Building for Development: An Evaluation of Four Infrastructure Projects in Tonga and Samoa

Quality Assurance Series
No. 14 May 1999

The Australian Government's
Overseas Aid Program

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TONGA: MINISTRY OF WORKS INFRASTRUCTURE DEVELOPMENT PROJECT PHASE 2

TONGA: PANGAI HARBOUR PROJECT

SAMOA: FIRE SERVICE UPGRADE PROJECT

SAMOA: PUBLIC WORKS DEPARTMENT BUILDING INSPECTION UNIT STRENGTHENING PROJECT

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AusAID
The Australian Government's Overseas Aid Program

EVALUATION RESPONSIBILITIES

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ABBREVIATIONS

AMB	Activity Management Brief
BIU	Building Inspection Unit
CASP	Commodity Assistance Support Program
CEPA	Commonwealth Environment Protection Agency
EIRR	Economic Internal Rate of Return
GOA	Government of Australia
GOS	Government of Samoa
GOT	Government of Tonga
KRA	Key Result Area
MMFB	Melbourne Metropolitan Fire Brigade
MMP	Ministry of Marine and Ports
MOT	Ministry of Transport
MOU	Memorandum of Understanding
MOW	Ministry of Works
MOWIDP	Ministry of Works Infrastructure Development Project
NBC	National Building Code
O & M	Operations and Maintenance
OHS	Occupational Health and Safety
OPCV	Overseas Projects Corporation of Victoria
OSB	Overseas Service Bureau
PCC	Project Coordinating Committee
PCR	Project Completion Report
PDD	Project Design Document
PID	Project Implementation Document
PWD	Public Works Department
SMEC	Snowy Mountains Engineering Corporation
TDS	Tonga Defence Services

CURRENCY

At the time of evaluation Australian one dollar was equal to 0.97 Tongan pa'anga and 1.72 Samoan tala.

EXECUTIVE SUMMARY

OBJECTIVE AND APPROACH

Four completed projects on infrastructure development from AusAID's South Pacific program were selected for this cluster evaluation. The projects were:

- Tonga: Ministry of Works Infrastructure Development Project Phase 2
- Tonga: Pangai Harbour Project
- Samoa: Fire Service Upgrade Project
- Samoa: Public Works Department Building Inspection Unit Strengthening Project.

The objective of the evaluation was to assess the relevance, sustainability, and the development impact of the projects with a view to drawing lessons learned for the selection, design and implementation of future projects.

A cluster evaluation approach was used for the assessment. Cluster evaluation, covering a group of projects, allows common themes and issues to be highlighted. Significant cost savings in the evaluation process is also achieved, which improves the cost-effectiveness of evaluation of small projects which would probably not otherwise undergo ex-post evaluation.

This report presents the findings of the evaluation which was undertaken during October-November, 1998. The evaluation is based on a review of the project completion reports (PCRs), other project documents, material in AusAID files, discussions with staff members of AusAID's Tonga and Samoa desks in Canberra and the AusAID posts in Nuku'alofa and Apia. Discussions were also held with Australian managing contractors, aid coordinating and project implementing agencies, and with other in-country agencies. In addition, wide consultations were also held with other stakeholders in the projects. The main work for the evaluation was undertaken over a five-week period. This included two weeks of desk work in Canberra reviewing documents, followed by three weeks of fieldwork. Draft reports were written in the field and provided to the Government of Tonga and Samoa officials and to the posts at the end of each fieldwork phase. Meetings were then held in Nuku'alofa and Apia to discuss these draft reports. These were attended by senior staff from the aid coordinating and implementing agencies, and by AusAID staff from the posts. At these meetings the draft reports were discussed and detailed comments obtained. The draft reports were then finalised in Canberra. They included comments received at the above meetings, and those by Canberra-based AusAID staff and an Advisory Group established for this task. This final report has been approved by the AusAID's Program Quality Committee.

MAIN FINDINGS

Three of the four projects were assessed as highly successful, whilst the fourth was found to be moderately successful. As development projects they are considered worthwhile and sound investment by Australia and the Governments of Tonga and Samoa. The Tonga Pangai Harbour Project, the Samoa Fire Service Upgrade Project and the Samoa Public Works Department Building Inspection Unit Strengthening Project achieved almost all their design objectives. The new harbour at Pangai has made a significant improvement to sea transport infrastructure serving the Ha'apai group. The harbour meets the berthing needs of all inter-island vessels currently servicing the region. The safety of passengers and ease of operation of vessels has also improved. For the target beneficiaries the project has significantly improved the quality of life. They include Pangai townsfolk, villagers, local businesses, community groups, and passengers and ships' crews. The potential longer-term development impact of the project is considered to be enormous.

The Samoa Fire Service Upgrade Project and the Samoa Public Works Department Building Inspection Unit Strengthening Project assisted in upgrading and installing new equipment, improved management systems, helped develop better operational procedures, and trained a critical mass of technical and managerial staff, both locally and in Australia. The longer-term development impact of these two projects are considered to be potentially high, provided the trained staff remain in their current positions and continue to perform satisfactorily.

The Tonga Ministry of Works Infrastructure Development Project Phase 2 was only moderately successful. Whilst the project achieved most of its design objective there are important concerns about the longer-term sustainability of project as highlighted below.

The overarching problem for the sustainability of all four projects and their longer-term development impact will be the continued future support for the project-begun initiatives by the Governments of Tonga and Samoa. Adequate budgets will need to be provided for operations and maintenance, training of technical and managerial staff continued, and the technological developments maintained in the future years. Central to this is the issue of asset maintenance, both the physical items built or supplied and the human capital development. To some extent asset maintenance is a generic problem bearing on all aid projects after their completion. The small island states of the South Pacific, such as Tonga and Samoa, are particularly vulnerable to low levels of asset maintenance since their low absorptive capacity, small economies and high turn-over of trained personnel quickly reduces project-aid gains. For example, the Pangai Harbour Project, whilst built to an excellent design standard, will need to be effectively maintained if it is to continue to generate longterm economic and social benefits for the target beneficiaries. In all four projects the equipment supplied by Australia will need to be effectively maintained, and in some cases upgraded, to realise their benefits. In addition, trained staff will need refresher courses to keep up-to-date with new

technologies and when older staff leave newer ones will have to be trained. Therefore, the Governments of Tonga and Samoa will need to continue to provide adequate operations and maintenance budgets to undertake post-project activities. If not, the potential longer-term development impact of the four projects will be greatly reduced.

This evaluation has highlighted that infrastructure projects with strong institutional strengthening components can be successfully undertaken in the South Pacific, despite their small bureaucracies, high turn-over of staff and the opportunities to emigrate. The evaluation found that Australia should continue to support infrastructure projects in the South Pacific. They generate high economic and social gains. However, given the longer-term concerns about project sustainability greater attention is needed in project designs to (a) seeking firm commitment from recipient Governments for continued funding of project initiatives after project completion, (b) promoting environmental considerations, and (c) improving institutional sustainability.

Of particular concern for the long-term sustainability of projects in the South Pacific is the underfinancing of recurrent costs. Unless the required funds for operation and maintenance are available, the longer-term social and economic goals of projects will be at risk. In this context, AusAID's recent study *Asset Maintenance: The Impact of the Underfinancing of Recurrent Costs (1999),* proposes several actions for aid donors that should be considered in future project designs. Summarised, they are:

(a) There needs to be a fundamental shift in the approach to project and program design. This includes improved risk analysis in project designs and greater attention to project duration, project size, operations and maintenance capacity, and the rationale for the project in the overall recipient Government's investment plan. (b) There needs to be greater donor coordination of aid projects in the South Pacific so as to reduce the administrative burden on the recipient countries. (c) AusAID needs to address the question of recurrent cost funding for specific projects/sectors, such as in infrastructure, education and health. (d) Provision, by Australia, of improved advice on financial, economic and planning issues, as they affect the use of investment resources by the recipient countries.

PERFORMANCE ASSESSMENT

The four projects evaluated can be grouped under the infrastructure sector, a Key Result Area (KRA) for AusAID's recently adopted performance assessment system. AusAID's strategy for provision of infrastructure in its aid program is defined as: (a) creating enabling environments for both private and public financing and management of infrastructure; (b) promoting human resource development and capacity building in infrastructure; and (c) improving access of poor people, including in rural areas, to essential infrastructure such as water supply and sanitation, energy, transport and communications.

A performance evaluation of the four projects was undertaken. This entailed the degree to which each project achieved its objectives. Using the scoring system developed for AusAID's Activity Management Briefs (AMBs) the projects were scored as follows:

Project	Score
Tonga: Ministry of Works Infrastructure Development Project Phase 2	3
Tonga: Pangai Harbour Project	4
Samoa: Fire Service Upgrade Project	4
Samoa: Public Works Department Building Inspection Unit Strengthening Project	4

The scores indicate that three projects were assessed as highly successful, whilst the fourth was found to be moderately successful. As development projects they are considered a worthwhile and sound investment by Australia and the Governments of Tonga and Samoa.

MAIN LESSONS

The three main lessons learned from this evaluation relate to **funding, training, and project design.** First, the project design document (PDD) and the project implementation document (PID) should clearly specify how recipients' will provide for **funding** for recurrent costs after project completion. They should also specify how the assets supplied by the project would be maintained so as to continue to provide longterm benefits to the target beneficiaries after project completion. Clearly there is a risk to Australian investment in a project if the recipient's continued funding commitment to a project is unclear. The designs of the four projects evaluated could have been significantly improved in this regard. The Governments of Tonga and Samoa were unclear on the level of recurrent cost funding that will be required after project completion for critical operations and maintenance of the facilities and equipment. The Government's ability to allocate funds for operations and maintenance is of critical importance in projects that rely on the best-practice technology transfer and operational systems upgrade, such as when introducing computing equipment in an institution.

Second, **training** of staff in a project has to have a longterm perspective to ensure the sustainability of project impact. A sufficient number of staff must be trained to ensure that if some leave during the project or immediately thereafter there will still remain a critical mass of skills to carry-on the initiatives begun by the project. Some staff should be trained as trainers of staff who may join the institution after project completion. The training program should be sufficiently well resourced and should include modules

and manuals that can be used by the trainers to train others as needed after project completion. In technology transfer projects these trainers provide the key skills towards further introduction of new technology and adaptation of existing technology. Twinning arrangements with experienced overseas institutions to assist training of staff during projects is a powerful medium which often allows personnel development to continue well after project completion. Training programs should be developed in close consultation with the institution providing the training. A careful balance must be struck between in-country and overseas training based on needs, costs and longterm goals.

Third, AusAID's **project designs** should incorporate sufficient monitoring and review mechanisms in order to provide early advice on the best way of making quick shifts in project inputs, institutional organisation or objectives. Rapid responses to changing institutional arrangements, often prompted by rapidly changing economic circumstances of recipients, reduces project risks and enables greater returns on the investments. In addition, project designs should promote environmental considerations and institutional sustainability.

1. TONGA: MINISTRY OF WORKS INFRASTRUCTURE DEVELOPMENT PROJECT PHASE 2

1.1 SUMMARY

1.1.1 Objectives and Scope

The goal of the Ministry of Works Infrastructure Development Project (MOWIDP) Phase 2 was to assist the economic and social development of Tonga by improving the efficiency of management, construction and maintenance of infrastructure resources. The project emphasised human resources development and maintenance of physical assets. The project was centred at the headquarters of the Ministry of Works (MOW) in Nuku'alofa.

The total project costs were approximately AUD 8.5 million. The Australian contribution was approximately AUD 6.5 million and the GOT contribution was approximately AUD 2 million.

1.1.2 Implementation

The project was very relevant. Implemented as Phase 2 of an earlier AusAID project (concluding in July 1991) it was also directed at building the capacity of the MOW. Phase 2 emphasised maintenance of existing infrastructure rather than the development of new infrastructure. Another aspect was assistance with establishment of systems for planning and programming of regular maintenance procedures. The project addressed instilling an appropriate 'planned maintenance' philosophy throughout the MOW. It also promoted a method of 'stores inventory' control involving computerised systems and training of staff.

The project had four components:

- Training: This involved in-country courses directed at practical 'hands on' training in the workplace. In addition, the project developed MOW staff to fill senior in-line positions to increase the sustainability of other inputs. A training initiative was undertaken to achieve this.
- Construction of buildings and roads: This was relatively minor and related to training rather than major infrastructure development.
- Equipment: This was related to MOW work requirements and to the capability of MOW to operate and maintain its fleet.
- Technical support and project management: This was intended to be a high impact area based on continuation of the twinning arrangements with Tweed Shire Council set-up in Phase 1.

Overall, the project concentrated on training activities using various components of the MOW works program as the vehicle.

1.1.3 Conclusions and Key Issues

The project achieved most of its objectives. It is considered a moderately successful development project. All senior positions in MOW are filled by Tongan staff, with internationally recognised qualifications mostly gained through the project. There is also a pool of middle level staff with appropriate tertiary qualifications. Computerised systems are in place to support MOW's design, construction and maintenance activities in the Engineering and Building Divisions. An upgraded computer network to support these systems is in operation and staff are competent in its use. The various MOW's construction and maintenance activities, which formed the vehicle for project based training, have been successfully completed.

However, there are some concerns about the project's longer-term sustainability. First, continued training will be needed to maintain the skills of staff. In addition, new staff will need training. The MOW has no current training plan, nor is there any allocation of funds to support further training. In the long-term, further management development in the MOW will greatly assist infrastructure development projects. Second, while the project has equipped the MOW with a range of up-to-date equipment, and the skills to maintain it effectively, funding for maintenance and replacement is severely restricted. Third, continued sustainability will be dependent on the availability of appropriate levels of recurrent cost funding.

Three key lessons have been identified. They have applicability in Tonga and in other countries:

- for training to be sustainable, recipient agencies need to budget for training upgrades and for training new staff recruited after project completion;
- budgets should include provision for phased replacement of equipment to ensure they remain technologically viable; and
- introduction of computer based systems require care that the systems are appropriate for the organisation and its absorptive capacity.

1.2 PROJECT DESCRIPTION

1.2.1. Introduction

The Ministry of Works (MOW) is responsible for infrastructure development in Tonga. The project targeted capacity building in MOW. It wanted to make it a more efficient organisation and less dependent on outside assistance in its delivery and maintenance of public works. The goal of the Ministry of Works Infrastructure Development Project (MOWIDP) Phase 2 was to assist the economic and social development of Tonga by improving the efficiency of the management, construction and maintenance of infrastructure resources. The emphasis was on human resources development and maintenance of physical assets. The project was centred at the headquarters of the MOW in Nuku'alofa.

1.2.2 Rationale

The need for an effective and active MOW in Tonga has been recognised for many years by both the Government of Tonga (GOT) and the Government of Australia (GOA). A first step towards this was the appointment of the consortium of Pak Poy and Kneebone and the South Australian Department of Housing and Construction in 1987 to review the operation of the MOW. The review found the MOW to be reasonably efficient, but identified the need for significant training of staff in planning and programming of aid related activities.

Subsequent discussions between Tongan and Australian authorities in 1988, led to a program of development assistance for three years. The main components were:

- training consisting of in-country short courses, short term ad-hoc attachments and formal academic awards;
- building construction;
- road construction;
- equipment supply; and
- technical support and project management through a twinning arrangement and a Managing Contractor.

1.2.3 Formulation

The project was planned for three financial years from 1988/89 to 1990/91. However, it was not until January 1990 that the Snowy Mountains Engineering Corporation (SMEC) was appointed as the Managing Contractor.

At the conclusion of the project in July 1991, AusAID decided that a further phase was needed to continue training initiatives. SMEC prepared a draft Project Design Document (PDD) for Phase 2 n June 1991 and a new contract was awarded to SMEC in February 1992. An AusAID mid-term review in early 1994 resulted in a three-year extension to 1998.

1.2.4 Objectives and Scope

The objectives of Phase 2 were to:

- assist the MOW to establish an appropriate organisational structure;
- train MOW staff to plan, implement and manage infrastructure works;
- provide equipment and other resources to continue MOW infrastructure works; and
- provide management training to senior MOW staff.

1.2.5 Project Cost

The total project costs were approximately AUD 8.5 million. The Australian contribution was approximately AUD 6.5 million and the GOT contribution was approximately AUD 2 million.

1.3 IMPLEMENTATION PERFORMANCE

1.3.1 Implementation Process

The project comprised the following four components:

- Training: This was directed towards in-country courses with practical 'hands on' training in the workplace. In addition, the project emphasised the development of MOW staff to fill senior in-line positions to increase the sustainability of other inputs. A formal training was undertaken to achieve this.
- Construction of buildings and roads: This was relatively minor and related to training rather than major infrastructure development.
- Equipment: This was related to MOW work requirements and to the capability of MOW to operate and maintain its fleet.
- Technical support and project management: This was intended to be a high impact area involving a continuation of the twinning arrangements with Tweed Shire Council set up in Phase 1.

Overall, the project concentrated on training activities using various components from the MOW works program as the vehicle.

The following table presents a summary of project progress.

Date	Activity
March 1992	Commencement of in-country training
March 1992	Commencement of academic studies
March 1992	Commencement of equipment procurement
March 1992	Commencement of twinning technical support
May 1992	Commencement of short training courses
October 1992	Commencement of construction activities
November 1992	Commencement of training in Australia
1994	Mid Term Review
November 1994	Completion of short course training

February 1995	Completion of training in Australia
December 1995	Completion of construction activities
November 1996	Completion of equipment procurement
December 1996	Completion of twinning technical support
February 1997	Commencement of computer upgrading
June 1997	Completion of computer upgrading
October 1997	Completion of in-country training
January 1998	Project completed
April 1998	Project Completion Report submitted by Managing Contractor
1998	Completion of academic studies (on-going)

1.3.2 Organisation and Management

Project management was by SMEC. As the recipient agency, MOW was responsible for implementing the activities assisted by staff of the Managing Contractor. Strategic policy issues were decided by a Project Coordinating Committee (PCC) which met at six-monthly intervals.

1.3.3 Project Completion

Phase 2 was completed in January 1998 and the Project Completion Report (PCR) was submitted by the Managing Contractor in April 1998. Phase 2 took six years to implement, the original three years from February 1992 to February 1995, and an extension of a further three years to January 1998.

1.4 IMPACT ASSESSMENT

1.4.1 Operational Performance

The project assisted MOW to improve the efficiency of its operation and management. The training provided has increased the skill base of key engineering staff. There are many examples which reflect these improvements, including efficiencies gained in road survey and design, road construction and sealing, material testing, road maintenance and management, plant fleet management and maintenance, building design and construction, building maintenance and management, project costing and budget control, and record keeping and reporting.

The impact of the training was significantly constrained by the limited funds available. For example, staff members trained in the road maintenance management system did not have sufficient funds to carry out a comprehensive survey program, especially in centres other than Tongatapu. Thus the application and consolidation of the skills developed was restricted.

Road design and construction. All road design is now carried out on computer based systems, namely GeoComp and AutoCAD. Staff members are well trained and have the skills and enthusiasm to undertake their duties to a high standard. Designs for other infrastructure are also prepared using these systems. In addition, the staff have recently been involved in the development of a master plan for a local school and a drainage design for the area around the Nuku'alofa market.

The technology transfer in road construction and sealing has resulted in a significant improvement in the quality of work. Staff are well trained and understand their duties well. The materials testing laboratory is utilised for aggregate testing, although in general the equipment provided to the laboratory is not fully utilised.

Road maintenance. The road maintenance and management system is being utilised effectively. Survey work on Tongatapu is complete and it is planned to undertake survey work on the outer islands soon. However, the laptop computer provided with the survey vehicle is currently in use in Ha'apai. No survey work is possible until the computer is available for use with the survey vehicle. MOW advised that it would be returned from Ha'apai at the end of 1998 to enable further road surveys to take place. The training undertaken in this area has been effective and MOW staff are using the system competently. However, it seems that decisions on work priorities still often have subjective input, diminishing the system's value as an effective asset management tool. The quality of repairs undertaken by MOW has improved and the skills learned during the project are applied effectively. Budgetary constraints limit the amount of work undertaken.

Plant fleet management and maintenance. Plant fleet management and maintenance has benefited from the training given. Staff are now well trained and motivated. While the general level of maintenance capability has improved, there are problems in obtaining spare parts. Very little stock is kept at the workshops and spare parts and tools have to be ordered as required and dependent on funds available. Small parts and tools are usually accessible from New Zealand within a week of ordering but larger parts can take up to two months to arrive. These delays lead to longer periods of plant down-time. Some cannibalisation of older equipment is carried out to relieve this situation. Some provision is made for replacement of the existing plant fleet and specific requests for plant are made through the usual budgetary process. Together with equipment provided under bilateral and multilateral projects, this should ensure that the MOW has adequate equipment for its tasks. The MAXIMO system introduced during the project has not been used to a significant degree since project completion and there is a real possibility

that the skills acquired in its use have lapsed. For example, the last summary monthly report for the Tongatapu Mechanical and Transport Pool was produced for the months September to November 1997 during the last few months of the project.

Project costing and budgetary control. Project costing and budgetary control did not fair well during the project. While training was given in use of Attache and MAXIMO, neither system is currently being used in this area. During the latter stages of the project, Attache training was discontinued in the need for conformity with the Government's central accounting system. MAXIMO can be used to streamline project and labour costs but manual systems are still being used.

1.4.2 Institutional Development

Staff Training. The project has had a significant impact on institutional development. Prior to 1990, the MOW's organisational structure was fairly informal with only a small number of qualified or trained staff. The senior positions of Chief Engineer/Architect, and Quantity Surveyor, as well as other key positions, were filled by expatriate staff. The extensive training initiative implemented has enabled MOW to fill all positions in the organisation with suitably qualified Tongan staff.

Training was provided at a number of levels:

- in-country on-the-job training (37 inputs, each involving an average of 5 staff)
- in-country short courses (20 courses, each involving an average of 5 staff)
- training in Australia (7 staff completed work experience placements-one of 12 months, one of two months, four of 6 weeks and one of one month. A further ten completed practical training of six weeks duration with Tweed Shire under a twinning arrangement)
- academic studies (one at Master's level, one at Bachelor's level, two at Diploma level, seven at Associate Degree level, two at Associate Diploma level, eight at Certificate Level and six completed single or multiple subjects at non-award level)

Details provided by MOW indicated that 17 staff completed their studies successfully, eight were finishing by the end of 1998 and twenty-two withdrew.

While the success of those who have completed, or are about to complete their studies, has made a significant contribution to the capacity of the MOW, the high withdrawal rate is a cause for concern in terms of cost effectiveness of the expenditure of training funds. Many of those who withdrew were studying in the external mode and this form of study can be extremely demanding. MOW provided some time during working hours to assist these trainees to complete their studies and provided the assistance of senior staff where this was available. In addition, students in the same course formed informal study groups

to share ideas and provide peer support. In many cases the Australian institutions concerned also sent staff to Tonga to conduct practical sessions. All of these measures were of considerable assistance in reducing the drop-out rate. However, during discussions with those who participated in the academic program, the suggestion was made that a more comprehensive briefing of all potential trainees would have been beneficial. It was clear that some trainees committed themselves to commence study with an unrealistic view of the amount of work that would be required. A briefing would have enabled the details of the additional study workload to have been discussed, and this may have resulted in a reduced drop-out figure. If, after briefing, a prospective trainee made the decision to not proceed with the course, that place could have been given to another trainee. It was also suggested that a closer form of monitoring of progress of trainees may have resulted in an earlier transfer of training opportunities from those who were making unsatisfactory progress, to others more worthy.

Another issue was the failure to obtain accreditation for some of the courses with the Establishment Section of the Prime Minister's Department prior to commencement. When advice was received that accreditation was not possible (and trainees would not receive an automatic salary increment on completion), some lost their motivation to continue. Had the accreditation arrangements been finalised prior to commencement of studies more trainees would have finished their courses.

During interviews it was also clear that the successful trainees developed many higher order skills, including additional academic skills and the ability to work independently.

A concern is that MOW does not have any training plan or a training budget to ensure the skill levels are maintained and new staff trained. Without these institutionally supported measures the benefits of the training provided under the project will soon dissipate.

Though GOT sourced funding for training is restricted, there are a number of donors, including AusAID, who provide funds for in-country training. A training plan would enable MOW to present a case for a donor-funded training.

There is also a case for more on-the-job training. For example, the MOW previously employed a computer technician trained at graduate level in New Zealand. This person was recruited away from MOW. The system is now maintained by another person who is studying at a certificate level. Although very competent in his work there is the possibility that he too may leave. The loss of this technician would have very serious consequences for the organisation. Key staff members such as these need to be identified and additional staff assigned and trained to replace those leaving.

Twinning arrangement. Further institutional strengthening was provided through the twinning arrangements established with Tweed Shire Council. A total of 12 staff were attached to the Shire and one elsewhere. Feedback confirmed the value of experiencing

the actual operation of an efficient organisation. Senior staff from Tweed Shire later visited MOW and carried out further training of staff to reinforce the skills developed. Most staff indicated that they went to Australia with a clear understanding of the area they were to focus on in gaining experience and were able to apply many of the lessons learned on their return. The view was expressed that there could be value in arranging the return visit of the Australian 'mentor' as close as possible to the return of the MOW staff members. This would enable support to be provided in applying the lessons learned more immediately to the MOW context.

1.4.3 Operation and Maintenance

In general, the operations capacity of MOW staff is now greatly improved through the delivery of comprehensive training in many of the MOW's work areas and across planning, design, construction, maintenance and asset management sectors. Greater efficiencies are being realised through the use, by the trained staff, of state-of-the-art software packages. However, the MOW's capacity to deliver a fully cost-effective level of service is severely constrained by the limited maintenance funding available. This is clearly demonstrated in many aspects of MOW's work involving plant and equipment where frequent problems are encountered in the area of spare parts availability and plant replacement. Much of this is described in Section 1.4.1. Despite the availability of appropriate skills, the full potential for reducing plant downtime is not being realised. MOW workshops frequently resort to cannibalisation of old and redundant plant to ensure that other plant remains serviceable.

1.4.4 Economic Impact

The project has equipped the MOW with the necessary skills and resources to undertake both capital and maintenance works in a much more cost-effective manner. This is most evident when examining capital works undertaken under donor funding. Examples include the new airport currently being constructed at Ha'apai and the wharf constructed at Ha'afeva in the Ha'apai group. The wharf had the additional benefit of technology transfer from the Pangai Harbour Project. However, the full benefits of the project are not being realised due to the limited funds available for internally funded projects and for on-going maintenance activities.

1.4.5 Environmental Impact

AusAID's *Environmental Assessment Guidelines, 1996*, were used in the evaluation of this project.

The project is considered to have a neutral impact on the environment. No specific training was given in minimising the environmental impacts of public sector projects either in respect of design or construction activities. In the design of the project it would have been useful to include a small environmental education initiative based on AusAID's environmental guidelines.

1.4.6 Social and Gender

The goal of AusAID's gender and development policy for the infrastructure sector is to promote equal opportunities for women and men as participants and beneficiaries of development. The guiding questions listed in AusAID's current *Gender and Development Guidelines* were used in the evaluation of this project.

While there is an historical bias towards men in participation in the technical areas of work within MOW, both men and women have equal opportunities for training. The organisational culture is not a constraint to the employment of women. The MOW has three female middle to senior level staff-the Chief Accountant, Senior Librarian and the Housing Inspector. There is also one female building tradesperson.

One female staff member (the librarian) was awarded a scholarship for formal academic study under project funding. The Chief Accountant benefitted from some in-house, project-funded training in financial systems. Some female clerical and secretarial staff also received in-house training in word-processing.

As a result of qualifications gained, the librarian has since project completion been promoted to Senior Librarian.

1.4.7 Occupational Health and Safety

Development of appropriate and safe practices was an essential part of the training provided. In some areas safety practices have greatly improved. The quarry, where significant safety hazards exist is a good example. A recent review of the project reported that safety practices were well understood and followed in the blasting operations. However, in their observations of the road resealing gang, the review team commented that 'the only aspect missing …. was public and employee safety. No signage was used and no safety vests were worn by employees'. The supervisor of the gang advised that generally in rural areas no signage is used because of the lower traffic volumes. Without clear written procedures to cover all aspects of safety throughout the organisation, the benefits of training in safety will be lost as staff water down and adapt the practices they were trained to follow. Senior staff advised that there were no specific responsibilities assigned for OHS, no written manuals or guidelines were used and no training was given to staff on a regular basis to ensure that safe practices were developed and maintained. The only coverage of OHS was in the short induction course given to all new full-time staff by the Prime Minister's Department, and this was, of necessity, brief and quite general.

1.5 SUSTAINABILITY

There are some concerns about longer-term sustainability of the project. A key factor in sustainability will be the availability of appropriate levels of recurrent cost funding.

1.5.1 Institutional

On-going training for MOW staff. Currently the level of skills in road survey and design, road construction, materials testing, plant fleet management and maintenance, building design and maintenance, project costing, budget control and record keeping is high. However, these skills need to be maintained and passed on to new staff. No training plan exists within MOW to ensure this. Accessing funds for this will be difficult as there is no provision for training costs in the current budget. The MOW relies on external funding for training. Sources include Australian and New Zealand funded scholarships overseas and in-country training but these are very limited. Funds are not available within MOW for low-cost locally funded training conducted by MOW staff trained under the project. Some on-the-job training is carried out but this is insufficient to maintain skill levels. No succession planning is being implemented in key areas. At the conclusion of the review, the MOW indicated that it had set up a training unit which was charged with the preparation of a training plan. However, the Training Officer appointed will not be returning to duty with MOW for about one year. This will contribute to a lack of activity in the training area.

Organisational structure. A new structure for MOW was introduced as part of the project. This has proved to be very effective. However, if the organisation is to remain responsive to changing requirements, its structure needs to be under more systematic review on a continuing basis.

1.5.2 Technical Issues

MOW's construction capabilities. The project has significantly improved the skills base of MOW staff in the construction sector. The MOW now has the capabilities to construct major public works infrastructure. This is well demonstrated by MOW's performance in the construction of the Ha'apai airport. For major aid projects however, there are benefits in the continued engagement of expatriate advisors to maintain a check on quality. It is also vital for MOW to undertake regular in-house training to ensure that the existing skills base is maintained and developed. New staff must also receive adequate training. In the long-term, further management development in the MOW will assist it to take a more effective role in infrastructure development projects.

Maintenance of facilities/equipment. The project has equipped the MOW with skills to maintain its equipment. In order for this equipment to be utilised effectively for its design life, periodic maintenance must be undertaken. Currently funds for maintenance are limited, resulting in long delays in repairing unserviceable plant and lengthening the time between service intervals. This compromises the benefits of maintenance and reduces the life of equipment. Apart from some fast moving small spare parts, only a small stock is carried. When the need for replacement part occurs, a separate order has to be placed and, provided that funds are available, the part is procured from New Zealand. This process can take anything from one week to two months.

In the past, an equipment replacement account has been maintained. The MAXIMO software provides a mechanism to allocate funds to this but is not currently used. It is understood that the funds in this account have recently been fully utilised for major equipment purchases.

MOW's operational capabilities. The project introduced a number of specialist computer based systems. Training was provided to selected MOW staff and in general, this has been very effective. While the road maintenance management system, GeoComp and AutoCAD, seem to be well understood and used, outputs from MAXIMO have not been utilised as planned. There is a risk that skills in operating the system have already been reduced. The MOW advised that the Head of the Mechanical Section would be away until the end of 1998 and on his return MAXIMO reports would again be subject to review and become an input to management decisions. It is important that the systems are used on a regular basis to reinforce the training given and to build operational experience. It is vital that the computer for the Pavement Management System survey vehicle be returned from Ha'apai so that continuity occurs in the roads maintenance area.

1.6 KEY ISSUES AND LESSONS LEARNED

1.6.1 Conclusions

The project has achieved most of its objectives. It is considered a moderately successful development project. However, there are some concerns about project sustainability.

The MOW now has a better structure and staff have received very effective training to enable them to competently plan, implement and manage infrastructure works. The project has also provided substantial equipment which have significantly assisted the MOW. For instance, equipment assistance has enabled the MOW to commission and operate sophisticated computer based management and monitoring systems.

1.6.2 Key Issues and Lessons Learned

All senior positions in MOW are now filled by Tongan nationals with internationally recognised qualifications, mostly gained under the project. There is also a pool of middle level staff with appropriate tertiary qualifications. Computerised systems are in place to support MOW's design, construction and maintenance activities in the Engineering and Building Divisions. An upgraded computer network to support these systems is in operation and staff are competent in its use. The various components of the MOW's construction and maintenance activities, which formed the vehicle for project based training, have been successfully completed.

Training sustainability. Continued training will be needed to maintain and further develop the skills of staff and to develop the skills of new staff. The MOW has no current training plan, nor is there any allocation of funds to support further training.

Equipment sustainability. While the project has equipped the MOW with a range of up-to-date equipment, and the skills to maintain it effectively, funding for maintenance and eventual replacement is restricted. This is graphically illustrated in the case of the computer system. A total of 29 computers were provided as part of the project. Further project funds were provided for upgrading these computers during the life of the project. Assuming an average 'technological life' of 3-5 years, MOW now needs to allocate funds to upgrade approximately 25% of the network each year. This level of funding is not currently available and there appears to be a reliance on donor funding to take care of such issues. Similar problems will arise with heavy plant, some of which has already become unserviceable and is now being utilised for spare parts.

Systems relevance. A number of computer based systems were introduced to MOW. Since project completion, the utilisation of some of them has lapsed and of that of others has not been high. Care must be taken during the project to ensure that systems introduced are appropriate for the organisation in terms of need and absorptive capacity. If this is not the case, then there is a risk that the cost of the systems and the investment in training will be wasted. In addition, if funds are not available in the recurrent budget for the continued operation of the systems, staff will lose the skills they developed.

2. TONGA: PANGAI HARBOUR PROJECT

2.1 SUMMARY

2.1.1 Objectives and Scope

The goal of the project was to provide a safe and reliable harbour at Pangai. This was expected to improve the quality of life for the local population and enhance development opportunities for the region. In addition, the project was to improve the institutional capabilities of the Ministry of Works (MOW). The MOW was responsible for construction of the harbour and was supervised by a Managing Contractor appointed by AusAID.

The total project costs were approximately AUD 4.2 million. The Australian contribution was approximately AUD 3 million and the Government of Tonga (GOT) contribution was approximately AUD 1.2 million.

2.1.2 Implementation

The project was very relevant. It has provided a more secure shipping to and from Ha'apai. The previous harbour facilities comprised a narrow causeway across a reef flat with a short berthing face at its head. The head was fully exposed to winds and waves from the west quadrant resulting in dangerous berthing conditions. In extreme conditions, vessels were not able to berth, or transfer freight after anchoring further offshore, for periods of up to one month.

The harbour facilities provided by the project comprised:

- a large protected turning basin;
- a steel sheet pile wharf equipped with a ramp to accommodate inter-island roll-on/roll-off vessels;
- a concrete deck on a piled wharf;
- an offshore breakwater to provide protection to the basin;
- a passenger shelter;
- a reclaimed area;
- a boat ramp; and
- an emergency boat ramp and bollards.

All these facilities have been completed satisfactorily and are being properly utilised.

Institutional strengthening and training were also provided by the project. Training was provided to MOW staff in eight key areas of harbour construction/management.

Overall the training was appropriate and effective.

2.1.3 Conclusions and Key Issues

The project achieved almost all of its objectives. It was a highly successful development project and is considered a worthwhile investment by Australia. The longer-term development impact of the project is likely to be substantial. The new facilities at Pangai provide significant improvement to sea transport infrastructure serving the Ha'apai group. The harbour meets the berthing needs of all vessels currently serving the region, with improved safety and ease of operation. The MOW received additional institutional strengthening in the area of wharf construction through both on-the-job-training and specially designed short courses, undertaken on site and in Australia. The project has wide support from target beneficiaries, including the Governor of Ha'apai, the Ha'apai Development Committee, community groups, local businesses, passengers and ships' crews.

However, there are some concerns about the longer-term sustainability of some aspects of the project. A key factor will be the availability of appropriate levels of recurrent cost funding for maintenance.

Three key lessons were identified. They have applicability to other projects in Tonga and in other comparable countries in the South Pacific:

- there is a need for specialist supervision in projects having significant technology transfer;
- training has to be relevant; and
- an assured provision by the recipient, for operations and maintenance funding, should be sought at the project design stage.

2.2 PROJECT DESCRIPTION

2.2.1. Introduction

Marine transport plays a vital role in maintaining communications and freight services within the Kingdom of Tonga. The island of Lifuka, in the Ha'apai group, lies about 150 km north east of Nuku'alofa and depends on sea transport as an important part of its economic and social development. Prior to the project, berthing vessels safely was difficult and had to be suspended during extreme weather conditions. It was not uncommon for vessels to be unable to berth at the existing harbour at Pangai for up to one month, severely impacting on the social and economic life of the island.

2.2.2 Rationale

The Government of Tonga recognises the importance of reliable and safe marine communication links through the diverse 170 islands that make up the Kingdom of

Tonga. Backed up by rather limited air services, marine transport plays a vital role in social and economic life. The level of marine service needs to be improved to enable development of the outlying islands.

Previous studies identified the need for improved harbour facilities at Pangai. Under the Australian development cooperation program, emphasis had been placed on the development of the outer islands and the Ha'apai group in particular, for which the Ha'apai fund had been established. Since January 1990, AusAID had also been involved in providing institutional strengthening to the Ministry of Works (MOW) through its Infrastructure Development Project, which provided key technical training to staff. The construction of a new harbour at Pangai by MOW was regarded as a logical continuation of Australia's commitment to Ha'apai and support for MOW's institutional capacity.

2.2.3 Formulation

The project was conceived in the mid 1980s when a study by the Central Planning Department of Tonga (Reidel & Byrne, 1986) concluded that the lack of marine facilities in the outer islands of Tonga was hampering the establishment of a regional transport system. This lack was considered a major constraint to the social and economic development of the outer islands. Further work as part of the Asian Development Bank Marine Infrastructure Study (Reidel & Byrne, 1990) specifically examined the Ha'apai and Nomuka Island Groups. The study concluded that facilities to cater for regional distribution/collection of cargo and passengers, using larger vessels, should be established/improved at three locations, including Pangai on the island of Lifuka. It further identified that the MOW harbour construction team could be used to provide additional facilities quickly and cost effectively.

In January 1993 AusAID commissioned site investigation work, planning and detailed design for infrastructure work at Pangai harbour. It was intended that construction would be undertaken by the MOW. This was followed by the preparation of the Project Design Document (PDD) in 1994, which included the results of a review of all previous documents and drawings, an update of required inputs and the identification of discrete outputs. The PDD also included the environmental requirements specified by the Commonwealth Environment Protection Agency (CEPA) as appropriate. The PDD also outlined the role of the Managing Contractor in respect of the works.

In December 1994, Kinhill Engineers was appointed as AusAID's Managing Contractor for the Pangai Harbour Project. The original works program, planned for completion in eighteen months, ie by June 1996, was delayed, primarily due to difficulties in obtaining suitable rock for the offshore breakwater. The project was completed in December 1996, six months behind schedule. The harbour facilities were officially opened by His Majesty King Taufa'ahau Tupou IV on 4 December 1996.

2.2.4 Objectives and Scope

The goal of the project was to provide a safe and reliable marine facility at Pangai. This was expected to improve the quality of life for the local population and enhance development opportunities for the region. In addition, the project was to help improve the institutional capability of the MOW.

The specific objectives of the project were to:

- improve the social and economic condition in the Ha'apai group of islands by providing improved marine transport facilities in the form of a protected harbour; and
- use the construction of the harbour and facilities to improve the institutional capacity of the MOW through the provision of specific training inputs and regular monitoring of the construction works.

The MOW was responsible for all aspects of construction and was supervised by a Managing Contractor appointed by AusAID. The Managing Contractor was responsible for:

- providing a quality review of the physical works;
- assisting the MOW with the project program and budget;
- ensuring the adoption of appropriate environmental safeguards;
- providing training;
- checking and approving MOW's monthly acquittals;
- reporting; and
- the procurement of long lead items.

2.2.5 Project Cost

The total project costs were approximately AUD 4.2 million. The Australian contribution was approximately AUD 3 million and the Government of Tonga (GOT) contribution was approximately AUD 1.2 million.

2.3 IMPLEMENTATION PERFORMANCE

2.3.1 Implementation Process

The project began in December 1994 with mobilisation of staff from MOW and the Managing Contractor to Pangai. The following table presents a summary of progress through the construction phase.

Date	Activity
March 1995	On-site earthworks commenced and the hard rock quarry was established.
August 1995	Piling commenced. Training activities commenced.
March 1996	Piling completed. Main wharf practically completed. Passenger shelter practically completed.
May 1996	Basin excavation practically completed.
August 1996	All works practically completed. Omissions and defects list prepared.
December 1996	All omissions and defects rectified. Formal opening by His Majesty King Taufa'ahau Tupou IV.

The completed works comprised:

- a large protected turning basin;
- a steel sheet pile wharf equipped with a ramp to accommodate inter-island roll-on-roll-off vessels;
- a concrete deck on pile wharf;
- an offshore breakwater to provide protection to the basin;
- a passenger shelter;
- a boat ramp; and
- an emergency barge ramp and bollards.

The latter item was added to the scope of work during the project to provide an alternative berthing location for the roll-on-roll-off vessels used for inter-island cargo and passenger services between Vava'u, Ha'apai and Nuku'alofa.

The project provided significant on-the-job training opportunities for the MOW staff. In addition, eight construction related training programs were incorporated into the project, addressing welding, preventative plant maintenance, maintenance of marine coatings, pile driving, hydrographic surveying, site reporting, services design and diving.

Three procurement contracts were commissioned in the name of the MOW for long lead-time items comprising steel sheet and tubular piling, fabricated steelwork and fenders.

2.3.2 Organisation and Management

The implementation process involved:

Agency	Role
Ministry of Works	Construction implementation
Kinhill Engineers Pty Ltd	Managing Contractor

2.3.3 Project Completion

The Project Completion Report (PCR) was submitted by the Managing Contractor in January 1997, signifying the end of the project. The project took just over two years to implement, six months longer than originally planned. This delay, which had no impact on project cost, was primarily due to the difficulties associated with obtaining suitable rock for breakwater construction.

2.4 IMPACT ASSESSMENT

2.4.1 Operational Performance

The project has provided improved harbour facilities at Pangai and a focus to sea transport in the Ha'apai region. The harbour is situated on the west side of Lifuka Island and, as such, is protected from the dominant east and southeast winds and waves. Protection from the more severe cyclonic weather conditions from the west and northwest is provided by a new composite breakwater (rock and steel sheet piling) constructed on reef material offshore. This provides full protection from westerly weather and environmental conditions but the harbour entrance is vulnerable to those from the northwest with waves able to enter directly. During March 1997, waves entered the harbour from this direction during Cyclone Hina and damaged some of the rock armour protection near the small boat ramp. The breakwater itself appears to have remained stable since completion. In general however, the breakwater is providing significantly calmer conditions in the harbour area, increasing the ease of ship movements in the harbour.

The steel sheet pile wharf provides good berthing facilities for the existing ferry fleet. A ramp is provided to facilitate cargo unloading. Good separation is now achieved between passenger and cargo movements. Two ferries currently serve Ha'apai on a regular basis, one with a stern door and the other with a bow door. The ship with stern cargo access makes use of the deepened turning area within the harbour to manoeuvre into the wharf and ramp. The vessel with the bow door makes a similar manoeuvre when leaving the harbour.

The newly constructed passenger shelter is highly regarded by the community. It provides protection from the weather for passengers and those waiting for ship arrival. Toilet facilities are included. Prior to the project, there was no shelter. It also provides a focal point for vendors catering for those waiting and for disembarking passengers.

A concrete small boat jetty provides improved mooring facilities for small craft. This, combined with the protection provided by the breakwater, has been significant in providing safer and protected facilities for smaller inter-island boats.

Two other ramps are provided within the harbour to provide access and launching facilities, with one serving as a standby facility for the ferries in the event that two arrive at Ha'apai at the same time. Both have a low level of usage.

While a relatively short time has passed since commissioning, it appears that there is an increasing number of passengers using sea transport to travel to and from Pangai. A total of 10,620 passengers used the port during 1997 and 9,239 had used the port in 1998 to 16th October.

2.4.2 Institutional Development

The Pangai Harbour Project also sought to assist the MOW to further develop its capability to carry-out harbour works. It was also to serve as a training mechanism in a number of key areas. Prior to the commencement of the project, the MOW construction team had developed considerable proficiency in harbour construction through construction of Nafauna Harbour on Eua, Touliki Naval Base and the installation of various navigation aids on reefs throughout the Kingdom. These works were all undertaken under the supervision and control of an expatriate engineer. It was intended that, for the construction of Pangai Harbour, the work would be constructed under the supervision and control of the MOW. The main function of the Managing Contractor was to be a 'review, checking and training' role.

The institutional development aspect of this project should be considered together with the overall MOW Infrastructure Development Project. There was an overlap between the two projects.

Key areas for training during the course of construction were as follows:

- Maintenance of paint system;
- Pile driving;
- Routine maintenance programs;
- Welding certification;
- Survey techniques;
- Reporting; and
- Diving

A review of the success of these is summarised below:

Maintenance of paint systems. While the training of personnel was carried out during the construction phase, the responsibility for maintenance of the facilities shifted from MOW to the Ministry of Ports and Marine (MMP) on completion. The MOW staff who received training remained with MOW. While they were involved in patching of damage to the protective paint system which occurred during construction, they have not been involved in maintenance of paint systems since completion of construction. No maintenance of the paint systems has been carried out by MMP since completion. Rust is showing in a number of places (the sheet piling wharf, the sheet pile breakwater and the steel crossheads on the small craft jetty). For the training to be effective those trained need to be assigned to the maintenance of steel marine structures. This could be achieved in a number of ways. The responsibility for maintenance of the wharf itself and other land-based components, such as rock armour, could be shifted back to MOW (as is the case for maintenance of other major public works). An alternate approach could be to assign the MOW staff who received training to MMP on a fee-for-service basis to carry out regular inspections and any routine maintenance. This aspect of the project is further discussed under Section 2.5.2 on sustainability.

Pile driving. The training in this area took place during construction and subsequently the same staff, under the same foreman, carried out construction work on the new wharf at Ha'afeva. While it was not possible to inspect this facility, interviews with a number of independent sources who had inspected the wharf indicated an effective transfer of skills took place. The MOW now has a larger number of staff proficient in pile driving.

Routine maintenance programs. This training took place during construction and appears to have met the objective of reducing down-time during the construction of the harbour. Further transfer of training is apparent in the recent construction of Ha'apai airport upgrading. However, the ability to carry out routine maintenance continues to be affected by issues such as availability of recurrent budget.

Welding certification. This training achieved its planned results. The wharf was successfully fabricated to an acceptable standard and MOW now has two staff certified to perform welds on tubular and structural steel sections. These staff members have been used in the construction of wharf facilities at Ha'afeva. They are currently based in Nuku'alofa.

Survey techniques. Some hydrographic survey work was carried out by MOW during construction. However, there does not appear to be any increase in the capacity of MOW to carry out hydrographic survey work as a result of the project. MOW staff have well developed cadastral survey skills, much of which were developed during the MOWIDP. Hydrographic survey for the Pangai project was undertaken by Tongan Defence Services (TDS) personnel on a fee-for-service basis.

Reporting. The objective was the development of improved project control and reporting processes, and the development of project management skills in the MOW site staff. The monthly reports reflect the improved capability of MOW in this area. Staff trained in the project have subsequently been involved in the management and supervision of Ha'afeva wharf construction and Ha'apai airport upgrading. In both these projects the MOW had the role of contractor. It appears that transfer of training has occurred, though the work on the airport upgrading has not been fully under the control and supervision of MOW as the services of expatriate staff have also been utilised. Because of this it is not possible to fully assess MOW's independent capacity in reporting.

Diving. The output of this training was to have been an expansion of the ability of MOW to use the services of accredited occupational divers. During the project locally engaged divers were used to assist construction. Since completion of their occupational diving course in Australia in 1995, the MOW staff who received training have been posted to other tasks in Nuku'alofa. They have not carried out any underwater work since trained. Therefore it is not possible to assess the effectiveness of transfer of skills training.

2.4.3 Operation and Maintenance

Responsibility for operation and maintenance (O&M) lies with the MMP. Training during the project was primarily focussed on construction activities. Only that provided for the maintenance of marine coatings and the conduct of hydrographic surveys relates to O&M needs. However, this limited training was provided to staff of MOW and not to those with future responsibility for O&M. The preparation of an O&M manual was not included as part of the project design. These two factors have resulted in a lack of appropriately trained resources within MMP to undertake maintenance of the harbour.

Essential maintenance activities should include:

- Inspection and repair of damaged/corroded sheet pile coating;
- Regular inspection and repair of rock armour for stability assessment, particularly after storms;
- Regular inspection and repair of damaged steelwork and concrete at the small boat jetty; and
- Regular hydrographic surveys to check for erosion and sedimentation problems in the harbour turning area and the channel, followed by dredging if required.

2.4.4 Economic Impact

The construction of the improved harbour facilities has made a significant economic impact on the community. Ships are able to deliver goods in all except the most severe weather conditions. Previously they would sometimes have to bypass Pangai and proceed

direct to Vava'u because wind and wave conditions made it impossible to berth. On other occasions, if conditions were less severe they would sometimes have to anchor further offshore and transfer goods to smaller boats which would bring them ashore with consequent risk of damage.

Local fishermen are now able to bring their catches directly into the small boat jetty, obtain ice from the adjacent Fisheries depot, and then transfer their catch to the ferry for transport to Nuku'alofa for sale.

The local cooperative is now able to more reliably ship-in goods from Nuku'alofa for sale in their shop in Pangai and for further distribution throughout the Ha'apai group. Overseas supplies are imported via Nuku'alofa where they are broken down into small wire frame 'containers' and transferred to the ferries for transport to Pangai. Approximately fifteen of these small containers per week are received by the cooperative.

More reliable deliveries of supplies has also benefited the local tourist resort operators and local builders. Previously deliveries could be missed at crucial times due to poor weather conditions.

In the longer-term, the economic benefit of the project is expected to be substantial.

2.4.5 Environmental Impact

AusAID's *Environmental Assessment Guidelines, 1996*, were used in the evaluation of this project.

Guidelines for the minimisation of environmental impact during the construction phase were prepared by a project appointed environmental officer. These were consistent with AusAID's Environmental Guidelines. They seem to have been applied well. In addition, they are reported to have also been applied to subsequent jetty construction work at Ha'afeva. However, there are some concerns. A copy of the guidelines is not held at the MOW office at Pangai. The work at Ha'afeva was reported to have been undertaken without direct reference to those guidelines, but rather using knowledge gained during their application at Pangai. In addition, MOW is reported to have moved plant directly across sensitive reef material at low tide. A greater awareness of environmental issues within MOW, and the institutionalisation of environmental procedures, would assist future construction work undertaken by MOW.

There are no reports of negative environmental impact due to the project since its completion. This is supported by local anecdotal information that there has been no reduction in the number or quality of the fish caught in the harbour area.

2.4.6 Social and Gender

The goal of AusAID's gender policy for the infrastructure sector is to promote equal opportunities for women and men as participants and beneficiaries of development. The guiding questions listed in AusAID's current *Gender and Development Guidelines* were used in the evaluation of this project.

While there was no formal discrimination against women during construction activities, no women were employed in construction roles. However, a female environmental officer was appointed to draft the guidelines to minimise environmental impact during construction.

The Ha'apai community has suffered significant population loss over many years and this has been partly attributed to inequities in the distribution of funds for development. The most significant development has tended to occur in Tongatapu and Vava'u. The Ha'apai Development Committee has sought to redress this problem in a number of ways. The construction of the harbour has been a major factor in giving the community greater confidence that an active interest is being taken in their livelihoods, and that there is a brighter future for their families by remaining in Ha'apai.

In addition, many of the safety aspects of the new harbour facility (see Section 2.4.7 for further detail) have had considerable social and gender impact. For example, women (especially those travelling with children) are now more prepared to travel by ferry because of the improved safety of embarkation and disembarkation. Women travelling by small boat from the outer islands have reported that they found access easier and safer because of the improved facilities (only 25% of the women in Ha'apai live on Lifuka, the remainder live on the outer islands of the Ha'apai group). The Women in Development handicraft shop in Pangai reported that hand made goods for sale from the outer islands can be shipped more easily and with less risk of damage than previously. This will assume greater significance with the construction of the new handicraft centre scheduled for completion in early 1999.

The MMP employs an officer-in-charge at the harbour. It has recently recruited an assistant who acts in the role when the more senior officer is absent on other duties such as inspecting the operation of navigation aids in the outer islands. The assistant is a woman. This has further enhanced the favourable attitude expressed by women about the harbour development.

2.4.7 Occupational Health and Safety

The project has made considerable impact in this area. Specific areas where OHS has been improved are as follows:

- Safer access by the vessels to Pangai wharf during a range of weather conditions. Prior to construction, the ferry would bypass Ha'apai up to 10 times per year due to unsafe weather conditions (strong winds from a westerly direction).

- Safer disembarkation and embarkation of passengers due to segregated unloading and loading of cargo and passengers. Previously all loading and unloading took place at the one point (the vessel's lower deck loading ramp). Cargo is still unloaded and loaded via the vessel's ramp, but passengers now disembark and embark via a gangplank directly connected from the wharf area at the side of the vessel to the upper decks. This has the further advantage that passengers no longer pass through an area of the vessel which can become quite heavy with diesel fumes.
- A larger area is now available for stacking of cargo immediately on unloading. The previous wharf area was quite constricted. This meant that forklift drivers, and those involved in manual unloading, worked in a congested area with high safety risks. Now there is a large area immediately surrounding the unloading ramp where large amounts of cargo can be stored quickly and safely. Similar safety advantages have now been gained in the loading process. It is now possible for those despatching cargo to bring it to the wharf ahead of time and stack it safely with adequate access for forklifts to use once the vessel docks.
- Safer loading and unloading for deck cargo. As well as cargo carried in the lower deck (which is unloaded via the loading ramp), items of cargo are often carried on the upper decks and unloaded manually or using ship-based derricks. Once passengers have disembarked, these cargo can now be safely unloaded over the side of the vessel and stacked on the expanded wharf area.
- Safer passenger waiting facilities. The construction of the passenger facilities means that a protected area is available for passengers and their families to await the vessel's arrival. The facilities include toilets and drinking water as well as seating and electric lighting. One corner is taken up by a office for the MMP staff who manage the harbour.
- Safer vehicle parking facilities. The greatly expanded area provides adequate and safe parking for the large number of vehicles that congregate to meet each vessel.
- Safer berthing for smaller vessels. Because of the number of outlying islands in the Ha'apai group, many people travel across large stretches of open water to reach Lifuka. It was reported that the presence of a safe, sheltered berth at the end of the journey has meant that more are prepared to undertake the sea passage in poorer weather conditions. Previously the inevitable risks of passage were compounded by the risks on arrival.

2.5 SUSTAINABILITY

2.5.1 Institutional

MOW construction capabilities. Construction of Pangai wharf by MOW led to the consolidation of construction skills. Since completion, MOW has constructed a jetty at

Ha'afeva, also in the Ha'apai group, to an acceptable standard. Marine construction capabilities are good but assistance in the area of quality control, through an independent adviser, is considered advisable for a few years.

On-going training for MOW staff. While the level of skills in wharf construction is currently high, it is important for those skills to be enhanced and passed on to new staff. No training plan exists within MOW to ensure this. Accessing funds for training will be difficult as there is no provision for training costs in the current budget.

Maintenance of facilities. There has been no regular maintenance of the facilities since construction finished. While maintenance requirements have been low so far, demands will increase and these will have to be addressed if the wharf is to remain functional in the longer term. Funding for maintenance activities is not sufficient at present. MMP estimate that it currently receives only about 40% of funds required for effective O&M of its facilities. This issue is complicated by the move towards corporatisation and the formation of a ports authority.

MMP's lack of O&M capabilities. The sustainability of the wharf is compromised by the lack of maintenance. MMP is responsible for operation and maintenance of port facilities but its staff have limited maintenance capabilities. A training needs analysis will identify areas needing attention.

2.5.2 Technical Issues

Harbour design. The harbour facilities were designed to meet the draft requirements of the vessels currently serving the Ha'apai region, the largest of which are the MV Olovaha and the TDS patrol boats. The design was also based on the present style of cargo handling. It is clear that the design has met these two requirements effectively. The MV Olovaha is likely to reach the limit of its economic life during the effective life of the harbour.

Corrosion. There is increasing evidence of corrosion of metalwork at the wharf. It is visible on the fabricated steelwork of the small boat jetty and the steel sheet piles of the wharf and breakwater, including the cell head. The project specification required that steelwork for the jetty be hot dipped galvanised and that the steel sheet piles be coated with a factory applied corrosion resistant coating. These requirements were complied with during the construction phase. Inevitably, during construction, some damage was sustained, and some on-site remedial action was required. The procedures adopted for this work are not certain, but it appears that the training given during the project in the repair of coatings was not followed. This is leading to unsightly corrosion on the structures. In addition, the facilities are subject to harsh environmental conditions that require regular maintenance to arrest corrosion. Failure to undertake this work will significantly reduce the effective life of the facilities. This requires immediate attention by MMP. It should be noted that no manuals aimed at post-project maintenance were prepared during the project.

Rock armour stability. No significant movements of the breakwater rocks due to wave action have been observed since project completion. However, stability has yet to be tested during a severe storm/cyclone. Any future damage should be identified and repaired quickly so that protection levels are maintained. Some damage was sustained to the revetment south of the boat ramp in March 1997 during Cyclone Hina. Repairs were carried out successfully by the MOW. Anecdotal data suggests that damage was caused by large waves entering the harbour, over-topping the bank and flushing out the finer filter material, causing revetment collapse. Better protection to the revetment system is required at this location.

Seabed levels. Regular survey of the seabed profile in the harbour area and channel is required to ensure that there is sufficient depth for the designed marine operations. The harbour has deliberately been left open at the south and north ends to facilitate tidal currents and flushing of associated sediment loads. However, some accumulation of sediment is inevitable and must be detected and dealt with before it becomes a constraint to operations. This is the responsibility of the MMP. In the past, survey work has been contracted to the TDS which undertakes hydrographic surveys. The TDS conducted a hydrographic survey of the harbour during November 1996 and confirmed that the harbour had been constructed to the design depth. No survey has been conducted since that time, but the TDS is planning to do so in the near future as part of its marine chart preparation.

2.6 KEY ISSUES AND LESSONS LEARNED

2.6.1 Conclusions

The project achieved almost all of its objectives. It was a highly successful development project and is considered a sound investment by Australia. The longer-term development impact of the project is likely to be substantial. The new facilities at Pangai provide significant improvement to sea transport infrastructure serving the Ha'apai group. The harbour meets the berthing needs of all vessels currently serving the region, with improved safety and ease of operation. The MOW received additional institutional strengthening in the area of wharf construction through both on-the-job-training and specially designed short courses, undertaken on site and in Australia. The project has wide support from target beneficiaries including the Governor of Ha'apai, the Ha'apai Development Committee, community groups, local businesses, and passengers and ships' crews.

Appropriate budget support will be needed to maintain the facility over the useful life of the harbour.

2.6.2 Key Issues and Lessons Learned

Technology transfer and supervision. The training provided to the MOW was effective in building skills in marine construction. MOW is increasingly competent to undertake such work. However, there is a need for specialist supervision to provide advice and expertise in design, construction techniques and quality. The project's training component did not address maintenance issues after completion. This is considered essential for effective asset management.

Maintenance. There are concerns over the ability of the MMP to provide the necessary maintenance for the harbour, both in terms of necessary skills and funding. The project design did not include provision for O&M training for MMP, or the preparation of a maintenance manual. These omissions are considered oversights. The ability of the responsible authority to maintain assets should be addressed at the design stage.

Training relevance. A comprehensive training program was provided during the project. Some of the courses were very relevant and built on skills within the MOW. However, training in some areas has not been utilised since project completion and more careful assessment of training needs is required. Examples include training in hydrographic surveys and diving.

3. SAMOA: FIRE SERVICE UPGRADE PROJECT

3.1 SUMMARY

3.1.1 Objectives and Scope

The goal of the project was to build a new fire station, equip it with fire fighting equipment and provide training for Fire Service personnel in order to establish an efficient and effective fire emergency service. The project was located in Apia.

Following a review of the project seven months after implementation, further inputs were proposed to strengthen the institutional capacity of the Fire Service. An outcome of this review was that the responsibility for the Fire Service was transferred from the Ministry of Transport to the Police and Prisons Department.

The total project costs were approximately AUD 3.4 million. The contribution by the Government of Australia (GOA) was approximately AUD 2.6 million and the Government of Samoa (GOS) contributed approximately AUD 0.8 million.

3.1.2 Implementation

The project was needed to provide an adequate fire protection service in Apia, the capital of Samoa. The initial request was for the supply of a new fire fighting vehicle to supplement the existing fleet of obsolete and unreliable vehicles.

An initial appraisal of the request indicated that the existing Fire Service had great difficulty in operating and maintaining any equipment. It was also clear that provision of new or replacement equipment would not adequately address the problem. It was considered that the assistance would be better delivered in the form of a complete project rather than the provision of new fire fighting equipment alone. The Samoan Government agreed to this approach and the request was modified accordingly.

The project consisted of the following four components:

- the supply of equipment and materials for the Fire Service;
- the design and construction of a new fire station;
- training and institutional development; and
- project management.

All these inputs have been completed satisfactorily and are being properly utilised. The training provided was appropriate and effective. Relevant components of the training have already been passed on to the first group of 14 new recruits.

3.1.3 Conclusions and Key Issues

This was a highly successful development project and is considered a sound investment by Australia. The project achieved all of its objectives. The project has assisted the Fire Service to improve the efficiency of its management, its operational procedures and the overall skill level of all personnel. It has also provided significantly upgraded facilities and equipment. The image of the Fire Service in the community has been significantly enhanced. Before commencement, it was generally regarded as an ineffective service and enjoyed little community confidence. Thus, the project was highly relevant to the needs of Samoa and it has had a very high impact. The new facilities have provided a focus for development of a highly motivated and disciplined group of Fire Service staff as well as auxiliary Fire Service members. An important factor in sustainability will be the availability of appropriate levels of recurrent cost funding.

Four key lessons were identified. They have applicability in Samoa and in other countries:

- **Project design.** Assumptions made in the training and institutional strengthening components of the project underestimated the difficulty of implementing change in a traditional island culture. Had a more realistic assessment been made of these difficulties at the design stage major changes in project implementation, with consequent delays, would not have been necessary;
- **Project review.** Prompt review of a project, as soon as difficulties become apparent, is vital. AusAID activated a review process in the first year of the project's life soon after difficulties were notified. There is no doubt that such early intervention contributed to a very successful project;
- **Twinning arrangements.** The project required significant rebuilding and transformation of the original Fire Service. The twinning arrangement with the Melbourne Metropolitan Fire Brigade (MMFB) was important in achieving significant structural and cultural changes in the organisation in a very short time. Funds should be provided to enable the twinning relationship to continue; and
- **Milestones.** At completion, agreement was reached on a number of milestones. This was an effective way of promoting sustainability and ensuring staff remained focussed on continuous improvement.

3.2 PROJECT DESCRIPTION

3.2.1. Introduction

The problems affecting the provision of an efficient and effective Fire Service in Samoa have been the object of a number of inspections and investigations. These included:

- the 1978 Clarkson report, a detailed study carried out with technical assistance from the New Zealand Government. Considerable efforts were made during the term of Chief Fire Officer Jahnke to implement the key recommendations of this report;
- the 1989 Austral Report, a report by the General Manager of Austral Specialised Vehicles (NZ) Ltd., containing detailed proposals to re-vitalise the Fire Service into an efficient and effective force; and
- the 1989 Cabinet Directive. This came out of the Austral Report and agreement was reached to form a Board to administer and upgrade the Fire Services in Samoa.

3.2.2 Rationale

Following these studies, in 1990 the Government of Samoa (GOS) made a request to the Government of Australia (GOA) to fund a fire fighting vehicle.

An initial appraisal indicated that the existing Fire Service was experiencing great difficulty in operating and maintaining any equipment. It was considered that assistance to the Fire Service would be better delivered in the form of a complete project in all aspects of the Fire Service. After two cyclones, which struck Samoa in 1990 and 1991, there little was left of the Fire Service in terms of its physical resources or operational ability. This situation provided the catalyst for the project. The project sought to address institutional, administrative, technical, building and equipment needs.

The GOS agreed to this approach and the request was modified accordingly.

3.2.3 Formulation

At project design it was recognised that considerable institutional strengthening of the Fire Service would be required. During discussions with GOS officials the possibility of transfer of the Fire Service to other departments or to existing services such as the Police and Prisons Department was canvassed. The decision was that the project should remain under the Ministry of Transport (MOT).

The Project Design Document (PDD) prepared by the Overseas Projects Corporation of Victoria (OPCV) did not include a separate component for institutional development. It did include a training component.

After the project had been operating for several months, it became apparent that the project design had not placed sufficient emphasis on the institutional aspects of the project. AusAID commissioned a review team which visited the project in March 1994. Their report was issued in September 1994. A number of changes were recommended to the project which sought to strengthen the institutional capacity of the Fire Service. In addition, the Fire Service was transferred to the Police and Prisons Department to be managed by the Commissioner of Police.

The review recommended a number of additional changes:

- further institutional development inputs;
- further training inputs;
- further equipment inputs;
- extension of the project completion date to one year after commissioning of the new Fire Station; and
- revisions to project management.

These additional inputs increased the cost of the project by approximately AUD 122,000 and extended the completion date to January 1996.

3.2.4 Objectives and Scope

The goal of the project was to establish an efficient and effective fire and emergency service in Samoa.

The key objective of the project was to upgrade the fire station and the fire fighting equipment, and to provide training for the fire fighting personnel.

The project consisted of the following four components:

- the supply of equipment for the new Fire Service;
- the design and construction of a new fire station;
- training and institutional development; and
- project management.

The GOA was to supply the inputs necessary for the achievement of the above objectives. The GOS was to provide land for the new fire station, fire fighting personnel and their salaries.

3.2.5 Project Cost

The total project costs were approximately AUD 3.4 million. The contribution by the GOA was approximately AUD 2.6 million. The GOS contributed AUD 0.8 million.

3.3 IMPLEMENTATION PERFORMANCE

3.3.1 Implementation Process

The following table presents a summary of progress in the project:

Date	Activity
February 1992	Project Design Document finalised
January 1993	Project commenced with inception visit by OPCV staff
August 1993	Long term training adviser commenced
April 1994	Project review completed
July 1994	Fire Service re-formed under Police and Prisons Department
July 1994	New Chief Fire Officer appointed
September 1994	Work commenced on construction of the new fire station
April 1995	New fire station occupied
August 1995	Long term training adviser concluded his assignment
November 1995	Final Project Coordinating Committee meeting (milestones agreed on)
January 1996	Project Completion Report
April 1996	Report of review on agreed milestones

3.3.2 Organisation and Management

The implementation of the project was the responsibility of the Managing Contractor, the Overseas Projects Corporation of Victoria (OPCV). In managing the project, OPCV worked in association with the Melbourne Metropolitan Fire Brigade (MMFB) and the Irwin Alsop Group (IAG). The executing authority within Samoa was the Ministry of Transport from August 1993 to June 1994, and the Police and Prisons Department from July 1994 to November 1995.

3.3.3 Project Completion

The project commenced in January 1993 and completion was 30 November 1995. The draft Project Completion Report (PCR) was submitted by the Managing Contractor in January 1996. Minor follow-up activity occurred during 1996 and 1997.

3.4 IMPACT ASSESSMENT

The impact of the project was achieved through a range of project inputs. In summary these included:

- provision of fire fighting equipment;
- training, both in Australia and in-country; and
- management support.

Specific areas of impact are discussed below.

3.4.1 Operational Performance

The project has assisted the Fire Service to improve the efficiency of its management, its operational procedures and the overall skill level of all personnel. It has also provided significantly upgraded facilities and equipment. The image of the Fire Service in the community has been significantly enhanced. Before commencement, it was generally regarded as an ineffective service and enjoyed little community confidence. There are many examples of ways in which the Fire Service has developed greater efficiency and effectiveness. These include the development of increased discipline within the Fire Service, a wider view of its role within the community and a greater emphasis on continuous training and maintenance/checking of equipment.

The Fire Service now employs 28 staff. This is a significant increase on the 12 staff employed before the project commenced. In addition, the number of auxiliary fire fighters has increased from 10 to 18. This increase in trained staff has significantly increased the Fire Service's capacity to meet its performance objectives.

During 1997, the Fire Service attended a total of 21 structural fires, 27 grass fires, 12 other incidents, six car fires, one call activated by a building alarm, one false alarm, 13 rubbish fires and three electrical pole fires.

3.4.2 Institutional Development

The Fire Service Upgrade Project sought to assist the Fire Service to move from the pre-project situation of being a Service that had great difficulty in operating and maintaining any equipment, to a modern, appropriately housed and equipped emergency service. In addition, it provided training in fire fighting techniques and established the discipline necessary for the Fire Service to provide a high level of emergency response. It also sought to develop an institutional capacity within the Service to continue to operate and maintain at high level of efficiency and effectiveness. The specific areas of impact of the project are discussed below.

Staff Training. The project has had significant impact in this area. A total of eight staff participated in specifically designed training in Australia. Two of these have since left the

Fire Service. A comprehensive in-country training program was also implemented. This training has ensured that the new fire fighting equipment could be effectively utilised.

New facilities. A new fire station was built and equipped. It is a focal point for a new and efficient Fire Service.

Re-forming of the Fire Service under the Commissioner of Police. After review, the responsibility for the Fire Service was transferred from the Ministry of Transport to the Police and Prisons Department. Key staff changes also took place at this time. This resulted in significant cultural changes within the Fire Service, including a higher level of discipline and increased motivation. Staff also achieved parity in pay scales with the police. These measures contributed to significant institutional development.

Strengthening links with the auxiliary fire fighters in the Fire Service. The project has strengthened the links between the 'permanent' Fire Service and the 'volunteer' auxiliary fire fighters. The two groups work very effectively in joint training exercises as well as in all operational matters. This has produced an overall service with greatly increased capacity to respond to a wide range of emergency situations in a very cost-effective way. When any emergency occurs, the Chief Fire Officer takes overall control of all emergency services that attend.

Extended area of response. The Fire Service has a responsibility to respond to calls for assistance within a five mile radius of Apia's centre. Its enhanced ability has enabled it to respond to calls for assistance outside this radius. It also responds to all calls for assistance on Upolo, mostly using auxiliary fire fighters as a first response team. It attended approximately ten calls from Upolo last year. Earlier this year, the Fire Service assisted with serious bushfires on Savai'i that had been burning out of control for a while. The first response was with a small unit and team. After two days a larger unit was used. This unit and its crew remained on the island for ten days to bring the fires under control.

Additional services to the community. The Fire Service now has the institutional capacity to provide a wide range of additional services to the community. These include:

- provision of community education in disaster prevention and disaster awareness;
- awareness raising amongst children, through provision of educational visits to the fire station;
- establishing and strengthening of safe practices in public buildings, through provision of an advisory service, assistance in preparation of emergency evacuation plans and other safety procedures, demonstrations and conduct of safety drills as well as 'hands on' training in the use of extinguishers and other fire safety equipment;
- checking plans of all proposed new building for compliance with fire safety requirements of the National Building Code (NBC);

- monitoring the handling and storage of hazardous marine cargo; and
- regular inspections of buildings within the Apia area to check on fire safety and the provision of advisory reports to building managers.

These contributions to greater community safety are discussed further in Section 3.4.7.

3.4.3 Operation and Maintenance

In general the operations capacity of the Fire Service is now greatly improved. This operational capacity is also greatly enhanced by the provision of up-to-date equipment. As an emergency service, an important part of its overall operational efficiency is its ability to maintain its equipment at optimum condition by continuous checking and testing. Records indicate that this has been occurring on an ongoing basis.

The project has provided a modern fire station which provides an effective base from which the Fire Service operates. This is well maintained by the Fire Service and is kept in clean condition. Its maintenance reflects the pride of the members of the new Fire Service. Some operational improvements to the station have been made since project completion. This includes the addition of extra windows to assist in the overall visual communication between work areas.

Another improvement is the ability of the Fire Service to ensure staff are fully proficient in the use of all equipment. The Fire Service regularly conducts drills with all staff, including auxiliary staff, to achieve this. However, limits on maintenance funding have at times restricted the ability of the Fire Service to achieve maximum impact in this area. For instance, in training drills, it is not possible to use foam chemicals because of the effect of such non-emergency use on operating costs. Staff only experience the use of foam in real fire situations. While this has some training benefit, the only way to ensure that staff can properly use foam in firefighting conditions is to use it in training. Doing this will build confidence in the use of specialised equipment. This was highlighted in the report of Review of Agreed Milestones, prepared by the Project Director during the follow-up visit after project completion. He observed that the officers of the Fire Service were able to demonstrate a range of skills in both a practical command exercise and during oral presentations. However, he commented that 'some of them still panic during a real emergency'. One way of addressing this quite reasonable outcome in an emergency service is to make the training as realistic as possible. The use of operating funds on non-emergency situations such as training is a necessary part of this process.

The Fire Service maintains good records on its operations. Inspection of the weekly and monthly reports prepared showed a systematic approach to record keeping and reporting.

3.4.4 Economic Impact

The main economic benefits of the project derive from:

- trained and effective staff both in numbers and quality;
- greater community awareness of fire prevention;
- improved response time; and
- improved access to fires, both in urban and rural areas.

While it is not possible to calculate the economic internal rate of return (EIRR) for the project because of difficulty in valuing social benefits, it is evident that there are substantial benefits being achieved.

In the longer-term the worth of these benefits is likely to increase further as a result of potential losses avoided as the Samoan economy continues to grow.

The greatest economic impact of the project is in Apia. In this area any reduction achieved in the incidence of fires or in the extent of loss for each event has much higher economic value than in the rural areas.

In the rural areas of Upolo and Savai'i there are likely to be lower, yet important economic benefits flowing from the project. Trained fire fighters undertake greater surveillance of fires. They now have more opportunities to interact with the rural community in preventing fires. The economic benefits through losses avoided in rural areas accrue from reduced losses to buildings, crops and livestock. In addition, there are important environmental benefits through reduction of forest fires resulting in losses to flora and fauna. Overall the economic impact of this project is considered very significant.

3.4.5 Environmental Impact

AusAID's *Environmental Assessment Guidelines, 1996*, were used in the evaluation of this project.

The increased level of training received by Fire Service staff has increased their awareness of hazardous materials and appropriate ways of handling them. In addition, the Fire Service is now equipped with a wider range of equipment for more effective handling of hazardous materials. The Fire Service has also introduced a number of initiatives that have impacted on the wider community. For instance, as discussed in Sections 3.4.2 and 3.4.7, there are a number of steps taken by the Fire Service that have reduced the level of environmental risk in Samoa.

3.4.6 Social and Gender

The goal of AusAID's gender and development policy for the infrastructure/institutional strengthening sector is to promote equal opportunities for women and men as participants and beneficiaries of development. The guiding questions listed in AusAID's current *Gender and Development Guidelines* were used in the evaluation of this project.

The creation of what is essentially a completely new Fire Service has had significant social impact. The community has far greater confidence in the ability of the organisation to provide an appropriate emergency response, and an increased awareness of fire safety issues through a range of public education activities. All new building plans, both commercial and domestic, are inspected and approved by the Fire Service. This heightens community awareness of fire safety in building construction. Routine inspections of buildings in the Apia area increases community awareness of building maintenance in fire safety.

The Fire Service has one female fire fighter and two female auxiliary fire fighters. All participate in regular training activities and attend emergency calls. The Fire Service itself has no restrictions on female fire fighters. However, there has been an historical reluctance on the part of women to apply to join. The female fire fighter has a high profile in the community. She assists the Fire Safety Officer in community education programs. It is likely that with such a successful role model female applicants will increase.

3.4.7 Occupational Health and Safety

Community aspects. The project has had considerable impact on OHS both in the community and within the Fire Service. Overall, the community now has a Fire Service that is well trained and equipped to handle the full range of fires that are likely to occur. In addition, community education and awareness raising is vigorously carried out. For example, during the evaluation visit, the Fire Service established and manned a public display as part of Apia's Disaster Awareness Week. The Fire Service also participates in joint training exercises with other emergency services in Samoa. These were introduced during the project. The evaluation team also witnessed the testing of a tsunami scenario. Two international advisers in disaster preparedness evaluated the test. A report is awaited but initial verbal feedback from the advisers on the Fire Service's response is very favourable.

Awareness raising amongst children. School groups are actively encouraged to arrange visits to the fire station. An education program has been developed to specifically cater for these groups. This will, over a period of time, have considerable impact on community safety.

Staff in public buildings. The Fire Service also assists in strengthening safe practices within the community. It does this through an advisory service to hotels and offices to assist with preparation of evacuation plans and other safety procedures. Fire Service staff also attend and advise when the practical drills of these procedures are carried out. Demonstrations and 'hands-on' training in the use of extinguishers and other fire safety equipment are provided to staff of these establishments.

Handling of hazardous materials. The MOT now notifies the Fire Service of the arrival of ships carrying hazardous materials. Inspections are carried out to ensure risk is minimised in cargo handling and storage. This also assists the Fire Service with useful background knowledge should they be called out to an emergency at the port. Further, the Fire Service is able to track the movement of the materials within Samoa and identify the ultimate location for possible future reference.

Regular building inspections. Regular inspections of premises are carried-out within the service's area of operation. Apia has been divided into three areas for inspection. Each shift is now responsible for building inspections and pre-fire planning. In this work they are required to list all the major buildings in their area and prepare a priority list according to life safety risks. The aim is to inspect all risks every twelve months. The shifts rotate their responsibilities every year so that each firefighter actually visits every fire risk in Apia and the surrounding district over a period of three years. Where deficiencies in preparedness are noted, a written report is provided to the property owner/manager/operator. This process highlights the usefulness of careful prior preparation. This was missing pre-project.

Safer operating procedures. Within the Fire Service work practices now reflect safer procedures. These are documented in Standard Operating Procedures (SOPs). They reflect standardised procedures for handling different forms of emergencies and these are then practised at regular weekly drills. The procedures also include the designation of appropriate protective clothing for different situations.

3.5 SUSTAINABILITY

3.5.1 Institutional

The Fire Service Upgrade Project has rebuild an organisation that was not functioning effectively. Reports prepared during the project highlight the difficulties faced in maintaining capability in the old Fire Service. In addition, the Australian advisers operated in the newly constructed facilities for only eight months. Given this, the achievements of the project in reaching such a high operational standard are remarkable. It is vital that the gains that have been made are sustained and that further development continues to occur in the organisation. Two previous attempts since the 1950s, funded by another donor, to develop sustainability within the Fire Service, were not successful. What has been achieved in this project is more visible than any previous attempt. It is a

tribute to the work of the GOS, the staff of the 'new' Fire Service, and the project staff including the twinning organisation, the MMFB. To maintain these benefits requires deliberate measures discussed below.

Twinning arrangement. An effective twinning arrangement was established during the project with the MMFB. Under this arrangement, staff from MMFB conducted specific specialised training in Samoa. Samoans were attached to the MMFB. Organisational assistance and supporting documents were also made available to assist the Fire Service. These documents were of great assistance in establishing benchmarks and understanding the issues. For example, the manager of the Airport Fire Service at Faleolo and the Chief Fire Officer were seeking to develop joint operating procedures at the main airport. Through the twinning arrangement, a copy of the Melbourne Airport procedures was provided to the Fire Service. This greatly assisted their understanding of general airport procedures and the preparation of the emergency plan for Faigali airport. Without this outside support the task would have been much more difficult and possibly outside the ability of the Fire Service to achieve.

Since project completion no exchange of staff has occurred with the MMFB because of lack of funding. The Service needs to ensure that such exchanges are not seen as an 'optional extra' but a necessary part of its continued efficient operation. This would ensure that there are regular and frequent opportunities for the testing of the Fire Service's practices and procedures against international standards. A number of services within Australia or New Zealand could provide effective support. However, there would be benefits in capitalising on the good links already established with MMFB.

Establishment of milestones and an annual review process. At the final PCC meeting, a number of milestones were proposed and agreed on. These were improvements and goals to be reached by the Fire Service in the period after project completion. Additional funding was provided by the GOA to undertake some of these improvements. However, of greater significance was the generation of a response within the organisation to a defined need for improvement. A follow-up visit was arranged for April 1996 and a report issued to provide feedback on achievement of the milestones. This proved a successful strategy. The review report suggested a similar annual review of the Fire Service at which further milestones would be agreed on. These would be followed-up at the subsequent annual review when new milestones for the next twelve months would be agreed on. The review recommended that such an approach should continue at least until there was satisfactory evidence that the Fire Service was able to function effectively and efficiently in its own right. Given the difficulty of sustaining the high level of improvement already achieved, such an approach is supported.

Fire Service Advisory Committee. This committee was established under the project to create a link and support between the business community and the new Fire Service. Fire Orders, which came into effect in April 1998, formalised the concept and the name has been promulgated as the Fire Service Board. Such a board has the full support of the

Police Commissioner and the Chief Fire Officer. It could play a valuable role as a legitimate watch-dog for the community to ensure the long-term sustainability of the Fire Service. It could also enable the direction of the Fire Service to be monitored and any initiatives proposed to be subject to some form of review. The Board has yet to meet. It needs to be activated without delay to ensure community confidence is maintained and sustainability improved.

Public sector reform. Samoa has embarked on a major program of public sector reform. This has the potential to increase autonomy within line ministries, with significant changes in processes concerning recurrent cost funding and revenue retention. The Fire Service is already generating some funds through fees collected for checking plans of all proposed new buildings for compliance with the NBC. Funds are also generated through the provision of training support as well as an advisory service on fire safety to commercial and public buildings. These funds are currently returned to government revenue. While the pace of change is not known, revenue retention is likely to be implemented in some areas of public sector operations in the next two to three years. In addition, line ministries will be judged against performance measures during the annual budgetary process. The Fire Service is preparing a strategic plan which will establish suitable performance targets for the next few years. Managed properly, this form of planning could have a positive impact on the ability of the Fire Service to establish its needs for funds in the revised budgetary process.

Forward estimates. The GOS is actively considering the introduction of a forward estimates approach to departmental budgets. Provided the Fire Service prepares a well researched plan to cover the expensive project items such as fire appliances, this forward estimates approach should be of major benefit to the Fire Service.

Budget delegation. Currently, under Treasury procedures, the Chief Fire Officer can only recommend expenditure within the Fire Service. Approval must then be sought from the Police Commissioner. A high degree of co-operation exists between these two senior officers. However, the efficiency and effectiveness of the Fire Service would be enhanced if the Chief Fire Officer was given delegated authority to approve expenditure within the approved budget of the Fire Service.

Year 2000 compliance. AusAID is presently seeking certification from the Managing Contractor that all equipment supplied is Year 2000 compliant.

3.5.2 Technical Issues

Design of facilities. There were a number of features of the original design of the fire station that restricted the efficient use of the facilities. Some of these were defined during the early months of operation. Major changes, such as installation of fixed windows and air-conditioning in the training room to cut down traffic noise and increase its effectiveness for training, were rectified with Australian funding. Some additional

internal windows in key offices, which improved communication within the building, were also provided with GOA funding. During the period immediately following project completion, problems were experienced with site drainage. These were rectified using Fire Service labour. After the station had been in operation for a while staff reviewed their ability to manage the operation and security of the facility with minimum staffing levels. This is of great importance when some staff are out on a fire call. This review resulted in a need for further internal windows. This work was carried out by the Fire Service utilising volunteer labour (often supplied by members of the auxiliary) and at minimal cost. The resourcefulness and initiative of staff in planning and carrying out these modifications is commendable.

Modifications to fire appliances. After operating the main fire appliance supplied under the project for some time it became apparent that some features were not optimal for conditions being experienced. Unfortunately, the appliance was subsequently involved in an accident where it was rolled. The Fire Service took the opportunity provided by the accident to rebuild the vehicle in a modified way so that it met their needs more effectively. This included shifting the location of the main pump and re-positioning other equipment so that it could be manned and monitored more effectively by the crew. This process improved the usefulness of the vehicle. It also engendered a greater pride in its continued maintenance. Other, older appliances that were in use before the project and which were essentially obsolete, have also been modified. This has increased the size and effectiveness of the vehicle fleet. All these modifications were funded from within the Fire Service.

Additional equipment. Since project completion, the Fire Service has been pro-active in the procurement of additional equipment. Some of this equipment, such as Hurst Air Bags and 'jaws of life' equipment, were funded by the UK Government. A portable pump was obtained with the support of the New Zealand Government. Further items, such as replacement uniforms, new ropes and thirty replacement hoses were recently purchased from within the Fire Service budget as part of a normal replacement policy. This indicates a high level of initiative, enthusiasm and motivation within the Fire Service which augers well for sustainability.

3.6 KEY ISSUES AND LESSONS LEARNED

3.6.1 Conclusions

This was a highly successful development project and is considered a sound investment by Australia. Despite the size of the task and the difficulties faced during implementation, it was able to achieve all of its objectives. The project has assisted the Fire Service to improve the efficiency of its management, its operational procedures and the overall skill level of all personnel. It has also provided significantly upgraded facilities and equipment. The image of the Fire Service in the community has been greatly enhanced. Before commencement, it was generally regarded as an ineffective Fire Service

and enjoyed little community confidence. Thus, the project was highly relevant to the needs of Samoa and it has had a very high impact. The new facilities have provided a focus for development of a disciplined and highly motivated group of Fire Service staff as well as auxiliary Fire Service members.

3.6.2 Key Issues and Lessons Learned

Project design. The PCR reported that a number of assumptions in the project design underestimated the difficulty of implementing change in a traditional island culture. Had a more realistic assessment been made of these difficulties major changes in project implementation, with consequent delays, could have been avoided.

Project Review. Soon after the arrival of the long-term training adviser it became apparent that some changes to the design was necessary. In early 1994 a decision was made by the GOA to conduct a review of the project design. Some form of review had been included in the project design but it had not been planned at such an early stage of project implementation. The review was completed in April 1994 and a number of recommendations were made, particularly with respect to the institutional strengthening activities. Central to these recommendations was the transfer of the Fire Service to the Police and Prisons Department under the control of the Police Commissioner. In addition, it included the recruitment of new staff and the provision of additional project visits by the Project Director and short-term training advisers. This early intervention contributed significantly to the success of the project.

Twinning arrangements. The twinning arrangement with MMFB was significant in achieving major changes in a very short time. The project required significant rebuilding of the pre-project organisation. Institutional development is a difficult task. It is even more difficult when the organisation is also required to develop an effective and efficient emergency response capability. Change in individuals is more effectively achieved when the desired behaviour can be modelled. One way of achieving organisational change is for all the individuals in the organisation to see an effective model for them individually as well as an organisational model. Twinning arrangements are a very cost-effective way of achieving this. Funds should be provided in the Fire Service's budget to continue the twinning arrangement with MMFB.

Milestones. Milestones were used as a very effective tool to assist in organisational capacity building. Agreeing on milestones for recipient government staff to achieve soon after project completion can be an effective way of promoting sustainability.

4. SAMOA: PUBLIC WORKS DEPARTMENT BUILDING INSPECTION UNIT STRENGTHENING PROJECT

4.1 SUMMARY

4.1.1 Objectives and Scope

The goal of the project was to reduce the extent of injury and material loss in Samoa resulting from natural disasters such as cyclones and earthquakes. The purposes of the project were:

- to develop and strengthen the institutional capabilities of the Building Inspection Unit (BIU) within the Building Division of the Public Works Department (PWD), and
- to assist PWD efforts to ensure that construction and reconstruction of buildings, including primary schools, adhered to appropriate building standards to resist cyclone/earthquake damage.

These objectives were addressed through the provision of advisers, training programs, public awareness campaigns about the National Building Code, and the distribution of a Home Building Manual. This manual aimed to assist the understanding by builders of the NBC and to demonstrate the use of cyclone resistant techniques and materials. During the project, this was focussed mainly on primary school reconstruction and retro-fitting.

The total project costs were approximately AUD 2 million. The overall Australian contribution was approximately AUD 1.2 million (direct project funding of AUD 0.8 million and an estimated value of AUD 0.4 million for the volunteer Rotary teams). The Samoan contribution was approximately AUD 0.8 million. There was also related funding provided by the GOA prior to commencement of this project of AUD 2 million for building materials used in rebuilding of the primary schools damaged in the cyclones of 1990 and 1991.

4.1.2 Implementation

The project was very relevant. Following the devastating cyclones in 1990-91, a large number of buildings had to be rebuilt. These included residential, commercial, religious, community and educational buildings. The GOA donated approximately AUD 2 million in August 1992 which was used for the purchase of building materials to assist in the reconstruction of primary schools. It became clear that rebuilding was only part of the need, and that the project should also include increased security against similar environmental conditions.

The design for the BIU Strengthening Project was prepared in 1992. Implementation followed between November, 1992 and December 1996.

Two components were undertaken. The first was appropriate institutional strengthening of the BIU of the PWD. The second comprised retro-fitting Samoa's primary schools to a standard to provide increased protection against cyclones and earthquakes.

4.1.3 Conclusions and Key Issues

The project achieved almost all of its objectives. It is considered a highly successful development project and a worthwhile investment by Australia. Provided that adequate recurrent cost funding is available, the project is likely to be sustainable, and its long-term development impact is expected to be very substantial. The BIU is now a well-trained unit within the PWD. In addition, it fulfils the role of ensuring that that buildings are designed and constructed to the requirements of the NBC. The public awareness campaigns were very successful. The project succeeded in retro-fitting 134 primary schools to a standard ensuring increased protection against cyclones and earthquakes. This involved extensive community participation and labour provided by Rotary Australia. Overall, the project is likely to generate very substantial economic and social benefits through potential losses avoided compared with the pre-project situation.

A key factor in sustainability will be the availability of appropriate levels of recurrent cost funding.

Four key lessons were identified. They have applicability to other projects in Samoa and other similar countries in the South Pacific:

- the project involved significant community participation. This assisted in raising awareness of the need for stronger buildings and enabled technology transfer to occur;
- equipment provided by the project for specific long-term functions should not be deployed to other areas;
- funding for the six building inspector positions in the project design is not currently available. If the BIU is to function efficiently, a full complement of inspectors is required. Budget should be made available and recruitment started; and
- for training provided under the project to be sustainable, there needs to be budgetary provision for training upgrades.

4.2 PROJECT DESCRIPTION

4.2.1. Introduction

Samoa lies within the South Pacific's cyclone belt. It experiences severe weather from cyclonic activity with risks to human life and property. Such weather conditions is expected between November and April. Severe cyclones were experienced in 1990 and 1991 (Cyclones Ofa and Val respectively), which lead to significant property damage, particularly on the island of Savai'i. Each caused 16 deaths and numerous injuries.

4.2.2 Rationale

The project was essential to help reduce loss of lives and property damage resulting from cyclones and earthquakes. One significant way of doing this was through improved building inspection procedures. Prior to project implementation, there was little public confidence in the building permit system. The lack of appropriately trained and skilled staff, primarily Building Inspectors, was the main constraint. The project attempted to provide increased capabilities in the area of building inspection. This was done through the placement of qualified Australian building surveyors/inspectors to work within the PWD's Building Inspection Unit (BIU). In parallel to this capacity building program, a practical program of cyclone-proofing primary schools was undertaken. This involved extensive community participation since the responsibility for school maintenance and management is vested in local communities.

Because procurement of materials was not within the financial resources of the communities arrangements were made for the necessary materials to be provided by the project.

4.2.3 Formulation

Following a request from AusAID in May 1992, the project design was prepared by the Overseas Service Bureau (OSB) between May and August 1992. OSB was subsequently engaged for project implementation in November 1992. The original project cost was estimated around AUD 0.589 million with a scheduled completion date of 1 July, 1995.

An extension to June 1996 was approved in February 1995 due to delays in PWD staff recruitment and delays in the procurement of construction materials. The project cost was increased to AUD 0.705 million. Two further contract amendments were issued (August, 1995 and May, 1996), allowing additional retro-fitting work to be carried out in schools not included initially. Project completion was set for March 1997 with a revised project cost of AUD 0.825 million. The total economic cost of providing volunteers through Rotary Australia is estimated to be approximately AUD 0.4 million.

4.2.4 Objectives and Scope

The goal of the project was to reduce the extent of injury and material loss in Samoa resulting from natural disasters such as cyclones and earthquakes. The purposes of the project were:

Objective 1. To develop and strengthen the institutional capabilities of the BIU within the Building Division of the PWD.

Objective 2. To assist PWD efforts to ensure that construction and reconstruction of buildings, including primary schools, adheres to appropriate building standards to resist cyclone/earthquake damage.

Objective 1 was satisfied by:

- provision of an enhanced complement of BIU staff;
- adoption of revised work practices within the BIU;
- preparation of building inspection work schedules;
- generation of a close working relationship between the Australian project staff and their BIU counterparts;
- creation of increased awareness of stakeholders regarding construction techniques and technology required to resist cyclone/earthquake damage;
- increased BIU office efficiency through the introduction of a computerised information storage/retrieval system;
- enhancement of Building Inspectors' skills through a comprehensive training program, including attendance on the Advanced Building in Domestic Construction course at the Polytechnic College an Apia; and
- preparation of user-friendly handbooks and demonstration models for trade/community education purposes.

Objective 2 was satisfied by:

- retro-fitting 134 primary schools to demonstrate the appropriate use of cyclone/earthquake resistant techniques and materials;
- production of the free *Fale Mautu* bilingual booklet providing advice on the role of the BIU and of the new building code and techniques;
- production of the free *Sima Lelei* bilingual booklet providing advice on improved concrete preparation and the role of the BIU;
- technical advice and assistance to local communities through on-site inspections of buildings under construction;
- improved building inspection services throughout Samoa; and
- greater awareness of safe building techniques.

4.2.5 Project Cost

The total project costs were approximately AUD 2 million. The overall Australian contribution was approximately AUD 1.2 million (direct project funding of AUD 0.8 million and an estimated value of AUD 0.4 million for the volunteer Rotary teams). The Samoan contribution was approximately AUD 0.8 million. There was also related funding provided by the GOA prior to commencement of this project of AUD 2 million for building materials used in rebuilding of the primary schools damaged in the cyclones of 1990 and 1991.

4.3 IMPLEMENTATION PERFORMANCE

4.3.1 Implementation Process

The project began in November 1992 with Team Leader mobilisation to Samoa. He was joined by the second team member in early 1993. During these initial months project planning was undertaken. Building inspector training commenced in July 1993, and the first project-trained Senior Building Inspector was appointed in May 1994. The second followed in June 1994. The project team reached full strength in September 1994 with the arrival of two more team members.

Procurement of essential materials commenced in April 1994 following survey of the schools reconstructed with the initial AUD 2 million grant following the cyclones. Materials identification was undertaken by the project and procurement was the responsibility of the Commodity Assistance Support Program (CASP).

Retro-fitting schools (95 initially) started in January 1995 after the arrival of materials procured under CASP.

Volunteers from Rotary Australia assisted reconstruction. In total, 26 teams were provided at no cost to the project. This greatly increased the exposure of the project across a wide range of communities in Samoa. It also helped raise the profile of the work of the BIU as an advisory service, in addition to its regulatory and enforcement duties.

Community involvement was assisted with the production and free distribution of user friendly information booklets on construction methods and techniques.

AusAID agreed to extend the project in January 1996 to include those schools not previously included in the project. This added a further 39 schools to the program, giving a total of 134. Almost every primary school in Samoa participated in the project.

The project was completed in December 1996 and the Project Completion Report (PCR) was finalised and approved in October 1997.

4.3.2 Organisation and Management

The Overseas Service Bureau (OSB) managed the project from its office in Melbourne. The PWD was responsible for implementing the local components of the project. Strategic policy issues affecting the project were discussed by a Project Coordinating Committee (PCC) which met at six monthly intervals through the life of the project.

4.3.3 Project Completion

The project was completed in December 1996 and the PCR was finalised and approved in October 1997. The project took four years to implement.

4.4 IMPACT ASSESSMENT

The project has made a significant impact on the overall construction techniques through the production of two booklets. The first set out safer construction practices and the second described techniques for producing better concrete. Both are available to the community at no cost. The strengthening of the BIU has also enabled more effective and efficient implementation of the NBC. Specific areas of impact are discussed below.

4.4.1 Operational Performance

The project has greatly assisted the BIU to improve the efficiency of its management and implementation of the building approvals process. Training has increased the skills base of the inspectors and the unit has increased in size to meet the demand for building approval. There is now a generally increased community awareness of the importance of complying with the provisions of the NBC and a greater awareness of cyclone-proof building techniques. The standard of building construction has improved through the implementation of the project.

The unit size was increased to four Building Inspectors and two Senior Building Inspectors to cater for the expected increase in building permit applications.

Work procedures. The project introduced significant changes in the way the building permit process is managed. The Building Inspectors are fully familiar with these and apply them on a daily basis. No modifications to the procedures and forms introduced have been made since project completion although the unit has prepared a form used during inspections for the inspectors to summarise daily activities. The computerised information storage and retrieval system introduced by the project is working well and is used to generate reports on applications on a regular basis. The system tracks the register number of applications, the number of permits granted and the number of buildings constructed without a permit. All applications are reviewed by the Fire Service. Recommendations are made to ensure conformity with the provisions of the NBC in respect of fire safety. These are passed to the BIU prior to building permit issue.

The project design sought to equip the BIU for a dual role as advisers in respect of the requirements for safer building and enforcers of the provisions of the NBC. It is clear that both roles are still performed although the advisory role is diminishing as the level of expertise within the building fraternity increases. Advice is given on-demand to owners of older houses seeking to ensure that their properties are strong enough to withstand cyclone conditions. On a typical site inspection visit advice to up to ten owners of houses is given. This is contributing to the retro-fitting of the existing housing stock.

Safer construction awareness. The two project components have worked together to raise the general level of awareness and benefits of safer building construction. This has been achieved through the public education campaigns conducted during the project, the practical work undertaken during the primary schools retro-fitting, and advice given

by Building Inspectors. It is reported that the level of awareness is now developed to the point where builders adopt safer construction techniques as a matter of course. The building permit application process provides the official check on this. The two free bilingual booklets prepared by the project, *Fale Mautu* and *Sima Lelei*, have been widely distributed and are recognised as appropriate guidelines for safer construction. They also provide advice on the role of the BIU, raising the unit's profile. The demonstration models prepared are still being used and are part of the equipment carried by inspectors to support their advisory role. However, due to the increase in awareness of appropriate construction techniques, there is diminishing need for their use.

All new building construction should now conform to the NBC. The BIU estimates that 80% of all building now comply with the requirements of the NBC. In cases where building work is undertaken without a building permit, Building Inspectors issue a stop work order on site, prohibiting further work until a permit is granted (refer to discussion below on the status of the NBC). Increasingly, insurance companies are becoming part of this process, requiring proof of conformity before cover is issued.

On occasions, design and construction issues fall outside the expertise of the inspectors. The unit has access to more specialised engineering advice as required.

Cyclone-proof primary schools. Most primary schools in Samoa suffered damage during the cyclones of 1990 and 1991. While rebuilding was commenced before the project, in general it was not undertaken to standards sufficient to ensure that similar devastation could be avoided. The project provided materials and expertise to provide cyclone safe primary schools across the country. A total of 134 schools participated in the project. The process involved initial inspections, which identified the measures required, followed by procurement of necessary materials. Some delay occurred in importing materials. Procurement was undertaken through the CASP process. Retro-fitting work was undertaken by each school community under the supervision of the project staff and Building Inspectors. Rotary Australia provided 26 teams of volunteers to assist the building process. Apart from assisting construction, it also enabled enhancement of cross-cultural understanding between the people of Samoa and Australia.

In Samoa, the village schools provide an important community focus. The provision of safer school buildings provides a haven during cyclones. Since project completion some schools have undertaken additional safety work utilising methods learned during the project.

4.4.2 Institutional Development

Human resources development. The BIU comprises two inspection teams, each with a Senior Building Inspector and two Building Inspectors. They report to the Chief Building Inspector who is responsible to the Assistant Building Director. The skills of the unit were significantly enhanced by the project through on-the-job training and

lectures/seminars conducted by the project advisers. The inspectors were involved in the primary schools retro-fitting program and undertook formal studies at the Polytechnic College in Apia, attending the Advanced Building in Domestic Construction course. This improved their understanding of NBC. In addition, it upgraded their skills in identifying construction faults, interpretation of house building plans, environmental issues, and report writing. Inspectors also attended a basic computer familiarisation course.

Since project completion no new training has been possible due to lack of funding. While skill levels are currently sufficient for the operation of the unit, this is a concern for the future.

National Building Code. At the time of the project design, it was assumed that legislation of the NBC, developed with assistance from New Zealand, would occur. This is yet to eventuate. It is clear that most building construction now conforms to code requirements, essentially on a voluntary basis. This is a testament to the impact of the project's work in raising awareness of the benefits of safer construction. However, until the code is passed into legislation, there is no legal basis for its adoption. This could place the BIU in an untenable position, insisting on compliance without the power of the law to support its work. To date this has not caused any problems. A more concerted effort is required by the Ministry to resolve this issue.

4.4.3 Operation and Maintenance

In general, the operations capacity of the BIU has greatly improved through the project. The unit is now able to undertake inspection work efficiently. This has been possible through better systems and procedures, and better record keeping on applications, surveys, inspection results and permits.

Equipment. Being mainly an institutional strengthening project equipment procurement was small. The only significant equipment provision was three Toyota Hilux vehicles equipped with radios. These vehicles were to assist the unit's mobility in undertaking its duties across the country, including the island of Savai'i. This is currently compromised as only one vehicle remains assigned to the BIU, the two others being utilised for other duties within PWD. There is a general shortage of vehicles within PWD. Vehicle shortage is limiting the number of site visits and decreasing operational efficiency of the unit. In addition, currently none of the Building Inspectors are authorised to drive PWD vehicles. The BIU would operate more efficiently if the project vehicles were returned to the BIU.

Maintenance of the vehicles is carried out by the PWD. The vehicles are reported to be in good running order. No provision for replacement has been made.

Building permit fees. The BIU charges builders/owners for the building permit process. This process existed before the project, but the ease of collection of fees has increased as the community has become aware of the BIU's role. There is a set scale of fees, with sums payable increasing for expensive properties. The fees do not cover the actual cost of service provision, particularly when extensive travel is required to visit the site, which may be on another island. This situation is exacerbated when multiple visits are needed during various stages of construction. Current Treasury policy supports application of a realistic fee-for-service approach.

4.4.4 Economic Impact

Compared to the without project situation, the community acceptance of the NBC has considerable potential to reduce economic and social losses over the longer term. Constructing stronger buildings reduces property damage, loss of life and injuries during cyclones and earthquakes.

Apart from economic losses avoided, there are far reaching social benefits. Throughout history, cyclone damage has been an inevitable feature of life in Samoa. It is estimated that Cyclone Val caused over USD 368 million in damage. It was the most devastating cyclone to hit the Samoan islands for over 100 years. Samoa lies in the South Pacific cyclone belt which experiences an average of 10 cyclones per year. Severe cyclones are more likely during strong El Nino activity when the risk of cyclones in the Samoa/Cook Islands region increases by 70%. The last cyclone season (1997/98) lasted a record 208 days with 15 cyclones in the region, 8 of which reached hurricane force. The most significant to strike Samoa during the season was Cyclone Tui which passed over Savai'i on the night of 26th January, 1998 causing minor crop damage and one death.

While it not possible to calculate the project's economic internal rate of return (EIRR) because of lack of quantitative data, it is evident that there are significant potential economic and social benefits through losses avoided during cyclones and earthquakes. If it is assumed that, say, only a modest 50% of new buildings conform to the NBC, and that the economic and social losses avoided for those buildings are, say, a modest 10% less compared with the without project situation, then the benefits of the project are still considered very significant. The value of these economic and social benefits will continue to rise with the longer-term economic growth of Samoa.

4.4.5 Environmental Impact

AusAID's *Environmental Assessment Guidelines, 1996,* were used in the evaluation of this project.

The project has no adverse impact on the environment. On-the-job training was provided to the inspectors on environmental issues associated with building construction. Sand mining is conducted locally and permits have to be obtained to do this. The inspectors keep a watching brief to ensure that sand mining does not occur

without the necessary permits being issued. Disposal of building waste is monitored although it is not a major problem. The vast majority of items are reused/recycled by the community. Items such as plastic, containers, tins, strapping and wood and metal off-cuts are highly valued.

The NBC describes provision for the disposal of residential sewage, usually undertaken through pit latrines or septic tank systems. Inspectors are familiar with these requirements. With an increasing number of buildings complying, the impact of discharges to the environment will be reduced.

4.4.6 Social and Gender

The goal of AusAID's gender and development policy for the infrastructure/institutional strengthening sector is to promote equal opportunities for women and men as participants and beneficiaries of development. The guiding questions listed in AusAID's current *Gender and Development Guidelines* were used in the evaluation of this project.

While there is an historical bias towards males in participation in technical areas of work, there is no formal discrimination against women in employment. All of the inspectors engaged by the BIU are male. The position of plans clerk within the unit was originally filled by a female but she has recently resigned. A replacement, also female, has been recruited. Construction work at the schools was undertaken predominantly by males, along traditional Samoan lines.

The retro-fitted schools now provide a secure community facility of benefit to all. However, they are of particular value to those needing more protection, the elderly, the young and women, who have prime responsibility as care-givers in families. This is a significant improvement compared with the without project situation. In the long-term this project is likely to provide substantial benefits to women because of the number of schools assisted.

4.4.7 Occupational Health and Safety

Informal training in safe working practices was provided to the Building Inspectors by the Australian advisers. During site inspections, the Building Inspectors offer advice to builders if they see scope for improvement of work practices. The OHS risks associated with home building are low.

4.5 SUSTAINABILITY

4.5.1 Institutional

Legislation of NBC. This has been described in Section 4.4.2. While there is a general acceptance within Samoa that the code's principles are sound, there is no legal

framework for enforcement. This situation threatens the sustainability of the BIU's work. A renewed effort aimed at legislation of the NBC is needed to strengthen the potential long-term sustainability of the project.

Public sector reform. Samoa has embarked on a major program of public sector reform. This has the potential to increase autonomy within line ministries, with significant changes in processes concerning recurrent cost funding. It is expected to move relatively quickly and may impact on public sector operations in the next two to three years. Line ministries will be judged against performance measures during the annual budgetary process. Revenue retention is likely to be implemented in some areas. Managed properly, this could have a positive impact on the BIU.

Recurrent cost funding. The budget for operation of the BIU is considered adequate for its current level of operation. However, currently two positions are not filled, one for a Building Inspector and the other for a Senior Building Inspector. The current budget has no provision for funding these positions. The public service is facing problems of funding and therefore it is likely that the unit will remain below full strength.

On-going training of BIU staff. While the level of skills is considered sufficient it is important that these skills be enhanced and passed on to new staff. There has been no training undertaken since the project finished and no training plan exists to facilitate this should funding become available. This is a concern for the future sustainability of the unit.

Equipment replacement provision. While the procurement of operational equipment was a minor part of the project, it is vital that this equipment is replaced when it reaches the end of its design life. Provision must be made to finance such purchases. The main items are the three BIU vehicles and the computer used for the unit's database.

4.5.2 Technical Issues

Mobility of inspectors. Given the travel requirements of the unit, it is essential that the availability of transport is not a constraint. Three appropriately equipped vehicles were provided by the project to assist the unit's work, both during the project and after completion. All vehicles were equipped with a radio which is regarded as essential in the execution of the BIU's duties. Most commonly, radio communication with base is used to check the status of building permit applications. This enables on the spot decision. The current situation, where only one vehicle remains with the BIU, limits its capacity to undertake its duties. Steps must be taken to ensure that the full complement of vehicles is restored to the BIU. The staffing of the BIU, whilst not perfect, is sufficient to field a number of inspection teams simultaneously.

Loss of staff to other employment. Current staff of BIU benefited from the training provided by the project. This has increased their marketability since private sector salaries are higher. Loss of experienced staff to other employment must be considered when addressing the provision of satisfying working environment for employees. The status of the BIU, promotion opportunities, on-going training opportunities and provision of tools for the job (eg. vehicles) all play a part in helping retain staff. The unit has considerable investment in its staff and must do all possible to retain them.

4.6 KEY ISSUES AND LESSONS LEARNED

4.6.1 Conclusions

The project achieved almost all of its objectives. It is considered a highly successful development project and a worthwhile investment by Australia. Provided that adequate recurrent cost funding is available, the project is likely to be sustainable and its long-term development impact very substantial. The BIU is now a well-trained unit within the PWD and fulfils its role of ensuring that buildings are designed and constructed according to the NBC. Due to the public awareness campaigns the BIU's role and the methods for responsible building construction are well understood by the community. The project succeeded in retro-fitting 134 primary schools to a standard ensuring protection against cyclones and earthquakes. This involved extensive community participation and additional labour was provided by Rotary Australia. Overall, the project is likely to generate substantial economic and social benefits through potential losses avoided compared with the pre-project situation.

4.6.2 Key Issues and Lessons Learned

Effective community participation. The project demonstrated benefits in effective community participation. Not only were school communities actively involved in the retro-fitting work at primary schools, but a high level of technology transfer was also achieved. This increased community awareness of the need for better constructed buildings to resist cyclones and helped improve the skills of local tradespersons. Working in conjunction with the BIU also raised the profile of the unit and its role in the building inspection/permit system.

Retention of project equipment. The project was designed with both implementation and the longer-term operation of the BIU in mind. Accordingly, three vehicles, equipped with two way radios were provided by Australia. Only one vehicle remains with the BIU and this is a constraint to the effective operation of the unit. As a general principle, equipment, including vehicles, provided for specific functions within the targeted unit, should remain with the unit if considered essential.

Recurrent cost funding. Funding for the six Building Inspector positions is not currently available. If the BIU is to function as intended, a full complement of inspectors is required. Budget should be made available and recruitment started.

Training sustainability. There are some concerns about the project's sustainability. Continued training will be needed to maintain and further develop the skills of staff who have been trained and develop the skills of new staff. The BIU has no current training plan, nor is there any funds to support further training.

TERMS OF REFERENCE

TONGA AND SAMOA CLUSTER EVALUATION

1 Background

AusAID is undertaking an ex-post evaluation of the following projects in Tonga and Samoa:

Tonga

- Ministry of Works-Infrastructure Development Project, Phase 2
- Pangai Harbour Project;

Samoa

- Fire Service Upgrade Project;
- Public Works Department-Strengthening Building Inspection Unit Project.

These are being undertaken together as a cluster evaluation, rather than individually, to make the evaluation process more cost-effective.

2 Evaluation Objective

The objective of the evaluation is to assess the relevance, sustainability and measure the development outcomes of the projects (and, if possible, their development impact) with a view to drawing lessons learned for the selection, design and implementation of future projects.

3 Background to Projects

3.1 Tonga: Ministry of Works-Infrastructure Development Project, Phase 2

The goal of the Ministry of Works-Infrastructure Development Project, Phase 2 (MOWIDP) was to assist the economic and social development of Tonga by improving the efficiency of the management, construction and maintenance of infrastructure resources. The emphasis was on targeting development of human resources and maintenance of physical assets. The project was centred at the headquarters of the Ministry of Works in Nuku'alofa. The four components of the project were: (1) training; (2) construction maintenance; (3) equipment supply; and (4) technical support and program management. The project (Phase 2) started in February, 1992 (following the initial project which commenced in January, 1990) and was completed in February, 1998. Total project cost was about AUD9.0 million (Australia AUD7.0 million and Tonga AUD2.0 million).

A midterm review of the project was undertaken in March, 1994. This study found that while most of the activities listed in the Project Implementation Document (PID) were on target, the project was ambitious with respect to training and the introduction of management information systems. In addition, the report identified the need for further infrastructure development and equipment supply if the benefits of the project were to be sustainable.

The main aspects to be investigated by the evaluation include the: (1) relevance of the training provided during the project, (2) any continued provision of training after project completion, (3) recurrent cost funding arrangements and other resources to sustain the project benefits, (4) level of operations and maintenance of facilities and equipment supplied by the project, (5) suitability of the twinning arrangements and work placements with the Tweed Valley Shire Council in Australia, (6) extent of institutional capacity building, and (7) an assessment of the sustainability and the development outcomes or impact of the project.

3.2 Tonga: Pangai Harbour Project

The goal of the Pangai Harbour Project (PHP) was to: (1) provide a safe and reliable harbour and thereby an improved quality of life for the local population and enhanced development opportunities for the Ha'apai Group; and (2) use the construction of the harbour and facilities to improve the institutional capacity of the Ministry of Works. The main development objective of the project was to assist inter-island trade and provide a focus for regional growth in the northern Ha'apai Group of islands. The harbour was constructed at Pangai on Lifuka Island. The three components of the project were: (1) construction of the harbour facilities; (2) technology transfer and training of Ministry of Works employees, and; (3) project management. The project commenced in December, 1994 and was completed in December, 1996. Total project cost was about AUD4.2 million (Australia AUD3.0 million and Tonga AUD1.2 million).

The main aspects to be investigated by the evaluation include the: (1) usage of the harbour facilities and the standard of construction, (2) technology transfer achieved, (3) relevance of the training provided, (4) recurrent cost funding arrangements and other resources needed to sustain the harbour facilities, (5) level of operations and maintenance of facilities and equipment supplied by the project, (6) extent of institutional capacity building, and (7) an assessment of the sustainability and the development outcomes or impact of the project.

3.3 Samoa: Fire Service Upgrade Project

The goal of the Fire Service Upgrade Project (FSUP) was to build a new fire station, equip it with fire fighting equipment and provide training for fire service personnel in order to establish an efficient and effective fire emergency service. The project was located in Apia. The four components of the project were: (1) supply of equipment and

materials; (2) design and construction of a new fire station; (3) training and institutional development; and (4) project management. The project started in January, 1993 and was completed in August, 1997. Total project cost was about AUD3.4 million (Australia AUD2.6 million and Samoa AUD0.8 million).

A midterm review of the project was undertaken in September, 1994. This study suggested a number of changes to the PID. These included transferring the fire service to the Department of Police and Prisons under the control of the Commissioner of Police. Additional inputs to the project were also proposed increasing the total value of Australian contribution. These changes were regarded as necessary to improve the potential sustainability of the project.

The main aspects to be investigated by the evaluation include the: (1) standard of the fire station construction, (2) relevance of the equipment supplied, (3) usefulness of the training provided and the success in the implementation of operational procedures, (4) performance of the fire services unit during fire emergencies, (5) recurrent cost funding arrangements and other resources needed to sustain the fire station, (6) level of operations and maintenance of facilities and equipment supplied by the project, (7) extent of institutional development achieved, and (8) an assessment of the sustainability and the development outcomes or impact of the project.

3.4 Samoa: Public Works Department-Strengthening Building Inspection Unit Project

The goal of the Public Works Department-Strengthening Building Inspection Unit Project (PWDSBIUP) was to reduce the extent of injury and material loss in Samoa resulting from natural disasters such as cyclones and earthquakes. The headquarters of the project was in Apia. The two components of the project were: (1) development and strengthening of the institutional capabilities of the Building Inspection Unit (BIU) within the Building Division of the Public Works Department (PWD), and (2) assisting PWD to ensure that construction and reconstruction of buildings, including primary schools, adhered to appropriate building standards to resist cyclone and earthquake damage. The project started in December, 1992 and was completed in October, 1997. Total project cost was about AUD2.5 million (Australia AUD1.7 million and Samoa AUD0.8 million).

The main aspects to be investigated by the evaluation include the: (1) standard of the building manuals and inspection codes developed and their level of adoption by the BIU and the wider community, (2) relevance of the training provided, (3) level of institutional strengthening achieved within the BIU and the PWD, (4) recurrent cost funding arrangements and other resources needed to sustain the project initiatives, (5) level of operations and maintenance of facilities and equipment supplied by the project, and (6) an assessment of the sustainability and the development outcomes or impact of the project.

4 Scope

The overall scope of the evaluation is to assess the relevance, sustainability and measure the development outcomes/impact of the projects and their efficiency. The scope of the evaluation will recognise the context in which all projects were designed and implemented. The lessons to be learned will be those that are applicable to AusAID's future programming in Tonga and Samoa. Project reports and other documents will form the basis for the desk evaluation and provide guidance for the field evaluation.

Under the direction of the AusAID Task Manager, the evaluation team will:

- Review project documents and from them briefly describe the development context of each project and its objectives, and determine key questions and areas to be examined in the field. In addition, the team should assess project design and approach, changes during implementation, ownership, availability and quality of resources, and project management. An assessment should also be made of the appropriateness of the projects to Australia's then objectives and country strategy.
- Meet with relevant Government officials, counterpart and implementing agencies, and target beneficiaries, to obtain their views on the performance of the projects and their benefits.
- Collect an appropriate level of information relating to the current status of activities improved by or introduced by each project.
- Using a set of guiding questions undertake a rapid field evaluation (RFE) of the projects.
- On each project collect information on:
    - final project expenditure
    - recurrent cost financing arrangements
    - current levels and values of benefits or output
    - changes to institutional arrangements or structures.
- Assess the outcomes of the projects for target beneficiaries.
- For each project, using the project implementation logframe, assess the project performance and development outcome against the specified outputs, purposes and goal.
- Identify and assess any unintended outcomes.
- Assess the social and gender effects of the projects.
- Assess the success and sustainability of the training programs associated with the projects in terms of skills upgrading, facilitating technology transfer, and strengthening institutional management and coordination capabilities.

- Assess whether the projects were consistent with AusAID's environmental guidelines in place at the time of the projects.
- Assess the sustainability of the projects, particularly the issues of recurrent cost financing arrangements, operation and maintenance of equipment, and any changes to institutional capability since Australian inputs finished.
- Assess the efficiency of the projects.
- Assess the development outcomes/impact of the projects.
- If appropriate data are available undertake cost-benefit analysis of the projects and estimate their economic rates of return.
- Prepare key sections of the draft report in-country, including tentative findings and conclusions. These will be discussed with the Post, the aid coordinating agencies and the implementing agencies.
- Brief AusAID and finalise report, in close consultation with the Pacific Bilateral Section (BIPAC), within four weeks of returning to Australia.

5 Evaluation Team

The Evaluation Team will consist of two short-term consultants. Dr S. Chandra, Performance Information and Assessment Section, AusAID will be the Task Manager. The consultants will be a Team Leader/Evaluation Specialist and a Civil Engineer/Institution Specialist. Their TORs are listed under section 8.

Dr Chandra's prime responsibility will be to manage, coordinate and oversight the work of the consultants during the desk review and in the field to ensure that the contents of the draft report, including the findings, conclusions and lessons learned, meet AusAID's requirements. In addition, he will be responsible for ensuring that the final evaluation report meets AusAID's requirement for publication. During the desk study and in the field, Dr Chandra will assist the evaluation of all projects.

Dr Chandra will work in close consultation with the staff of the BIPAC Section in Canberra, including Mr Langford (Director), the Country Program Managers Dr Doyle and Mr McNee, and with the Nuku'alofa and Apia Posts.

To assist the evaluation, suitable local counterparts from the implementing agency for each project will be invited to assist the Evaluation Team for the in-country work. The Post's cooperation in the selection of the local counterparts is requested.

An advisory group has been formed to assist the evaluation. This consists of Dr Doyle and Mr McNee of the BIPAC Section, Dr Kutch, Director of the Performance Information and Assessment Section, (PIA), and Mr O'Shaughnessy from the Infrastructure and Environment Group (IEG).

6 Workplan

The workplan for the evaluation will consist of the following four phases. The time inputs shown below are that of the Team Leader/Evaluation Specialist; the other Team member will have a shorter input; details will be specified in their contracts.

- A desk review of documents within AusAID, and preparation of a detailed approach, method and itinerary, from 28 September to 7 October, 1998 (10 days).
- A field mission, beginning on 8 October to 29 October, 1998 (21 days which includes all international and in-country travel). The Team will depart for Tonga on 8 October and undertake the Tonga evaluations until 18 October. On 19 October the Team will proceed directly to Samoa and undertake the Samoa evaluations until 28 October. The Team is expected to depart Apia for Australia on 29 October.
- On return from the field prepare the draft report for comments, beginning on 2 November, 1998 for 8 days.
- On receipt of comments, revise the draft report into a final report for publication by the Team Leader/Evaluation Specialist for 5 days, the Civil Engineer/Institution Specialist for 3 days, at a time to be advised by AusAID.

7 Reporting

A short report of around 40 pages of text and any essential appendices is expected. Key sections of the draft report will be completed in-country. The current AusAID ex-post evaluation report format will be used as a framework. The lessons learned will be produced in a format for incorporation into the AusAID's lessons learned database. The final report will be published in hard copy as well as made available on the AusAID Intranet on the AusAID website. In addition, a flier will be produced publicising the findings.

8 Australian Consultants' Terms of Reference

8.1 Team Leader/Evaluation Specialist

The Team Leader/Evaluation Specialist will:

(i) As Team Leader:

- Be responsible to the Task Manager for the overall conduct of the evaluation.
- Coordinate discussions with the Managing Contractors, aid coordinating agencies and implementing agencies.
- Describe and assess the development context of each project. This should take into account the AusAID country strategy and the policy environment at the time of the project.

- During the desk evaluation develop a set of key questions/issues on each project for discussion with implementing agencies in the field. These will be faxed to the implementing agencies via the Post during the desk review.
- With the other Team members identify the key lessons learned.
- Undertake responsibility for the preparation of the drafts and final report.
- Carryout any other tasks for successful completion of the evaluation as requested by the Task Manager.

(ii) As Evaluation Specialist:

- Assess the extent of support for project goals within each implementing agency.
- Review all aspects of the projects to compare targets with actual achievements.
- With the other Team member plan and implement a rapid field evaluation (RFE) of the projects.
- Assess the recurrent cost funding arrangements and other resources to sustain project initiatives. Assess whether the projects are likely to be sustainable.
- Assess the level of operations and maintenance of facilities and equipment supplied by the projects.
- Assess whether the projects were consistent with AusAID's social and gender guidelines in place at the time of the projects.
- Assess the efficiency of the projects.
- If appropriate data are available undertake cost-benefit analysis of the projects and estimate their economic rates of return.
- Assess the sustainability and the development outcomes/impact of the projects.

8.2 Civil Engineer/Institution Specialist

The Civil Engineer/Institution Specialist will work with the Team Leader to collect and analyse information relevant to all aspects of the evaluation exercise. In particular:

- Assess the standard of the construction activities undertaken in the projects and assess their likely sustainability to deliver long-term developmental benefits.
- Assess the quality of the training provided and the outcome of the training on management and system improvement in all projects.
- Assess the effect of institutional strengthening and capacity building on target institutions and their ability to continue the momentum for improvement initiated by the project activities.
- Check the relevance, and the operation and maintenance standards of the Australian-supplied project assets.

- Assess the recurrent cost financing arrangements for the project-begun initiatives. Check if the project-supplied assets are being maintained to the extent necessary for the projects to be sustainable. If not, discuss with the Governments how they are planning to deal with this risk.
- Assess whether the projects were consistent with AusAID's environmental guidelines in place at the time of the projects. For the Pangai Harbour Project in Tonga assess the environmental safeguards adopted during the construction phase.
- Assist the Team Leader in assessing the social and gender effects of the projects.
- Assist the Team Leader to undertake a rapid field evaluation of the projects.
- With the Team Leader identify the key lessons learned.
- Undertake responsibility for preparation of appropriate major sections of drafts and final report as requested by the Team Leader.
- Carryout any other tasks for successful completion of the evaluation as requested by the Team Leader.

9 Counterparts' Terms of Reference

The nominated counterparts from the implementing agencies should be familiar with the projects. The counterparts will work with the Australian team members to collect and analyse information relevant to all aspects of the fieldwork phase of the evaluation exercise. In particular:

- Assist the Team Leader in the field to review all aspects of the projects to compare targets with actual achievements.
- With the Australian team members undertake a rapid field evaluation of the projects.
- At each project site assist the Team to gather information relevant to the evaluation.
- Assist the Team to assess the sustainability and the development outcomes/impact of each project.
- Prior to the arrival of the Team in Tonga or Samoa, assist gathering of information by the implementing agencies for discussions at meetings, based on the questions/queries that will be faxed to them by the Team Leader via the Post during the desk study in Canberra.
- Assist the Post in finalising the draft itinerary for the fieldwork to be sent by the Team Leader within two days of beginning the desk evaluation.

Quality Assurance Series No. 14

Building for Development: An Evaluation of Four Infrastructure Projects in Tonga and Samoa

The South Pacific countries desperately need essential infrastructure to promote social and economic development. Four recently completed infrastructure projects in Tonga and Samoa were evaluated. Three projects were assessed as highly successful, whilst the fourth was found to be moderately successful.

The evaluation found that Australia should continue to support infrastructure projects in the South Pacific. Such projects generate high social and economic gains for the target beneficiaries. However, assets need to be maintained so as to continue to provide long-term development benefits.