <li>• Release of all software programming codes to allow modifications in accounting system.</li> <li>• Preparation of draft final report.</li> </ul> |
|---|---|

An analysis of the financial implications of the postproject results was carried out using two complementary approaches: one to determine what costs are justified by the identifiable inputs that the consultant has provided through the project period, including manpower and out-of-pocket expenses such as airfares, communications, office costs, and equipment purchases; the other to determine the value of the project outputs in comparison with the requirements of the terms of reference (TOR) based on the original contract conditions.

As a consequence of the attempt to change the contract and the TOR, however, the consultant has not prepared or submitted claims for costs since September 2001, and therefore available records of project expenses are substantially incomplete. In the present analysis, missing data was replaced with estimates. The estimates may be confirmed through an audit of the consultant's project accounts. Section 7.02 of the Contract Agreement authorizes UNTAET to conduct such an audit and to receive reimbursement from the consultant if any overpayments are determined. It was recommended that UNTAET make arrangements to be made by responsible authorities to conduct such an audit as soon as possible. It should also be noted that the consultant's reporting of project outputs were seriously out of date and that the draft final report was never submitted.

the action plan. The government requested that technical assistance be implemented without delay and that EIRP finance interim critical contracts of UNTAET personnel to keep sector operations going.

In early 2002, in light of the pressing need to improve the financial sustainability of the sector and to establish sector management competency and institutions, the strategic action plan, comprising items below, was agreed to address priority needs.

- (i) Conduct of a power sector public relations campaign in Dili;
- (ii) Short-term management and training support for billing system operation and technical operations;

- (iii) Review of power sector salary structure;
- (iv) O&M structure for rural power operations;
- (v) Cost study and tariff review;
- (vi) Finalization and implementation of legal framework;
- (vii) Registry and valuation of power sector assets in Timor-Leste; and
- (viii) Preparation of a framework for private sector participation in power sector service delivery and investment (including the option of a management contract).

The most critical items under the action plan were adopted in the matrix for the Transitional Support Program. Under this matrix, the Government committed to making a decision in September 2002 on the suitability of a performance-based power sector management contract as an effective mechanism for obtaining a well-managed efficient, and self-sufficient power utility. Accordingly, the Government, on 18 September 2002 decided to implement a power sector management contract, establish a proper regulatory function, and introduce prepayment meters to improve collections.

**June-October 2002**

**At the request to implement the short-term action plan including preparing the management contract documentation, EIRP funded and ADB administered technical assistance for accomplishing such tasks.**

*Hydro Tasmania was contracted.*

In June 2002, after approval of the matrix for the power sector, a consultant (Hydro Tasmania) was engaged under the EIRP to assist the Government in implementing the plan and this included support to prepare the management contract documentation in consultation with the Power Sector Steering Committee and the Government. The time-bound schedule of progressive consultations and outputs were agreed and implemented for the development of the documentation. With this support and in line with the power sector action matrix—the Government identified a viable management strategy, the management contract option, for the sector by the end of September 2002 and officially presented its selected strategy to the donors on 9 October 2002.

At the Government's request, EIRP financed contracts of international personnel considered critical for maintaining power service. These included support to (i) tariff collection, (ii) meter reading and billing in the districts, (iii) training of invoicing officers, (iv) billing and payment of consumers at subdistrict level, and (v) a public awareness program for inducing cost recovery in the sector.

The objectives (Box 2.9) of the proposed management contract, over a 3-year period, emphasized the following:

- (i) installation of the prepayment meters under a time-bound schedule as a turnkey program,
- (ii) asset management and operation of the power system in all of Timor-Leste, and
- (iii) commercial management of the sector in all of Timor-Leste

Under the proposed management contract documentation, remuneration of the contractor is proposed to be linked with the contractor's performance on (i) key performance indicators, (ii) improvement in revenue collection, and (iii) reduction of sector costs. The contract calls for an independent auditing and certification of the contractor's performance. This auditing and certification would be carried out

### Box 2.9: The Management Contract: An Update as of 9 December 2002

The management contract to be tendered shortly provides for the total transfer of operational control and responsibility of the power sector in Timor-Leste to an external contractor, for a period of 3 years. The Contractor is to have full autonomy in the appointment and management of both international and local staff (subject to The Democratic Republic of Timor-Leste labor regulations), the setting of salaries and employment conditions, and the design and implementation of a staff training program that will result in a permanent staff development capacity and preparation of Electricidade de Timor-Leste (EDTL) for fully localized management.

The Contractor will be responsible for all plant technical operations and maintenance, as well as for ensuring reliable service in Dili and in all rural power centers that are under EDTL control. The Contractor will be required to collect revenues from customers, meeting agreed financial targets including a collection rate from all consumers of better than 90% of invoices by the end of the contract, with most of the improvements accomplished in the first year. To support this requirement, the Contractor may implement metering, billing, and revenue collection systems and technology that the Contractor may propose, including prepayment meters. The Contractor is also responsible for implementing all administrative, accounting, and financial control systems (hardware and software).

Previous work in developing the management contract specified the introduction of prepayment meters as a requirement to support revenue collection and reduce customer service costs. Allocations of \$1.9 million of government funds and up to \$0.9 million from the Trust Fund for East Timor are available to meet the capital cost of prepayment meters. However, as the technology has not been previously tried in Timor-Leste, the Government has expressed reservations about the technology and its social acceptance, and has removed the requirement. The management contract now requires bidders to make two proposals for metering and billing, one that focuses on continuation with conventional meters, and another which introduces prepayment meters. This requirement will allow the Government to evaluate both approaches for each bidder in terms of relative technical merit, cost, financial implication, and risk. It will also make possible a direct comparison of each approach across bids. The Government will then choose the optimal approach proposed by the preferred bidder. The above funds remain available to meet the capital costs of either metering approach, once accepted.

The design of the staff training program, the strategy to take full operational and administrative control of the rural power centers, and the selection of a metering and revenue collection strategy that will meet the financial objectives of the Contract will be proposed in the contractors' bids and will be finalized and accepted at the negotiations.

It is understood that the 'final form' management contract documentation has been reviewed and issued by the Minister of Planning and Finance and the Minister of Transport, Communications, and Public Works.

by a party unconnected to either the Government or the contractor. This certification would also constitute the basis for payment of fees, incentives, and penalties to the contractor. It would provide judgements on the performance of both the Government and the contractor on the provisions of the Agreement. Independent auditing and certification of performance would be arranged through quarterly external audits. Accordingly, payments to the contractor would be made on a quarterly basis for the commencing quarter on the basis of performance during the past quarter. In accordance with best practices, the contract was proposed to be tendered under competitive and international procurement guidelines to ensure transparency and control of the tender processes. A schedule for the tender was tentatively agreed.

The proposed management contract included two preconditions: (i) repairs at Comoro in the estimated amount of \$1.2 million to avoid complete replacement, in the event of major breakdown of the generation facility; and (ii) the investment of \$2.5 million in prepayment meters to provide a credible and effective mechanism for revenue collection and a feasible method for the contractor to comply with the financial indicators under the contract.

### ***Immediate Power Station Repair Requirements***

As explained above, the Comoro Power Station (Comoro) had benefited from a postconflict restoration programs funded by the Government of the United Kingdom and the Government of Japan administered by UNDP. This program has delivered routine and periodic maintenance on the power generators in Comoro.

From the time the completion of the restoration program funded by the Government of Japan ended in April 2002, however, no maintenance had been carried out at Comoro. The Government and its power sector advisers<sup>6</sup> report that no maintenance funding has been appropriated in the power sector budget. In light of the neglected regular maintenance, generator failures occurred in August and September 2002. At the request of the Government, the EIRP reviewed the immediate repair requirements of Comoro. Table 2.11. provides an itemized list of immediate repair requirements identified at the Comoro station under the conducted review.

The Governments of Norway and Japan have adopted a role in fulfilling the requirements identified under the review. In conjunction, the Government is financing repairs of the MAK 2. To address the immediate need for increased generating capacity and improved quality of supply for Dili, a bilateral agreement was signed between the Governments of Timor-Leste and Norway at the end of October 2002. Under this agreement Norway will provide additional diesel capacity of 6 MW for installation at Comoro Power Station. The present theoretical capacity of the station is 15.9 MW, with the practical maximum output at 10.7 MW. Thus, Norway's assistance will increase

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<sup>6</sup> Two positions funded under UNMISSET.

Table 2.11. Immediate Requirements of the Comoro Power Station

Prerequisite Item	Estimated Cost (\$)	Potential Sources of Funding	Status of Commitment
<b>A. Comoro Station Repairs</b>			
1. Obtain addition generation of at least 4 MW	700,000	Norway <sup>1</sup>	Committed
2. Purchase parts and contract required to repair Mak 2	140,000	Government Investment budget <sup>2</sup>	Committed
3. Issue maintenance contract for immediate overhaul of all sets (Manpower)	100,000	Japan (JICA) with UNDP <sup>3</sup>	Proposed
4. Spare parts for refurbishment and catch-up of delayed services	100,000	Japan (JICA) with UNDP <sup>3</sup>	Proposed
5. Purchase and install a standalone compressor unit.	7,000	Japan (JICA) with UNDP <sup>3</sup>	Proposed
6. Refurbishment of existing fire fighting system and purchase of additional portable CO <sup>2</sup> sets	8,000	Japan (JICA) with UNDP <sup>3</sup>	Proposed
7. Clean the fuel supply tanks	5,000	Japan (JICA) with UNDP <sup>3</sup>	Proposed
8. Repair oil purifiers	100,000	Japan (JICA) with UNDP <sup>3</sup>	Procured
9. Contingencies	40,000	Distributed among the above funding	

effective capacity by almost 60%, reducing power cuts and improving the quality of supply to consumers.

While the recommended immediate repair program at Comoro will enable the current power production facilities to attain the expected life of the generation facilities, recurrent and heavy maintenance will still be required on an ongoing basis.<sup>7</sup>

### **Prepayment Meters**

The proposed management contract was determined to require prepayment meters as a collection mechanism to enable the contractor to comply with the set

<sup>7</sup> ADB funded technical assistance under TA 3748-ETM: Power Sector Development Plan – Phase 1 will prepare a power sector master plan utilizing least-cost methodology for the development and expansion of the power system in East Timor. The objective is to formulate a least-cost and technically optimum strategy for developing and expanding the power networks throughout Timor-Leste to support the country's economic and social development. The TA will (i) prepare a detailed and comprehensive technical survey of the energy sector in Timor-Leste; (ii) determine a least-cost development strategy for the power sector that facilitates economic development and poverty reduction; (iii) prepare a 20-year technical master plan for the sector based on a demand growth model; and (iv) prepare a technical and economic feasibility study for prioritized investment requirements.

financial targets under the contract. Prepayment meters are being used on Ebeye Island of the Marshall Islands in association with a management contract, in sections of Port Moresby in Papua New Guinea, and in parts of Australia, among others.

With prepayment meters, customers pay in advance for a desired amount of electricity and are given a code which opens their meter for the amount of electricity purchased. When this amount has been used, the meter can be replenished with a new payment. The system eliminates billing and meter reading (although periodic inspections are still required to control tampering) and it eliminates the need for disconnections/reconnections. A prepayment meter costs approximately \$100 installed.

The analysis concluded that a prepayment metering provides a technical solution for restoring financial sustainability of the sector in light of the experience with the sector finances over the past 2½ years. Prepayment meters offer a softer option to reduce payment delinquency. The prepayment meters do not require government action to cut off power supply of delinquent consumers, rather these receive a signal warning of the need to pay for future consumption of power supply.

On the basis of tariff collection performance, the power sector was assessed to require additional funding—over and above the approved budget subsidies of \$4.0 million in FY2002/2003 and \$2.0 million in FY2003/2004 to the sector. In October 2002, ADB staff advised the donors of the overall sector resource requirements assuming the management contract, the prepayment meter (Table 2.12), and the immediate repairs at Comoro. ADB's analysis concluded that an additional fiscal subsidy of \$5.3 million would be required for the sector over the next 3 years over and above the currently appropriated subsidy of \$6.02 million.

Table 2.12. Funding of the Prepayment Meters

Prerequisite Item	Estimated Cost	Potential Sources of Funding		Status of Commitment
Prepayment Meters	\$2,500,000	Additional TFET-funding for power sector	\$600,000	Proposed
		Savings of EIRP	\$300,000	Proposed
		Fiscal budget 2002/03	\$1.9 million	Proposed needs approval of Council of Ministers

#### 4. The Power Sector – A Way Forward

To address the sustainability and cost recovery issues of the sector, a power sector component was included in the World Bank's Transitional Support Plan (TSP) Action Matrix agreed in May 2002. The most critical item in the Matrix is a decision to tender a management contract for sector operations.

ADB and the EIRP have supported the Government with the implementation of the actions in the Power Sector Matrix (Appendix 2.2). At the request of the Government, the EIRP resources were applied to prepare the management contract documents in June 2002 and to develop consensus on the concept of management contract as well as its details. In accordance with the Matrix, the Government's intention is to tender the contract within 2002. As expected, the prepared draft documentation required a careful review, updating, and adjustment to meet the requirements and concerns of the Government and to attract qualified bidders. This process is supported by additional ADB technical assistance.

Additional assistance will be required for the Government to ensure a transparent tender processes for the contract award and for independent certification of the management contractor's performance against the agreed and negotiated key performance indicators.

#### 5. Technical Assistance Activities

The Power Sector Development Plan (Box 2.10) will be prepared under the ADB-funded TA 3748 commencing in early 2003. This will develop a nationwide assessment of the potential for exploiting indigenous energy resources including hydropower, geothermal, wind, solar and biomass (Box 2.11). Additionally, this study will (i) analyze costs and benefits of converting the current diesel fueled system to use lower grade fuels to reduce operating costs, and (ii) examine potential for expanding and centralizing the rural electrification system. The resulting masterplan will provide a planning framework for selection and prioritization of development projects. These development initiatives need a strong time-bound and sequenced framework that will guide the Government with sourcing the least-cost financing for project preparation (see Appendix 2.1 for the Project Implementation Schedule).

**October 2001**

**ADB approved technical assistance funding for the TA 3748-ETM: Power Sector Masterplan for \$400,000.**

### Box 2.10: Preparing the Power Sector Development Plan – Phase I TA 3748-ETM

**Project Rationale:** To prepare a long-term domestic energy sector development plan, including a sector strategy, to support sustainable economic development and growth, and reduce poverty in Timor-Leste.

**Beneficiary** – Timor-Leste

**Project Scope**

- Prepare a detailed and comprehensive technical survey of the energy sector in Timor-Leste.
- Determine a least-cost development strategy for the power sector that facilitates economic development and poverty reduction.
- Prepare a 20-year technical master plan for the sector based on a demand growth model.
- Prepare a technical and economic feasibility study for prioritized investment requirements.

**Executing Agency:** East Timor Public Administration – Ministry of Economic Affairs and Development

**Cost Estimates and Financing Plan:** \$400,000 equivalent financed by ADB on a grant basis from the Japan Special Fund funded by the Government of Japan

**TA Commencement Date:** January 2003

**Estimated Project Completion Date:** July 2003

**Recruitment of Consultants:** Recruitment of consultants is in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for the engagement of domestic consultants.

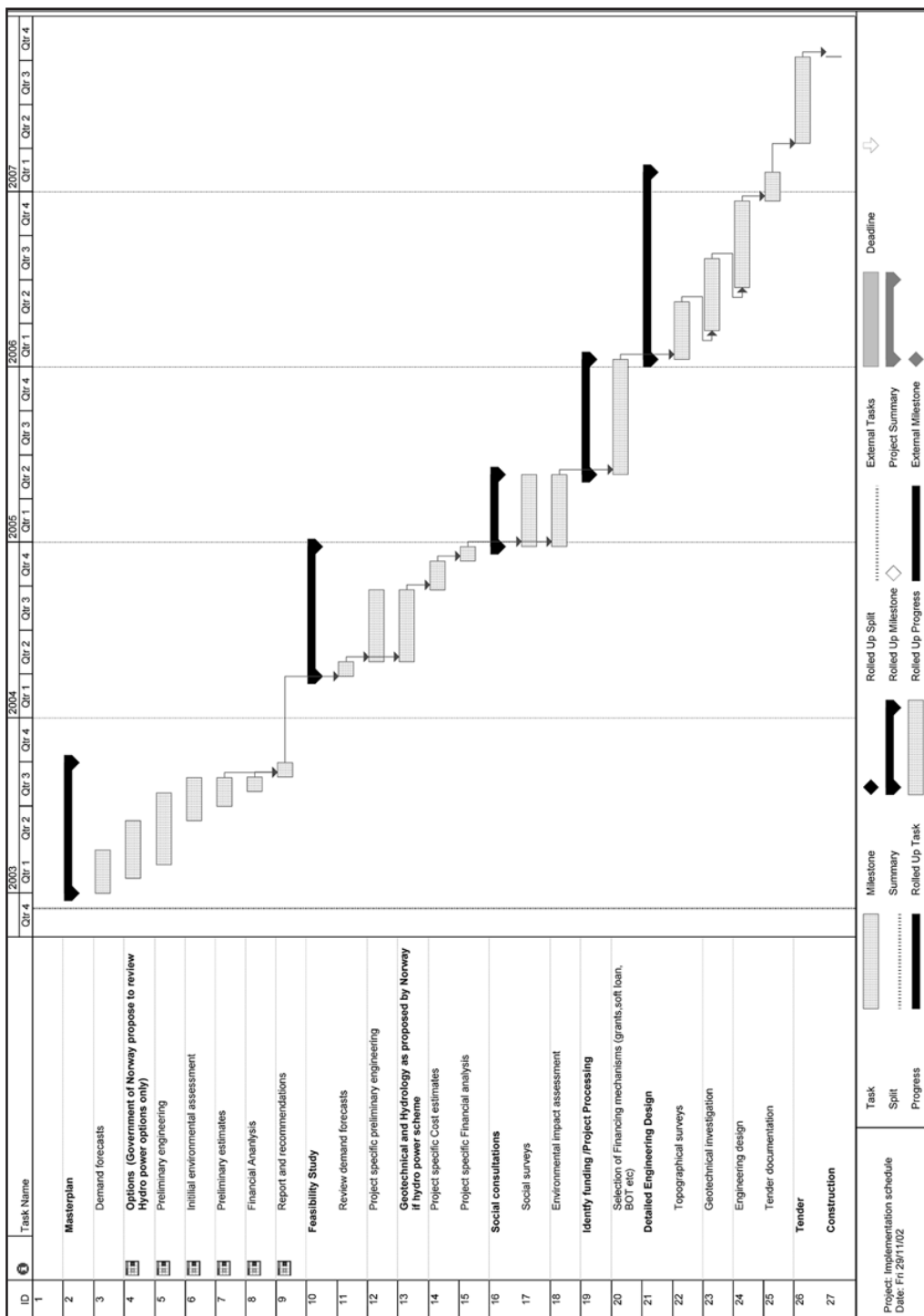
**Implementation Progress To Date:** Contract negotiations concluded on 28 Nov 2002



### Box 2.11: Proposed Progressive Development Plan

1. **Power Sector Development Plan (Master Plan).** Carry out a comprehensive study of all power generation options available to Timor-Leste. The objective of the study is to determine options that are technically and economically appropriate to deliver the amount of power required and to the locations where it is required. The technical and economic (due diligence) project appraisal documentation for the feasibility studies would be completed with preliminary designs.
2. **Social and Environmental Feasibility.** Environmental, social, resettlement, and poverty impact assessments and institutional examination related to the economically and technically viable options for exploiting renewable energy resources. These elements of the (due diligence) project appraisal documentation would be prepared.
3. **Project Processing.** On the basis of the detailed feasibility studies and project appraisals. The project processing phase confirms technical and financial aspects of the potential generation solutions and reflects these with the economic, social, resettlement, and poverty impacts of the proposed project. During project processing the financing possibilities would be explored. This involves reviewing access to grants, concessional borrowing, and possibly commercial borrowing possibilities through a build-own-transfer arrangement. Project implementation and disbursement arrangements will be identified.
4. **Detailed Engineering Design.** Precise definition of all of the project's physical requirements. This work would have to be carried out regardless of the implementation or financing arrangement. With regard to any medium hydropower options, geological conditions at the proposed sites would be investigated in detail at this stage. From the hydrology perspective, the feasibility study would ideally require many years of rainfall data that presently do not exist. It is therefore most desirable that the country establishes rainfall measurement stations and river flow gauging stations throughout the country without delay. The data gathered would have many uses (agriculture, bridge design, drainage design, flood control, etc.) as well as for the design of hydropower generation. Hydrology may therefore be considered as a separate activity.  
  
Particularly, in the case of significant hydropower developments, this phase would include detailed geotechnical investigation of the site including drilling, seismic, and other surveys to gain the information necessary for the detailed design.

### Appendix 2.1 Project Implementation Schedule



Project Implementation schedule  
Date: 17.28.1102

Appendix 2.2  
Power Sector Matrix

NDP/Budget Reference	Actions taken by 30 June 2002	Actions taken by 30 September 2002
1. Establish appropriate, adequately staffed and motivated management structure for East Timor Electricity (EDTL).	<ul style="list-style-type: none"> <li>✓ Established Power Sector Steering Committee (PSSC) and appointed members, including private sector representative.</li> <li>✓ Contracted interim management team for period 20 May to 30 August. (PSSC/MoPF)</li> <li>✓ Appointed consultant to prepare TOR and Key Performance Indicators for Management Contract.</li> <li>✓ Agreed on moratorium on expansion of capacity until financial and institutional structure of power authority resolved.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Decide on management contract vs. managers' contracts for power sector. (Sept)</li> <li>→ Execute selected option and relevant tenders. (Sept)</li> <li>✓ Prepare performance indicators for Management Contract (July)</li> <li>✓ Issue international call for expressions of interest (noncommittal) for Management Contract. (July)</li> <li>✓ Present to Donors power sector management options and financial implications. (9 September)</li> </ul>
<b>REVISED</b>		
2. Improve cost recovery.	<ul style="list-style-type: none"> <li>✓ Adopted government budget presenting reduction in subsidy to EDTL from \$6.8M in FY2002 to \$4M in FY2003.</li> <li>✓ Launched media cost recovery campaign. (June)</li> <li>✓ Launched Dili awareness campaign.</li> <li>✓ Launched District interim billing and payment campaign.</li> <li>✓ Launched Subdistrict community managed payment consultations.</li> <li>✓ Reported on review and status of correction of billing system; billing errors tracked in performance reports – by EDTL. (June)</li> </ul>	<ul style="list-style-type: none"> <li>→ Contract-out meter installing with 500 meters to be installed per month. (July)</li> <li>→ Amend tariff directive tightening disconnection provisions and enforcement of revenue collections approved by CoM. (July)</li> <li>✓ Undertake Tariff Analysis and set Targets for cost recovery – by EDTL/SSE/PSSC. (August)</li> <li>→ Install a total 1,000 meters since contract commenced for meter installation. (September)</li> <li>✓ Monitor monthly financial performance of EDTL, including status of billing system errors and corrections – by EDTL/SSE/PSSC.</li> </ul>

Actions taken by 31 December 2002	Actions taken by 31 March 2003	Actions taken by 30 June 2003
<ul style="list-style-type: none"> <li>• Appoint and mobilize Management Contractor or International Managers – as per decision in September – by EDTL. (December)</li> </ul>	<ul style="list-style-type: none"> <li>• Hand over electricity assets to management contractor, if management contract is selected. (January)</li> <li>• If selected, Management Contractor reports to PSSC on regular basis. (January, February, March)</li> </ul>	<ul style="list-style-type: none"> <li>• If selected, Management Contractor reports to PSSC on regular basis.</li> </ul>
<ul style="list-style-type: none"> <li>• Revise and approve Management Contract Tender. (before Donors Meeting 9 December 2002.)</li> <li>• Minister of Finance to sign and issue Management Contract Tender. (by 6 December 2002)</li> <li>• Request to ADB for the provision of a Power Sector Procurement Specialist.</li> <li>• Request to ADB for the provision of assistance in the Independent Monitoring and Certification of the Management Contractor.</li> </ul>	<ul style="list-style-type: none"> <li>• Establish Tender Evaluation Committee. (Jan 2003)</li> <li>• Bid Conference in Dili (by 1 February 2003)</li> <li>• Closure of Tenders (by 28 February 2003)</li> <li>• Tender Evaluation</li> <li>• Tender Evaluation Committee Meeting (by 21 March 2003)</li> <li>• Public Opening of Financial proposals in Dili (by 25 March 2003)</li> </ul>	<ul style="list-style-type: none"> <li>• Commence contract negotiations (by 7 April 2003)</li> <li>• Mobilization (by 1 May 2003)</li> <li>• Hand over electricity assets to management contractor (May 2003)</li> <li>• Management Contractor reports to PSSC on regular basis.</li> </ul>
<ul style="list-style-type: none"> <li>• Report on review and status of correction of billing system; billing errors tracked in performance reports – by EDTL. (Oct, Nov, Dec)</li> <li>• Install a total of 2,500 meters since contract commenced for meter installation. (December)</li> <li>• Evaluate media campaign on cost recovery for Dili. (Dec)</li> <li>• Evaluate interim billing and payment mechanism in Districts. (December)</li> <li>• Evaluate payment system in sub-districts. (December)</li> <li>• Monitor monthly financial performance of EDTL, including status of billing system errors and corrections - by EDTL/SSE/PSSC.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor first set of Key Performance Indicators under the contract. (March)</li> <li>• Monitor monthly financial performance of EDTL, if management contract not adopted.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor Key Performance Indicators under the contract.</li> <li>• Monitor monthly financial performance of EDTL, if management contract not adopted.</li> </ul>

Appendix 2.2  
Power Sector Matrix (cont'd.)

NDP/Budget Reference	Actions taken by 30 June 2002	Actions taken by 30 September 2002
REVISED		
3. Establish appropriate institutional structure for an autonomous power authority.	<ul style="list-style-type: none"> <li>✓ Issued Regulation 2001/13 providing for revenue retention authorities as first step in a process leading to the creation of autonomous private enterprise.</li> <li>✓ Prepared TOR for external audit, amendment of contract – by PSSC/MoPF. (June)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Complete external audit of EDTL prior to placement under management contract – by MoPF. (August)</li> <li>→ Review of legal framework and preparation of legal drafting instruction on sector structure (August) – to be reviewed with Ministry of Justice.</li> <li>✗ Prepare draft legislation including all related and affected legal texts for defining asset ownership, sector organization, government responsibilities, and procurement, personnel and financial management procedures for the sector and EDTL - by MoPF/SSE/MIA. (September)</li> </ul>
REVISED		

Actions taken by 31 December 2002	Actions taken by 31 March 2003	Actions taken by 30 June 2003
<ul style="list-style-type: none"> <li>• Report on review and status of correction of billing system; billing errors tracked in performance reports – by EDTL. (Oct, Nov, Dec)</li> <li>• Implement contact and install meters available in EDTL stores.</li> <li>• Monitor monthly financial performance of EDTL, including status of billing system errors and corrections – by EDTL/SSE/PSSC.</li> <li>• Request ADB for the provision of technical assistance to rectify problems in the PIMS billing system as identified by the audit report.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate interim billing and payment mechanism in Districts.</li> <li>• Evaluate payment system in subdistricts.</li> <li>• Monitor monthly financial performance of EDTL.</li> <li>• Complete the installation of available meters.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor monthly financial performance of EDTL.</li> <li>• Installation of pre-paid meters to commence under the Management Contract if that option selected (June 2002)</li> </ul>
<ul style="list-style-type: none"> <li>• Submit draft Power Sector legislation to CoM for approval</li> <li>• Submit Power Sector legislation to Parliament. (December)</li> </ul>		
<ul style="list-style-type: none"> <li>• Commence review of draft legislation for Power Sector.</li> </ul>	<ul style="list-style-type: none"> <li>• Submit draft legislation for establishment of Power Sector Regulator and the creation of an autonomous public enterprise to CoM for approval.</li> </ul>	<ul style="list-style-type: none"> <li>• Submit draft legislation for establishment of Power Sector Regulator and the creation of an autonomous public enterprise to Parliament.</li> </ul>

Appendix 2.2  
Power Sector Matrix (cont'd.)

NDP/Budget Reference	Actions taken by 30 June 2002	Actions taken by 30 September 2002
4. Prepare long-term national power development plan and framework for private sector participation.	✓ Issued TORs for preparation of national power development plan.	→ Appoint consultants for preparation of national power development plan. (September)
REVISED		

CoM = Council of Ministers, MoPF = Ministry of Planning and Finance, NDP = National Development Plan, PSSC = Power Sector Steering Committee, TORs = terms of reference.

Actions taken by 31 December 2002	Actions taken by 31 March 2003	Actions taken by 30 June 2003
<ul style="list-style-type: none"> <li>• Undertake Inception Review of the preparation of national power sector development plan. (October)</li> <li>• Undertake Mid-term review of the preparation of national power sector development plan. (December)</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake Final Review of preparation of national power sector development plan. (March)</li> <li>• Formulate TORs for second phase for preparation of the national power sector development plan. (environment, poverty)</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss draft National Power Sector Development Plan with stakeholders and finalize.</li> </ul>
<ul style="list-style-type: none"> <li>• Appointment of Contractor for the preparation of national power development plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake Inception Review of the preparation of national power sector development plan. (by Feb 2003)</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake Mid-Term Review of the preparation of national power sector development plan. (April 2003)</li> <li>• Formulate TORs for second phase for preparation of the national power sector development plan. (environment, poverty)</li> <li>• Undertake Final Review of preparation of national power sector development plan. (2004)</li> <li>• Discuss draft national power sector development plan with stakeholders and finalize. (2004)</li> </ul>



# Water Supply and Sanitation

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## Sector Status

During the violence in 1999 the water supply systems in towns were comprehensively targeted. Vehicles, equipment, spare parts, and any removable items of value were removed. Buildings, water treatment, storage tanks and the like were burnt or damaged. Records were destroyed and most of the professional and management staff returned to Indonesia. When houses and other consumers' buildings were destroyed the water connections, meters, latrines, and septic tanks were also damaged or destroyed.

In the rural areas the damage was not so extensive because there was much less water supply infrastructure to destroy. Reports suggest that wells were poisoned, pipes and hand pumps stolen, and intakes from springs damaged.

The destruction recognized the importance of water supply and sanitation to health and quality of life. This vital role was equally recognized in the efforts of the United Nations Transitional Authority in East Timor (UNTAET), donors and NGOs, especially in the emergency phase immediately following the violence.

In the first months after the violence, national and international NGOs and district administrators under UNTAET restored rudimentary water supply in both districts and rural areas. After this emergency and humanitarian need had been met UNTAET faced a twofold challenge:

- first, to repair and rehabilitate the many damaged urban and rural water supply and sanitation facilities to an appropriate level of operation;
- second, to reestablish institutions and systems for managing, operating, maintaining and developing urban and rural water supplies and sanitation that are both appropriate and sustainable.

Under the Indonesian administration the SUSENAS survey in 1998 indicated that only 23% of the population of Timor-Leste received piped or pumped water supplies. Some 62 of the 76 districts and subdistricts had water supply networks but coverage within the urban areas was limited and the quality of facilities was low—even in Dili almost half the households had to rely on shallow wells rather than public supply. In the 440 rural villages water supply was available but most were of very low standards.

Most water supply will soon have been restored to the service levels under the Indonesian administration but these levels are considered inadequate to achieve the country's reasonable public health goals. Sanitation, including wastewater, solid waste and drainage, have not yet been restored to earlier levels but, as with water supply, public health and environmental protection goals will require attainment of standards significantly higher than under the Indonesian administration. Considerable progress was made under the UNTAET administration to restore water supply and sanitation

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services but much remains to be done to reach appropriate standards for public health, environmental protection, and quality of life.

To meet the institutional challenges, rather than seek to restore the earlier multiplicity of water supply agencies it was decided to establish a single agency, initially the Water and Sanitation Authority but subsequently the Water and Sanitation Service (WSS).<sup>1</sup> The responsibilities given to WSS include policy and planning; water resources management,<sup>2</sup> public water supply, community water supply, sewage and wastewater, urban drainage, and solid waste disposal.

Although functioning, WSS remains a new and developing agency. Under UNTAET staffing, institutional infrastructure, policies, legislation, and operational and management systems were established. Immediately after independence in 2002, WSS had 143 staff and expenditure for 2002-03, though budgeted at \$2.38 million, was expected to be limited to about \$1.5 million due to constraints on the national budget. At this level of expenditure, 91% of the total will be used for operation and maintenance of existing infrastructure and services, including salaries and wages at about 9%.

The continuing need for development of facilities and institutional capacity require funds which are not available in the national budget. This need stresses the importance of securing additional sources of funds from (i) effective collection of affordable user charges; and (ii) mobilization of communities to help themselves in developing and operating facilities in rural areas while WSS concentrates on urban areas.

Since the 1999 referendum, no user charges have been collected from urban users. Under a Directive in July 2000 allowing UNTAET to charge for goods and services, water charges were approved on the basis that the first 800 kiloliters per month were free and subsequent consumption was charged at \$1.1 per kiloliter. Under the Indonesian administration water was charged at Rp150/m<sup>3</sup>, less than \$0.02.

As with electricity tariffs approved by UNTAET, unit rates were substantially increased but with a large level of initial lower cost consumption to protect poorer consumers and without the necessary meters and billing systems to actually levy the charges. Support is being provided for the introduction of effective user charges under the ADB-managed and TFET-funded projects:

- Phase 1 consultant support included water tariffs preparation and, subject to approval of the proposed schedules and passing of the necessary legislation by the Council of Minister, billing will commence in January 2003;
- Phase 2 consultant support includes water user billing support before and in the initial billing operations; and
- water meters are being supplied.

In the absence of effective metering and charging it is understood that many informal connections have been made to urban supply systems, possibly increasing

<sup>1</sup> In Portuguese, Servico das Aguas e Saneamento (SAS).

<sup>2</sup> In the absence of any other mechanism, WSS will be responsible for water resource management until a higher responsible body is legally established. Irrigation, flood control, meteorology, and environmental aspects are each the responsibility of other agencies.

the number of connections by 20%. In addition to losses to unauthorized connections there is wastage due to leaks caused by poor system design and maintenance. Water quality is also often poor, leading to customer frustration and potential resistance to user charges.

The combination of user charges and more efficient and effective management of the water supply systems in urban areas should both increase the flow of funds into operation and maintenance and development of the sector and reduce unit costs through reduced wastage of water and other resources.

In the rural areas WSS has no capacity or resources to develop water supply and sanitation systems or to operate and maintain such systems. The model adopted for development of rural water supply is based on partnerships between communities and NGOs to develop, operate, and maintain facilities with WSS supporting this process through active involvement in planning, donor coordination, establishment of technical standards and guidelines, and monitoring and evaluation. Communities provide labor for development and operations and donors have funded development materials and equipment and capacity building. The TFET-funded and ADB-managed projects have effectively implemented this model, as described later.

This community development model allows the benefits of safe water supply to be enjoyed by rural groups, where poverty is highest, who could not otherwise benefit due to resource constraints on WSS both for development and operation and maintenance. Development of an effective water users group is an essential part of the model and, once established, can provide a means for other community developments, such as in promoting hygienic sanitation facilities.

Community water supply and sanitation is a key program for WSS as it is the only means currently available to address the needs of 60% of the population. WSS also seeks to utilize a community approach in urban areas to allow more rapid development of water supply and sanitation facilities and their subsequent maintenance.

From this present position WSS, with support from TFET-funded and ADB-managed projects, has developed a 5-year action plan as part of the National Development Plan. The key sectoral development objectives for the 5-year time horizon are:

- 80% of the urban population to have access to adequate and safe piped water supply;
- 80% of the rural population to have access to safe water supply;
- 80% of the rural population to implement and effectively use appropriate sanitation facilities;
- appropriate solid waste management systems planned and implemented to handle 100% of urban solid waste in Dili and district capitals;
- urban drainage systems operating effectively in Dili and district capitals, flooding avoided in excess of design standards;
- appropriate treatment facilities are implemented and maintained for disposal of septic and other liquid wastes; and
- effective water resource management system is established and operating.

## Development Interventions

### 1. Projects

The damage caused to water supply during the postreferendum violence and the vital requirement for safe water supply led to a large number of interventions by NGOs, and bilateral and multilateral agencies to restore supply immediately.

- **National and international NGOs** proved most able to respond in a timely manner to the humanitarian crisis. They formed the core of assistance to the water supply and sanitation sector, providing equipment, materials, and personnel to make emergency repairs. They addressed needs of urban, piped water supply and for rural village water supply and, to a lesser extent, sanitation. The first multilateral and bilateral funds were channeled through them and rapidly assembled United Nations district administrations provided on the ground support to their fieldwork. Principal among the national NGOs were Bia Hula, Forte, and Hamoris Timor Oan and among the international NGOs were the Red Cross, Care, Oxfam, and Action Contra la Faim (ACF). Several NGOs have continued working after the humanitarian crises, particularly in addressing the needs of rural communities and the poor.
- The **Australian Agency for International Development (AusAID)** was the first bilateral donor to support restoration of the sector, commencing in November 1999 and supporting the following projects:
  - Emergency Water Supply and Sanitation, supporting Oxfam and Bia Hula – November 1999 to August 2001
  - Human Resource Development Assistance to WSS – April 2001 to April 2002
  - Rural/Community Water Supply and Sanitation with NGO assistance (IDSS, Oxfam, EGIS) – January 2002 to December 2004
  - Capacity Building for Water Supply NGO, starting before the referendum to support the Bia Hula NGO in rehabilitation of rural water supply and water users groups – 1998 to April 2002
  - Human Resource Development to support management procedures and systems – proposed for a 2-year period from 2002.
- **United Nations** was the first multilateral to undertake projects, initially to support its own operations:
  - Service Provision including staff, technical assistance, equipment, materials and training – December 1999 to January 2002 – UNTAET
  - Wastewater Disposal to construct sewerage disposal ponds in Dili – January to April 2000 – Interfet
  - Waste Clean Up to remove waste from Dili – March to December 2000 – United Nations Development Programme (UNDP)
  - Rural Water and Sanitation Initiative to supply water and sanitation facilities

to schools and health centers and promote hygiene – 2000 and still ongoing  
– United Nations Children’s Fund (UNICEF)

- **Japan International Cooperation Agency (JICA) and other Japanese agencies** have undertaken rehabilitation projects, providing equipment and materials:
  - Urgent Improvement Project for Water Supply undertook asset mapping and planning in Dili and most districts – March to December 2000
  - Urgent Improvement Project for Water Supply – Quick Impact Projects undertook physical improvements in several districts and 10 schools – March to December 2002
  - Dili Water Supply and Sanitation Rehabilitation addressed needs of source development, transmission and treatment facilities in Dili – June 2000 to June 2002
  - Urgent Rehabilitation and Improvement of Water Supplies addressing facilities requirements in Liquica, Los Palos, and Manatuto district towns – 2002
  - Urgent Rehabilitation and Improvement of the Distribution Network in Dili Water Supply – 2002 to 2003
- **Portugal** has provided technical assistance and infrastructure development support:
  - East Timor Sanitation and Drainage Master Plan focused on Dili but addressed needs of all districts, including solid waste management and sewerage as well as sanitation and drainage – May to December 2000
  - Urban Water Supply Rehabilitation addressed the infrastructure needs of Baucau and Aileu district towns – May 2000 to December 2001
- **Canadian International Development Agency (CIDA)** has supported rural water supply and sanitation in the districts of Aileu, Lautem and Ainaro implemented by NGO CARE (Canada) – April 2001 to March 2004.
- **Germany, through the German Agency for Technical Cooperation (GTZ) and Kreditanstalt für Wiederaufbau (KfW)**, supported rehabilitation and improvement of 6 subdistrict water supply systems in Viqueque and Baucau districts – February 2000 to July 2002
- **United States Agency for International Development (USAID) and US Government Engineering Team (USGET)** have provided support programs for physical infrastructure:
  - WatSan supports 28 small grants for village water supplies spread over 7 districts – ongoing
  - USGET provides engineer resources to support restoration of basic facilities in water treatment, distribution, and laboratories – ongoing

With the occasional exception of projects addressing the larger scale needs of Dili, the interventions tend to be programs rather than projects. The programs allowed flexible response and prioritization in the face of changing needs in the emergency

situation. This approach was consistent with the need to restore and develop over 500 water supply systems.

The two TFET-funded Water Supply and Sanitation Rehabilitation projects (WSSRP1 and 2) follow this programmatic and multicomponent pattern. At \$4.5 million each they differ in being among the largest project interventions in the sector. They follow other projects in addressing urban needs through WSS and rural needs through a community development approach in partnership with NGOs. The projects differ from most interventions—apart from those of AusAID—in the degree of emphasis placed on capacity building and institutional development through development of systems and practical experience.

Though there were separate grants<sup>3</sup> the second was a logical continuation of the first, building on and developing the initial achievements, and can be considered as one activity in terms of impacts.<sup>4</sup> The sectoral goal of the projects is to ensure access to water supply and sanitation services essential for public health, environmental protection, and economic growth. This was to be achieved through three components continuing through both projects:

### ***Infrastructure Rehabilitation/Water Supply and Sanitation Implementation Program***

The major project activity was to support implementation of priority water supply and sanitation projects in Dili, district capitals, and community systems. In both projects this component accounted for over 70% of the TFET project funds.

The activity was divided into 3 subcomponents in WSSRP1 and refined to 5 subcomponents in WSSRP2 based on experience and perceived needs.

- **Quick Response Facility** – the largest subcomponent in WSSRP1 and was without any fixed activities, providing a flexible response to address unforeseen urgent needs that emerged during implementation. Outputs included 5 deep wells and major repairs of the Viqueque transmission main over the Cuha River. Much of the activity concerned small-scale procurement and contracts to support WSS during the difficult establishment and transition phase and to maximize benefits from major works funded by other agencies. Regular liaison was maintained with the USGET engineering team. With the improved situation and greater knowledge of requirements the subcomponent forms a lower proportion of WSSRP2 but remains important due to the flexibility provided to respond to unforeseen needs. Some of the

<sup>3</sup> WSSRP1 commenced activities in September 2000. Physical implementation is complete and financial closure is expected by end-November 2002. WSSRP2 was approved in July 2001. Physical completion is expected by end-March 2003 and financial closure by end-June 2003.

<sup>4</sup> Team leaders of WSSRP1 and 2 have each been required to submit draft project completion reports but one single report will be presented on completion of WSSRP2.

small-scale works are now more easily foreseen and incorporated in other subcomponents in WSSRP2.

Minor works have been done to support the Japan-funded Dili Water Supply Urgent Rehabilitation Project. Coordination with USGET engineers has continued. Problems arising from the availability and quality of electricity supply have been addressed by replacing pumps, upgrading supplies, and providing generators. Drains have been cleaned and rehabilitated. A domestic rainwater harvest guide is being developed. Period drafting contracts have been established. Though beneficial, the large number of small activities are proving demanding on the time of the PMU.

- **Dili Water Supply Repair and Rehabilitation Program** – designed primarily to complement the Japan-funded upstream water supply rehabilitation by addressing downstream needs in the distribution system. Distribution systems have been rehabilitated and constructed to increase the number of beneficiaries of the improved water supply system. Small contracts were used to construct deep wells and repair distribution systems for low-income areas, including public taps and other water points. Some 4,000 meters were procured in anticipation of the reintroduction of user charges and 2,000 have so far been installed by WSS.

Under WSSRP2 the activity is being continued through small-scale works to correct remaining distribution problems. Proposed work to revise the Dili Water Supply Network Plan has been deferred on the understanding that it will be undertaken under a Japan-funded project. Small-scale works are being undertaken as an opportunity for practical capacity building for WSS staff and local employees of domestic consulting engineering firms.

- **District Water Supply Repair and Rehabilitation Program** – provided a range of assistance to address the needs of district and rural communities throughout Timor-Leste. Supported activities included repair and rehabilitation of systems; procurement of pipe and equipment; borehole rehabilitation; design and documentation for transmission, storage, and distribution; and supervision and civil construction works. Work was undertaken through contracts with national and international NGOs for surveys, mapping, formation of water users groups (WUGs) (Box 2.12), equipment procurement, implementation, and ongoing support for WUGs (Figures 2.3–2.6). The activity developed the capacity of both the NGOs and community groups and is providing improved water supply and sanitation for an estimated 32,000 people.

In WSSRP1, this had been the smallest of the three subcomponents, at some 20% of the total component cost. In WSSRP2 the activity was expanded to be 64% of the component cost and over 4 times the total cost. The activity was split into two subcomponents, one addressing the larger systems of district towns, implemented and operated by WSS, and the other addressing the smaller, community-based systems in rural areas.

- **Continuing work begun in WSSRP1** – The subcomponent will upgrade water supply systems in 6 districts with international consultants to design and supervise construction. A contract has been agreed and work has commenced on the transmission system for Viqueque district and bids have been received for construction in Suai and Liquica districts. Design and documentation for water supply systems at Oecussi, Gleno, and Maliana are being completed. Materials have been procured in advance to expedite completion. Progress has been relatively slow, but physical completion is expected by the end of March 2003 and the closing date will be 30 June 2003.
- **Community Water Supply and Sanitation Rehabilitation and Improvement** – continues in WSSRP2 the model developed in WSSRP1's district subcomponent and applies it to continue to develop peri-urban, subdistrict, and rural systems. These systems will be developed, operated, and maintained by communities and become the property and responsibility of the community rather than WSS. The contribution of WSS will be in the form of ongoing technical support provided by the Community Water Supply and Sanitation Division.  
Sixteen national and international NGOs are implementing \$800,000 of community-based water supply and sanitation projects to serve almost 40,000 beneficiaries in generally poor rural villages. This participatory approach appears to be highly cost-effective compared, for example, to Dili development costs and also appears potentially much closer to sustainability due to community commitment and management.  
The expected outcomes are (i) provision of basic water supply and sanitation services for many small communities; (ii) enhanced community empowerment through local participation, accountability, and organization; and (iii) greater local NGO capacity to undertake similar activities in future.
- **Urban Sanitation Improvement** – as a new activity, WSSRP2 seeks to address Dili's needs for drainage, and solid waste and human waste management. The Government requested changes to delete solid waste collection and procurement of a tracked loader and include rehabilitation of the Tibar waste disposal site and increased emphasis in drainage and wastewater. Consultants have been selected for planning, design, and contract implementation but work has not yet begun.

### ***Capacity Building and Institutional Development Program***

This component sought to assist WSS to establish essential institutional infrastructure, particularly in Dili and the district capitals. Under WSSRP1 this component

- constructed or renovated office, workshops, and stores in each of the 12 district towns for use by WSS district staff and customers;
- procured vehicles (16 vehicles and 4 motorcycles) and priority tools, equipment, and materials for the PMU and WSS district offices;



### Box 2.12: Main Steps in Creating a Water Users Group

- Organize a community group to consider water supply and sanitation issues with NGO advice.
- Undertake training with the NGO on the practicalities and costs of establishing, operating, and maintaining a system.
- Group members then discuss and agree on the management of the system, including commitment of labor as social capital, user charges, charging system, and penalties for nonpayment.
- Draw up an agreement as the basis for formation of the group, and for the development and operation of the system; coordinate with the WSS on technical matters.
- Provide labor for the construction work, using project-provided materials under the guidance of the NGO and WSS.
- After construction, give further training in the management of the water users group.
- Register the water supply system with WSS as the property of the community through the Water Committee (Figures 1 and 2).
- Basic tools, equipment and supplies are provided—including a cash box and float of \$50 and signed for by the representative of the committee (see Figures 2–4).
- The community is then responsible for management, and operation and maintenance of the system with no further claim on WSS or project funds.

Figure 2.3: System Map of the Borhei and Tasimate Village Water System

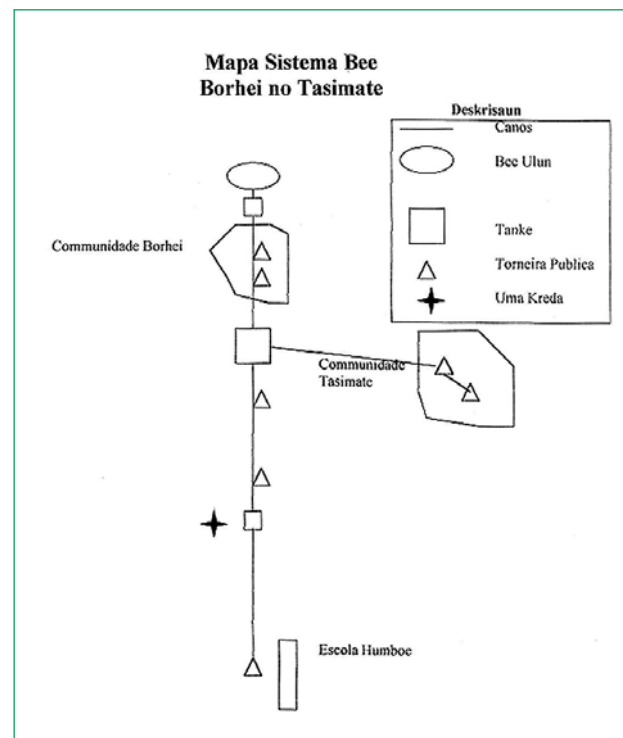



Figure 2.4: Registration of a Water Committee


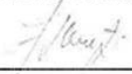


**DATE: 26 February 2002**  
**Official donation to the community**

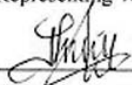
In October of 2001, Action Contre la Faim (ACF) rehabilitated and installed a gravity fed water system in Borhei and Tasimate village, subdistrict of Ermera, district of Ermera, East Timor; providing safe drinking water to the community and Humboe school. This system includes 1 spring catchment, Two reservoirs and 5 public tapstands.

ACF, an international non-governmental organization, undertook this work independently to provide humanitarian assistance. ACF now turns over the responsibility and the legal ownership of the system to the Water Committee, created within the community and represented by Pedro Salsina Exposto. The Water Committee will be the only legal owner of the system. Should the committee cease to exist, the ownership could be handed over to the government, currently represented by the Water and Sanitation Service (WSS)

The Water Committee of Borhei and Tasimate is now officially registered with WSS as owner of the Water system of Borhei and Tasimate and is responsible for the system's maintenance, technically and financially. Any issues concerning water supply will have to be addressed to WSS of Ermera District.

<p>Representing ACF</p>  <hr style="width: 100%;"/> <p>Bakary Doumbia Chefe ACF, Programma ECHO</p>	<p>Representing the Committee of Borhei and Tasimate</p>  <hr style="width: 100%;"/> <p>Pedro Salsina Exposto Chefe De Suco</p>
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Representing WSS




26/02 2002

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Thomas Da Silva  
Head of WSS Ermera

**Attached: System Map, List of Tools provided**


Figure 2.5: List of Tools Provided to a Water Committee by an NGO



**LISTA CHAVE BE NIA'N NEBE ACF PREPARA BA KOMITE BE HUMBOE**  
(LIST OF TOOLS PROVIDED BY ACF FOR WATER COMMITTEE HUMBOE)

English	Tetum	No. (Numero)
Shovel short handle	Kanuru badae (ki'ik)	2
Pick	Kalabai	2
Hoe	Insada	2
Wheelbarrow small	Gerobak	1
Measuring Tape 8 metre	Metru Fita 8 Metro	1
Hammer	Martelu	2
Concrete trowel - rectangular	Pa Beton - rectangular	1
Concrete trowel - diamond	Pa Beton - diamond	1
Tool Box	Sabi Kaixote	1
Wire Brush	Iskoba besi	1
Crowbar	Aisuak	2
Measuring Tape 50 metre	Metro 50 metre	1
Hacksaw	Kado	2
Hacksaw blade	Kado nia nehan	10
Stilsons Wrench - 24	Sabi Ingles 24	2
Stilsons Wrench - 12	Sabi Ingles 12	2
Adjustable Wrench - 12	Sabi ingles atu menyetei	2
Threader 1½" to 2" (ACF to provide teeth later)	Traca 1½" to'o 2" (ACF fo dentes aban bain rua)	1
Mason level	Level ba badae fatuk	1
Teflon tape	Ligadura kanu nia	20
Cashbox	Kaixa kas	1
Startup Money (USD)	Osan (USD)	50
Notebook	Kaderno nota	1
Cement Bags	Simenti	5
Spare Taps ½"	Torneira Reserva ½"	3
Spare Taps ¾"	Torneira Reserva ¾"	7
Valves - ¾"	Valvo Reserva - ¾"	2
Valves - 1"	Valvo Reserva - 1"	2
Valves - 1 1/4"	Valvo Reserva - 1 1/4"	1
Pipes - ½"	Pipa - ½"	5
Pipes - ¾"	Pipa - ¾"	5
Pipes - 1"	Pipa - 1"	5
Pipes - 1 1/4"	Pipa - 1 1/4"	5
Unions - ½"	Uniao - ½"	5
Unions - ¾"	Uniao - ¾"	5
Unions - 1"	Uniao-1"	5
Unions - 1 1/4"	Uniao-1 1/4"	5
Tees 1 1/4" - ¾"	Tees 1 1/4" - ¾"	2
Tees 1" - ¾"	Tees 1" - ¾"	2
Tees ¾" - ½"	Tees ¾" - ½"	1
Tees ¾"	Tees ¾"	1

Figure 2.6: Receipt Issued by a Water Committee for Tools Received




DATA 26 Fevereiro 2002  
Comite Be Humboe

Ha'u deklara katak hau simu lista chave be nian iha pagina leten. Ha'u aceita katak cahve sira ne'e comunidade ninan no sei la usa ba rajao personal ninia. Ha'u mos hatetan katak prepara orsamentu balu nebe sei uja de'it ba atu kompras sasan nebe precija atu hadia no manten sistema be Borhei no Tasimate ou atu selu teknikal atu serbisu hadia sistema.

*(I certify that I have received all the tools listed on the page above. I acknowledge that these tools are the property of the community and will not be used for personal reasons. I also acknowledge that the money provided is ONLY to be used to purchase items needed for repair and maintenance of the Borhei and Tasimate Water System or to pay the technician for the work he performs on the system)*

Represente Comite Borhei no Tasimate

  
 \_\_\_\_\_  
 Pedro Salsina Exposto  
 Chefe de Suco

- replaced priority information technology (IT) and communications equipment;
- provided capacity building technical assistance packages to address issues including preparation of a Program Implementation Document (PID) and Sector Management and Investment Framework (SMIF); policy, legislation, and guidelines; water tariffs; national water supply and sanitation technical standards and guidelines; and a solid waste management plan.

WSSRP2 seeks to build on the achievements of WSSRP1 to improve the capacity of WSS through support for policy development, management and planning systems, human resource development, and donor coordination. Activities being undertaken include:

- Capacity Building Technical Assistance continues the wide-ranging support to WSS provided in WSSRP1. The mix of assistance was varied at inception. The originally proposed management and financial information systems were deleted as this assistance is being undertaken through the Ministry of Finance. The previously proposed Water Resources Planning and Management support and Environmental Monitoring assistance have been removed to form separate ADB TAs. Technical assistance addresses:
  - legislation assistance to revise Draft Regulations for Water Resources, Water Supply Services and Sanitation, which have been forwarded to the Government for promulgation;

- planning assistance to define appropriate sector goals and activities to be included in the National Development Plan and forward budget submission; the assistance also resulted in the 5-Year Sector Development Plan referred to earlier;
  - revision and improvement of WSS Community Water Supply Guidelines to enhance sustainability, undertaken jointly with AusAID;
  - introduction of an Infrastructure Asset Management System to improve operation, maintenance and replacement activities; a complementary Dili Water Supply Forward Plan is also proposed to program asset management to 2020;
  - reintroduction of water user charges, which has been delayed in lengthy consultation and approval processes but is expected to begin in Dili in January 2003;
  - development of a Dili Drainage and Wastewater Management Strategy for WSS; and
  - a proposed activity to support a Dili Water Supply Master Plan is pending review of the outputs of current Japanese projects.
- Training Assistance, introduced as a subcomponent during inception for WSS staff. Two local WSS staff attended a congress and exhibition of the International Water Association, and high level staff were supported in consultations on water resources in preparation for the World Summit on Sustainable Development. Current plans include training in customer relations, pricing and asset management, sustainability of water resources, and people management. Such training will provide exposure to improved technology and management methods. While staff are receptive the training opportunities are constrained by the limited staff numbers in relation to work requirements.
  - IT and Communications equipment, including computers, local area network and communications equipment has been indefinitely deferred pending broader government plans for network integration being prepared by the Ministry of Planning and Finance. Implementation has been limited to PMU needs but with sufficient capacity available for use by WSS.

### ***Water Supply and Sanitation Sector Management and Implementation Program***

This component was to assist WSS to implement TFET-funded projects through establishment of a Project Management Unit (PMU) and to plan future development of the sector. The PMU was established in September 2000 and successfully carried out its tasks. The plan documents were completed by December 2000 and approved by UNTAET/East Timor Public Administration (ETPA) in early 2001.

Under WSSRP2 the PMU was established in October 2001, initially supporting completion of WSSRP1 activities. The inception report was produced in December

2001 and approved by WSS then and by ADB in January 2002. The component supports WSS's project implementation and planning in close consultation with WSS staff, bilateral donors, NGOs, and beneficiary communities.

Achievements during 2002 have included organization and support of a Joint Donor Coordination Mission in March and April. This resulted in greater understanding among donors of sector priorities and coordination. A follow-up mission is proposed for the first quarter of 2003 before the end of WSSRP2 implementation.

## 2. Technical Assistance

Considerable technical assistance was provided within the TFET-funded projects as described above and no ADB technical assistance has been undertaken separately which specifically addresses water supply and sanitation issues. However, related issues have been addressed in

- TA 3501-ETM: Environmental Assessment Capacity Improvement, undertaken between January 2001 and mid-2002 to support capacity in the Ministry of Economic Affairs and Development using ADB TA funds; and
- Project AOTA: ETM 34541-01 – Water, Environment and Natural Resources, currently commencing, will develop capacity for natural resources management.

## Development Impacts – Current and Prospective

### 1. Poverty Impact

The two projects have addressed the water supply and sanitation needs of whole communities in which poverty incidence is high. Particularly the community water supply activities but also the district level systems have provided benefits to an estimated 240,000 people living outside the capital, Dili; poverty incidence is generally much higher in the areas outside Dili.

Within Dili itself the project has addressed the needs of low-income areas by developing deepwells where piped supply is not available and providing public taps and other water points where household connections are not available.

Project design and implementation have, thus, targeted benefits on the poor. Their benefits will be in terms of improved health and quality of life from access to safe and reliable drinking water supplies. The greater availability of water will promote increased use for washing, bathing, and other hygiene activities to improve health and living conditions for all household members.

The project has not provided ongoing income-generating opportunities but has saved labor that would otherwise have been required for collection of water—a time-consuming task that is often an additional burden on the workload of women and children in rural communities.

These benefits will not be exclusively for the poor but have been provided to whole communities. Project implementation has been inclusive, with poorer members of the communities participating in the planning and implementation process, including in the setting of tariffs in the rural systems. This participatory process ensures that full weight is given to issues of affordability of user charges so that the poor are able to share the benefits.

## 2. Social and Economic Impacts

All members of the communities will receive the benefits of access to safe water supply and saving of labor in water collection tasks.

In Dili, several projects funded by various donors address different but interdependent requirements of the water supply and sanitation systems. Benefits received are joint products of several projects and numbers of beneficiaries of different projects are, thus, imprecise. Estimates suggest that perhaps more than 15,000 people in Dili have been served by the TFET-funded projects.

Estimates of beneficiaries outside Dili suggest that up to 240,000<sup>5</sup> people have benefited from the two project phases. Of considerable importance in terms of nation building is the fact that the WSSRP1 beneficiaries included 8,000 in the isolated enclave of Oecussi. WSSRP2 will include some 23,500 beneficiaries in Oecussi as well as some 1,750 on Atauro Island, through a community water supply project based on rainwater harvesting.

In addition to these ongoing, long-term benefits there were also immediate benefits in terms of days of employment generated in project implementation. Estimates of these direct and indirect employment days generated vary from 65,000 to 90,000 persondays.

## 3. Institutional and Capacity Development

Capacity building and sector development activities within the TFET-funded projects—as well as the implementation experience provided by the projects—has equipped the increasing number of WSS staff with management, technical, and planning skills which will enhance performance of the new institution to the benefit of the whole country.

The use of local NGOs to support implementation has allowed them to develop their capacity for implementation of participatory community development activities, including mobilizing beneficiary groups, training and physical implementation.

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<sup>5</sup> Estimates suggest some 90,000 beneficiaries of WSSRP1 outside Dili and 150,000 beneficiaries of WSSRP2. Given that the second project often continued development of systems supported in the first project there will be some double counting in adding the two total together. Even allowing for this it is probable that the number of beneficiaries was of the order of 200,000 or more, a large proportion of the population.

The communities thus helped have also been equipped with skills to make them more self-sufficient and self-reliant, able to address their shared needs and implement agreed solutions—moving on to develop sanitation and similar services not directly supported by the projects.

## Key Issues

### 1. Sustainability

The projects have provided two different categories of facilities with distinct issues in terms of sustainability.

The community-based facilities are intrinsically more sustainable since the beneficiaries and system sustainers are one and the same group. The creation of the group includes training to make members aware of the costs and requirements of sustainable operation and includes agreement on the user charges and consequences of nonpayment for individual group members and the group as a whole. The risks to sustainability are then centered on failure of the group to accomplish its agreed tasks.

Such failure could arise due to weaknesses in the group or changes in membership which failed to maintain the institutionalized knowledge provided through NGO support. This risk can be addressed through ongoing training support, perhaps provided by the Community Water Supply and Sanitation Division of WSS. Disruption could also occur due to mismatches in timing of revenue and costs, particularly in rural communities where income is not regular but follows harvest cycles. The initial working capital of \$50 from project funds may provide for such fluctuations or the community must manage its expenses or raise more working capital to address this problem and make the group sustainable.

For the government-managed and financed facilities the risk to sustainability is the level of cash inflow available. At present, operation and maintenance and replacement are dependent on government budget and, as noted under Sector Status above, the budgeted amount may be adequate but the constraints of funds available suggest that only operation and maintenance can be currently funded with no significant funds either for replacement or development.

In the near term sustainability depends on the ability to secure additional revenue in Dili and the district towns served by WSS in the form of user charges. These charges are planned to commence with bills for larger customers in Dili from January 2003. The projects have provided 4,000 meters to support this development. TAs under the project have provided advice on tariffs and currently supply support in development of billing activities.

It is noteworthy that the tariffs proposed for government approval are not those of the consultant or donor but those proposed by WSS based on the advice and support given. This is likely to generate a sense of government ownership of and commitment to the tariff structure which will support collection and enforcement activities.



Sustainability does not require full cost recovery from user charges as the Government is willing to provide funds from scarce public resources to meet such basic human needs.

## 2. Lessons Learned

Project implementation tests project design and lessons can be learnt from successful projects, such as these, for application elsewhere. Based upon the complete WSSRP1 and experience of WSSRP2 to date the principal lessons are

- Flexibility in design and implementation have enabled the project to address the needs of such a large number of small projects and respond to a developing situation in conditions, especially at the outset, which were very uncertain. This flexibility has also allowed timely support to other projects and programs that encountered unforeseen needs.
- Design and implementation have sought to ensure consistency with the strategies of the recipient institution, WSS, rather than following an exogenous agenda. Emphasis has also been placed on coordination with other agencies and donors to prevent overlaps and redundancy. This approach has been successful and may be developed further in a comprehensive assessment of total water supply needs in Dili and other districts.
- Capacity-building support has been undertaken in a manner that supports local ownership and understanding, including agreement with the recipient on changes in the scope of support. To be effective, support needs to have an appropriate pace, timing, and coordination.
- Use of NGOs allows effective and early access to local experience and knowledge of social and physical conditions. NGO involvement has been crucial to implementation success when WSS lacks the resources (human and skills rather than just funds, which the project can provide) to undertake the work. Use of NGOs enabled community participatory approaches to be integrated in physical rehabilitation activities and helped capacity building for WSS staff as well as for the communities and the NGOs themselves.
- Capacity building in the community needs to empower and educate so that people can be involved in water management, including the need to ensure quality of supply and effectiveness of sanitation. System design and operation must allow for the capacity of the community to pay for the services at a level which provides financial viability of the system. Particularly, women must be involved as full partners in the community and gender issues addressed.
- Levels of service may best be improved and costs reduced by reducing leakage in the existing water supply system, increasing efficiency and effectiveness rather than capacity. Reintroduction of metering and user charges—even at affordable rates without full cost recovery—is not simply a mechanism to

generate revenue but also to promote efficient use of a scarce resource and encourage less wasteful use by consumers.

## Continuing Needs

### 1. Project Activities

Interventions by TFET-funded project and by other donors have restored basic water supply to preconflict levels, but public health, environmental protection and economic development, as reasonably proposed in the National Development Plan, require continued improvement in supply quantity and standards. This requires continuation of projects similar to those successfully developed in the past.

Projects have concentrated on supply of safe water and neither wastewater nor solid waste disposal has received adequate attention thus far. In terms of public health, these services could produce significantly greater benefits than those available from water supply alone. Considerable work remains to be done to address waste disposal issues and secure the public health, environmental, and quality of life benefits.

Capacity has been established in NGOs and rural communities to implement, operate, and maintain project facilities. This capacity represents a cost-effective channel through which donors may address rural issues, including promotion of hygienic toilets and practices, and also diverse requirements such as skills development or income-generating opportunities. If the capacity is left unused it is likely to decay.

### 2. Technical Assistance Activities

Records and databases on water supply and sanitation and wider aspects of water resources were lost in the postreferendum violence. Though progress has been made without such information the continued development of services and improvement in decision making and planning requires that such databases be restored. Technical assistance could be used for better data collection and reestablishment of databases as well as to improve the quality of analyses. This would support efficient resource use, allocation, management, and decision making.

WSS has been created and developed in the postreferendum period. Considerable progress has been made in developing a core of professional and technical staff experienced in the rehabilitation and basic operations of water supply and sanitation systems. National Development Plan aspirations will require considerable further development in terms of quality and geographical scope of service provision. New management tasks will include billing of user charges and improved financial management. Assistance to support such development and expansion would be appropriate.

# Finance

## Sector Status

Prior to the referendum in 1999, Timor-Leste was served by 18 banking units. These included 5 branches of Indonesian state banks, 10 regional development banks and 3 Indonesian private commercial banks. Bank Rakyat Indonesia, the government-owned rural banking institution operated a number of village bank units, Unit Desa, which provided general savings and loan services at village level.

The major activity of the banks was as deposit takers rather than lenders: in March 1999 savings accounts totaled some \$68.4 million compared to outstanding loans of just \$18.2 million. This demand for a safe institution in which to keep savings is also reflected in the experience of the microfinance institution supported by TFET funds and described in the succeeding paragraphs under this section.

During the 1990s credit unions were actively developed, with the Credit Union Federation (CUF) being formed in 1994. By August 1999, 27 credit unions were operating.

In the aftermath of the referendum all of the Indonesian bank branches were withdrawn including vehicles, equipment, and records as well as the Indonesian staff. Bank and credit union offices also suffered in the violence with destruction of both physical assets and records. The financial sector was then reduced to four functional credit unions and no commercial bank branches.

UNTAET began the task of rebuilding the financial infrastructure needed for the resumption of normal business and trade:

- The Central Payment Office, which later became the Banking and Payments Authority (BPA), was established to regulate and supervise financial and monetary policies and institutions in the role of central bank.
- Regulations were passed concerning establishment of commercial banks, conservatively setting minimum capitalization requirements at \$2 million, considerably higher than the level of \$50,000 to \$150,000 applied in Indonesia and neighboring countries for microfinance institutions and rural banks.
- Proposed regulations were also developed to govern the activities of financial NGOs, cooperatives and credit unions, including their operations as nonbank financial institutions. The regulations focused on lending and restricted deposit taking by such institutions.

Although this began to reestablish a means for the supply of credit in rural areas, it neglected the provision of safe deposit taking facilities which, by value, had been by far the greater need before the referendum.

Two foreign banks opened branches in Dili to meet the banking needs of the capital, including UNTAET and other agencies and their staff. ANZ Bank of Australia

and Banco Nacional Ultramarino (BNU) of Portugal operate branches in Dili but they do not offer a full range of banking services and have no operations outside the capital. With the ongoing withdrawal of United Nations and other personnel, the Dili banking market is unlikely to prove attractive to international banks in the near term.

Of the 27 credit unions surviving in August 1999, some 21 were still included in the monitoring by the CUF. All had suffered loss of assets, financial resources, records and members and only 4 were considered to be operational postconflict while 17 were moribund. The credit unions, with an estimated 7,350 members, appeared to offer potential to complement the microfinance institutions by providing channels to access groups of small borrowers and depositors.

In practice, the old credit unions have generally proven beyond rehabilitation. The largest of the old credit unions, which had over 1,100 members on record, was delisted by the CUF in July 2002. Only 12 unions are now listed by the CUF of which only 5 are from among the prerferendum group and 7 are new. Of these 12, only 3 are considered to have the potential for self-sufficient operation in the short term. In addition to shortage of skills, the major obstacle is the simple lack of members for viable operation: 9 of the unions have less than 100 members and, of these, 6 have less than 50 members. Sustainable operation is considered to require a minimum of some 250 to 300 members able to generate a loanable fund of some \$35,000.

## Development Interventions

### 1. Projects

In the early post-violence period the **TFET-funded and World Bank-managed Small Enterprises Project (SEP)** was undertaken. The project aimed to support revival of the local economy and create jobs by providing commercial credit and business training to small and medium East Timorese businesses. The credit was administered by the Portuguese BNU, which did not fund its own credit activities.

The SEP commenced in April 2000 offering loans ranging from \$500 to \$50,000, averaging over \$11,000, over periods of 3–36 months with 3 months grace and 10% interest. Under the first grant agreement (SEP1) some 345 loans were made, of which 79 (23%) were in Dili and 266 (77%) were distributed through the other 12 districts of Timor-Leste.

SEP2, commenced in April 2002 with an increased emphasis on business development and capacity building in private sector enterprises. For the credit component, the minimum loan size has been increased to \$1,000 and interest rate increased to 14%. Again, a financial intermediary is used to implement the project credit line.

The **TFET-funded and ADB-managed Microfinance Development Project (MDP)** differs in major respects from SEP and is providing a complementary rather than competing activity:

- target borrowers are the poor in microfinance groups and small traders;
- loan sizes are much smaller, with only the largest loan products overlapping with SEP's low limit;
- loans are for a shorter period aimed at short term and working capital credit needs;
- services include credit and savings facilities, the latter being the larger financial need prior to the referendum and not addressed by SEP; and
- in place of quick-disbursing credit through an intermediary institution, the project aims at long-term institutional development through establishing a sustainable microfinance bank and credit unions.

The full range of microfinance lending and savings products with summary terms are given in Table 2.13.

The SEP did not create any financial institution and thus avoided the regulatory issues noted above in relation to the high level of capitalization required for banks and the lack of ability to accept deposits by nonbank financial institutions.

Deliberately seeking institutional development benefits, the MDP has provided support for the development of the regulatory framework for financial institutions in Timor-Leste. The supporting technical assistance programs undertaken by ADB are described in the following section.

The necessary legal basis for a microfinance institution was promulgated on the 1 December 2001 through Executive Orders No. 2001/7 and 2001/8, issued by the Office of the Special Representative of the Secretary General with endorsement of the Council of Ministers. The orders created the Foundation for Poverty Reduction in East Timor (FPRET) and the Microfinance Institution of East Timor (MFIET) or *Instituicao de Microfinancas de Timor Leste*.

The Foundation is the interim legal owner of MFIET and the Board of Trustees is composed of (i) one representative each appointed by ADB and, on behalf of the donors, AusAID and the Portuguese Mission; and (ii) two representatives appointed by the then Est Timor Public Administration (ETPA). The European Union (EU) has nonvoting observer status. The Foundation will remain as owner until divestiture is complete.

In February 2002, a total of \$2 million was received for paid-up capital and application made by MFIET to BPA for a bank license. The preliminary license to operate as a registered microfinance institution was issued by the BPA on 21 May and on 4 September 2002 the final license was issued after a review of MFIET's initial operations, systems, procedures, facilities, and physical establishment. The license allows MFIET to

- receive demand, time, and other types of deposits in US dollars;
- extend credit with a minimum of 65% of the portfolio for microcredit;
- provide payment and collection services;
- issue and administer current or checking account services; and
- provide safe keeping services for valuables.

Table 2.13: Microfinance Loan Services

**Microfinance Loan Services**  
(Note: Product designs and interest rates are subject to revisions from time to time.)

Name of Service	Target Group	Loan Purpose	Loan Limit (in US\$)	Term or Maturity	Repayment Scheme/Schedule	Security Requirement	Current Interest Rate	Other Fees
<b>LOANS:</b>								
MICROFINANCE GROUP LOAN – Weekly amortization	Rural and urban poor, women	Income-generating projects/Productive activities	80, for the 1 <sup>st</sup> round, then 100, 150, 200, 250	112 days/16 payments	Weekly. Same day of the week	Deed of assignment on deposit	0.35% every installment	5% service charge
MICROFINANCE GROUP LOAN – 2 weekly amortization	Rural and urban poor, women	Productive activities	150, 200, 250	112 days/8 payments	2-weekly. Same day every 2 weeks	Deed of assignment on deposit	0.70% every installment	5% service charge
MICROFINANCE – Wholesale (Refinance Facility)	NGOs, co-ops, credit unions	Additional liquidity for microcredit expansion	10,000	3 mos. – 1 year max. depending on Promissory Notes (PNs)	Lump-sum payment to coincide with maturities of notes discounted	Guarantee from mother organization Endorsement/Pledge on notes	5% above deposit interest rate	5% service charge
MARKET VENDOR Daily Collection Loans	Storeowners/stallholders	Additional inventory	200 – 500	91 days	Daily collection	Chattel mortgage on Stock-in-trade	0.35% per week	5% service charge
SEASONAL CROP LOANS (Short-term Agricultural loans)	Rice, vegetable, coffee farmers	Inputs, labor expenses	200 – 500	Depends on crop cycle. Max 270 days. Interest payment – 4 weekly	Lump sum payment of principal on the maturity date. interest collected every 4 weeks. (To coincide with schedule of visiting Staf Lapangan)	Real properties, chattel on standing crops, chattel on working animals	1.5% per month	5% service charge
MICROENTERPRISE LOANS	Microenterprises	Purchase of raw materials and inventory	2,000	120 – 180 days	Annuity, paid 4 weekly	Real property, chattel on inventories and equipment, if any	1.5% per month	5% service charge
OTHER AGRICULTURAL LOANS	Farmers/agri-business	Off-farm projects, ex. livestock raising	2,000	30 – 360 days	Annuity, paid 4 weekly	Real properties, chattel on working animals, farm equipment	1.5% per month	5% service charge
FISHERIES	Fisherfolks	Nets, gears, materials	500	30 – 120 days	Annuity, paid 4 weekly	Real properties, chattel on gears and equipment	1.5% per month	5% service charge
<b>PAYROLL LOANS :</b>								
SALARIED INDIVIDUALS	Permanent Employees in private and government sectors	Personal, emergency, household needs	1,000	90 – 360 days	Annuity, paid monthly	Pledge/endorsement of monthly payroll/ authority to deduct from payroll	1.5% per month	5% service charge
LOANS TO STAFF/EMPLOYEES (Subject to approval of FPES)	Regular bank staff/employees	Vehicle, education, personal	1,000	90 – 360 days	Annuity, paid monthly	Endorsement/authority to deduct from payroll	1.5% per month	5% service charge

Table 2.13: Microfinance Loan Services (cont'd.)

## Microfinance Loan Services

Saving Product	Target Customer/Client	Distinctive Feature	Minimum Opening	Minimum Balance	Withdrawal Restrictions	Age Restriction	Interest Calculation	Others
SERVICE ACCOUNT	All bank customers/ clients: mandatory	A provision set-up for excess payments, and other credits. Automatically created by system	0	0	None	None	None	Automatically opened by the system for all customers
CHECKING ACCOUNT	Business enterprises, entrepreneurs, traders, patrons, supporters and advocates	Goes with the checkbook in 25 pcs. per booklet	500.00	500.00. Service charge of \$2.00/m	None. But, no DAIF, DAUD	Age of maturity	None	A charge of \$ 3.00 per booklet
PLEDGED SAVINGS	All microfinance group borrowers	No passbook. Customer/ Acct IDs to be provided. Also collected during weekly/2 weekly Pusat loan collections	0	10.00 minimum to earn interest	Limited as long as loans are outstanding. Withdrawals require authorization from Group KK/Slat Lapangan	Age of maturity	Variable and market- dictated Interest rates. Computed daily based on balance at end of banking day. Interest capitalized/ posted monthly	Amount to be saved decided upon by the Kolompok Keuangan
PASSBOOK SAVINGS	General public; regular clients and patrons	Passbooks issued to depositors	10.00	50.00 minimum to earn interest	None restrictions unless subjected to legal, death, loan holds	Age of maturity. Account for children and minors. ITF by parents		

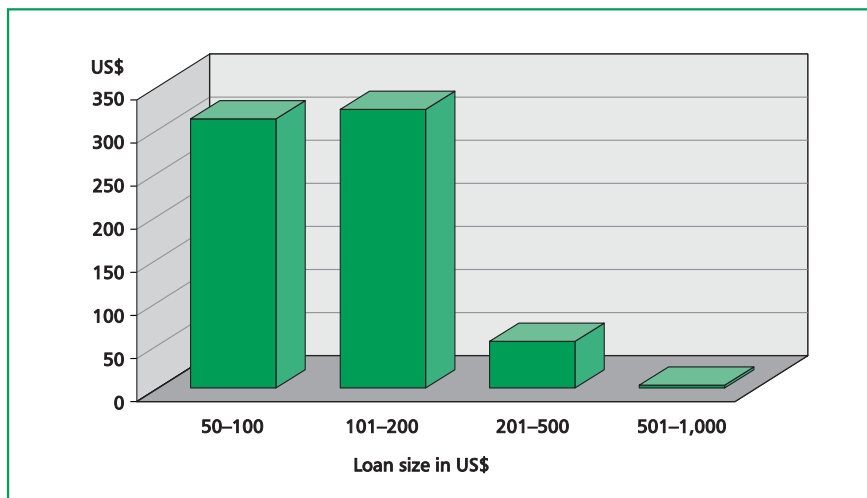
In order to provide the services, MFIET has been permitted to establish a settlement account with BPA and has become a member of the Timor-Leste interbank clearing system.

The MFIET Head Office and Main Branch in Dili were opened on 13 May 2002. The Prime Minister, Dr. Mari Alkatiri, was guest of honor and keynote speaker and handed over the first 20 microfinance loans to the clients. On Independence Day, 20 May 2002, the market vendor loan program was inaugurated with the President of ADB, Mr. Tadao Chino, delivering the first loans in the program.

On 17 September the first branch outside Dili was opened in Gleno in Ermera district. A second branch was opened on 22 November 2002 in Maliana. Two more branches were planned to be opened in the near future but this may now be reviewed due to the limiting of the grant to \$4 million rather than the previously committed \$7.72 million.

During the first 6 months of operation, MFIET made a total of 692 loans with a total value of \$79,276. In its first 6 weeks of operation, the new branch in Gleno was able to extend 212 loans to microfinance groups, reflecting the degree of unsatisfied demand in rural districts. Overall, the average size of loan during these initial operations is \$115 and the largest loan is less than the \$1,000 minimum under the World Bank managed SEP2 program (Figures 2.7 and 2.8). Other aspects of the initial activities are reviewed in the later section on impacts.

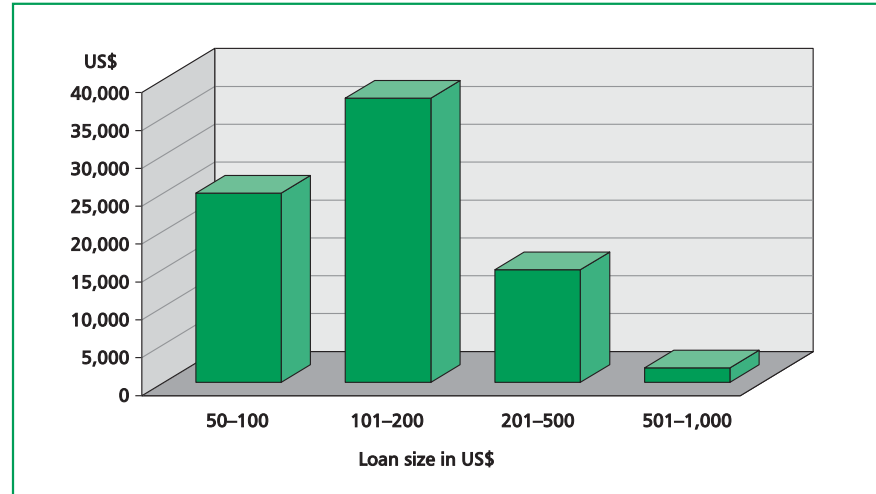
Figure 2.7: Number of Loans by Size: 31 October 2002



In parallel, the project sought to rehabilitate the 21 existing credit unions and refurbished the offices of 4 unions which had been wrecked in the postreferendum violence, providing a model for other credit unions to follow. Training support was also given to the unions. However, as noted earlier the individual unions have mostly proven to be too small for viable operation while some, with larger memberships,



Figure 2.8: Value of Loans by Size: 31 October 2002



have proved to be too institutionally damaged in terms of political disputes, lost staff, resources, records, and trust to reactivate their operations.

The emphasis of project activities has moved to the strengthening of the Credit Union Federation (CUF) so that they can better meet the needs of new credit unions to establish themselves and achieve a viable size. The CUF has received operating subsidies, technical and logistical support in the form of transport facilities, office and computer equipment, furniture, supplies and training. Training has included attendance by CUF leaders at the Asian Credit Union conference in Bangkok in September 2002. Additional technical assistance support has been provided under the project to assist development of the federation and proposal of systems and regulations, including a Credit Union Law.

## 2. Technical Assistance

The Microfinance Development Project has deliberately sought to establish a financial institution to serve the ongoing development requirements of Timor-Leste rather than address the immediate emergency requirements of the postreferendum period. With institutional development and capacity building as stated objectives from the outset, provision was made for technical assistance (TA) to support such development and facilitate implementation of the MDP. As such, ADB has effectively led institutional development in the financial sector.

The first of the supporting TA programs is TA No. 3556-ETM for Strengthening the Microfinance Policy and Legal Framework, approved in December 2000 together with the proposal of the MDP. The purpose of the TA was to review and make proposals for policies and regulations for bank and nonbank financial institutions, including credit unions and cooperatives. The proposals made addressed general requirements of policy

and regulation for financial institutions as well as the specific requirements of the project. Effectiveness of implementation as a partnership among international agencies, donors, UNTAET and then ETPA is indicated by the issue of Executive Orders in December 2001, noted above, and the evident support of the Prime Minister at the opening of MFIET head office in May 2002 and subsequently. With the issue of MFIET's preliminary license in May 2002 the TA is considered to have successfully achieved its objectives.

The second TA No. 3743 ETM, was approved in October 2001 to support installation and adoption of the UN/FAO-GTZ micro-banking software package MBWin as the core banking software for MFIET. The TA has provided software and hands on training to staff. The TA training activities are nearing completion, though the system has operated successfully since MFIET began and produces data in a timely manner, as supplied for this report.

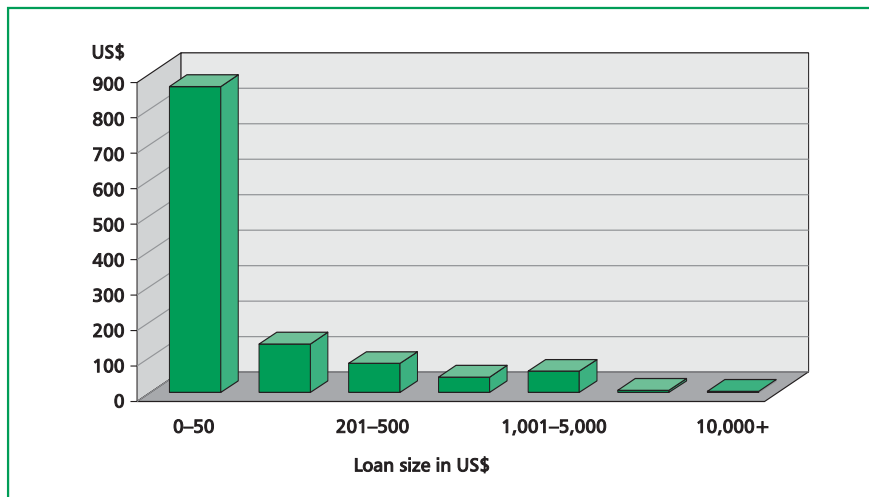
## Development Impacts – Current and Prospective

### 1. Poverty Impact

The Project seeks the overall goal of poverty reduction through increased rural employment and income opportunities by supporting microenterprises for the poor and giving access to responsive and appropriate financial services. Specifically, a sustainable financial institution is to be established for poor and low-income households.

In the prereferendum period, as noted above, the major banking activity was receiving deposits rather than extending credit. The initial 6 months activity by MFIET suggests that this need continues, providing a safe place where the poor are able to keep their limited savings. Some 1,194 deposit accounts were opened by the end of October, of which 863 were less than \$50, averaging about \$12 (Figure 2.9).

Figure 2.9: Number of Deposits by Size: 31 October 2002



In the first 6 weeks of operations at Gleno branch 198 deposit accounts were opened, of which 183 (92%) were less than \$50, an average of just \$8.

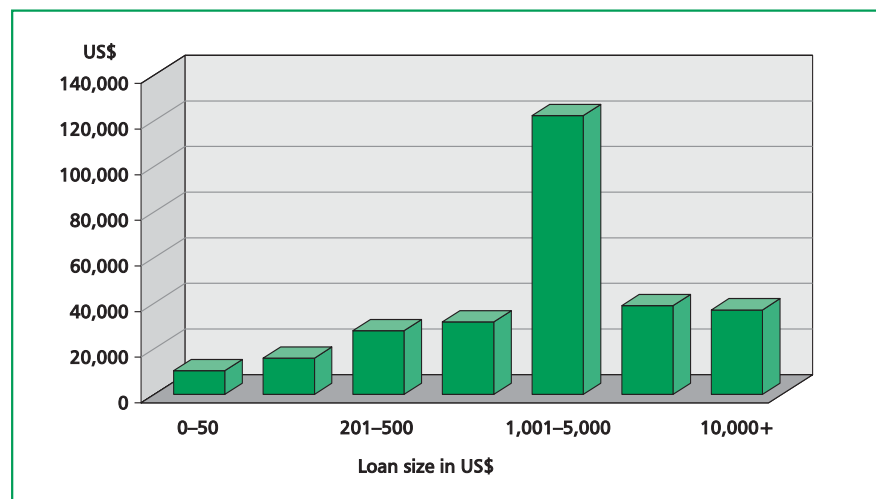
For the total 692 loans to the end of October, the average size is \$115. However, the 490 microfinance group loans are mostly small, averaging \$78, with 290 (some 60%) being less than \$50.

The project, thus, appears to be serving the needs of poorer households both as a secure place for savings and source of small, short-term loans. If this service can be provided efficiently and sustained properly then it is possible that the poor will benefit both from access to credit (such as for production) and from assistance in balancing seasonal variations in income and expenses.

## 2. Social and Economic Impacts

While most of the deposits by number are very small the greater part by value are larger deposits in the range of \$1,000 to \$5,000 with a small number but significant amount in excess of \$5,000. Only 9% of the number of deposits are over \$500 but by value over 80% of the deposits exceed \$500 and 70% exceed \$1,000 (Figure 2.10).

Figure 2.10: Value of Deposits by Size: 31 October 2002



This situation was not specifically provided for in preparation of the microfinance project and is not directly related to poverty. The high level of deposits may simply reflect the absence of a countrywide payment system, though MFIET's two branches cannot yet be considered a network and all of the deposits over \$500 are in Dili, not Gleno. It is possible that MFIET is overly competitive with the Dili commercial branch banks and both service charges and deposit interest may appropriately be adjusted. However, the deposit service appears to be meeting a need and, if soundly based, could be providing economic benefits through a more efficient payment and transactions system.

Over 70% of the loans to date are for microfinance groups, meeting the needs of predominantly poor households. By value there is a more even split between microfinance groups and market vendors and stallholders, reflecting the average vendor loan size of \$196 compared to the \$78 for groups (Figures 2.11 and 2.12). It is also noteworthy that while the Gleno branch has made 211 loans to microfinance groups in its first 6 weeks of operation it has made no loans to vendors.

Figure 2.11: Type of Loans by Number: 31 October 2002

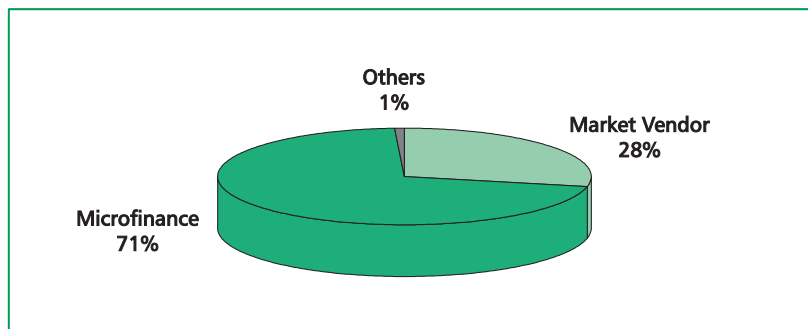
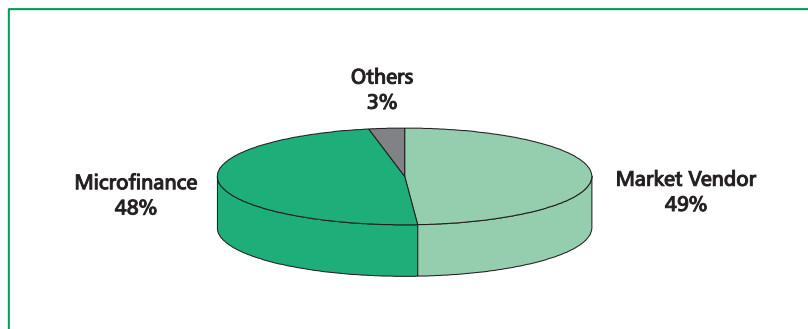


Figure 2.12: Type of Loans by Value: 31 October 2002



Neither market vendors, borrowing about \$200, nor the microfinance group members can be considered rich and vendors and stallholders needing to borrow such small amounts may themselves be poor. None qualify for support under the SEP credit line and very few are likely to be attractive customers for the foreign commercial bank branches in Dili. Thus, the credit activities appear to be meeting the needs of small borrowers who would not otherwise be served by financial institutions.

Preparatory studies for the project suggested a substantial difference in the credit levels sought by men and women. Women typically sought credit of \$10 to \$100 while men indicated a need for credit in excess of \$1,000.

For the larger market vendor loans, there is an even split between loans to men and to women. However, for the smaller microfinance group loans, data suggest a very strong gender bias towards women, with some 90% of the borrowers being women (Figure 2.13 and 2.14).

Figure 2.13: Gender Distribution of Group Loans

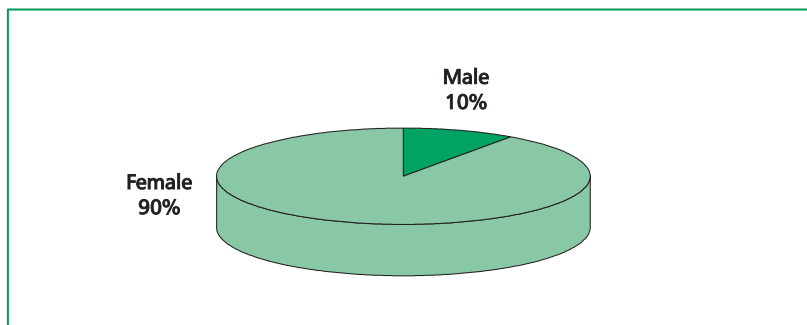
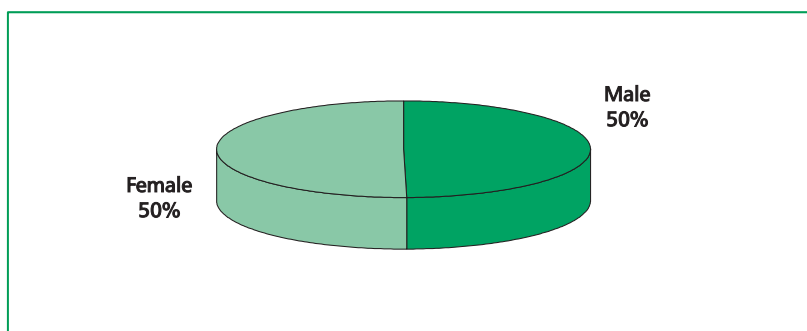


Figure 2.14: Gender Distribution of Vendor Loans



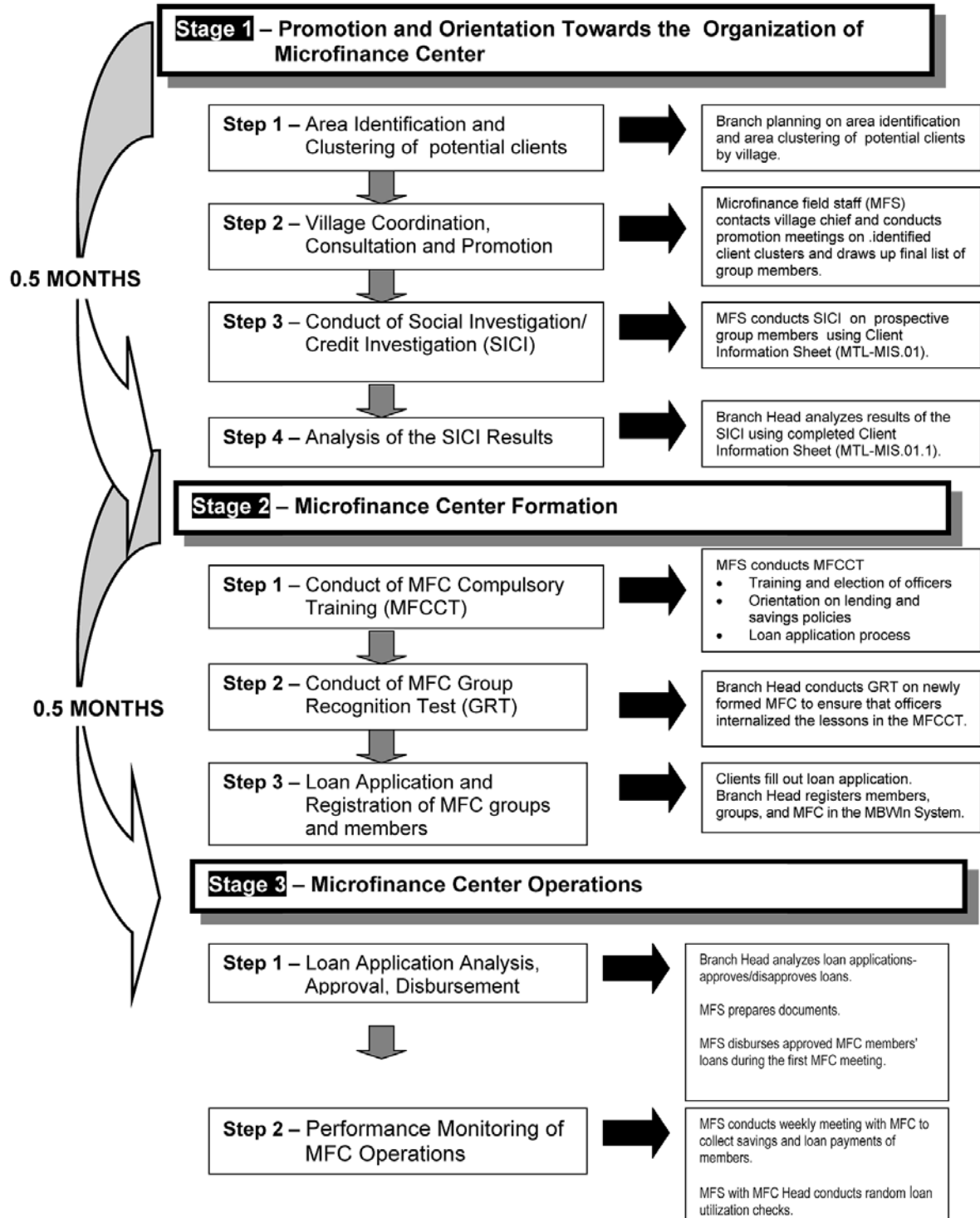
It may, therefore, transpire that ADB's Microfinance Development Project effectively targets the poor, with a particular emphasis on the needs of poor women, while the World Bank's Small Enterprise Project targets economic development by the "nonpoor" with a gender bias towards men.

### 3. Institutional and Capacity Development

As noted in discussions of the project and TA interventions, institutional and capacity developments have been specific objectives of the TFET-funded and ADB-managed Microfinance Project. This concerns both the microfinance institution and the credit union elements of the project, in which the former appears to have been successful thus far but the credit union component still has to show some degree of success.

In addition to development of the policy and regulatory framework and internal systems and procedures for microfinance institutions, the project has also targeted the capacity of beneficiaries to access and utilize credit. Before loans are made to a group, they undergo a month long socialization process to ensure that the group is soundly established and that the principles of credit and responsibilities of the borrower are well understood (Figure 2.15). Performance over the first 6 months of operation suggests that this is successfully achieving good rates of timely repayment compared to market vendor loans which do not have such a process.

Figure 2.15: Microfinance Center Promotion, Formation, Operation and Monitoring

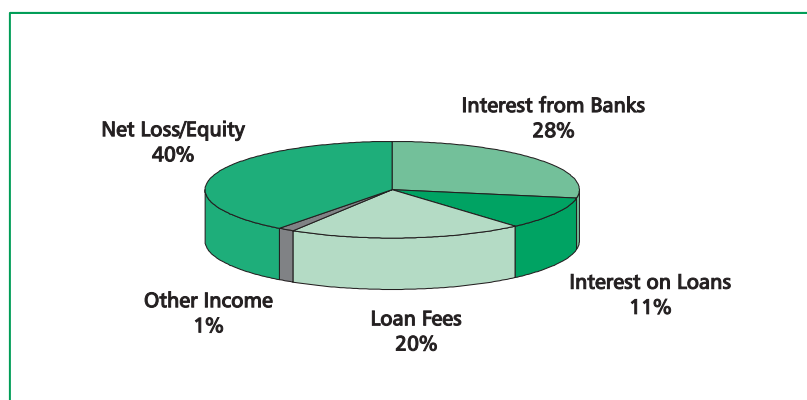


## Key Issues

### 1. Sustainability

The project seeks the long-term benefits from the ongoing operations of a microfinance bank receiving deposits from poor households and extending loans to them. This requires that the bank or institution be financially viable and sustainable.

Figure 2.16: Sources of Funds: 1 May to 31 October 2002



The first 6 months period of operation, with only the main branch throughout and a second branch only in the last 6 weeks, is too short a time for conclusions. Indications are possible, however.

In the first 6 months, income from lending operations have provided 31% of the funds needed to cover operating costs. Most of this (20%) has been earned from the front-end loan fees charged while interest on loans has provided only 11% (Figure 14). As MFJET develops, the loan portfolio will increase and it could reasonably be expected that income from interest on loans would increase and there is no reason why income from loan fees should decrease.

However, as the loan portfolio increases, the deposits with banks will fall and interest from banks will, thus, also fall. So far, interest on deposits has covered 28% of costs. Income from all sources has covered 60% of costs, leaving 40% of costs as a net loss to be charged against equity. All the equity available has been paid up and the existing balance is on deposit earning interest from banks. As these deposits are used to increase the loan portfolio the demands of sustainability will require the incremental interest on loans not simply to replace the interest foregone on the deposits (28% of costs) but also to cover the present level of losses to produce a breakeven or better.

Sustainability requires that the funds that generate interest on deposits equal to 28% of costs should, when lent to microfinance groups and so on, generate interest on loans equal to 68% of costs, i.e., interest rates on loans should be about 2.5 times the interest rate on deposits with banks.

If such a differential in rates is not practically affordable by borrowers then additional funds will be needed to achieve sustainability. Such funds could be provided by new shareholders in the absence of further funding under the Project. Alternatively, continued rapid growth of deposits could provide funds to achieve the required level of lending.

Of particular concern is the risk of defaults on loans, for which no significant provision is currently made. While microfinance groups are maintaining high levels of timely repayment, there are signs of delinquencies and missed installments payment by 6% of market vendor borrowers. It is possible this arises from a perception of the loans as grant-funded and project related special credits for which there is a culture of nonpayment.

Though it is not possible to draw conclusions at this stage, divestiture will require that such issues be addressed and resolved as needed.

## 2. Lessons Learned

While conflict situations show clearly visible damage to physical infrastructure, they may also devastate institutional infrastructure. After the conflict, the financial institutions were physically removed but so were the systems, records and most of the staff vital to their operation. The regulatory and legal framework for the system was also removed. The trust upon which a financial system depends also appears to have been greatly damaged through the loss of deposits along with the records.

Reestablishment of the financial infrastructure is not susceptible to emergency measures or quick disbursing projects. The necessary legal and regulatory framework has been developed in partnership between the TFET-funded project and related TAs and both the United Nations and Timor-Leste Government. Despite considerable progress, work remains to be completed, such as the credit union law.

Of the 18 bank branches existing before the conflict, only 2 were managed by East Timorese. This reflects the scale of damage to the human resource and management systems needed to operate the financial system. Though it may be possible, as emergency measures, to introduce foreign staff and expertise, rehabilitation of the financial systems requires a substantial investment in human resource development in parallel with legal and regulatory development.

Though these are time consuming rather than emergency postconflict developments, their importance to restoration of economic and social activity requires that they be commenced as soon as possible in a postconflict period.

## Continuing Needs

### 1. Project Activities

In the short term the project intervention will provide financial services in only 3 of the 13 districts, with possible extension to 2 more districts subject to availability of additional funds. There is a need for continuing project support to extend the network



to all 13 districts and to develop systems, possibly through credit unions or mobile branches, which provide access to savings and loan facilities at subdistrict and village levels.

Such extension may occur through organic growth of MFIET but resource constraints would necessarily make that a long-term process. During such slow development the beneficial impacts on poverty as well as social and economic development will be foregone. Continued project interventions would ensure attainment of those benefits.

## **2. Technical Assistance Activities**

There is a continuing need for technical assistance support for capacity building. The regulatory and legal framework is not yet complete. Practical operation under the laws and regulations is only just beginning. Support to monitor performance and, possibly, propose adjustments in the light of initial experience may be necessary.

Though MFIET appears to have successfully absorbed the training and systems support under project-related TAs, a rapid expansion to provide services nationwide may give rise to a continuing need for assistance. The experience thus far with credit unions suggests that a viable institutional model is not yet in place and continuing support, probably through development of capacity in the CUF, is needed.

# Part 3

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## ADB Technical Assistance Program



# ADB Technical Assistance Program

## Program Summary

### Summary of ADB Technical Assistance to Timor-Leste

No.	Name	US\$	Agency	Date Approved	Date Started	Completion Date	Status
<b>Completed Technical Assistance</b>							
3425	Poverty Assessment and Statistics	52,900	UNTAET	Apr-00	Apr-00	Dec-00	Closed
3435	Microfinance	150,000	UNTAET	May-00	Jun-00	Dec-01	Closed
3400	Community Empowerment Program	990,000	UNTAET	Feb-00	Feb-00	Dec-01	Closed
3401	Transport Sector Restoration	1,000,000	MTCPW	Feb-00	Mar-00	Nov-02	Closing
3428	Rehabilitation of Telecommunications Sector	300,000	MTCPW	Apr-00 Sep-00	May-00	Jul-02 Sep-02	Closing
3501	Environmental Assessment Capacity Improvement	250,000	MDE	Sep-00	Jan-01	Jul-02	Closing
3512	Strategies for Economic and Social Development	650,000	MPF	Oct-00	Jan-01	Dec-02	Closing
3515	Capacity Building for Local Government	150,000	MPF	Oct-00	Oct-00	Dec-01	Closing
3556	Strengthening the Microfinance Policy and Legal Framework	250,000	MDE	Dec-00	Feb-01	Jun-02	Closing
3592	Economic Policy Forum	150,000	MDE	Dec-00	Dec-00	Dec-02	Closing
11	Subtotal	3,942,900					
<b>Ongoing Technical Assistance</b>							
3412	Capacity Building and Governance for Sector Management	1,000,000	MPF	Mar-00	Apr-00	Dec-02	Ongoing
3654	Exclusive Economic Zone Demarcation	120,000	MPF	May-01	May-01	Feb-03	Ongoing
3743	Microfinance Information Technology System	150,000	MDE	Oct-01	Mar-02	May-03	Ongoing
3819	Postal Services Development	250,000	MTCPW	Dec-01	Mar-02	Dec-03	Ongoing

No.	Name	US\$	Agency	Date Approved	Date Started	Completion Date	Status
3803	Economic Policies and Strategies for Development Planning	950,000	MPF	Dec-01	Nov 02	Mar 03	Ongoing
3839	Capacity Building to Develop Public Sector Management and Governance	688,000	MPF	Mar-02	Oct-02	Sep-03	Ongoing
6	Subtotal	3,158,000					
<b>Other Technical Assistance</b>							
3731	Transport Sector Improvement	500,000	MTCPW	Oct-01	Delayed		Delayed
3748	Preparing the Power Sector Development Plan	400,000	MTCPW	Oct-01	Delayed		Delayed
2	Subtotal	900,000					
<b>New Technical Assistance</b>							
3986	Integrated Water Resources Management	600,000	MTCPW MAFF MDE	Nov 02	-	-	Implementation to start
1	Subtotal	600,000					
20	Total	8,600,900					

MAFF = Ministry of Agriculture, Fishing and Forestry, MDE = Ministry of Planning and Development, MPF = Ministry of Planning and Finance, MTCPN = Ministry of Transport, Communications and Public Works, UNTAET = United Nations Transitional Authority in East Timor.

A total of 20 technical assistance grants have been provided by ADB to Timor-Leste in the postconflict period. Some have been related to TFET-funded projects being implemented, and often address the projects' institutional and capacity building needs, while others have addressed wider planning and capacity building needs. Individual TAs are reviewed in the following section.

Eleven of the TAs have now been completed or are in the process of closing and 6 are ongoing with 3 expected to close by the middle of 2003 and the other 2 before the end of 2003. Two TAs approved in late 2001 have yet to commence due to further changes in scope requested by the new Government, and another TA has just recently been approved.

## Individual TA Summaries

### TAs Completed or Closing

TA 3425-ETM: Poverty Assessment and Statistics

\$	Agency	Date Approved	Date Started	Completion Date	Status
52,900	UNTAET	Apr-00	Apr-00	Dec-00	Closed

The first TA completed addressed the needs for data on social and economic conditions including agriculture, private sector activity, physical infrastructure, health and education. About 1,000 households and 50 business were surveyed in 6 districts. Poverty assessments and statistics produced by the TA have been widely used to support work in Timor-Leste.

TA 3435-ETM: Microfinance

\$	Agency	Date Approved	Date Started	Completion Date	Status
150,000	UNTAET	May-00	Jun-00	Dec-01	Closed

The TA built upon work by the private sector and international agencies which identified opportunities for microfinance through rehabilitation of credit unions and a microfinance bank. The TA assessed options and requirements for viable microfinance in Timor-Leste and, by August 2000, had produced the feasibility study leading to the TFET funded Microfinance Development Project.

TA 3400-ETM: Community Empowerment Program

\$	Agency	Date Approved	Date Started	Completion Date	Status
990,000	UNTAET	Feb-00	Feb-00	Dec-01	Closed

The first TA approved and one of the largest TA grants, totaling \$1.29 million including IBRD support, targeted capacity building to establish an efficient and effective system of local governance in the 13 districts, 64 subdistricts, and 440 villages of Timor-Leste. The TA supported socioeconomic assessment plans, village rehabilitation training of village representatives, and long-term capacity building of village development councils. The TA assisted elections in 50 subdistricts, appointment of facilitators in subdistricts and villages, helped implement the TFET-funded Community Empowerment Program, established communications systems for village council members, distributed emergency rehabilitation support to village development councils, and resulted in preparation of the World Bank-managed, TFET-funded Community Empowerment and Local Governance Project for \$21.5 million.

## TA 3401-ETM: Transport Sector Restoration

\$	Agency	Date Approved	Date Started	Completion Date	Status
1,000,000	MTCPW	Feb-00	Mar-00	Nov-02	Closing

In parallel with the transport activities of the EIRP, the TA promoted effective transport sector management for roads, ports and airports, including the institutional and regulatory framework and a review of long-term development requirements to achieve poverty reduction and economic growth. Outputs by mid-2002 include (i) proposed port and airport management contracts; (ii) proposed shipping services to Oecussi and Atauro and related institutional development; (iii) transport sector legislative framework; (iv) review of port and airport sector investment and restoration requirements; and (v) a multimodal plan as input to the National Transport Plan and the Transport Sector Masterplan presented to donors in May 2002.

## TA 3428-ETM &amp; TA3504-ETM: Rehabilitation of Telecommunications Sector

\$	Agency	Date Approved	Date Started	Completion Date	Status
300,000	MTCPW	Apr-00 & Sep-00	May-00	Jul-02 & Sep-02	Closing

The two TAs, for Phases I and II, addressed the need for a telecommunications strategy, examined the technical options for rehabilitation, formulated a strategy and plan for the sector, drafted a regulatory framework and modality for government involvement, and prepared and supported the tender process. Support was given in evaluation and negotiation of a BOT contract with Portugal Telecom International in July 2002.

## TA 3501-ETM: Environmental Assessment Capacity Improvement

\$	Agency	Date Approved	Date Started	Completion Date	Status
250,000	MDE	Sep-00	Jan-01	Jul-02	Closing

The TA developed a core Timorese expertise to review, evaluate, and monitor the enforcement and implementation of environmental management laws, regulations and standards. The TA addressed institutional development, reviewed and made recommendations on legislation and regulations, identified critical issues, and provided training through short courses and in-service training. An action plan was produced to strengthen environmental monitoring.

## TA 3512-ETM: Strategies for Economic and Social Development

\$	Agency	Date Approved	Date Started	Completion Date	Status
650,000	MPF	Oct-00	Jan-01	Dec-02	Closing

The TA supported formulation and adoption of a coherent set of policies and strategies for economic and social development. In-depth poverty analysis was undertaken using household survey and participatory methods and social and economic strategies formulated, and a simple, cost-effective economic and social management strategy was designed. The village level survey data has been widely disseminated and a report prepared on the participatory poverty assessment. A Poverty Assessment Composite Report is presently being prepared drawing on various surveys conducted by ADB, World Bank, JICA, AusAID, UNICEF, and EU.

#### TA 3515-ETM: Capacity Building for Local Government

\$	Agency	Date Approved	Date Started	Completion Date	Status
150,000	MPF	Oct-00	Oct-00	Dec-01	Closing

This TA builds on the work of TA 3400-ETM: Community Empowerment Program to provide capacity building for (i) district administrators and (ii) decision makers establishing the local government political structure. Outputs include workshops, study tours, and a think tank for decision makers to examine and discuss options for local government structures. The TA is seen as part of an ongoing process of capacity building.

#### TA 3556-ETM: Strengthening the Microfinance Policy and Legal Framework

\$	Agency	Date Approved	Date Started	Completion Date	Status
250,000	MDE	Dec-00	Feb-01	Jun-02	Closing

The TA supported the Microfinance Development Project by addressing policy issues and regulations relevant to microfinance institutions, particularly in matters influencing the ability to lend to the poor. The TA (i) drafted a credit union law; (ii) proposed guidelines and standards for credit monitoring and supervision; (iii) proposed credit union central fund policy and guidelines; (iv) proposed a foundation for issues of ownership and control of the microfinance institution; and (v) drafted statutes and by-laws of the foundation and the Microfinance Bank.

#### TA 3592-ETM: Economic Policy Forum

\$	Agency	Date Approved	Date Started	Completion Date	Funding	Status
150,000	MDE	Dec-00	Dec-00	Dec-02	ADB	Closing

The Forum, held in March 2001 in Dili, sought to build Timorese capacity and ownership in economic policy work and provide a strategic vision and policy direction for sound economic development. The TA supported preparation of papers

for the Forum, administered the Forum, and then prepared and circulated papers on the discussions in the Forum. Summaries of the papers were translated into local languages, Portuguese, and Bahasa Indonesia to promote dissemination of the proceedings.

### TAs Currently Ongoing

TA 3412-ETM: Capacity Building and Governance for Sector Management

\$	Agency	Date Approved	Date Started	Completion Date	Status
1,000,000	MPF	Mar-00	Apr-00	Dec-02	Ongoing

This long running TA is approaching completion and has supported critical skills development including for parliamentary business, judicial administration, and public sector management. Support has included workshops, short courses, and overseas training for over 1,400 government staff, specialist support in training, personnel, information technology, fiscal policy, and fisheries. The TA also supported the Timor Sea Office with a petroleum fiscal adviser to help the Government in the negotiations of Timor Sea.

TA 3654-ETM: Exclusive Economic Zone Demarcation

\$	Agency	Date Approved	Date Started	Completion Date	Status
120,000	MAFF	May-01	May-01	Feb-03	Ongoing

The TA, for which the completion date has been extended, supports establishment of databases, maps, and the data sets needed for the requirements of the United Nations Convention on the Law of the Sea (UNCLOS). Work is continuing but data sets are already available which can be used for agreements with neighboring countries on the internationally accepted Exclusive Economic Zone for Timor-Leste's future economic development.

TA 3743-ETM: Microfinance Information Technology System

\$	Agency	Date Approved	Date Started	Completion Date	Status
150,000	MDE	Oct-01	Mar-02	May-03	Ongoing

This TA continues the work of two earlier microfinance related TAs to establish efficient operational systems for the microfinance institutions and credit unions. FAO has installed and customized its microfinancing software and additional computer and networking hardware has been acquired. Training has been undertaken and the system is operational and will be installed in new branches.



## TA 3819-ETM: Postal Services Development

\$	Agency	Date Approved	Date Started	Completion Date	Status
250,000	MTCPW	Dec-01	Mar-02	Dec-03	Ongoing

The TA provides assistance in reestablishing an appropriate framework for developing an efficient, cost-effective postal system for Timor-Leste. A master plan, legal framework, and training program are to be prepared and implemented. The TA has completed the planning phase and implementation is ongoing. The TA is also supporting capacity building through on-the-job training in information technology for local Timorese.

## TA 3839-ETM: Capacity Building to Develop Public Sector Management and Governance

\$	Agency	Date Approved	Date Started	Completion Date	Status
688,000	SOTL	Mar-02	Oct-02	Sep-03	Ongoing

The TA follows earlier TAs for community empowerment and local government and public sector capacity building. This TA addresses the needs of the newly independent government for capacity building of district and subdistrict administrators, village chiefs, and trainers. The initial, ongoing phase is a needs analysis leading to an implementation plan to meet the needs identified.

## TA 3803-ETM: Economic Policies and Strategies for Development Planning

\$	Agency	Date Approved	Date Started	Completion Date	Status
950,000	MEAD	Dec-01	Delayed		Ongoing

Following earlier economic planning related TAs, this TA seeks to enhance skills of the Timor-Leste leadership and set up systems and procedures to monitor and evaluate strategic economic objectives and action plans. The TA is presently supporting the Government in developing a capital development plan.

**Approved TAs Being Processed to Implementation**

## TA 3731-ETM: Transport Sector Improvement

\$	Agency	Date Approved	Date Started	Completion Date	Status
500,000	MTCPW	Oct-01	Delayed		Delayed

The TA will support establishment of sustainable operations; management and administration of ports, airports and roads; and identify effective administrative

structures and processes. The TA may be reviewed in the light of additional work done by UNTAET and UNDP programs and issues raised by the Government.

TA 3748-ETM: Preparing the Power Sector Development Plan

\$	Agency	Date Approved	Date Started	Completion Date	Status
400,000	MEAD	Oct-01	Delayed		Delayed

The TA will prepare a long-term power sector development plan, including sector strategy to support sustainable economic growth and poverty reduction. The plan will address technical, cost and economic issues over a 20-year time horizon. Consultants have been selected and are expected to commence in the near future.

### Newly Approved TA

\$	Agency	Date Approved	Date Started	Completion Date	Status
600,000	MPF, MAFF & MDE	Nov 02	–	1 year after start	For implementation

The TA is to create a national water policy that will lead to the adoption and progressive implementation of integrated water resources management in Timor-Leste.

# ADB AT A GLANCE

## MEMBERS AND SHAREHOLDINGS

### Regional: 43

% Shareholding <sup>a</sup>		% Shareholding <sup>a</sup>	
Afghanistan	0.034	Malaysia	2.773
Australia	5.892	Maldives	0.004
Azerbaijan	0.453	Marshall Islands	0.003
Bangladesh	1.040	Micronesia, Fed. States of	0.004
Bhutan	0.006	Mongolia	0.015
Cambodia	0.050	Myanmar	0.555
China, People's Rep. of	6.562	Nauru	0.004
Cook Islands	0.003	Nepal	0.150
Fiji Islands	0.069	New Zealand	1.564
Hong Kong, China	0.555	Pakistan	2.218
India	6.447	Papua New Guinea	0.096
Indonesia	5.546	Philippines	2.426
Japan	15.893	Samoa	0.003
Kazakhstan	0.821	Singapore	0.347
Kiribati	0.004	Solomon Islands	0.007
Korea, Republic of	5.130	Sri Lanka	0.591
Kyrgyz Republic	0.305	Taipei, China	1.109
Lao People's Democratic Republic	0.014	Tajikistan	0.292
		Thailand	1.386

### Regional: 43 (cont'd.)

% Shareholding <sup>a</sup>		% Shareholding <sup>a</sup>	
Tonga	0.004	Uzbekistan	0.686
Turkmenistan	0.258	Vanuatu	0.007
Tuvalu	0.001	Viet Nam	0.348
		<b>Total regional</b>	<b>63.674</b>

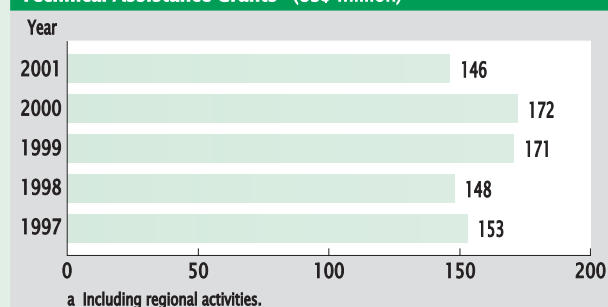
### Nonregional: 16

% Shareholding <sup>a</sup>		% Shareholding <sup>a</sup>	
Austria	0.347	Norway	0.347
Belgium	0.347	Spain	0.347
Canada	5.327	Sweden	0.347
Denmark	0.347	Switzerland	0.594
Finland	0.347	Turkey	0.347
France	2.370	United Kingdom	2.080
Germany	4.405	United States	15.893
Italy	1.840	<b>Total nonregional</b>	<b>36.326</b>
The Netherlands	1.045		
		<b>Grand total</b>	<b>100.000</b>

a Figures may not add because of rounding.

## TECHNICAL ASSISTANCE

### Technical Assistance Grants<sup>a</sup> (US\$ million)



### TECHNICAL ASSISTANCE GRANTS BY SECTOR, 2001

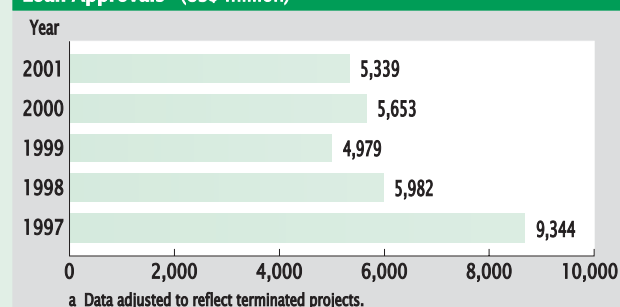
	US\$ Million	%
Agriculture and Natural Resources	22.2	15.2
Social Infrastructure	19.3	13.2
Finance	13.2	9.0
Transport and Communications	10.5	7.2
Energy	9.4	6.4
Industry and Nonfuel Minerals	1.5	1.0
Multisector	7.2	4.9
Others	33.3	22.7
Total grants to developing member countries	116.57	9.6
Regional activities	29.9	20.4
<b>Grand total</b>	<b>146.4</b>	<b>100.0</b>

### RECIPIENTS OF TECHNICAL ASSISTANCE GRANTS, 2001

	US\$ Million	%
Indonesia	15.9	13.7
People's Republic of China	12.4	10.7
Viet Nam	8.4	7.2
India	8.0	6.9
Philippines	7.6	6.5
Cambodia	6.8	5.8
Pakistan	6.6	5.7
Lao People's Democratic Republic	5.2	4.5
Bangladesh	4.9	4.2
Papua New Guinea	4.3	3.7
Other Developing Member Countries	36.4	31.2
<b>Total</b>	<b>116.5</b>	<b>100.0</b>

## LENDING

### Loan Approvals<sup>a</sup> (US\$ million)



### LOANS BY SECTOR, 2001

	US\$ Million	%
Transport and Communications	1,425.5	26.7
Energy	662.9	12.4
Agriculture and Natural Resources	603.5	11.3
Finance	565.0	10.6
Social Infrastructure	492.1	9.2
Industry and Nonfuel Minerals	86.0	1.6
Multisector	757.0	14.2
Others	747.0	14.0
<b>Total</b>	<b>5,339.0</b>	<b>100.0</b>

### BORROWERS BY COUNTRY, 2001

	US\$ Million	%
India	1,500.0	28.1
People's Republic of China	997.0	18.7
Pakistan	956.8	17.9
Indonesia	500.0	9.4
Bangladesh	297.9	5.6
Viet Nam	260.6	4.9
Sri Lanka	146.0	2.7
Philippines	105.0	2.0
Nepal	95.6	1.8
Papua New Guinea	75.9	1.4
Other developing member countries	384.2	7.2
<b>Total</b>	<b>5,319.0</b>	<b>99.6</b>
Regional activities	20.0	0.4
<b>Grand total</b>	<b>5,339.0</b>	<b>100.0</b>



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