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IMPLEMENTATION COMPLETION REPORT

PHILIPPINES

EARTHQUAKE RECONSTRUCTION PROJECT

(LOAN 3263-PH)

May 22, 1997

Infrastructure Operations Division
Country Department I
East Asia and Pacific Region

CURRENCY AND EQUIVALENTS

Currency Unit = Philippine Peso (P)
(monthly average values)

2/90	US$1.00 = P22.600
2/91	US$1.00 = P28.125
2/92	US$1.00 = P26.500
2/93	US$1.00 = P25.250
2/94	US$1.00 = P27.700
2/95	US$1.00 = P25.700
2/96	US$1.00 = P26.205
2/97	US$1.00 = P26.335

UNITS OF MEASUREMENT

Systeme Internationale

ACRONYMS AND ABBREVIATIONS

ADB	-	Asian Development Bank
COA	-	Commission on Audit
DBM	-	Department of Budget and Management
DILG	-	Department of Interior and Local Government
DOF	-	Department of Finance
DOH	-	Department of Health
DPWH	-	Department of Public Works and Highways
DSWD	-	Department of Social Welfare and Development
GOP	-	Government of Philippines
ICR	-	Implementation Completion Report
NAMRIA	-	National Mapping and Resource Information Authority
NHA	-	National Housing Authority
NIA	-	National Irrigation Administration
PCR	-	Project Completion Report
PHIVOLCS	-	Philippine Institute of Volcanology and Seismology

GOVERNMENT'S FISCAL YEAR

January 1 to December 31

Vice President	:	Jean-Michel Severino, EAP
Director	:	Javad Khalilzadeh-Shirazi, EA1
Division Chief	:	J. Shivakumar, EA1IN
Task Manager	:	Kevin Page, EA1DR

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Preface

This is the Implementation Completion Report (ICR) for the Earthquake Reconstruction Project in the Philippines, for which Loan 3263-PH in the amount of US$125 million equivalent was approved on October 9, 1990 and made effective on December 12, 1990.

The loan was closed on December 31, 1996, compared with the original closing date of March 31, 1995. The final disbursement took place on May 13, 1997, at which time the balance of US$15,694,374.13 equivalent was canceled.

The ICR was prepared by Messrs. Peter Long, Highway Engineer, EA1IN, and Kevin Page, Operations Officer, EA1DR, and was reviewed by Messrs. J. Shivakumar, Chief, EA1IN; and Walter Schwermer, Projects Advisor, EA1DR.

Preparation of this ICR was begun during the Bank's final supervision mission. It is based on material in the project file, site visits by the ICR mission, and the comprehensive Project Completion Reports provided by the four implementing agencies, Department of Public Works and Highways, Department of Health, National Irrigation Administration, and National Housing Authority, during the ICR mission which took place between March 4 - 14, 1997. The Borrower's Executive Summary of these four Completion Reports is attached as Appendix A. The final draft of this ICR was provided to the Borrower for comment, and comments received were incorporated into the final report.

IMPLEMENTATION COMPLETION REPORT
PHILIPPINES
EARTHQUAKE RECONSTRUCTION PROJECT
(LOAN 3263-PH)

Evaluation Summary

Background

i. In July 1990, an earthquake registering 7.7 on the Richter scale shook Luzon causing high loss of life and wide ranging destruction of infrastructure. The Government and the international donor community reacted quickly to assess and respond to the disaster. The Government's emergency response opened roads and established emergency housing and health care arrangements within days of the earthquake; the Bank loan of US$125 million equivalent was identified, prepared, appraised and negotiated within two months of the earthquake and began financing longer-term reconstruction within six months of the earthquake. A similar Asian Development Bank (ADB) loan was also made available, and although no formal linkage between the Banks' loans existed, their implementation was marked by close and effective collaboration, particularly in the highway sector.

ii. In June 1991, Mount Pinatubo erupted causing even greater damage. The Bank loan was amended and also used to mitigate some of the pressing problems created by this second natural disaster, including retargeting the housing component assistance and funding some civil works and consultancy from the Department of Public Works and Highways component. The project closing date was extended to March 31, 1996 and subsequently to December 31, 1996 to permit the completion of the Pinatubo works and consultancy.

Project Objectives

iii. The objectives of the multisectoral project, as amended, were to: (i) minimize the adverse economic impact of the July 1990 earthquake and the Pinatubo eruption by assisting in the reconstruction of essential infrastructure and other facilities to promptly restore economic activity in the affected area; and (ii) introduce measures to reduce the negative impact of future disasters. These objectives and the Bank's intervention strategy were consistent with the Bank's Operational Directive 8.50 of November 28, 1989, and were appropriate in this case.

iv. The OD 8.50 called for the following project design considerations: (i) early involvement of Bank staff; (ii) prior working relationship with the country and sector agencies; (iii) strong government commitment to recovery, and access by the emergency coordination unit to the highest levels of government; (iv) limited objectives and realistic time schedule; (v) rapid agreement with the government on the strategy and scope of the overall recovery program; (vi) conditionalities linked directly to the emergency, rather than to long-term macroeconomic policies; (vii) commitment to restoration of standard cost recovery practices; (viii) simple implementation arrangements and full use of existing

institutions, including sector agencies, NGOs, and community groups; (ix) use of disaster-resilient reconstruction design standards; and (x) inclusion of measures for preventing and mitigating the impact of future disasters.

v. Each of these criteria was included in the project design. Bank staff were on the scene the day after the earthquake in 1990. The Bank-financed components were selected on the basis of ongoing working relationships with the sector agencies. A Presidential Task Force in the Philippines was responsible for coordination of the international reconstruction efforts. The Project had limited objectives and a planned implementation schedule of 3.75 years, which was extended 1.75 years to accommodate activities related to the Pinatubo disaster that occurred a year after the earthquake. Agreement on the overall scope was reached with the Government within two months of the earthquake, and specific interventions were defined during implementation. Conditionalities were limited and linked to the emergency; they also encompassed standard cost recovery for the appropriate sectors. Implementation arrangements, though somewhat complicated by the number of agencies, were straight-forward. The use of disaster-resistant designs was introduced during implementation and had significant institutional impact which should mitigate future earthquake damage.

Implementation Experience and Results

vi. Implementation experience was very positive overall and the results satisfactory. In general, works carried out under thousands of small contracts were completed on or ahead of schedule and to an acceptable level of quality. A US$25 million component to supply retroactive financing of critical construction materials and commodities was also successfully completed. Work was largely carried out as planned in three sectors, highways, irrigation and health with some small reallocations made to respond to the Pinatubo eruption. The description of the fourth component for housing was amended after the eruption of Pinatubo. Instead of providing housing finance to earthquake victims, the loan was amended to allow for the creation of resettlement sites for some of the thousands of families dislocated by the lahar flows. While the results were generally good, one aspect of implementation that was not fully satisfactory was the delay in submission of withdrawal applications that was one of the main reasons for the cancellation of US$15.7 million from the Bank loan and the government's financing of a higher-than-planned portion of the reconstruction effort.

Summary of Findings, Future Operations, and Key Lessons Learned

vii. The project met its development objectives. The works and materials financed by the Bank allowed for the rapid economic restoration that occurred in Luzon, despite the Pinatubo eruption a year later. In addition, the Bank financed important technical assistance that has introduced and disseminated more sustainable earthquake-resistant designs for roads, bridges, hospitals, and other structures subject to seismic failure as well as better defining seismic hazard zones. These designs and other awareness-raising activities have improved the chances that newer and retrofitted structures will survive future seismic events. Since much of the work was rebuilt to a higher standard and is being maintained, sustainability of the Project benefits is considered to be likely.

viii. The project design, although complicated by the number of implementing agencies and the large number of contracts, was essentially quite simple. This simplicity, along with clear Borrower ownership, were key elements of the Project's success.

ix. The Bank was able to react quickly, with negotiations completed within two months of the earthquake. In spite of this fast-tracking the performance of the Borrower and the Bank in project implementation was at least as good or better than most projects prepared and appraised in a conventional manner and time frame.

x. Lessons Learned:

(a) The project design criteria established in the Bank's Operational Directive 8.50 were appropriate and successful in this project. This reinforces the suitability of OD8.50 (since replaced by Operational Policy/Bank Procedure 8.50) for future emergency operations (paras. 2 - 4.)

(b) For emergency projects, which are generally prepared quickly, a substantial project review should be conducted after one year of implementation. This may also be appropriate for non-emergency lending operations (para. 28.)

(c) The disbursement system needs to be improved to assure smooth implementation of future emergency projects in the Philippines (paras. 30 - 32.)

IMPLEMENTATION COMPLETION REPORT
PHILIPPINES
EARTHQUAKE RECONSTRUCTION PROJECT
(LOAN 3263-PH)

IMPLEMENTATION ASSESSMENT

Statement/Evaluation of Objectives

1. The objectives of the project were to: (i) minimize the adverse economic impact of the July 1990 earthquake by assisting in the reconstruction of essential infrastructure and other facilities to promptly restore economic activity in the affected area; and (ii) introduce measures to reduce the negative impact of future earthquakes. These were amended as of March 8, 1992 to include the Pinatubo eruption.

2. The objectives of this multisectoral, emergency operation were consistent with the Bank's OD8.50 (dated November 28, 1989) and, most important for the success of the project, those of the Borrower. Further, the project's intervention strategy of reconstruction of infrastructure and quick disbursing budget support for a positive list of imports (needed at a time of budget constraint in the Philippines) was well thought through, appropriate, and timely.

3. The OD 8.50 called for the following project design considerations: "(i) early involvement of Bank staff; (ii) prior working relationship with the country and sector agencies; (iii) strong government commitment to recovery, and access by the emergency coordination unit to the highest levels of government; (iv) limited objectives and realistic time schedule; (v) rapid agreement with the government on the strategy and scope of the overall recovery program; (vi) conditionalities linked directly to the emergency, rather than to long-term macroeconomic policies; (vii) commitment to restoration of standard cost recovery practices; (viii) simple implementation arrangements and full use of existing institutions, including sector agencies, NGOs, and community groups; (ix) use of disaster-resilient reconstruction design standards; and (x) inclusion of measures for preventing and mitigating the impact of future disasters."

4. Each of these criteria was included in the project design. Bank staff were on the scene the day after the earthquake in 1990. The Bank components were selected on the basis of ongoing working relationships with the sector agencies. A Presidential Task Force in the Philippines was responsible for coordination of the international reconstruction efforts. The Bank-assisted Earthquake Reconstruction Project had limited objectives and a realistic time schedule. Agreement on the overall scope was reached with the Government within two months of the disaster, although specific interventions were defined during implementation. Conditionalities were limited and linked to the emergency; they also encompassed standard cost recovery for the appropriate sectors. Implementation arrangements, though somewhat complicated by the number of agencies, were straight-forward. The use of disaster-resistant designs was introduced during implementation and had significant institutional impact which should mitigate future earthquake damage.

Achievement of Objectives

5. The objectives were achieved. The works and materials financed by the Bank allowed for the rapid economic restoration that occurred in Luzon, despite the Pinatubo eruption a year later. The influx of ODA, including the Bank loan, was critical in allowing the Government to finance the restoration of the areas and people affected by those disasters. Without Bank assistance, the Government's emergency reconstruction efforts would have been very difficult to sustain due to lack of funds, with less satisfactory medium- and long-term results for the affected population. In addition to aiding in the restoration of critical transportation, health, housing, and irrigation infrastructure, the Bank loan injected needed capital into the devastated region during the economic downturn following the disasters, helping to reduce the economic dislocation.

6. The Bank and the ADB Earthquake Loans financed important technical assistance that has introduced and disseminated earthquake-resistant designs for roads, bridges, hospitals, and other structures subject to seismic failure. These designs and other awareness-raising activities have improved the chances that newer and retrofitted structures will survive future seismic events. The achievement of the objectives is described in more detail, by component, below.

7. Department of Public Works and Highways (DPWH). Damage was widespread and reconstruction sub-projects were implemented in six regions. A total of 1,164 civil works sub-projects were implemented under the IBRD-assisted project, for a total value of Pesos 2.2 billion. Scheduled at appraisal to be completed by mid-1994, these sub-projects were substantially completed by the end of 1993, and have significantly contributed to the objective of minimizing the adverse economic impact of the earthquake.

8. The objective of future mitigation was pursued in several ways. Buildings, water supply facilities and retaining walls were rebuilt to higher standards, new bridges were designed to current international seismic codes, and other bridges strengthened. DPWH Standard Designs for bridges, retaining walls, school buildings, other public buildings and elevated water tanks were revised and updated. Some forty seminars and workshops on earthquake related topics were held. Three specialized Bridge Inspection Vehicles were procured to assist with bridge inspection, repair and maintenance. Soon after the earthquake a private firm had flown a Synthetic Aperture Radar (SAR) survey of the affected area. The data imagery from this survey was procured and, under a separate consulting assignment, this was interpreted to produce geologic and regional and urban hazard intensity maps. Training and equipment was provided under the project to the Philippine Institute of Volcanology and Seismology and to the National Mapping and Resource Information Authority to give these agencies the capability to continue to make such analyses for other areas of the Philippines.

9. Another technology introduced as part of the Earthquake Reconstruction Project was the use of Vetiver grass for slope stabilization. The use of this special grass to inhibit slope erosion has been shown in other parts of the world to be an environmentally sound mitigative measure. It is also often less expensive than building rip rap and other retaining structures, themselves subject to failure during a seismic event. The DPWH Bureau of Maintenance, with assistance from the Project Management Office of the National Irrigation Administration's Irrigation Watershed Management Project, is pursuing pilot projects in the

Philippines to introduce Vetiver and to assess its value as part of an ongoing maintenance program. Two pilot projects are underway, on the Famy-Infanta and Nueva Vizaya - Benguet roads. DPWH has established two Vetiver nurseries and has had several expressions of interest from local farmers willing to grow seedlings for sale to the Government and contractors.

10. National Housing Authority (NHA). The original purpose of this component, to provide housing finance to earthquake victims, was amended to allow use of the original funds to develop resettlement sites for people displaced by the eruption of Mount Pinatubo. The funds were used to finance horizontal and vertical infrastructure for ten upland and two lowland sites, as well as to finance building materials which were provided directly to displaced families. The sites were completed in the third quarter of 1993, earlier than had been programmed for the original housing component. The quick development of the sites helped to alleviate the significant suffering of displaced families that had been temporarily relocated from the deadly slopes of Mount Pinatubo to highly concentrated and disease-prone emergency camps.

11. The upland sites were specifically developed for habitation by indigenous Aeta families that had lived on the slopes of Mount Pinatubo, and were prepared taking into account the customs and preferences of the affected tribes. Ultimately, permanent relocation has been voluntary, with some 4,200 of 9,300 families evidently having chosen to move elsewhere, either back to dangerous areas around Pinatubo or to lowland settlements. For the 5,100 families that remain in the upland sites, there is excellent access to education, health facilities, water supply and job opportunities other than those offered by subsistence farming. The infrastructure appears to be in good shape, but funds and training for maintenance and operation of the water supply systems, in particular, appear to be lacking. Sustainability, however, in terms of utilization of the sites appears to be good four years after the establishment of these communities.

12. The two lowland sites outside of Angeles City cater to 3,236 families affected by the Pinatubo eruption. The sites' horizontal infrastructure was built to very high standards and appears to be maintained regularly by the responsible Local Government Unit. Vertical infrastructure, such as schools and water supply, fall within the responsibility of various agencies and the city and appear to maintained to a satisfactory standard. The families resettled after the Pinatubo eruption suffered from a loss of livelihood, exacerbated by the general economic downturn in the Angeles area after the closure of Clark Air Force Base. However, economic activity has picked up in recent years with the introduction of a Clark duty free and industrial zone. While inhabitants of the two resettlement sites may have lower-than-average incomes, they enjoy better-than-average facilities and appear to be thriving communities.

13. It is worth noting that the original housing finance scheme, while consistent with housing finance policies agreed between the Bank and the Borrower, was complicated and suffered from initial delays due to difficulties in obtaining full agreement with the Borrower as to the precise terms and conditions to be placed on the funds to ensure the appropriate targeting of beneficiaries. It appears likely that the use of funds to mitigate the effects of the Pinatubo disaster speeded the implementation of the component and may have led to a more successful outcome in terms of rapidly improving conditions for disaster-affected people.

14. National Irrigation Administration (NIA). Reconstruction activities were successful, covering 19 national and 567 communal irrigation schemes and restoring over 127,000 hectares of land to full productivity. The implementation schedule slipped about two years due to insufficient counterpart budget allocations, despite the availability of loan funds and higher disbursement percentages after September 1990. While implementation was delayed, final disbursement performance was superior to that of the other components, which failed to fully utilize their respective portions of the loan proceeds despite some degree of overprogramming. Maintenance of the works appears to be satisfactory.

15. To mitigate against future earthquake damage, NIA undertook efforts to improve slope stability, including piloting the use of Vetiver grass. As a large part of the damage caused by the earthquake involved siltation, stabilization of slopes should mitigate the need for future dredging.

16. Department of Health (DOH). Initial implementation of civil works under this component went well, with 85 percent completed by December 1992. However, disbursement performance lagged severely, a problem which was compounded by a three-year suspension of disbursements due to DOH's failure to comply with audit covenants. By the closing date of December 31, 1996, only US$4 million had been utilized from the loan proceeds out of the US$10.1 million envisioned at appraisal. Of the remaining 15 percent of civil works, most had been completed by loan closing, with the remainder to be completed by the end of 1997. The delays resulted from three primary factors, namely: (i) inadequate local funds to complete the works without Bank funding; (ii) delays caused by difficulty in acquiring the land for relocating facilities, which resulted in cost increases; and (iii) the devolution of hospitals in 1993 to the LGUs, which changed the funding arrangements.

17. In terms of sustainabilty and mitigation of future risk, the reconstructed hospitals were inspected by engineers and in many cases were retrofitted to improve seismic resistance. Many newer hospitals have benefited from earthquake-resistant improved designs including, in some cases, relocation to areas less prone to severe earthquake damage based on studies carried out under the Earthquake Reconstruction Project.

18. Department of Finance (DOF). A US$25 million component was included for import of critical construction materials and commodities from a positive list including cement, lime, ingots, iron, steel, roof sheets, pipes, pipe fittings, timber and critical commodities (petroleum). The Department of Finance handled the procurement of the commodities according to procedures agreed with the Bank. Disbursements proceeded very quickly for this component, with $20 million disbursed within a week of loan effectiveness and the remaining $5 million disbursed within the first year of implementation. The component provided important budget support soon after the earthquake and helped to achieve the objective of rapidly restoring economic activity to Luzon.

Major Factors Affecting the Project

19. The largest factor affecting the Project was the eruption of Mount Pinatubo in June 1991. The Pinatubo disaster was of even greater scope than that of the 1990 earthquake, and continues to affect vast areas of Luzon. In response to Pinatubo, the Earthquake Reconstruction Loan Agreement was amended to redirect the funds intended to develop

housing for earthquake victims toward the development of resettlement sites for thousands of families dislocated by the eruption. The eruption generated billions of cubic meters of lahar, a mud/ash slurry with a high specific gravity. When mobilized by the annual monsoons, lahar moves quickly like very dense water, and has washed away infrastructure and buried large areas around the Pinatubo volcano. The redirected loan funds helped the Government to move more quickly to relocate some families whose towns had been (or were in imminent danger of being) completely destroyed.

20. In addition to the changes in the housing component, the Government requested and the Bank agreed to reallocate part of the project funds to consultancy services and civil works for the eruption-affected area. The reallocated funds were managed by the Mt. Pinatubo Reconstruction Project Management Office. The project closing date was extended to March 31, 1996 and subsequently to December 31, 1996 to permit completion of the Pinatubo works and consultancy.

21. Other factors that affected the project were lack of counterpart funding and disruptions caused by the Persian Gulf War. The Philippines portfolio generally suffered from a shortage of counterpart funds in the early 1990s due to macroeconomic conditions that were exacerbated by the onset of the Gulf War and increased prices for oil. In recognition of the hardships posed by the war, the Bank raised the disbursement percentages for several projects in the Philippine portfolio, including the Earthquake Reconstruction Project. Despite the increased disbursement percentages and a somewhat overprogrammed rehabilitation program, problems with collecting documentation for reimbursement from Local Government Units and national departments' regional offices led to failure to fully utilize the loan proceeds.

Project Sustainability

22. None of the physical components of the project were revenue-generating. The sustainability of the project therefore rests on the maintenance of the works produced. Most of the works financed by the project consisted of rehabilitation or reconstruction of previously existing infrastructure which was already part of the regular maintenance program. The works are being maintained to the standards set by the various Departments, which is in most cases adequate.

23. An exception to the above situation was the development of resettlement sites under the Pinatubo housing component. Responsibility for maintenance of the lowland sites has been assigned to the relevant LGU and appears to be taking place. However, while maintenance responsibility has also been assigned for upland sites, concern was expressed to the mission that inconsistent funding and training has led to a suboptimal level of maintenance. Additional training was requested, particularly for maintenance of the water systems. The mission agreed to explore the possibility of addressing these issues as part of the Indigenous People Development Plans being generated under the Second Subic Bay Freeport Project.

24. Supervision missions by both the Bank and ADB in 1991 identified problems with the quality of the implementation of some of the civil works under the project. As a result, DPWH produced an action plan to address these issues, one element of which was the

approval of all works under the project by the international consultants before being accepted for funding under the project. As a result, works approved for Bank financing have generally been of adequate quality.

25. Except for the housing component infrastructure, the assets reconstructed under the project were already part of the overall Philippine assets managed by the various agencies. Maintenance and operation are therefore covered under the annual maintenance programs, to a similar standard as the rest of the assets managed by each agency. Responsibility for maintenance of the housing assets have generally been assumed by the local governments and, in some cases, by national agencies. As reconstructed facilities are built to higher standards of seismic resistance than the original works, the sustainability in the event of a future seismic event has been enhanced.

Bank Performance

26. Bank performance during identification, preparation, appraisal and negotiations was highly satisfactory. Project negotiations were completed less than two months after the earthquake. The Project became effective less than six months after the disaster. The project design, developed closely with the Government and other donors, was sound and met immediate needs. The design and preparation were also consistent with the OD8.50, dated November 28, 1989, Emergency Recovery Assistance. One exception was that while the OD called for projects to be completed within a limited period, normally three years, the Earthquake Reconstruction Project was scheduled to be substantially completed within 3 1/2 years, with disbursements completed within 4 3/4 years. As it turned out, the bulk of the project's civil works were substantially completed within 3 1/2 years, with disbursements lagging by a greater degree. The project was extended to allow for completion of the Pinatubo component (not anticipated at appraisal) and to complete longer-term technical assistance to mitigate against future earthquakes.

27. Supervision performance was satisfactory. Because the diverse components of the project involved four different agencies, supervision of each component was generally carried out by independent sectoral missions, the findings of which were consolidated into an overall annual project review by the task manager. The Bank proved to be flexible during implementation, allowing not only for reallocation and formal amendments of project description to accommodate the Pinatubo eruption, but also the problems caused by events in the Middle East.

28. At the end of the first year of implementation, after the international consultants were in place, there were concerns about the quality of some of the civil works carried out in the first year. Together with ADB, the Bank organized a review of this problem which resulted in an action plan by DPWH to improve the quality of works. This action plan was supervised carefully, and resulted in appreciable quality improvements and rejection of Bank financing for poor quality work. Although some instances of substandard work continue to appear, the awareness of the Bureau of Maintenance in DPWH to such problems has been raised and is increasingly being addressed. Given the compressed preparation schedule for the project, the thorough supervision review at the end of the first year of implementation proved to be highly useful, both in keeping the project on track and in providing an opportunity for

enhanced institutional development. This type of review after the first year should be incorporated into other project designs.

Borrower Performance

29. Borrower performance during preparation was highly satisfactory. The Presidential Task Force on Rehabilitation in conjunction with the respective agencies' Regional and District Offices did an excellent job of generating, validating, and summarizing proposed reconstruction proposals. The implementation performance varied by agency, but was satisfactory overall. The projects were mostly completed on time and within budget. One area in which all the agencies, except NIA, needed improvement was in obtaining the necessary documentation for reimbursement under the loan, which slowed disbursements.

30. Slow disbursements resulted from several factors. First, local governments and regional offices of the national agencies received direct budget allocations from Department of Budget and Management to perform the work under the project. Assembling the documentation needed to submit for reimbursement under the SOE procure was not clearly understood and proved time-consuming. Additionally, since the Bank's reimbursement was made to the Department of Finance, and not the LGUs and regional offices, this received low priority at these levels. As a result, loan proceeds remained unliquidated at the close of the project due to the fact that many activities eligible for Bank financing were not submitted for reimbursement.

31. To rectify this situation in future emergency operations, the Bank, working closely with Commission on Audit (COA), at project launch (or before) should produce a brief and specific set of guidelines, tailored to the Philippines, detailing the documentary requirements for reimbursement. These guidelines must be understandable by local authorities with no previous experience with Bank procurement. Further, some mechanism should be in place to create an incentive for regional offices and LGUs to submit SOE withdrawal applications.

32. A further problem, which hampered disbursements, were the audits of the project expenditures by COA, which was unable to certify some project expenditures due to lack of documentation. Partly because the headquarters COA auditors waited to receive audits for the regional COA auditors, audits were invariably presented to the Bank well after the covenant time limit of six months after the close of each fiscal year. This was a particular problem with the DOH audits, which remained unresolved for three years during which time disbursements were suspended. Resolution only occurred after staff had changed and a general Audit Action Plan was agreed between COA and the Bank. However, problems were also experienced with the DPWH audits and the Bank suspended processing of SOE withdrawal applications for ten months in 1993/4 until the 1992 audit report was submitted.

Assessment of Overall Outcome

33. The overall outcome was satisfactory. The project met the two major development objectives of helping to rapidly restore economic activity and introducing measures to mitigate future earthquake damage. Infrastructure was reconstructed under the project in a timely manner. A significant degree of technology transfer took place, with the development of seismic resistant designs and of updated Philippine building codes.

Future Operations

34. Future operation is a matter of continued maintenance of the works and procedures established under the project. Maintenance is ongoing and satisfactory. The institutional developments under the project, such as promulgation of updated designs, SAR mapping, and use of Vetiver grass for slope stabilization should continue to be promoted and integrated into planning. As noted above, maintenance and operation are covered under the general annual maintenance programs, to a similar standard as the rest of the assets in stock.

35. Two studies carried out under the project were of particular interest for future operations. The first was the review of Philippine bridge design standards in the light of updated methods recently developed in California, which showed that most bridges in the Philippines, even recently constructed ones, need retrofitting to strengthen them to withstand seismic events. A pilot program for this was started in the earthquake affected area under the parallel ADB project. This program should be extended to cover the whole country.

36. The second was the Bank financed hazard zonation mapping. This showed that a large area of the town of Dagupan is built on soils susceptible to liquefaction under seismic events with the consequent danger of collapse of buildings. This awareness has led to efforts to improve location and design of facilities to withstand earthquakes. Other cities in the Philippines (for example in Mindanao) are thought to have similar problems, and it is highly desirable to extend the hazard zonation type of analysis to other areas in order to guide future decisions on urban planning and zoning, and on building codes to be applied in such areas.

Key Lessons Learned

37. The primary lessons that emerge:

(a) The project design criteria established in the Bank's Operational Directive 8.50 were appropriate and successful in this project. This reinforces the suitability of OD8.50 (since replaced by Operational Policy/Bank Procedure 8.50) for future emergency operations (paras. 2 - 4.)

(b) For emergency projects, which are generally prepared quickly, a substantial project review should be conducted after one year of implementation. This may also be appropriate for non-emergency lending operations (para. 28.)

(c) The disbursement system needs to be improved to assure smooth implementation of future emergency projects in the Philippines (paras. 30 - 32.)

Table 1: Summary of Assessments

A. Achievement of objectives	Substantial	Partial	Negligible	Not applicable
Macro policies				✓
Sector Policies				✓
Financial objectives				✓
Institutional development	✓			
Physical objectives	✓			
Poverty reduction				✓
Gender issues				✓
Other social objectives				✓
Environmental objectives				✓
Public sector management				✓
Private sector development				✓
Other (specify)				✓

B. Project sustainability	Likely	Unlikely	Uncertain
	✓		

C. Bank performance	Highly satisfactory	Satisfactory	Deficient
Identification	✓		
Preparation assistance	✓		
Appraisal	✓		
Supervision		✓	

D. Borrower performance	Highly satisfactory	Satisfactory	Deficient
Preparation	✓		
Implementation		✓	
Covenant compliance		✓	
Operation (if applicable)		✓	

E. Assessment of outcome	Highly Satisfactory	Satisfactory	Unsatisfactory	Highly Unsatisfactory
		✓		

Table 2: Related Bank Loans

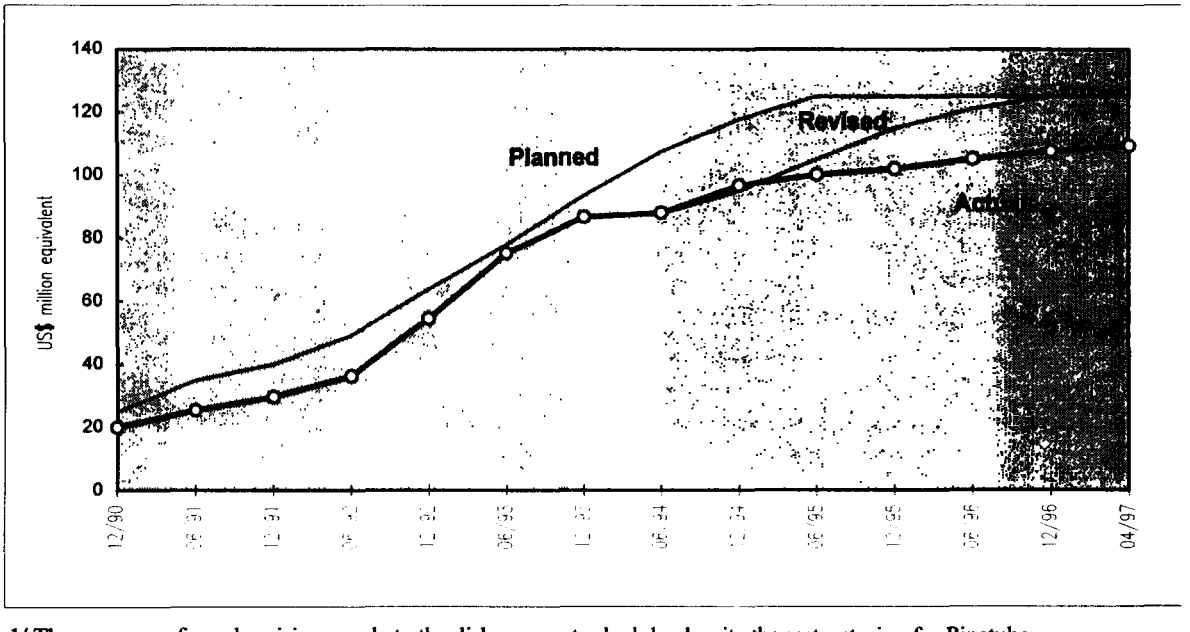
There were no previous emergency loans made to the Philippines.

Table 3: Project Timetable

Steps in project cycle	Date planned	Date actual
First mention in files		07/17/90
Identification		08/09/90
Appraisal		08/09/90
Negotiations		09/12/90
Board presentation		10/09/90
Signing		11/8/90
Effectiveness		12/12/90
Project completion	9/30/94	12/31/96
Loan closing	03/31/95	12/31/96

Table 4: Cumulative Disbursements (Planned v. Actual)
(US$ Million Equivalent)

FY/ Semester	Cumulative Disbursements		
	Planned	Revised /1	Actual
1991			
December, 1990	25.00	19.98	19.98
June, 1991	35.00	25.39	25.39
1992			
December, 1991	40.00	29.64	29.64
June, 1992	49.00	36.24	36.24
1993			
December, 1992	64.00	54.50	54.50
June, 1993	78.00	75.27	75.27
1994			
December, 1993	93.50	86.75	86.75
June, 1994	107.50	87.66	88.07
1995			
December, 1994	117.70	95.00	96.75
June, 1995	125.00	105.00	100.15
1996			
December, 1995	125.00	115.00	102.06
June, 1996	125.00	121.00	105.17
1997			
December, 1996	125.00	125.00	107.57
April 30, 1997	125.00	125.00	109.31



1/ There were no formal revisions made to the disbursement schedule, despite the restructuring for Pinatubo.

Table 5: Key Indicators for Project Implementation

No implementation indicators were required or developed for the project.

Table 6: Key Indicators for Project Operation

No operations phase indicators were required or developed for the project.

Table 7: Studies Included in the Project

Study Name	Purpose as defined at Appraisal/redefined	Status	Impact of Study
Geologic Interpretation of Synthetic Aperture Radar Data for Luzon and Preparation of Seismic Hazard Maps	The work was undefined at appraisal, but was designed to provide maps detailing seismic risk for policy (zoning) and design consideration.	Complete	SAR data has been collected and interpreted for all Luzon and is available for design and policy consideration. It has been used, for example, by the Bridge Retrofit Program and to relocate several hospitals under the Project.
Environmental Guidelines and Proposals for Post-Earthquake Infrastructure Projects	Undefined at appraisal; a handbook for environmental considerations in infrastructure projects	Complete	The guidelines handbook was completed and multiple seminars and briefings held to disseminate results. Copies of the guidelines are widely held and used in design and implementation.
Reconstruction Proposals (Baguio City, Dagupan City, and Agoo)	Proposals upon which the selection of World Bank-financed reconstruction projects would be based.	Complete	As anticipated at appraisal, the Reconstruction Proposals provided the basis for selection of projects eligible for Bank financing.
Hydrogeological and Structural Survey of Masiway and Pantabangan Dams	To update information on the hydrogeological nature of the watersheds and to assess the extent of damage to the dams caused by the earthquake.	Complete	The studies' methodologies and conclusions were questioned by the Bank's irrigation specialist.

Table 8A: Project Costs
(US$ Millions)

	Local		Foreign		Total	
	SAR	Actual	SAR	Actual	SAR	Actual
Roads and Bridges	35.7	37.5	47.0	49.3	82.7	86.8
Housing /1	9.4	8.8	4.2	4.0	13.6	12.8
Medical Facilities	5.2	5.3	6.4	6.5	11.6	11.7
Irrigation Systems	9.7	11.3	6.5	7.6	16.2	18.9
Critical Construction Materials and Commodities	-	-	25.0	25.0	25.0	25.0
Technical Assistance	2.0	1.5	6.5	4.7	8.5	6.2
Physical Contingencies	6.0	-	6.5	-	12.5	-
Price Contingencies	8.4	-	4.2	-	12.6	-
Total Project Cost	76.4	64.4	106.3	97.1	182.7	161.5

Table 8B: Project Financing
(US$ Millions)

	Local		Foreign		Total	
	SAR	Actual	SAR	Actual	SAR	Actual
Government	57.7	52.2	-	-	57.7	52.2
IBRD	18.7	12.2	106.3	97.1	125.0	109.3
Total Financing	76.4	64.4	106.3	97.1	182.7	161.5

Table 9: Economic Costs and Benefits

The economic costs and benefits of this Emergency Lending Operation were not required to be calculated during appraisal and have not, therefore, been calculated for the ICR.

Table 10: Status of Legal Covenants

Section	Covenant Description	Status	Comments
3.01 (b)	Borrower shall relend a portion of the proceeds to NHMFC under a subsidiary loan agreement	NA	This covenant was made unnecessary by the Pinatubo amendment.
3.01 (d)	NHMFC shall onlend the proceeds of the subsidiary loan to the housing entity as construction loans and then to mortgage loans to the beneficiaries	NA	This covenant was made unnecessary by the Pinatubo amendment.
4.01	Borrower shall submit audited financial statements for the project accounts, including the special account, as well as a separate opinion on SOEs by June 30 of each year	NC	While audits were ultimately received and acceptable, they were consistently very late, necessitating suspension of disbursements, in some cases for up to 2 1/2 years.
Schedule 5	Borrower shall prepare reconstruction proposals for the affected area by 3/31/91 and submit them for review by a panel of experts	C	Proposals offered by the implementing agencies were acceptable to the Bank.

KEY: NA = Not Applicable; NC = Not Complied; C = Complied

Table 11: Compliance with Operational Manual Statements

There was no significant lack of compliance with the Operational Directives, which were followed quite closely during project design.

Table 12: Bank Resources: Staff Inputs

Project Stage	Staffweeks	Dollars
Preparation	13.9	40,800
Appraisal	13.2	37,000
Negotiation/Board	7.4	24,900
Supervision	99.1	312,500
ICR	7.0	23,600
Total	140.6	438,800

Source: Staff Use and Schedule (Product View) Report COSR20

Table 13: Bank Resources: Missions

Mission Type	Mission Dates	Mission Personnel
Initial Assessment	7/17/90	Resident Representative, highway engineer, port consultant
Appraisal/Negot.	8/9 - 9/14/90	Financial analyst (TM), seismic engineer, housing specialist, urban planner/engineer, water engineer, highway engineer, lawyer
Supervision I	11/5 - 11/9/90	Financial analyst (TM), housing specialist
Supervision II	12/90	Sr. Architect, health facility expert
Supervision III	1/27 - 2/1/91	Irrigation specialist
Supervision IV	5/20 - 5/26/91	Financial Analyst (TM)
Supervision V	7/91	Sr. Architect, health facility expert
Supervision VI	9/12/91	Highway engineer
Supervision VII	11/5 - 11/15/91	Financial Analyst (TM), housing specialist, geographical information systems specialist
Supervision VIII	2/3 - 2/5/92	Sr. Architect
Supervision IX	3/23 - 3/27/92	Highway engineer
Supervision X	3/1 - 3/16/92	Housing specialist
Supervision XI	5/1 - 5/8/92	Irrigation specialist
Supervision XII	9/7 - 9/11/92	Financial analyst (TM)
Supervision XIII	10/12 - 10/19/92	Sr. Architect
Supervision XIV	10/19 - 10/30/92	Housing specialist
Supervision XV	6/17 - 6/22/93	Sr. Architect, housing specialist
Supervision XVI	5/18 - 5/27/94	Financial analyst (TM), highway engineer
Supervision XVII	11/14 - 11/18/94	Financial analyst (TM)
Supervision XVIII	3/1 - 3/3/95	Sr. Economist (irrigation expert), 2 consultants
Supervision XIX	11/1 - 11/21/95	Highway engineer (TM)
Supervision XX	3/20 - 3/22/96	Highway engineer (TM)
ICR Mission	3/4 - 14/97	Highway engineer (TM), Operations Officer

PHILIPPINES
EARTHQUAKE RECONSTRUCTION PROJECT (LN. 3263-PH)
IMPLEMENTATION COMPLETION REPORT

BORROWER'S PCR EXECUTIVE SUMMARY

FOREWORD

This Executive Summary presents an overall review of the Earthquake Reconstruction Project (ERP) - its objectives, scope, costs, financing arrangements, implementation, compliance with Loan covenants, an assessment of the benefits and beneficiaries, and conclusions, lessons learned and recommendations. The Project was supported by ADB Loan No. 1053-PHI(SF) ($100.0 million) and IBRD Loan No. 3263-PH ($125.0 million). The Summary draws on the individual Projects Completion Reports (PCRs) prepared by the four Implementing Agencies - the Department of Public Works and Highways (DPWH), the Department of Health (DOH), the National Housing Authority (NHA) and the National Irrigation Administration (NIA); these PCRs are attached in full as Annexes. The ADB loan was administered solely by DPWH; all four Agencies were assisted by the IBRD loan.

The IBRD loan closed on December 31, 1996; the ADB loan will close on June 30, 1997. This Executive Summary and the DPWH PCR present the status of the Project as of December 31, 1996; these Reports will be updated after the closure of the ADB loan.

A. Project Description

1. Objectives

The main objective of the multisectoral project was to minimize the adverse economic and social impact of the magnitude 7.7 earthquake which struck Luzon on July 16, 1990, affecting an area of about 100,000 sq. km., by reconstruction of essential public infrastructure including roads, bridges, Government buildings, schools, hospitals, health centers, housing and water supply, flood control and irrigation systems. These measures were intended to ensure that normal economic and social activities could resume promptly in the affected areas. The total cost of repairing the damage sustained by public facilities was estimated at 15.0 billion, (about $600 million).

In addition, steps were to be taken to reconstruct the damaged facilities to a condition at which risk of future damage by natural disasters would be minimized, and to strengthen existing structural codes and their enforcement. Training and transfer of technology from international experts to the Government Agencies, local consultants and contractors were also prime objectives of the project.

2. Official Development Assistance

In August, 1990 the Government of the Philippines (GOP) allocated 10.0 billion (about $400 million) for the public infrastructure rehabilitation and relief effort; this sum was to be financed from GOP sources and foreign loans and grants. The principal loans received were from the Asian Development Bank ($100.0 million) and the World Bank ($125.0 million). Assistance was also provided by Denmark, the European Union, Germany, Japan, Switzerland, the USA (through USAID) and the United Kingdom. The ERP, the subject of this Report, was assisted by the World Bank/IBRD and ADB loans. A portion of the Government's counterpart funds was sourced from OECF Emergency Commodity Loan PH-CI5.

3. Executing Agencies and Project Components

Four Executing Agencies were involved in the implementation of the Project:-

(i) the Department of Public Works and Highways (DPWH) (ADB and IBRD assisted) with responsibility for the rehabilitation of roads, bridges, schools, colleges, water supply and flood control systems and a limited number of ports, wharves and Government buildings.

DPWH (together with Local Government Units LGUs) implemented:

a) 1,760 (ADB 596, IBRD 1,164) road and bridge projects

Repair of settled areas, damaged asphalt and concrete pavements; reshaping of cut and fill slopes; repair of longitudinal and cross drainage; removal of slipped materials from carriageways; construction of stone masonry and gabion retaining walls. Replacements of bridge bearings, repair of bridge decks, handrails, steel trusses, replacement of Bailey panels; in certain cases, construction of new, replacement bridges, temporary road detours and temporary bridges. Repair and up-grading of bridge foundations, piers and abutments, and associated scour protection works.

b) 57 flood control projects (ADB-assisted)

Reconstruction of failed spur dikes, river banks, bunds; construction of new river training works. Clearing of channels filled with loose debris from unstable slopes.

c) 84 water supply projects (ADB-assisted)

Cleaning, redrilling, repairing shallow and deep hand wells. Repair of water tanks, reservoirs, water treatment plants, storage and distribution systems, including pipe-work.

d) 2,203 school and college building projects (ADB-assisted)

Repair and strengthening of foundations, footings, floor slabs, beams, columns, ceilings, roofs, drainage, windows, internal and external walls, electrical, mechanical, water and sewerage systems.

e) 62 other infrastructure projects (ADB-assisted)

Repairs to public buildings and markets, health centers, ports and wharves.

In addition, with ADB assistance, 96 important bridges in Luzon, including 23 in Metro Manila, were seismically retrofitted under the Bridge Retrofitting Program (BRP) and consulting services, equipment and incremental DPWH costs were financed. IBRD assisted in financing limited civil works for the Mount Pinatubo Rehabilitation Project, in consulting services, equipment procurement, hazard mapping and training.

(ii) the Department of Health (DOH) (IBRD assisted), which handled the repair and reconstruction of hospitals and health centers. Eighty-three hospitals, three DOH Offices, 120 Main Health Centers and 314 Barangay Health Stations were repaired or reconstructed. In the case of seven of the hospitals, temporary facilities were provided to allow these hospitals to maintain their operational capability. NHA assisted DOH in the provision of the temporary facilities. A total of seven hospitals had to be relocated as the original buildings were situated in areas of seismic risk. In additional, medical equipment was procured to replace equipment destroyed by the earthquake.

(iii) the National Housing Authority (NHA) (IBRD assisted); the original housing component was programmed to reconstruct or repair homes destroyed or damaged by the earthquake in seven urban areas. However, at the request of the Government, the loan proceeds were reallocated to assist in the resettlement of the victims of the Mount Pinatubo volcanic eruption of June, 1991, and the component became the Mount Pinatubo Housing Component, under the administration of the Presidential Task Force for Rehabilitation (Mount Pinatubo). Despite the revised use of the loan proceeds, the component remained within the ERP, and the Implementing Agency was NHA. NHA constructed ten upland resettlement sites for indigenous tribes people who had lived on the slopes of Mt. Pinatubo, and two lowland resettlement sites, for people displaced by ashfall and lahar destruction in the areas surrounding the volcano.

The works for the upland settlements included site development, roads drainage, and provision of materials and tools to the beneficiaries to allow them to construct their own houses, to approved standard plans. The loan proceeds financed site development, horizontal infrastructure, communal

facilities including health clinics, toilet facilities, school buildings and markets, and housing construction materials and carpentry tools. For the two lowland settlement areas NHA provided and prepared sites for basic communal facilities such as school buildings, health centers and markets, together with concrete roads, drainage, elevated water tanks sourced by deep wells and individual house water connections.

(iv) the National Irrigation Administration (NIA) (IBRD assisted), which implemented the reconstruction of 19 damaged national and 567 communal irrigation systems including canals, canal structures, diversion works and roads; 127,080 has. of affected service area were restored. NIA also procured cranes equipped with draglines, and portable pumps, to desilt canals and provide temporary water supplies for irrigation respectively. The IBRD loan also financed technical assistance for the hydro-geological and structural evaluation of two major dams, including the procurement and installation of seismological instruments to established a seismic monitoring network.

(v) $25.0 million was allocated by IBRD for the importation of essential construction materials required for the Project; this procurement was handled by the Department of Finance (DOF). Materials imported included cement, steel, and fuel.

With the agreement of the GOP and ADB, 110 Metro Manila school building projects in the DPWH program were implemented by the Department of Education, Culture and Sports (DECS); similarly, certain DPWH water supply projects outside Manila were undertaken by the Local Water Utilities Administration (LWUA). LWUA's project scope of 52 projects included rehabilitation of intake structures, pipelines, reservoirs, pumping equipment, pumphouses, power lines, chlorinating facilities, generator sets, service connections, drilling of new wells and demolition of old concrete reservoirs and other structures. Close technical coordination was maintained between DPWH and these Agencies, and their withdrawal applications to ADB were checked and finalized in the DPWH Project Implementation Unit (PIU).

The total programmed allocations per Agency (after two reallocations of IBRD loan proceeds in 1992 and 1993) were:

Agency	Loan Proceeds: $m		GOP input: $m equivalent	Totals: $m
	IBRD	ADB		
DOF	25.00	-	-	25.00
DPWH	64.80	100.00	64.72	229.52
DOH	10.10	-	3.78	13.88
NHA	10.60	-	4.49	15.09
NIA	14.50	-	7.75	22.25
Total	125.00	100.00	80.74	305.74

4. Changes in Project Components

For the IBRD-assisted components, the main changes were the reallocation of the Housing loan proceeds to the Mt. Pinatubo resettlement areas, handled by NHA, and realignment of $4.92 million dollars from the roads/bridges and equipment categories to finance consultants and civil works associated with the rehabilitation following the Mt. Pinatubo eruption. The Mt. Pinatubo consultancy and civil works were under the purview of the DPWH Mt. Pinatubo Rehabilitation Project Management Office; this Office had the administrative and technical responsibility, and prepared and sent withdrawal applications directly to IBRD.

IBRD-financed Synthetic Aperture Radar (SAR) imagery was procured for the whole of Luzon (excluding the Bicol Region) and seismic hazard maps were prepared for the same area by international consultants. The provision of strong-motion equipment was deleted from the original project scope, as this was provided under a separate Japanese-assisted project. A slope stabilization program using vegetation (vetiver grass) was initiated and three bridge inspection vehicles were procured, all of which had not been originally foreseen.

For the ADB-assisted components, DPWH and the Bank agreed to implement a Bridge Seismic Retrofitting Program (BRP) under which 300 bridges in Luzon were studied and 96 seismically retrofitted. The DOH and NIA components had no major changes in scope.

B. Project Implementation

1. Implementation Schedules, Planned and Actual

Appendix A shows how the actual implementation schedules compared with those planned at appraisal of the two loans in 1990. The ADB loan closing date was rescheduled from December 31, 1994 to June 30, 1997 in three stages. The IBRD loan closing date was revised from March 31, 1995 to December 31, 1996 in two steps. In the case of DPWH, the ADB-assisted components (apart from the BRP activities, which are expected to be completed in June, 1997) were finished by the end of 1993, as envisaged at appraisal. The IBRD-assisted civil works components were also completed by the target date of December, 1994, although the seismic mapping project and bridge inspection vehicle procurement, (not envisaged originally), were completed in April, 1995 and December, 1996 respectively.

NHA's implementation proceeded smoothly, and the civil works for both upland and lowland resettlement areas were completed in the third quarter of 1993, earlier than had been programmed for the original housing project component. NIA's target completion date was December 31, 1993. However, due to inadequate budgetary allocations, NIA continued with minor works on its final irrigation projects until December, 1996, although the bulk of the NIA civil works had been completed by late 1995. Consultants' services for flood prediction training and

software procurement were only partly completed by the revised loan closing date, due to time constraints.

The major part (85%) of the DOH civil works were completed by December, 1992. Thereafter limited civil works continued intermittently until the loan closing date, on specific hospitals in Metro Manila, Baguio City and Kayapa (Nueva Viscaya), but at a slow pace, due to difficulties experienced in acquiring new sites for relocated facilities, and funding problems due to the suspension by the Bank of SOE reimbursements. Completion of the last projects is expected by the end of 1997.

2. Implementation Methods Used

A Presidential Task Force on Rehabilitation (PTFR) was created in August, 1990 to oversee, coordinate, monitor and report on the rehabilitation activities. DPWH, DOH, NHA and NIA implemented their respective components independently; DPWH was responsible through its Project Coordination Unit (PCU) for overall monitoring and reporting to the Banks on the implementation of the ERP by the four Agencies concerned, on a quarterly basis.

Immediately after the earthquake, each Agency's Regional and District staff, assisted by LGUs identified, listed and summarized the damage to individual public infrastructure facilities. These lists were sent to PTFR in Manila, which consolidated them. Specialized facilities such as airports were handled by the Department of Transportation and Communications (DOTC), and were not included in the Bank-assisted ERP.

Each of the four ERP Agencies engaged local consultants as necessary, who assisted in the validation of projects, designs, bidding, and supervision of construction. International experts were recruited by DPWH to provide advice not only to DPWH but to the other Agencies, in fields such as earthquake engineering, slope stability, building reconstruction, environmental aspects and road and bridge reconstruction and project implementation. These experts supervised and assisted the local consultants as well as assisting the Agencies. Project Implementation Units (PIUs) were established in the Central Office of each Agency, which handled the day-to-day technical and administrative activities. Civil works were carried out by local contractors after competitive bidding procedures, by the Agencies themselves (NHA and LWUA) and partly by beneficiaries (NIA and NHA). Simplified bidding procedures and negotiated contracts were permitted only until February, 1991; thereafter normal bidding procedures were followed rigidly. Both Banks agree that LGUs could implement DPWH projects within their technical and financial capabilities, provided that appropriate standards and procedures were followed and that DPWH retained overall responsibility.

NIA implemented its project using a participatory approach in which farmers were involved in the actual rehabilitation works. Works such as desilting of canals and repair of minor structures were assigned to groups of farmers on a small

contract basis. Major works were undertaken either by NIA itself or by contractors. NIA utilized its Regional Offices in Regions 1, 2, 3, and CAR as direct implementors.

NHA staff designed the civil works, awarded the contracts though simplified bidding procedures and supervised construction. Resettled beneficiaries constructed the upland area housing themselves, with materials and tools furnished by NHA.

DOH's Health Infrastructure Services (INFRA) was designated to act as the DOH PIU, and INFRA was responsible for planning, design, bidding and award, construction supervision and submission of withdrawal applications to the Bank. In the design phase DOH utilized its in-house capabilities, DPWH services, and consultants; the last also provided supervision services. DOH Regional Offices awarded and administered contracts within their delegated authority limits. The Hospital Operations and Management Services of DOH handled the procurement of the medical equipment.

3. Costs and Financing Arrangements

The GOP fully financed all DPWH original ERP civil works and DPWH claimed reimbursement from both Banks as documents for completed projects became available. The BRP and Mt. Pinatubo contractors were paid directly by the Banks. DOH, NHA and NIA also used the reimbursement procedure. Seven local consulting firms recruited by DPWH were initially financed from GOP sources and reimbursement claimed later from the ADB loan. The BRP local consultants were paid directly by ADB; all international consultants were paid directly by ADB, except the Program Advisors, financed from the IBRD loan.

The importation of construction materials, the procurement of the bridge inspection vehicles and consulting services were paid directly by IBRD.

The Department of Budget and Management (DBM) initially disbursed ERP funds directly to certain LGUs and DPWH Regional and District Offices. Such direct allocations led to problems for the DPWH Central Office, PCU (and later PIU) in keeping track of the allocation and utilization of ERP funds.

The total costs presented in this Report are the sum of the total costs of all subprojects or individual contracts to which the Bank(s) made some financial contribution. Works 100% financed by the GOP and for which no reimbursement was made by the Banks have been excluded, since such projects generally had unacceptable technical or contractual features, or insufficient documentation, rendering them ineligible for Bank financing.

The DPWH had available from the ADB loan $100.0 million, and from the IBRD loan $64.8 million. DPWH completed 1,760 road and bridge projects (P3.954 billion), 57 flood control projects (P147 million), 84 water supply projects (P54 million), 2,203 school building repairs (P765 million), 62 other infrastructure

projects (P144 million) and the bridge retrofitting civil works are expected to cost P516 million. The Pinatubo consultants' and civil works' costs totalled P127 million. Consultants' fees and expenses, procurements and the ADB service charge accounted for the balance of the two loans utilized. However, $9.88 million of the IBRD loan is scheduled to be cancelled, principally as a result of the non-availability of acceptable documents to allow any further claims for reimbursement of civil works costs to be made by DPWH.

NHA's share of the IBRD loan was $10.6 million and this (less $1.65 million to be cancelled) was used to finance P321.0 million worth of civil works for the resettlement areas. NIA utilized $14.63 million of loan proceeds and $0.520 million reallocated from IBRD Loan No. 2948-PH Irrigation Operations Support Project (ISOP). On the ERP, total costs were $0.6 million higher than programmed, but $0.52 million of this was financed from Loan No. 2948-PH.

DOH was not able to use all the $10.1 million available from the IBRD loan due to funding problems (partly the result of IBRD's suspension of loan disbursements from August 1993 to December 1996. $6.0 million of the DOH allocation is expected to be cancelled.

As of December 31, 1996, the total cost of the ERP is estimated at $282.77 million, of which $192.20 million (68.0%) was financed by the Bank loans, and $90.57 million equivalent (32.0%) by the Government. Details of the project costs and sources of financing are presented in Appendix B. $17.43 million (13.9%) of the IBRD loan is scheduled for cancellation.

4. Consultants and Training

In late 1990 DPWH recruited seven local consulting firms for the ERP civil works, and subsequently a total of 15 international consultants (7 from firms, 8 as individuals). The international experts served for periods ranging from 2 months to 6« years as Program Adviser (1), Program Coordinator (1), Technical Specialists (9) and Implementation Specialists (4). Consulting firms (international) were engaged for the acquisition of SAR data and the hazard mapping component; for the design and supervision of the BRP, a local firm was recruited.

DOH utilized local consultants for design and supervision of the large hospital projects, while NHA relied almost exclusively on in-house staff for design and implementation. NIA engaged two international consulting organizations for hydrogeological evaluation and structural evaluation of major dams respectively. The hydrogeological aspects included a review of the Upper Pampanga Basin and activities comprised predicting design storms, reviewing flood forecasting procedures, providing advice on possible flood damage due to dam breaching and training of NIA staff in flood forecasting and risk assessment. Two major dams in Luzon were studied for safety when subjected to seismic forces, and recommendations made for rehabilitation works.

During the ERP implementation period the international consultants attached to DPWH participated in 40 earthquake-related workshops, training sessions and seminars (some conducted outside Manila), and usually as resource persons.

During the hazard mapping contract implementation, two specialized courses were conducted by the consulting firm concerned on interpretation of radar imagery. The international consulting team after completion of the hazard mapping component made presentations of the results to the Philippine Institute of Civil Engineers, and to senior staff of DPWH, other Agencies and academics.

5. Procurement, and Recruitment of Consultants

The essential construction materials ($25 million) comprising cement, steel, gasoline and diesel were procured as commodities from overseas by DOF. The three bridge inspection units were procured through ICB. NIA procured cranes, portable pumps and seismological instruments.

The original seven local consulting firms were appointed directly by DPWH, with the approval of ADB. The acquisition of SAR data for Luzon was implemented on a sole-source basis, with the agreement of IBRD, while the DPWH/IBRD-financed seismic mapping consultants were engaged following international competitive recruitment. The BRP local consultants were selected competitively, while all international individual consultants were selected following requests for and submission of bio-data by firms and individuals, and evaluation by DPWH. The Banks concurred with the evaluations. DPWH civil works contracts were generally awarded following LCB procedures acceptable to both Banks.

NHA engaged their contractors through LCB, as did DOH and NIA. Local consultants were recruited through comparison of technical proposals and international experts mainly on the basis of experience as demonstrated in their bio-data, following IBRD guidelines. NHA implementation did not utilize any consulting services. DOH's local consultants were engaged following the Government's procedures.

6. Loan Covenants

All four Implementing Agencies complied with most of the loan covenants, which were not onerous, given the emergency nature of the Project. However, DPWH, DOH, and NHA all had difficulty in meeting the deadlines for annual submission of audited projects accounts and financial statements, and at various times IBRD suspended processing of withdrawal applications. Submission to the Banks of audit reports with qualifications also resulted in queries from the Banks. Apart from Audit Reports, the only delayed compliance was the late submission to the Banks by DPWH of Reconstruction Proposals for the affected areas. Given the speed of repair and rehabilitation, and the delayed recruitment of international consultants, it was not practicable for the Government to prepare in time detailed proposals for every major urban area in Luzon affected by the earthquake;

eventually detailed proposals were submitted by DPWH to the Banks for only Agoo, Baguio City and Dagupan City, and the Banks raised no objections.

7. Environmental Impacts

The pre-earthquake environment in Luzon was very seriously affected by the earthquake and its aftershocks. In particular, landslides devastated hillsides, roads and river systems. Debris from steep slopes found its way into the rivers and the bed levels aggraded. Vegetation was destroyed, irrigation, flood control and water supply systems destroyed or damaged, and the earthquake had devastating impacts on the lives and well-being of millions of people in Luzon.

Most of the infrastructure repair was directed at the restoration of the pre-earthquake facilities, with strengthening where practicable. But the reforestation and vegetation of barren slopes and removal of debris from rivers will take many years to complete. DPWH and NIA have started to use vetiver grass to stabilize hill slopes and river and canal banks. To the extent possible, the civil works were carried out to repair as much of the environmental damage as possible without causing further problems. But depositing surplus material over cliff edges and undercutting already steep slopes along hill roads was often the only way to reopen blocked roads providing access to remote communities. An Environmental Specialist visited all parts of Luzon advising Government officers, consultants and contractors on the main environmental issues. He drafted new Environmental Guidelines which were distributed throughout the country, and he prepared five reports, each dealing with the environmental problems and proposed rehabilitation in a particular Region of Luzon.

C. Initial Operations

1. Initial Operations Following Rehabilitation

The Government reacted very quickly to the extensive damage to infrastructure resulting from the earthquake, and, with the Banks' assistance, roads were reopened, dangerous buildings condemned, temporary repairs to schools and hospitals effected and plans put in place for the longer term repair or reconstruction. Basic communications were re established within one week, but devastating typhoons later in 1990 and in 1991, and the eruption of Mt. Pinatubo in June, 1991 further aggravated the already precarious infrastructure fabric of Luzon. Nonetheless, life returned rapidly to normal and initial operation are considered to have been satisfactory, with roads and bridges reopened (or detours built), schools reopened and temporary classrooms organized, and makeshift water supply and health care facilities organized quickly.

Plans were made at an early stage for the medium and long-term rehabilitation works required, and overall the initial responses to the earthquake are considered to have been above expectations; the longer term measures are now also mostly in place. However, it is considered that the engagement of the international experts at

an earlier stage (they did not commence work until February, 1991, 6« moths after the earthquake) would have provided expert advice at the time it was most needed.

2. Maintenance and Sustainability

Since most of the damaged facilities were already part of the Government stock, they were included in annual maintenance programs. Accordingly, after repair, the facilities have continued to be maintained with annual budgetary funding. On the advice of both Banks maintenance procedures (in DPWH) are being reviewed and revised, and features such as maintenance by contract rather than by administration have already been implemented. Maintenance of damaged facilities is now more focussed, since local engineers responsible appreciate the need for regular maintenance, and understand better the mechanism of and potentials for failure under natural calamities. The introduction of vegetation (vetiver grass) for stabilization of slopes, now utilized by DPWH and NIA, is another sound development, as is the use of flexible gabion-based structures for earth-retaining walls, training works and bridge foundation protection, rather than the traditional rigid and brittle rubble masonry.

The bridge seismic retrofitting program has lessened the potential for major failures of 96 bridges in Luzon during an earthquake.

3. Benefits and Beneficiaries

The Project achieved its main objective of assisting the Government to restore quickly infrastructure damaged by the earthquake. Although the Government itself initially financed the ERP civil works, the Bank loans ensured early reimbursement of eligible expenditures. The Banks had envisaged at appraisal that the reconstruction works would be completed by the end of 1993, and this was substantially achieved, (except for the seismic retrofitting of bridges which was implemented under a later component, commencing in July, 1994).

Buildings, water supply facilities and earth-retaining structures were rebuilt to higher standards, improving their capabilities to withstand future natural disasters. New bridges were designed to current internationally accepted seismic codes, and the bridges requiring retrofitting were strengthened to current seismic standards. Major bridges and flyovers in Metro Manila and bridges on the North and South Expressways were checked under the BRP; some of the major bridges in Metro Manila were retrofitted. DPWH Standard Drawings for bridges, school buildings from one to four stories, gymnasia, public market buildings, other public buildings and elevated steel water tanks were revised and updated.

Simple environmental guidelines for infrastructure projects were prepared and distributed. A program for environmental stabilization of river banks and roadside slopes through planting of vetiver grass was formulated under the ERP. A Unit within the DPWH Bureau of Research and Standards was strengthened to provide

geotechnical and geological advice to Government designers and supervisors, based on the results of the hazard mapping work for Luzon carried out under the Project.

NHA were able to develop 10 Upland Settlement areas which were occupied by about 5,129 families. 380 has. were developed for residential purposes while 3,000 has. were reserved for communal farming. 3,236 residential plots were prepared in the two lowland sites.

NIA benefitted from the work of international consultants on hydrogeological and structural aspects of dam safety.

The SAR and Mapping Projects for Luzon brought the Philippines into the forefront in geologic mapping and hazard risk assessment. This will enable planners, designers and contractors in the future to introduce appropriate hazard risk mitigation measures into infrastructure projects.

Technology transfer was achieved through interaction between the international consultants and Government and LGU officers, local consultants, and contractors. Philippine structural codes were revised on the basis of up-to-date information, largely obtained by the international consultants. With the assistance (in part) of UNCRD, over forty separate seminars and workshops on earthquake-related topics were held, with the international consultants usually being the chief resource persons. Throughout the country a very much wider appreciation of the need to design, construct and strengthen facilities to withstand future earthquakes and other natural disasters has been developed.

No financial or economic justifications for this emergency project were prepared by the Banks at appraisal; consequently no quantified benefit data are presented in this Report. The civil work packages were all carried out by local contractors, generating employment for both skilled and unskilled labor at a time employment was needed most; in the case of the civil works, most materials were procured locally. The economic benefits, although not quantified, were substantial and are considered to have reached the targeted beneficiaries, and normal economic activities in the affected areas resumed quickly.

D. Conclusions, Lessons Learned and Recommendations

1. Conclusions

It is concluded by the four Agencies concerned that the project was generally successful. Infrastructure damaged and destroyed by the earthquake was repaired or replaced in a timely manner. Normal social and economic life in the affected areas resumed quickly. Technology transfer and upgrading of Government standard designs and specifications were implemented and the larger structures repaired during the later stages of the project had adequate seismic-resistant features incorporated. Government officers in Manila and the Regions, consultants and contractors were exposed to up-to-date seismic design and construction techniques.

National building codes were updated and state-of-the-art geologic and seismic hazard maps prepared for the whole of Luzon. The use of local labor and materials in the reconstruction measures aided the recovery of economic activity in the areas affected.

Considerable experience was gained by the Agencies in the implementation of large foreign-assisted projects, and data bases and computer techniques were developed which are now proving useful in the implementation of regular projects. However, all Agencies stressed the need for rapid and full release of funds by DBM; delays in the release of funds prevented timely completion of rehabilitation works.

2. Lessons Learned

The Principal lessons learned were:

i) it is essential that systems are established in Government Agencies so that they can implement at short notice large emergency projects: data bases should be set up, staff trained in disaster-related activities and a record-keeping system set in place so that a sudden expansion of the work-loan can be accommodated;

ii) if international technical assistance is required, experts should be recruited quickly, since their most useful advice can be given at the commencement of rehabilitation efforts. A data base of international consultants (individuals and firms) experienced in disaster-related projects should be set up in concerned Government Agencies;

iii) the early allocation of adequate funds is vital to the implementation of disaster relief efforts. However, direct disbursement of Government funds to Regions and LGUs may not be the best procedure. Allocation to the Agency's central office, with subsequent reallocation to the Regional Offices of the Agency, allows close central control and monitoring of scarce resources;

iv) after ODA loans have been approved, the Government's budgetary allocations to the Agencies concerned should be revised to take account of the newly available (and additional) funds;

v) it is important that the lessons learned from the Luzon earthquake be promulgated throughout the Government and to Agency Regional Offices, since a similar intensity earthquake (or other national calamity) could occur at any time in any part of the country; and

vi) NHA considered that its close and focussed project supervision was a crucial factor in the timely completion of this component; delegation of authority to the project supervisor and clear delineation of responsibilities facilitated appropriate responses.

3. Recommendations

i) the Bridge (Seismic) Retrofitting Program should be extended to all parts of the country;

ii) the geological and seismic hazard mapping completed for Luzon should be expanded to cover the whole of the Philippines;

iii) the relevant national building and structural codes should be revised whenever new seismic data become available and thereafter the revised versions should be disseminated to all Government Agencies concerned;

iv) the vetiver grass slope and bank stabilization pilot project should be expanded, and the use of vetiver encouraged;

v) flexible gabion retaining walls, dikes and river training works should become standard, rather than the traditional rubble masonry structures;

vi) in emergency projects the early recruitment of international experts should be a priority; their most useful input can be made immediately after the disaster;

vii) a network of instruments to measure and record strong seismic motions should be set up throughout the country;

viii) a Housing Program for families affected by national disasters should be formulated dealing with various disaster scenarios; in this way the correct response to a particular calamity can be quickly identified;

ix) NHA recommends the decentralization of its activities and delegation of authority to its offices in the Regions;

x) Government fund allocation procedures should ensure that immediately after ODA loans become available following a disaster, information on the fund allocations is passed to the Agencies concerned;

xi) the Banks should prepare jointly a brief and specific set of guidelines detailing the documentary requirements for reimbursement purposes on multi-contract emergency projects; and

xii) COA should be requested to prepare a similar handbook detailing the requirements for preparation of annual project Audit Reports on large-scale, multi-contract, emergency projects.

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT EARTHQUAKE RECONSTRUCTION PROJECT (LN. 3263-PH)

FINAL AIDE MEMOIRE

OF THE IMPLEMENTATION COMPLETION REPORT (ICR) MISSION UNDERTAKEN DURING THE PERIOD MARCH 4 - 14, 1997.

1. A completion mission of the International Bank for Reconstruction and Development (the Bank), comprising Messrs. Peter Long, Highway Engineer and Kevin Page, Operations Officer, visited the Philippines from March 4 - 14, 1997 to review the implementation of the Earthquake Reconstruction Project (Ln. 3263-PH) and to prepare the Implementation Completion Report (ICR) to be submitted to the Bank's Board of Directors no later than June 30, 1997.

2. The mission would like to thank the officials of the four implementing agencies for the courtesies extended and their excellent cooperation in reviewing and compiling the data for the ICR. The mission's findings are subject to clearance by Bank Management in Washington, DC.

Implementation Results

3. The mission has thoroughly reviewed the four PCRs produced by the various implementing agencies, reviewed the Project with counterpart staff, and undertaken a two-day site inspection of representative work accomplished under the Project. Based on its findings, the mission recommends that the ICR include an overall satisfactory rating for the outcome of the project. The implementation results would have been highly satisfactory except for some of the early delays related to lack of counterpart funding and the overall failure to liquidate the full loan despite the need for the funds.

Main Lessons Learned

4. Three primary lessons that emerge:

(a) The project design criteria established in the Bank's Operational Directive 8.50 were appropriate and successful in this project. This reinforces the suitability of OD8.50 (since replaced by Operational Policy/Bank Procedure 8.50) for future emergency operations.

(b) The disbursement system needs to be improved to assure smooth implementation of future emergency projects in the Philippines.

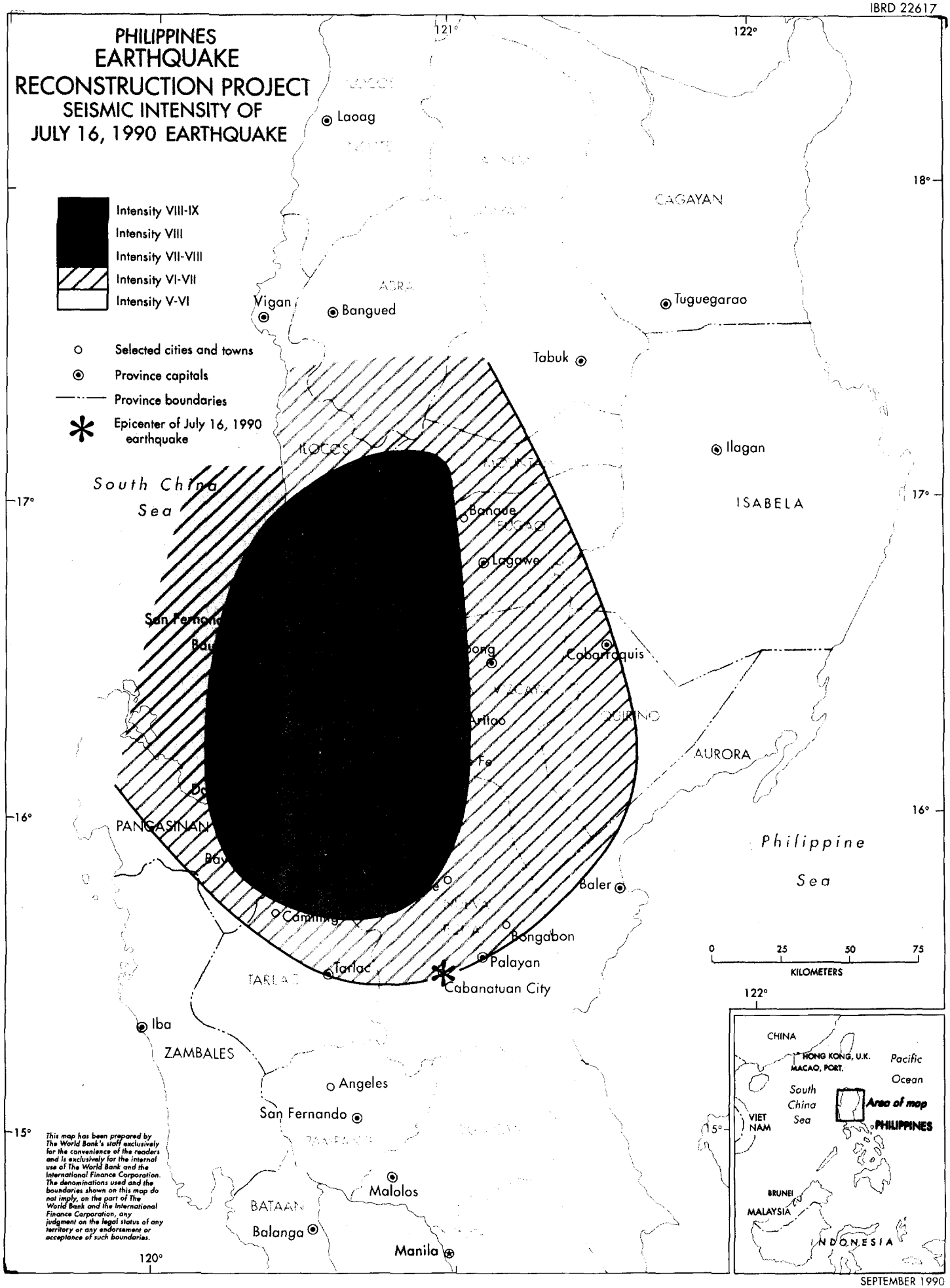
(c) For emergency projects, which are generally prepared quickly, a substantial project review should be conducted after one year of implementation. This may also be appropriate for non-emergency lending operations.

Further Actions

5. Copies of the Draft ICR were left with the respective implementing agencies for comment prior to finalization of the ICR. Comments were received and incorporated. The Bank will send the final ICR to the respective agencies after it is printed.

IBRD 22617

PHILIPPINES
EARTHQUAKE RECONSTRUCTION PROJECT
SEISMIC INTENSITY OF JULY 16, 1990 EARTHQUAKE



SEPTEMBER 1990

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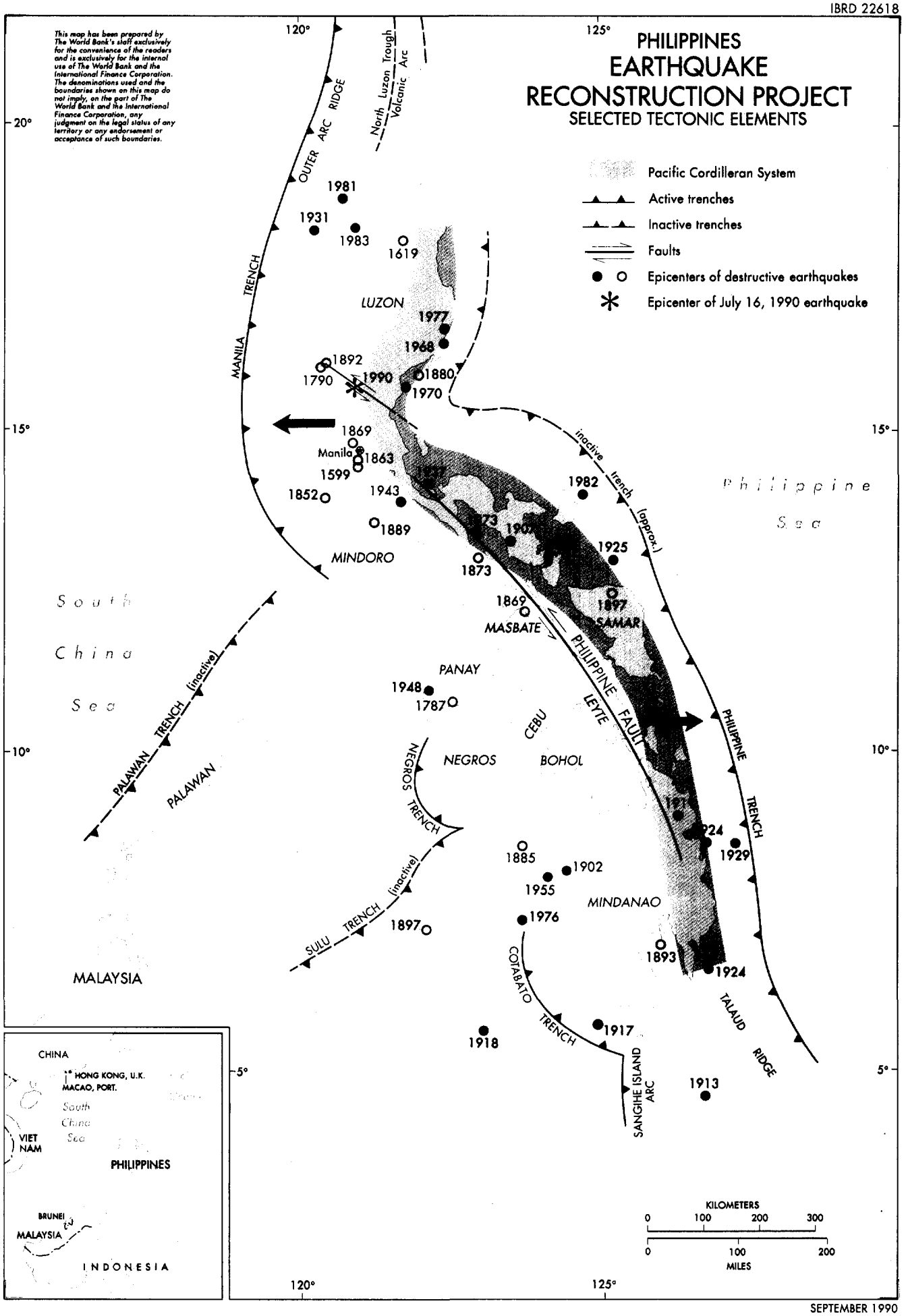

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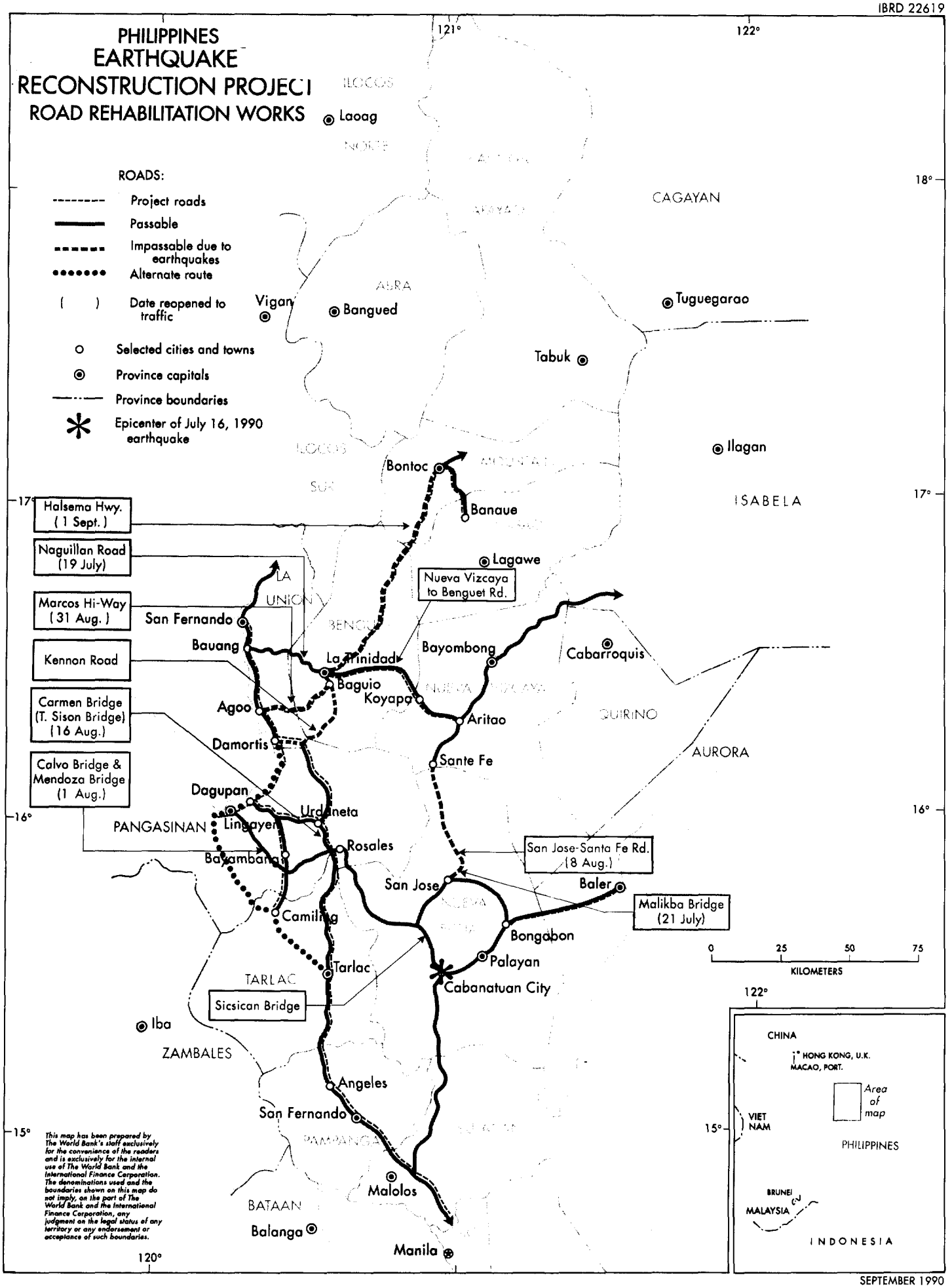
PHILIPPINES EARTHQUAKE RECONSTRUCTION PROJECT

ROAD REHABILITATION WORKS



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SEPTEMBER 1990

IMAGING

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