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The World Bank

Report No. 32676-TR

PROJECT PERFORMANCE ASSESSMENT REPORT

TURKEY

ERZINCAN EARTHQUAKE REHABILITATION AND RECONSTRUCTION PROJECT
(L3511-TR)

TURKEY EMERGENCY FLOOD AND EARTHQUAKE RECOVERY PROJECT
(L4388-TR)

EMERGENCY EARTHQUAKE RECOVERY PROJECT
(L4518-TR)

June 27, 2005

Sector, Thematic, and Global Evaluation Group
Operations Evaluation Department

Currency Equivalents (annual averages)

Currency Unit = <Turkish Lira (TL)>

1996	US$1.00	TL 81,805.76
1997	US$1.00	TL 152,751.73
1998	US$1.00	TL 262,204.89
1999	US$1.00	TL 420,648.94
2000	US$1.00	TL 624,753.74
2001	US$1.00	TL 1,240,941.73
2002	US$1.00	TL 1,542,022.09
2003	US$1.00	TL 1,528,853.81
2004	US$1.00	TL 1,377,706.00

Abbreviations and Acronyms

CAE	Country Assistance Evaluation
CRED	Center for Research on the Epidemiology of Disasters
DSI	State Hydraulic Works
EERL	Emergency Earthquake Recovery Project (Loan 4518-TR)
EIB	European Investment Bank
Erzincan	Erzincan Earthquake Rehabilitation and Reconstruction Project (L3511-TR)
GDI	General Directorate of Insurance
GDLRC	General Directorate of Land Registry and Cadastre
HDA	Housing Development Administration
ICR	Implementation Completion Report
ISMEP	Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (P078359)
MEER	Marmara Emergency Earthquake Reconstruction Project (L4517-TR)
MERLIS	Regional land information system
MoE	The Ministry of the Environment
MoH	The Ministry of Health
MPWS	The Ministry of Public Works and Settlement
NGO	Nongovernmental Organization
OED	Operations Evaluation Department
PIR	Policy Implementation Review
PPAR	Project Performance Assessment Report
PIU	Project Implementation Unit
SAR	Staff Appraisal Report
SIL	Sector Investment Loan
SRMP	Social Risk Mitigation Project
SSF	Social Solidarity Fund
TCIP	Turkish Catastrophic Insurance Pool
TEMAD	The Emergency Management Agency of Turkey
TEFER	Emergency Flood and Earthquake Recovery Project (L4388-TR)
WBSR	Western Black Sea Region

Fiscal Year

Government: January 1 – December 31

Acting Director-General, Operations Evaluation*	:	Mr. Nils Fostvedt
Acting Director, Operations Evaluation Department	:	Mr. Kyle Peters
Manager, OEDSG	:	Mr. Alain Barbu
Task Manager	:	Mr. Ronald Parker

*Because Mr. Chhibber was The World Bank Country Director for Turkey during part of the period covered by the PPAR, he recused himself of all review and supervisory functions related to it. Mr. Fostvedt acted as Director-General and Mr. Peters as Director.

OED Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Operations Evaluation Department assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, OED annually assesses about 25 percent of the Bank's lending operations. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons. The projects, topics, and analytical approaches selected for assessment support larger evaluation studies.

A Project Performance Assessment Report (PPAR) is based on a review of the Implementation Completion Report (a self-evaluation by the responsible Bank department) and fieldwork conducted by OED. To prepare PPARs, OED staff examine project files and other documents, interview operational staff, and in most cases visit the borrowing country for onsite discussions with project staff and beneficiaries. The PPAR thereby seeks to validate and augment the information provided in the ICR, as well as examine issues of special interest to broader OED studies.

Each PPAR is subject to a peer review process and OED management approval. Once cleared internally, the PPAR is reviewed by the responsible Bank department and amended as necessary. The completed PPAR is then sent to the borrower for review; the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the OED Rating System

The time-tested evaluation methods used by OED are suited to the broad range of the World Bank's work. The methods offer both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. OED evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (more information is available on the OED website: http://worldbank.org/oed/eta-mainpage.html).

Relevance of Objectives: *The extent to which the project's objectives are consistent with the country's current* development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). *Possible ratings:* High, Substantial, Modest, Negligible.

Efficacy: The extent to which the project's objectives were achieved, or expected to be achieved, taking into account their relative importance. *Possible ratings:* High, Substantial, Modest, Negligible.

Efficiency: The extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. *Possible ratings:* High, Substantial, Modest, Negligible. This rating is not generally applied to adjustment operations.

Sustainability: *The resilience to risk of net benefits flows over time. Possible ratings:* Highly Likely, Likely, Unlikely, Highly Unlikely, Not Evaluable.

Institutional Development Impact: The extent to which a project improves the ability of a country or region to make more efficient, equitable and sustainable use of its human, financial, and natural resources through: (a) better definition, stability, transparency, enforceability, and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Institutional Development Impact includes both intended and unintended effects of a project. *Possible ratings:* High, Substantial, Modest, Negligible.

Outcome: The extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently. *Possible ratings:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry and supported implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of the project). *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower assumed ownership and responsibility to ensure quality of preparation and implementation, and complied with covenants and agreements, towards the achievement of development objectives and sustainability. Possible ratings: Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

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This report was prepared by Kristin S. Little, who assessed the project in November, 2004. Ronald S. Parker is the task manager. The report was edited by William Hurlbut and Helen Phillip provided administrative support.

Principal Ratings

	*ICR**	*ES**	*PPAR*
Erzincan Earthquake Rehabilitation and Reconstruction Project (L3511-TR, Erzincan)			
Outcome	Satisfactory	Satisfactory	Satisfactory
Sustainability	Likely	Likely	Likely
Institutional Development Impact	Modest	Modest	Modest
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Satisfactory
Turkey Emergency Flood and Earthquake Recovery Project (L4388-TR, TEFER)			
Outcome	Satisfactory	Satisfactory	Satisfactory
Sustainability	Likely	Likely	Likely
Institutional Development Impact	Modest	Modest	Modest
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Satisfactory
Emergency Earthquake Recovery Project (L4518-TR, [Cash Transfer])			
Outcome	Satisfactory	Satisfactory	Satisfactory
Sustainability	Likely	Non-evaluable	Likely
Institutional Development Impact	Substantial	Not Rated	Substantial
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible operational division of the Bank. The Evaluation Summary (ES) is an intermediate OED product that seeks to independently verify the findings of the ICR.

Key Staff Responsible

	Task Manager/Leader	*Division Chief/ Sector Director*	*Country Director*
Erzincan Earthquake Rehabilitation and Reconstruction Project (L3511-TR, Erzincan)			
Appraisal	Mohsin Alikhan	Paula Donovan	Michael Wiehen
Completion	Henry Boldrick	Margret Thalwitz	Ajay Chhibber
Turkey Emergency Flood and Earthquake Recovery Project (L4388-TR, TEFER)			
Appraisal	Piotr M. Wilczynski	Ricardo A. Halperin	Ajay Chhibber
Completion	Christoph Pusch	Sumter Lee Travers	Andrew N. Vorkink
Emergency Earthquake Recovery Project (L4518-TR)			
Appraisal	James Parks	Pradeep K. Mitra	Ajay Chhibber
Completion	Jeanine D. Braithwaite	Pradeep K. Mitra	Ajay Chhibber

Preface

This report is comprised of two sections: I. Project Performance Assessment Reports (PPARs) for three individual emergency reconstruction projects in Turkey; and II. An analysis of the natural disaster experience of these projects, plus more recent Bank-funded disaster assistance to Turkey, taken collectively. Findings will inform an OED Natural Disaster Policy Implementation Review. The projects assessed are as follows (see Annex A for Basic Data Sheets).

Erzincan Earthquake Rehabilitation and Reconstruction Project (L3511-TR), for which a loan in the amount of $285 million was approved July 23, 1992. Parts of the loan were canceled on three occasions—$42 million on May 7, 1997; $19.5 million on August 9, 1998; and $17 million on April 5, 1999; for a total cancellation of $78.5 million. The original project closing date was June 30, 1996. The revised project closing was June 30, 2000.

Emergency Flood and Earthquake Recovery Project (L4388-TR), for which a loan in the amount of $369 million was approved on September 10, 1998. The original project closing date was June 30, 2002. The revised project closing was September 30, 2003. Savings of $62.5 million were reallocated to finance housing reconstruction following the Marmara earthquake of August 1999. At closing, $120 million remained uncommitted and was cancelled.

Emergency Earthquake Recovery Project (L4518-TR), for which a loan in the amount of $252.53 million was approved in November 16, 1999. The original project closing date was December 31, 2000. The revised project closing was March 31, 2001.

An OED mission traveled to Turkey in November 2004 to discuss the projects, as well as other issues relevant to natural disasters with Bank staff, government officials, beneficiaries, donors, and consultants. The cooperation and assistance of all stakeholders and government officials is gratefully acknowledged.

The report was prepared by OED based on the Implementation Completion Reports (ICRs), Staff Appraisal Reports (SARs), as well as a review of Bank files, a survey of the literature, and discussions with Bank staff and other stakeholders. Following standard OED procedures, the draft report was sent to the borrower for comment. No comments were received.

Summary

In the last century, Turkey experienced 130 earthquakes (5.0 magnitude and above) which caused approximately 80,000 casualties, 54,000 injuries, and heavy damage to 450,000 buildings. Between 1992 and 1999 alone, earthquakes in Turkey killed some 18,000 people and caused an estimated $20 billion in damage.

Turkey is ranked among the Bank's top 10 borrowers for natural disaster recovery and management, and is the recipient of the largest single funding package assembled by the Bank in response to a natural disaster to date – $1.2 billion following the Marmara earthquake in 1999. Since 1992, the Bank has responded to six disaster emergencies in the context of four loans, three of which are assessed in this report:

- **Erzincan Earthquake Rehabilitation and Reconstruction Project** (L3511-TR) (the "Erzincan" project); *Disasters addressed: Erzincan earthquake, March 1992, 6.8 on the Richter scale; Landslides in Senirkent, July 1995, and Sütçüler, November 1995.*
- **Emergency Flood and Earthquake Recovery Project** (L4388-TR) (the "TEFER" project); *Disasters addressed: Landslides and flooding in the Western Black Sea region, May 1998; Adana earthquake, June 27, 1998, 6.3 on the Richter scale.*
- **Emergency Earthquake Recovery Project** (Loan 4518-TR) (the "Cash Transfer" project); *Disaster addressed: The Marmara Earthquake, August 1999, 7.4 on the Richter scale.*

The Erzincan project contributed greatly to the rehabilitation of that city and its environs. The urban housing, consisting of cooperative housing, government apartment units, teachers', nurses', and medical staff lodgings was, on the whole, well built. Project-financed infrastructure is still fully functional ten years later, and the PPAR mission observed that civil works had stood the test of time quite well. Only about 30 percent of the originally estimated number of housing units were built or repaired, however, mainly due to corrections for inaccurate damage assessments.

Similarly, a smaller number of shops and offices than expected were reconstructed, as demand turned out to be lower. In the more rural neighborhoods, 2,885 barns were financed by the project and rebuilt by the beneficiaries themselves. Disbursements lagged significantly as a result of project overestimation of the capacity of the government to carry out the works in a post disaster context. Progress toward development and implementation of seismic risk prevention and mitigation measures was less than expected, but the installation of a GPS system in the Marmara region was completed by November 1999 and a study to revise the Reconstruction Law to include aspects on disasters was also carried out. The latter facilitated legal revisions in the context of the following project, TEFER. OED rates the *overall outcome* as **satisfactory**. *Sustainability* is rated as **likely**, *institutional development* as **modest**. *Bank performance* and *borrower performance* are both rated **satisfactory**.

The TEFER project assisted the government in restoring basic infrastructure in municipalities and rural areas affected by the flood and landslides by repairing structures and facilities of economic and social importance. Among the project's vulnerability

reducing investments were 13 flood protection schemes in the West Black Sea Flood region, and the acquisition of weather and river monitoring systems (software and hardware). Major infrastructure achievements included the rehabilitation of sewerage systems, municipal and rural roads, water supply systems, and bridges. Among actions taken to restore the local economy was the construction of 31 irrigation systems. Private housing was rebuilt following the Adana earthquake: 5,000 urban housing units were constructed, and 3,131 rural beneficiaries received funding that enabled them to complete the reconstruction of their houses. OED rates the *overall outcome* as **satisfactory**. *Sustainability* is rated as **likely**, *institutional development* as **modest**. *Bank performance* and *borrower performance* are both rated **satisfactory**.

To help restore living conditions in the Marmara region following the devastating 1999 earthquake, the World Bank prepared a two-stage program. In the first stage, the Bank reallocated $267 million in funds from ongoing Bank projects. The second stage consisted of two Bank financed projects—one for reconstruction and mitigation, and one supporting the government's emergency cash transfer program. The reconstruction project—the Marmara Earthquake Emergency Reconstruction Project, or "MEER", is an ongoing $737.11 million project, of which the Bank is financing $505 million. It is discussed in the context of this report, but is not rated. Along with MEER, the Bank supported the government's cash transfer program for earthquake victims through the Earthquake Emergency Recovery Loan (EERL, $252.53 million).

The Cash Transfer project helped the government respond quickly and effectively to the disaster, as distribution of rental allowances began as early as December 1999. The fast-disbursing nature of the loan was particularly important in that it ensured that displaced persons and other groups made vulnerable by the earthquake received adequate assistance particularly during the winter months, while longer-term reconstruction efforts got underway. It was highly advantageous that the assistance was in cash and not in kind, given recipients' needs at the time, and in terms of the logistics of delivering assistance to victims quickly. The cash transfers were delivered successfully, even though there were several constraints – high applicant volume, time pressure, and limited resources. OED rates the *overall outcome* as **satisfactory**. *Sustainability* is rated as **likely**, institutional development as **substantial**. *Bank performance* and *borrower performance* are both rated **satisfactory**.

An issue common to all three projects is that the post-disaster assessment process was significantly flawed. All the projects that built new infrastructure significantly overestimated beneficiary demand for the units produced. This overestimation led to empty units, which in turn led to vandalism and, in some cases, a succession of social problems associated with crime and insecurity. It is noteworthy that each subsequent project built upon the lessons of its predecessors, however.

Among the lessons for disaster recovery suggested by the experience of the projects are the following:

Bank involvement during the emergency phase can be highly beneficial. Getting cash support to victims quickly, positively affected the economy and perhaps even affected people's sense of safety and security. It was a prominent first sign of the government's support in a time of acute need. The promptly provided support enabled people to

survive, put funds into the economy, and was reported as highly preferable to in-kind support by beneficiaries.

Greater accuracy of damage assessments is still needed to avoid unnecessary construction. Although there has been progress, and the Marmara response had the most comprehensive damage assessment of any of the projects, more precise estimates of public and private infrastructure requirements and demand would lead to significant (financial and social) cost savings and a faster return to normality.

Addressing the social and economic recovery aspects of emergency projects, although difficult, is critical for the sustainability of the reconstruction investments. The Bank has a long and positive experience in terms of the execution of physical components of projects – the physical design of the housing in Erzincan, TEFER, and MEER is appropriate and of good quality. The failure to create legally required social organization necessary for upkeep and decision-making in the housing areas caused problems, however. Although considerable learning took place from one project to the next, incorporating lessons learned from a number of studies, and involving social scientists in the project process, creating the necessary sustainable users organizations to manage infrastructure remains an unsolved challenge.

Creating New Disaster Management Institutions takes more time than is available under one project. Although it was anticipated that Bank involvement in Erzincan would help to prevent the recurrence of similar damage in the future by increasing capacity for hazard mitigation, such a goal proved impossible to obtain in one project cycle. As it turns out, in Turkey institutional development took place slowly across many years and several projects. During the period when emergency reconstruction needs are high, institutional development issues can be neglected. Focus is on getting people housed. Nevertheless, through the implementation of several projects, the idea of preparedness has taken root, and become a topic of discussion. Turkey's focus is moving from crisis management to disaster preparedness.

Cash Transfer projects can make an extremely important contribution to recovery. Getting cash support to victims quickly, positively affected the economy and perhaps even affected people's sense of safety and security. It was a prominent first sign of the government's support in a time of acute need.

Nils Fostvedt
Acting Director-General
Operations Evaluation

Part I:
Project Performance Assessments

1. Responding to Emergencies in Turkey

On August 17, 1999, Turkey lost over 17,000 citizens, and suffered an estimated $5 billion direct economic impact from a 7.4 magnitude earthquake in its industrial center—the Marmara region. In the event of a similar earthquake centered on Istanbul, the risks to the nation stagger the imagination. Not all the natural disasters that strike the country are large scale, however. Turkey frequently experiences smaller earthquakes, flash floods and consequent mudslides, as well as other natural hazards. Disasters, small and large, have called for extensive assistance. Overall, Turkey is the seventh largest recipient of emergency humanitarian aid and the seventh hardest hit country in the developing world in terms of economic damages from disasters[1] (in the period 1974-2003).[2] And with average economic damage rising,[3] it becomes harder and harder to absorb the losses.

1.1 Of Turkey's natural hazards, earthquakes affect the most people and wreak the most economic damage. Turkey lies on the 1,400-kilometer-long Northern Anatolian fault, which slips at a rate of 24 millimeters per year. Between 1902 and 2004, Turkey experienced 130 earthquakes at 5.0 and above on the Richter scale (15 of which were between 6.8 and 7.9). In total, these caused approximately 80,000 casualties, 54,000 injured, and heavy damage to 450,000 buildings. For the period 1974-2003, Turkey is ranked the fourth hardest hit country with respect to total number of earthquake and (earthquake-caused) tsunami disasters.[4] Because earthquakes strike areas of varying population density, the damage and casualties reported from year to year are highly variable, depending primarily on the location of the earthquake's epicenter. When an earthquake hits a large urban area, damages and casualties soar, as in the case of the 1999 Marmara earthquake. Between 1992 and 1999, earthquakes in Turkey killed some 18,000 people and caused an estimated $20 billion in damage.

1.2 Not only are earthquakes frequent, but the vulnerability of many human settlements is high, especially in neighborhoods occupied by the less well-off. Self-constructed masonry houses, where the majority of the poor live, rarely survive significant earthquakes. Ninety-two percent of the country's territory is prone to earthquakes and 95 percent of the population lives in these areas. Additionally, 45 percent of buildings in the four largest cities – Adana, Ankara, Istanbul, and Izmir – are masonry houses.

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1. Behind China (number one), India, Armenia, Iran, the Russian Federation, and the Democratic People's Republic of Korea.
2. Turkey received an average of over $21 million in humanitarian aid per disaster, for seven major disasters that occurred between 1992 and 2003. D Guha-Sapir, D. Hargitt, and P. Hoyois, Center for Research on the Epidemiology of Disasters (CRED), *Thirty Years of Natural Disasters 1974-2003: The Numbers*, (UCL, Brussels: 2004), 51.
3. Economic damages reported are growing: $8 million (1984-1988), $18 million (1989-1993), $1,665 million (1994-1998), $20,566 (1999-2003). D Guha-Sapir, D. Hargitt, and P. Hoyois, Center for Research on the Epidemiology of Disasters (CRED), *Thirty Years of Natural Disasters 1974-2003: The Numbers*, (UCL, Brussels: 2004), 187.
4. Behind China, Iran, and Indonesia, in this category according to D Guha-Sapir, D. Hargitt, and P. Hoyois, Center for Research on the Epidemiology of Disasters (CRED), *Thirty Years of Natural Disasters 1974-2003: The Numbers*, (UCL, Brussels: 2004), 153.

Bank Support

1.3 Turkey is ranked among the Bank's top 10 borrowers for natural disaster management assistance.[5] Notably, Turkey is the recipient of the largest funding package assembled by the Bank in response to a natural disaster to date – $1.2 billion was committed following the Marmara earthquake in 1999, making Turkey the largest Bank borrower that year.[6] Between 1992 and the present, the Bank has responded to six disaster emergencies – the Erzincan earthquake, flooding and mudslides in both Senirkent and Sütçüler, flooding and landslides in the Western Black Sea Region, an earthquake in the southern area of Adana, and, finally, the devastating Marmara earthquake. These disasters were directly addressed in the context of four loans. Three of which are assessed in this report. Four loans form an important part of the Bank's response to these disasters. Three of these loans are assessed in this report. The fourth, the Marmara Emergency Earthquake Reconstruction Project (MEER) (L4517-TR) is discussed (Chapter 5) but not assessed, as it is still ongoing. The three assessed include:

- **Erzincan Earthquake Rehabilitation and Reconstruction Project** (L3511-TR) (the "Erzincan" project);
- **Emergency Flood and Earthquake Recovery Project** (L4388-TR) (the "TEFER" project);
- **Emergency Earthquake Recovery Project** (L4518-TR) (the "Cash Transfer" project).

2. The Erzincan Project

BACKGROUND

2.1 On March 13, 1992, Erzincan city, in Northeast Turkey experienced an earthquake that measured 6.8 on the Richter scale, followed by an aftershock of 6.1 on March 15. There were about 500 fatalities from collapsed buildings and some 700 persons were seriously injured. The central business district of Erzincan was destroyed, and municipal buildings, markets, schools, and housing were severely damaged. The heaviest damage occurred in approximately 60 buildings of four or more stories that collapsed, mainly along the central avenue of Erzincan. There was extensive damage in the surrounding rural areas as well.

2.2 A World Bank credit for reconstruction, The Erzincan Earthquake Rehabilitation and Reconstruction Project (L3511-TR), in the amount of $285 million was approved 4 months later, in July 1992. Parallel financing of $190 million was provided by the Council of Europe. The government contribution was $175 million. Loan proceeds were channeled to the Housing Development Administration (HDA).

2.3 **Objectives.** The Memorandum to the President listed the following objective: "reconstruct essential housing, infrastructure and other facilities, and to promptly restore

5. In terms of number of Bank-financed disaster-related projects.
6. $267 million in reallocated funds, $252.52 million Cash Transfer project (EERL [L4518-TR]), and $505 million (appraised value) MEER project loan (L4517-TR).

economic activity in the affected area." The loan agreement elaborated on these broad objectives by stating that the project will "assist the Government in carrying out its 1992-95 emergency reconstruction program for the Erzincan region through (i) rehabilitation and reconstruction of the areas affected by the earthquake, and (ii) development and implementation of seismic risk prevention and mitigation measures."

2.4 Two extensions of the scope of work were approved by the Board. Subsequently added to the list of components were the reconstruction of municipal infrastructure and the implementation of flood and erosion control measures in Senirkent and Sütçüler following mudslides and floods. The project was renamed the "Disaster Rehabilitation and Reconstruction Project."

Box 1: Erzincan Project Components

Comprehensive reconstruction/rehabilitation ($242.50 million at appraisal/$160.50 million actual)

- An urban reconstruction/rehabilitation program consisting of cooperative and government housing, hospitals, schools, public buildings, infrastructure, shops and businesses, building demolition and debris removal, and equipment.
- A rural reconstruction/rehabilitation program consisting of beneficiary-built barns, irrigation/water supply, animals, and equipment.

Training, studies, and consultant services ($42.50 million at appraisal/$16.50 million actual)

- Training for the construction industry
- Loss-reduction study
- A study on the development of an earthquake insurance industry
- A study on urban vulnerability
- A study on emergency preparedness
- Consultant services for (1) design, supervision and project management; and (2) institutional strengthening of the concerned agencies, and some supporting equipment

Revised Components:

Senirkent ($30 million at agreement/$16.20 million actual)

- Emergency works and shelter (clearing mud, temporary repairs of networks and houses, gabion structures, etc.);
- Reconstruction (full reconstruction of previously mentioned networks, storm water drainage network, and a wastewater treatment plant);
- Hazard mitigation (flood control measures and afforestation and erosion control activities).
- Design and management of the borrower's reconstruction program for the Senirkent region and the provision of equipment, materials and technical assistance, studies and training for the purposes.

Sütçüler ($8.75 million at agreement/$4.50 million actual)

Reconstruction of infrastructure

- Water supply and distribution network; wastewater network and simple sewerage treatment plant; storm water drainage rehabilitation; the rehabilitation and/or realignment of existing roads; electrical distribution network; telecommunication network.

Flood control measures

- Planting of trees and construction of retention ponds upstream of the town, construction of a channel through the town and downstream.

Design and supervision

Hospitals Retrofitting Design Program ($4.0 million)

- Carrying out of detailed assessment studies of the Istanbul and Izmir hospitals situated in the areas of highest earthquake risks.
- Carrying out of design studies to prepare the rehabilitation of those hospitals assessed as requiring structural strengthening.

Project management for revised components ($1.3 million)

2.5 Funding was made available quickly, but due to initial lack of institutional capacity in the project implementation unit (PIU),[7] and the difficulties the group experienced in setting up protocols with the various agencies involved in the reconstruction, disbursement was slow – it took two years for activities to start.

2.6 Once the PIU got up to speed, and activities commenced, implementation progressed smoothly. In fact, later, the PIU became well recognized by the government and donors as being a highly capable emergency reconstruction unit, and was instrumental in carrying out subsequent emergency reconstruction projects. Housing, both rural and urban, was built expeditiously and to relatively high standards. The number of cooperative housing units and barns built fell short of the number estimated, however.[8]

THE ACHIEVEMENT OF PROJECT OBJECTIVES

2.7 The project's first objective, to assist the government in carrying out its reconstruction program, was fully achieved. The second objective, to develop and implement seismic risk prevention and mitigation measures was only partially achieved.

Objective 1: To assist the government in carrying out its 1992-95 emergency reconstruction program for the Erzincan region through rehabilitation and reconstruction of the areas affected by the earthquake

2.8 Reconstruction went well. The project contributed greatly to the rehabilitation of Erzincan and its environs, especially with respect to the hospitals and public buildings. The PPAR mission observed that project-financed infrastructure was well built, and had stood the test of time (over 10 years had passed since it was built).

2.9 The urban housing, consisting of cooperative housing, government apartment units, teachers', nurses', and medical staff lodgings[9] was, on the whole, well built. Just over 30 percent of the originally estimated number of units of cooperative housing was built or repaired as the actual number of eligible damaged units turned out to be smaller than appraised. In the end, it turns out that few dwellings were simply repaired, as people had a strong preference for new construction following the shock.

2.10 In rural neighborhoods, barns had collapsed as a result of the earthquake. In response, the project planned to fund the reconstruction of a total of 4,100 storage and cattle barns, and the distribution of 10,900 animals, in order to restore some of the lost capital. This was the first physical component to finish. Beneficiaries built 2,885 barns with lump sum payments for construction materials. This is fewer than the original estimate of 4,100, for the same reason as the housing – inaccurate damage estimates. All of the barns seen by the November 2004 PPAR mission were used for purposes other

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7. Located in the Housing Development Administration (HDA), in the Prime Minister's Office.
8. Cooperative housing: only 1,131 units of the originally planned 3,640 were repaired or reconstructed. Barns: only 2,885 were built, as opposed to the original target of 4,100.
9. The project built 150 units of nurses' lodgings, along with another 500 units of housing for medical staff, and 300 units of teacher's housing, as planned. By the time of the PPAR mission, there was less need for nurses' and medical staff lodgings, and the mission observed that this well built housing had been converted to different, but related uses (e.g., laboratories).

than housing livestock, with one exception. They were being used as houses, storage sheds, and in one case, even a restaurant. Residents explained that the barns were not warm enough for the livestock, thus they had been used for other purposes, or some are used for livestock in the summer and storage in the winter. The project distributed 10,348 of the planned 10,900 animals.

2.11 In addition to the shopping centers, the project rehabilitated 512 shops, and 143 apartments were reconstructed.[10] The other construction works – three hospitals, public buildings, municipal offices, an Adult Education Center, a Horticulture Research Center, a National Education Center, four municipal workshops, a Rural Affairs Building, and a bus terminal were built or repaired as planned and to quality standards.

2.12 Civil works and equipment under the infrastructure components were completed much as planned, with the exception of 100 kilometers of road repairs which were canceled.[11] The sugar factory chimney was repaired as planned.

Revised components: Senirkent and Sütçüler

2.13 In late 1995, a first amendment in the Loan Agreement was made. In addition to extending the closing date to December 31, 1999, this amendment added the $20 million Senirkent Rehabilitation program. Though it was much smaller than the Erzincan program, it was modeled after that project concept. It was designed to support recovery from July 1995 mudslides in the city and included reconstruction of essential infrastructure, measures for flood and erosion control, hazard mitigation, and supporting equipment.[12] The PPAR mission observed that, indeed, plantation of trees had taken place, gabion structures had been built, as had the flood prevention works. The latter construction was evaluated by COEDB engineers as having been built to exceed the five hundred year (return period) event.

2.14 In 1997 a second amendment was added to the loan, further extending the closing date (to June 30, 2000), canceling $42 million, adding a hospital retrofitting design component, and a $7 million program for the town of Sütçüler.

2.15 In November 1995, the mountainside town of Sütçüler in the Western Taurus Mountains also suffered mudslides from heavy rains. The program for Sütçüler, a town of 5,000, was similar to that of Senirkent. Because the works were beginning approximately two years after the mudslides had taken place, housing reconstruction and repair needs

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10. Comparing the assessed market rental value with the costs for the three reconstruction/repair contracts yields a rate of return of 7 percent. (Erzincan ICR). There was no NPV or IRR calculated for the project during preparation/appraisal.

11. This was cancelled following disagreements between the Bank and the Highways Directorate on the need for a detailed design prior to bidding, and on whether an earlier list of bidders from another project could be used as the short list.

12. In July 1995, severe rains caused disastrous mudslides in the town of Senirkent. 74 people died, 195 houses collapsed, the water, sewer, electricity, telecommunications, and roads networks were all severely damaged. The three components proposed for the Senirkent Emergency Reconstruction Program (funded through the 1995 Amendment, in more detail were: (1) emergency works and shelter (clearing mud, temporary repairs of networks and houses, gabion structures, etc.); (2) reconstruction (full reconstruction of previously mentioned networks, storm water drainage network, and a wastewater treatment plant [not built]); and (3) hazard mitigation (flood control measures and afforestation and erosion control activities).

had been met and emergency repairs of infrastructure had been made. The project covered the needed rehabilitation and reconstruction of infrastructure and flood control measures to mitigate future disasters and to restore the quality of road access, and water, sewerage, electricity and other services in town.

2.16 Officials reported that they had had no problems with the infrastructure built by the project. The wastewater treatment facility, however, had not been used. Though the ICR states that the plant was not constructed, the authorities took the OED mission to visit a wastewater treatment facility which they described as being constructed with Bank financing under the Erzincan loan. Officials said that, during the project design phase, the town noted that it did not have sufficient operating funds in its budget to cover the expense of maintenance and treatment. Subsequent to the construction of the facility, the municipality made a bypass, and currently the fluid is running off into the creek directly, without treatment. The PPAR mission also observed that part of the works had fallen off the cliff on which they were built, apparently built on unstable ground.

2.17 Though the added components involving reconstruction following flooding and mudslides in Senirkent and Sütçüler were for the most part well executed, they extended the loan period by four years, increasing supervision costs greatly in relation to the funds disbursed over that time period.

Objective 2: The development and implementation of seismic risk prevention and mitigation measures

2.18 Bank involvement in Erzincan was intended to help prevent the recurrence of similar earthquake damage in the future. To achieve this, the project planned to perform several studies aimed at institutional capacity building for disaster preparedness, including separate studies on: loss-reduction, earthquake insurance industry development, urban vulnerability, and emergency preparedness. In addition, training was to be provided for the construction industry on building earthquake-resistant buildings.

Table 1: Original vs. Revised ID Components, Erzincan Project

Erzincan	
Original ID component:	**Revised ID component:**
Loss reduction study including: (i) revisions of the Disaster Law; (ii) revisions of the Reconstruction Law, Building Code and other laws related to construction; (iii) microzoning plan for Erzincan, and (iv) a program of assessing and improving public buildings in Turkey;	*a study to revise the Reconstruction Law* and include aspects on disasters
Training of the construction industry;	*preparation of a public information campaign* and *development of training materials* for the construction industry[13]
Earthquake insurance industry study;	
Urban vulnerability study; and	
Emergency preparedness study.	
	MIS system for the MPWS
	GPS system in the Marmara region

2.19 While reconstruction activities were being carried out, the institutional development component received little attention. Though the earthquake hit in March 1992, the institutional development activities had still not started in 1995. A first amendment to the project saw the addition of, among other things, a component providing an MIS system for the Ministry of Public Works and Settlement (MPWS). During discussions for a second amendment to the loan agreement in August 1997, a significantly abbreviated, revised institutional development component was developed and agreed on (see Table 1) and a new piece was added: a Geographic Positioning System (GPS) for the Marmara Region to identify the areas of the highest seismic risk. The system is now in use and the revised institutional development objective was satisfactorily met. Also added was a component to design earthquake retrofitting plans for the structural systems of hospitals located in the provinces of Istanbul and Izmir. The plans were successfully completed by Bank-approved consultants, reviewed by experts at Bogazici University, and forwarded to the related authorities.

2.20 Given Turkey's vulnerability to disaster, the institutional strengthening objective (the development and implementation of seismic risk prevention and mitigation measures) was highly relevant. At project close this goal had not been attained. However, the ideas planted at the time of the Erzincan earthquake took root during the course of the following 12 years, and by the time of the PPAR mission in November 2004, positive results were evident. Government capacity to manage disasters had increased as evidenced by the government's response to subsequent disasters, and by the newly created emergency management agency, TEMAD, and many of the seismic risk prevention and mitigation measures that had been completed, albeit by subsequent emergency projects.

2.21 *Consultant services.* This component, covering the design, supervision, and management of the project, represents 14 percent of the project costs. The PIU responsible was located in the HDA. Institutional strengthening of the PIU and some supporting equipment was included.

RATINGS

Outcome. The project was justified by the circumstances created by the disaster and the need to help Turkey deal with the aftermath. The objectives were relevant to the country's immediate needs and priorities were coordinated with the government's overall recovery strategy. While the project failed to meet its original institutional development objective (preparedness for future earthquakes), the project did meet all of its reconstruction goals (85 percent of the project funds), building, inter alia, quality housing, shops and businesses, barns, and roads. Though it is difficult to say how much of the area's economic growth can be attributed to the Erzincan project, the regional economy recovered from the 10-14 percent drop following the earthquake with strong performance in 1994 (probably due to the reconstruction activities) and continued growth in 1996 and 1997. The objectives of the subsequently added Senirkent and Sütçüler

13. Though no campaign or training took place. This was folded into similar activities under another Bank-financed project.

reconstruction projects were substantially met, as well as the additional components of designing the retrofitting plans for hospitals in Izmir and Istanbul and the installation of a GPS system in the Marmara area. Though the project was relevant to country needs at the time of the disaster and substantially met its physical objectives, there were a number of shortcomings, primarily in the area of institutional development. Efficiency was satisfactory though hampered by initial overestimates of funding needed and capacity to implement, as well by the delayed closing of the project and subsequent addition of small components for other disasters. Project outcome is rated **satisfactory**.

2.22 *Institutional Development Impact.* Institutional development goals went largely unmet during the course of the project. However, the effects of having proposed the notion could be seen in the progress made in subsequent disaster-related projects (discussed in the following chapters). Without the start that the Erzincan project gave to several ideas of capacity building for natural disaster mitigation, the current gains may never have been made. Institutional development is rated **modest**.

2.23 *Sustainability.* The sustainability of the project (the resilience of future project benefits to major project risks) can almost be rated by observation, given the amount of time that has passed since completion. The sustainability is rated as **likely**. The project-funded buildings built following the 1992 earthquake were observed to be of good quality. The malls are currently in use and do not show signs of closing. The great majority of the infrastructure investments in Senirkent and Sütçüler will likely continue to serve their functions well. The institutional development components, though not fully carried out during the lifetime of the project, were eventually picked up in some form and implemented, such that, there is now an organization for disaster management and many disaster mitigation measures being introduced, including the $400 million Bank-funded Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP) (P078359) that is fully dedicated to disaster mitigation. In addition, the hospitals retrofitting design component is also being built upon in the ISMEP project.

Bank Performance

2.24 The Bank responded quickly and comprehensively to the disaster, judging borrower commitment for the physical components well. Staff spent considerable time assisting the PIU with procedural issues such as hiring design and supervision consultants and the preparation of bidding documents, and Bank procedures. Importantly, World Bank Resident Mission staff played a large and critical role in the smooth operation of the project. As is common, project focus leaned toward the physical construction activities, as noted by a QAG report. Little attention was paid to reestablishing economic activity. On balance, however, Bank performance is rated as **satisfactory.**

Borrower Performance

2.25 Borrower performance is rated **satisfactory**. The PIU's performance is assessed as satisfactory because, though it faced a number of challenges from the beginning, it managed to successfully create protocols needed to work well with a multitude of agencies, and developed the capacity to effectively coordinate the project activities. The

government was in full support of the construction and infrastructure components, whereas there was less support for mitigation components.

3. The TEFER Project

BACKGROUND

3.1 On May 21, 1998, in Turkey's Western Black Sea Region (WBSR), an area of about 37,000 square kilometers with a population of 2.2 million was affected by flooding that is estimated to occur only once every 200 years in this region. [14] The flooding was accompanied by several hundred landslides lasting for several weeks thereafter. More than 150 rivers over-ran their embankments, and 478 settlements were left wholly or partially under water. The flood damaged private houses, public buildings (including schools, hospitals and housing), rural and urban infrastructure, telecommunication and energy transmission systems and destroyed crops and livestock. Total damage was estimated at about $500 million. In response to a government request for assistance, the Bank began preparation of an emergency flood project.

3.2 During project preparation, on June 27, 1998, a major earthquake struck southern Turkey. Around 150 people died in Adana Province and over 1,000 people were injured. Over 74,000 housing units suffered collapse or damage, with total damage estimated in the range of $1 billion.[15] As a result, the Bank agreed with the Government of Turkey (GOT) to include emergency earthquake response and recovery assistance under the flood project, in a $685 million multi-sectoral project, with a loan amount of $369 million.

3.3 As the project was being launched, Turkey experienced yet another earthquake, one of its most devastating, in the Marmara region of Western Turkey with its epicenter approximately 55 miles southeast of Istanbul. In response to this disaster, the GOT and the Bank agreed to amend the project's loan agreement to cover emergency construction needs for Marmara. Under this amendment of September 1999, $62.5 million was reallocated – about 17 percent of the original loan amount – for housing construction in the area affected by the Marmara earthquake, as well as to provide technical assistance to the government to prepare the launch of the Turkish Catastrophic Insurance Pool.

Objectives. The objectives of the project were to assist the GOT in: (a) restoring basic infrastructure in municipalities and rural areas affected by the flood by repairing structures and facilities of economic and social importance; (b) providing assistance to restore housing in the earthquake affected Province of Adana; and (c) reducing vulnerability to future floods and earthquakes.

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14. Depending on location.
15. Based on the information prepared by numerous official investigation teams within three weeks of the event.

Box 2: TEFER Components

Municipal and Rural Infrastructure ($70.10 million equivalent at appraisal/$44.90 million actual)

- State Highways.
- Rural Services: Drinking Water Supply, Sewerage, Irrigation Facilities, Rural Roads and Bridges.
- Forestry: Forest Roads.
- Municipal Roads and Bridges,
- Engineering Designs and Supervision.

Flood Management and Hazard Reduction ($135.80 million equivalent at appraisal/$62.70 million actual)

- Flood and Landslide Risk Reduction and Mitigation
  (i) assessing its current mitigation activities, determining the need for additional mitigation activities at the state level, and implementing the necessary changes in policy to make mitigation part of the decision-making process for all state government activities;
  (ii) examining mitigation at the provincial and municipal levels, and implementing pilot mitigation projects; and
  (iii) pursuing the development and implementation of disaster insurance to reduce the ongoing and increasing burden of disaster recovery on the state budget.
- Modernization of the Monitoring, Forecasting, and Warning Systems
- Improvement of Disaster Response Capabilities
- Repair and Improvement of Flood Protection Infrastructure

Earthquake Reconstruction ($156.10 million at appraisal/$80.18 million actual)

- Demolition of Damaged Units
- Housing
  Adana. 4,000 housing units
  Çehan. 1,000 housing units
- Emergency Rural Housing Reconstruction.
- Consultant Services for Design, Construction Supervision and Management
  Urban Housing
  Rural Housing

Project Implementation Unit ($4.2 million equivalent at appraisal/$3.22 million actual)

THE ACHIEVEMENT OF PROJECT OBJECTIVES

3.4 The first and third objectives (restoring infrastructure and reconstructing housing) were substantially achieved. However, the second objective, involving vulnerability reduction, was only partially achieved during the lifetime of the project, as the Marmara earthquake hit as the TEFER project was being launched. Realizing the need for larger improvements in vulnerability reduction, the goals of the objective were modified and implemented instead under a subsequent emergency project, MEER.

Objective 1: Assist the government in restoring basic infrastructure in municipalities and rural areas affected by the flood by repairing structures and facilities of economic and social importance

This objective was fully achieved. Through the municipal and rural infrastructure rehabilitation component (31 percent of the appraised project cost) the project succeeded in completing the repair of the wastewater and water supply networks, roads, and bridges in Devrek, Yenice, and Karabuk damaged by the flood were all completed. It was decided that works necessary in Bartin were more extensive than originally thought, so that municipality's repairs were subsequently subsumed in the MEER project. The success is particularly noteworthy given the large number of both minor civil works and NCB contracts. Major infrastructure achievements included the rehabilitation/reconstruction of 10 sewerage systems; 1,446 km of municipal and rural roads; and 165 water supply systems, 31 irrigation systems, and 93 bridges.

Objective 2: Assist the government in reducing vulnerability to future floods and earthquakes

3.5 Flood management and hazard risk reduction efforts got off to a slow start, and were only partially achieved by project close. The Flood Management and Hazard Reduction component (23 percent of total appraised project cost) involved flood and landslide risk reduction and mitigation, modernization of the monitoring, forecasting, and warning systems, improvement of disaster response capabilities, and the repair and improvement of flood protection infrastructure. Energy was focused on the implementation of the physical components, while the forward-looking mitigation component was largely ignored. Among the project's vulnerability reducing physical investments were 13 flood protection schemes in West Black Sea Flood Region, and the acquisition of weather and river monitoring systems (software and hardware). Both aspects were completed successfully. When the Marmara earthquake struck, however, the institutional aspects of the project's vulnerability reduction activities still had not gotten off the ground, save the disaster insurance study, and were incorporated into the MEER project.

3.6 The OED mission observed some shortcomings on the ground. For instance, in the municipality of Devrek, properly built downstream flood protection works were observed, but the precise area upstream where blockage had caused the river to flood the town in the first place was left untouched. Additionally, upstream, the mission observed that debris removal had not been performed along the riverbanks, and that debris will inevitably enter the river, reducing the causeway and increasing the risk of the river's flooding unless it is moved. The municipality does not have the equipment or the funding to remove it.[16] While these difficulties are due in part to contractor financial collapse and a supervisory failure to grasp the implications, it is indicative of the difficulties in coordinating the work of different ministries. The mission understands that the government will address the oversight this year.

Objective 3: Provide assistance to restore housing in the earthquake affected Province of Adana

3.7 The housing reconstruction component was the largest of the four, making up 45 percent of the loan. It involved demolition and emergency housing reconstruction in Adana and Çehan. Private housing rebuilt included: 5,000 urban housing units, of which 2,600 were allocated to earthquake victims, and the remainder were either allocated to other agencies or held in reserve pending court cases concerning eligibility; and 3,131 rural beneficiaries received funding that enabled them to complete the reconstruction of their houses.

3.8 The PPAR mission observed multiple complexes of well-built urban housing, as well as high-quality rural housing. An independently performed beneficiary survey of 299 TEFER housing project beneficiaries conducted in preparation for the construction of

16. DSI has it in the work program for the coming year.

MEER project housing determined that the majority of the residents are satisfied with their houses.[17]

3.9 The option of rebuilding in situ was considered, and implemented in Çehan, where 1,000 units were constructed on their original site to reduce the cost of site development. The idea was considered in Adana, but the PAD notes that doing so with multi-family housing reconstruction would be problematic because only a portion of the inhabitants of a given building might have been eligible for disaster relief. The selected site in Adana was previously considered for another Bank project and much work was completed towards preparation. The notion of rebuilding in situ was found feasible for single-family units in the rural reconstruction component, however.

3.10 Assessment of the need for housing proved difficult, as is common in an emergency situation. Though the project design significantly cut the officially assessed required number of units, and only *14 percent* of those needed as reported by the assessment were built, the number of units built was still nearly *double* the amount required to meet beneficiary needs.[18] Furthermore, a number of factors exacerbate the problem. Low uptake can be partially attributed to construction timing and beneficiary patience—the ability and willingness to wait for a unit as well as their acceptance of the location of the housing. Also, in this region, rents are sometimes paid up to two years in advance, meaning that some of the beneficiaries had already committed to a lease elsewhere and could not move in. Still others were reported to live elsewhere and rent out their unit for the extra income (see Housing—Urban and Rural in Part II).

3.11 The PPAR mission observed the consequences of overbuilding. Blocks of unoccupied units had been vandalized – windows were broken and doors were removed, exposing the interiors to the elements, and units were stripped of all fixtures, hinges, outlets, counters, sinks, etc. In such a state, the physical decay of the units will be accelerated and making them owner-ready once again will take a significant investment. Social dynamics are affected as well. The damaged units, too, can quickly lead to a lessened attractiveness of the complex as a whole. Not surprisingly, the units are subject to the ongoing predations of criminals and barbed wire stockades have been erected around the more densely populated zones of the housing area.

3.12 Also lacking was a (legally required) management structure for maintenance of the commons – heating, public lighting, grounds, and repairs. In the Çehan housing complex, where this issue was particularly evident, a high local government official assured the OED mission that he would start the organization of a community management structure by beginning to collect funds for improvements (essentially acting on behalf of condominium associations that the municipality would set up) while setting up the structure, and then handing it over to the condominium associations when they were up and running. The previously mentioned beneficiary survey concluded that the lack of associations may have been because of beneficiary mistrust of their unknown

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17. Strateji/Mori Research and Planning Ltd. Co. "Evaluation of TEFER Housing Project in Adana and Çehan and Public Participation for Reconstruction of Housing Under MEER."

18. In fact, when an evaluation of the TEFER housing project, commissioned by the PIU, was completed following the Marmara earthquake, 38.7 percent of the people residing in the housing were beneficiaries. ("Evaluation of TEFER Housing Project and Public Participation for Reconstruction of Housing under MEER," 40).

neighbors. The study suggested that letting the beneficiaries organize their own groupings when assigning housing would be more conducive to creating trust. [19]

3.13 For the rural housing component, families chose from architectural designs and then contracted the construction of them (or built them by themselves). The PPAR mission observed extremely sturdy rural housing in Kürkçuler. The dimensions of the steel-reinforced concrete columns and beams indicated that these houses could likely survive the 500-year earthquake. Families received funding in installments, depending on the completion of a building phase – one installment came after excavation, others after the completion of the foundation, construction works, and finishing work.

RATINGS

3.14 *Outcome.* The project objectives were highly relevant to the needs of the disaster-affected country. The physical aspects (the bulk of the project) were achieved to a great extent during the life of the project, and some aspects of the housing component were later even improved using funding from MEER project. The institutional goals were not met during the life of the project, but did live on in the MEER project, and influence the design of that project. Overall, the project is rated **satisfactory**.

3.15 *Institutional Development Impact.* The PPAR mission observed that the institutional capacity development initiated during the TEFER project has subsequently taken hold. Although little headway was made during the life of the project (largely because the Marmara earthquake hit and project ID goals were rethought, expanded, and transferred to the still ongoing MEER project) the project had an impact beyond its scheduled years of implementation. The mission observed progress in the Meteorological department. The institutional development impact of the project is rated **modest**.

3.16 *Sustainability.* Given the short amount of time since project close, it is difficult to rate project sustainability. However, the mission noted that roads and flood infrastructure were being maintained by the respective agencies, a positive sign. Some units in Adana and Çehan were vacant, but project infrastructure was built to last, and the shortcomings (lack of parking, amenities, and a health center) were being addressed by the MEER project, along with the bulk of the institutional development component. The weather forecasting achievements are expected to be sustainable. Project-built systems are under normal operation and the State Hydraulic Works (DSI) is fully committed. Project sustainability is rated **likely**.

Bank Performance

3.17 The Bank responded quickly after the 1998 flooding, mudslides, and earthquake, once again playing an organizing role. Like for the MEER project, the appraisal mission was staffed by some of the Bank's foremost disaster experts, who were able to deal with not only one, but several disasters, incorporating them into project plans. The team brought to the response and recovery program an organizational framework and a clear

19. PIU, "Evaluation of TEFER Housing Project and Public Participation for Reconstruction of Housing under MEER," 46.

process for identifying, selecting, and implementing priority infrastructure and flood management investments Bank performance is rated **satisfactory**.

Borrower Performance

3.18 On the ground, some of the implementing agencies lacked sufficient communication with one another, which affected project implementation, as in the Devrek example. On balance, however, borrower performance is rated **satisfactory**. As has generally been the case in the emergency projects in this cluster PPAR, the borrower worked closely with the Bank's project team, and difficulties that arose were attended to swiftly. The PIU, having had experience in emergency projects (Erzincan) proved highly capable. The group always went the extra mile to meet demanding construction schedules, and proactively deal with implementation issues.

4. The Cash Transfer Project

4.1 On August 17, 1999, a 7.4 magnitude earthquake devastated the Marmara region of Turkey – the country's industrial heartland. Areas of peak damage included the seven provinces of Kocaeli (Izmit, Golçuk), Sakarya (Adapazari), Yalova, Bolu, Istanbul, Bursa, and Eskisehir. Over 17,000 lives were lost, an estimated 200,000 people were made homeless in the region, and Turkey's industrial center was extensively damaged. 23 percent of the country's population lives in this area that produces 34.7 percent of Turkey's GNP.

4.2 The poor, who generally live in structurally weaker housing stock, were particularly vulnerable. Adding to this vulnerability was the fact that their prime job market – the self-employed, small, and micro-enterprise sectors – was the hardest hit by the earthquake. About 20,000 small businesses were destroyed, leaving about 140,000 people without jobs.[20] The earthquake pointed out the need for upgrading the existing emergency response system, the lack of effective enforcement of Turkey's building codes, and the inadequate coverage of earthquake insurance in the housing sector.

4.3 At the government's request, the Bank prepared a two-stage program. In the first stage, it immediately approved separate amendments to eight existing loans, reallocating $267 million in funds from ongoing Bank projects toward emergency relief and reconstruction.[21] The second stage of the assistance program consisted of a reconstruction project that included prevention and mitigation components (MEER, $737.11 million project cost, $505 million of which was Bank-financed), and an ERL supporting the government's cash transfer program for earthquake victims (EERL, $252.53 million).

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20. V. Akgiray, G. Barbarosoglu, and M. Erdik, "Lessons Learned in Dealing with Large-Scale Disasters" General Secretariat, Advisory Unit on Multi-Disciplinary Issues, Organization for Economic Cooperation and Development, 16 September 2003, 13.

21. Projects included: Turkey Emergency Flood and Earthquake Recovery Project, Loan No. 4388-TR; Road Improvement and Safety Project, Loan No. 4048-TR; TEK Restructuring Project, Loan No. 3345-1 -TR; National Transmission Grid Project, Loan No. 4344-TR; Employment and Training Project, Loan No. 3541 -TR; Basic Education Project, Loan No. 4355-TR; Primary Health Care Services Project, Loan No. 4201-TR; Health II Project, Loan No. 3802-TR.

MEER is not one of the projects being assessed, as it is still ongoing. It is examined in the next chapter, however, to inform the larger analysis found in Part II of this report, as it forms the major part of the Bank's experience with disasters in Turkey.

4.4 The Cash Transfer project, a $252.53 million emergency recovery loan (ERL), helped the government respond expeditiously to the Marmara earthquake emergency by providing up-front cash assistance to earthquake victims for accommodation assistance (75 percent of total benefits), repair assistance (13.4 percent), death and disability benefits (10 percent), and death benefit, survivor, and disability pensions (1.5 percent). Business owners received a lump sum payment of between $340 and $855 (U.S. equivalent) for damages following the disaster. Victims not living in temporary housing received $170 per month for 18 months as rent assistance.

4.5 Providing immediate *cash* assistance for victims meant that they could purchase their own supplies, shelter, etc. rather than receive items in kind which might not have been appropriate. From a social standpoint, the project gave hope and reassurance to the affected population in a time of desperate need, a tangible sign of the government's efforts to help the victims, affecting not only their material status, but also their psychological well being. In Gujarat, India, earthquake victim's need for this sort of cash assistance became apparent to the Bank in an indirect way following the 2001 earthquake. Families were using the first installment of house construction funding to purchase food and other necessities to survive, rather than using it toward the construction. As a result, when it was time to issue the second installment, many of the families did not have the first phase of the house to show in order to receive the second installment.

THE ACHIEVEMENT OF PROJECT OBJECTIVES

4.6 The three project objectives identified by the Memorandum and Recommendation of the President (MOP) were fully achieved as follows.

Objective 1: Help the government respond quickly and effectively to the disaster

4.7 During a period of chaos and lack of information, the Cash Transfer program helped the government respond quickly to the August 17, 1999 catastrophe – The project was appraised on October 10, 1999, approved by the Board on November 11, 1999, and made effective on December 14, 1999. The fast-disbursing nature of the loan was particularly important to project success. Disbursements were made against allowances paid, and support for expenditures was rapid: 41 percent of total project funds had been disbursed by the end of December 1999, 60 percent by the end of January, and 80 percent by the end of March, 2000.[22]

4.8 The process went smoothly. The cash transfers were administered through existing institutions that had an established system for administering cash transfers. Ninety-eight percent of the transfers were administered through Turkey's social

22. The closing date was extended by three months to permit the completion of analyses and recommendations for how the GOT can improve its capacity to respond to future catastrophes.

protection agency, the Social Solidarity Fund (SSF), which had over 900 offices, and extensive experience with normal social protection payment distribution. The benefits were delivered successfully, especially given the constraints – high applicant volume, time pressure, and limited resources.

Objective 2: Ensure that displaced persons and other groups made vulnerable by the earthquake received adequate assistance particularly during the winter months, while longer-term reconstruction efforts got underway[23]

4.9 This objective was achieved through the provision of cash support for five priority programs under the government's earthquake recovery program supported by the cash transfer project – accommodation assistance; repairs assistance; death and disability benefits; workplace social allowances; and death benefits, survivor, and disability pensions. The program provided quick cash to people who needed the help immediately, and to survive the winter.

4.10 *The accommodation assistance program.* This program, administered by the SSF, was for families whose dwellings had collapsed or had suffered heavy or medium damage. Called "rent support" in common usage, it provided families with 100 million TL (around US$170) per month, for 18 months. Displaced families were able to choose between the cash assistance or free accommodation in public facilities or pre-fabricated housing. An independent evaluation reported that by the end of March 2000, when 80 percent of project funds had been disbursed, accommodation assistance amounted to $98,344,606, or 39.0 percent of project funds. Seventy-five percent of project funds were targeted for this component. By completion, 75.2 percent had been allocated toward it. Though some families were incorrectly given accommodation and repair allowances, the government promptly analyzed and corrected the situation.

4.11 *The repairs assistance program.* This program, also administered by the SSF, provided a lump sum of 600 million TL (around $1,025) for families in the affected region whose dwellings had suffered light damage. As planned, this component accounted for 13.4 percent of project funds.

4.12 *Lump-sum death and disability benefits.* These benefits were paid to all families that had suffered a death or disability. The death allowance provided financial support of a lump sum 750 million TL (around $1,280), and the disability allowance provided those with a first degree (80 percent) disability with a lump sum of 500 million TL (around $855) and those with a second degree (60 percent) disability 300 million TL (around $515). This program was also administered by the SSF. Like the previous component, the amount planned in project design was indeed allocated – 10 percent.

4.13 *Workplace social allowances.* These were provided to those who, at the time of the earthquake, actively used a workplace (that had been destroyed) to earn their living, whether they were tenants or workplace owners. These people received a lump sum between 500 million TL (around $855) and 200 million TL (around $340), depending on the amount of damage the workplace had suffered.

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23. This is the objective stated in the Memorandum of the President. In the ICR the objective is stated differently: "Help ensure that payments are made to all eligible beneficiaries" (ICR p 5).

4.14 The lump sums were not enough to get businesses back on their feet again, according to one person working on the project. While citizens affected by the disaster received monthly payments for rental allowance, business owners received the one, relatively small, lump sum. More support to businesses might have helped the funds work toward generating livelihoods, thereby spurring economic recovery.

4.15 *Death benefits, survivor, and disability pensions.* One and a half percent of the funds went toward these benefits that were administered by ES (Retirement Fund – for government and white collar workers), SSK (Social Security Fund – workers), and BK (fund for self-employed persons). In the end, 1.5 percent of project funds was allocated toward this component, as planned.

4.16 The funds were distributed for one year, and the government extended the rental allowances for an additional six months (the extensions were not covered by loan financing). One official involved in the project noted that because there was no clear information on the duration of payments, beneficiaries found it difficult to make informed resource allocation decisions. And further, that cash transfer, when administered over a long time period, runs the risk of creating dependency. As well, it was argued that the funds might be more effectively invested in more permanent solutions, such as creating industry and jobs to provide people with opportunities to make the money themselves. The suggestion was made that perhaps limiting the number of months of support would be less likely to cause dependency issues.

4.17 In an independent beneficiary assessment, 85 percent of the respondents were satisfied with the approach of the officials administering the programs.[24] This assessment, performed by Istanbul University, investigated how people were coping with the aftermath of the earthquake and how successful the allowances and benefits were in reaching their intended target populations.[25] The assessment also reported that there were no complaints about people's ability to obtain their benefits under the project. The beneficiary assessment was one of two independent assessments provided for by project plans. The other, an operational review performed by Price Waterhouse, examined, first, the adequacy of procedures and systems used in project implementation and, second, the efficiency and effectiveness of the results. The primary concern outlined by this document was a lack of central direction for standard approval and distribution controls of the administering institutions, as well as their lack of a centralized information database. The review also points to a need for "advance emergency planning with well defined procedures and responsibilities for appropriate institutions." These issues are being taken up in a follow-on project—the $500 million Social Risk Mitigation Project (SRMP) (L4638-TR).The institutional strengthening component of that loan will include the implementation of the key agreed recommendations of the operational review, inter alia, requiring formal financial reporting arrangements of the SSF, and the development and implementation of an integrated MIS.

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24. Dr Taylan Akkayan, Istanbul University, Beneficiary Assessment, cited in Price Waterhouse Coopers, "Emergency Earthquake Recovery Loan International Bank for Reconstruction and Development Operational Risk Assessment Project," (Istanbul: Price Waterhouse Coopers, 2000).
25. 1,200 questionnaires were administered and 135 in depth interviews were conducted. 5,000 people were reached.

4.18 Though the Price Waterhouse report observed some weaknesses in the programs, it stresses that the assessment of effectiveness of the program must be taken in the context of local conditions, post-disaster—claims processors were themselves disaster victims and working under difficult conditions, and many documents were unavailable because they had been lost in the earthquake when administrative buildings collapsed. Regarding the latter, it was impossible to access individuals' income data needed to determine eligibility as the public buildings containing such records were largely destroyed. This point has been taken up by the recently approved ISMEP project, which within one component attends to the "retrofitting/reconstruction of priority public facilities such as hospitals, clinics, schools, administrative buildings and infrastructure."

Objective 3: Assist in keeping Turkey's reform program on track

4.19 1999 was a difficult year for Turkey. Largely due to high interest rates (exceeding 100 percent), the economy was in a deep recession with output declining by over 4 percent and inflation over 60 percent. The Marmara earthquake contributed significantly to the economic costs seen in the downturn. To help the economy out of its recession, a drop in real interest rates was necessary. The Turkish government launched a comprehensive economic reform program in 1999 to achieve this drop. The government pushed through many economic and institutional reforms by the end of 1999, despite two earthquakes, adding to the success of the economic reform program. These changes, combined with the earthquake recovery process and reconstruction is believed to have contributed to a sharp economic upturn in late 1999 and early 2000. Interest rates in treasury bills dropped from over 110 percent in November to 35-40 percent in January. The provision of funds from IFIs such as the Bank and the IMF, and other bilateral and multilateral sources (of which the Cash Transfer project can be seen as a part, infusing $252.53 million into the economy in a time of great need) was one of three important, interlinked factors designated to bring about the reduction in real interest rates. The infusion of funds through the Cash Transfer project likely mitigated the immediate impact of the earthquake, to some extent.

RATINGS

4.20 *Outcome.* The outcome is rated **satisfactory**. The cash transfer project provided a swift solution to the immediate problem by providing *cash* benefits to the affected population. This innovative approach to immediate disaster assistance proved successful when paired with a strong and carefully thought out reconstruction and mitigation plan (MEER). Bank identification of the project was rapid, as required in this emergency situation, and this Bank-supported program represented the first, very important assistance made to victims. The fast-disbursing nature of the loan (disbursements were made against allowances paid) was key in achieving such a rapid response. The additional objective of improving the capacity of Turkish institutions to respond to emergencies happened in the course of implementation. With respect to efficiency, no ERRs or IRRs were calculated as it was an emergency operation. However, more support for business owners may have shown higher economic returns on the investment, given that this move could have generated jobs and economic activity. Administration of the project was efficient. Though there were a number of instances of people receiving

multiple benefits, such cases were relatively few. The funds served to stimulate the economy at a critical time, thus aiding the economic recovery of the country.

4.21 *Institutional Development Impact.* The institutional development impact of this project is rated **substantial**. Though the project did not have any stated institutional goals, during implementation, a new objective arose[26] – to improve the capacity of Turkish institutions, especially the SSF, to respond in future emergency situations. The agencies have had valuable experience in the administration of such a program, including setting up additional field offices, coordinating volunteers, and effectively delivering benefits in the context of an emergency.

4.22 This on the ground experience, combined with the input from two institutional assessments,[27] provides a base from which to move forward on capacity building. This base will be further developed in the ongoing follow-on project, the Social Risk Mitigation project (L4638-TR) ($500 million), which is a social protection project, developed with the SSF as implementing agency.

4.23 *Sustainability.* The sustainability of this project is rated **likely**. The gains in experience with emergency cash transfer operations, will be supported and improved upon by the follow-on Social Risk Mitigation project. The temporary payments made to earthquake victims have helped move the beneficiaries into permanent living situations, producing sustainable benefits in that sense. The fact that the system relied heavily on volunteer help exposes a potential weakness in dealing with future disasters. Without such support, the result might not have been as positive.

Bank Performance

4.24 The Bank performance is rated as **satisfactory**. Bank performance was both innovative and well thought out. Project documents outlined the project, in part, as a traditional balance of payments loan, with a positive list of imports, etc., when in reality it was a pioneering departure from such lending.

Borrower Performance

4.25 The borrower performance is rated **satisfactory**. The implementing agencies (SSF and the social insurance agencies [Bag-Kur, SSK, ES]) quickly set up additional field offices, effectively processed applications and administered benefits under very difficult circumstances.

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26. It was not formally added, however.

27. Operational assessments commissioned included: Price, Waterhouse, Coopers. "Emergency Earthquake Recovery Loan International Bank for Reconstruction and Development Operational Risk Assessment Project" (Istanbul: Price, Waterhouse, Coopers, 2000); and "Social Solidarity Fund Report on Strengthening of Information Systems and Operational Activities." (Istanbul: Price, Waterhouse, Coopers, 2001).

5. The Ongoing Marmara Earthquake Emergency Reconstruction Project

5.1 The Marmara Emergency Earthquake Framework Program is a multi-donor effort with a total program cost of $1,795.75 million. The World Bank and the European Investment Bank financed the bulk of the works, which are being implemented using a shared PIU (the same one used for Erzincan and TEFER). At $505 million, the ongoing MEER project forms the largest piece in the Bank's $1.2 billion response to the catastrophe (see following box for an outline of project components). The project has disbursed about $219.5 million and the undisbursed amount is about $285.5 million, of which $180 million is contingency funding for the Turkish Catastrophic Insurance Pool (TCIP)—funding available to support insurance payout in the event of a disaster.[28]

The MEER Program Components (appraisal estimates of indicative costs)

PARTIALLY FINANCED BY WORLD BANK LOAN OF $505 MILLION:

- **Disaster Response System and Risk Mitigation** ($419.16 million)
  - *National Emergency Management System* ($110.17 million)
  - *Disaster Insurance Scheme* ($273.00 million)
  - *Land Use Planning and Enforcement of Construction Codes* ($11.78 million)
  - *Cadastre Renovation and Land Management* ($24.21 million)
- **Trauma Program for Adults** ($6.89 million)
- **Construction of Permanent Housing in Bolu, Kocaeli and Yalova** ($293.32 million)
- **Project Management** ($12.69 million)

FINANCED BY CO-FINANCIERS:

- **Business Rehabilitation** ($109.72 million)
- **Construction of Permanent Housing in Bolu, Sakarya, Yalova, Istanbul, Bursa and Eskisehir** ($177.07 million)
- **Repair of Existing Housing Stock and Healthcare Facilities** ($632.12 million)
- **Rebuilding and Repair of Roads, Water supply Systems, Wastewater Systems, Power Distribution Networks** ($139.73 million)

5.2 The MEER project had several objectives. The first objective was to help restore the living conditions in the earthquake-affected region. The project was to produce 10,000 new homes, and funds from a previous emergency project, TEFER, would finance an additional 2,600 in Adapazari. This represented about 30 percent of the number of collapsed, heavily damaged, and medium damaged units in urban areas defined as uninhabitable units. Included in urban housing complexes were schools, health centers, and common areas (as well as the shops and businesses complexes discussed later).

5.3 By the end of FY2002, the construction of approximately 12,000 housing units was completed, along with cofinancier-funded off-site infrastructure, and additional landscaping works were finalized. The MEER project also financed some work at housing sites in Adana and Çehan, carried over from the TEFER project. The OED mission observed that the housing was well-built, residents had independently planted amenity gardens to beautify their housing complexes, and sports facilities such as basketball courts and playgrounds had been installed. The PPAR mission understood

28. The MEER project is not included as one of the projects being assessed by this PPAR. The following examination of the project informs the analysis in Part II of this report.

from interviews with residents that they appreciated the Bank-funded housing because they perceived it to be safe and of good construction quality.

5.4 While the physical construction of the housing component went smoothly, the project encountered difficulties when confronted with the less tangible aspects of the endeavor, such as the creation of cooperative maintenance organizations in the housing areas. In Turkey, maintenance of the commons is usually taken care of by cooperative associations of the inhabitants, yet this type of organization was not evident in the Bank-funded sites. The TEFER housing beneficiary survey mentioned in the last chapter concludes that this effect could be due to not preserving existing neighborhood groupings and other social relationships in placing the occupants in their new buildings – the new residents had a low level of comfort with one another. [29]

5.5 The number of units handed over to the beneficiaries closely follows the number of housing units constructed, according to the most recent figures provided by the PIU.[30] The number of units actually occupied is lower than that handed over, however.[31] Moreover, those occupied are not all occupied by the beneficiaries (many beneficiaries are renting out their units). In all of the project sites there is a relatively high general occupancy rate except one – Hereke.

5.6 With only 30 percent overall occupancy 3 years after completion, Hereke suffers from vandalism and neglect. The mission observed broken windows, damaged units, and cows grazing in the common areas. The lower occupancy rates were explained by a number of factors. The site, while it commands a stunning view of the Marmara Sea, is 30 kilometers from the nearest center of work. And the roads department (KGM) only recently finished the access road (August 2004). Lowering the demand even further, the Ministry of Public Works and Settlement (MPWS), also responsible for building housing for earthquake victims, built 500 extra units closer to town following public complaints that the Hereke site was too isolated. Also, by the time the Hereke housing was finished, few beneficiaries remained and several of the units were offered to beneficiaries from other districts or from rural areas, but most declined.

5.7 Beneficiary-constructed rural housing reconstruction was undertaken through a $22.92 million sub-component consisting of building houses in rural areas of the Yalova and Kocaeli provinces that started in September 2000 and completed by August 2001. Out of 1,377 eligible beneficiaries, 796 participated. In terms of the size of the buildings constructed, 65 percent built 90-110 square meter houses, 25 percent built 75 square meter houses (the payment based size of the program), and 9 percent built 60 square meter houses. During field visits, it appeared that this range was typical of the size of houses in the area. Beneficiaries, under the supervision of consultants, undertook, or contracted out construction of seismic-resistant buildings. In so doing, the beneficiaries

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29. Strateji/Mori Research and Planning Ltd. Co. "Evaluation of TEFER Housing Project in Adana and Çehan and Public Participation for Reconstruction of Housing Under MEER."
30. In Izmit, 99.9 percent were handed over, in Golçuk 99.9 percent, Adapazari 97.9 percent, Gebze 99.1 percent, Cumayeri 100 percent, Golyaka 94.9 percent, Duzce 99.9 percent, Korfez (Hereke) 78 percent.
31. In Izmit there is a 98.0 percent occupancy rate, in Golçuk 99.0 percent, Adapazari 78.0 percent, Gebze 90.0 percent, Cumayeri 100.0 percent, Golyaka 67.5 percent, Duzce 98.0 percent, Korfez (Hereke) 30.0 percent.

received instruction on such building and construction quality and adherence to designs was enforced.

5.8 Payments to beneficiaries were made in increments, based on a successful approach used in previous emergency projects—Erzincan and TEFER—with the first payment made only after evidence of clear title to the land was provided. Remaining payments were made in pre-agreed stages. In the case of the rural housing, each family received 6 billion TL (2001) to rebuild.[32] The OED mission observed seismic-resistant, safe buildings, designed to accommodate expansions.

5.9 Given only 58 percent of the eligible beneficiaries actually participated, the PIU contracted a six-month study, completed in December 2003. The study suggests ways to increase beneficiary acceptance in future rural housing projects, including:

- Take into account the education level of the beneficiaries when promoting the program. Many of them may not be familiar with banking or credit systems. Simple, clear communication at all levels (promotion, information, contracts, etc.) is needed.

- Consider having village organizations coordinate the sub-contracting for all of the houses in the village, to reduce the costs, and increase participation by certain groups, such as the elderly (who were less likely to participate in the self-construction or sub-contracting than other groups).

- Consider building types more common to the local rural areas.

- If they address the same target group, combine the rural and urban housing components. Because the rural project area was close to the urban housing built in the MEER project, potential rural housing beneficiaries were considering both options. Linking the two under one multi-dimensional program could be more effective.

5.10 The business rehabilitation component of the framework program, modeled after the Erzincan project experience (though not Bank-funded), had the potential to support the second MEER project objective: economic recovery and growth. The project provided a sub-component for credit financing of small scale shopping malls.[33] Shopkeepers and other business people were organized into cooperatives which were the recipients of the financing.[34]

5.11 The OED mission observed 14 business centers of varying sizes. The buildings built were two-story free-standing malls situated within the housing sites created in the MEER housing component. The layout was such that shops on the bottom floor faced outward, toward a number of parking spaces, and could also in some instances be accessed from a corridor running down the middle on the inside.

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32. The figure was determined by MPWS.
33. Provided if requested by mayors of stricken cities.
34. This sub-component represented roughly half of the business rehabilitation component. The other portion went primarily toward asset replacement assistance.

5.12 Most of the malls were less than half full and several were completely empty. Some of the unoccupied centers had been vandalized. One shop manager (who rented from the original beneficiary) explained that the few shops there were struggling because the potential customers living nearby were accustomed to shopping in the city center. She commented that the new shops were built far from where the beneficiary shopowners shops had originally been located. Consequently, many declined to take on the units. In three locations where tenants for the shops and businesses were absent, it was anticipated that a nearby university would take over part of the empty centers. A shop manager interviewed by the OED mission was eager for the university to take over a nearby (project funded) complex of shops and businesses that was empty and abandoned, hoping for increased business from the students.

5.13 The third objective of the MEER project was to develop an institutional framework for disaster risk management and mitigation. The Disaster Response System and Risk Mitigation component ($419.16 million appraised value, in total) was designed to help meet objective number three. It includes the National Emergency Management system, the disaster insurance scheme, land use planning and construction codes, and cadastre renovation and land management sub-components. Progress on this component has been uneven.

5.14 *National emergency management system* ($110.17 million). This sub-component includes: (1) the creation of a new national emergency management agency, (2) realignment of responsibilities among ministries and general directorates, and (3) decentralization of authority and enhancement of emergency management capabilities at the municipal and provincial levels. Item number one, the Turkish Emergency Management Agency, TEMAD, was indeed created, but progress on forging political will to implement the component had been slow-going.

5.15 Since a low point when the component was nearly cancelled, the group has been showing significant signs of progress. TEMAD has initiated substantive discussions with other key organizations, including the General Directorate of Civil Defense (Ministry of the Interior) and the General Directorate of Disaster Affairs (Ministry of Public Works and Settlement), about operational and institutional arrangements. TEMAD is about to begin construction of a new, permanent, emergency management facility, new national emergency communications system, and an emergency management information system. The agency has also shown operational promise by aiding neighboring countries following disasters, and conducting multi-nation risk simulation activities. These signs, combined with the initiatives proposed in ISMEP, point to the continued progress and sustainability of this component.

5.16 *Disaster insurance* ($273.00 million). In order to extend liquidity to homeowners, reduce government liability, and lessen dependence on foreign donors in the event of future disasters, the disaster insurance scheme was launched in September 2000. The scheme, which will cover $1 billion in damages in the event of a disaster, got off the ground in a timely fashion, and had soon more than tripled the level of insurance penetration for earthquake coverage[35] compared to that achieved by the private insurance market before the introduction of the scheme. It also demonstrated its ability to pay

35. Measured in terms of numbers of policies.

claims quickly in a number of small- and medium-sized earthquakes that have occurred since its initiation. A successful public awareness campaign, combined with an affordable average annual premium of $20 brought the scheme significant penetration initially (the average is currently $46), and the level has held steady at around 2 million policies over the past three and a half years.[36] If the draft Earthquake Insurance Law is passed, it could increase penetration further, but so far this has not happened. In addition the Bank team is currently investigating several measures to increase the number of policy holders. To enable the scheme to use more (of the less costly) Bank financing in its cover, the Bank and TCIP agreed on an increase of the existing $100 million contingent capital facility by $80 million.

5.17 Despite initial success, the scheme faces some difficulties in not only sustaining, but increasing the numbers of insured in the country. Two newly enacted laws pertaining to state-owned enterprises, the Public Financing and Supervision Law and the Procurement Law for State-Owned Enterprises, may terminate the insurance program's current exemption from all state regulations applying to government-owned enterprises (It was created as a special, non-government entity, as it does not have government employees, and the government only intervenes in the highly unlikely event of a disaster calling for over $1 billion in coverage.) Whether these laws will apply to the TCIP is currently being clarified. The current Disaster Law #7269 (which provides easy compensation to earthquake victims), along with the lack of a strong insurance culture in Turkey add to the challenges faced by the scheme.

5.18 *Land use planning and enforcement of construction codes* ($11.78 million). To reduce vulnerability in the region, this sub-component was designed to support a review of ongoing modifications in the legal system and actions to strengthen municipal ability to regulate, plan, and implement disaster-resistant development. After a slow start, implementation recently begun to progress. Notably, a series of groundbreaking workshops has been held, engaging a variety of stakeholders, including the engineering community, academia, local governments, lawyers, and legislators in a discussion of the Urban Development Framework Act, the Urban Transformation Draft Act, and the Building Retrofitting Code.

5.19 *Cadastre renovation and land management sub-components* ($24.21 million). The idea behind this sub-component is to establish a contemporary land information system to support the reconstruction and future development of the Marmara Earthquake Region. Implemented by the General Directorate of Land Registry and Cadastre (GDLRC), it finances the creation of a cadastral database, the hardware needed to support the database, map production of current information needed for inventory and immediate planning, and renovation of cadastre registers and associated maps, through basic field measurements. The sub-component also finances the strengthening of the GDLRC in the Marmara earthquake region through increased operational capacity of field offices and institutional improvements. After a long decision process concerning cadastre and land registry methodology as well as waiting for government completion of the regional land information system (MERLIS), the component picked up speed. The OED mission

36. These gains are currently at some risk because of possible change in two laws that could be interpreted to affect the entity (TCIP). Another point to note is that, though the gains have been sustained for a number of years, they have not increased. Market research analysis is currently being undertaken to alleviate the situation.

witnessed that the construction of cadastral offices had been completed, and understands that the mapping of rural and urban areas and the procurement of hardware and software to operate the MERLIS system was scheduled to be finalized by May 2005. It is reasonable to assume that this initiative will live on in the GDLRC's wider vision to modernize the national land registration and cadastre system in the next 10 years by completing the real estate cadastre in the country, automate land registration offices, and develop digital cadastre maps to support the e-government initiative.

Part II:
A Review of World Bank Funded Natural Disaster Responses in Turkey

Part II systematically reviews challenges faced and shows how each subsequent project built upon the lessons of its predecessors. Examining Bank's work in this way allows for a better look at progress made along the response/preparedness continuum. The three emergency projects assessed, plus the more recent MEER and ISMEP projects developed strategies and activities to deal with the various problems they confronted. For the purpose of analysis these have been divided into short-term, medium-term, and long-term issues. Drawing from the analysis in Part I and work which has been done for the MEER and ISMEP projects reveals a more detailed picture of progress.

6. Natural Disasters and Turkey

6.1 Improving the way the nation confronts natural disaster involves preparing for less frequent major disaster events as well as developing a response capacity for numerous smaller ones. Looking at Bank projects in Turkey over the last 13 years provides valuable lessons of experience. The major events were:

- *The Erzincan earthquake.* In 1992, the Erzincan region was hit by an earthquake measuring 6.8 on the Richter scale, and an aftershock two days later of 6.1. The Bank responded with the *Erzincan Earthquake Rehabilitation and Reconstruction Project* (L3511-TR) of $285 million.

- *Flooding and landslides in the Western Black Sea Region.* In May 1998, the Western Black Sea region suffered from severe flooding and landslides, killing less than 100 people, but affecting 2.2 million over an area of 37,000 square kilometers, and causing economic losses estimated at $500 million.[37] The Bank responded by preparing a $685 million multisectoral project, with a loan amount of $369 million, the *Emergency Flood and Earthquake Recovery Project* (L4388-TR) (TEFER), to rebuild damaged infrastructure and pick up where Erzincan left off with respect to institutional development and prevention/mitigation.

- *The Marmara earthquake.* Only a year after the TEFER project commenced, an earthquake of magnitude 7.4 hit the industrial heart of Turkey. The Marmara earthquake caused 17,480 deaths, 43,953 injured, and 66,441 collapsed or heavily damaged housing units. The Bank produced a three-part response. First, $267 million was reallocated from eight ongoing loan projects. Second, a $252.53 million credit to support an immediate cash transfer program – the *Emergency Earthquake Recovery Project* (L4518-TR) was initiated, and a $505 million reconstruction and disaster mitigation project, the *Marmara Emergency Earthquake Reconstruction Project* (L4517-TR) (MEER), was designed and approved.

Project experience is summarized in the following table (see Table 2):

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37. UN ReliefWeb, "Recent Natural Disasters in Turkey: An Overview of the National Technological Capacity and Its Utilization," http://www.reliefweb.int/rw/rwb.nsf/AllDocsByUNID/c66fdb0e7c9d170d8525693f00574c42, 02/09/05.

Table 2: The Projects[38]

Project	Disaster	Date	Location	Project Cost	Bank Funding
Earthquake Rehabilitation and Reconstruction Project (L3511-TR)	Earthquake	Mar. 1992	Erzincan	Appraisal: 650 Actual: 201.7	Appraisal: 285 Actual: 201.7
	Mudslide	July 1995	Senirkent		
	Flooding and mudslide	Nov. 1995	Sütçüler		
Turkey Emergency Flood and Earthquake Recovery Project (L4388-TR)	Flooding and several hundred landslides	May 1998	Western Black Sea Region	Appraisal: 685 Actual: 239.8	Appraisal: 369 Actual: 191
	Earthquake	Jun. 1998	Adana		
Marmara Earthquake Emergency Reconstruction Project (L4517-TR) (ERL)	Earthquake	Aug. 1999	Marmara Region	Appraisal: 737.11 Actual: --	Appraisal: 505 Actual: 211 disbursed as of 11/04
Emergency Earthquake Recovery Project (L4518-TR) (ERL)				Appraisal: 252.53 Actual: 252.53	Appraisal: 252.53 Actual: 252.53
Istanbul Seismic Risk Mitigation and Emergency Preparedness Project (ISMEP) (P078359)	Disaster Mitigation	Under preparation	Istanbul	$400 million	$400 million

6.2 These emergency projects developed strategies and activities to deal with short-term, medium-term, and long-term problems (see Table 3). Each of these timeframes provides a structure for analysis, and the issues that correspond to each category in the table will be discussed in the following sections. Looking at the projects together greatly facilitates the analysis of their strengths and weaknesses.

Table 3: Expected completion timing depends on the activity

Short Term	*Medium Term*	*Long Term*
Damage Assessment	Reconstruction	Institutions for Disaster Management
Reallocation	• Housing	Disaster Law
Cash Transfer Support Project	• Shops and Businesses	Disaster Insurance
Project Design	• Hospitals and other Public Buildings	Building Codes
	• Municipal and Rural Infrastructure	Flood Management and Hazard Reduction
	Training and Studies	Pilot Mitigation Projects

38. See Annex A for Basic Data Sheets and Annex C for Project Objectives Table.

7. Short Term Issues

7.1 Following a disaster, there are strong incentives for a country to rapidly assess its immediate needs in order to claim high damages. Likewise, there is pressure on the donor community to respond generously and quickly.[39] Finding knowledgeable officials to work on damage assessment is difficult, however, given that hundreds and even thousands of victims are making urgent demands on public authorities for assistance and/or services. In addition, they are almost certainly are operating under difficult circumstances (transport disruptions, access difficulties, damaged public offices, possible loss or destruction of files and other records). Accurate assessment is also problematic. While it is relatively easy to quantify buildings that have been entirely destroyed, it is difficult to assess medium to light damage[40] without careful on-site surveys conducted by specially trained personnel. Add to this the fact that often people move out of the area following a disaster, stay with relatives, and/or fail to make timely damage claims.

7.2 When reports from various agencies acting under time pressure are synthesized into one assessment, which has become standard practice in Turkey, there is room for miscalculation of the damage. On the other hand, when disaster assessments are credible, and they include an assessment of the economic and social impact of the event as well as a physical needs assessment, countries ultimately mobilize more assistance than would be the case with clearly exaggerated claims.

Designing a Rapid Response Requires Clear Priorities and Tradeoffs

7.3 Directly following disasters in Turkey, Bank missions have helped the government to assess the damage and to design comprehensive emergency recovery projects for the Bank to finance. The Bank documentation for the projects acknowledges the need for a response that is simple, rapidly executable, sharply focused, and not burdened with excessive conditionality. The experience of the four ongoing or completed projects shows that it is not that simple: there is always a tradeoff between speed and thoroughness of implementation. The way in which the government and donors assist stakeholders during the first months after each disaster can be seen to enhance or constrain the overall recovery process.

7.4 *Speed.* The Bank response to disasters in Turkey has been rapid. In 1992, a team surveyed the damage in Erzincan and prepared a project for approval in a matter of five weeks. Likewise, for the 1998 TEFER project, the plans were prepared and approved in less than five months, notwithstanding a second disaster that occurred during project preparation requiring additional plans for another disaster. In 1999, MEER was prepared yet quicker. Project plans were ready and approved within 12 weeks of the disaster.

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39. Project appraisal documents note that several past emergency loan projects (Columbia Popayan, Mexico Earthquake, Jamaica Hurricane Emergency Reconstruction, El Salvador Earthquake, among others) reveal that a speedy response is imperative.

40. Structures that have collapsed or are beyond repair are classified as heavily damaged. Structures that can be repaired for between 6 and 30 percent of their total replacement cost are considered medium damaged and 5 percent and below considered lightly damaged.

7.5 A quick Bank response has been instrumental in facilitating overall organization of the disaster response and donor coordination. Years ago, it was not uncommon for the Bank team to wait for emergency-related activities to finish before making an appearance. OP 8.50 Emergency Reconstruction, even states that the Bank does not do emergency relief. As will be discussed below, this non-involvement with relief is becoming a grey area; there are some problems during the emergency relief phase that are of a scale to warrant World Bank involvement.

7.6 Because Bank experience with emergencies suggests a need for simplicity, emergency projects tend to focus on activities that do not require elaborate preparation or for which detailed designs can be prepared during implementation. However, at times the quick response resembles a lack of due diligence, resulting in delays. The Erzincan ICR notes, "as a result of the rapid appraisal and approval of the project, preparation work was not as rigorous as in more typical Bank supported projects. By Board approval, there were no designs or draft tender documents prepared for the civil works, no agreed TORs for the studies and training activities, and no capacity in the implementing agency for managing the preparation of the tender documents and subsequent contracts."[41]

7.7 In the case of Erzincan, in the name of saving time, compromises were made by the project team and the PIU with the goal of getting the victims into new housing before the winter. But it was for naught. Though the loan was prepared in five weeks, construction activities did not start until two years later (Spring/Summer 1994).[42] So, with hindsight, time could have been spent acquiring more desirable building sites and identifying (and counting) eligible, interested beneficiaries. Most housing units were completed during late 1995, almost four years after the earthquake had struck (though one year ahead of schedule).

7.8 In the case of the TEFER housing component, the design process was also abbreviated in order to house the families before winter arrived. In doing so, however, the designs were finished before reliable estimates of the number of units needed were available, and, as already noted in Part I, twice as many homes were built than were needed.

7.9 Another result of rushing the design process has been slow disbursements. The speed with which disbursements would take place was significantly overestimated during project preparation (see Figure 1). Also, low implementation capacity creates a "hurry up and wait" situation. A key constraint to implementation in Erzincan was a lack of capable and functioning administrative structure. It may be the case that taking a little more time to prepare an emergency project would allow adequate attention to be given to temporary shelter, and contribute to increasing the capacity to implement.

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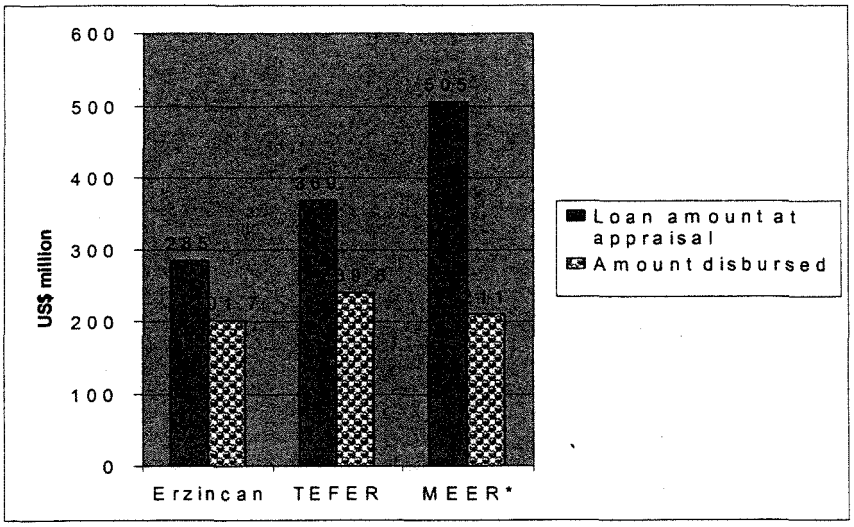
41. Erzincan ICR, 4.

42. According to the ICR, "there were several problems during the first three years of the project with the selection and work of the consultants who assisted HDA with design and construction supervision for the four main construction components. These difficulties significantly contributed to the initial implementation delays."

Figure 1: Demand for Bank Funds Overestimated at Appraisal



* Project has not yet closed. $180 million of the total loan amount forms a contingency fund for the disaster insurance component. This sum is not represented in the $211 million "amount disbursed" figure.

7.10 To summarize, the greatest flaw of the early disaster projects was the belief that permanent housing could be provided to victims in a matter of months. Experience showed that it inevitably takes longer. The donor community had previously learned that temporary shelter was to be avoided because the cost often equals the cost of the lost permanent home and there have been many social problems associated with temporary shelter.[43] Of course, most bad experiences were documented in warm countries, and in places where it was possible to construct temporary shelter out of recycled materials. For Turkey, the lesson which was learned was that there are circumstances where projects do need to invest in temporary shelter. And this is what was done under the Marmara project.

Bank Funding Overestimations Created the First Contingency Insurance Pool

7.11 When budgeting for reconstruction after a major catastrophe many public officials believe that it is better to overestimate the cost than to run short. Because of the frequency of disaster in Turkey, it can also be inferred that the government had a hidden agenda – it needed to overestimate in order to have resources in hand for the next disastrous event. After all, the Turkish experience shows that major disasters can follow one another in a matter of a few months.

7.12 The funding needed to complete the original project components that involved civil works was overestimated across the board. Following implementation of the physical components of the Erzincan project, 115 million in undisbursed funds were treated by the government as a reserve for the next disaster. The undisbursed project funds sat idle for years (the project closed in 2000, eight years after approval) accruing commitment fees. Despite

43. See Frederick C. Cuny, *Disasters and Development*, (Oxford: Oxford University Press, 1983); and Mary B. Anderson and Peter J. Woodrow, *Rising from the Ashes: Development Strategies in Times of Disaster*, (Boulder: Lynne Reinner Publishers, 1998).

the Bank's suggestions that the government close the loan, it declined.[44] And then the next disasters struck: first the Senirkent mudslide disaster of July 1995 and then Sütçüler mudslides of November 1995.

7.13 The TEFER project had been a response to (1998) flooding in the Western Black Sea region. Just a few months later, the city of Adana was struck by an earthquake that measured 6.3 on the Richter scale, which destroyed masonry structures in the city, nearby towns, and the surrounding countryside. Unspent funds for the Erzincan institutional development component were officially passed on to TEFER. Before flood and earthquake reconstruction work could be completed (and a functioning disaster management agency established), the catastrophic Marmara event occurred.

7.14 The lesson learned by the Bank and borrower following these disasters, is that a special pool of funds is required on a permanent basis to help Turkey to smooth out the lumpy financial demands of recurrent disaster. The way in which this was sustainably accomplished is discussed in the section on disaster insurance under the long-term heading, below.

Learning to Do Assessments That Do Not Overestimate Infrastructure Needs

7.15 Each of the projects that built infrastructure, Erzincan, TEFER, and MEER, significantly overestimated the scale of the ultimate demand. This was so even though they each anticipated (and compensated for) overestimation stemming from data synthesized from sources in poor communication with each other.

7.16 In Erzincan, due to inaccuracies in the original damage assessment which formed the basis for the Bank's appraisal, 3,640 units of cooperative housing were slated to be repaired or reconstructed, but during the project, only 1,131 actually were. According to the project completion report, this was due to inaccuracies in the original damage assessment which formed the basis for the Bank's appraisal. The actual number of eligible damaged units turned out to be a much smaller number. Similarly, the originally planned number of barns to be constructed (4,100), based on damage and needs estimates, was almost twice that which was ultimately constructed (2,885) due to inaccuracies in the original damage assessment used for appraisal. Furthermore, the estimates did not accurately incorporate the willingness of the families whose homes were to be replaced, to actually want to invest in the housing offered.

7.17 In TEFER, even though the project design cut the housing needs estimate received from the government, the number of housing units ultimately constructed was nearly double

44. As noted in the Erzincan ICR: "The Bank had made several inquiries to the Government about canceling the remaining funds. GOT was reluctant to cancel any loan funds and proposed other uses for the funds. The Bank replied that it would be more appropriate to consider a new project on its own merits rather than add new activities to make use of the surplus funds. GOT's unwillingness to cancel the remaining funds was the dominant factor behind the request for amendment and extension, and the Bank finally agreed since the proposed activities in Senirkent (and later in Sütçüler) were similar in nature to the original project activities."

the amount required to meet the immediate claims of eligible beneficiaries.[45] MEER, was closer to the mark in overall occupancy (in most sites housing occupancy ranges between 67 and 100 percent). However, in the case of one large site, Hereke, the occupancy reaches only 30 percent. More problematically, many housing occupants in the emergency projects should never have been made emergency project beneficiaries because they never suffered a relevant disaster-related loss. The beneficiary survey mentioned in Part I states that 1,936 beneficiaries were living in the TEFER-built housing (50 percent of the total beneficiaries of Çehan were living in the houses built in Çehan, and 80 percent of the total beneficiaries of Adana were living in the houses built in Adana).[46]

7.18 Overestimations of housing demand and consequent oversupply of housing units meant difficulties filling the available units. Beneficiary demand hinged on the willingness of the disaster victims to wait for housing as well as on their interest in the location and layout of the units. This beneficiary interest, may have also been overestimated, as noted in Part I. Empty units were subsequently vandalized, stripped completely of electrical and plumbing fixtures and kitchen cabinetry and appliances, making their subsequent occupation far more difficult. Underutilized housing developments generally suffered rapid deterioration and crime (for more on this, see the housing section, below).

7.19 In the MEER project, the Bank proposed to finance replacements for 30 percent of the raw number of "uninhabitable units." These were defined as: collapsed, heavily damaged, and medium damaged units in urban areas (eligible under the Disaster Law).[47] Additionally, two weeks before the construction contracts were signed, the borrower was responsible for providing an update of the damage assessment and eligibility estimates. Based on the updates, the Bank reviewed the total number of housing units to be constructed in order to mitigate the risk of over-investment.

Implementation Time Is a Function of Implementation Capacity as well as Task and Institutional Simplicity

7.20 In the Erzincan project, design sought to lower the risk of delay in project execution by relying primarily on existing institutions of proven capacity; making a Minister of State fully responsible for the direction and coordination of the project; and ensuring full funding for the project from the start of project execution. An effort was made to provide sufficient flexibility both on the part of the government and the Bank to help resolve implementation problems rapidly as they arose. In practice, project activities covered almost every sector of the local economy, which led to an unwieldy number of often very small contracts. In the Erzincan project files, staff note that too many institutions were involved in the project, and it would have been beneficial if the division of responsibilities between the Bank and other actors had left the project with 2-3 sectors to focus on.

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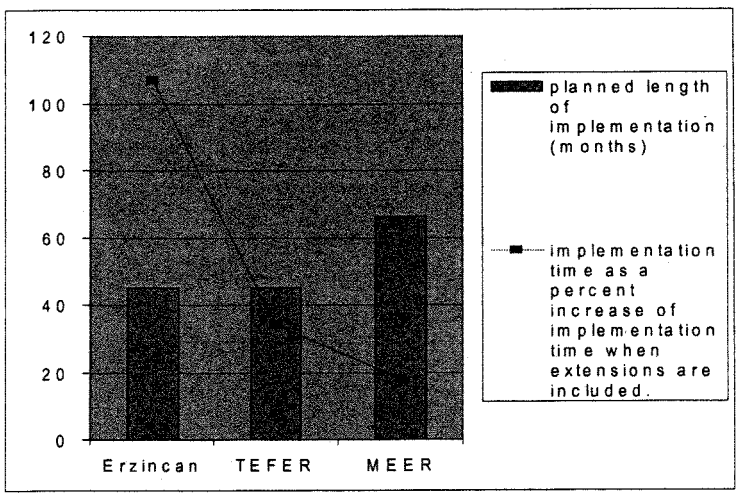
45. Court cases, however, continue identifying additional beneficiaries. Some units that stood vacant have been allocated to civil servant use, and others are being allocated to claimants under other programs.
46. Strateji/Mori Research and Planning Ltd. Co. "Evaluation of TEFER Housing Project in Adana and Çehan and Public Participation for Reconstruction of Housing Under MEER."
47. This discounting was expected to allow for second homes included in damage assessments, migrations out of the area, and other distortions and social factors.

7.21 Following the eight-year implementation period for Erzincan, the TEFER project adopted simple, straightforward solutions to project design, flow of funds, and procurement in order to reduce the risk of delay. Equally important, it built on established institutional and implementation capacity by employing the PIU created for the Erzincan project.

Figure 2: Planned Implementation Length Is Becoming More Realistic



7.22 It can be seen that over the years, Turkish disaster projects have learned to be more agile (see Figure 2). They have tried to lower the risk of delay in many ways – avoiding institutional complexity, choosing simple designs, and relying on existing institutions, to name a few.

Cash Transfer Program Provided Quick, Highly Valued Assistance

7.23 The Bank has traditionally tried to stay away from the emergency phase of disasters, letting specialized agencies handle search and rescue, etc. One area during the immediate post disaster phase where the Bank has begun to discover it can be helpful is in providing income support when employment opportunities are scarce and local economies are borderline non-functional. Cash transfer programs provide up-front cash assistance to earthquake victims. A key objective is to ensure that displaced persons and other groups made vulnerable by the earthquake receive adequate assistance while longer-term reconstruction efforts get underway.

7.24 The $252.53 million Cash Transfer project (Emergency Earthquake Recovery Loan [L4518-TR] assessed in Part I of this report) assisted the government in responding expeditiously to the Marmara earthquake by providing quick cash support for earthquake victims. Once the lesson had been learned that something needed to done about temporary housing because it was not possible to beat the coming of winter, several approaches to the provision temporary housing were adopted – possible because of cash transfers. Where there were rental units available, they were used. Payments for accommodation assistance went on for 18 months and totaled 75 percent of total cash transfer benefits. Some families were able

to approach the reconstruction of their former home in phases in order to provide themselves with temporary shelter. Repair assistance for housing comprised 13.4 percent of transfers.

7.25 Other benefits provided under the cash transfer project included: disability benefits (10 percent), and death benefit, survivor, and disability pensions (1.5 percent). Business owners received lump sum payments.

7.26 The Cash Transfer project was put together quickly because it used institutions that already existed in Turkey's social protection system. When the disaster struck, the SSF rapidly mobilized a large number of temporary workers from all over the country, as well as computers and other resources and systems needed to rapidly disburse project funds. Compensation in cash was highly valued by beneficiaries, and Bank support for project expenditures was rapid. Quick action by the Bank undoubtedly made a major contribution to the government's ability to respond quickly with social protection payments.

The Bank's Experience with Reallocating Funds

7.27 In an attempt to provide immediate assistance, the Bank often reallocates funds from ongoing projects since it is the quickest method of funding disaster response. Each of the projects[48] involved reallocated funds in some way – some received and some provided. The Erzincan project was amended twice to reallocate undisbursed funds to two subsequent disasters – mudslides in Senirkent in July 1995, and again for flooding and landslides in Sütçüler in November 1995. When the TEFER project was prepared, with the exception of funding destined for institutional development from Erzincan which was reallocated, the notion of responding to the disaster by reallocating funds from existing projects was rejected because the level of resources that could be freed was inadequate and the nature of the problem required sustained attention to design. However, in the midst of project preparation, in June 1998, an earthquake struck near Adana in the southern part of the country. A response to this, in the form of a 5,000-unit housing project, was added to the project under preparation. When the Marmara earthquake struck, the response of the government and the Bank included an immediate reallocation of $267 million from eight ongoing projects (including TEFER) for the reconstruction of the Marmara region.[49] About 17 percent of the original TEFER loan amount ($62.5 million) was reallocated for housing construction in one of the affected towns, Adapazari,[50] as well as to provide technical assistance. Once again, the institutional restructuring component (originally from Erzincan now from TEFER) was redirected to the next Bank-funded disaster project.

7.28 Looking back on the project experience with reallocation, staff involved remarked that, in the case of disaster, new financing tends to be used more effectively. It is used in ways that are more likely to be well designed and more attention is given to the institutional

48. The first four listed in Table 2. ISMEP is a mitigation project that has not yet been approved.
49. The eight existing loans were: Turkey Emergency Flood and Earthquake Recovery Project (Loan No. 4388-TR); Road Improvement and Safety Project (Loan No. 4048-TR); TEK Restructuring Project (Loan No. 3345-1 –TR); National Transmission Grid Project (Loan No. 4344-TR); Employment and Training Project (Loan No. 3541 –TR); Basic Education Project (Loan No. 4355-TR); Primary Health Care Services Project (Loan No. 4201-TR); Health II Project, (Loan No. 3802-TR).
50. For housing in Adapazari.

structure. The best results seem to occur when such projects are managed by special disaster units that are authorized to make decisions, and are charged with responding quickly. When careful plans made for funds are suddenly abandoned and the same staff that helped to design the original plans are expected to direct activities tied to the emergency, suboptimal results should not be a surprise.

8. Medium Term Issues

8.1 In the medium term, the Bank constructed housing, shops and businesses, hospitals, municipal and rural infrastructure. These were of high quality and constructed in a timely manner. The less tangible social aspects of projects, such as the creation of owners and users associations, which are essential for sustainability, received too little attention.

Housing – Urban and Rural

8.2 In Turkey, earthquakes cause extensive damage to housing units. 450,000 buildings have suffered heavy damage over the last century. Turkey's response is governed by the 1959 Disaster Law #7269. The law commits the government to provide replacement units for every family that lost their home in an earthquake. The precedent for compensating earthquake victims with new housing was set following a 1959 earthquake, when the provisions of the Disaster Law were codified. Building housing following that earthquake was a relatively easy task, given the small scale of the 1959 disaster. However, full replacement became more and more difficult to replicate in subsequent disasters, given the increasing number of victims.

8.3 All of the infrastructure projects had an element of housing. Erzincan financed the building of 2,183 houses, TEFER built 4,000 houses in Adana and 1,000 in Çehan, MEER built 12,008 houses.

8.4 All three projects built urban and rural housing. In the urban areas Bank financing led to multi-family housing built in very large numbers to remarkably high standards.[51] The Erzincan, TEFER, and MEER projects all built multi-story, multi-block housing complexes with 80-square-meter, two-bedroom units, on sites 10-20 minutes from the nearest urban center. Each unit cost approximately $20,000. While the housing design might be criticized for lack of variety, the construction is of good quality. The approach to housing designs was refined from one project to the next, but remained similar in all projects. For example, the PIU improved upon the somewhat problematic Erzincan roof design when putting together the TEFER project. Likewise, for the MEER project, building designs took into account the cool-damp climate of the Marmara region by introducing pitched roofs to enable more effective water proofing and insulation, heater exhaust vents, enclosed stairways, wall insulation, and double-glazed windows. In the rural areas, families were allowed to select from a number of approved designs and build or contract the construction on their own, learning seismic-resistant techniques in the process.

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51. These generally consisted of multi-story, urban housing blocks with two-bedroom, 80 sq m units. Traditionally, an average of 77 net square meters is considered an acceptable standard, according to the TEFER PAD.

Many Beneficiaries of Housing Refused the Facilities They Were Offered

8.5 Why were the percentages of disaster victims in project-built housing so low? One of the causes of non-occupancy of dwellings was that the allocation of the houses did not consider the conditions of the beneficiary's previous dwelling or his lifestyle, income, or habits. This caused conflicts among people coming from diverse backgrounds. TEFER- and MEER- qualified housing beneficiaries participated in focus groups where they were asked to speak about the low up-take of the units. [52] They reported that the major reason that beneficiaries had not moved to the assigned house was that they did not want to leave their original neighborhood. Beneficiaries reported a strong preference for rebuilding their own damaged houses, rather than moving to the assigned houses in new neighborhoods.[53] Moving meant dissolving social networks that often had generations of history. The exercise found that another reason families refused to move in was because they did not have the money to pay deposits for the water and electricity hookup. Others opted to turn their eligibility into an income stream: they rented out their unit and lived in a less expensive location. In Adana, rents are paid for a year or two in advance. Some of the beneficiaries had already rented a house and could not afford to move out when their permanent housing was completed.

8.6 The project-sponsored beneficiary survey found that people who did move liked the houses and thought that the space provided was adequate for small families. They also appreciated the ample space for parking and the daylight in the units.

8.7 One of the main variables affecting people's decision to move in, according to the survey, was the type of house a given beneficiary had before the earthquake. Those who had previously been living in an apartment were more inclined to move into the houses provided. Also, it was found that the poor were less likely to move into the houses because of larger family size. In the post-disaster context, it proves important, especially when targeting the poorest, to offer a variety of housing options. The fact that facilities were refused for various reasons does not, however, mean that the projects should have built bigger units. Such expansion could be unsustainable not only from a financial standpoint, but also from an urban planning viewpoint.

8.8 Unused housing was almost non-existent in the rural housing component. In the rural housing component implemented in the MEER project, the government gave 562 participating beneficiaries (out of a total of 1,377 identified potential beneficiaries) funding and training in seismic-resistant building techniques, and allowed them to select from among a number of pre-designed earthquake-resistant plans to build or contract the construction on their own house. Additional funding came, subject to the meeting of certain criteria (excavation completed, foundation completed, etc.). Though the OED mission observed that the houses were built much stronger than likely necessary, the approach was successful in creating carefully and safely built homes to house the victims, in situ. Additionally, the plans

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52. Strateji/Mori Research and Planning Ltd. Co. "Evaluation of TEFER Housing Project in Adana and Çehan and Public Participation for Reconstruction of Housing Under MEER."

53. This would not be desirable in cases where housing is in a high risk zone. There is often a tendency for others to occupy the unsafe land once the original occupants have been relocated, however, defeating the purpose.

allowed for later, vertical, expansions. There is a consensus that the urban housing components could have benefited from a more owner-driven approach.

Shops, Businesses, and Barns—Cases of "Changed Use"

8.9 Following the Marmara earthquake, in Golçuk, the MPWS provided space in town for shops and businesses, which are now full. The shops and businesses located within the MEER housing sites outside of town are empty, however. The use and disuse of the shops and businesses built by the Erzincan and MEER projects suggest a number of important lessons.[54]

8.10 Both projects suffered a similar problem in that the stores, shops, and offices were constructed in numbers that vastly exceeded demand. Moreover, the beneficiaries were often uninterested in the spaces offered because of the location (far from their original shop, and far from the city center).[55] Or they were unable to return to their original businesses because the type of facility they were offered did not correspond to their trade. For example, a tire repair shop owner might get a second-story unit, or a newspaper seller might not have curbside frontage. No allowance was made for the reintroduction of unused units into the market after a period of years. This led to commercial areas with low customer traffic due to the number of unused units.

8.11 Staff reported that many unused shops and business areas will be converted into classrooms and turned over to local institutions of learning. Another situation of "changed use" was encountered in Erzincan. The cow barns constructed for farmers turned out to be too poorly insulated for cattle to survive in them through the winter without a heating system (which was not economically sustainable). They were subsequently converted to storage sheds, or provided with heat and used as homes, and in at least one case, a restaurant.

Social Issues Received Sufficient Attention Except in Housing and Shops Components

8.12 Oktay Ergunay and Mustapha Erdik, longtime Turkish disaster experts, noted the importance of addressing the social aspects of emergencies over 20 years ago, "The objective of permanent housing should not be the provision of fast shelter, but rather, should be socio-economic rehabilitation of the recipients."[56]

8.13 Projects initially lacked coordination of social and site needs with the main construction program. Multifamily housing in Erzincan, TEFER, and MEER was created without the legally required management committees to see to maintenance of the commons (including heating, public lighting, grounds, and repairs). Subsequently, it was realized that landscaping, parking, and play places were important elements to the design. Existing

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54. Though the shops and businesses component of the MEER project was funded in parallel by the European Investment Bank (EIB), it is included in the discussion because of the potential lessons it contains.
55. Likewise, some shop owners that did not lose their shops but lost their homes did not take up the opportunity for housing because they could not stay near their business.
56. O. Ergunay (Head, Division of EQ research in the MPWS), and M. Erdik, "Disaster Mitigation Program in Turkey," International Conference on Natural Hazard Mitigation Program Implementation, 1984, 177.

already in the MEER project, they will be added to the TEFER housing sites.[57] Similarly, scores of commercial structures with hundreds of offices and stores were left to fend for themselves with no organizational structure created to cover monthly operating costs and maintenance. The problems have been redressed, to a varying extent, in each follow–on project, however.

8.14 This is not to say that no attention was paid to social issues during the projects. They were taken more into account in the two more recent projects. The Cash Transfer project addressed vulnerability without building any physical works. In the MEER project a social scientist helped site engineers and local officials develop communication and consultation programs. Social scientists helped to promote participation in the rural housing scheme. And families affected by land expropriation were identified by a targeted study. Public information campaigns were set up for health services, and to inform the public about damage assessments.[58] Local officials charged with assessing damage were provided training on how to communicate effectively with the public. A special public information campaign was conducted disseminating building codes and related requirements.

9. Long Term Issues

9.1 Mitigation works need time. Vulnerability reduction depends on political will. Creating a disaster insurance capacity requires nearly simultaneous actions by legislative branch and the private sector. Since the Marmara earthquake, there seems to be a movement from physical preparedness (e.g., seismically resistant construction, anti-seismic construction norms) to social and self-preparedness (the "Self-protecting community approach").

Institutions for Disaster Management Developed over the Course of many Years

9.2 Subsequent to the Erzincan project, the TEFER PAD recognized "while quick response to disaster is important, it is equally important to identify underlying problems in the policy and institutional environments, and determine how to resolve them in ways that result in long term sustainable solutions to managing the risks of natural disasters."[59]

9.3 Though it has taken about 13 years, institutional capacity for natural disaster management has improved since the Erzincan earthquake struck in 1992. With persistence, gains have been made – disaster insurance is now in place, with over 2 million insured; TEMAD has been formed and is taking root; the PIU has done an outstanding job of implementing reconstruction and mitigation works since its beginning in 1992; and the MEER project is breaking new ground, bringing stakeholders together to discuss urban development legislation; among other things.

9.4 The Bank took advantage of the window of opportunity following disaster to initiate organization for disaster mitigation by adding it to emergency reconstruction efforts. Judging from the experience across these projects, implementation of institutional development plans

57. Using MEER project funds.
58. An adult trauma program was also part of the MEER project.
59. TEFER ICR, 3.

were not the top priority, however. Successive attempts at creating an institutional capacity to manage and prevent natural disasters foundered, and looking at the institutional development achievements of each project, in isolation creates a bleak picture. Incomplete institutional development components were passed from one project to the next, starting with the largely untouched institutional development component in the Erzincan project. The responsibility for continuing this component was passed on to TEFER. One year after TEFER startup, the occurrence of the Marmara earthquake sidetracked the institutional restructuring planned under TEFER. The institutional development aspect of the TEFER project was transferred to the MEER project and made more comprehensive.

9.5 As a result of Bank and PIU persistence, there is now a newly created and MEER project-supported Emergency Management Directorate, TEMAD. Its responsibility is to act as the central coordinating body for prevention and preparedness. In this capacity, it is also responsible for monitoring and evaluating the preparation of short-term and long-term disaster mitigation plans of governmental agencies and departments. With respect to response, it is responsible for conducting resource coordination activities, and for coordinating the receipt, protection, and transportation of relief supplies.[60]

9.6 TEMAD has had a difficult time getting started, but the PPAR mission observed that it is gaining traction. After long delays, it is acquiring critical equipment and strengthening its capacity to coordinate response to natural disasters. It has also shown recently that it is capable of aiding neighboring countries following disasters, as well as organizing international response and coordination training.

9.7 A PIU was set up in the HDA to oversee the implementation of the first project, Erzincan. At first, as any new organization, there was a certain amount of learning that needed to take place. The group learned with time, and has since implemented many disaster projects for the Bank, as well as other donor organizations. The PPAR mission consistently found that this group is highly regarded for its high technical and professional standards, and has done an outstanding job with disaster-related projects, thanks to their high energy and hard-earned knowledge.

Bank Attention to Mitigation Is Increasing on Many Fronts

9.8 Scientists anticipate that the regions of Istanbul and Izmir are in danger of being hit by several earthquakes in the relatively near future. Finding a way to get mitigation in place quickly is obviously a topic of utmost importance. To this end, Bank projects have funded a number of ways of mitigating the effects of future events. For instance, the Bank has

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60. In addition to TEMAD, Turkey has several entities that play varying roles in disaster prevention and response (see Annex D for a full outline). In the event of a crisis, the Prime Ministry Crises Management Center manages coordination among the military and other associated ministries. The General Directorate of Civil Defense takes care of the immediate response and rescue responsibilities. Other actors in the response phase are the General Directorate of Turkish Red Crescent, the Ministry of Defense/General Staff, the Ministry of Health, and the Ministry of Foreign Affairs. Provincial and local governments also play a role in the response and relief phase. Following the response/relief phase municipalities undertake reconstruction work, using funds provided by the central government. The General Directorate of Disaster Affairs, in the MPWS deals primarily with recovery, conducting damage assessments and resettlement/reconstruction for victims.

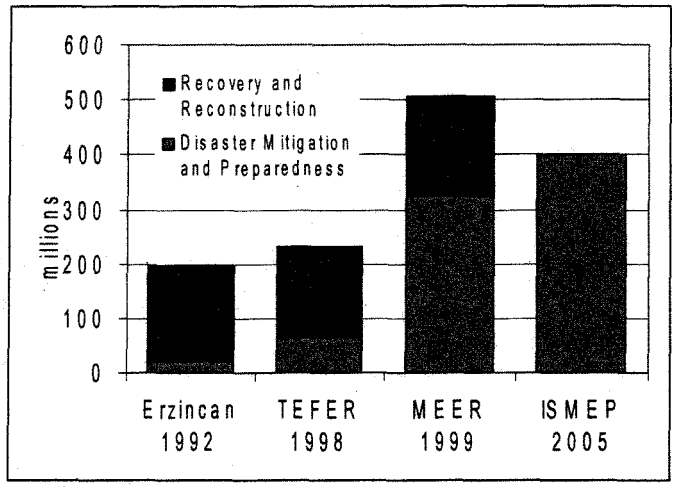
supported the development and functioning of a disaster insurance program in the country that will help provide additional liquidity in the event of a disaster. The Bank has funded structurally sound, earthquake resistant multi-family housing in urban areas, and steel reinforced concrete homes in rural areas, the designs of which have been vetted over the course of several loans. In flood-prone areas, as in Senirkent and Sütçüler, the Bank has funded construction of flood control systems and afforestation, all of which has contributed to mitigating the effects of natural hazards.

9.9 The Bank has led by example. Vulnerability has been reduced by having built good-quality housing. As well, the housing will serve as an example for other new housing. The mayor of one town remarked that he could now use the Bank-funded housing project as an example when in negotiations with developers "so they will build their works as safe and as pleasant as these."

9.10 The Bank is taking a long-term approach to disasters in its current work in Turkey. The ISMEP project, which will invest $400 million in preparing the country for future disasters, is scheduled for approval in June 2005. This 5 year Sector Investment Loan (SIL) focuses 100 percent on mitigation is in the project approval stage. The project will initiate a process that aims at transforming Istanbul in the next 10-20 years into a city resilient to major earthquake. The overall goal of the project is to save lives and reduce the social, economic, and financial impacts in the event of future earthquakes. The specific objective of the project is to improve the city of Istanbul's preparedness for a potential earthquake through enhancing the institutional and technical capacity for disaster management and emergency response, strengthening critical public facilities for earthquake resistance, and supporting measures for better enforcement of building codes.

9.11 Bank support for natural disaster mitigation measures has increased steadily from project to project (see Figure 3).

Figure 3: A larger proportion of Bank project funds has been spent on mitigation in each subsequent project



Disaster Insurance Scheme Has Taken Initial Hold

9.12 The concept of disaster insurance is relatively new to Turkey.[61] A disaster insurance scheme has been initiated, along with changes in legislation (building codes, disaster law), to lessen the burden of future disasters on the government.

9.13 The idea of starting an earthquake insurance scheme was first explored in the Erzincan project. The project included funding for a study to explore the feasibility of a disaster insurance system for the country. The subject was pursued again in TEFER, beginning in 1998. The TEFER project carried out an investigation that determined that the financial policy of the government was not conducive to the success of an insurance scheme. The resultant study clarified the issue and the shortcomings of the situation, yet did not define the changes necessary for the success of an insurance scheme in the country.

9.14 Almost 10 years after the Erzincan disaster, a compulsory insurance scheme finally took hold, with support from the MEER project and the establishment of the TCIP. The principal development objective of the Disaster Insurance Scheme sub-component of MEER was to support the Government Earthquake Insurance Program with the view of establishing and expanding national catastrophic risk management and risk transfer capabilities. To do so the sub-component created an insurance mechanism to make liquidity readily available to tax-paying owners of residential dwellings destroyed or damaged by an earthquake for the purpose of their repair or replacement; reduce government fiscal exposure and the risk to the national economy due to major earthquakes; ensure the financial solvency of the Insurance Pool after all but the most catastrophic of events, such as those in excess of the Marmara earthquake; and reduce government financial dependence on the Bank and other donors' financial assistance in the aftermath of major earthquakes.

9.15 The original proposal amounted to $273 million in assistance to finance two major activities: (i) technical assistance to the General Directorate of Insurance (GDI) in establishing catastrophic insurance pool (TCIP) and ensuring its operational efficiency and financial soundness for the first five years of its existence; and (ii) initial capitalization of TCIP through a contingent loan facility.

9.16 The insurance costs on average, one lump sum payment of $46.[62] Payment of this sum will insure the bearer for a full year, and must be renewed. To purchase insurance, one needs to own a house and pay real estate taxes. Public awareness of the benefits of the insurance is key to expanding the system. The bearer must realize that in the event of a disaster, the government would pay out perhaps only half of what an insurance company would pay out, making the $46 payment more apparently worthwhile. Given that the government has a long history of paying for relief and rehabilitation following disasters, the apparent incentive to pay for disaster insurance is low. It would be difficult for the government to change its assistance policy in the wake of a disaster. For insurance to catch on, homeowners would

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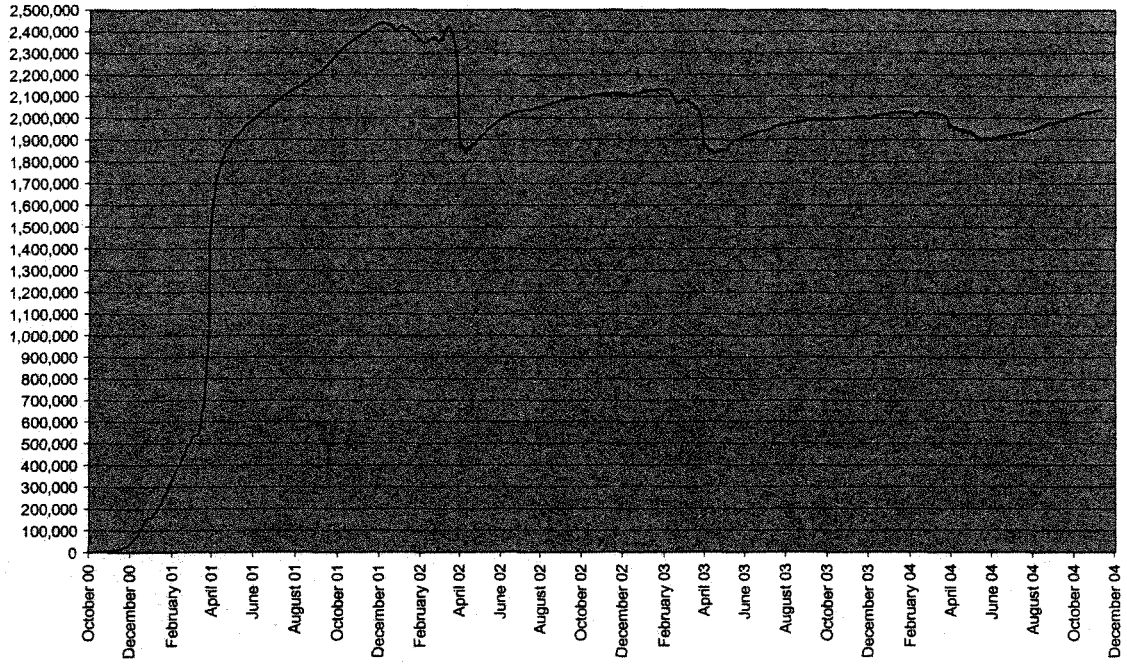
61. Since 1992, house insurance in Turkey has been mandatory – but it only applies to new owners when they buy property. A government proposal to hold contractors responsible for construction quality was reversed by the High Court. http://www.ifrc.org/publicat/wdr2002/chapter5.asp

62. Insurance premiums vary according to a risk map which divides the country into 5 risk levels. Each level pays a premium commensurate with its level of risk.

need to be aware of how the payout to the insured would measure up to government assistance to those not purchasing insurance in order to make an informed investment.

9.17 On average, 15 percent of the 13 million eligible homes in Turkey are insured. In the Marmara Region, this figure reaches 25 percent. Those currently insured are so insured because of the project, and they are in reinforced housing and are less likely to be in the group suffering damages in the event of another disaster. The total number of policies in effect over time is shown in Figure 4.

Figure 4: Total Number of Disaster Insurance Policies in Effect



9.18 The graph indicates that the first year (soon after the Marmara earthquake) the TCIP sold reached the 2,400,000 policies mark. However, the number of policy holders dropped sharply to 1,800,000 soon thereafter when the government declared that it would help all people living in the disaster area without differentiating between insured and uninsured victims. Hence, people did not see the need for an insurance policy. Subsequent drops in the numbers (April 2003, June 2004) were due to similar shocks.

9.19 Additional ways of increasing coverage, include:

- *Make it compulsory.* The existing disaster legislation could be amended to require insurance enrollment when homeowners are applying for gas, telephone, and electricity.
- *Improve incentives.* Political will is required to address the contradiction between the insurance and Disaster Law #7269, which provides for full replacement of disaster victims' housing in the event of a disaster.

- *Address the squatter and code compliance problems.* If a house is illegal because it is on someone else's land, it is difficult to insure. And many houses are illegal for other reasons – some have proper original designs, but owners make changes to approved plans during construction. Some are built properly, but never acquired a building permit. And so on.
- *Set insurance premiums high enough.* While the idea is to attract policyholders with low premiums, the reality must be sustainable. People then expect that the premium will always be so low, making it difficult for the industry to raise the rates enough to support itself through time. This has happened in Bank experience (India). However, measures have been taken in the case of Turkey, including government upgrade of the premium to a secure level on a one-time basis, removal of rate-setting responsibility from Parliament, and indexing of the newly strengthened rates to an independent construction price index issued by the MPWS.

10. Lessons

10.1 The following lessons arise from both the experience of individual projects responding to natural disasters in Turkey and from the collective experience of the four projects over time.

Bank involvement during the emergency phase can be highly beneficial.
Expeditious cash support proved valuable to disaster victims on an individual financial and psychological level as well as on a macroeconomic level. A cash transfer project, while risky if continued for the long term because of the potential to create dependency, can be a useful means to providing stability and safety to victims. The Cash Transfer project provided support to victims in a time of intense need. The promptly provided support enabled people to survive, put funds into the economy, and was reported as highly preferable to in-kind support by beneficiaries.

The Bank needs to develop a clearer understanding of which aspects of emergency response can be rushed, and which cannot.
Analysis of the projects reveals a need to get on the ground quickly, but then take the necessary time to prepare. The prompt fielding of Bank teams enabled more effective donor coordination, which proved useful to the Government of Turkey in organizing funding for the recovery effort. However, quickly prepared plans for reconstruction met with huge delays. More time spent in the design phase could be afforded and might be time well spent. An emergency creates pressure to opt for speed at the expense of detail, yet it is the details that determine the outcome of a project. Taking the time to develop a finer textured design could have lessened a number of problems.

Greater accuracy of damage assessments is still needed to avoid unnecessary construction.
Although there has been progress, and the Marmara response had the most comprehensive damage assessment of any of the projects, more precise estimates of public and private infrastructure requirements would lead to significant (financial and social) cost savings and a faster return to normality.

Addressing the social and economic recovery aspects of emergency projects, although difficult, is critical for the sustainability of the reconstruction investments.
The Bank has a long and positive experience in terms of the execution of physical components of projects – the physical design of the housing in Erzincan, TEFER, and MEER is appropriate and of good quality. The failure to create legally required social organization necessary for upkeep and decision-making in the housing areas caused problems, however. Although considerable learning took place from one project to the next, incorporating lessons learned from a number of studies, and involving social scientists in the project process, creating the necessary sustainable users organizations to manage infrastructure remains an unsolved challenge. Creating a capacity for maintenance is often as critical to long-term vulnerability reduction as the quality of the initial construction.

Reducing vulnerability to earthquakes requires different approaches for rural and urban areas.
For rural areas, project approaches that were notably successful and worthy of replication in future projects include:

- Incorporating seismic-resistant building training into the rural housing component
- Linking payments to easily definable construction progress
- Rebuilding in situ

For urban areas, successful strategies include:

- Preserving pre-disaster social networks, proximity to jobs.
- Promoting policies that favor the creation of markets, shops, and related commercial development and services.
- Fostering stable urban communities by creating a safe space for parents and children (playgrounds, parks, sports fields). Likewise, basic site amenities such as landscaping, parking, erosion control/adequate drainage, contribute to a positive environment.

For both rural and urban areas:

- Providing a reasonable range of design options to cover differences in family size and occupations.
- The creation of a sense community and of trust contributes to infrastructure maintenance, and even community survival.

CASs in disaster prone countries should thoroughly address disaster risk.
Given that each project notes that a disaster of that magnitude was not anticipated in the CAS, there appears to be room for increased anticipation of disasters in the CAS, and better overall preparedness on the part of the Bank. With the frequency of disasters in Turkey, they should not be treated as an unexpected interruption of business as usual. Bank task managers need guidance on recovery strategies, expedited contracting procedures, and disaster-resistant design criteria when responding to large emergencies. The scale of urgently needed construction in the immediate post-disaster context can be expected to exceed governmental management capacity at the outset.

Creating New Disaster Management Institutions takes more time than is available under one project.

Although it was anticipated that Bank involvement in Erzincan would help to prevent the recurrence of similar damage in the future by increasing capacity for hazard mitigation, such a goal proved impossible to obtain in one project cycle. As it turns out, in Turkey institutional development took place slowly across many years and several projects. During the period when emergency reconstruction needs are high, institutional development issues can be neglected. Focus is on getting people housed. Nevertheless, through the implementation of several projects, the idea of preparedness has taken root, and become a topic of discussion. Turkey's focus is moving from crisis management to disaster preparedness.

Cash Transfer projects can make an extremely important contribution to recovery.
Lessons from the one experience are:

- It was possible to effectively and accurately administer emergency cash transfers on a large scale.
- Using institutions with cash transfer experience, and that already have the necessary human resources and management systems in place, was critical to smooth delivery of the assistance program.
- Getting cash support to victims quickly, positively affected the economy and perhaps even affected people's sense of safety and security. It was a prominent first sign of the government's support in a time of acute need.
- The process was streamlined by SSF staff, volunteers, other government agencies, and NGOs worked together. In one project site, application processing, bank account creation (for allowances), and result notification were combined into one procedure.
- Because cash transfer runs the risk of creating dependency, public awareness campaigns are required that make clear up front the number of months that payments will be made. When beneficiaries know this, they can make informed resource allocation decisions. Otherwise, going month to month without clear information on the duration of payments can lead to dependency beyond the short-term.

Beneficiary knowledge was not adequately valued or used.
The barns, though well built, are not being used to house animals because the engineers who designed them did not realize how cold the winters were in Erzincan. In Sütçüler the waste water treatment plant was not wanted by the municipality, which refused to cover its operating costs or to staff it. While it may have been the lowest cost technology to build, maintenance costs could not be covered by local funding.

Overestimating infrastructure needs can lead to major social problems.
Each post-disaster assessment process was significantly flawed. All the projects that built new infrastructure significantly surpassed the existing demand. There is an incentive for agencies to overestimate because allocating surplus units provides rent and other benefits. Before that can happen, however, overestimation of beneficiary needs led to empty units, smashed glass, broken doors, looting, and a succession of social problems associated with crime and insecurity. The shops and businesses need a low-crime environment and a critical mass of functioning units to become successful as a mall. With too many units built, the concentrations of businesses were low, thus taking away from the success of the whole.

References

Akgiray, V., Barbarosoglu, G., and Erdik, M. "Lessons Learned in Dealing with Large-Scale Disasters." General Secretariat, Advisory Unit on Multi-Disciplinary Issues, Organization for Economic Cooperation and Development, 16 September 2003.

Anderson, Mary B. and Woodrow, Peter J. *Rising from the Ashes: Development Strategies in Times of Disaster.* (Boulder: Lynne Reinner Publishers, 1998).

Cuny, Frederick C. *Disasters and Development.* (Oxford: Oxford University Press, 1983).

Ergunay, O. and Erdik, M. "Disaster Mitigation Program in Turkey." International Conference on Natural Hazard Mitigation Program Implementation, 1984.

Guha-Sapir, D. Hargitt, D. and Hoyois, P. *Thirty Years of Natural Disasters 1974-2003: The Numbers.* Center for Research on the Epidemiology of Disasters, (Brussels: UCL, 2004).

Harrald, John R., Tanali, Irmak Renda, and Perkins, Jeanne B. "The Collection, Synthesis, and Quality Assessment of Data Describing the Response to Human Needs Following the 1999 Turkey Earthquakes." (Washington, D.C.: The George Washington University) http://www.seas.gwu.edu/~icdm/Turkey_Report.htm

Ozdemir, Ozlem; Ewing, Bradley T.; and Kruse, Jamie B. "Disaster Losses in the Developing World: Evidence from the August 1999 Earthquake in Turkey," Turkish Economic Association Discussion Paper 2004/19.

Price, Waterhouse, Coopers. "Emergency Earthquake Recovery Loan International Bank for Reconstruction and Development Operational Risk Assessment Project." (Istanbul: Price, Waterhouse, Coopers, 2000).

Price, Waterhouse, Coopers. "Social Solidarity Fund Report on Strengthening of Information Systems and Operational Activities." (Istanbul: Price, Waterhouse, Coopers, 2001).

Strateji/Mori Research and Planning Ltd. Co. "Evaluation of TEFER Housing Project in Adana and Çehan and Public Participation for Reconstruction of Housing Under MEER." (Ankara: Prime Ministry Project Implementation Unit, September 2000).

UN ReliefWeb. "Recent Natural Disasters in Turkey: An Overview of the National Technological Capacity and Its Utilization," http://www.reliefweb.int/rw/rwb.nsf/AllDocsByUNID/c66fdb0e7c9d170d8525693f00574c42, 02/09/05.

Annex A. Basic Data Sheets

ERZINCAN EARTHQUAKE REHABILITATION AND RECONSTRUCTION PROJECT (L3511-TR, ERZINCAN)

Key Project Data *(amounts in US$ million)*

	Appraisal estimate	Actual or current estimate	Actual as % of appraisal estimate
Original commitment	285	201.7	70.8
Total cancellation	0	83.3	29.2
Total project cost	650	201.7	31.0

Project Dates

	Original	Actual
Departure of Appraisal Mission		04/19/1992
Board approval		07/23/1992
Effectiveness	09/18/1992	09/18/1992
Closing date	06/30/1996	06/30/2000

Staff Inputs (staff weeks)

	Actual/Latest Estimate	
	N° Staff weeks	US$('000)
Preappraisal	34.2	95.3
Appraisal/Negotiation	35.4	105.6
Supervision	233.0	420.0
Total	302.6	620.9

Mission Data

	Date (month/year)	No. of persons	Staff days in field	Specializations represented[1]	Performance Rating	
					Implementation Progress	Development Objective
Identification/ Preparation	04/92	6		1 E, 1 RS, 1 H, 1 WS, 1 S, 1 PD		
Appraisal	06/92	4		1 E, 1 F, 1 P, 1 E		
Supervision	08/92	2		1 E, 1P		
	09/92	1		DP		
	11/92	2		1 E, 1 P		
	09/93	3		1 FMS, 1 E, 1 P		
	06/94	2		1 FMS, 1 E	S	S
	12/94	2		1 FMS, 1 E	S	S
	02/95	2		1 FMS, 1 E	S	S
	10/95			E	S	S
	07/97	2		1 FMS, 1 E	S	S
	10/98	2		1 FMS, 1 Engineer	S	S
	06/99	1		1 E	S	S
	06/00	2		1 FMS, 1 E	S	S

DP=Disaster Prevention, E=Engineer, EC=Economist, F=Financial Specialist, H=Housing Specialist, P=Procurement Specialist, PD=Post-Disaster Specialist, RS=Reconstruction, S=Seismic Expert Specialist, WS=Water & Sanitation Specialist

TURKEY EMERGENCY FLOOD AND EARTHQUAKE RECOVERY PROJECT (L4388-TR, TEFER)

Key Project Data *(amounts in US$ million)*

	Appraisal estimate	Actual or current estimate	Actual as % of appraisal estimate
Total project costs	685	239.8	35
Loan amount	369	191.0	52
Cofinancing		0	
Cancellation		120	

Project Dates

	Original	Actual
Board approval		09/10/1998
Effectiveness		10/13/1998
Closing date	6/30/2002	09/30/2003

Staff Inputs (staff weeks)

	Actual/Latest Estimate	
	N° Staff weeks	US$('000)
Supervision	332.6	1330.7
Other (ICR)	8.0	32.6
Total	340.6	1362.7

Mission Data

	Date (month/year)	No. of persons	Specializations represented[1]	Performance Rating	
				Implementation Progress	Development Objective
Supervision	5/19/1999	5	1 I, 1 I, 1Ecs, 1 INF, 1 HC	S	S
	5/01/2000	3	1 TL, 1 A, 1 U	S	S
	8/30/2000	6	1 TL, 1 HE, 1 INFE, 1 P, 1 PS, 1 TM	S	S
	10/10/2000	3	1 TAL, 2 COMP	S	S
	6/01/2001	2	1 TL, 1 DM	S	S
	10/12/2001	2	1 TL, 1 SS	S	S
	4/12/2002	13	1 TL, 1 HE, 1 FW, 1 SEG, 1 ERM, 1 HU, 1 HR, 1 FM, 1 PO	S	S
	11/20/2002	13	1 TL, 2 DI, 1 FP, 1 SS, 1 ES, 1 IPP, 1 HU, 1 PO, 1 FM	S	S
	04/25/2003	8	1 TL, 1 SS, 1 HU & HR, 1 PS, 1 FM, 1 FDI, 1 O	S	S
	9/14/2003	6	1 TL, 1 SS, 1 PS, 1 FM, 1 O	S	S
Completion (= to ICR?)	9/14/2003	6	1 TL, 1 SS, 1 PS, 1 FM, 1 O		

A=Architect, COMP=COMP B4A Per Aide-Mem., DI-Disaster Insurance, DM=Disaster Management Specialist, ECs=Senior Economist, ERM=Emergency Management, ES=Environmental Safeguards, FDI=Flood Defense Infra., FM=Financial Management, FP=Flood Prot Infra./Warn, FW=Flood Warning, HC=Housing Construction, HE=Hydraulic Engineer, HR=Rural Housing, HU=Urban Housing , I=Insurance Specialist, INF=Infrastructure, INFE=Infrastructure Expert, IPP=Inst. Pilot Projects, O=Operations, P=Procurement, PLS=Planning Specialist, PO=Procure/Off-site Infrastructure, PS=Procurement Specialist, SEG=Social & Environmental Safeguards, SS=Social Safeguards, TAL=Task Leader, TL=Team Leader, TM=Technical Manager, U=Urban Specialist.

MARMARA EMERGENCY EARTHQUAKE RECONSTRUCTION PROJECT (L4517-TR, MEER)

Key Project Data *(amounts in US$ million)*

	Appraisal estimate	*Actual or current estimate**	*Actual as % of appraisal estimate**
Total project costs	1795.5		
Loan amount	505		
Cofinancing	348.65		
Cancellation			

Project Dates

	Original	*Actual*
Board approval		11/16/1999
Effectiveness	11/30/1999	12/29/1999
Closing date	05/31/2005	Current revised: 05/31/2006

*No actuals yet. Project close scheduled for 05/31/2006.

EMERGENCY EARTHQUAKE RECOVERY PROJECT (L4518-TR)

Key Project Data *(amounts in US$ million)*

	Appraisal estimate	Actual or current estimate	Actual as % of appraisal estimate
Total project costs	252.53	252.53	100
Loan amount	252.53	252.53	100
Cofinancing	0	0	
Cancellation	0	0	

Project Dates

	Original	Actual
Initiating memorandum		
Negotiations		
Board approval		11/16/99
Signing		
Effectiveness	11/23/99	12/14/99
Closing date	12/31/2000	03/31/2001

Staff Inputs (staff weeks)

	FY99	FY00	Total US$ ('000)
Preappraisal	18.88		59.0
Appraisal/negotiation	14.15		45.0
Supervision		6.95	25.0
Other			
Total	39.98		129.0

Mission Data

	Date (month/year)	No. of persons	Staff days in field	Specializations represented[1]	Performance rating	
					Implementation Progress	Development Objective
Identification/ Preparation	10/99	15		6 EC, 2 FM, 3 FA, 2 PS, 1 Counsel, 1 D		
Appraisal	10/99	15				
Supervision	5/2000	6		3 EC, 1 FM, 2 FA	S	S
	10/2000	4		2 EC, 1 FM, 1 FA	S	S
Completion	3-4/2001	2		1 EC, 1 F		

C=Counsel, D=Disbursement Officer, EC=Economists, F=Financial Specialist, FM=Financial Management Specialist, FA=Financial Analyst, PS=Procurement Specialist

Annex B: Project Objectives Chart

Erzincan	TEFER	MEER	EERL	ISMEP
To assist the Government in carrying out its 1992-95 emergency reconstruction program for the Erzincan region through **Reconstruction** (i) rehabilitation and reconstruction of the areas affected by the earthquake, and **Prevention/mitigation** (ii) development and implementation of seismic risk prevention and mitigation measures.	To assist the Government of Turkey in: **Reconstruction** ***Infrastructure*** a) restoring basic infrastructure in municipalities and rural areas affected by the flood by repairing structures and facilities of economic and social importance ***Housing*** b) providing assistance to restore housing in the earthquake affected Province of Adana; and **Prevention/mitigation** c) reducing vulnerability to future floods and earthquakes.	1. Help restore the living conditions in the region of Turkey that was affected by the August 17, 1999 Marmara earthquake, 2. Support economic recovery and resumption of growth, and 3. Develop an institutional framework for disaster risk management and mitigation.	1. Assist the Government of Turkey to respond quickly and effectively to the impact of the Marmara earthquake which hit on August 17, 1999. 2. Help ensure that the following social protection payments to earthquake victims were made to all eligible beneficiaries: a. "Repair allowance" paid by the Social Solidarity Fund (SSF) b. "Accommodation allowance" paid by the SSF c. Lump-sum death and disability payments made by the SSF, and d. Workplace allowance (for damaged or destroyed workplaces) e. Payments made by the three social insurance funds (SSK, Bag-Kur and ES) for death benefits, survivor pensions and disability pensions which are attributable to the earthquake. 3. Assist the Government to keep its economic reform program on track. *New objectives:* In the course of the EERL, another objective emerged	Initiate a program that aims to transform Istanbul in the next 10-20 years into a city resilient to major earthquakes. The project will contribute to saving lives and reducing the social, economic and financial impacts in the event of future earthquakes. This is expected to be achieved through: 1. Enhancing community awareness and training, and the institutional and technical capacity for disaster management and emergency response in the Istanbul region 2. Retrofitting critical public facilities, such as hospitals, clinics, schools, emergency response centers, etc. for better earthquake resistance; and 3. Supporting innovative approaches on a pilot basis to strengthening private housing, to building code enforcement, and to seismic retrofitting through research and test application.

			(although the objectives were not formally revised). This new objective was to improve the capacity of Turkish institutions--especially the SSF--to respond to future emergency situations by providing cash benefits. This goal emerged as the project team identified ways improvements could be made in the capacity of Turkish institutions to handle a natural disaster such as the Marmara earthquake.	

Annex C: Turkish Natural Disaster Management System

Prime Ministry Crises Management Center

- Established at the central level in case of a crisis
- Manage all coordination, cooperation and activity between General Staff of Military and other associated ministries

Emergency Management Directorate of Turkey (TEMAD)

Prevention

- Act as the central coordinating body for prevention and preparedness
- Monitor and evaluate the preparation of short and long term plans by governmental agencies and departments for disaster mitigation

Response

- Conduct the activities of coordination in the utilization of all types resources owned by public and private sectors in cases where emergency management is introduced
- To make arrangements that encourage voluntary organizations and individuals providing relief in emergency situations and to coordinate the receipt and protection of relief supplies and their dispatch to locations where such supplies are needed

General Directorate of Civil Defense

- Set-up and maintain civil defense search and rescue teams and use them to rescue lives and property if a disaster takes place
- Organize civil defense services across the country, to maintain and supervise the preparation, implementation and coordination of these services at public and private institutions,
- Plan and implement armless, protective and rescue precautions, emergency rescue and first aid activities, to determine measures against fires and standards for fire brigades,
- Educate, supervise and coordinate the volunteer search and rescue groups

Following the Marmara earthquake, Civil Defense Search and Rescue units were established and equipped with state-of-the art- SAR equipment in 11 provinces. Each unit is responsible for 5 – 10 provinces in their vicinity. Each unit consists of 120 search and rescue technicians.

Ministry of Public Works and Settlement (MPWS)
(General Directorate of Disaster Affairs)

Prevention and Preparedness

- To take short and long term precautions needed for after disaster shelter in disaster areas,
- To designate disaster prone areas and take necessary mitigation measures (building codes etc.)

Recovery

- Make damage assessments
- Resettlement/Reconstruction – housing for the victims

MPWS has three Directorates:

- *The General Directorate of Construction Works* (housing, including development and infrastructure plans, building construction, and supervision)
- *The General Directorate of Construction Works* (Afet Isleri) (emergency assistance and coordination, temporary housing provision, provision of studies needed for development plans; donor interlocutor)
- *The General Directorate of Technical Research and Implementation* (construction materials/technology, energy savings and cost reducing measures studies, earthquake damage reduction studies.)

General Directorate of Turkish Red Crescent

Response

- Organize a rapid response operation to help out those affected by disasters by providing food, cloth, blanket and tent
- Assist in the delivery of international and national humanitarian aid.
- In cooperation with Ministry of Health provide medical assistance to victims and supply medical material.

Recovery

- Provide psychological help to disaster victims

Ministry of Defense/General Staff

- Human resources for immediate response
- Use of military assets in support of humanitarian activities

Ministry of Health

- First aid and treatment of victims
- Protective health services.

Ministry of Foreign Affairs

- Channels information to the international community on damage and needs
- Provides coordination on the transportation of international relief aid.

Provincial Level

- Response to a disaster is under the responsibility of Governor at the Provincial level and District Governors at district level.
- Governors and District Governors are connected to the central government.

Municipalities

- The municipalities are responsible for disaster prevention and preparedness activities. (development plan, construction permits and controls)
- The fire departments who take major role in disaster response work under the authority of the municipalities.

Municipalities also undertake reconstruction work with the funds provided by the central government.

TURKEY

EMERGENCY RECONSTRUCTION AND MITIGATION LENDING

PROVINCE CAPITALS*
NATIONAL CAPITAL
RIVERS
PROVINCE BOUNDARIES*
INTERNATIONAL BOUNDARIES

*Province names are the same as their capitals.

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Marmara Earthquake
August 1999, 7.4 magnitude
Cash Transfer Project (L4518)
MEER Project (L4517)

Western Black Sea Region Landslides & Flooding
May 1998,
TEFER Project (L4388)

Senirkent Mudslide
July 1995,
Erzincan Project (L3511)

Sütçüler Flooding & Mudslide
November 1995,
Erzincan Project (L3511)

Erzincan Earthquake
March 1992, 6.8 magnitude
Erzincan Project (L3511)

Adana Earthquake
1998, 6.3 magnitude,
TEFER Project (L4388)

BULGARIA
GREECE
RUSSIAN FEDERATION
GEORGIA
AZER-BAIJAN
ARMENIA
AZER.
ISLAMIC REP. OF IRAN
IRAQ
SYRIAN ARAB REPUBLIC
Black Sea
Mediterranean Sea
Sea of Marmara
Dardanelles
ANKARA
Istanbul
Erzincan
Senirkent
Sütçüler
Adana
Ceyhan
Edirne
Kirklareli
Tekirdag
Çanakkale
Bursa
Yalova
Kocaeli (Izmit)
Sakarya (Adapazari)
Bilecik
Balikesir
Eskisehir
Kütahya
Izmir
Manisa
Usak
Afyon
Aydin
Denizli
Mugla
Burdur
Isparta
Antalya
Konya
Aksehir Gölü
Hoyran Gölü
Baysehir Gölü
Tuz Gölü
Aksaray
Nigde
Karaman
Goksu
Seyhan
Kirikkale
Yozgat
Cankiri
Çorum
Amasya
Tokat
Sivas
Kirsehir
Nevsehir
Kayseri
Kizil
Devrez
Sakarya
Çekerek
Kelkit
Zonguldak
Bartin
Karabük
Kastamonu
Sinop
Samsun
Ordu
Giresun
Trabzon
Rize
Artvin
Ardahan
Kura
Coruh
Gümüshane
Bayburt
Erzurum
Aras
Kars
Igdir
Agri
Tunceli
Bingöl
Mus
Elazig
Malatya
Lake Van
Van
Bitlis
Siirt
Batman
Diyarbakir
Tigris
Hakkari
Sirnak
Mardin
Adiyaman
Kahraman Maras
Ceyhan
Euphrates
Gaziantep
Osmaniye
Sanliurfa
Kilis
Hatay (Antakya)
Icel (Mersin)
0 50 100 150 200 Kilometers
0 50 100 150 Miles
26°E
28°E
30°E
32°E
34°E
36°E
38°E
42°N
40°N
38°N
36°N
42°E
44°E

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