

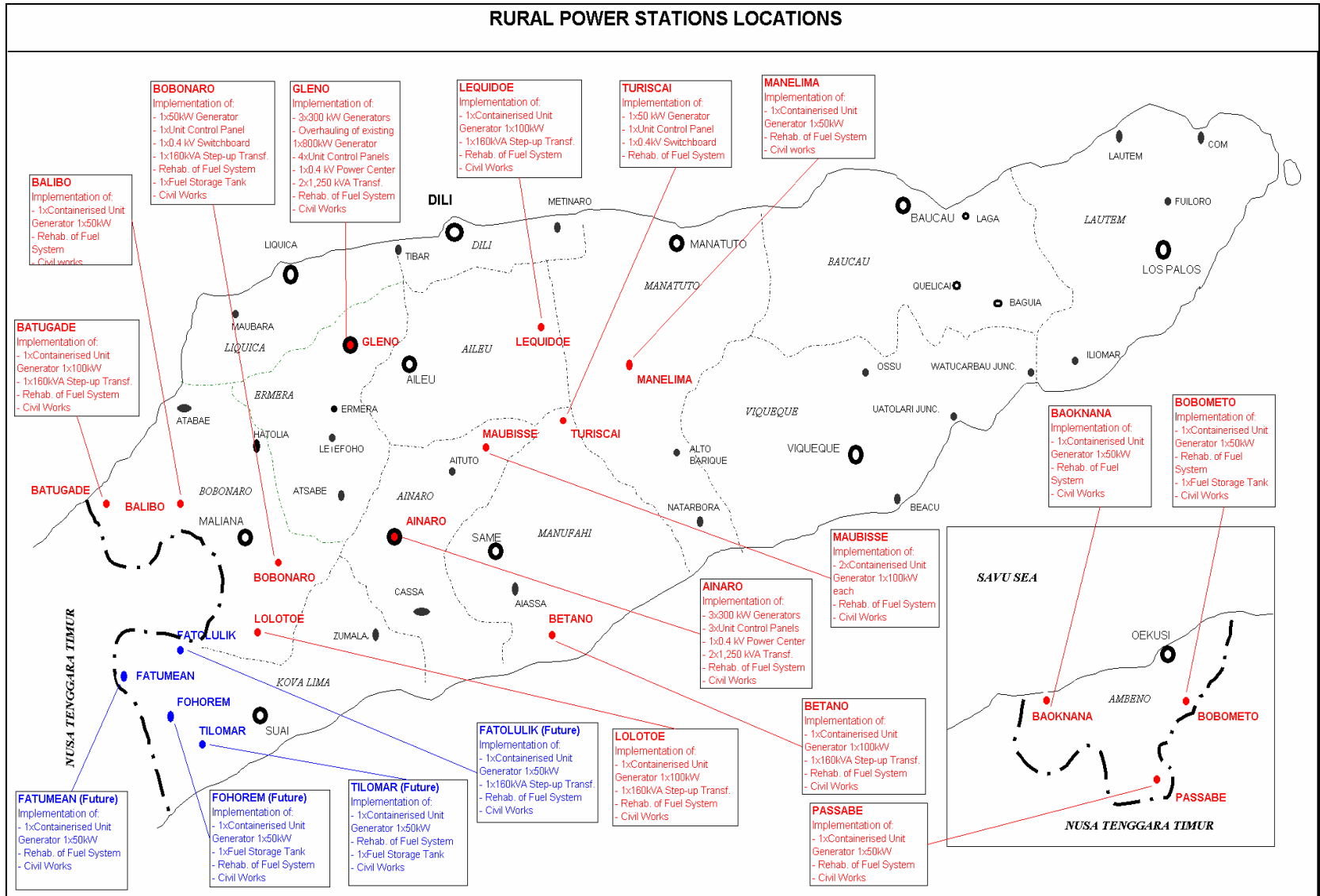
TFET- Funded

Grant No. 8181-TIM (TF)

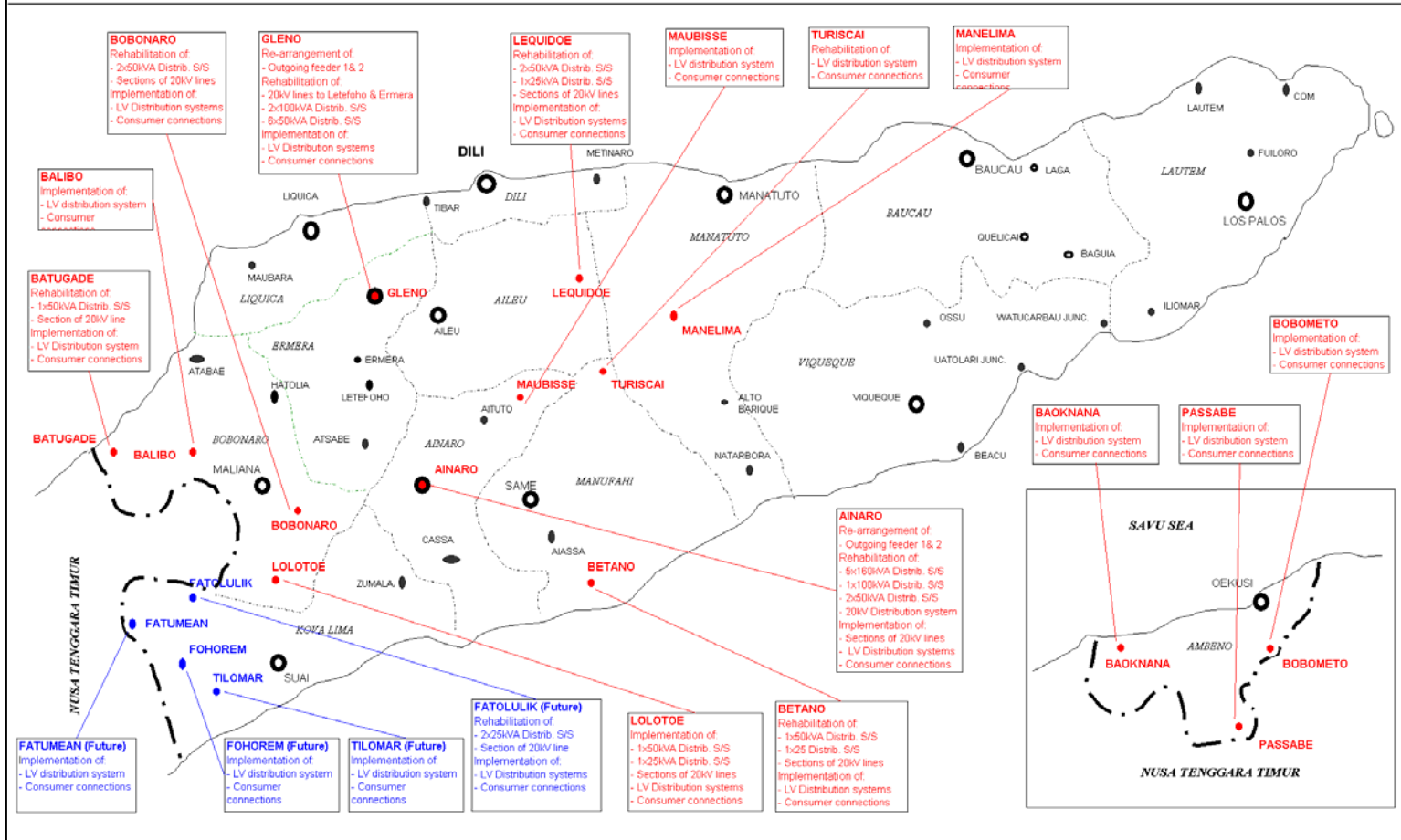
Emergency Infrastructure
Rehabilitation Project

Phase 1

RURAL POWER STATIONS LOCATIONS



RURAL POWER STATIONS LOCATIONS AND ASSOCIATED DISTRIBUTION SYSTEMS TO BE REHABILITATED



THE EMERGENCY INFRASTRUCTURE REHABILITATION PROJECT EIRP-1 (PHASE 1) – GRANT 8181-TIM (TF)

A. Summary

Timor-Leste's transport and power infrastructure was severely damaged during the postreferendum conflict and hindered humanitarian relief and security operations. The Asian Development Bank (ADB) prepared and administered a grant funded by the Trust Fund for East Timor (TFET) for Phase I of the Emergency Infrastructure Rehabilitation Project ("the Project") to restore road conditions, port operations, and power infrastructure to facilitate peace and security, and to provide access to humanitarian assistance. The project cost was estimated at \$29.8 million and financed by a grant from TFET. The estimated project completion date is 30 June 2003. All procurement activities followed *ADB's Guidelines for Procurement* consultants were selected in accordance with *ADB's Guidelines on the Use of Consultants*.

The Project aims to (i) undertake emergency road repair works to facilitate efficient transport of humanitarian aid and help revive economic activity; (ii) expand the port facilities to reduce congestion; and (iii) reinstate power supply. The Project also supports financial management of the power sector and implementation of transport sector institutions. The Project is classified as environmental category B. The Project is being executed by Ministry of Transportation, Communication and Public Works (MTC&PW).

The benefits expected from the Project are (i) restoration of transport and power sector assets and supply; (ii) improvement the quality of life; (iii) more reliable flow of goods, fuel, health care services, food and access to reviving markets, and (iv) generation of significant employment, especially among returning refugees who have lost their property and livelihoods.

The United Nations Transitional Authority in East Timor (UNTAET) was the recipient of the grant, with the Project Management Unit (PMU) as the Executing Agency. The PMU, headed by a project manager from Timor-Leste, was established in May 2000 under UNTAET's head of infrastructure, and since August 2001 under the MTC&PW. A chief technical advisor, a chief financial advisor, and international and local engineers comprise the PMU.

B. Background

1. Rationale of the Project

The Project aims to support humanitarian assistance in Timor-Leste by rehabilitating transport and power infrastructure to facilitate peace and security, and to provide the people of Timor-Leste with access to humanitarian relief aid.

2. Intended Outputs

In addition to the objectives listed above, the Project supports long-term sector development by strengthening the local contracting industry, instituting operational and maintenance systems, and providing capacity building for sector management. The Project consists of the following components:

- (i) road rehabilitation, including road repair, equipment for road repair works, labor-based road and causeway restoration, and rehabilitation and reinstatement of bridges and depot facilities port;
- (ii) rehabilitation, including wharf extension at Dili Port, restoration of the landing craft slipway at Dili Port, restoration of the container yard at Dili Port, and port repairs;
- (iii) power sector rehabilitation, including rehabilitation of 15 power stations, and support to develop a power utility and its financial management system; and
- (iv) project management services and training.

Following are the intended outputs of the Project:

Road Restoration

- (i) *Bridge Restoration Works*. Keep roads open to security and humanitarian traffic during critical postconflict operations;
- (ii) *Contractor Classification and Prequalification*. Enable Road Service Division to prequalify domestic and international contractors according to their technical and financial capabilities;
- (iii) *Five Emergency Contracts*. Closure of any specific road subnetworks to be cleared within 48 hours during the rainy season in the third quarter of 2000;
- (iv) *Pilot District Road Priority Work*. Emergency repairs on the feeder road network in 3 districts on a pilot basis;
- (v) *Road Maintenance and Rehabilitation*. Execution of substantive repairs to the structures on the primary road network once the 2000–2001 rainy season ended;
- (vi) *Supervision*. To ensure the quality through controlled measurement of the works under road maintenance and rehabilitation contracts (RMRCs). Guide local contractor in the execution of the works and provide training to local supervisors;
- (vii) *Refurbishment of Regional Depots*. Establishment of four regional depots to manage and implement road maintenance;
- (viii) *Community Road Maintenance*. Implementation of a community-based routine maintenance program to improve access to markets in poor communities and generation of employment and income opportunities;
- (ix) *Road Asset Management System*. Implementation of basic road inventory and asset management program in the Road Services Division of the MTC&PO to provide a basis for preparing an optimum routine maintenance program;
- (x) *River Training Assessment*. Engagement of consultants to assist PMU with the design of economic and efficient solutions to problems of bridge abutment damage;
- (xi) *Geo-Technical Assessment*. Engagement of consultants to enable PMU to undertake RMRC projects to maximize benefits while avoiding potential costly geological instabilities.

Port Restoration

- (i) *Eastern Container Yard*. Seal the container yard area to improve container management, to provide additional maneuvering space, thereby alleviating congestion in the Port;
- (ii) *Completion of the Third Berth and Repair of the Slipway*. Reduce congestion and transport costs that hamper the initial delivery of relief and security goods to Timor-Leste.

Power Restoration

Rural Power Station Rehabilitation. Rehabilitation of 14 rural power stations and associated MV/LV distribution systems and consumer connections. Extension of distribution system to connect new consumers that expressed willingness to pay. Technical training for local mechanics and electrical operators to cover operating and routine maintenance procedures. Implementation and development in the subdistricts of village-based committees to manage day-to-day power station operation.

Power Sector Restructuring

Power Sector Restructuring. Improvements in the management of the power sector and gradual financial strengthening of the sector are expected to result in (i) improved services, (ii) greater consumer satisfaction, (iii) gradual increase in capacity to extend power supply, (iv) lower operating costs, (v) reduction and gradual elimination of the fiscal subsidy to the sector, and (vi) achievement of financial self-sustenance by the sector.

C. Implementation Performance

1. Achievement of Output

Roads Rehabilitation

- (i) *Roads Rehabilitation.* The Project has tendered 65 road repair civil works contracts. The contracts have addressed specific road closures by repairing slips, culvert failures, and drainage. The contracts addressed backlog maintenance to the extent possible, in addition to ensuring access on the main road network. These contracts have generated 192,263 labor days, and restored 1,025 km of road drainage involving 259 villages. The 248 contractors were prequalified under a capacity classification system that provided the foundation for a contractor registry. Of the total 104 prequalified contractors, 95 are from Timor-Leste. Community involvement in routine maintenance has been implemented over about 1,445 km of the core network.
- (ii) *Bridges Restoration.* The Project conducted an assessment and a medium-term bridge condition survey covering all major bridge structures and the culverts. This resulted in a phased emergency bridge works program and a medium-term bridge rehabilitation program incorporated into the transport sector master plan. Under its first phase, the emergency program includes works identified on nine critical bridges, river training, and provision of a stock of temporary bridge materials for use in the event of weather-related bridge failures. The Project implemented these requirements under its road repair component.
- (iii) *Roads Maintenance.* The Project has established four regional depots: Baucau, Dili with Oecusse as its subdepot, Maliana, and Same, each with a regional engineer from Timor-Leste and an international engineer-trainer. The depots have been equipped with basic equipment necessary for routine maintenance and small-scale road repair. The depots will establish a core routine road maintenance organization. The Project is providing training for the emerging contractors on the use of appropriate technologies for emergency and periodic maintenance of rural roads, bid preparation, estimation, cost control, contract procedures, and management.

- (ii) *Roads Administration.* The Project is establishing basic accounting and recording systems to support field management, budgeting, and contracting, as well as for record keeping and enhancement of sector governance and accountability.
- (iii) *Donor Coordination.* Road restoration activities are coordinated on a geographic basis by the Project and the Government of Japan funded Dili-Ainaro road rehabilitation. The road rehabilitation activities include (i) road works under the Project, (ii) the United Nations Development Programme (UNDP)-Japan project for the Dili-Aileu-Ainaro-Cassa road, (iii) UNTAET-funded road repair and bridge restoration projects, and (iv) the UN Peacekeeping Forces road works.

Port Rehabilitation

- (i) *The Project has completed* (i) the third berth and slipway repair, (ii) concrete decking of the third berth, and (iii) rehabilitation of the hardstand area at the eastern container yard of Dili Port. The Project has also installed a sealed surface in the area to reduce the environmental implications of heavy machinery operating on a compacted surface.
- (ii) *Donor Coordination.* The port rehabilitation activities included (i) the Project's rehabilitation works, (ii) UNTAET's small works for restoration of lighting and communications at Dili Port, and (iii) UNDP-Japan funded contracts for the restoration of the wharf fenders and navigation aids at Dili Port.

Power Rehabilitation

- (i) *Rehabilitation of Rural Power Stations.* The Project has assessed 21 power stations. The PMU has carried out detailed assessment of the communities' needs and concluded that communities consider power to be essential for ensuring a safe and healthy standard of living, facilitating economic activities, and providing security; and that they are willing to pay for electricity supply. Funding was available for rehabilitation of 14 prioritized rural power stations (12 subdistricts and 2 districts), associated distribution systems, and consumer connections. The cost is estimated at \$3.34 million. The Project will restore power supply to approximately 4,400 consumers, 30% of which are new consumers. The sector requires significant additional resources to rehabilitate remaining distribution networks, subdistrict and district stations, the latter having been commissioned after the postreferendum conflict with only quick-impact bilateral assistance.
- (ii) *Utility Development and Financial Management System.* The Project has commenced to establish a power utility, efficient utility management, and its financial management regime. Rigorous tariff collection is being implemented with the support of the Project. It has additionally procured and installed 1,000 single-phase and 300 three-phase meters, and is undertaking to prepare a human resource development program for the power sector.
- (iii) *Technical Assistance.* The Project has supported the power service with tariff evaluation, accelerated tariff collection, budget preparation, provision of status reports, and assessment of sector issues. Through technical assistance and policy dialogue, ADB assisted the Government with preparation of strategy options and long-term development directions in the sector. ADB is funding TA 3748-ETM to prepare the power

sector development plan. The TA will examine the potential for alternative renewable energy sources in Timor-Leste.

- (iv) *Donor Coordination.* Donor-supported rehabilitation programs are coordinated on a geographic basis in the context of ADB-supported aid coordination meetings. The power rehabilitation activities included (i) the rehabilitation works under the Project, (ii) rehabilitation of 13 subdistrict power stations and overhaul of the Comoro power station with funding from the Government of Japan, and (iii) Government of Portugal-funded rehabilitation of 4 power stations and support to increase the billing capacity of the power service.

2. Cost

Based on the available funding for emergency infrastructure restoration, in December 2001, the Project was allocated \$29.8 million of which 70% of the funding was directed to restoration of roads with 9% for power restoration, 7% for port restoration, and 10% for project management and advisory services. Power sector activities are ongoing; however, it is relevant to note that net savings in the PMU, Roads, and Ports categories as well Physical and Price Contingencies were transferred to the Power components, the scope of which underwent significant changes during Project implementation.

3. Procurement AND CONSTRUCTION

Road Rehabilitation

The planned first phase of the road restoration commenced in June 2000 with award of five contracts tendered using international shopping (IS) procedures. Local interest in participating in this program was greater than had been envisaged and two of five contracts were awarded to entirely local bidders, two to an international contractor, and one to a joint venture between an international and a local company. It was the intention at appraisal that these contracts would be labor-intensive, thereby generating cash incomes in the rural areas. Some difficulty was experienced in reconciling the need to perform the works in a timely and technical satisfactory manner and the need to generate employment to facilitate economic recovery.

It was intended at inception that international contractors be used to undertake all maintenance in a region while at the same time mentoring local contractors in all aspects of implementation. This methodology assumed that the capacity of the local contracting industry would be minimal and that considerable support would be required. The tender process for the five Emergency Infrastructure Rehabilitation contracts (EIRCs) demonstrated that considerable local interest existed though capacity was in doubt. The PMU has reviewed the efficiency of international competitive bidding (ICB) maintenance contracts for which only \$2 million each would be available. It was also concluded that a significant portion of the funds available for each ICB would be consumed in contractors' overheads. It was therefore decided that the budget identified for contract supervisors should be reallocated to Regional Engineer Trainers whose role would be to support local regional engineers and maintenance staff in developing institutional maintenance capacity. The regional offices would be used to assist in the supervision of work to be implemented under small contract packages. The physical works would be undertaken by a combination of local and international contractors prequalified to undertake works of a value commensurate with their respective capacities.

Contractors were invited to prequalify in three categories: (i) up to \$50,000, (ii) up to \$200,000, and (iii) up to \$1 million. A list of prequalified bidders was established, which was later adopted by MTC&PW for its own work program. Bids were invited for defined work scopes using “Bill of Quantity” type contracts. A total of 65 such contracts (known as the “RMRC” contracts) were let and constructed between January 2001 and June 2002. It was found that the local contractors were indeed limited in their capacity to execute the contract in a timely manner and initially, did not understand the contract arrangements. This also caused difficulty with the supervision arrangements. The regional offices did not have the capacity to supervise the works therefore local and international consultants were engaged to assist. The use of local consultants (working with internationals) contributed significantly to training and capacity building among local consultants.

Depot equipment was procured directly by the PMU using IS procedures.

Implementation of the community-based maintenance program required considerable inputs from the newly established regional engineers and their supervisors. Detailed community consultations were required involving over 400 community groups in order to ensure that the obligations assumed were fully understood.

Port Rehabilitation

Two civil works contracts for the graveling of the eastern container yard, repairs to the east slipway, and completion of the wharf extension, were let in June 2000. The eastern container yard works were accomplished without problems, but the wharf extension work suffered delays due to concrete quality problems. The design of the graveling of the eastern hardstand was inadequate to the extent that it failed to address the environmental and safety concerns. A subsequent contract to pave the area was let following IS procedures in February 2002 and completed in June 2002. This contract included lighting, fire fighting equipment, power outlets for refrigerated containers, and fencing.

Power Rehabilitation

Consistent and coordinated with the bilateral interventions, ADB mobilized consultants in October 2000 to prepare detailed designs for 15 rural district and subdistrict power stations that had been either totally destroyed or severely damaged. Security concerns in border areas delayed the program and 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 UNTAET limited the Project to restoration of 12 subdistricts and 1 district power station. A contract for the Project was awarded in February 2002. Physical completion of the rural power restoration is expected by June 2003. The original project design and the bilaterally-funded rural electricity projects focused on generating capacity while transmission and distribution were excluded from the restoration efforts. The 20 kV distribution system was significantly damaged and in particular the LV network and consumer connections that require the implementation of completely new systems.

In April 2002, savings in other components of the Project were reallocated to extend the scope of the rural electrification program to include (i) rehabilitation of the medium voltage and implementation of new low voltage distribution networks and consumer connections, associated with the selected power stations, (ii) rehabilitation of Gleno district power station,

(iii) increase in generating capacity from 50 kW to 100 kW in Betano, (iv) addition of one 100 kW unit in Maubisse, (v) training, (vi) supply of workshop tools, (vi) supply of distribution transformers, and LV distribution panels and equipment to be used for extension of distribution network. The 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.

In light of the 20 May 2002 Independence Day celebrations, the Government by mid-March 2002, requested the Project to provide assistance for urgent rehabilitation of the Gleno power station as well as restoration of power supply to Ermera and Letefoho. The activities to be undertaken were (i) execution of extraordinary maintenance to an existing 800 kW generator, (ii) supply of 1x1,250 kVA step-up power transformer, (iii) rehabilitation of 20 kV lines to Ermera and Letefoho, (iv) rehabilitation of 8 distribution substations, and (v) implementation of new LV distribution system and consumer connections. The PMU procured goods, materials, equipment, implementation works and provided overall supervision. Works were completed as scheduled and on 19 May 2002, the Gleno power station was inaugurated by ADB's President, Mr. Tadao Chino.

The Project also provided funds to the United States Support Group East Timor (USSGET) to purchase equipment and spare parts required for emergency repair in the Baucau and Oecussi district power stations.

4. Operation and Management Performance

The Project began its operation in April 2000 with the support of both international and local staff. In addition to its project administrative functions, the Project supports establishment of the road operation within the MTC&PW. The Roads Contracting Section of the PMU has been coordinating with the contracting section of the Roads Services Division in MTC&PW. On-the-job training by PMU experts for MTC&PW staff has also facilitated successful implementation of Consolidated Funds for East Timor (CFET)-funded contract works. The Project, on a quarterly basis, review the sector funding requirements, and identifies available funding and the emerging financing gaps. The 2002/2003 budget planning cycle has benefited from the first reports of the road asset management system. In the power sector, the PMU is managing the restoration activities for 14 rural power stations and associated distribution systems in close cooperation with Eletricidade de Timor-Leste (EDTL). Half of the power stations to be restored are operating and the PMU is successfully implementing the village based community management, a key factor for the sustainability of the rural power stations.

D. Project Impacts

1. Socioeconomic Impacts

The Project, through provision of employment opportunities at a critical time, has assisted recovery in rural areas. Sustainable employment will be provided through continued use of communities for routine maintenance tasks. Overall restoration of reliable road access has allowed other reconstruction activities to proceed and assisted with normalization of social conditions. Restoration of power supply in rural areas, rehabilitation and implementation of distribution networks, and consumer connections and extension to new consumers, is significantly contributing to poverty reduction, improvement of the quality of life, and resumption of social services that use electricity such as education and health facilities. The Project, by

extending supply to new consumers, is also providing long-term socioeconomic benefits. The beneficiary consultations continue to confirm widespread support for the Project.

2. Environmental Impacts

The Project has had no negative environmental impacts. In roads, repairs to drainage have decreased the possibility of erosion and much work has been done to prevent landslides adjacent to the roads. No land acquisition was required and consequently, no persons were displaced by the project activities. In the port, pavement construction has eliminated the dust problem in central Dili.

3. Impacts on Capacity Building

When the EIRP commenced there were no effective management skills existing in Timor-Leste. The Project is providing capacity building services as follows:

Roads Sector

The Project undertook activities to re-establish capacity in the Government to plan, implement, and maintain road maintenance, through the implementation of (i) Road Asset Management System, (ii) Contractor Classification and Prequalification, (iii) Contractor Training, (iv) Training of Local Consultants, and (v) Technical Assistance.

Power Sector

Efforts to build a sustainable power infrastructure and institutional framework have been challenging. The major challenges facing the sector are (i) to manage the transition from a subsidized public service to a truly user-supported power system; (ii) to improve the financial sustainability; and (iii) to establish sector management competency and institutions. In January 2002, ADB assisted the Government with the preparation of a short-term action plan. At the Government's request to implement the plan including preparing the management contract documentation, the EIRP funded and ADB administered technical assistance for accomplishing such tasks. Management contract documentations required a careful review, updating, and adjustment to meet the requirements and concerns of the Government to attract qualified bidders. The process has been supported by additional technical assistance from ADB. The management contract document was finalized, approved by the Government and tendered, and proposals from bidders have been received and technical and financial evaluation is in progress.

The rural power stations rehabilitation component is providing training and capacity building to 24 local operators (2 for each rural power stations) and to 4 operators at national level. Training for local operators provided basic skills for execution of an operation and ordinary maintenance schedule program, while training of national level operators will focus on execution of extraordinary maintenance (major overhauling activities including dismantling and substitution of engine parts).

E. Overall Contribution to the Economy

1. Sustainability of the Investment in the Long Term

Roads Sector

Considerable follow-up action is required in the roads sector to ensure sustainability. Both physical works and capacity development is incomplete. The Project has identified the required regional depots to be responsible for routine maintenance and has introduced a variety of implementation methods. The local staff who have been trained will require further training and continued motivation. A component for such support is included in the TFET-funded Phase 2 of the Project. The Project was unable (through limitation of funding) to meet the demand for periodic maintenance and failure to address this requirement in the immediate future poses a significant threat to the sustainability of the network.

Port Sector

The Port will receive further support for the development of its physical infrastructure from the Government of Japan. This will include paving of the western container yard. The Port is already “off-budget” with revenues funding recurrent costs. It is expected that port operations will be sustainable.

Power Sector

In villages where rehabilitation of rural power stations and distribution networks are provided under the Project, community management committees were formed to take responsibility for day-to-day operation and maintenance of the power station. The village, through the management committee, is free to decide the number of hours per day of operation (which could change from time to time based on fluctuations in the availability of cash to pay for fuel), the methods of fee collection, and the monthly rates applicable to different levels of consumption. The communities will be supported by a mobile maintenance team for major overhauling (dismantling and substitution of engine parts).

Experience with five villages where the power station and distribution systems are operative is in general positive. The village-based committee is periodically monitored and assisted by the PMU and the overall performance is satisfactory. An important factor for sustainability will be (i) the technical support for major maintenance works to be provided by EDTL, and (ii) availability of additional funds for extension of the distribution system within a technically feasible distance from the power station to increase the number of customers and, thus, the benefits and sustainability of power stations through a large customer base and a higher load factor.

2. Lessons Learned

Lessons learned from the implementation of the Project 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. Unknown geological conditions, landslides, road closure, and unpredictable weather

determined priorities at short notice, 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 repeat works. To minimize these risks a program of training in procurement, work management, and quality control needs to be undertaken; In the current situation, alternative project implementation actions are necessary in view of the lack of capacity and facilities. Considerable executing responsibility was assumed in project management that allowed for prompt response and implementation. However, there are limitations to the PMU and the Government must play an active role in project coordination and execution.

F. Continuing Needs and Investment

1. General

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 development of the national potential. The main concern for infrastructure management is the inadequate capacity of Timor-Leste to finance the recurrent costs of operation and maintenance of the re-installed facilities. Therefore, Timor-Leste's infrastructure should deserve more attention and additional funding for restoration, development, and capacity building.

2. Roads Sector

Continuation of the capacity building efforts and human resources development is needed in this sector.

3. Power Sector

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 expansion of the distribution network in the rural areas creates the opportunity for substantially greater poverty reduction benefits. Realization of this potential requires:

- Assistance to establish efficient management systems and sector planning capacity;
- Capacity development for management and operation of district and subdistrict systems and review of local power management capabilities;
- Review of technical needs of eight district power stations (Aileu, Baucau, Los Palos, Maliana, Oecussi, Same, disruptions are common.
- Review of technical needs of remaining subdistrict rural power stations in Kovalima District and in other rural districts, not covered for rehabilitation under any other aid program; and
- Rehabilitate and expand distribution network to increase the number of poor households connected to the system and increase the hours of Suai and Viqueque) and associated distribution system. The conditions of the eight district power stations not

covered under the aid-funded rehabilitation programs have become acute and power supply per day, and enhance affordability through both lower unit costs and quality of supply.