ASIAN DEVELOPMENT BANK **PCR: COO 31619**

PROJECT COMPLETION REPORT

ON THE

CYCLONE EMERGENCY REHABILITATION PROJECT
(Loan 1588-COO[SF])

IN THE

COOK ISLANDS

September 2000

CURRENCY EQUIVALENTS

Currency Unit – New Zealand dollars (NZ$)

		At Appraisal (25 November 1997)	At Project Completion (2 March 2000)
NZ$1.00	=	US$0.625	US$0.4929
US$1.00	=	NZ$1.56	NZ$2.0290

ABBREVIATIONS

ADB	–	Asian Development Bank
ACCG	–	AC Consulting Group
AusAID	–	Australian Agency for International Development
CIDB	–	Cook Islands Development Bank
CMC	–	Cyclone Management Center
CMEP	–	Cyclone Martin Emergency Program
km	–	kilometers
kV	–	kilovolt
LA	–	Loan Agreement
MFEM	–	Ministry of Finance and Economic Management
MMR	–	Ministry of Marine Resources
NDMO	–	National Disaster Management Office
NZODA	–	New Zealand Overseas Development Assistance
PMC	–	project management consultant
TCI	–	Telecom Cook Island
TCMRTF	–	Tropical Cyclone Martin Recovery Task Force

NOTE

The fiscal year of the Government ends on 30 June.

CONTENTS

BASIC DATA

A. Loan Identification

1.	Country	Cook Islands
2.	Loan Number	1588-COO(SF)
3.	Project Title	Cyclone Emergency Rehabilitation Project
4.	Borrower	The Government of Cook Islands
5.	Executing Agency	Ministry of Finance and Economic Management
6.	Amount of Loan	SDR583,000 (US$783,351 equivalent)[1]
7.	PCR Number	

B. Loan Data

1.	Appraisal	
	- Date Started	12 November 1997
	- Date Completed	25 November 1997
2.	Loan Negotiations	
	- Date Started	24 November 1997
	- Date Completed	25 November 1997
3.	Date of Board Approval	8 December 1997
4.	Date of Loan Agreement	9 December 1997
5.	Date of Loan Effectiveness	
	- In Loan Agreement	7 March 1998
	- Actual	6 January 1998
	- Number of Extensions	Nil
6.	Closing Date	
	- In Loan Agreement	30 June 1999
	- Actual	16 June 2000
	- Number of Extensions	Nil
7.	Terms of Loan	
	- Interest Rate	1%
	- Maturity	40 years
	- Grace Period	10 years

8. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
12 January 1998	16 June 2000	1 year 4 months

Effective Date	Original Closing Date	Time Interval
6 January 1998	30 June 1999	1 year 6 months

[1] Net loan amount of SDR474,722 (US$636,132 equivalent) after cancellation of undisbursed loan balance of SDR107,740.07 and SDR538.01 on 27 March 2000 and 16 June 2000 respectively.

b. Amount

(US$'000)

Description	Original Allocation	Final Allocation	Amount Disbursed	Undisbursed Loan Balance	Amount Cancelled
Civil Works	458,693	459,044	479,883	(20,839)	(20,839)
Equipment & Materials	244,215	244,215	106,368	137,847	137,847
Emergency Services	77,671	77,671	49,881	27,790	27,790
Imprest Fund	351	0	0	0	0
	780,930	**780,930**	**636,132**	**144,798**	**144,798**

9. Local Costs Financed (US$'000) Nil

C. Project Data

1. Total Project Costs

(US$ million)

	Appraisal Estimate	Actual
Foreign Exchange Cost	0.800	0.636
Local Cost	0.100	0.300
Total Cost	**0.900**	**0.936**

2. Financing Plan: Implementation Costs

(US$ million)

	Appraisal Estimate	Actual
Borrower-financed	0.100	0.300
ADB-financed	0.800	0.636
Total	**0.900**	**0.936**

3. Cost Breakdown by Project Components

(US$ million)

Component	Appraisal Estimate	Actual
Civil Works	Not Provided	0.777
Equipment and Materials	Not Provided	0.109
Emergency Transport Services	Not Provided	0.050
Total	**0.900**	**0.936**

4. Project Schedule

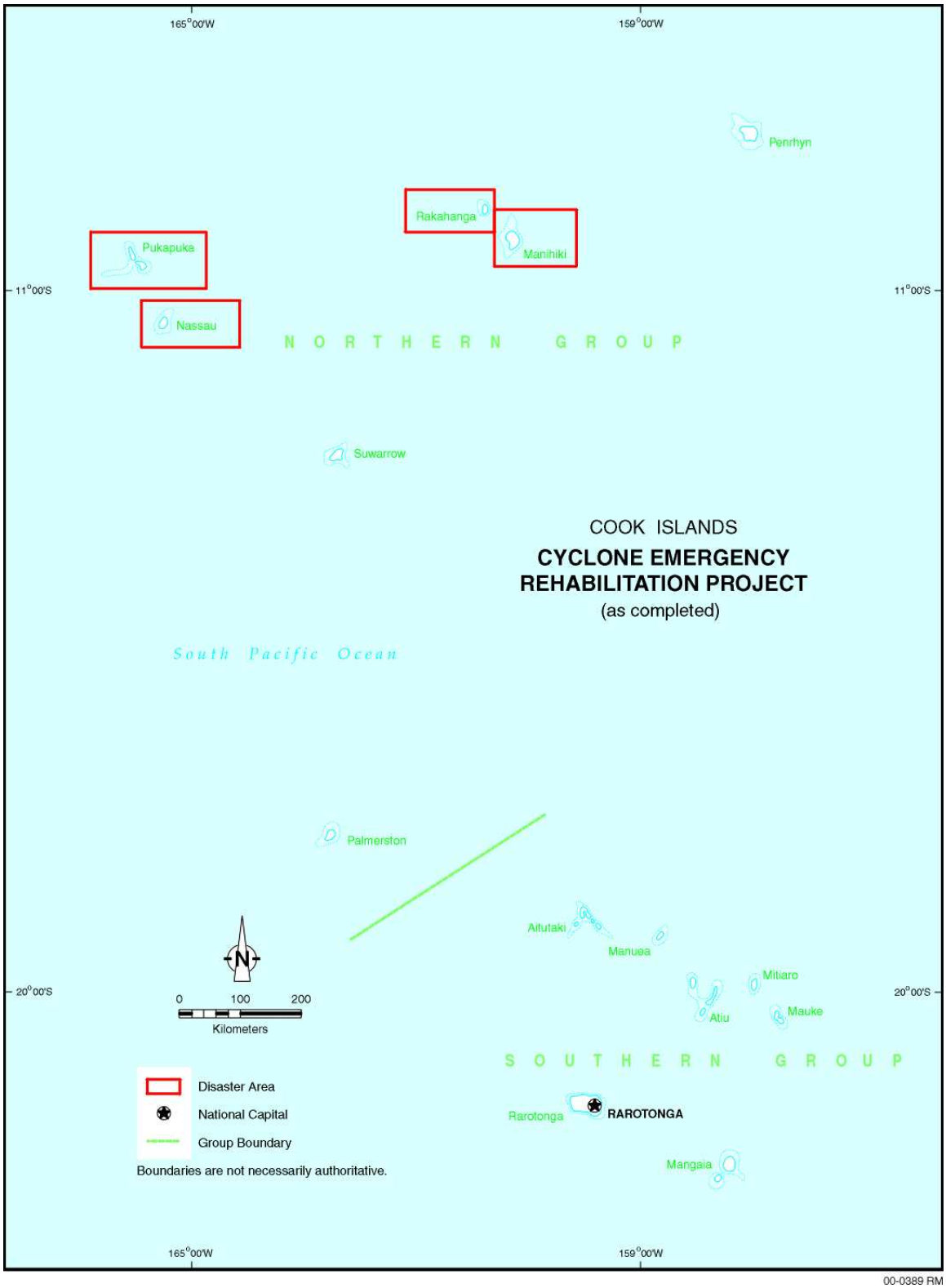
	Appraisal Estimate	Actual
Civil Works		
Started	Jan 1998	Apr 1998
Completed	Dec 1998	Dec 1999
Consulting Services		
Started	Not provided	Mar 1998
Completed	Not provided	Jun 1999

Procurement of Equipment and Materials		
Started	Nov 1997	Jan 1998
Completed	Dec 1998	Jun 1999

C. Data on ADB Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members[2]
Appraisal	12-25 Nov 1997	1	14	a
Review	8-17 Sep 1998	1	10	a
Review	19-29 Jul 1999	1	11	a
Project Completion Review	20 Feb-2 Mar 2000	2	24	a, b

[2] a-project implementation officer, b-economist.


165°00'W
159°00'W
Penrhyn
Rakahanga
Manihiki
Pukapuka
Nassau
11°00'S
N O R T H E R N G R O U P
Suwarrow
COOK ISLANDS
CYCLONE EMERGENCY
REHABILITATION PROJECT
(as completed)
South Pacific Ocean
Palmerston
Aitutaki
Manuae
Mitiaro
Atiu
Mauke
20°00'S
N
0 100 200
Kilometers
S O U T H E R N G R O U P
Rarotonga
RAROTONGA
Mangaia
Disaster Area
National Capital
Group Boundary
Boundaries are not necessarily authoritative.

00-0389 RM

I. PROJECT DESCRIPTION

1. The Project aimed to assist the Government of Cook Islands to rapidly restore economic activity and key social and physical infrastructure in the Northern Group of the Cook Islands following the devastation wrought by Cyclone Martin. The cyclone struck the islands on 1-2 November 1997. In addition to hurricane-force winds, it generated a massive and unpredicted wave surge that struck the island of Manihiki killing 9 people; 10 more are missing and presumed drowned. The cyclone devastated Manihiki, destroying nearly all buildings, roads, wharves, food crops, and trees; disrupting all support services; and necessitating the evacuation of about 570 of its population to Rarotonga and elsewhere. The 1996 census noted that Manihiki had 662 people in that year. The islands of Nassau,[1] Pukapuka, and Rakahanga were also struck by the cyclone, which caused extensive damage to their infrastructure, agriculture, and services. The National Disaster Management Office estimated the direct costs of the cyclone at NZ$11 million, excluding the loss of production from pearl farms in the lagoon at Manihiki. Although the underwater infrastructure of the pearl farms was relatively unaffected by the cyclone, the loss of boats, outboard motors, seeding sheds, tools, and diving equipment, along with the devastation, meant that the industry would take some time to recover. The national economy was becoming increasingly reliant on the pearl industry and hence a rapid response was needed to reduce human suffering by restoring basic services, infrastructure, and economic activities. The Government requested assistance from the Asian Development Bank (ADB) on 4 November 1997, and formulated a comprehensive rehabilitation program in which ADB played a key role.

2. ADB responded rapidly following its emergency rehabilitation procedures,[2] and approved a loan of SDR583,000 (about US$800,000 equivalent) for the Cyclone Emergency Rehabilitation Project on 8 December 1997. The primary objective of the loan was to restore economic activity and key social and physical infrastructure as quickly as possible. The Project as appraised provided for (i) rehabilitation of the water supply and sewerage systems, and community and government buildings, including new community accommodation facilities; (ii) restoration of public transport facilities including roads, boat ramps, wharves, and jetties; (iii) procurement of pearl farming equipment; (iv) provision of rudimentary fishing equipment; (v) provision of equipment and materials for environmental monitoring and management of Manihiki's lagoon; (vi) procurement of agricultural equipment and materials; and (vii) provision of freight and transport. A brief chronology of the Project is presented in Appendix 1. The ADB Project complemented and comprised part of the Government's Cyclone Martin Emergency Program (CMEP), which was planned and implemented under direction of the Tropical Cyclone Martin Recovery Task Force (TCMRTF) established by Government. The total value of contributions to the program was about NZ$12.0 million (Appendix 2).

II. EVALUATION OF IMPLEMENTATION

A. Project Components

3. The scope of the Project was expanded in May 1997 when ADB approved a request from the Ministry of Finance and Economic Management (MFEM) to include consulting services to assist the Government departments implementing the Project. The scope was further expanded by including Nassau as the fourth island eligible to receive assistance under the loan.

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[1] Nassau Island was also affected by Cyclone Martin but was overlooked at appraisal.

[2] ADB. 1987. *Rehabilitation Assistance to Small Developing Member Countries Affected by Natural Disasters*. Manila.

4. At appraisal, owing to the special nature of emergency assistance and the need for rapid processing of a quick disbursing loan, the project components were not fully detailed or quantified. Provision was made for civil works, including rehabilitation of water supply, sewerage systems, and government buildings, in addition to repairs to transport infrastructure. Although the Project provided for the works to be carried out in all parts of the island needing rehabilitation, the works were actually located largely in the so-called low hazard[3] areas. The areas were categorized based on a hazard map developed by the consultants engaged by New Zealand Overseas Development Assistance (NZODA) to assess damage immediately following the cyclone (Appendix 2). Under the ADB Project, a major part of the assistance was directed to cleaning the debris; a local contractor was engaged to carry out the work in conjunction with the local population. The contractor removed debris mainly from areas designated as low hazard, and the debris remains elsewhere except where individual landholders privately arranged for its removal. The work has been generally satisfactory, except in the low hazard areas. Although there was only limited debris removal from the lagoon owing to the difficulty of removing debris from deep waters, the Ministry of Marine Resources (MMR) in December 1997 indicated that the debris posed no major hazard to the lagoon's ecology.

5. The rehabilitation of water supplies under the Project comprised immediate repairs to water tanks and sewerage systems on all affected islands, with more substantial improvements being made on Manihiki later as part of the Manihiki Reconstruction Project implemented by NZODA. On completion of the Manihiki Reconstruction Project, most of Manihiki's population will have adequate, high quality water and sewerage (septic tank) systems. While at appraisal it was envisaged that the two schools on Manihiki would be rehabilitated under the Education Development Project,[4] ADB however agreed to use part of the loan proceeds for the Cyclone Emergency Rehabilitation Project for that purpose.[5] The rehabilitated schools are now functioning effectively, with minor work needed to complete toilet facilities. The appraisal also proposed that two community accommodation facilities would be constructed to provide shelter and living facilities while families rebuilt their homes and pearl farms. However, the TCMRTF made alternative arrangements by evacuating most people and establishing two temporary camps prior to constructing two cyclone management centers and 74 microshelters under the NZODA project. Under the ADB Project, a total of 7.8 kilometers (km) of road was rehabilitated and 1.3 km of new road constructed, all on Manihiki. The new roads were in the low hazard areas and provided access to the cyclone management centers; the airport in Tukao; and the new power stations, fuel storage, and telecommunication buildings. The access roads to the two public wharves in Tauhunu and Tukao were also restored and the wharves made serviceable. Most farmers have restored or rebuilt their own boat ramps, jetties, and seeding sheds.

6. Although provision was made to procure pearl farming equipment under the Project, this became unnecessary when the Cook Islands Development Bank (CIDB) lent US$1.9 million to 47 farmers to meet working capital needs. The remaining 30 farmers who did not borrow funds from CIDB either suffered little damage or were able to replace their equipment using their assets and cash flow.[6] The MMR assessment indicated that while 95 percent of farms suffered damage to above-water facilities, 75 percent suffered 0 to 10 percent damage to below-water facilities.

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[3] The areas identified on Manihiki Island that would not be exposed to risks or damage against wave surge actions in the event of cyclones.

[4] Loan 1317-COO(SF): *Education Development Project,* for SDR1,852,000, approved on 22 September 1994.

[5] See the back-to-office report of the ADB Review Mission of September 1998.

[6] MMR surveyed oyster farms in November 1999 and found that there were 77 active oyster farmers operating.

7. The Project provided chain saws, wheelbarrows, and other tools to assist in the cleanup after the cyclone, as well as outboard motors, generators, welders, pumps, and other pieces of equipment. This equipment was most helpful in the immediate recovery period but some of the subsequent maintenance and management of the equipment has been inadequate. The Project provided equipment to assist with ecological monitoring of the lagoon but this was not required since the existing equipment at MMR laboratory was still serviceable. The planting material and agricultural tools made available to people on Manihiki and other affected islands have helped with the recovery of food production, particularly on the more remote islands that were less affected by the cyclone. Food production on Manihiki has still not returned to normal and the new community nursery supported by the Food and Agriculture Organization, which had been opened six weeks prior to the cyclone, has not been replaced.[7]

B. Implementation Arrangements

8. The implementation arrangements followed those proposed at appraisal apart from the appointment of a domestic consultant. As the Executing Agency, MFEM was responsible for implementation in coordination with National Disaster Management Office; MMR; the Ministry of Outer Island Development; and the island councils of Manihiki, Nassau, Pukapuka, and Rakahanga. MFEM was a member of the TCMRTF and helped coordinate other externally assisted activities through its Aid Coordinating Committee. During the first five months of implementation, most of the management decisions concerning the project activities were taken by the TCMRTF or by the domestic consultant who was also the local counterpart to the NZODA Cyclone Shelter Project. The Government, through the TCMRTF, established an overall plan for reconstruction of Manihiki and subsequently developed similar plans for Nassau, Pukapuka, and Rakahanga of which the ADB Project formed only a small part. These plans were the major focus of Government activities and had a strong influence on the utilization of the loan. The plans extended beyond the relief and recovery activities that ADB's Project envisaged, to embrace longer term reconstruction activities.

9. MFEM's advice to the TCMRTF was not always heeded and some procurement and other difficulties were experienced as the TCMRTF did not fully understand ADB's procedures. ADB and MFEM recognized the difficulties and agreed to a minor change in project implementation arrangements[8] to allow the loan proceeds to be used to engage a local consulting firm to provide the services of a project management consultant (PMC). This provision was not initially included in the Project but the rationale for ADB assistance in this area was that the Government did not have the technical capacity to supervise the civil works proposed under the Project. The consultant served as the PMC from March 1998 to the end of June 1999.

C. Project Costs and Financing

10. The total estimated cost of the Project at appraisal was US$900,000 and the actual Project cost is estimated to be US$936,100 or 104 percent of the appraisal estimate. At appraisal it was envisaged that ADB would finance 88 percent of the total cost. However, at project completion, ADB had actually financed 68 percent of the total cost. The major causes of the reduced ADB financing were (i) the reduced expenditure on pearl farming inputs, which

[7] Established as part of the Food and Agriculture Organization's project FAO/TCP/CK1/66611.
[8] ADB interoffice memorandum dated 5 May 1998: Loan 1588-COO(SF).

were financed by CIDB;[9] (ii) a 21 percent depreciation of the New Zealand dollar against the United States dollar; (iii) the application of zoning provisions that restricted cleanup and other activities to low or medium hazard zones, thus reducing ADB inputs and shifting some of the financing to the local inhabitants; and (iv) the Government financing of the local currency costs rising to three times more than the amount estimated at appraisal. At project completion about US$145,000 remained undisbursed under the loan partly as a result of the zoning provisions applied to the Project.

D. Project Schedule

11. The Project was implemented over 24 months rather than the 18 months planned. The delay resulted from changes in implementation arrangements; early difficulties with procurement; limited implementation capacity in MFEM and other agencies; and delays in the associated projects for cyclone shelters, power supply, and telecommunications. The Project was stalled for the first three months while issues relating to procurement and consultant selection were resolved. The project works were substantially completed by June 1999 with the only pending works being the rehabilitation of the two schools on Manihiki. The Project was substantially physically completed on 31 December 1999, about six months after the expected completion date. The actual loan closing date was delayed to June 2000 pending finalization of the statements of expenditure and the refund of the unliquidated balance in the imprest accounts.

E. Engagement of Consultants and Procurement of Goods and Services

12. Difficulties associated with the initial process followed to recruit the PMC were resolved with ADB's assistance. As indicated in para. 9, the TCMRTF assumed full responsibility of project implementation without heeding advice from MFEM, and engaged a domestic consulting firm without following adequate recruitment procedures. Subsequently, ADB's South Pacific Regional Mission in consultation with ADB's Consulting Services Division, reviewed the recruitment process, reviewed the curriculum vitae of all the candidates and evaluated them, revised the terms of reference and the consultant's contract, and executed a legal binding contract with MFEM instead of the earlier contract with the TCMRTF. The recruitment process then complied with ADB's *Guidelines for the Use of Consultants*. Goods, materials, and equipment for the Project were procured following direct purchase, and civil works were procured following local competitive bidding procedures in accordance with ADB's *Guidelines for Procurement.* A few cases of misprocurement occurred in the early stages of the Project and were resolved with ADB's assistance. The TCMRTF again carried out faulty procurement, which included an undersized secondhand barge and a small-track excavator. The barge was not utilized under the Project and was sold locally to the Ministry for Outer Islands Development and the cost was recovered. The excavator was sold to the contractor who used it while cleaning up Manihiki Island. Subsequent to these events, all project procurement was carried out by MFEM with prior consultation with ADB.

F. Performance of Consultants, Contractors, and Suppliers

13. The PMC satisfactorily supervised the civil works and overall management of the project activities, but was not effective in communicating and consulting with the island community and with the field staff supervising the civil works. There was a breakdown in communication

[9] In addition, Canadian International Development Agency assistance provided approximately NZ$40,000 to the Pearl Farmers' Federation to help with cyclone recovery.

between the people on Manihiki and the authorities associated with the Government's CMEP, partly due to the approach taken by the TCMRTF and the PMC. A strong controlling role may have been needed early in the relief operations following the cyclone; however, a more effective participatory approach should have been taken during the recovery and reconstruction phases.[10] Because the island council was weak, it was insufficient to rely entirely on consultation with it as the basis for community participation. In numerous instances, the community was provided with too little time or information to participate fully in decisions affecting CMEP activities. The remoteness of the cyclone-affected islands and the poor physical communication facilities also hindered community consultation. Various assistance agencies, island council members, and some of the consultants criticized the community for lack of contributions to the cyclone recovery activity. This criticism seems unwarranted given that the community was and is still coming to terms with the immensity of the personal tragedies associated with the cyclone. The community's response to pressure to make early decisions about long-term reconstruction activities was unproductive, and the responsibility for such decisions reverted to the authorities. Perhaps it would have been prudent to have delayed the reconstruction phase of the CMEP.

14. The local contractor engaged for the majority of the civil works performed satisfactorily and adhered to the contract specifications set down and supervised by the PMC. The limited civil works carried out on the islands of Nassau, Pukapuka, and Rakahanga were conducted using a force account involving the Ministry for Outer Island Development and community assistance. All project suppliers were local companies or agencies and all performed satisfactorily. The PMC negotiated cost-effective freight charters that enabled rapid transport of resources and minimized the problems brought about by the remoteness of the project area.

G. Covenants

15. Compliance with the loan covenants was satisfactory (Appendix 3).

H. Disbursements

16. Disbursement procedures were adequate and, although there were early difficulties with the imprest account, all ineligible expenditures were subsequently reimbursed by the Government. MFEM and ADB have been slow in finalizing the statements of expenditure and the imprest account. ADB contributed to the delayed loan closing by misplacing a large withdrawal application[11] that was not processed until just prior to the Project Completion Review Mission.

I. Environmental and Social Impacts

17. At the time of appraisal the impact of Cyclone Martin on the lagoon environment in Manihiki had not been thoroughly assessed. However, MMR expressed concern that the lagoon environment may have become polluted. The sources of pollution may have comprised debris from household equipment, damaged houses, sheds, roofing iron, and motors, as well as pollutants such as chemicals, fuel, lubricants, and refrigerants. While much effort was made to clean the lagoon, it was mostly concentrated in areas within the reach of the contractor's equipment. In addition, the pearl farmers used their diving equipment to help clean the deeper

[10] ADB. 1991. *A Disaster Manager's Handbook'*. Manila: ADB, page 295.
[11] Withdrawal Application No. 4 for NZ$323,196 was submitted in December 1998 but not processed by ADB until February 2000 owing to an administrative oversight.

ends of the lagoon within the ambit of their pearl farms. However, the entire lagoon, particularly the deep ends, was not completely cleaned due to lack of adequate resources and equipment. Subsequently, and as part of the Project, MMR cleaned up more of the lagoon and was satisfied that there was no evidence of pollution that might threaten the lagoon ecosystem. Monitoring by MMR since that time indicates no evidence that pathogens have been introduced or that the growth rate of pearl oysters has been adversely affected.[12] All ADB-supported activities have been carried out with due regard for the environment. In this context, the debris was properly disposed of, and fallen trees were cut into small pieces and buried in large pits. Environmental controls for the extraction of road materials from the coastal areas were prepared by the PMC and adhered to by the local contractor.

18. The Project assisted in the relief and recovery of the local population. The cleanup activities that it facilitated were widely appreciated and psychologically important as part of the recovery process. The Project also helped rehabilitate the schools, which provided an opportunity for the community to assist with small tasks, such as painting and cleaning up, and thus become more involved in the school activities. Health services have been overlooked in the recovery planning, with little done to improve such services since the cyclone. The social benefits of the Project would have been greater if (i) the PMC and TCMRTF had established a basis for an effective participatory approach for reconstruction activities, (ii) the project activities had been restricted to those required in the recovery and rehabilitation phases. As it was, the inclusion of reconstruction activities meant that the community was effectively disempowered as they were unable and unwilling to make longer term decisions about issues such as changes in village layout and the design of shelters or locations of roads.

J. Performance of the Borrower and the Executing Agency

19. The Government generally performed satisfactorily in meeting its obligations under the Loan Agreement. Although the National Disaster Management Office was established two months prior to the cyclone, it generally performed well under difficult circumstances (Appendix 4). The TCMRTF served as an effective, high-level policy and decision-making body, which was appropriate in the relief and early recovery phase after the cyclone. However, once the immediate relief phase was completed, the TCMRTF should have taken less of a hands-on role while retaining oversight of the CMEP. Since the cyclone, the Government has moved decisively and effectively to strengthen its capacity to deal with emergencies, including cyclones. It has developed a comprehensive national disaster plan and embarked on a process whereby each island or vaka (district) council is required and assisted to develop and document its own emergency action plan. At the time of the Mission, the Government with Red Cross assistance was conducting workshops for capacity building and educating the local community on emergency plans. The plans encompassed disaster relief activities, and disaster prevention, preparedness, and mitigation measures.

20. As the Executing Agency, MFEM generally performed satisfactorily. It was less effective early in the Project when the high-level TCMRTF was taking some independent decisions that impacted on the project adversely. As of March 1998, MFEM became more actively involved in the Project and helped resolve communication problems between consultants and the local community on the overall CMEP.

[12] The ADB-funded survey of the health of oysters in Manihiki under TA 2322-COO: *Outer Islands Marine Resource Management Training*, for US$300,000 approved on 17 April 1995, also found the oysters to be generally healthy.

K. Performance of the Asian Development Bank

21. ADB's performance was generally satisfactory. The rapid response in appraising and approving the loan was exemplary, reducing the processing time to only five weeks whereas in 1989 ADB had been content to process such loans in six months.[13] ADB initially overestimated the Government's capacity to supervise the civil works associated with the Project, but subsequently rectified this by agreeing to the appointment of the PMC. In early stages of the Project, the staff of MFEM, including the PMC, received training on ADB's disbursement, project administration, and implementation procedures; this helped build the Government's implementation capacity. ADB's subsequent supervision of the Project was satisfactory, but early project performance could have been improved significantly had ADB organized an early posteffectiveness inception mission. Such a mission would have been able to provide timely guidance to the TCMRTF and is likely to have resulted in earlier recognition of the need for a consultant to supervise the civil works. It may also have identified the potential problems that arose when the TCMRTF adopted a total reconstruction program approach rather than dealing first with the relief and recovery phases. The mission could also have provided guidance on procurement and avoided the misprocurement that occurred. ADB demonstrated its flexibility by effectively supplementing activities under the Project with those in the education sector and by combining subsequent review missions with those dealing with other sectors. The time overrun to close the loan accounts could have been minimized if ADB had exercised careful administration and monitoring of the loan disbursements. Similarly, a lot of time would have been saved if MFEM had immediately deposited the refund of the unliquidated loan balance to the stipulated ADB account in New Zealand instead of sending the funds in NZ$ to ADB. The two partial cancellations of the undisbursed loan balance by ADB were due to the delay in the refund of the unliquidated loan balance by MFEM. Subsequent transactions with the commercial bank delayed the finalization of the loan account by about three months.

III. EVALUATION OF INITIAL PERFORMANCE AND BENEFITS

A. Financial and Economic Performance

22. Prior to the cyclone, the pearl industry in Manihiki had been growing strongly. After the storm, there was concern that the effects would slow down industry development. Almost all pearl farmers were faced with substantial costs for replacing buildings, equipment, and pearl farm materials. Based on the MMR survey, the total value of damage to pearl farms is estimated at about NZ$3.37 million.[14] A similar cost could be expected for another cyclone of similar magnitude since the ADB Project was not designed to offset such damage. Based on data provided by the Cook Islands Meteorological Office, the probability of a cyclone in any one year is approximately 0.08, or a cyclone can be expected once every 12.5 years in the Northern Group. On this basis, the estimated annual cost of cyclones to the pearl industry in Manihiki is NZ$400,000 or about NZ$5,200 per active farm (footnote 6).

23. Since the cyclone, the pearl industry has performed impressively. The number of farms with oysters has remained almost constant (77 in 1999 and 76 in 1996), and the number of adult oysters has increased 73 percent from an estimated 880,000 in 1996 to 1,525,000 in 1999 (footnote 6). Although pearl farmers suffered a considerable setback from the cyclone, they have energetically redeveloped their farms. Many farmers are now employing labor, with an

[13] ADB. 1989. Rehabilitation Assistance after Disasters. Manila. ADB. para. 40.
[14] MMR. 1997. Impacts of Cyclone Martin to Manihiki Lagoon and Cultured Pearl Industry, Cite, page 2, para. 1.

estimated 80 additional people working seasonally on the pearl farms.[15] MMR's records suggest that the official value of pearl production has increased from NZ$3 million in 1997 to NZ$5 million in 1998. However, there is substantial underreporting of pearl exports, and hence these figures do not provide a reliable assessment of the extent of the industry's recovery after the cyclone.

B. Attainment of Benefits

24. The main economic benefit from the Project was that the project activities enabled the pearl industry to resume normal operations more rapidly than would have occurred without the Project. By helping with the island cleanup and restoring essential services, the Project enabled pearl farmers to return to work on their farms and hence to reduce the extent of production losses associated with the cyclone. While data available do not provide reliable measures of financial or economic returns to ADB's Project, the Project probably reduced cyclone-induced production losses by about NZ$2 million (Appendix 5). The estimate is based on information provided by a sample of pearl farmers interviewed to assess the impact of the cyclone on their farms. The Project is likely to have had a smaller beneficial impact on other economic activities, such as subsistence food production and fishing activities, particularly on the islands of Nassau, Pukapuka, and Rakahanga.

25. The social benefits from the Project relate to reestablishment of key social infrastructure. The Project was instrumental in putting in place a basic network of rehabilitated roads and landing facilities that provided the community with access to normal social services and enabled other community activities to resume more quickly than they would have done without the Project. The Project also rehabilitated the schools on Manihiki. The schools remained open for normal classes but operated under difficult conditions before they became fully functional after a lapse of 18 months. Early cleanup of the cyclone-affected islands, and restoration of water and sanitation facilities prevented any outbreak of any serious disease. An intangible social benefit may have been that, by involving MFEM in regular monitoring visits to Manihiki, the Project provided a mechanism for dealing with some of the conflicts that arose between the community and some of the agencies responsible for other elements of the Government's overall CMEP.

26. Most of the project benefits appear to be sustainable if the roads and rehabilitated facilities are properly maintained. The Project provided a supportive framework for inputs from other projects and the ability of these parallel projects to continue to provide benefits will also depend on the maintenance of the roads rehabilitated under the ADB-assisted Project.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

27. This was ADB's second emergency assistance loan to the Cook Islands.[16] Despite minor deviations, the Project was implemented as planned, only slightly above the cost estimate, and its objectives were achieved. Although project implementation took longer than anticipated at appraisal, the delay has not detracted from the Project's final benefits and may have helped by

[15] CIDB records indicate that 226 people were employed on the 47 farms that received loans. Pearl farming may be generating around 40 full-time jobs in addition to family labor inputs.

[16] The first loan was Loan 1171-COO(SF): *Emergency Telecommunications Rehabilitation Project*, for SDR291,408, approved on 16 July 1992.

making assistance available to the Government over a longer period. Overall, based on ADB's *Criteria for Assessment of Project Performance/Success*, the Project is judged to be successful.

B. Lessons Learned

28. The design of recovery plans following disasters involving island communities should provide for a clear separation in time between the relief and recovery phase and the reconstruction phase. Reconstruction activities will require community input if they are to use a participatory approach that is essential for local communities to take ownership of the changes. The experience in Manihiki suggests that island communities are unable to participate in reconstruction activities until some level of recovery has been achieved. Unless the recovery and the reconstruction phases are managed differently, the local community may be alienated, reconstruction costs increased, and the benefits of the reconstruction activities reduced.

29. Mechanisms are needed to ensure effective local input into planning of all recovery and reconstruction activities. Such plans should embrace all sectors and take into account local community views and indigenous knowledge, as well as the experience of Government agencies and staff. Efforts are needed to strengthen the capacity of island councils to ensure effective local inputs. The disaster management training currently being provided to groups on each island is a positive step. Particular attention needs to be given to the form of assistance accepted from funding agencies to ensure that it is sustainable and fully compatible with local requirements.

30. More attention needs to be given to the capacity of the agencies and communities to implement the recovery measures planned following a national disaster. Great care should be taken in managing any external input to ensure that it is used effectively and in conformity with community expectations. Similarly, more care needs to be taken to use the desire and willingness of local communities to contribute to the recovery effort. The interests of external agencies must not be allowed to override the interests of the local community. Every effort must be made to encourage local community inputs and to make full use of local capacities, knowledge, and skills. After an event such as this, the population should not be evacuated, unless it is absolutely necessary.

31. There should be a continuing effort to encourage risk management among pearl farmers and others in island communities by emphasizing that cyclones should be expected and planned for rather than viewed as unexpected events. To consider encouraging pearl farmers and others to insure themselves against losses, the Government may wish to allow tax-free interest-bearing deposits that could be drawn upon when required.[17] Part of the efforts to reduce damage by future cyclones should involve reforestation of coastal areas, which would help protect people, dwellings, roads, and other infrastructure.[18]

32. In selecting personnel to manage relief and recovery activities, attention needs to be given to their capability to deal successfully with social issues and communication, along with project management and engineering works. Similarly, greater attention needs to be given to traditional or modern forms of trauma counseling following a disaster of the magnitude suffered by the people of Manihiki.

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[17] Farm Management Deposit Scheme AFFA99/34T of 2 March 1999, provided for farmers in Australia to encourage self-insurance against drought and floods.

[18] See Terminal Report for Food and Agriculture Organization Project FAO/TCP/CK1/66611, Ministry of Agriculture, Cook Islands.

33. Particular efforts need to be made in relief and recovery programs to ensure equitable access to services for all intended beneficiaries. In this case, owing to zoning decisions, some inhabitants were assisted with the cleanup while others were not. Similarly, inhabitants who delayed their return after being evacuated found that they were unable to participate in the microshelter assistance program.

34. The Government should set aside funds to enable it to cope with the additional welfare needs generated by a disaster of this scale. It should also ensure full coverage of all essential services (health centers were neglected in the recovery activities on Manihiki). The Government should continue to improve the coordination of efforts among all its departments, and to ensure that emergency measures complement rather than displace normal Government support services.

C. Recommendations

1. Project-Related

a. For Future Monitoring

35. ADB should continue to monitor the completion of works at the schools and to support the Government's efforts to strengthen its capacity to deal with national disasters including cyclones. ADB should encourage the adoption of a risk management approach by pearl farmers in any ADB-supported activities that are intended to further development of the pearl industry. The Government should consider seeking assistance from appropriate agencies to provide earlier warnings of surge waves, perhaps through provision of weather-oriented monitoring buoys.

36. The Government should monitor the efforts of the island council to maintain the facilities provided under the Project, and in particular the roads and items of emergency equipment. The Government, through MMR, should continue to monitor the ecology of the lagoon and regulate the pearl industry to ensure that it is able to continue production at a level that is ecologically sustainable.

b. Further Action

37. The Government should ensure that the works and equipment supplied are adequately maintained, that the work on the school buildings in Manihiki is completed promptly, and that all project facilities are adequately maintained. At the time of the Mission, the Government agreed to complete the outstanding works under the ongoing ADB-financed Education Development Project (footnote 4).

2. General

38. ADB's appraisal for emergency assistance loans should include a careful assessment of the resources and the implementation capacity of the implementing agencies, and ensure due consultation with beneficiaries. ADB should schedule an inception mission soon after effectiveness of emergency assistance loans to hasten implementation by helping the borrower overcome any implementation difficulties that were not foreseen at appraisal.

APPENDIXES

PROJECT HISTORY

A. Project Processing to Loan Closing Dates

1 Nov 1997	Cyclone Martin struck the Northern Group of Cook Islands.
4 Nov 1997	Government of Cook Islands requested the Asian Development Bank (ADB) for Emergency Rehabilitation Assistance.
12-25 Nov 1997	Appraisal mission fielded.
20 Nov 1997	Loan negotiations dates approved by ADB.
24-25 Nov 1997	Loan negotiated.
8 Dec 1997	Loan approved.
9 Dec 1997	Loan signed.
6 Jan 1998	Loan declared effective.
30 Jun 1999	Original loan closing date.
16 Jun 2000	Loan closed.

B. Consulting Services for Project Management, Design, and Supervision

Dec 1997	Domestic consulting firm directly recruited by National Disaster Management Office.
Jan 1998	Domestic consultant appointed and fielded by the Tropical Cyclone Martin Recovery Task Force.
4 Mar 1998	ADB's country programming mission advised the Government consultant about an item not eligible for financing under the loan.
17 Mar 1998	Ministry of Finance and Economic Management (MFEM) submitted all supporting documents for the recruitment of consultants.
27 Mar 1998	ADB reviewed the selection and recruitment process of the consultants.
17 Apr 1998	MFEM sought a minor change in project scope to include the provision of consulting services.
6 May 1998	ADB approved the minor change of implementation arrangements.
7 May 1998	Consultant selection process revisited, terms of reference revised, and consultant's contract amended to meet ADB's requirements.
30 Jun 1999	Consultants completed their contract.

C. Procurement of Goods and Services: Civil Works for Local Competitive Bidding

11 Feb 1998	Prequalification of contractors advertised.
6 Mar 1998	Contractors prequalified.
27 Mar 1998	Bids evaluated.
15 Apr 1998	Contract awarded.
31 Dec 1998	Contract completed.

D. Project Implementation

8 Nov 1997	Imprest account established.
10 Dec 1997	Advance requested.
12 Jan 1998	Initial advance of US$400,000 deposited. Secondhand excavator and barge procured.
4 Mar 1998	ADB advised that secondhand excavator and barge were ineligible items for financing under the loan.
25 Jun 1998	Nassau was included in the project scope as it was also affected by Cyclone Martin but was not included at appraisal.
8-17 Sep 1998	Review mission fielded.
23 Sep 1998	Survey by Ministry of Marine Resources confirmed that although deeper areas of Manihiki lagoon had debris, it was not harmful to the marine environment and the pearl farms.
4 Nov 1998	Aitutaki barge (hired from Ports Authority) sank.
24 Mar 1999	Design of Tukao school and Tauhunu toilet blocks completed.
31May 1999	Procurement of materials for Tukao and Tauhunu schools completed.
19-29 Jul 1999	Review mission fielded.
1 Sep 1999	Rehabilitation of Tukao and Tauhunu schools commenced.
29 Oct 1998	Secondhand excavator sold and imprest account reimbursed.
31 Dec 1999	Rehabilitation of Tukao and Tauhunu schools completed.
21 Feb – 2 Mar 2000	Project completion mission fielded.

PROJECT-RELATED ASSISTANCE

1. The Cyclone Emergency Rehabilitation Project (assisted by the Asian Development Bank) was one of about 17 projects or project activities undertaken to assist in the recovery after the cyclone. The four major projects are described briefly here. Table A2 summarizes the activities and their costs.

A. NZODA Manihiki Reconstruction Project

2. The Government of New Zealand agreed to assist the Manihiki community with the repair of damage, and appointed AC Consulting Group (ACCG) in late November 1997 to assess the damage and recommend reconstruction requirements. The ACCG report was provided to the Government and much of the planning for the rehabilitation of the island proceeded along the lines recommended in that report. Subsequently, New Zealand Overseas Development Assistance (NZODA) agreed to fund the Manihiki Reconstruction Project, based on the ACCG report. NZODA appointed ACCG to oversee the implementation of the Manihiki Reconstruction Project.

3. The national objectives of the Manihiki Reconstruction Project were to

(i) minimize the losses from future cyclones;
(ii) restore, as near as practicable, Manihiki to its precyclone condition;
(iii) maximize the use of local resources and skills in the reconstruction;
(iv) transfer as much knowledge and skill as possible during the reconstruction program; and
(v) use the experience gained from Tropical Cyclone Martin and the subsequent recovery programs in the development of other islands.

4. The NZODA project sought to support these national objectives constructing two cyclone management centers (CMCs) and microshelters for all families (initially expected to be 110-135 families) on the island.

5. The specific project goal was to provide cyclone shelter to the people of Manihiki and to restore the basic water and sanitation infrastructure. The expected outputs included

(i) cleaning up the lagoon,
(ii) cleaning up debris on farms,
(iii) designing village plans (layouts to form basis of new development to take into account cyclone and other hazards),
(iv) restoring power,
(v) constructing two CMCs,
(vi) constructing 110-135 microshelters,
(vii) opening a revolving account for the pearl industry,
(viii) installing a nondirectional beacon at the airport, and
(ix) installing an automatic weather station.

6. NZODA inputs were initially estimated at NZ$4.54 million. Two addenda to the project covered (i) the Australian Agency for International Development (AusAID) Power Reconstruction Project, for which AusAID was to provide NZ$780,000, and Government to provide about NZ$100,000; and (ii) assistance to accelerate the construction of microshelters so that 74

shelters could be completed by November 1999: NZODA was to provide an additional NZ$608,000 for this purpose.

7. Both CMCs and 35 microshelters are completed, 8 microshelters are almost complete, and 31 are under construction. NZODA is currently considering a third addendum to the project to complete the activities by end June 2000. The expenditure to date is in excess of NZ$4.52 million.

B. AusAID for Power Supply

8. AusAID financed the replacement of the power generation and supply system on Manihiki at a cost of NZ$860,000. Prior to the cyclone, AusAID was investigating the feasibility of upgrading the power supply on Manihiki and Penrhyn. After the cyclone, the Ministry of Energy assessed the damage and produced plans and cost estimates for restoring power supply on Manihiki to precyclone conditions. AusAID agreed to support the reconstruction of power supply as part of the rehabilitation program. AusAID contracted ACCG to redesign the project to restore power and to provide an entirely new distribution network. This led to the addendum to the Manihiki Reconstruction Project, which was agreed to by AusAID and ACCG.

9. The project provided two new diesel-powered generating sets, which were housed in converted microshelters. Power from the generators was stepped up to 11 kiloVolt (kV) rather than the 3.3 kV recommended in the AusAID feasibility study. This was to ensure compatibility with the system used in the Southern Group of Islands and to reduce the cost of components since the 11 kV components are more common and thus cheaper than 3.3 kV.

10. At the time of the Project Completion Review Mission, the power supplies had not been restored. Because the generating system has a large capacity, it requires a larger load than is currently available because most households are still not connected to the system. Efforts are currently being made to hasten the connection of all households and to install a ‘dummy load’[1] so that the system can be operated. This load is expected to increase the operation costs of generating the power on the island.

C. Telecom Cook Island Telecommunication

11. The semi-privatized telecommunication provider, Telecom Cook Island (TCI), undertook to replace the telephone facilities on Manihiki that were destroyed by the cyclone. The new facilities comprised a telephone exchange, satellite equipment, and six mobile units. The total cost of the investment is estimated to be NZ$2 million.

12. Although TCI could not hope to fully recover the costs of its investment in the new facilities, it viewed this as part of its community service obligations. (The current revenues from the 63 subscribers on Manihiki are about NZ$8,000 per month).

13. TCI initially planned to locate the facilities within a CMC but negotiations over the use of the CMC were protracted and the cost of using that facility was considered excessive. After six

[1] A mechanically operated device placed in the electrical circuit to stimulate the real load of the generators.

months with no significant progress, TCI decided to find its own site and to manage the construction project itself. TCI negotiated directly with the landowners to obtain the land for the site, having used the hazard maps to select a site with low risk. While there were protracted land disputes with other construction activities on Manihiki, TCI was able to conclude the purchase of land within one day apparently because it negotiated directly with the landowners. TCI made careful plans for all aspects of the construction and assembled all materials in advance and shipped these to Manihiki. The materials included aggregate for foundations and water for making concrete.

14. As a result of using a low-risk site, very high construction standards, and carefully specified equipment and facilities, TCI was able to fully insure the new facilities. This had not been possible with the previous satellite facilities on Manihiki.

15. The new facilities became operational in November 1999. Although services are performing well on Tukao, the service to Tauhunu using a remote wireless local loop has proved unreliable. TCI hopes to eventually have the supplier fix the problem, but in the meantime, is planning to install a separate radio link from Tukao and a separate exchange on Tauhunu. This replacement system should be fully functional by April 2000.

D. Cook Island Development Bank (CIDB)

16. CIDB provided loans to 47 pearl farmers to assist with reconstruction and development of their businesses following the cyclone. The total amount provided was NZ$1.9 million[2] with an average loan of NZ$40,000. In the first 12 months following the cyclone (to end in November 1998), there were 14 loans totaling NZ$0.57 million. In the next 12 months there were 26 loans totaling NZ$1.1 million. The remaining 7 loans were taken out since December 1998 and totaled NZ$0.24 million. The largest loan was NZ$102,000 but only 13 loans exceeded NZ$60,000. Over half the loans were less than NZ$40,000. The term of the loans varied from 5 years to 12 months with the majority being 2-3 years. Interest rates varied from 12 to 17¼ percent depending on the date the loan was granted.

17. The loans were used to provide working capital and to replace assets damaged by the cyclone. Repayment performance has been excellent, with only one loan having delayed repayment.

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[2] NZ$579,411 of this was provided under the ongoing Asian Development Bank-financed Loan 1380-COO(SF): *Third Cook Island Development Bank,* for SDR1.977 million, approved on 26 September 1995.

Table A2: Details of Cyclone Martin Emergency Program

(NZ$)

Donors	Date	Estimate	Actual Received	Activities
Asian Development Bank	08-Dec-97	1,200,000.00	1,258,546.00	Clean-up and rehabilitation activities
Australian Agency for International Development	1998/99 & 1999/2000	1,053.00	859,279.00	Power reconstruction
Government of the People's Republic of China	16-Dec-97	32,175.03	32,175.03	Rehabilitation activities
Cook Island Development Bank		1,900,000.00	1,900,000.00	Pearl development activities
Government of Cook Islands		100,000.00	600,000.00	Ministry of Outer Islands contribution
New Zealand Overseas Development Assistance	1997/98	60,000.00	60,000.00	Airport beacon
	1997/98	270,000.00	1,059,603.00	Reconstruction activities
	1998/99	2,291,913.99	2,280,000.00	Reconstruction activities
	1999/2000	1,294,858.00	1,615,522.00	Reconstruction activities (to 30/06/2000)
Government of Samoa	20-Feb-98	30,129.14	30,129.14	Rehabilitation, and Repatriation activities
Government of Switzerland	13-May-98	12,256.27	12,256.27	Food parcels
Telecom Cook Island		2,000,000.00	2,000,000.00	Telecommunication facilities
Target Resource Assignment from the Core	12-Dec-97	158,977.52	158,977.52	Food parcels, charters, and rehabilitation activities
Government of United Kingdom	30-Mar-98	87,782.81	87,782.81	Food parcels, charters and clean-up tools
United Nations Disaster Assistance	04-Nov-97	15,870.59		
United Nations Disaster Assistance	01-Nov-97	31,711.58		
United Nations Disaster Assistance	04-Dec-97	16,493.48	64,075.55	Food parcels and rehabilitation activities
Total		**9,503,221.41**	**12,018,346.32**	

Sources: Project Aid Division of Ministry of Finance and Economic Management, Cook Islands.

COMPLIANCE WITH MAJOR LOAN COVENANTS

Covenant	Due Date	Status
1. Project to be carried out with due diligence and efficiency and in conformity with sound administrative, financial, engineering, environmental, and public utility practices (Section 4.01, Loan Agreement [LA]).	Throughout the Project.	Complied with.
2. Make available, promptly as needed, the funds, facilities, services, and other resources that are required, in addition to the proceeds of the loan, for the carrying out the Project and operating and maintaining the project facilities (Section 4.02, LA).	Throughout the Project.	Complied with.
3. Ensure that the activities of departments and agencies carrying out the Project and operating of project facilities are conducted and coordinated in accordance with sound administrative policies and procedures (Section 4.03, LA).	Throughout the Project.	Complied with.
4. Maintain records and documents adequate to identify the eligible items financed out of the proceeds of the loan, to disclose their use in the Project and to record the progress and cost of the Project (Section 4.04 [a], LA).	Throughout the Project.	Complied with. Eligible expenditures incurred under imprest account verified by review missions.
5. Enable the representative of the Asian Development Bank (ADB) to inspect the project facilities and any relevant records and documents (Section 4.04 [b], LA).	Throughout the Project.	Complied with. Inspected by review missions.
6. Furnish to ADB all reports and information as ADB requests concerning (i) the loan, and the expenditure of the proceeds, and maintenance of the service thereof; (ii) goods and services financed out of the proceeds of the loan; (iii) implementation of the Project; (iv) administration, operation, and financial condition of the agencies of the Borrower responsible for carrying out the Project and operating the project facilities; (v) financial and economic conditions in the territory of the Borrower and the international balance-of-payments position of the Borrower; and (vi) any other matters relating to the purposes of the loan (Section 4.05 [a], LA).	Throughout the Project.	All complied with.
Furnish to ADB every three months reports on the Project. The reports will indicate, among other things, progress made and problems encountered during the quarter under review, steps taken or proposed to be taken to remedy these problems encountered, steps	Throughout the Project.	Complied with. Regular quarterly reports have been submitted to ADB.

Covenant	Due Date	Status
taken or proposed to remedy these problems, and proposed program of activities and expected progress during the following quarter (Section 4.05 [b], LA).		
7. Promptly after the closing date for withdrawals from the loan account, but in any even not later than two weeks thereafter or a later date agreed between the Borrower and ADB, the Borrower will furnish to ADB a report on the project implementation, including its cost, the Borrower's performance of its obligations, and the accomplishment of the purposes of the loan (Section 4.05 [c], LA).	Two months after loan final claim.	Complied with.
8. No other external debt owed to a creditor other than ADB will have any priority over the loan by way of a lien on the assets of the Borrower. To that end, the Borrower undertakes (i) that, except as ADB otherwise agrees, any lien created on any assets of the Borrower will equally and ratably secure the payment of the principal of, and service charge and any other charge on, the loan; and (ii) that the Borrower will make express provision to that effect (Section 4.06 [a], LA).	Throughout the Project.	Complied with.
9. The Ministry of Finance and Economic Management (MFEM) will be the Executing Agency of the Project, responsible for implementation including overseeing the allocation and disbursement operations of the loan. The ministry will work in close coordination with the National Disaster Management Committee, the Ministry of Marine Resources, the Ministry of Outer Islands Development, and the island councils of Manihiki, Pukapuka, and Rakahanga (Schedule 5, LA)	Throughout the Project.	Complied with. Effective March 1998, MFEM became more actively involved in the day-to-day implementation of the Project assisted by project management consultant.

THE TROPICAL CYCLONE MARTIN RECOVERY TASK FORCE

1. The Government established the Tropical Cyclone Martin Recovery Task Force (TCMRTF) immediately following the cyclone. The minister for national disaster management took overall control with the chair of the TCMRTF (the commissioner of police) reporting to the minister. The National Disaster Management Office (NDMO), which had been established in September 1997 just two months prior to Cyclone Martin, provided some support for the TCMRTF, but its role was initially very limited as was to be expected given its recent formation. NDMO was given the responsibility of ensuring coordination of all agencies (regional, national, and international). The TCMRTF was given overall responsibility for implementing the Government's overall Cyclone Martin Emergency Program, which also included the Cyclone Emergency Rehabilitation Project financed by the Asian Development Bank. Within the TCMRTF a special committee (Manihiki Reconstruction Committee) was established to deal specifically with the reconstruction of Manihiki. The TCMRTF employed a domestic consulting firm to initially help manage the Cyclone Martin Emergency Program. The consultant was subsequently appointed as both the designated domestic consultant (counterpart) for the Cyclone Martin Emergency Program (NZODA) project and as the project management consultant for the Project.

2. The TCMRTF through the chairman and minister took immediate control of the relief operations on Manihiki and ordered the evacuation of the population, fearing health risks if people were to stay on the atoll. Subsequently, it directed the development of cyclone emergency rehabilitation programs for Manihiki, Nassau, Pukapuka, and Rakahanga. The domestic consultant was charged with developing the programs for consideration by the TCMRTF. For each island, the consultant was required to (i) assess damage and hazard areas, (ii) assess resource requirements needed for recovery, (iii) develop and estimate the cost of long-term implementation programs for rehabilitation, and (iv) supervise the implementation of these programs on each island.

3. The TCMRTF served as an effective, high-level policy and decision-making body, which was appropriate in the relief and early recovery phase after the cyclone. However, once the immediate relief phase was completed the TCMRTF could have taken a less directive role and turned key components over to the agencies normally responsible for longer term development planning and implementation to the Ministry for Outer Islands Development and island councils. The TCMRTF was a particularly high-level agency and its authority was reported to have overpowered the communities and some of the key line agencies. This resulted in the community (and apparently some line agencies) pulling back from some of the deliberations about recovery and rehabilitation operations. This in turn led to greater reliance on consultants and external inputs from aid agencies. The local community and island councilors interviewed by the Project Completion Review Mission reported that this high-level and authoritative method deterred inputs from the island councils and community members.

4. Since the cyclone, the Government through NDMO has taken a number of steps to strengthen its capacity to deal with emergencies including cyclones. NDMO has developed a comprehensive national disaster plan and is currently facilitating a process whereby each island or vaka (district) council is developing and documenting its own emergency action plan. Workshops are being held on most of the islands (including Manihiki) to develop the local capacity to respond to emergencies. The emergency plans encompass disaster relief activities and disaster prevention, preparedness, and mitigation measures.

ESTIMATE OF CYCLONE-RELATED COSTS TO THE PEARL INDUSTRY IN MANIHIKI

1. The cyclone resulted in two types of costs to pearl farmers at Manihiki. First, the cyclone caused direct damage to pearl farm infrastructure and equipment above and below water. These costs are estimated to total of about NZ$3.37 million (Table A5). The costs were estimated using information collected by the Project Completion Review Mission from a number of sources. The basic information on farm size and numbers was derived from the census conducted by the Ministry of Marine Resources (MMR) in November 1999. The information on damage to farm infrastructure and equipment was based on results of the MMR assessment of damage conducted in November 1997. The figure for loss for above-water infrastructure was based on information provided to the Mission by a sample of pearl farmers contacted by the Mission. Based on this information it was estimated that 50 percent of farms lost 95 percent of their above-water infrastructure. The rate of loss of below-water infrastructure was based on the extent of damage assessed by MMR and was assumed to be common across all farm sizes. The value of the inventory of items on each farm (above and below water) was based on the data collected by the Mission for the Pearl Industry Development Project.[1]

2. The second type of cost relates to production losses following the cyclone. These losses reflect the fact that some farmers were unable to seed their oysters either because (i) the oysters were stressed as a result of the cyclone (turbidity, downed lines, etc.) or (ii) the farmers had been evacuated or were unable to provide the required labor owing to the need to clean up and rebuild after the cyclone. Based on the information provided by a sample of pearl farmers, the Mission assumed that (i) in 1997, 50 percent of the farmers were unable to seed 50 percent of their oysters; (ii) in 1998, all farmers were unable to seed 30 percent of their oysters; and (iii) in 1999, 50 percent of farmers were unable to seed 15 percent of their oysters. Using the pearl model developed for the Pearl Industry Development Project completion report, these assumptions result in an estimated production loss of about NZ$3.37 million as indicated in (Table A5). Discussions with some pearl farmers suggested that the older oysters (those ready for their fourth and fifth seeding) were more likely to succumb to the stress of the cyclone than the younger ones. Since the older oysters produce bigger (and thus more valuable) pearls, the production loss estimated in Table A5 is likely be an underestimate.

3. Based on these estimates, the total losses for the pearl industry as a result of the cyclone are estimated to be NZ$6.65 million as indicated in Table A5.

4. The Mission attempted to estimate the benefit to the pearl industry from the Project by estimating what the production losses might have been without the Project and the associated support provided by Cook Islands Development Bank and other assistance projects. However, it is not possible to separate the benefits that might have accrued to the pearl industry from the Project from those that might have accrued from other sources of assistance. The Project had no effect on the direct cyclone damage costs since these costs had already been incurred. The benefit from the Project therefore depends on the level of production losses that might have been incurred without the Project. Based on discussions with a small sample of farmers, production losses in 1998 and 1999 might have been twice as high if farmers had not been able to return to their farms as promptly as they did. Farmers indicated that the production losses

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[1] Loan 1309-COO(SF): *Pearl Industry Development Project,* project completion report, PCR: COO 25259 Table A4.2, page 16, Appendix 4, page 2.

would have been the same in 1997 since the critical time was November and all farmers who had not seeded by the time of the cyclone would have incurred production losses with or without the Project. These estimates were used to derive an expected production loss without the Project (and associated assistance activities) as indicated in Table A5. The difference between the expected production loss without the Project and that with the Project is the benefit of the Project (and associated assistance activities) to the pearl industry. This was estimated to be NZ$2.03 million.

Table A5: Estimated Benefits

Rate of Loss Incidence			**Farms**				**Total**
Cyclone Impact	Item affected	Incidence of loss	2500 shell farm	5000 shell farm	25000 shell farm	50000 shell farm	Totals (US Dollars)
Cyclone Damage Costs							
Shells Seeded			2,500	10,000	25,000	50,000	
Inventory of Farms			25	24	21	7	
Above Water Items			41,700	44,700	78,700	118,700	
Below Water Items			11,550	46,200	115,500	231,000	
Losses							
Above Water Items	50%	95%	495,188	509,580	785,033	394,678	2,184,478
Below Water Items			288,750	1,108,800	2,425,500	1,617,000	5,440,050
Low Damage	5%	75%	10,828	41,580	90,956	60,638	204,002
Medium Damage	35%	10%	10,106	38,808	84,893	56,595	190,402
High Damage	85%	15%	36,816	141,372	309,251	206,168	693,606
Total Damage	85%	15%	552,938	731,340	309,251	718,078	3,272,488
Production Losses							
1997	50%	50%	438,275	420,744	368,151	122,717	
1998	100%	30%	525,930	504,893	441,781	147,260	
1999	50%	15%	131,483	126,223	110,445	36,815	
2000							
Total Losses			1,095,688	1,051,860	920,378	306,793	3,374,718
Cyclone Effects (damage & production losses							6,647,205
Expected Production Losses without Project							
1997	50%	50%	438,275	420,744	368,151	122,717	
1998	100%	60%	1,051,860	1,009,786	883,562	294,521	
1999	50%	30%	262,965	252,446	220,891	73,630	
2000							
Total			**1,753,100**	**1,682,976**	**1,472,604**	**490,868**	**5,399,548**
Project Benefits (Production losses avoided)			**657,413**	**631,116**	**552,227**	**184,076**	**2,024,831**

Source: staff estimates