

Document of
The World Bank

Report No: ICR00001071

IMPLEMENTATION COMPLETION AND RESULTS REPORT

(CREDIT NO. 3885-WSO and GRANT NO. H083-WSO)

ON A

CREDIT AND GRANT

IN THE AMOUNT OF SDR 3.0 MILLION
(US\$4.47 MILLION EQUIVALENT)

TO

INDEPENDENT STATE OF SAMOA

FOR A

CYCLONE EMERGENCY RECOVERY PROJECT

March 29, 2009

Transport, Energy and Mining Unit
Sustainable Development Department
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2008)

Currency Unit = Samoan tala (WST)

WST 1 = US\$0.37

US\$1 = WST 2.73

SDR 1 = US\$1.47

FISCAL YEAR

July 1 – June 30

ABBREVIATIONS AND ACRONYMS

CERP	Cyclone Emergency Recovery Project
CIM	Coastal Infrastructure Management
COEPs	Codes of Environmental Practice
DFA	Development Financing Arrangement
EMP	Environmental Management Plan
ERRP	Emergency Road Rehabilitation Project
FMS	Financial Management System
GOS	Government of Samoa
IA	Implementing Agency
IAMP	Infrastructure Asset Management Program
IDA	International Development Association
IPSC	IAM Program Steering Committee
LARF	Land Acquisition and Resettlement Framework
MNRE	Ministry of Natural Resources and Environment
MOF	Ministry of Finance
MWTI	Ministry of Works, Transport, and Infrastructure
PMT	Project Management Team
PUMA	Planning and Urban Management Agency
SOE	Statement of Expenditures
US\$	US dollar
WST	West Samoan tala

Vice President:	James W. Adams
Country Director:	Nigel Roberts
Sector Manager:	Junhui Wu
Project Team Leader:	Thakoor Persaud
ICR Team Leader:	Thakoor Persaud

**INDEPENDENT STATE OF SAMOA
CYCLONE EMERGENCY RECOVERY PROJECT**

CONTENTS

A. Basic Information	
B. Key Dates	
C. Ratings Summary	
D. Sector and Theme Codes	
E. Bank Staff	
F. Results Framework Analysis	
G. Ratings of Project Performance in ISRs	
H. Restructuring	
I. Disbursement Profile	
1. Project Context, Development Objectives and Design.....	1
3. Assessment of Outcomes	11
4. Assessment of Risk to Development Outcome.....	14
5. Assessment of Bank and Borrower Performance.	14
6. Lessons Learned.	16
7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners	18
Annex 1. Project Costs and Financing.....	19
Annex 2. Outputs by Component	21
Annex 3. Economic and Financial Analysis.....	31
Annex 4. Bank Lending and Implementation Support/Supervision Processes	32
Annex 5. Beneficiary Survey Results	33
Annex 6. Stakeholder Workshop Report and Results.....	34
Annex 7. Full Copy of Borrower's ICR	35
Annex 8. List of Supporting Documents	39
Annex 9: Maps showing location of physical works on Upolu and Savai'i.....	40
Annex 10: Examples of Storm Damage and Completed Project Outputs	44
Map.....	48

A. Basic Information			
Country:	Samoa	Project Name:	Cyclone Emergency Recovery Project
Project ID:	P088246	L/C/TF Number(s):	IDA-38850,IDA-H0830
ICR Date:	03/29/2009	ICR Type:	Core ICR
Lending Instrument:	ERL	Borrower:	INDEPENDENT STATE OF SAMOA
Original Total Commitment:	XDR 3.0M	Disbursed Amount:	XDR 3.0M
Environmental Category: B			
Implementing Agencies: Ministry of Finance Ministry of Works, Transport and Infrastructure Ministry of Natural Resources and Environment			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	02/23/2004	Effectiveness:	06/28/2004	08/31/2004
Appraisal:	03/10/2004	Restructuring(s):		
Approval:	04/29/2004	Mid-term Review:	05/15/2007	05/29/2007
		Closing:	12/31/2006	06/30/2008

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Satisfactory
Risk to Development Outcome:	Low or Negligible
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Highly Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Highly Satisfactory
Overall Bank Performance:	Satisfactory	Overall Borrower Performance:	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Central government administration	5	7
Flood protection	75	79
Roads and highways	20	14
Theme Code (Primary/Secondary)		
Natural disaster management	Primary	Primary
Other environment and natural resources management	Secondary	Secondary
Rural services and infrastructure	Secondary	Secondary

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	James W. Adams	Jemal-ud-din Kassum
Country Director:	Nigel Roberts	Xian Zhu
Sector Manager:	Aurelio Menendez	Jitendra N. Bajpai
Project Team Leader:	Thakoor Persaud	William D. O. Paterson
ICR Team Leader:	Thakoor Persaud	
ICR Primary Author:	Thakoor Persaud	
	Colleen Mary Gollach	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

The objectives are to assist the Borrower to recover from the damage caused by Cyclone Heta and reduce the vulnerability of its people to prevailing natural hazards through:

(a) Recovery of coastal resilience to erosion, flooding, and landslide hazards through appropriate and sustainable use of structural and non-structural protection;

(b) Nurturing the recovery of fragile coastal ecosystems through sustainable practices;
and

(c) Rehabilitation of damaged land transport communications.

Revised Project Development Objectives (as approved by original approving authority)

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Vulnerable coastline with improved resilience to natural disasters.			
Value quantitative or Qualitative)	n/a km	About 24 km		24 km
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	Target value derived from subcomponents A.1+A.2+A.3. A.3 clarified at MTR discussions w/ Gov't as representing actual lengths of improved sections, not entire shoreline as dunes were replaced at different locations. 100% achievement.			
Indicator 2 :	Fragile coastal ecosystems recovered by the Project			
Value quantitative or Qualitative)	0	33		58
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	Target value derived from A.4+A.5. Small grants increased at MTR in discussion w/ Govt. By EOP, 50 small grants implmtd, of which 10 awaited final reports to Govt committee to issue of formal letter to community.176% achieved.			
Indicator 3 :	Land transport river crossing rehabilitated			
Value quantitative or Qualitative)	0	About 5		4
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	Original target value was "about 5 bridges". MTR in consultation with Govt., funds were insufficient to reconstruct 5 crossing to an improved standard, so 4 were done within estimate. 100% achievement.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	A.1. Structural Rehabilitation			
Value (quantitative or Qualitative)	0	About 14 km		10 km
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	Fully funded by the Government in the immediate aftermath of the cyclone. 100% achievement of Government's target set once implementation began.			
Indicator 2 :	A2. Structural Upgrading			
Value (quantitative or Qualitative)	0	About 10 km		12 km
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	Exceeded target set at appraisal but 86% achievement of the increased target discussed with the Government at mid-term review.			
Indicator 3 :	A3. Non-structural Rehabilitation			
Value (quantitative or Qualitative)	0	About 2.5 km		1.97 km
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	Nourishment of nearly 2km of beaches w 20,000 m3 sand for dune recon. Linear tar. reduced MTR in discuss w Gov based on eng est, avail funds & dune dimensions to be impl. Subsequently amended target greatly exceed mid-term expectations within avail fund			
Indicator 4 :	A.4. Small Resilience Subprojects completed			
Value (quantitative or Qualitative)	0	25		50
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	Target increased at mid-term review in discussion with Government as project closing date was to be extended and this subcomponent was progressing well. Double orig. tar. achieved and revised target achieved by 143%.			
Indicator 5 :	A.5 Ecosystem Recovery Plans prepared			
Value (quantitative or Qualitative)	0	8		8
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	100% target achieved. A number of small works indicated under the recovery plans were also implemented under subcomponent A.4.			
Indicator 6 :	B2. River crossings completed.			

Value (quantitative or Qualitative)	0	5		4
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	80% achieved although Government is looking into making improvements to design of one of the completed crossings.			
Indicator 7 :	C. Resilience projects prepared			
Value (quantitative or Qualitative)	0	100% of budget		100% of budget
Date achieved	05/06/2004	12/31/2007		06/30/2008
Comments (incl. % achievement)	100% achieved.			

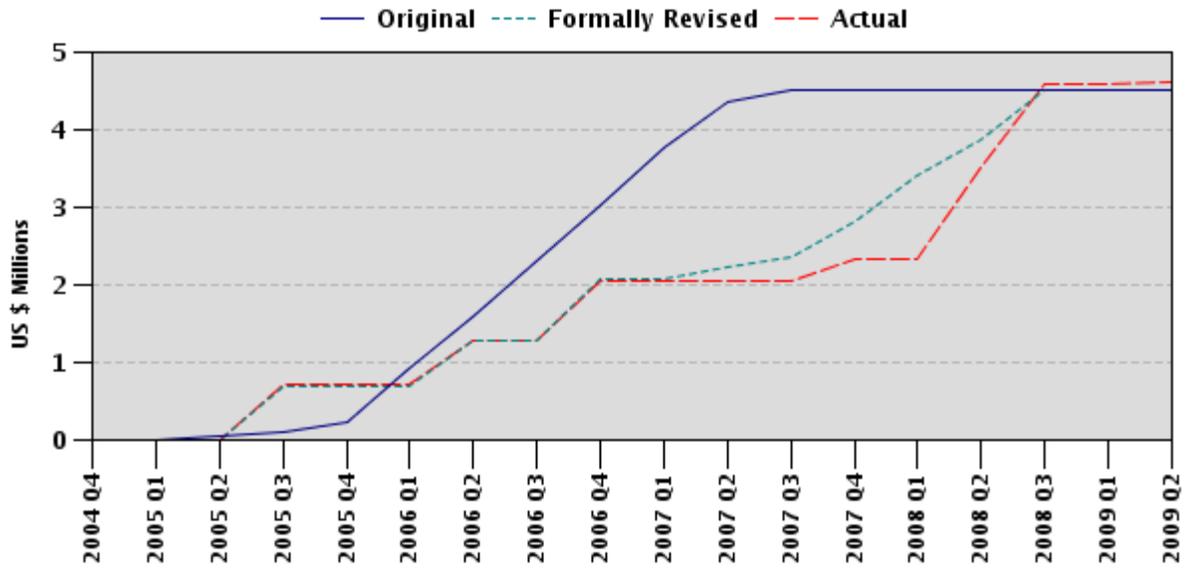
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	06/22/2004	Satisfactory	Satisfactory	0.00
2	12/28/2004	Satisfactory	Satisfactory	0.00
3	06/20/2005	Satisfactory	Moderately Satisfactory	0.71
4	02/07/2006	Satisfactory	Moderately Satisfactory	1.28
5	04/03/2007	Satisfactory	Moderately Satisfactory	2.04
6	08/23/2007	Satisfactory	Satisfactory	2.34
7	05/28/2008	Satisfactory	Satisfactory	4.58
8	03/09/2009	Satisfactory	Satisfactory	4.61

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1.1.1. Samoa comprises nine islands in one main cluster situated just south of the equator in an area prone to tropical cyclones. The islands of Upolu and Savai'i make up 96 percent of Samoa's land area of 2,842 square kilometers and account for 99 percent of its population. Since the early 1990s, Samoa has undertaken a number of tax, tariff, public sector and related economic reforms. As a result, over the past 15 years, real per capita GDP has increased by over 3 percent per year on average and external public debt has fallen below 40 percent of GDP. The external position has benefited from the rapid growth of remittances from overseas and tourism receipts. Samoa has now "graduated" above the LDC criteria set by the U.N. for the Human Assets Index and the per capita Gross National Income Index, although its economic vulnerability remains high due to its remoteness, small size and external dependency.

1.1.2. The country is also vulnerable to natural hazards, particularly cyclones. There were 12 events reported in the period 1950-2004 which, in disaster years, affected an average of 42 percent of the population and caused economic losses equivalent to about 50 percent of GDP. In recent years, Cyclones Ofa (1990) and Val (1991) killed over a dozen people, displaced thousands, damaged many key assets and washed away coastal lands, leaving monetary losses estimated at about \$140 million and \$300 million respectively.

1.1.3. On January 4-5, 2004, Tropical Cyclone Heta passed within 80 km of Samoa as it moved southwest of the country. It was accompanied by sustained hurricane force winds of up to 100 knots (180 km/h), gusting up to 140 knots (250 km/h) at its peak, and torrential rain covered the country. The cyclone caused significant damages estimated at about US\$35 million (equivalent to 12 percent of Samoa's GDP), mainly in coastal and utilities infrastructure, trees and crops, and coastal ecosystems. Power, water, transport, and other services were disrupted for periods up to a week or more before being substantially restored. Although several houses were destroyed, fortunately there were no fatalities.

1.1.4. The extent of damage was limited when compared with the major events of Cyclones Ofa and Val. In part, Heta was of only moderate duration (around 36 hours) and in large part too, protective structures built cyclones Ofa and Val proved durable. Nonetheless, along coastal areas, mainly along the north and west coasts of Savai'i and the north coast of Upolu, strong wave action overtopped seawalls and caused significant localized erosion of road shoulders, culverts and seawalls, depositing substantial debris of boulders, sand and flotsam across roads and into villages. Erosion and debris damage was worst on Savai'i from Sataua in the northwest to Faga in the east. Electric power lines and some telephone services were cut, and water services were disrupted by landslides or erosion in several areas. A few private houses were severely damaged or destroyed by tornado winds in the Fagalii-Moata'a area. There was extensive wind damage to trees, including about 80 percent of the breadfruit and banana trees and six large historic trees in Apia were uprooted. There was also extensive damage to 50-70 percent of coral reefs and coastal fishing grounds.

1.1.5. Limited recovery assistance was provided to the Government for the power and water sectors through ongoing assistance from the European Union and the Asian Development Bank. The Government requested International Development Association (IDA) assistance for recovery

works and implementation services for roads and coastal infrastructure as the extent of damage was beyond the Government's own resources. Initial Government damage and loss assessment for road and coastal infrastructure estimated the losses at about WST 90 million (US\$35 million), including WST 63 million for seawalls repair and construction and for road repairs and restoration. A further WST 30 million was the estimated damage to trees, crops and buildings.

1.2 Original Project Development Objectives (PDO) and Key Indicators

1.2.1 The objectives of the project were to assist the Government to recover from the damage caused by Cyclone Heta and reduce the vulnerability of its people to prevailing natural hazards through:

- (a) Recovery of coastal resilience to erosion, flooding, and landslide hazards through appropriate and sustainable use of structural and non-structural protection;
- (b) Nurturing the recovery of fragile coastal ecosystems through sustainable practices; and
- (c) Rehabilitation of damaged land transport communications.

1.2.2 A Technical Annex, Memorandum and Recommendation of the President (MOP) and Development Financing Agreement (DFA) were prepared for the project. Appendix 7 of the Technical Annex listed the following activities and end-of-project targets: (a) 14 km structural rehabilitation coastal works aimed at improved resilience to natural disasters; (b) 10 km structural upgrading works aimed at improved coastal resilience to natural disasters; (c) 2.5 km non-structural rehabilitation works aimed at coastal resilience; (d) completion of 25 small resilience subprojects; (e) preparation of 8 ecosystem recovery plans; (f) completion of 5 river crossings; and (g) 100 community based small-scale resilience subprojects prepared. Elsewhere in the Annex, it was noted that these targets were approximate until more detailed design could be undertaken.

1.3 Revised PDO and Key Indicators

1.2.3 While no revisions were made to the PDO, during the mid-term review, the Government asked for several indicator target values to be amended, primarily because it had already carried out some of the high-priority remedial works in the immediate aftermath of the cyclone, fully funded from its own resources. This meant that IDA funds could then be applied to other subcomponents and slight changes made to some of the targets. Given the emergency nature of the works done, it was difficult at the time for the Government to disaggregate its own actual expenditures from wider maintenance activities and so the planned retroactive financing for these works could not be utilized. Another factor to note is that from the original appraisal targets, there was some confusion regarding what was to be measured, for example, the actual length of the entire seawall strengthened or the specific weak/damaged sections of the wall which were spot rehabilitated. After reviewing the record and discussing the details with counterpart staff, it became clear that the target was the entire length of coastline that was strengthened as a result of improvements to various key sections along those lengths. For replacement bridges, the number was reduced from "about 5" to 4 during the mid-term review because the engineering estimates based on detailed design were significantly higher than appraisal estimates¹. One bridge had to be deleted from the works program at the time of bid preparation but the GoS is still planning to construct it with its own funds. Finally, in some cases, (for example, completion of small

¹ Although subsequently, actual bids submitted tended to be comparable to the original appraisal estimates and were generally lower than the engineer's estimates. This issue is discussed in more detail in Annex 2 as well as Section 6.

resilience subprojects), the IDA project team agreed with the Government that the target values would increase because the project was to be extended and so the small works, which had been progressing well, were increased to continue over the remaining life of the project.

1.2.4 The project Closing Date was extended twice, for a total of 18 months. The first was for twelve months to allow for some delays in finalizing consultant contracts and to adjust design of a sea wall to respond to access concerns of residents. The second extension, for six months, was to complete a section of a seawall where, because of strong tidal action and inclement weather, workers had had difficulty in gaining access to and completing the structure (see Annex 2 for details).

1.4 Main Beneficiaries

1.4.1. The main direct beneficiaries comprised the high-risk population living along or near coastal areas affected by the cyclone. These areas were physically rehabilitated and made more resilient to withstand future natural hazards using both structural (seawalls, culverts, bridges, etc.) and “soft” solutions (sand dunes, mangrove, reef planting, etc.). Due to the success of the project activities along the coast, not only residents in affected coastal villages but subsequently, across all villages in the entire country, ultimately benefitted from awareness-raising and hazard-management education campaigns carried out under Cyclone Emergency Recovery Project (CERP) and another IDA-supported Infrastructure Asset Management Project (Phases 1 and 2). Coastal village infrastructure management plans (CIMP) were prepared under IAMP1 and 2 using participatory planning methods involving not only village leaders and traditional figures but also all residents (in particular, targeted inclusion of women and youth). Many small priority works identified in these CIM plans were financed by small grants to communities under CERP.

1.4.2. In addition, *Pulenu’u* (Mayors) and villagers in eight cyclone affected villages received training and awareness-raising in developing detailed coastal ecosystem recovery plans for their villages as well as on the impacts of various coastal management and reclamation initiatives on shoreline communities and ecosystems.

1.4.3. Other beneficiaries include staff of implementing agencies Ministry of Natural Resources, Environment and Meteorology (MNREM) and Ministry of Works, Transport and Infrastructure (MWTI) who received on-the-job training and TA in design solutions, risk management, and works procurement and contract management and training. In particular, environmental and engineering staff of the two implementing Ministries are now working in a more collaborative way to ensure that infrastructure, superstructure and other activities do not impede natural processes such as flushing of ecosystems, beach accretion and protection of mangrove areas. While these actions have had a positive beneficial effect, because most of the land is communally owned under customary title, land use issues can take some time to be resolved.

1.4.4. The project also benefited a large number of locally hired, semi-skilled workers who acquired on-the-job construction skills on the various works contracts. It also provided business opportunities for local construction contractors who successfully won the competitive bids and carried out the works contracts over the four years of the project.

1.4.5. Finally, there were benefits from the conservation of marine resources and recovery of the coastal ecosystems for the communities whose livelihoods largely depend on these resources. Whilst hard to quantify, these encompass growing eco-tourism, healthy reef systems that dissipate wave energy and encourage growth in fish stocks, shoreline vegetation that provides stabilization of the land, and natural flushing of inlet ecosystems encouraging fish and crab breeding.

1.5 Original Components². Because the Bank appraisal team was in Samoa within two weeks after the cyclone and there were several damage assessment and costing activities still underway, with several priorities slated to be done quickly by the Government, it was decided that the legal documents would refer to approximate target figures where these could not be easily finalized at appraisal, e.g. “about 14 kilometers” and “about five bridges”.

A. Coastal Resilience Recovery \$3.65 million (61 percent of total costs).

Support under this component was for the restoration and improvement of coastal resilience in three areas:

- (a) repair works to some existing seawalls to properly restore the armor layers;
- (b) complete removal, reconstruction of the inner-core material with appropriate overlying filter and structural layers and some extensions to selected seawalls; and
- (c) non-structural, “soft” solutions at selected sites to maintain the natural beach ecosystems and nurture the recovery of fragile coastal ecosystems through sustainable practices.

The project design was made up of five subcomponents, concentrated in particular on the northern sides of the two main islands, Upolu and Savai'i (see maps in Annex 9), where cyclonic damage had been the most severe. Detailed design of the exact location and scope of works to be undertaken was included as a project activity.

A.1 Structural Rehabilitation (Savai'i and Upolu) (US\$980,000, 16.3 percent total project costs): Rehabilitation of about 14 km of shoreline protection structures (i.e. carrying out spot maintenance).

A.2 Structural Reconstruction and Upgrading (Savai'i)(US\$1.72 million, 28.6 percent of total project costs). Reconstruction and upgrading of shoreline protection structures at selected locations along a total coastal length of 10 km so that the structures could withstand prevailing natural hazard risks in the future.

A.3 Non-Structural Rehabilitation (Savai'i and Upolu) (US\$401,000, 6.7 percent of total project costs). Restoring the natural resilience of about 2.5 km affected shorelines to withstand prevailing natural hazard risks through non-structural measures (mainly beach nourishment for dune reconstruction).

A.4 Small-Scale Resilience (Upolu and Savai'i) (US\$133,000, 2.2 percent of total project costs). Small subgrants (up to WST 15,000 each) were allocated to local community groups (*Komiti*/ women's groups and *Komiti a le Pulenu'u*/special members appointed by the villagers and *Pulenu'u*/Mayor) under the leadership of the *Pulenu'u* to undertake various small-scale subprojects aimed at accelerating eco-system restoration and enhancing the resilience of coastal environments against future possible hazards, thereby improving protection of coastal resources and communities. Eligible activities included coastal garden restoration works and establishing plant nurseries, protection of communal fresh water pools, establishing mangroves for marine fish and crab breeding and establishing and monitoring “no-catch” marine protection areas.

A.5 Coastal Ecosystem Recovery (Services and Works) (US\$418,000, 7 percent of total project costs). Recovery Plans, using consultative and participatory planning methodologies, to be prepared for eight cyclone-affected villages and subsequently, Village Agreements and Recovery Plan Agreements were drawn up and adopted. Priority recovery activities identified in the Plans were then implemented as part of the coastal ecosystem rehabilitation. The recovery activities

² As at Project appraisal.

comprised (a) “soft solutions” such as construction of plant nurseries, replanting of coastal plants and mangroves, coral replanting, banning of destructive fishing methods, controlling/managing activities that affect coastal habitats and resources such as sand mining and reclamation, and (b) small works, such as culvert crossings.

B. Road Infrastructure Rehabilitation (\$1.38 million, 23 percent of total project costs).

The activities funded under this component would help rehabilitate the damaged land transport system and communications.

B.1 Road and Drainage (Savai'i and Upolu) (US\$848,000). Clearing of debris, rehabilitation or replacement as necessary of road pavements, drainage structures, slope stabilization and road furniture damaged by the cyclone on both Upolu and Savai'i.

B.2 Bridge Replacement (Savai'i and Upolu) (US\$528,000, 8.8 percent of total project costs). Reconstruction and upgrading of about five bridges, allowing freer land transportation and also facilitating the natural flushing and replenishment of upstream eco-systems which in turn allows for more vigorous mangrove growth and improved fish and crab breeding grounds.

Implementation Support (US\$977,000, 21 percent of total project costs).

The activities under this component were to support the implementation of the above two main project components.

C.1 Technical assistance (US\$812,000, 13.5 percent of total project costs). The main assistance provided by the consultant was in coastal engineering for design and supervision of coastal works, small and community based resilience structures, management of small grants and supervision of road and bridge works.

C.2 Project management (US\$113,000, 5 percent of total project costs). Management and coordination of project activities, procurement, financial management and accounting, monitoring of environmental safeguards requirements, auditing of project accounts, monitoring and reporting, etc. over the life of the project.

C.3 Operating Costs (US\$52,000, 0.9 percent of total project costs). The operating costs expenditures were used to supplement the implementing agencies' own budgets on project related expenditures such as advertising costs, local transport for supervision purposes, stakeholder workshops and similar.

1.6 Revised Components

1.6.1 There were no formal revisions to the main Project components.

1.7 Other significant changes

1.7.1 Please see Annex 2 for a detailed description of subcomponents.

1.7.2 Project design had included a provision for retroactive financing for up to 20 percent of the total IDA funds, for eligible expenditures incurred by the Government from the date of appraisal until the project became effective. This was to support Government's own rapid response activities under subcomponent A.1 (repair of strategic seawalls before the next cyclone season) and subcomponent B.1 (clearing of debris and opening up main transport corridors). However, at the time, MWTI was undergoing internal restructuring and to some extent, this, plus the fact that the works had to be done on a fast-track basis, led to extensions of several ongoing contracts which, in turn, affected MWTI's ability to disaggregate and certify Cyclone Heta-related maintenance expenses from its national maintenance operations. The Government therefore decided not to make use of the retroactive financing facility and instead, in joint

discussions between the Government and IDA, a decision was made to assign the IDA funds from subcomponents A.1 and B.1 to subcomponents A.2 (reconstruction of seawalls) and B.2 (bridge repairs). As these subcomponents are all within the same disbursement category (1-A) in the Financing Agreement, a formal reallocation was not required. Fully funding the rehabilitation works from its own account, the Government also decided to extend the road works it undertook whilst decreasing the seawall repairs (leaving some works on these to undergo more complete reconstruction under subcomponent A.2).

1.7.3 Risk-based methods for determining engineer's estimates were used in the detailed design. However, no international contractors submitted bids for any of the works under the project and the bid prices received, all from domestic contractors, were mostly lower (in some cases by a factor of 3) than the engineer's estimates. The IDA task team and counterpart staff subsequently did an evaluation of options and a modification of packaging arrangements to promote greater use of funds. This re-advertisement, coupled with lack of familiarity of new MWTI staff with large procurement, resulted in some of the first year delay in implementation and the subsequent need to extend the project closing date.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

2.1.1 The overall quality at entry is rated as Highly Satisfactory. This assessment is based on the following:

- (a) Consistency with Government priorities and *Pacific Regional Strategy* and timeliness of IDA's response. The primary project development objective was to assist the Government to recover from the damage caused by Cyclone Heta and reduce the vulnerability of its people to prevailing natural hazards. The project directly addressed a significant portion of the identified \$35 million reconstruction needs which at the time, were beyond the financial ability of the Government. The Project clearly fell within the ambit of the Bank's broader development objectives for the region, namely to help reduce the vulnerability of small island states to economic and physical shocks -- a focus of the Bank's *Pacific Regional Strategy* (PRS) in 2002. The development objectives and target outcomes of the Project remain relevant under the more recently prepared PRS (2006-2009), notably to safeguard service delivery by improving resilience to natural hazards. In addition, IDA was timely both in its initial response (a mission visited Samoa within a few weeks of the cyclone), design (appraisal and negotiations took place within three months of the cyclone) and approval of the project (Board approval was within four months of the disaster).
- (b) Simplicity and focus of project design. The primary objectives of the project (recovery of coastal resilience to erosion, flooding and landslides, sustainable practices to nurture recovery of fragile ecosystems; and rehabilitation of damaged land transport systems) were few, clearly defined, well-focused and achievable, and as such, appropriate to the small country context. Immediate priority was given to physical reconstruction works to open up transportation links and to commence strengthening seawall structures before the on-set of the next cyclone season. The design included a provision for retroactive financing of up to SDR 0.6 million (20 percent of the proposed IDA funding) to assist the Government's own early responses (although this was not finally taken up by the Government). Additionally, by providing good structural design standards for Government implementing Ministries and by involving communities in planning and design of small-structures and non-structural solutions, the project provided Samoa with a comprehensive package of an appropriate range of approaches.

- (c) Lessons of earlier operations taken into account in project design. Relevant lessons for project design were drawn from previous international and Bank experience in disaster management and from ongoing infrastructure projects in Samoa. These included the importance of adopting a comprehensive approach to natural hazard risk management, including risk mitigation; the use of well-designed protective seawalls, protection of inland infrastructure, typically worth more than ten times the investment costs of the seawalls themselves; the need to make communities aware of, and willing to view soft protection measures as an alternative to hard structures which can lead to the loss of natural beaches; implementing sustainable practices aimed at nurturing recovery of ecosystems which otherwise can take many years to recover; and the use of private sector contractors who are able to function effectively in rapidly restoring road access.
- (d) Project Risks and Mitigations. Risks identified from recent experiences in Samoa and other tropical island countries were that coastal communities and authorities perceive structural treatments (such as rock walls) as durable and effective protection but that these measures alone can lead to a hardening of coastlines and loss of natural shoreline environments. The project included specific components (A.3 and A.5) to restore and thus demonstrate the value of non-structural measures and also to provide advisory services support to eight affected villages to identify, plan and implement a range of ecosystem recovery measures. A further risk identified was that under-designed structures can disintegrate and increase the cost of damages during an emergency event. The project included a specific component (A.2) to reconstruct a number of seawalls to a high and more durable design standard for future adoption by MWTL.
- (e) Adequacy of Participatory Processes. The investigation and design activities under CERP followed the provisions of the Consultation Framework successfully established under the ongoing Bank-supported Infrastructure Asset Management Project. The natural risk management approach was based on the development of district-level Coastal Infrastructure Management Plans (CIMP), which involved substantial participation and consultation among affected communities, led by MNRE. Within the Samoan culture of a *Matai* or village chief speaking on behalf of all the people, this initiative introduced a new dimension of “bottom-up” participatory community planning. It recently received an international award (from New Zealand) and is regarded as a best-practice case for the region. The high level of community in-kind contributions to the small grants component also confirms the widespread awareness and acceptance of this project subcomponent among the beneficiaries.

2.2 Implementation

2.2.1 The project was not restructured, nor was it at risk at any time. In mid-2004, a new team assumed supervision responsibility under a new Sydney-based task manager. Although the larger works subcomponents (A.2 and B.2) experienced some initial delays, project management performance throughout the life of the project was rated as Satisfactory and Implementation Progress was rated Satisfactory other than during 2005 when it was rated Moderately Satisfactory, reflecting the time being taken to repackage the works, finalize contracts, etc. As discussed below, all project outcomes were largely achieved and in some cases, exceeded.

2.2.2 Coastal Resilience Recovery Outcome (US\$4.24 million; 69 percent of total cost³). This core component was the most successful of the components from several perspectives. First, within ten months after the cyclone, and to ensure that the country was not caught unprepared in another cyclone season, the Government quickly used its own resources to fully clear all debris, open up key affected main roads and repair the denuded armor layers of seawalls that had been cyclone-damaged. By the end of the project, selected seawalls along a 14 km length of high-risk coastline on both main islands (compared to an original project target of 10 km) had been reconstructed and upgraded to a high design standard and 20,000m³ beach nourishment and dune stabilization with protective fences and access ways had been implemented. Further non-structural solutions also were achieved with active involvement and support from communities. These include the completion of 50 (compared to an original target of 25) small grants for replanting coastal coral gardens, establishing land plant nurseries, protecting communal fresh water pools, re-establishing mangrove ecosystems with accompanying fish and crab breeding grounds, and demarcating and enforcing “no catch” protection areas.

2.2.3 For the structural reconstruction and upgrading works, following project effectiveness, site inspections were originally made of a long list of 50 sites on Upolu and Savai'i and specific works to be undertaken by the Project were evaluated and selected according to agreed priority criteria. The selected sites were then grouped into five packages for ease of bidding and contract management. As noted above, there were some delays in finalizing the designs and the letting of all of the larger works packages in line with original estimates. Also, since the MWTI was undergoing internal restructuring at the time and initially did not have enough dedicated staff to manage the project-related contracts, this highlighted some initial capacity constraints. Administratively, the Attorney General's office was also apparently not clear about its role in reviewing the contract documents and the task team had to clarify that with the Government's signing of the project legal agreements, provisions governing use of Bank standard bidding documents and other Safeguard measures were not subject to further review and adjustments by the Attorney General's office on an individual basis..

2.2.4 Because Samoa's construction industry was not very large when the cyclone occurred and it was just starting to expand in response to initiatives by the Government to promote greater public-private-partnership (PPP) initiatives, the bidding process also showed several areas of contractor-consultant weaknesses. For example, initial bids received were not properly prepared in several respects (incomplete information, not enough liquid assets, equipment, history of past activities, safeguards details, etc). As a result of joint reviews of options with the GoS and others, the Government repackaged, phased and adjusted the packages and within a relatively short period, bid prices, all from domestic contractors, became extremely competitive and responsive.

2.2.5 As a result of the combined efforts of counterpart staff, consultants and the project team, implementation progress picked up and for the latter half of the (extended) project, progress was Satisfactory. As the finally awarded contract prices on the three large works packages were significantly lower than the engineer's estimates, in August 2007 the contract was amended to reconstruct additional lengths of seawalls which were all completed to improved standards by December 2007, falling slightly short of physical targets set at appraisal and the mid-term review.

³ Total project costs exclude the subcomponents A.1 and B.1 which were fully funded by the GoS. Project design had included a provision for retroactive financing for eligible expenditures incurred by the Government on these subcomponents. Because of the emergency, the GoS increased several ongoing maintenance contracts to do the works quickly. MWTI was undergoing internal restructuring and to some extent this also affected its ability to disaggregate and certify Cyclone Heta-related maintenance expenses from its national maintenance operations.

2.2.6 Strong stakeholder commitment and collaborative working arrangements between the Government and participating communities were an important element in the implementation process. In keeping with local tradition, communities provided significant contributions of voluntary inputs to identify, plan and implement subprojects. *Ex post* site visits to a sample of the subprojects confirmed that they are being well utilized, operated and maintained by the community groups.

2.2.7 Road Infrastructure Rehabilitation Outcome (US\$616,000; 10 percent of total cost). Under subcomponent B.1, the Government used its own resources to replace or rehabilitate as needed, road pavements, drainage structures, slope stabilization and road furniture damaged by the cyclone. Main transportation corridors were opened on both islands within weeks of the cyclone. A total of 9.06 km. spot maintenance (with a roughly estimated value of WST 6m) was carried out along 17 km of affected shoreline (compared to an original target of 15 km of shoreline) all within ten months of the cyclone's passage.

2.2.8 The original target was to reconstruct about five small river crossings but with the actual cost coming in higher than originally anticipated, only four of these could be reconstructed. The Government is planning to finance the fifth one with its own resources later on. As noted earlier, during appraisal, approximate figures were used for several targets where key data was not available or decisions were yet to be made. For these bridges, reconstructing four instead of "about five" crossings falls within the original target as originally envisaged.

2.2.9 The design of the replacement bridges was not only to repair the transport links but also to allow freer drainage, thus facilitating the natural flushing and replenishment of upstream ecosystems. For these works, whilst the pace of construction and the quality of works were acceptable, there were some special circumstances which should be noted. Extensive consultation with the affected communities has already been mentioned as a positive element of the project; however, such consultation also contributed to some delays arising from communities seeking many design changes, enhancements and sometimes, even trying to relocate the structures from locations determined to be technically appropriate and needed.

2.2.10 Subsequent to its completion, localized flooding at one of the bridges seemed to indicate that its design may have been altered without appropriate documentation being made of the necessary review and approvals being followed. The Government acted in a timely way, with the MWTI taking over full supervision of the remaining works in the last six months of the project and some remedial actions were taken. However, this case continues to be a matter of dispute between the Government and the design and supervision consultants six month after the project closed and it has since been taken to contract arbitration for resolution.

2.2.11 Works were also impeded by unseasonal and continuous heavy rains and flash floods. Earlier lack of equipment and inadequate site monitoring and supervision at the some of the sites on the part of the contractor and supervising engineers were addressed and while they led to some delays, these were not substantial.

2.2.12 Implementation Support Outcome (US\$1.27 million, 21 percent of total cost).

Overall the works were well investigated and designed, taking into account local topography and wave conditions, and likely will be able to withstand future cyclones without unduly undermining natural beach conditions. However, as discussed above, the pace of implementation especially in the first year of the project was slower than planned, and in the last six months, MWTI assumed full responsibility for supervision of the remaining works.

The management and coordination of project activities, procurement, financial management and accounting, monitoring of environmental safeguards requirements, auditing of project accounts, monitoring and reporting, etc. over the life of the project were all efficiently carried out. The total

cost of this support was understandably higher than originally appraised as the project was extended twice by a total of 18 months.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

2.3.1 Since this was an emergency-response project to help reconstruct post-cyclone damage, it was expected that upon completion, these works would revert to the entities with original responsibility for their operation, maintenance and utilization. No provision was initially made to formally evaluate the outcomes or impact of the project activities and the DFA sets out seven Performance Indicators for outputs only. The new task team (which assumed supervision responsibility in mid-2004) sought to sharpen the monitoring and evaluation framework by linking these outputs to the overarching project development objectives. The result was a clearer link between the various outputs and three agreed outcomes indicators.

2.4 Safeguard and Fiduciary Compliance

2.4.1 Environmental Assessment. The cyclone caused widespread damage to roads, seawalls, dunes, trees and domestic structures. Project activities were designed to restore structures in their existing positions as well as to assist ecosystem recovery and so had a beneficial impact. A set of operating procedures was agreed for routine smaller works with minimal environmental impacts, based on a set of Codes of Environmental Practice (COEPs). Larger subprojects, with potentially higher environmental impacts and beyond the scope of the COEPs, were subject to Environmental Management Plans (EMPs) being drawn up and approved by the Government's Planning and Urban Management Authority in accordance with the approved Environmental Policy Framework (EPF). Both an EPF and Land and Resettlement Framework (LARF) were adopted and legally binding on the Government as one of the conditions of project effectiveness. No safeguards were triggered throughout the life of the project. Both Bank and counterpart safeguard experts monitored and ensured that all Safeguard conditions were being observed. All Safeguards assessments carried out during implementation were Satisfactory.

2.4.2 Land tenure. Most of the activities under the project were restoration works or community-based activities and did not require any new land acquisition from local land owners or the alienation of customary land. Land ownership and related issues were not triggered in the project works; to the degree that they may have been a factor (e.g., in some of the community driven development tasks such as fresh water ponds, mangrove planting, roadside plantings, etc., they were addressed at the village chief and council level).

2.4.3 Financial Aspects. Financial Management and Financial Performance compliance is rated Satisfactory. The project initially relied on GoS Treasury systems but due to a lack of reporting capability within the GoS system, a parallel reporting system, using spreadsheets and reconciled to Treasury accounts, was established and used by the PMT. The Financial Management of the project accounts was consistently rated as Satisfactory throughout the life of the project, as was the Financial Performance and subsequently, Counterpart Funding availability. The project accounts were audited by the Government Auditor General throughout the life of the project and audited financial statements were submitted on time or within a month of the due date. No material issues of concern were raised in any of the audits. The closing date of the project coincided with the close of the financial year June 30, 2008. As there were only a limited number of transactions to be processed after the close of the project, IDA agreed to extend the delivery date of the final audit (long period audit) for the year ended June 30, 2008 from December 31, 2008 to April 30, 2009. For various reasons related to the way its own financial system was set up, the GoS tended to make its payments directly and then claim reimbursement of eligible expenditures through the designated account at a later date, sometimes with a lag of several months. Towards the end of the project, the cumulative effect of this practice made it

difficult to accurately monitor available IDA funds (exacerbated at the time by both the declining USD and the approval in November 2007 of a number of variation orders providing for additional works under subcomponent A.2). As a result, the GoS ended up paying for several tasks costing slightly more than (about WST 57,000⁴) project funds available for reimbursement. The Government agreed to fully finance this amount and the financial management rating of the project remains Satisfactory.

2.4.4 Procurement. Procurement of works, goods and services was carried out in accordance with Bank *Guidelines*. Bidding processes were conducted in a fair and transparent manner. However, in the first year of the project, a modification to the packaging arrangements of the civil works contracts (seawalls) and unfamiliarity of new MWTI staff with large procurement caused occasional difficulties in ensuring timely implementation. Appropriate IDA feedback was provided and upstream assistance offered to assist in a smooth contract-management process.

2.5 Post-completion Operation/Next Phase

2.5.1 Operation and Maintenance arrangements. Under the project, several small community-based facilities (protected water springs, seedling nurseries, protected fish breeding grounds, etc.) were constructed with a clear commitment for required maintenance to be provided by the communities. Several supervision missions visited completed works and found the community groups operating and in attendance at the facilities. The roads and public seawalls constructed under the project have been incorporated into the asset management database of MWTI and are being maintained with annual budget provisions⁵. Except for periodic inspections and general maintenance such as vegetation control, most of the culverts, crossings and other such structures were designed with very little active maintenance requirements. From both mission site visits as well as reports prepared by the counterparts, the responsible authorities appear to be doing the needed monitoring and operation and maintenance tasks for the project works.

2.5.2 Sustaining reforms and institutional capacity. Sustaining institutional reforms made under the project is very likely, given the clear recognition by both Government policy-makers and staff as well as beneficiary communities of the positive impact of the well-constructed works. While many residents naturally tend to seek the hard solutions, many also accept the soft ones now that they have seen firsthand the resilience capabilities of sand dunes, mangrove areas, coral reefs, etc.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

3.1.1 Relevance of Objectives. The objectives of the project remain relevant to the Government's current medium-term *Strategy for the Development of Samoa 2008-2012*. Specifically, Goal 7: Environmental Sustainability and Disaster Risk Reduction which, among other things, calls for the "continuation of work on coastal management and adaptation programs for vulnerable villages and other coastal locations". The Project objectives also are consistent with the Bank's current *Regional Engagement Framework FY2006-2009 for Pacific Islands* which states that "The Bank will continue its assistance in helping the Government to manage the risks of Samoa's vulnerability to natural hazards".

⁴ According to PMU records as at November 20, 2008.

⁵ For example, MWTI's Road Asset Maintenance votes of WST17.3 million and WST 15.7 million in 2007/08 and 2008/09 respectively for supervising, monitoring and carrying out Road Routine Maintenance.

3.1.2 **Design and Implementation.** Project design was relevant to the needs of the Government and people of Samoa in the aftermath of Cyclone Heta. Implementation, through the two central Government Ministries tasked with disaster reduction and management (MNREM) and transport and infrastructure services (MWTI), as well as by community-based groups for recovery of local ecosystems also was appropriate and ensured that reconstruction efforts were coordinated and undertaken at different levels across the country. The use of both structural and non-structural interventions introduced communities to the value of strengthening the resilience of natural ecosystems, and capacity building through on-the-job experience in design standards and contract management was important for institutional strengthening at the central Government level, resulting in central agencies being better prepared to respond in the event of future disasters.

3.2 Achievement of Project Development Objectives

3.2.1 **ICR rating:** Overall achievement of Project Development Objectives is Satisfactory.

3.2.2 The objective of the project was to assist the Government in recovering resilience of the natural and built environments damaged by the cyclone to a sustainable level so that the vulnerability of the people and the economy to prevailing natural hazards is reduced.

3.2.3 The project component targets were all largely achieved and in some cases exceeded. Works completed under the project not only repaired damaged roads and seawalls but also reconstructed them to a more durable standard along several vulnerable coastal areas. Activities under the project also provided the Government, local construction industry and communities with models of both structural and non-structural protection devices (seawalls, sand dunes, mangroves, beach nourishment, etc.), demonstrating the merits of this double-pronged approach that feasibly can be replicated by the responsible agencies in the future. The use of these structural and non-structural approaches by both the authorities and communities contributed to the recovery of coastal resilience to natural hazards, to nurturing the recovery of fragile coastal ecosystems and to rehabilitation of damaged land transport communications, i.e. to achievement of the PDOs.

3.3 Efficiency

3.3.1 Economic Rate of Return and Cost Effectiveness Not applicable

The project was an emergency response operation and no economic or financial analysis was undertaken during appraisal. However, the Bank's 2006 Policy Note., "Not if, but When" contains some germane cost-benefit and related analyses of Risk Management of Natural Hazards (RMNH) measures in some Pacific and Caribbean Islands. For Samoa, where the project works were carried out to higher standards than the existing ones, the study noted, "*In 1991, cyclone Val hit Samoa with maximum wind speeds of 140 knots causing massive damage – equivalent to 230 per cent of the country's real 2004 GDP. By contrast, the impact of cyclone Heta in 2004 (with wind speeds of up to 170 knots) translated to just 9 per cent of Samoa's GDP. While the two cyclones were not directly comparable, having different tracks and duration, the effects of cyclone Heta would have been far worse if the country had not invested in risk management for natural hazards through the 1990s. Shoreline protection systems designed to cyclone standards performed well and sustained minor damage compared to adjacent areas with substandard coastal protection systems.*" Similar significant benefits were also estimated for the Cook Islands, the Federated States of Micronesia and the Caribbean.

The following is an assessment based on a Value for Money Assessment (VFMA) approach to rate the extent to which the project operated efficiently and effectively with due regard to economy and quality. The VFMA is based on a number of criteria (below), on all of which the project rates positively:

- (a) Project investments met the objectives for which they were conceived – rated Positive (justification: see section 3.2 achievement of DOs);
- (b) The financial, human and physical resources consumed in realizing the investments made are consistent with acceptable norms – rated Positive (justification: see section 2.4.7 procurement review; overall, actual costs (excluding additional works the Government chose to implement to its own account) were within 1 percent of the estimates provided at appraisal (justification: see Annex 1);
- (c) The process through which the investments were realized are consistent with accepted rules and regulations – rated Positive (justification: see section 2.2 implementation);
- (d) The quality of finished structural investments were constructed to the durable standard agreed upon and competitive bidding processes gave rise to acceptable and fairly priced unit rates – rated Positive (justification: see section 2.2); and
- (e) The impact and utilization of the investments is to the degree expected – rated Positive (justification: see section 3.2 achievement of DOs).

3.3.2 Financial rate of return

Not applicable.

3.4 Justification of Overall Outcome Rating

3.4.1 Rating: Satisfactory

3.4.2 The overall rating is based on

- (a) the ongoing relevance of the project to both the Government’s national programs and the Bank’s Regional Strategy (see Section 3.1);
- (b) a review of achievements of the main project objectives and positive assessment of the likelihood of long term sustainability of the outcomes (see Section 3.2);
- (c) compliance with safeguards (see Section 2.4); and
- (d) the efficiency assessment (see Section 3.3.1).

3.5 Overarching Themes, Other Outcomes and Impacts.

3.5.1. Poverty Impacts, Gender Aspects, and Social Development. The project contributed to poverty alleviation in Samoa in several ways. Firstly, access to affected rural settlements in vulnerable coastal areas was reopened in a timely way after the cyclone struck, with only a brief disruption in access to markets and social facilities. Secondly, the design solutions introduced in the reconstruction of bridges as well as the eligible activities supported by the small grants, both supported improvements to the natural environment and in particular to fish and crab breeding areas, an important part of rural communities’ food intake. Similarly, community-enforced “no catch” areas in offshore fish breeding areas also have contributed to improvements in fish stock levels. Anecdotal interviews with family heads in some of the affected areas confirmed these findings.

3.5.2. Other unintended outcomes. Importantly, the successful small grants program was implemented by existing community-based groups. During the latter half of the project, the subprojects to be funded were identified through the community-generated Coastal Management Improvement Plans (CIM Plans) prepared under the SIAM2 project. In response to the observation that the first generation plans were unduly focused upon the village *matai* (elders), the range of consultation techniques and the method of consultation was amended to include a wider range of village stakeholders, in particular women and untitled youths. This process finally involved over 190 village and district meetings and workshops and involvement by over 5,000 people (2,100 *matai*, 1,200 women and 1,500 untitled youth), representing approximately 8

percent of Samoa's total resident and 15 percent of Samoa's adult/working age population. The recent award from the New Zealand Planning Institute of this broad-based community approach to land-use planning and development in Samoa confirms the significance of this achievement.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

Not carried out.

4. Assessment of Risk to Development Outcome

4.1. ICR rating: Overall assessment of Risk to Development Outcomes is Negligible. The risk to development outcome at the time of the project closing is rated as Negligible, due to a number of factors discussed below.

4.2. Political and institutional risks are negligible. Important preconditions for a sustainable natural hazard resilience management system are in place. For example, the national goal of environmental sustainability and disaster risk reduction is clearly articulated in the current national five-year development strategy (the *Strategy for the Development of Samoa 2008-2012*). The *Strategy* also recognizes that vulnerability to natural disasters may increase in the future due to the effects of climate change and pledges the Government to promoting the integration of environmental sustainability in all its policies, programs and projects. At the grass-roots level, activities related to planning and undertaking small works, coastal coral and mangrove replanting, and beach nourishment for coastal resilience have been embraced by communities and assets created under the project are being well maintained both by Government ministries and community-based groups.

4.3. Technical risks are negligible. Supervision of reconstruction works for a number of seawalls and bridges was taken over by MWTI during the last six months of the project, demonstrating the Ministry's commitment to ensuring the works were well supervised. All large works contracts under the project were implemented by local construction contractors, thus demonstrating a local capacity to implement such works to the high, durable design standards set by the project. MNRE and MWTI staff report that they communicate well when planning new works on Government programs which is helping to ensure that "soft solutions" and environmental considerations introduced under the program are now being routinely included in Government-funded ongoing construction and maintenance programs. In addition, the reconstructed and repaired structures and roads are all captured in MWTI's asset maintenance program which the counterpart staff has reported as being adequately funded for the past four years.

4.4. Natural disaster risks in Samoa as elsewhere in the Pacific are moderate. Due to its location, Samoa faces high exposure to natural disasters of varying intensity. This may create incentives for the authorities to be proactive in sustaining the protective structures developed.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Highly Satisfactory.

5.1.1. IDA was able to respond to the Government's request to provide supplementary financing to address the cyclone damage in a timely way. Within a few weeks of the cyclone, an identification mission had been fielded. Appraisal and negotiations took place simultaneously, within three months of the cyclone, and Board approval was forthcoming within four months of

the cyclone. Activities designed under the project, also responded directly to the needs identified by the Government as high priority and for which it had insufficient own-funds to adequately respond.

5.1.2. Notwithstanding this degree of timeliness, the project team drew from lessons of experience elsewhere and provided a well-balanced approach to include both structural and non-structural solutions. As such, not only were visible, “hard” remedial works undertaken, but a series of environmentally sensitive interventions were planned and implemented. This involved a high degree participatory planning and implementation by community groups, thus ensuring a degree of local “ownership” and sustainability of the solutions. New, high design standards for the seawall structures and bridges also were introduced, making these investments relatively durable against future natural hazards.

5.1.3. Finally, given the small size of Samoa and relatively small operations portfolio in the country, project design was kept simple with only two project components (with the third being for project support) and two implementing agencies. The size of the project and scope of activities under it also meant that domestic contractors were able to successfully bid for the works and local construction capabilities could be retained within Samoa.

(b) Quality of Supervision

Rating: Satisfactory

5.1.4. IDA conducted regular supervision missions -- at least two per year, with additional special visits made when needed. The supervision missions regularly met with various stakeholders, periodically inspected physical works in the field and carried out rapid appraisal interviews with community groups. In addition, at key junctures, the task team also had weekly conference calls with counterpart staff to facilitate the process. Over the course of the project there were only two task team leaders, thus providing a degree of continuity to the Borrower. In late-2004, the headquarters-based task manager passed on responsibility to a Sydney-based task manager and team which had an appropriate skills mix for the task.

(c) Justification of Rating for Overall Bank Performance

Rating: Satisfactory.

5.1.5. Through systematic supervision and the collaborative relations that were built up between IDA’s project team and Government counterpart officials, early implementation delays were addressed and the project ended having successfully achieved its development objective.

5.2 Borrower Performance

(a) Government Performance

Rating: Satisfactory.

5.2.1. In the initial year of the project, the Government itself (through MWTI) undertook immediate remedial clearing and repair operations. When the initial engineer’s estimates for the works indicated that the cost of components A.1 and B.1 in particular were higher than originally estimated, the Government also chose to fully fund these components as well as meeting all counterpart funding requirements in a timely way. After the initial rapid response was over, the longer term design approvals and procurement for the larger works contracts under the project took longer to effect, in part due to the need for more resources to be dedicated to these processes. Once these issues were raised and discussed by the IDA project team, the Government responded

positively by both dedicating specific officers within MWTI to the project activities as well as hiring new staff in the Attorney General's office to facilitate the clearance process and no further delays were experienced. As a general policy, the importance of adaptation and natural hazard risk reduction is now one of the core development goals of the Government and features prominently in the national *Strategy for the Development of Samoa 2008-2012*.

(b) Implementing Agency or Agencies Performance

Rating: Highly Satisfactory.

5.2.2. The Government created a Project Steering Committee (SC), comprising representatives of each of the implementing agencies, associated Ministries and community and chaired by the Chief Executive Officer of the Ministry of Finance (MOF). The SC provided overall guidance to the project and monitored project implementation progress. A project management team (PMT) was established under the SC, to provide overall project management, monitoring and coordinating functions while MWTI and MNRE each implemented their respective components.

5.2.3. Other than the first year of the project, during which time MWTI was undergoing internal restructuring and was challenged to dedicate sufficient staff time to the project to ensure agreed implementation progress, MWTI carried out its implementation responsibilities in accordance with procurement procedures and agreed work plans. It routinely insisted on a high quality of works to be constructed and in the last six months of the project, chose not to extend the supervision consultancy for the ongoing works but assumed that responsibility upon itself in order to more closely supervise the quality of construction.

5.2.4. MNRE implemented its relevant components in accordance with agreed workplans and procurement procedures. It provided exemplary leadership in building community awareness for the small grants component and during subsequent implementation of this subcomponent. The target number of small grants was thus doubled during the life of the project. Understanding of the need for adaptation and maintenance of the assets created under this subcomponent is strong in Samoa.

5.2.5. The Project Management Team provided strong management and coordination support to both the Ministry of Finance and the implementing Ministries and at the end of the project, it had met all targets and was able to do so within the original appraised estimate of costs, *albeit* that the Government had chosen to fully fund some subcomponents and also extend some of the works to its own account.

(c) Justification of Rating for Overall Borrower Performance

Rating: Satisfactory.

5.2.6. The Government's commitment and implementation in the early years of the project in taking care of the physical works in the aftermath of the cyclone, were commendable. During the first year after effectiveness, there were some unexpected challenges as all parties took some time to orient themselves and also to address some capacity and related issues. While these led to some delays in implementation, these were resolved and subsequently the Borrower and implementing agencies demonstrated strong commitment to and ownership of the project and its outputs and outcomes.

6. Lessons Learned

6.1. Several lessons were learned from the project that would be relevant for future similar operations both in Samoa and elsewhere, particularly in Small Island States.

6.2. Firstly, whilst rapid recovery activities are fundamentally needed in the aftermath of an emergency, there is often a preference by communities and Government agencies for familiar hard structural solutions. These should be well-designed, taking account local topography and wave conditions, if they are not to result in further loss of natural features such as beaches and if they are to be durable against future hazards. Furthermore, soft protection measures (such as beach nourishment, vegetation replanting and inland drainage) should be implemented in parallel with construction of seawalls and similar structures in order to strengthen the ability of the natural ecosystems themselves to withstand future hazards. The value of soft protection measures needs to be thoroughly and carefully introduced to communities (and some agencies) to be acceptable and thereafter maintained.

6.3. Secondly, the size of community grants used for identifying, planning and undertaking both structural and non-structural solutions need not be large. What is more important is the participatory process by which appropriate solutions are identified, so that there is an ongoing community commitment to provide its own additional resources and to ensure that assets are maintained and well used after the “project” has closed. Central Government ministries have an important role to play in this regard, either directly through their own structures or through NGOs and community based systems (or both), such as building interest in and “marketing” the availability and purpose of grants, ensuring that the grants are easily accessible by communities for eligible activities, providing engineering/environmental and other technical inputs to communities at key points, and in encouraging communities to take ownership of the eventual assets. The Samoan CERP case provided an excellent example of partnership and mutual trust between central Government and communities that made use of existing community-based structures and procedures for planning and implementation of not only emergency reconstruction activities but also of longer-term adaptation measures to offset some of the relentless effects of climate change.

6.4. Thirdly, the depreciation of the US dollar against the local currency towards the end of the project, exacerbated by long periods between actual expenditure on the ground by the Government and submission of withdrawal applications to IDA, was not foreseen at the start of the project and so not fully appreciated by the implementing agencies. As a result, although the final costs of the project in local currency (comprising the bulk of procurement) were consistent with the appraisal estimates, the rate of drawdown from the foreign currency denominated grant and credit were not fully factored in when additional works were approved in the last year of the project (late 2007). In this case, the Government was willing and able to absorb the additional cost; however, there is need to ensure that for future projects, the Government’s system is geared to careful monitoring of foreign exchange fluctuations so as to avoid such information gaps.

6.5. Finally, in small countries with a relatively small construction sector, the methodology for calculating contracts’ estimates needs careful consideration. In some circumstances, where estimates could be out by a significant factor, bids may need to be repackaged (in accordance with the available budget) and re-advertised, resulting in implementation delays. In such operating circumstances, project engineers need to carefully consider local variables (e.g. outdated historical rates data or logistical challenges caused by remoteness) when developing their estimates and also make better use of “slice and package” approaches⁶.

⁶ Slice and Package: A procedure whereby a large homogeneous project is sliced into smaller similar contracts that are bid simultaneously so as to attract the interest of both small and large firms. Firms may offer bids on individual contracts (slices) or on a group of similar contracts (packages) and award is made to the combination of bids offering the lowest cost to the Employer.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

The Borrower received a draft of the ICR and collaborated with the IDA project team in finalizing the ICR. A separate Borrower's Contribution is attached at Annex 7.

(b) Cofinanciers

There were no co-financiers to the project.

(c) Other partners and stakeholders.

None received.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in US\$ Million equivalent)

Components	Appraisal Estimate	Actual/Latest Estimate ⁷	Percentage of Appraisal
	US\$ millions (WST millions)	US\$ millions (WST millions ⁸)	
COASTAL RESILIENCE RECOVERY	3.25 (8.95)	4.24 (11.57)	116%
ROAD INFRASTRUCTURE REHABILITATION	1.23 (3.37)	0.55 (1.5)	40%
PROJECT IMPLEMENTATION SUPPORT	0.98 (2.69)	1.27 (3.46)	131%
Total Baseline Cost	5.46 (15.01)	6.06 (16.53)	111%
Physical Contingencies and	0.55 (1.5)		
Price Contingencies			
Total Project Costs	6.01 (16.51)	6.06 (16.53)	101%
Project Preparation Fund	0		
Front-end fee IBRD	0		
Total IDA Financing Required	4.47	4.47	

⁷ As at October 31, 2008, when Project accounts were closed..

Total project costs exclude the subcomponents A.1 and B.1 which were fully funded by the GoS. Project design had included a provision for retroactive financing for eligible expenditures incurred by the Government on these subcomponents. Because of the emergency, the GoS increased several ongoing maintenance contracts to do the works quickly. MWTI was undergoing internal restructuring and to some extent this also affected its ability to disaggregate and certify Cyclone Heta-related maintenance expenses from its national maintenance operations.

⁸ Exchange rate as at October 31, 2008 of US\$1 = WST2.7307

(b) Financing (\$ '000)

Source of Funds	Type of Co-financing	Appraisal Estimate (US\$ millions)	Actual/Latest Estimate (US\$ millions)	Percentage of Appraisal
Borrower		1.53	1.666	109%
International Development Association (IDA)	Grant (H-0830)	2.39	2.37	99.2%
International Development Association (IDA)	Credit (IDA-3885)	2.08	2.01	99.7%
TOTAL		6.00	6.05	101%

Annex 2. Outputs by Component

A. Coastal Resilience Recovery (\$3.65million PAD, \$4.24 million actual). Overall performance for the five subcomponents under this component is rated Highly Satisfactory.

1. Cyclone Heta caused damage to existing coastal protection works around Samoa, in particular on the northern sides of the two main islands, Upolu and Savai'i. Generally, the well-designed works that had been constructed under the previous and ongoing World Bank supported Emergency Road Rehabilitation Project (ERRP) and the Infrastructure Asset Management Project (Phase 1) were able to withstand the effects of the cyclone. Much of the damage documented by MWTI in the immediate aftermath of the storm was loss of riprap from the seawalls and washout of adjacent road segments, with isolated failures over short segments. The immediate local emergency response was to back-tip material into the eroded segments but oftentimes this was without adequate grading of materials and without making use of structural and filter layers or appropriate toe and crest detailing.
2. In discussions with the Government, it was agreed that support for the restoration and improvement of coastal resilience would be needed in three areas:
 - (a) seawalls where repair works were required to properly restore the armor layers;
 - (b) seawalls where the design solution entailed complete removal and then reconstruction of the inner-core material with appropriate overlying filter and structural layers, and
 - (c) non-structural, "soft" solutions at some sites to maintain the natural beach ecosystems.
3. The project design was made up of five subcomponents, comprising:
 - (a) two structural subcomponents, namely, the repair and rehabilitation of shoreline structures in affected areas on Upolu and Savai'i and the reconstruction and upgrading of shoreline protection structures in affected areas on Savai'i; and
 - (b) three non-structural subcomponents, namely restoring the natural resilience of the shorelines in affected areas on Upolu and Savai'i; providing grants to improve the resilience of coastal environments and communities in affected areas on Upolu and Savai'i; and development and implementation of recovery plans in affected areas.

A.1 Structural Rehabilitation (Savai'i and Upolu)

PAD: \$980,000 (WST 2,690,000)

Actual: \$ WST 3,558,500 estimate)

4. This subcomponent is rated as Satisfactory. In the immediate aftermath of the cyclone, the Government, through MWTI, began early recovery operations on both Upolu and Savai'i by repairing and rehabilitating the denuded armor layers of existing seawalls that had been damaged by the Cyclone (and also cleared away debris and opened the affected main roads, see subcomponent B.1).
5. The preparation of designs and procurement of works contracts to implement the planned structural rehabilitation was delayed by more than six months. The initial designs by the design consultants recommended levels of five to six meters above the mean high water mark. The client considered this too high and likely to be obstructive to community movement to and from the sea as

well as being imposing upon the village setting, hence the variations to have these lowered to three meters. The rehabilitation could not wait for that long as land transportation especially along the main arterial roads (west coast and east coast roads) needed immediate treatment.

6. The Government program comprised repair and rehabilitation of short lengths (10-100m strips) of riprap shoreline defense systems, including adding a toe and additional rocks to restore the original design shape of the seawall.

7. In all, it carried out a total of 7.1 km⁹ spot maintenance along 10 km length of shoreline (the original assessment of damage was 14 km length affected shoreline but this was reviewed during implementation and reduced by agreement between the IDA task team with the Government during the Mid-Term Review).

8. The works were fully completed within about 10 months of the Cyclone (largely completed by December 2005). Project design had included a provision for retroactive financing for up to 20 percent of the total IDA funds, for eligible expenditures incurred by the Government from the date of appraisal until the project became effective. However, at the time, MWTI was undergoing internal restructuring and to some extent, this affected its ability to disaggregate and certify Cyclone Heta-related maintenance expenses from its national maintenance operations. In addition, the Government was concerned that the bid prices of works proposed under other subcomponents may be higher than originally estimated. It therefore decided not to make use of the retroactive financing facility and instead, made an internal reallocation of the IDA funds from subcomponents A.1 and B.1 to subcomponents A.2 (reconstruction of seawalls) and B.2 (bridge repairs). As these subcomponents are all within the same disbursement category in Financing Agreement, a formal reallocation was not undertaken. Fully funding the rehabilitation works from its own account, the Government also decided to extend the works it undertook.

A.2 Structural Reconstruction and Upgrading (Savai'i)

PAD: \$1,718,000 (WST 4,717,000)

Actual: \$1,964,835 (WST 5,365,375)

9. This subcomponent is rated as Highly Satisfactory. The intent was to reconstruct and upgrade about 2.22 km of shoreline protection structures at selected locations so that they could withstand prevailing natural hazard risks along a coastal length of 10 km. The project design and supervision consultant's contract became effective January 24, 2005. Site inspections were made of a long list of 50 sites on Upolu and Savai'i and specific works to be undertaken by the Project were evaluated and selected according to agreed criteria. The selected sites were then grouped into five packages for ease of bidding and contract management.

10. The main works under the subcomponent were:

Package A: Solosolo seawall at Vainamo Bay, Solosolo along the West Coast Road on Upolu.

10.1. The works comprised reconstruction of 950 meters of seawall by addition of a toe, modifying the existing crest and altering the slopes and armor layers. The Solosolo area is a high-energy coastal area with no protective reef. The main coastal access road and other infrastructure, homesteads and land along this area are in constant danger of storm damage and thus repair works to a high standard were a priority before the next cyclone season commenced.

⁹ Upolu: Salepouae (120m), Levi (400m), Tufulele (100m), Utualii (100m), Faleasiu (240m), Nofolii (20m), Matautu Tai Vaiala (1,100m), Apia-Falefa (1,550m), Siumu (500m). Savai'i: Fagasa (279m), Sataua Hospital (333m), Faletagaloa-Sasina (1,000m), Asau (200m), Puleia (800m), Faga-Puapua (375m). Total: 7,117m

10.2. The engineer's estimate for the contract was WST 4,508,690. Five bids were received on the bid opening date of August 29, 2005. The contract award was in an amount of WST 1,722,192 and commenced on June 1, 2006 with a completion date of January 24, 2007. The evaluation of bids and final award of the contract took a lengthy nine months to complete. Amongst the problems faced were that MWTI did not initially have dedicated staff to manage the project-related contracts and there also were delays in the Attorney General's office which wished to scrutinize the standard bidding documents.

10.3. During the course of the contract, progress was further impeded by unseasonally heavy rainfall, high seas and insufficient supply of primary armor rocks until an alternative source had to be found.

10.4. The engineer's estimate for reconstruction costs for this and the other packages was risk-based (Hong Kong) method in order to cater for the international competitive bidding process to be followed. The bidding process turned out to be very competitive with five bids received, all from domestic contractors. As the awarded contract price was significantly lower than the estimates, in August 2007 the contract was varied by an additional amount of WST 948,400 to reconstruct an additional length (650m) of the Solosolo seawall and also to reconstruct the Leusoali'i/ Luatuanuu seawall. The extended contract was completed to a good standard on December 12, 2007.

Package C: Savai'i seawalls at Saleia, Fagasa, Sataua Village and Satatua Hospital. (Due to budget constraints, seawall reconstruction at Manase west was not initially undertaken).

10.5. The reconstruction works comprised addition of a toe, modifying the existing crest and altering the slopes and armor layers on the seawalls. The works included the recovery and re-use of existing rocks, supply and special placement of additional rock armor and under-layers, extension of existing drainage culverts and associated minor works such as concrete steps. They entailed reconstruction of 520m at Saleia seawall, 140m at Fagasa seawall, 265m at Sataua Hospital seawall and 350m at Sataua Village seawall.

10.6. The engineer's estimate for the contract was WST 5,170,290 (excluding beach nourishment). Three bids were received on the bid opening date of October 31, 2005. Only one bid was evaluated as substantially responsive and the price offered in this bid for one of the crossings was not acceptable. In order to stay within the available budget, the Government therefore reduced the scope of works and re-advertised. New bids were opened on August 28, 2006, ten months after the first bid opening date. The final contract award was in an amount of WST 3,708,330 (covering both seawall reconstruction and beach nourishment) and commenced on November 23, 2006 with an original completion date of June, 2007, which was one of the motivating factors from the Government to request a project extension.

10.7. During the course of the contract, progress was highly satisfactory and completed one month ahead of schedule despite heavy rains at the start of the contract. The quality of works was good.

10.8. As the awarded contract price was significantly lower than the engineer's estimates, the contract was varied by an additional amount of WST 1,378,330 to extend the Saleia seawall eastwards by 150m, and provide additional seawall protection at Manase (200m) and Sasina (300m). The final contract was completed on December 12, 2007.

Package D: Upolu seawall at Malua.

10.9. The scope of work of the contract was the reconstruction of 1,250m of the seawall at Malua. The works included the recovery and re-use of existing rocks, supply and special placement of additional rock armor and under-layers, extension of existing drainage culverts and associated minor works such as concrete steps.

10.10. During the engineering design phase, works were proposed at Malua seawall (reconstruction), Leusoali'i seawall (reconstruction), Luatuanu' U-point seawall (reconstruction), Saleimoa seawall (reconstruction), Solosolo village seawall (reconstruction), Apia reclaimed area (rehabilitation) and Beach Road, Apia (rehabilitation) for which the engineer's estimate was WST 9,548,130. This was nearly three times the available funds under the project. Nonetheless, the works were advertised. Samoa's construction industry is not very large and the initial bids received (on October 31, 2005) were of a low quality with several procurement conditions (e.g. liquid asset requirements) not met. Only one substantially responsive bid was received and the bid price was substantially higher than the original appraised estimates (and thus the funds available) for the works, although less than the engineer's estimate. To meet the funding constraints, the Government reduced the scope of works to Malua seawall reconstruction only and re-advertised the contract. The resultant contract was awarded at a contract price was WST 2,124,500. Given these lengthy delays, the contract commenced on November 21, 2006, some 30 months after the project became effective and one month before the original project closing date. This was one of the motivating factors by the Government to request a project extension.

10.11. During the course of the contract, progress was further impeded by unseasonably heavy rainfall. Also the contractor experienced frequent equipment breakdowns which further slowed the works and a contract extension had to be provided.

10.12. In August 2007, as the contract price in local currency was less than the funds originally provided for this subcomponent, MWTI approved a Variation Order to the contract to extend the reconstruction of the Malua seawall by a further 50m and to reconstruct a 820m section of the Saleimoa seawall. The value of the Variation Order was WST 1,399,850, bringing the total contract price to WST 3,524,350. The contract was completed on December 12, 2007.

Package E: Aleipata Marine Protected Area Center.

10.13. Works proposed under this contract were to strengthen the Marine Protected Area at Aleipata building by replacing support poles and re-roofing. Due to budgetary constraints, it could not be financed under the project and responsibility for the improvements was transferred to MNREM for implementation under the A4 for Small Scale Resilience projects. The required works were procured and completed by the Ministry, on May 15, 2006.

10.14. Overall, subcomponent A.1 was highly satisfactory in that within the available budget, the physical targets set at appraisal were largely met or exceeded – a total of 12 km (of shoreline was finally protected to a high standard, compared to the original target of 10 km.

10.15. In the early years of the project, implementation of the works was delayed by a number of factors which resulted in the project needing to be extended by 18 months. Several problems and causes of delay can be attributed to shortages of key staff in MWTI to review contract documentation in a timely way, delays within the Attorney General's Office in providing timely legal clearances of bid documents within set bid validity periods; and redesign (lowering) of some

key seawall designs to meet beneficiaries' preferences and needs for coastal access. There were also some delays caused by factors outside of the Government control, including unseasonably high rainfall and high seas at certain times. For these reasons, Project Implementation was rated as moderately satisfactory from late 2005 through early 2006.

10.16. However, following the Mid-Term Review the Government took a number of steps to overcome these constraints (including recruiting more staff in the Attorney General's office and providing dedicated key staff in MWTI to the project). From there onwards, implementation progress greatly improved and all works contracts were completed by December 12, 2007 (and are currently in defects liability period). The quality of works too were of a high standard with close monitoring by MWTI which took full responsibility (from the consulting engineering firm) for supervision for the last six months of the project.

A.3 Non-Structural Rehabilitation (Savai'i and Upolu)- beach nourishment and dune stabilization at Avata and Tufutafoe.

PAD: \$401,000 (WST 1,101,000)

Actual: \$1,797,244 (WST 327,777)

10.17. This subcomponent is rated as Highly Satisfactory. It aimed to restore the natural resilience of affected shorelines to withstand prevailing natural hazard risks through non-structural measures including beach nourishment, stabilization of dunes and avoidance measures.

10.18. Works under this subcomponent comprised a part of Package C. The scope of work of part of the contract entailed nourishment of beaches for 20,000m³ of dune reconstruction at Avata, Tufutafoe I and Tufutafoe II. Beach nourishment involves the recovery of sand from land and sea-based sources, shaping into dunes, planting of vegetation and construction of protective fences and access ways.

10.19. The engineer's estimate for the contract was WST 900,000 (excluding seawall reconstruction). Three bids were received on the bid opening date of October 31, 2005. Only one bid was evaluated as substantially responsive and the price offered in this bid for one of the crossings was not acceptable. In order to stay within the available budget, the Government therefore reduced the scope of works on the seawall reconstruction elements and readvertised. New bids were opened on August 28, 2006, ten months after the first bid opening date. The final contract award was in an amount of WST 3,708,330 (covering both seawall reconstruction and beach nourishment) and commenced on November 23, 2006 with an original completion date of June, 2007, which was one of the motivating factors from the Government to request a project extension.

10.20. During the course of the contract, progress was highly satisfactory and the contract was completed one month ahead of schedule despite heavy rains at the start of the contract. The quality of works was good.

10.21. As the awarded contract price was significantly lower than the engineer's estimates, the contract was varied by an additional amount of WST 1,378,330 to extend the seawall protections though no further extensions were made to the beach nourishment/dune stabilization activities. The final contract was completed on December 12, 2007.

A.4 Small-scale Resilience (Savai'i and Upolu)

PAD: \$133,000 (WST 364,000)

Actual: \$224,790 (WST 613,834)

10.22. This subcomponent is rated as Highly Satisfactory. The project supported subgrants to local community groups to undertake various small-scale subprojects aimed at accelerating ecosystem restoration and enhancing the resilience of coastal environments against future possible hazards, thereby improving protection of coastal resources and communities. Eligible activities would be linked to effects from Cyclone Heta.

10.23. The original target was to fund 25 small-scale, community- based subprojects. The MNRE's Small Grants Scheme Manager operating under the Planning and Urban Management Agency (PUMA) was responsible for coordinating activities to promote public awareness of the scheme, solicit proposals from interested groups, coordinate their evaluation with technical support from MNRE/MNRE, prepare evaluation reports and technical recommendations to the Small Grants Operations Committee for approval, and monitor and report on progress. A strong partnership was formed between central Government and the community groups through the implementation of the small-scale projects. At the start of each subproject, a Memorandum of Understanding was signed between the Minister of Natural Resources and Environment and the *Pulenu'u* (Mayor) and leaders of the community and on the successful completion of each small subproject, an exchange of formal letters of thanks between the two parties took place.

10.24. Grants of up to WST 15,000 were provided to the approved community groups in two tranches, at inception and after verified completion in the initial stages of the project before being increased to WST 20,000 after the Mid-term Review. The small works were planned, coordinated and subsequently maintained through existing village based structures such as *Komiti* (women's groups), *Komiti a le Pulunu'u* (members chosen by villagers and the *Pulenu'u* for special projects) and/or the *matai* (elders). The project funds were used to purchase the materials for the works and in most cases the *taulele'a* (untitled men) of the villages provided significant contributions of voluntary labor to construct the works. In keeping with Samoan cultural traditions, there is free and open access to all completed works by all members of the villages.

10.25. In the latter years of the project, an increasing number of small works grant applications were made as a result of needs identified by the coastal ecosystem recovery plans (see A.5 below) as well as the community-generated Coastal Management Improvement Plans (CIM Plans) initiated under the parallel, Bank-supported Samoa Infrastructure Asset Management Project. Under the second phase of this APL project (SIAM2), the community consultation techniques were amended to include a wide-range of village stakeholders, from the *matai* to women and untitled youths and the CIM Plans finally were prepared by all villages throughout the country. The process involved 190 village and district meetings and workshops meeting over 5,000 people, representing around 8 percent of Samoa's resident population and 15 percent of the adult population.

10.26. When CERP was extended on December 30, 2006 to facilitate the completion of the large works contracts (subcomponents A.2 and A.3 above), additional funds were reallocated to increase the target number of small grants to 35. By the end of the project, 50 small-scale resilience subprojects had been successfully completed. Around 60 percent of the subprojects were concentrated on replanting activities such as coastal garden restoration works and establishing plant nurseries, 31 percent were for the protection of communal fresh water pools and the remaining 9 percent were for mangrove establishment (important for fish and crab breeding grounds, stabilizing effects and aerating the water) and for marine fish breeding and "no-catch" protection areas.

A.5 *Coastal Eco-system Recovery (Services and Works)*

Services PAD: \$251,000 (WST 689,000)

Actual: \$91,550 (WST 250,000)

Works PAD: \$167,000 (WST 459,000)

Actual: \$157,700 (WST 430,656)

10.27. This subcomponent is rated as Highly Satisfactory. The subcomponent recognizes the fundamental role that coastal and marine ecosystems play in supporting the livelihoods of the majority of the Samoan population (who live on the coastal areas) and in providing habitat for the country's marine biodiversity. The Recovery Plans, using consultative and participatory planning methodologies, were prepared for eight cyclone affected villages and subsequently, Village Agreements and Recovery Plan Agreements were drawn up and adopted. Priority recovery activities identified in the Plans also would be implemented as part of the coastal ecosystem rehabilitation.

10.28. The Recovery Plans were facilitated by consultants by means of assessment surveys, data analysis and mapping to highlight areas of high vulnerability and resilience. The survey results and observations then led into activities for restoration of coastal ecosystems and developing site-specific recovery plans in consultation with the communities. The completed Recovery Plans were taken back to the Village Councils for approval, ensuring village support and participation in the implementation phase.

10.29. The recovery implementation phase activities comprised both "soft solutions" (such as construction of plant nurseries, replanting of coastal plants and mangroves, coral replanting, banning of destructive fishing methods, controlling/managing activities that affect coastal habitats and resources such as sand mining and reclamation) and small works. The works consisted of design and construction of new multi-cell culvert crossings at Vaovai, Faleapuna, Apolima-uta and Taelefaga replacing the existing small diameter culverts to improve water movement. Single -cell culverts were also designed and constructed at Samatau and Safata.

10.30. The works (culverts) contract was awarded at a contract price of WST 495,254 and commenced on October, 2007. Progress was hindered by the water-logging of four of the six sites. After an extension, the contract was completed in January 2008.

10.31. In addition to preparing the Ecosystem Recovery Plans and constructing the culvert crossings in the eight villages, a number of other outputs were achieved under this subcomponent, namely: four community workshops were held; a 30-minute educational video program on sand mining and coastal reclamation and their impacts on shoreline communities and coastal ecosystems resilience was made; two pamphlets (one each in Samoan and English) on sand-mining and coastal reclamation and their impacts on shoreline communities and coastal ecosystems resilience were prepared, printed and published widely within local communities, schools and the general public; Environment or Conservation Committees were established in the villages and local surveillance programs were established. Public awareness for the CERP small grants also went hand in hand with the community consultations for the preparation of Coastal Infrastructure Management Plans (CIMPs) under the SIAM 2 project.

B. Road Infrastructure Rehabilitation (\$1.376million PAD, \$2,743 million actual). Overall performance for the two tasks under this component (roads and drainage in affected areas on Upolu and Savai'i, and bridge replacement in affected areas on Upolu and Savai'i) is rated Satisfactory.

B.1 Road and Drainage (Savai'i and Upolu)

PAD: \$848,000 (WST 2,327,000)

Actual: \$2,195,340(WST 5,994,800¹⁰)

10.32. This subcomponent is rated as Highly Satisfactory. It rehabilitated or replaced road pavements, drainage structures, slope stabilization and road furniture damaged by the cyclone. The main works under this subcomponent were carried out by MWTI shortly after the cyclone and was fully funded by the Government as these were considered urgent for the associated roads to be usable as they were littered with revetment rocks and boulders brought onto the road surfaces by the high tidal waves during the cyclone. The works were fully completed by December 2005. Retroactive financing equivalent to 20 percent of the total IDA funds was provided for in the project design for eligible expenditures incurred from the date of appraisal until the project became effective in order to cover the costs associated with project preparation activities and procurement of the main contract. However, the Government found it was not able to meet the eligibility requirements and also that once the early bids came in, costs were higher than originally estimated. Therefore, GOS decided not to seek retroactive financing of these works.

10.33. In the immediate aftermath of the cyclone, the Government, through MWTI, began early recovery operations on both Upolu and Savai'i by clearing away debris and opening the affected main roads. In all, it carried out a total of 9.059 km¹¹ spot maintenance along 17 km length of shoreline (as compared to the original target of 15 km length affected shoreline). The works were fully completed within about 10 months of the Cyclone (largely completed by December 2005).

B.2 Bridge Replacement (Savai'i and Upolu)

PAD: \$528,000 (WST 1,452,000)

Actual: \$616,095 (WST 1,682,367)

10.34. This subcomponent is rated as Moderately Satisfactory. The target was to reconstruct approximately five small river crossings (four targeted at the Mid-term Review as a result of higher than appraised costs of construction – see below) that had been damaged by the Cyclone and, whilst doing so, upgrade two of them so as to allow for freer movement of water through them, thus facilitating the natural flushing and replenishment of upstream eco-systems. This in turn allows for more vigorous mangrove growth and improved fish and crab breeding grounds

10.35. The works under this subcomponent comprised new 3-cell box culverts to replace the vented causeways at Safai and Lano on the North Coast Road of Savai'i, a box culvert to replace the existing vented causeway at Malaemalu, and a 5-cell box culvert to replace the existing vented

¹⁰ As at December 2005 – Estimated roads and drainages improved immediately after cyclone 17,128 m at 2005 rate for sealed road/m at WST 350.

¹¹ Upolu: Fasitoo T&T (550m), Savaia Tai (89m), Tafagamanu (650m), Falsely (250m), Apia-Falefa (314m), Fagaloa Bay (138m); Savai'i: Saleia (75m), Fagasa (200m), Sataua Hospital (250m), Falelima (350m), Safotu (128m), Sasina (400m), Auala (150m), Satuiatua-Salailua (300m), Gataivai (500m), Gautavai (310m), Puleia (800m), Faga-Puapua (1,490m), Safai-Fagamolo (1,450m), Lelepa-Avao (665m); Total: 9,059m

causeway at Poutasi, both on the South Coast Road of Upolu. The works were tendered under a single contract.

10.36. The bids received when the works were first advertised were similar to the engineer's estimate but higher than the PAD estimate and thus exceeded the funds available. The Government therefore reduced the scope of works to four bridges and re-advertised. The engineer's estimate for the revised contract was WST 2,089,300. Three bids were received on the bid opening date of September 20, 2005. The final contract award was in an amount of WST 1,698,689 to commence on January 20, 2006 with an original completion date of August 10, 2006.

10.37. Both the pace of construction and quality of work on the sites had some initial problems. Works were impeded by continuous heavy rains (at Malaemalu), flash floods (at Poutasi) and requests by the community to relocate one of the culverts (at Lano). Lack of equipment and inadequate initial site supervision at the various sites on the part of the contractor exacerbated the delays as the contractor was unable to work on more than one site at a time, as had originally been called for. As a result, the contract was twice extended. The crossings at Malaemalu and Poutasi were completed in July 2006 and at Safai and Lano only in February 2007.

10.38. Investigation of subsequent localized flooding at Lano indicated that the bridge design may have been changed without copies of the record of the appropriate review and process being authorized and followed. The Government acted in a timely way by MWTI taking over full supervision of the remaining works in the last six months of the project and also engaging an independent specialist to assess both the appropriateness and completeness of the designs and the consistency of the works as constructed with the drawings and Bill of Quantities. After the project closed, the issue was ongoing and the Government is investigating options for recovering the costs of rectifying the works from the supervision consultant.

10.39. Within 10 months of the project starting, the Government, through MWTI, had cleared away debris and opened affected main roads on both Upolu and Savai'i. It also carried out a total of 9.059 km¹² spot maintenance along 17 km length of shoreline, 13 percent more shoreline than the original target. By the end of the project, four bridges has been reconstructed, within budget. However, the number of bridges had to be reduced from "about five" to four owing to the high engineer's estimates and the circumstances regarding design adjustment on one of the bridges continues to be a matter of dispute between the Government and the design and supervision consultants six month after the project closed.

C. Implementation Support (\$977,000 PAD, \$1.268 million actual). Overall combined performance for the three tasks under this component was Satisfactory. Each of the subcomponents -- technical assistance, project management and operating costs, varied in what was achieved.

C.1 Technical assistance

PAD: \$812,000 (WST 2,234,000)

Actual: \$960,050 (WST 2,621,600)

¹² Upolu: Fasitoo T&T (550m), Savaia Tai (89m), Tafagamanu (650m), Falsely (250m), Apia-Falefa (314m), Fagaloa Bay (138m); Savai'i: Saleia (75m), Fagasa (200m), Sataua Hospital (250m), Falelima (350m), Safotu (128m), Sasina (400m), Auala (150m), Satuiatua-Salailua (300m), Gataivai (500m), Gautavai (310m), Puleia (800m), Faga-Puapua (1,490m), Safai-Fagamolo (1,450m), Lelepa-Avao (665m);
Total: 9,059m

10.40. This subcomponent is rated as Moderately Satisfactory. The subcomponent provided technical assistance to the MWTI and MNREMMNRE to implement project activities.

10.41. The consultant contract commenced at the beginning of 2005 and closed in 2007. The main tasks completed by the consultant were: (a) coastal engineering to identify, design and supervise selected structural and non-structural coastal resilience measures, (b) management of subprojects and (c) design, preparation and supervision of upgrading the river crossings.

10.42. Overall, the works were well investigated and designed, taking account of local topography and wave conditions that will be able to withstand future cyclones without undermining natural beach conditions. The use of risk-based methods for determining engineer's estimates was prudent given that many of the works were procured using international competitive bidding. However, the estimates might have been tempered by some insights into the regional and domestic contractors' competitiveness (no regional contractors submitted bids for any of the works for this project) and greater flexibility on the packaging of contracts. Much time was wasted in the Government having to repackage and re-advertise bids and also to downsize contracts only to discover once bids were received that prices were some three times higher than the estimates. Also, during implementation of the works, there were periods when the consultant only had two (instead of the three called for) supervisory engineers on site. As a result, the pace of implementation was frequently slower than planned and the quality of works in the case of the bridges, was not fully acceptable to the Government. MWTI finally, in the last six months of the project, took over all supervision so as to exert tighter controls on the contractors.

C.2 Project management

PAD: \$113,000 (WST 312,000)

Actual: \$290,180 (WST 792,397)

10.43. This subcomponent is rated as Highly Satisfactory. It provided management and implementation support to MOF and the implementing Ministries for project implementation. The consultant's contract commenced in 2005 and was completed on June 30, 2008. It provided management and coordination of project activities, procurement, financial management and accounting, monitoring of environmental safeguards requirements, auditing of project accounts, monitoring and reporting, etc. over the life of the project (which was extended twice by a total of 18 months). The project was in compliance with legal covenants throughout its life and required technical and financial monitoring and reporting was carried out in a timely way. Firm management of project costs was maintained and finally, the project substantially met all targets and was able to do so within the original appraised estimate.

C.3 Operating Costs

PAD: \$52,000 (WST 142,000)

Actual: \$17,830 (WST 48,689)

10.44. The operating costs expenditures were used to supplement the implementing agencies' own budgets on project related expenditures such as advertising costs, local transport for supervision purposes, stakeholder workshops and similar activities.

Annex 3. Economic and Financial Analysis

1. The project was an emergency response operation and no economic or financial analysis was undertaken during appraisal. However, the Bank's 2006 Policy Note., "Not if, but When" contains some germane cost-benefit and related analyses of Risk Management of Natural Hazards (RMNH) measures in some Pacific and Caribbean Islands. For Samoa, where the project works were carried out to higher standards than the existing ones, the study noted, *"In 1991, cyclone Val hit Samoa with maximum wind speeds of 140 knots causing massive damage – equivalent to 230 per cent of the country's real 2004 GDP. By contrast, the impact of cyclone Heta in 2004 (with wind speeds of up to 170 knots) translated to just 9 per cent of Samoa's GDP. While the two cyclones were not directly comparable, having different tracks and duration, the effects of cyclone Heta would have been far worse if the country had not invested in risk management for natural hazards through the 1990s. Shoreline protection systems designed to cyclone standards performed well and sustained minor damage compared to adjacent areas with substandard coastal protection systems."* Similar significant benefits were also estimated for the Cook Islands and the Federated States of Micronesia and the Caribbean.

2. The following is an assessment based on a Value For Money Assessment (VFMA) approach to rate the extent to which the project operated efficiently and effectively with due regard to economy and quality. The VFMA is based on a number of criteria (below), on all of which the project rates positively:

- (a) Project investments met the objectives for which they were conceived – rated Positive (justification: see section 3.2 achievement of DOs);
- (b) The financial, human and physical resources consumed in realizing the investments made are consistent with acceptable norms – rated Positive (justification: see section 2.4.7 procurement review; overall, actual costs (excluding additional works the Government chose to implement to its own account) were within 1 percent of the estimates provided at appraisal (justification: see Annex 1);
- (c) The process through which the investments were realized are consistent with accepted rules and regulations – rated Positive (justification: see section 2.2 implementation);
- (d) The quality of finished structural investments were constructed to the durable standard agreed upon and competitive bidding processes gave rise to acceptable and fairly priced unit rates – rated Positive (justification: see section 2.2); and
- (e) The impact and utilization of the investments is to the degree expected – rated Positive (justification: see section 3.2 achievement of DOs).

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
<i>system generated from PAD</i>			
Supervision/ICR system generated from archived ISRs			
Thakoor Persaud	Lead Economist	EASTE	Team Leader
David Michael Chandler	Sr. Financial Management Specialist	EAPCO	FMS
Stephen Hartung	Financial Management Specialist	EAPCO	FMS
Cristiano Costa e Silva Nunes	Procurement Specialist	EAPCO	PS
Colleen Gollach	Consultant	EASTE	Consultant
Lawrence Leonard William Carlson	Consultant	EASTE	Consultant
Sudesh Ponnappa	Sr. Program Assistant	EACNF	

(b) Staff Time and Cost system generated

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	US\$ Thousands (including travel and consultant costs)
Lending		
FY04	5.70	40,174.83
Total: 5.70		40,174.83
Supervision/ICR		
FY05	4.19	43,422.09
FY06	5.48	45,195.81
FY07	2.92	55,460.01
FY08	2.33	33,613.05
FY09	4.19	43,422.09
Total: 19.11		221,113.05

Annex 5. Beneficiary Survey Results

None undertaken.

Annex 6. Stakeholder Workshop Report and Results

None undertaken.

Annex 7. Full Copy of Borrower's ICR

ASSESSMENT OF PROJECT OBJECTIVES, DESIGN AND IMPLEMENTATION

1. The Borrower feels that the project was well designed and acknowledges the assistance of the Bank in helping to bring cohesion to such a diverse project with four different implementing agencies. We have come to appreciate that good design and preparation were crucial elements for the overall success of the project. The only concern with the project preparation would be if the Government had more clearly understood how it was to make use of retroactive funds and so overcome the inability of the Government to claim against the project some of the rehabilitation works that happened immediately after the cyclone.

2. The objectives of the project were simply stated and provided a clear focus for the overall purpose of the project which is to recover natural and built environment that were damaged by Cyclone Heta, and enhance the resilience of those features to a sustainable level so that the vulnerability of the Samoan people and the economy to prevailing natural hazards is reduced.

3. It was decided during appraisal that there would be more detailed technical and other consultative reviews with project beneficiaries before specific features and sites were selected. Nevertheless, the appraisal team identified three main areas.

- (a) Part A – Coastal Resilience Recovery in selected areas affected by Cyclone Heta,
- (b) Part B – Road Infrastructure Rehabilitation in selected areas affected by Cyclone Heta
- (c) Part C – Project Implementation Support in selected areas affected by Cyclone Heta

4. For the purposes of implementation, the objectives were broken down into 9 separate components. Specifically, each part of the project targeted the recovery and or strengthening of resilience through the following components;

- (a) **A.1** - Repair and rehabilitation of about 1.25 kilometers of shoreline protection structures at selected locations.
- (b) **A.2** - Reconstruction and upgrading of about 2.22 kilometers of shoreline protection structures to withstand prevailing natural hazard risks.
- (c) **A.3** - Restoration of the natural resilience of about 20,000m³ of shoreline to withstand prevailing natural hazard risks through non-structural measures, including beach nourishment, stabilization, or avoidance measures.
- (d) **A.4** - Subgrants to improve the resilience of coastal environments and communities through various small-scale subprojects.
- (e) **A.5** - Support the recovery of marine and coastal fringe ecosystems through inter-alia, assessment surveys, mapping and analysis of vulnerable areas, community consultation and development and implementation of recovery plans.

- (f) **B.1** - Rehabilitation or replacement of road pavements, drainage structures, slope stabilization, and road furniture damaged by the Cyclone.
- (g) **B.2** - Upgrading about five small river crossings, which were damaged by the Cyclone.
- (h) **C.1** - Supporting through Technical Assistance (TA) to provide advisory services to the Ministry of Works, Transport and Infrastructure (MWTI) and Ministry of Natural Resources, Environment (MNRE) to carry out:
 - (i) Coastal engineering to identify, design and supervise selected structural and non-structural coastal resilience measures;
 - (ii) Small-scale natural hazard mitigation measures;
 - (iii) Management of subprojects;
 - (iv) Preparation and supervision of road rehabilitation activities mentioned in B.1 above;
 - (v) Design, preparation and supervision of the river crossings upgrades as per B.2 above.
- (i) **C.2** - Management and implementation of TA to Ministry of Finance (MOF) for project implementation.

ACHIEVEMENT OF OBJECTIVES

4. The Borrower is satisfied that the project has been successful in achieving its objectives.

- (i) A1 - 10 kilometers of shoreline protection structures repaired and rehabilitated. (100%)
- (ii) A2 – 11.9 kilometers of shoreline protection structures reconstructed and upgraded to withstand prevailing natural hazard risks. (85%)
- (iii) A3 – 1.97 km of beach nourishment, coastal replanting and marine protected areas and avoidance measures implemented (78% of original target although the target was reduced during the project. The target volume of beach sand nourished was achieved.)
- (iv) A4 – 45 subgrants projects successfully completed which is 10 more than the revised target of 35 projects (plus five waiting for reporting to the Steering Committee). (128%)
- (v) **A5** – 8 ecosystem recovery plans successfully developed and implemented (100%)
- (vi) **B1** – 17 kilometers of road pavements, drainage structures, slope stabilization, and road furniture that were damaged by Cyclone Heta replaced and rehabilitated. (113%)
- (vii) **B2** – 4 river crossing completed (100%)
- (viii) **C1** – All detailed technical designs completed as well as supervision of the original works contracts. The supervision of variations for packages A, C and D were undertaken by the MWTI. (78% budget spent, one payment pending.)
- (ix) **C2** – All management services completed successfully. (100% budget spent)

MAJOR FACTORS AFFECTING IMPLEMENTATION AND OUTCOMES

The major factors affecting implementation were as follows:

- (i) Delay in the approval of designs.
- (ii) Delay in completion of coastal protection constructions due to poor weather conditions and rock supply constraints. This meant that the outcome was affected as there were insufficient financial resources to implement the full scope of part B.
- (iii) Inadequate supervision of bridge construction and discontinuity of original personnel.
- (iv) Imbalances in the early consultation processes between the consultants and communities during construction.
- (v) This led to a request for an extension of the loan period from 31 December 2006 to 31 December 2007.
- (vi) Capacity constraints in the implementing agencies meant that counterparts could not always work alongside consultants. This was partly overcome by training workshops to build capacity but staff shortages are recognized as a threat to sustainability, particularly in the Ministry of Works Transport and Infrastructure.

BANK AND BORROWER PERFORMANCE

- (i) The Borrower was highly satisfied with the performance of the Bank. It was particularly beneficial to have continuity of Bank personnel from the time of preparation through to completion. Clearances were for the most part timely and supervision was enthusiastic and comprehensive. We were given considerable assistance by the Bank staff and found the approach to be helpful and flexible rather than critical and pedantic.
- (ii) We consider the Borrower's performance to be highly satisfactory. Counterpart funds have always been made available to suit the implementation programme. The final contribution of the Borrower exceeded the original financing plan by about WST 57,000.
- (iii) Procurement was carried out reasonably effectively in a completely open and transparent manner as required by Bank guidelines and the Government of Samoa (GOS) procedures. It is acknowledged that there were some delays in obtaining legal clearances for contract award but this was partly due to a misunderstanding about the timing of the legal review, which has subsequently been rectified.
- (iv) The administration procedures for the project and the financial management system worked effectively and efficiently throughout. The Steering Committee met regularly and took prompt action to overcome any constraints that were impeding progress. The project management team also worked closely with the Borrower personnel and the Bank's technical team to resolve issues that have

arisen during the project through frequent virtual communications and teleconferences.

5. LESSONS LEARNED

- (i) The value of good project design and preparation.; the need for clear lines of communication between implementing agencies and consultants providing design or supervision services.
- (ii) In the reformed agency for works, transport and infrastructure, the need to adequately empower the supervision consultants with sufficient authority to administer the construction contracts on behalf of the agency.
- (iii) The value of an overall PMT to co-ordinate activities and provide support to the implementing agencies in a project that has more than one implementing agency.
- (iv) The value of strong consultative procedures and the value of local involvement in the project.

Annex 8. List of Supporting Documents

Aide Memoire, July 2004
Aide Memoire, Jan-Feb, 2005
Aide Memoire, August 2005
Aide Memoire, March 2006
Aide Memoire, August, 2006
Aide Memoire, November 2007
Aide Memoire, June 2008

Government of Samoa, Ministry of Natural Resources, Environment & Meteorology. 2007. *Coastal Ecosystems Recovery Plan – Vaovai*.

Government of Samoa, National Disaster Council. 2006. *Samoa’s National Disaster Management Plan 2006-2009*.

International Bank for Reconstruction And Development/ International Development Association. 2005. *Regional Engagement Framework Fy2006-2009 for Pacific Islands*.

Project Management Team. 2007. *Quarterly Progress Report No. 12. Period: July - September 2007*.

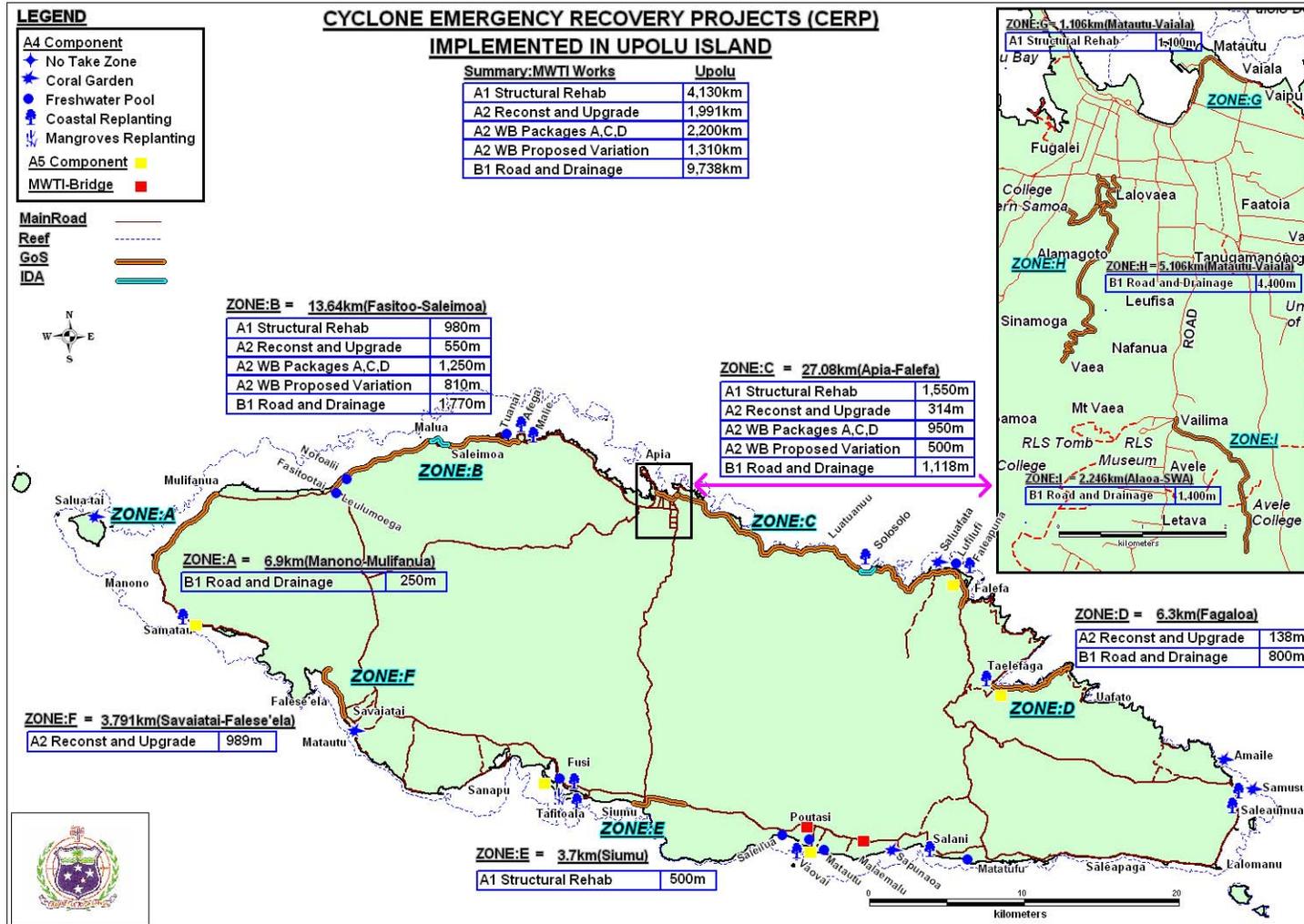
World Bank. 2004. “Technical Annex for a Proposed Grant in the Amount of SDR 1.6 Million and a Proposed Credit in the Amount of SDR 1.4 Million (Equivalent to US\$4.47 Million) to the Independent State of Samoa for a Cyclone Emergency Recovery Project.” Report No. T-7622. April 8, 2004. The World Bank, Washington, D.C.

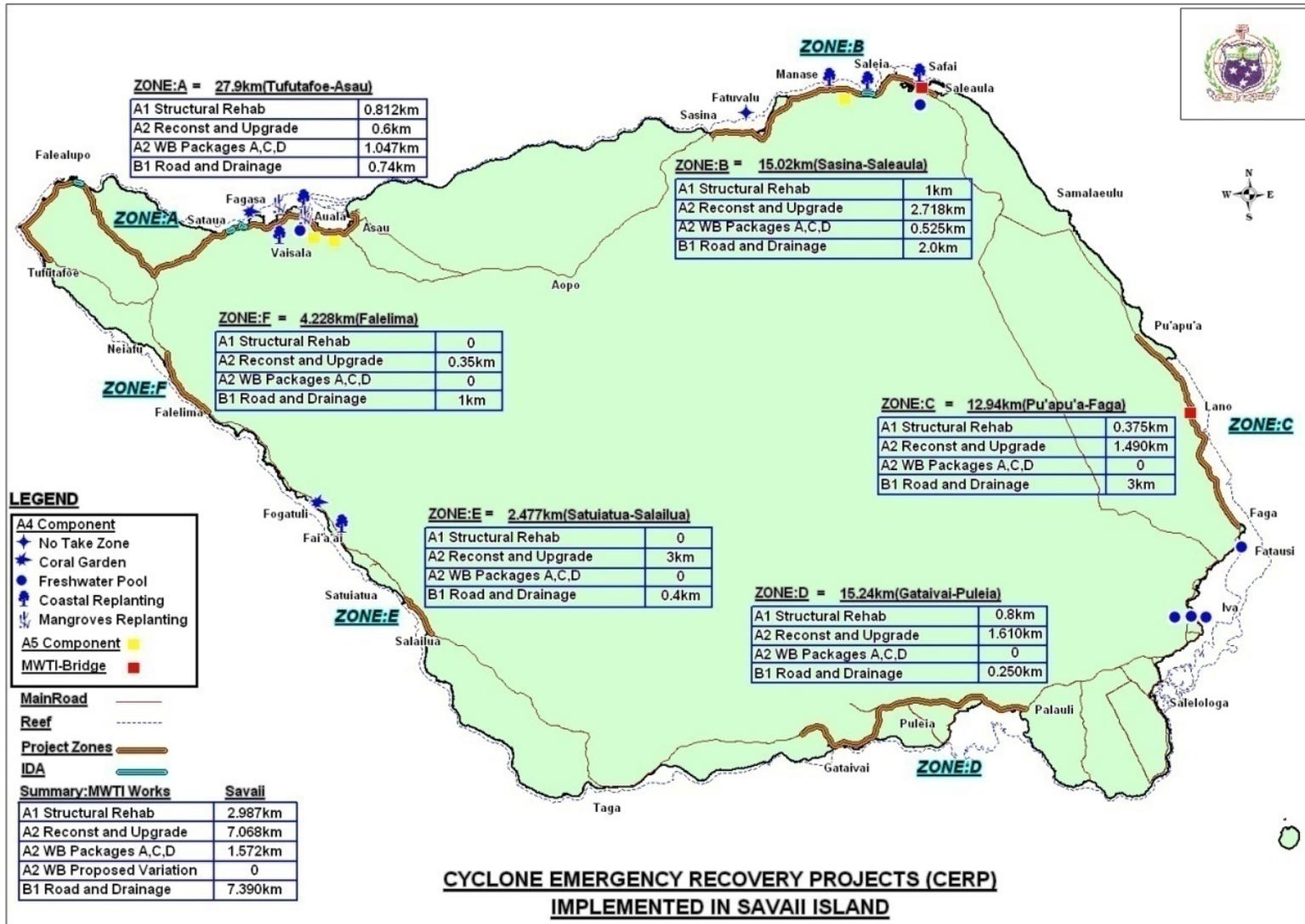
World Bank, 2004. “Memorandum and Recommendation of the President to the Executive Directors,” April 8, 2004.

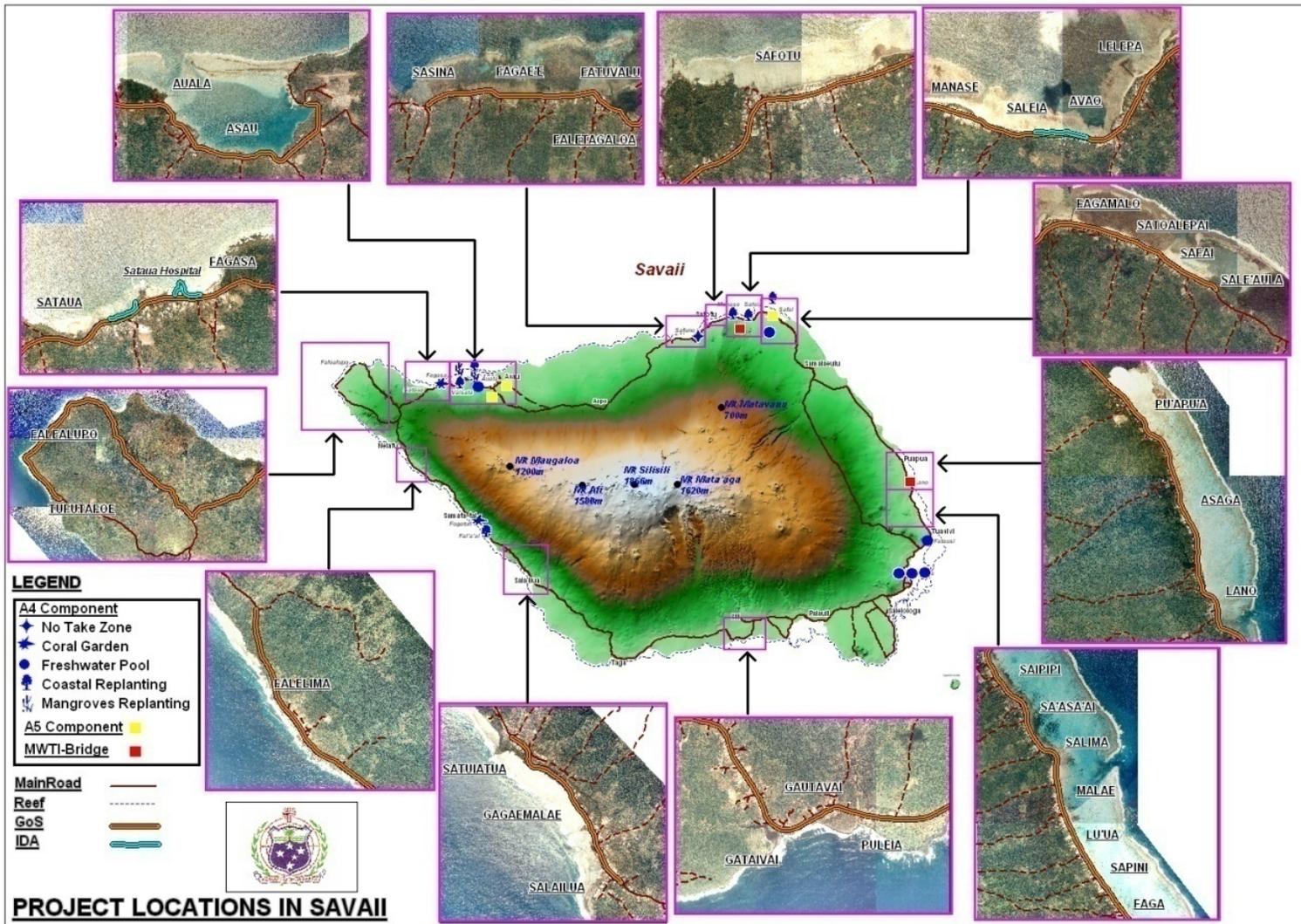
World Bank and Government of Independent Samoa. 2004. “Development Financing Agreement: Cyclone Emergency Recovery Project.” May 5, 2004.

World Bank. 2006. “Not If But When. Adapting to Natural Hazards in the Pacific Islands Region.” Policy Note - East Asia and Pacific Region Pacific Islands Country Management Unit. Washington D.C.

Annex 9: Maps showing type of physical works undertaken and their location (as at June 2007)







Annex 10: Examples of Storm Damage and Completed Project Outputs

Storm damage caused by Cyclone Heta:



Structural solutions to natural hazards:

Inadequately sized culvert on Main South Coast Road

... and reconstructed Lano culvert with cut out channel to allow natural flushing.



Solosolo seawall under construction and completed.



Wave turbulence on toe of seawall.



Sand dune reconstruction at Falelupo



Mangrove protection area.



“No-catch” marine protection area,



Coastal replanting.



In-kind labor contribution for small-scale resilience works.



Non-structural solutions to natural hazards:

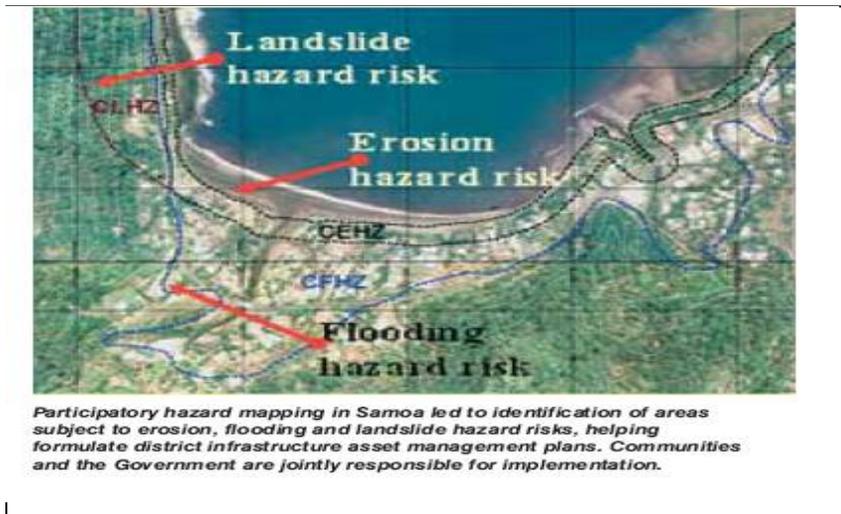
Community planning workshop
with PUMA/MNRE staff.



Coastal Infrastructure
Management (CIM) Plans



Example of a hazard map which feeds into the village Coastal Infrastructure Management Plans.



“The Nancy Norcroft Award is the New Zealand Planning Institute’s premier award for excellence in planning practice. It is made annually for outstanding creativity and innovation in one or a number of areas of report writing through policy preparation, consultation and planning processes and systems.

This year’s recipients include Beca International Consultants and the Planning and Urban Management Agency (PUMA) of the Ministry of Natural Resources and Environment, Government of Samoa for National Coastal Infrastructure Management Plans.

These bilingual Coastal Infrastructure Management Plans seek to implement earlier work done for a Coastal Infrastructure Management Strategy 2001 and the current project seeks to provide that management for Samoa’s 303km coastline. The CIMP for this stage covers 26 districts, 191 villages and some 5,000 people were directly consulted and culminated in the development of 26 plans. The CIM Plans cover a description of the existing environment, identify the existing infrastructure assets and their resilience, against coastal hazards and provide potential solutions to reduce susceptibility to coastal hazards. Actions are assigned to local government and villages to implement the CIMP.”

