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PERFORMANCE AUDIT REPORT

BRAZIL

**RIO FLOOD RECONSTRUCTION AND PREVENTION PROJECT
(Loan 2975-BR)**

June 23, 1999

*Sector and Thematic Evaluations Group
Operations Evaluation Department*

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Currency Equivalents (annual averages)

Currency Unit = Cz\$ (Cruzado)

1988	US\$1.00	Cz\$263.9
1989	US\$1.00	NCz\$2.86
1990	US\$1.00	NCz\$68.95
1991	US\$1.00	Cz\$403.83
1992	US\$1.00	Cz\$4492.62
1993	US\$1.00	CR\$88.46
1994	US\$1.00	R\$0.93 (Real)
1995	US\$1.00	R\$0.92 (Real)
1996	US\$1.00	R\$1.00 (Real)

Abbreviations and Acronyms

BNH	Banco Nacional de Habitacao (National Housing Bank)
CEDAE	Companhia Estadual de Agua e Esgoto (State Water and Sewerage Company)
CEF	Caixa Economica Federal (National Savings Bank)
FGTS	Fundo de Garantia do Tempo de Serviço (Employee Indemnity Fund)
GEORIO	Fundacao Institute de Geotecnica do Municipio do Rio de Janeiro (Geotechnical Institute of the Municipality of Rio de Janeiro)
GEROE	Grupo Executive para Recuperaçao e Obras de Emergência (Executive Group for Reconstruction and Emergency Works of the State of Rio de Janeiro)
ICR	Implementation Completion Report
IDB	Interamerican Development Bank
PROSANEAR	Programa de Saneamento para Populaçao de Baixa Renda (Water and Sanitation Program for the Low-Income Urban Population)
SAR	Staff Appraisal Report
SECPLAN	Secretaria de Planejamento (Secretariat of Planning of the State of Rio de Janeiro)
SERLA	Superintendência Estadual de Rios e Lagoas (State Superintendency of Rivers and Lakes)
UFRJ	Universidade Federal do Rio de Janeiro (Federal University of Rio de Janeiro)
UERJ	Universidade Estadual do Rio de Janeiro (State University of Rio de Janeiro)

Fiscal Year

January 1 to December 31

Director-General, Operations Evaluation	:	Mr. Robert Picciotto
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Office of the Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

**SUBJECT: Performance Audit Report on Brazil
Rio Reconstruction and Flood Prevention Project (Loan 2975-BR)**

The Brazil Rio Reconstruction and Flood Prevention Project (Loan 2975-BR, US\$175 million) was designed as an emergency response to severe floods that damaged the metropolitan area of Rio de Janeiro in March 1988. The loan was approved in June 1988 and closed in September 1995, four years behind schedule.

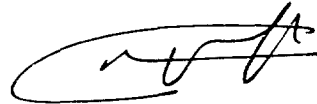
The project's comprehensive objectives combined emergency reconstruction of critical infrastructure with preventive activities. These actions were coupled with studies and institutional development measures to assist state and municipal authorities in developing and implementing a program to cope better with future emergencies. The main project components were: reconstruction of roads and bridges, and construction of major drainage works to minimize and prevent damage from future storms. The latter required the resettlement of families living in dangerous areas or in areas where works would take place. Included under the project were new sewerage systems and better solid waste collection and disposal. The project had 15 components (8 to be implemented by the state, 5 by the municipality of Rio, and 2 by other municipalities) and 22 studies (8 to be carried out by the state and 14 by the municipality of Rio). Implementation was the responsibility of nine state and eight municipal agencies. Implementers had to cope with truly significant obstacles: there had been a 20-year lapse in lending to the Metropolitan Region; the institutional structure was a carry-over from Rio's days as the nation's capital; and the need to deal with highly politicized stakeholders resulted in a difficult resettlement situation.

The project only partially achieved its objectives. While the project has assisted state and municipal authorities with the rehabilitation made necessary by the flood, and essential physical works have been constructed to minimize future flood damage, the lack of (financial and institutional) attention to drainage operation and maintenance, and the fact that expensively cleared areas are being re-occupied by squatters places at risk the sustainability of otherwise substantial achievements. State and municipal authorities have neither developed a program nor the institutional capacity to cope better with future emergencies—the acquisition of new fire and other emergency vehicles is a necessary but not sufficient contribution. And major studies that would have guided the process were often either not undertaken or only partially completed. Given the range of prevention activities undertaken, estimating two and half years for implementation demonstrates a lack of realism on the part of the preparation team. Additionally, while the mismanagement that characterized early implementation was largely overcome, it produced major delays and significantly raised costs.

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OED rates project outcome as marginally satisfactory, institutional development impact as modest, and sustainability as uncertain. Bank performance is rated as satisfactory, although preparation and appraisal were deficient with regard to the project timetable. This is consistent with the ICR ratings.

The main lesson suggested by this project is that disaster vulnerability reduction can work when project planners take into account the recurrent nature of catastrophic events. The sustainability of infrastructure reconstructed after disaster is always in doubt when long-term measures to address disaster mitigation are absent. If the disaster prevention components had been packaged in a separate loan, as the ICR suggests, it is likely that the all-important vulnerability-reducing activities would never have been funded. And during the heavy 1996 rainfalls, reconstructed areas would have experienced major damage once again. The audit also points out how anticipating the social adaptations people will make to new infrastructure can help to prevent problems.

A handwritten signature in black ink, consisting of a large, stylized initial 'C' followed by several loops and a final flourish.

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<p>This report was prepared by Ronald Parker (Task Manager), who audited the project in February 1999. William Hurlbut edited the report. Anna Amato (Consultant) provided research support and Helen Watkins provided administrative support.</p>
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Principal Ratings

	<i>ICR</i>	<i>Audit</i>
Outcome	Satisfactory	Marginally Satisfactory
Sustainability	Uncertain	Uncertain
Institutional Development	Modest	Modest
Borrower Performance	Unsatisfactory	Satisfactory
Bank Performance	Satisfactory	Satisfactory

Key Staff Responsible

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Preface

This is a Performance Audit Report (PAR) on the Rio Flood Reconstruction and Prevention Project (Loan 2975-BR), involving a Bank loan in the amount of US\$175 million to the Caixa Economica Federal with the guarantee of the Federative Republic of Brazil. The credit was approved on June 4, 1988, and closed, fully disbursed, on September 30, 1995. The closing date was postponed four times, leading to project completion four and a half years behind schedule.

The PAR was prepared by the Operations Evaluation Department (OED), based on a review of the Implementation Completion Report (Report No. 16183, prepared by the Latin America and Caribbean Region), President's Report, sector and economic reports, special studies, Country Strategy and Policy Framework papers, loan documents, and project files, and on discussions with Bank staff. An OED mission visited Brazil in February 1999 and discussed the effectiveness of the Bank's assistance with government officials, beneficiaries, and other stakeholders. The kind cooperation and invaluable assistance provided by Caixa Economica Federal (CEF) in the preparation of this report are gratefully acknowledged.

The ICR describes the project experience and covers the role of the Bank, achievements, delays, and the sustainability of project investments. The PAR focuses on project design and the resettlement activities supported by the project. It considers the effectiveness of the Bank and borrower dialogue; reflects on the borrower's ownership, consensus, and commitment; and assesses the effectiveness of the various project subcomponents to arrive at a set of lessons learned.

Copies of the draft PAR was sent to the relevant government officials and agencies concerned for their review and comments. No comments were received.

1. Background

Country and Sector Context

1.1 In February 1988, the equivalent of three months' annual rainfall fell in less than 24 hours in some areas of Metropolitan Rio de Janeiro. The unusually heavy rains caused flooding and landslides resulting in 289 dead, 734 injured, 18,560 homeless, and severe damage to infrastructure. Most severely affected were roads, bridges, canals, dikes, water and sewerage installations, electric power networks, homes, schools, and health facilities. Floodwaters mixed with sewage, contributing to outbreaks of leptospirosis, typhoid, and other gastrointestinal diseases. The damage to physical infrastructure severely disrupted economic activity, and further constrained the already limited access low-income families had to schools, health facilities, and basic sanitation. The total economic cost of the disaster was estimated at nearly US\$1 billion equivalent, including US\$435 million of lost production, US\$400 million in physical damage, US\$50 million in lost tourism revenues, and US\$50 million for the clean-up operation immediately following the disaster.

1.2 The disaster struck during a period of political and macroeconomic turmoil in Brazil, and the Federal Government was unable to provide the financial support necessary for emergency reconstruction. High inflation, five different currencies, and four stabilization plans made it exceptionally challenging to come up with counterpart funding. Political transitions (including impeachment of a president) also complicated implementation and made inter-institutional coordination (required for the smooth operation of interlocking subcomponents) difficult—the project spanned different electoral cycles at the federal, state, and municipal levels, with consequent lack of continuity.

1.3 The Rio Flood Reconstruction and Prevention Project was the first major operation financed in the State of Rio de Janeiro by any multilateral agency in 20 years, and the first Bank loan directly to Brazil's largest savings and loan institution, the Caixa Econômica Federal (CEF).¹ There had not been any Bank or IDB lending whatsoever to the water and sanitation sector prior to this loan, and therefore no institutional memory or tacit knowledge to tap. The (public) institutional structure dated from the time when the Rio Municipality was the Capital of Brazil. The State of Rio de Janeiro (a higher level unit under the Constitution) was institutionally weak, and barely able to contain the pressures of multiple municipalities flexing their muscles. The State and municipal administrations have been engaged in a perpetual power struggle (which continues) between a strong, powerful, and institutionally well-endowed municipal administration, versus a relatively small and less well funded state. Adjusting to its downgraded status had been difficult for Rio Municipality, and finding a productive way for the federal, state, and (multiple) municipal governments to interact in the Metropolitan Region had been challenging.

Bank's Role

1.4 The mission of the World Bank is to reduce poverty and to improve living standards through sustainable growth and investment in people. Unfortunately, progress in these areas can be short-lived, if disaster leaves low-income families worse off than they were before. Emergency Recovery Loans (ERLs) are designed to help rebuild physical assets and restore economic and social activities after emergencies. Bank-wide experience has shown that reconstruction of

1. The CEF simultaneously became involved with Municipal Water for Low-Income Areas (Loan 2983-BR), an experience documented in a separate OED audit report.

damaged infrastructure alone is imperative but insufficient, and that while a quick response to natural disaster is important, it is equally important to identify local vulnerabilities and determine how to reduce them in ways that lead to durable solutions. During the recovery from each emergency, measures are almost always needed to reduce the risk of similar future disasters and to safeguard people at risk. Responding to the GOB's request for flood recovery assistance, the Bank helped it to design a project that would strengthen the ability of public agencies to cope with catastrophes. In this effort, the Bank was able to build on its experience with another Brazilian disaster three years earlier when the Bank had financed an emergency flood reconstruction loan in the Northeast region (Loan 2645-BR, approved in 1985). Lessons from that effort were incorporated in establishing the institutional structure to coordinate and implement the Rio Flood Reconstruction program.

Institutional Framework

1.5 The intricacy of the project required complicated decision-making and coordination mechanisms. The loan had 15 components (8 implemented by the state, 5 by the Municipality of Rio, and 2 by other municipalities) and 22 studies, and was implemented by 9 state and 8 municipal agencies. The Caixa Economica Federal is a government-owned savings and loan bank. Following the closure of the National Housing Bank (BNH), CEF had inherited the responsibility for extending sanitation programs to the urban poor. Its activities in this area centered on the (literally translated) Water and Sanitation Program for the Low-Income Urban Population (PROSANEAR). Neither the state nor CEF had the experience or institutional mechanisms to manage an undertaking on the scale of the flood reconstruction project (see discussions on the project institutional framework and components below). The weak institutional capacity of CEF (the borrower) to manage a complex project, and the large scale of the flood reconstruction activities that were all to take place in one metropolitan region, led the CEF to create a decentralized project implementation unit in Rio de Janeiro. The state of Rio de Janeiro—which started with a weak implementation capacity, and lost budget and power following constitutional revisions during the project—set up a special project coordination group named the Executive Group for Reconstruction and Emergency Works of the State of Rio de Janeiro (GEROE). Rio municipality concentrated its reconstruction activities in departments directly linked to the city mayor's office.

Project Objectives

1.6 The project had three major objectives:

- To assist state and municipal authorities in the Metropolitan Region of Rio de Janeiro in urgent reconstruction and rehabilitation made necessary by the recent floods and landslides
- To implement essential physical works designed to minimize or prevent future flood damage
- To assist state and municipal authorities in developing a program and the institutional capacity to cope better with future emergencies.

Components

1.7 Most project components had both reconstruction and preventive aspects:

- Repair of roads and bridges (10 percent)

- Repair and dredging of drainage systems blocked by landslides or by debris deposited during the flooding, and canalization and dredging of silted-up drainage systems (45 percent)
- Terracing, buttressing, retaining walls, and other structural stabilization of steep hillsides (17 percent)
- Repair of sewerage systems, and essential extension of sewerage networks to improve collection of raw sewage draining into open waterways (8 percent)
- Improved collection and disposal of solid wastes (2 percent)
- Reforestation of steep hillsides most likely to slide (2 percent)
- Provision of minimally serviced sites for families whose homes were destroyed during the floods or landslides, and for families needing to be resettled because they lived in high-risk areas or in areas where flood-prevention works needed to be undertaken (10 percent)
- Repair and rehabilitation of public buildings (particularly schools, health facilities, and water-supply installations) damaged in the floods (3 percent)
- Purchase of imported rescue and salvage equipment needed for local flood-relief activities (2 percent)
- Consultants, services, and technical assistance (1 percent)
- Project administration (<1 percent).

Issues During Project Preparation

1.8 Staff involved with the project noted that, within the Bank, the scale of the loan's operations was often questioned during project preparation. To some the project included components that were difficult to see as part of an emergency response to damage caused by flooding. Some staff found operational policies that require ERLs be restricted to implementation period of 3 years to be too rigid. The staff who were promoting the comprehensive approach argued that the potential risk of recurrence of severe floods in the Metropolitan Region required a focus on prevention, and that the inclusion of large preventive physical works (such as drainage and slope stabilization) would in time reduce the risk of damage from heavy rains in the Rio area. Similarly, solid waste collection and disposal and institutional strengthening were required so that the investments in infrastructure would be sustainable. Drainage channels blocked by uncollected garbage had exacerbated the 1998 flooding. In the end, the doubters were persuaded, and the project went forward with its comprehensive design. The ICR raised this issue again, suggesting that packaging project activities into two lending operations—one just for rapid emergency recovery and the other for longer-term measures—would have been a better course of action. The Audit disagrees: restoring damaged infrastructure in vulnerable zones without vulnerability reducing measures is never advisable; since there is no guarantee that a follow-on operation will take place, leaving essential tasks out of this loan would have been an error.

1.9 The ability of the various implementing agencies to work effectively in the communities where they needed to was always questionable. The occupation of favelas and other low-income areas by armed hoodlums engaged in the drug-trade made supervision of projects a risky exercise at all times.

2. Implementation and Results

2.1 The closing date was postponed four times, until September 30, 1995 (four and a half years after the original closing date—implementation took seven years instead of the two and a half years estimated at appraisal). Road and bridge reconstruction, rehabilitation, and repair targets were amended, and targets were generally met or exceeded. Rehabilitation of public buildings was limited; compared to the US\$11.5 million estimated at appraisal for repairs to public buildings and installations, only US\$1.4 million was spent. Reforestation was to take place on 900 hectares; 83 percent of that area was actually reforested. Drainage and canalization works were to take place in 14 drainage basins; completed work included dredging and canalization in six river basins and just canalization on six rivers—a two-part flood water retention dam was also constructed. About 38 percent more slope stabilization works were undertaken than originally planned. More sewerage infrastructure was built than planned, but only 57 percent of planned sewerage connections were completed. The audit was unable to ascertain the degree to which a functional solid waste system had been put into place, but uncollected waste remains a major problem. Nevertheless, pilot recycling and composting efforts functioned for a while, and numerous specialized garbage hauling vehicles were purchased (vehicles were also acquired for fire and emergency personnel).

2.2 The enactment of the new Constitution in October of 1988 changed substantially the share of tax allocated to states and municipalities. Such an eventuality was, of course, not foreseen at appraisal. The new constitution affected the state's counterpart funds capacity negatively—the state was responsible for the implementation of a major portion of the loan. On the other hand, the new institutional arrangements led to more active and better funded city governments, which had a positive impact on the municipality's ability to undertake the activities assigned to it under the loan.

2.3 The role of GEROE continually evolved during project implementation. Until the end of 1990, GEROE was a special secretariat reporting directly to the Governor, with sweeping powers but a small structure. This arrangement proved too weak to manage the supervision of conventional investments, and did not detect the irregularities subsequently discovered in contracts (see *para. 2.4*). From 1991 through the end of 1994, GEROE was downgraded institutionally to the level of a division under the Secretariat of Planning. While staff numbers grew enormously, the group managed to establish centralized bureaucratic procedures for project approvals and improved controls on contract execution and payments. Nevertheless, GEROE ended up being bypassed by executing agencies, which dealt directly with CEF. The audit mission found that IDB-funded activities in the project area and planned Bank lending currently are handled by CEF directly.

ICR Findings

2.4 The ICR concluded that despite serious delays, project objectives had been substantially achieved. Project-funded activities took place during a period that overlapped with four federal, three state, and three municipal administrations, and the resulting lack of continuity within the executing agencies during implementation was the reason that the CEF assumed most coordination functions. The ICR noted that the most significant source of delays was the unavailability of federal counterpart funds (to be financed by CEF), which paralyzed the project during the first two years of implementation, and continued to significantly slow it down during the subsequent two years. The local economy experienced highly inflationary periods, which the GOB tried to control with four successive stabilization plans. Measures taken during the economic emergency affected the availability of funds to the Employee Indemnity Fund (FGTS),

the main source of counterpart funds for the project, and to the state budget. The ICR pointed out that no financial and institutional analysis had been made of the counterpart funding arrangement, which used funds not out of CEF's own resources but out of FGTS, with credit allocation mechanisms different from those of CEF. Additionally, the self-evaluation report suggested that the CEF's individual subproject approval procedures were incompatible with the emergency nature of the project, and they contributed to delays. Due to long initial delays in project implementation, changes in priorities in allocation of funds occurred frequently. Bank disbursement procedures also contributed to delays.

2.5 Contract Execution Irregularities. The early implementation period, as described in the ICR, was characterized by an escalation in unit costs and lack of transparency in procurement.² At the request of the Bank, a technical audit was commissioned of prices and quantities charged by the contractors.³ A two-year delay in the largest project component, the state drainage works, followed when irregularities were detected in contract execution. Works were stopped by negotiations with contractors for the refund of over-billed quantities. Other sources of delays highlighted in the ICR were:

- The impact of the State of Rio de Janeiro's defaults on its debt to CEF in 1991 and part of 1992
- Bank management of the Special Account in 1994 (early recovery of the account)
- Delays in the resettlement components that slowed down implementation of the drainage components
- High cost overruns under seven different contracts
- Mismatch between payments to contractors and work actually performed
- Changes aimed at minimizing relocation costs and provisions for the deduction of over-billed quantities were agreed upon with contractors
- Details of amended contracts, refunding provisions, and design changes.⁴

2.6 Economic Benefits. The ICR estimated that the flood control dams and improved drainage carried out under the project reduced by 40 percent the total floodable area (under rainfall conditions similar to those of 1988, benefiting about 140,000 people out of an estimated total population of 340,000 in the entire 1988 flood zone). It also noted that an ex-post cost-benefit analysis,⁵ based on the seven sub-basins of the Iguaçu/Sarapuí rivers,⁶ found yearly benefits of US\$65 million for a total investment of US\$78 million, and a benefit-cost ratio of 6.5 (net present value of costs and benefits estimated over a 30-year estimated investment life cycle, assuming a 12 percent discount rate). Net overall internal economic rate of return (IERR) for just the state drainage investments was estimated to be over 50 percent. No financial or economic cost-benefit analyses were carried out at appraisal.

² The Region describes this as a careful manipulation of the contracts, taking advantage of the CEF's lack of experience, the predictable gaps in the timings of bank supervision missions, and the overall confusion as a consequence of macro conditions, changing currencies, and/or a period of pre-electoral activity.

³ Works stopped as payments were suspended pending the outcome of the audit. The technical audit (completed in August 1991) identified over-billing in the amount of US\$16.4 million.

4. Contractors refunded the equivalent of US\$5.84 million, including US\$4.17 million from the Special Account.

5. Carried out by the Post-graduate School of Engineering of the Federal University of Rio de Janeiro.

6. Selected because they are covered under a Master Plan for which field survey data were available.

PAR Findings

2.7 The PAR supports the findings of the ICR. The procurement problems, sources of delay and administrative and financial irregularities described above and (in greater detail) in the self-evaluation are serious, and they raise the cost of the operation, but they have been adequately explored. The audit mission concentrated on the achievement of project objectives, compliance with the Bank's Operational Policies, the linkages between project activities and changes in the quality of stakeholders' lives, current conditions in the project area, and the identification of lessons learned for future emergency recovery and urban lending.

Reducing Vulnerability to Flooding

2.8 The Bank's Operational Manual section on emergency recovery lending (OP 8.50) requires the Bank to consider "prospects for reducing hazards from similar natural disasters in the future." In addition, the manual notes that the Bank may support freestanding investment projects for prevention and mitigation.

2.9 The project did much in these areas under challenging conditions (see Box 1). During the heavy 1996 rainfalls, the most severe event to test the efficacy of project-built infrastructure, areas that would have experienced major damage suffered only minor, nuisance flooding, which blocked roads for a few hours but left homes and other infrastructure intact. During these rainfalls, about 151 mm fell over the Baixada region in a single day (82 percent of the 184 mm that fell in the same time period in 1988).

2.10 Following the 1996 rainfalls, flooded roads drained on their own without need for special measures. The protection provided by the two dams and the drainage canals has broken the cycle of periodic flooding, which destroyed appliances and other personal belongings with such regularity as to discourage householders from investing in items of good quality. Many observers noted that residents in the formerly flood-prone areas have made considerable investments in major electronic appliances, such as refrigerators, confident that these items will avoid water damage and last for their designed useful life. Land values have increased in project areas and inhabitants are investing in small businesses and housing improvements.

2.11 Since the slope stabilization works financed under the project, staff assert that while there are still small-scale landslides and rock falls, there has not been a fatality in the areas where the hillsides have been protected. Smaller-scale private investments have also helped contain this type of damage, though their impact is enhanced because of the major works

Box 1. Problem-Solving with Appropriate Technology

Installing drainage infrastructure in Brazil's low-income neighborhoods offers particular technical challenges. For example, many *favelas* are located high on hills, and finding low-cost ways of reducing the speed of the descending water helped to avoid problems and lower maintenance costs. Several devices that have worked in other countries, including multiple flow-disturbing barriers (drop structures) and balancing tanks, helped to reduce water velocity in steeply sloped storm drainage ducts.

Another technology applied in Brazil for the first time was the garbage trap. Uncollected solid waste and litter inevitably blocks storm sewers and drainage canals following heavy rains.* To control the problem, large traps were constructed at places where it was estimated that water-borne garbage would concentrate. These huge sieved pools sift out much of the waste, and special trucks empty them regularly. Initial results from the use of these technologies are promising, although it remains to be seen if they will receive broader use.

*The implications of this problem are described in the audit of Loan 2983-BR.

financed by the project farther up the hillsides. The development of a comprehensive civil defense plan (planned under the project but not implemented) would have reduced the risk of injury and death in areas not protected by project investments.

2.12 Several causes for significant concern remain regarding the reduction of vulnerability to future flooding. The flood control infrastructure still works but it is not being adequately maintained, and in some cases it is not maintained at all. The audit saw canals filling with accumulated refuse (except where traps had been installed, as described in Box 1). In one industrial area, metalworking shops have taken to throwing junk cars into the canals after they strip them of reusable parts. Just one car dramatically reduces the volume of water that can flow through the canal under peak-use conditions. There is as yet no organization with clear responsibility for canal maintenance, nor is there budget allocated for canal cleaning and maintenance (one way to solve this is described in Box 2). Exacerbating the problem is that the canals flow through several municipalities.

2.13 Another problem is that the vertical concrete slabs (liners) that protect the canal banks and prevent erosion are not being sunk to adequate depth. This makes them unstable. To keep the liners in place, SERLA has begun connecting them across the top with steel-reinforced concrete beams. This solution creates two problems. First, the 1988 flooding was caused in part by bridges that trapped floating objects—and bridges were themselves destroyed by the raging flood waters because their clearance was insufficient to allow debris to pass—and caused the canal to overflow. The beams on the liners would do the same thing. Second, and perhaps worse, after all that was done to remove families from these hazardous areas and resettle them in safer zones, by providing shack-builders with a firm foundation to build on and the convenience of free rain-

Box 2. Drainage Maintenance in Tunisia

A recent OED Impact Evaluation on Tunisia* highlighted the success of the institution created to maintain the flood control infrastructure. The Bank loan supported a special Flood Protection Section within the Regional Directorate of the Ministry of Equipment based in the city of Sfax to be responsible for maintenance and repairs of flood protection works. Since February 1983, the *Direction de l'Hydraulique Urbaine* (DHU) has been responsible for the maintenance and repair of flood protection works in the Governorate. Government officials have found that these units function efficiently, as has the Bank-financed special equipment that helps to ensure proper maintenance of the canal. Maintenance crews regularly remove rubbish from the canal. The project's sustainability is assured by the force account funding for operation and maintenance. This approach to cost recovery was chosen because, while the benefits of the project would be widespread, the beneficiaries could not be easily identified. Three similar units have been established in other parts of the country, modeled on the Sfax canal maintenance unit.

The Tunisian Government decided that the state should pay for the cost of flood prevention infrastructure out of general revenues. First, different floods affect different parts of the city, and it is impossible to predict which residents will be affected and the extent to which their property and possessions may suffer from future floods. Second, the public infrastructure of the entire Sfax Governorate is at risk from floods. Third, the whole Tunisian economy is affected because of the essential rail, highway, port, and telecommunication, facilities pass through Sfax. There are problems, of course. City authorities have come to regard the canals and their maintenance as the central government's responsibility, and sometimes fail to adequately maintain the city's storm drains.

*Tunisia Impact Evaluation: Reducing Flood Hazards and Traffic Congestion. Report No. 16777.

water-borne sewage disposal for their latrines, the beams are an invitation to squatters to construct homes directly over the canal.⁷

2.14 OED evaluations have noted elsewhere⁸ that the public sometimes misunderstands the purpose and capabilities of protection works. In the *favela* of Rocinha, squatters have overestimated the capacity of the slope stabilization works.⁹ There the audit mission noted many multiple story buildings built on top of the stabilization works—one had reached seven stories and no one knows when it will stop growing.¹⁰ Since there is little available land, and no legal tenure in any event, buildings in the more central *favelas* (with good access to work opportunities) tend to grow in height as more families crowd into them year by year.

2.15 Although numerous families were relocated in order to construct and maintain drainage works, and many others were moved from sites deemed to be dangerous even after flood protection infrastructure was in place, in isolated areas squatters have again occupied these areas. The Presidents Report (para. 9, subsection b) notes that “perimeter enclosures would be built around areas where canalization and drainage works have been done to prevent future resettlement.” These were never built, but fences rarely deter squatters in any event. Preventing this problem of reoccupation (after the original families are moved away from canals) requires the construction of access roads on both sides of the waterways. Where these have been paved immediately after canals are complete, squatters have not reoccupied them, and the roads provide important new avenues of access to low-income areas. Pavement is more the exception than the rule, however, and new shacks and even brick houses are going up on the unpaved sections. Staff noted that they had been surprised to find that those families whose houses previously had only pedestrian access but which now have frontage on a main avenue become the protectors of the right of way. Since the value of their property increases greatly because they are on a major thoroughfare, they refuse to allow other squatters to build in front of them, and rob them of their new advantages. However, where it was announced that roads would be paved along new project-built drainage canal, but there was a delay of over a year, it became impossible for those families who wanted to keep the street clear to prevent squatters from reoccupying the area.

Resettlement

2.16 The resettlement component of the project nearly failed, but it was salvaged by a series of mid-course corrections. The intended beneficiaries rejected early resettlement initiatives because the resettlement sites were too far away, and the housing options were inadequate or non-existent. At the same time, groups that were not supposed to be resettled (because their situation was not a result of project activities) invaded the sites intended for construction. Resettlement delays caused other delays in the drainage component. Funds for housing loans were not included under the project, although the municipality and the state ultimately provided them.

2.17 While it was originally anticipated that families made homeless by the floods would be resettled on urbanized lots, this did not take place. Instead, the municipalities initially provided basic infrastructure to areas where homeless disaster victims (and others) were squatting and

7. A phenomenon documented in the PAR of the Philippines Regional Cities Development Project.

8. *Tunisia Impact Evaluation Report: Reducing Flood Hazards and Traffic Congestion, Sfax Flood Protection Project*. Report No. 16777.

9. Citing a study by GEORIO, the ICR reported decreases in fatalities and accidents due to rockfalls and landslides in Rio since 1988. The fatalities which occurred in Rio during the 1996 event were not in the project areas. In Petropolis, the number of accidents has also decreased, and no deaths were reported from the 1996 storm.

10. It does not fall because it leans into the hill behind it, which gives it support.

housing reconstruction had already commenced. The project did successfully resettle many families later on, once difficulties with securing land for the settlements were overcome. In some instances, this took until mid-1990. Compared to the appraisal estimate of 1,120 serviced sites to be provided to families made homeless by the floods, the Municipality of Rio delivered 1,772 serviced lots in five areas and urbanized an existing area with about 2,700 (although not all the beneficiaries were bona fide flood victims). The Municipality of Petropolis urbanized eight areas with a total population of about 1,031 families for those whose homes had been destroyed during the floods and landslides.

2.18 The relocation of families out of high-risk areas (so that municipal drainage works and landslide prevention activities could take place), was facilitated when it became possible to secure local financing for construction of the houses—not originally included under the project. Except for 372 houses constructed by the Municipality of Rio, relocation was implemented by the State. Standardized houses with necessary infrastructure including water, sewerage, electricity, drainage, paved roads, and (to varying degrees) community equipment and installations were provided to all relocated families.

2.19 Resettlement was carried out according to a plan with a timetable and budget that were frequently revised: the appraisal estimated that 9,880 families would be resettled, but modifications to the drainage component reduced the total number to be relocated by the State and the Municipality to about 3,400. Ultimately the State constructed about 3,000 houses. Due to the need to include financing for house construction for families relocated from drainage works and risky areas, the total cost of the resettlement component was much higher (actual cost US\$49.4 million, appraisal estimate US\$34.2, representing 144 percent).

2.20 Field visits to new communities built under the project revealed that construction quality was generally good, although livability varied greatly. Houses were built with a standardized 44 square meters of interior space, serviced with water, sewerage, and electricity. Housing units were constructed of brick with adequate kitchens and modern bathrooms.

2.21 Almost all resettled areas received the same basic housing unit. Although the social conditions of adjoining areas have a strong influence as well, urban density and community planning issues influenced the quality of life more than might have been expected. Communities where there were ample public spaces set aside—stores and markets, a bus terminal, schools, day care centers, churches, parks and playgrounds—were much more congenial than those where no provision for such facilities had been made. In one community corner units had storefronts included, and these were distributed preferentially to families that had had small businesses in their former homes. Where there were saloons in corner stores, intoxicated patrons tended to stay near the intersections, and the incidence of public drunkenness in the middle of the blocks (where children played) was lower. Controlled vehicular access—avoiding straight roads that run through the settled area that create shortcuts for motorists from other neighborhoods—makes neighborhoods safer and more convenient for pedestrians, and it may even mitigate criminality somewhat. While it might be just anecdotal, the contrast between the two types of community in terms of what was happening on the streets was hard to miss (even on the same day). In the most dense communities, mothers watched nervously over their children, encouraging them to stay away from drunks and out of blind alleys. In other equally low-income communities confident children played in spotless daycare facilities, on the safer streets, and drilled in community organized classes that taught traditional dance and self-defense (*capoeira*). In one community where each household had a few square meters of yard, a priest had promoted amenity plantings and almost every house had at least one tree. This made a dramatic visual difference.

2.22 A recent OED evaluation of another CEF project,¹¹ found that some low-income families sold their newly serviced land for a substantial profit and moved to other neighborhoods where they hoped to be project beneficiaries again. The communities resettled by the Rio Flood Reconstruction and Prevention project stabilized resettled neighborhoods and avoided this phenomenon with three well-crafted policies:

- Noting the instability of family life in squatter communities (staff estimate that 60 percent of houses in Rio's low-income areas are female headed), legal title to the housing units was put in the mothers' names.
- There was a "no resale" agreement lasting four years, coinciding with the payback period. Terms were made affordable (15 percent of the minimum salary [then 130 Reais/month], which amounted to a monthly payment of US\$19.50²). This four-year period is now over and there is almost no turnover.¹³
- Existing neighbor relationships were taken into account in the placement of families in the new communities, retaining the social fabric of the previous neighborhood.

2.23 Evaluation studies carried out by the State and the Municipality of Rio show a high degree of overall satisfaction among resettled beneficiaries. In one study undertaken soon after resettlement, 95 percent of families reported that their living standard had improved substantially from pre-project conditions. A follow-up study done four year later with low-income families that had completed their repayment schedule found that 80 percent still said they were substantially better off than before the project, this despite the economic difficulties affecting the nation.

3. Assessment of Performance

3.1 The audit rates **project outcome** as **marginally satisfactory**, **sustainability** as **uncertain**, and **institutional development** impact as **modest**. This confirms OED's ICR ratings.

3.2 The project only partially achieved its objectives. It assisted with essential reconstruction and rehabilitation and—although it has not fully solved the drainage and related problems of the project area—it significantly reduced Rio de Janeiro's vulnerability to periodic flooding. While the project did not have a poverty focus, it has benefited several hundred thousand low-income families. However, state and municipal authorities have neither developed a program nor the institutional capacity to cope better with future emergencies—the acquisition of new fire and other emergency vehicles is a necessary but not sufficient contribution. Sewer connections fell far short of estimates, little was done about uncollected solid waste, and major studies that would have guided these and other critical processes were often either not undertaken or only partially completed. While the project has assisted state and municipal authorities with the rehabilitation made necessary by the flood, the lack of (financial and institutional) attention to drainage O&M and the fact that expensively cleared areas are being re-occupied by squatters places at risk the sustainability of otherwise substantial achievements. Additionally, while the mismanagement that characterized early implementation was largely overcome, it produced major delays and

11. PAR, Loan 2983-BR.

12. The units were highly subsidized (total payments over the four years came to US\$936 for a unit that cost approximately US\$10,000).

13. The period was short enough to prevent the creation of a market for untitled units yet long enough to create a sense of community. It is impossible to know if male ownership of the units would have led to a different result.

significantly raised costs. Given the range of prevention activities undertaken, estimating two and half years for implementation demonstrates a lack of realism on the part of the preparation team.

3.3 *Institutional Development.* Although GEROE became increasingly marginal during the course of the project, after some initial reluctance CEF/Rio developed a strong sense of ownership. Resettlement went well considering that it took place under challenging conditions: errors in judgement could have led to the inclusion of hundreds of families not entitled to compensation. Some of the newly resettled areas have developed active community groups. The CEF's approach to monitoring and supervision is worthy of mention. In addition to tracking disbursements, periodic estimates of how much money would be required to *finish* each subcomponent under current conditions were required of each project agency. A deficiency that is also worth noting in this connection is that a comprehensive disaster response plan was not developed as planned under the project. Had such a plan been developed it is conceivable that deaths and injuries following the 1996 event could have been reduced in areas that did not benefit from project investments.

3.4 The CEF did not have experience in managing multilateral operations, and it did not use experienced former BNH staff well. Lessons learned by CEF are influenced by its experience under Loan 2983-BR, which it implemented concurrently. Implementation of the Rio Flood Reconstruction project became increasingly decentralized as the staff at CEF/Rio gained in experience. It is now more common that those staff with the best and most up-to-date information are involved in key project decisions. That CEF has become more agile and capable of implementing multiple multilateral projects around the country using local teams is based in part on its experience in the Rio Flood Reconstruction Project. Emulating the perceived success of the CEF projects, the Municipality of Rio de Janeiro set up a special unit for donor coordination. This unit handles special project development and supervises externally financed work. Staff in this unit credit their experience under the loan as having developed their capacity to work with multilateral and other donors (Japan).

3.5 Physical and institutional conditions were so bad in the Metropolitan Region of Rio de Janeiro at the time of appraisal that, to some degree, the fundamental problem of mitigation could only be addressed by improving the overall management of the municipalities that make up the MRRJ. A number of covenants were included under the loan requiring the preparation of Financial Action Plans, and funds were allocated to cover a broad range of institutional development initiatives. Partly as a result, Rio Municipality moved from formal declaration of bankruptcy in 1988 to a successful issue of US\$125 million Eurobonds in mid-1996. The significantly improved technical capacity to plan and manage complex investments by both the State and the Municipality of Rio can be seen from the fact that, taken together, in 1997 they had a portfolio of over US\$2 billion in new loans from both the Bank and the IDB. The IDB's Baixada Viva project, which has continued much of the work financed by this project in the flood-affected area is another indicator of the impact of this loan.¹⁴

Borrower Performance

3.6 The borrower's performance is rated marginally **satisfactory**. The unrealistic implementation time-frame is partly due to the fact that the borrower brought evidence to negotiations that land assembly was substantially completed, yet it was not. The availability of financing for resettlement housing and counterpart funds was also demonstrated to be available,

¹⁴ The impact of CEF's Bank-financed work in Brazilian urban areas on national urban policy (for low-income neighborhoods) is discussed more fully in the PAR on Loan 2983-BRA. Two loans financed by the IDB in both the State (*Baixada Viva*) and Rio Municipality (*Favela Bairro*) also build on the work of loans 2983 and 2975.

and yet funding proved to be a persistent problem. On the other hand, despite a lack of experience with complex bilateral projects, CEF demonstrated a willingness to learn and, in response to the state executing agencies' weakness, it gradually undertook inter-agency coordination and (following early detection of contract irregularities) results-based project monitoring. The performance of the various project entities did not match the standards set by the CEF, however. Besides the standard covenants, this credit had additional covenants.¹⁵ The borrower complied with all of them except those on performing and financing routine maintenance, which were SERLA, state and/or municipal functions.

Bank Performance

3.7 Bank performance was marginally **satisfactory**. The Bank demonstrated that it could move quickly and flexibly—only two and a half months between Initial Executive Project Summary and Board approval reflects efficient and agile preparation work by the Bank's task team. The Bank had just come out of the Reorganization of 1987, and staff were attempting to be more responsive to the client needs by responding so quickly. Conditions essential to the sustainability of the project were also well identified, resulting in the inclusion of a number of important vulnerability-reducing activities under the project (civil defense, reforestation, environmental education, solid waste collection and disposal, and institutional strengthening programs). Less positive, however, was the fact that a completely new management team may not have had enough institutional memory of the Brazilian macroeconomic environment. Supervision missions did not accurately evaluate the length of time required for completion of contracts, and repeated extensions had to be made to physically complete the project. Contract irregularities

Policy Consensus on Natural Disaster Housing Issues Urgently Required

During project preparation and throughout implementation, the appropriateness of the Bank's resettlement policies for relocation activities of the sort undertaken by this project was discussed. The shortcomings of the resettlement component suggest that this issue merits further consideration.

Inevitably, the resettlement of homeless due to floods or other catastrophic events and/or resettlement of families associated with the implementation of works in risky areas, requires a clear Bank commitment to housing reconstruction. How was it possible in this case that the project did not provide for financing and constructing housing? The exclusion of housing construction from the project resettlement component, when resettlement was caused by project works requirements, seems very hard to justify.

Shelter is among the most immediate needs following a rapid-onset disaster. Because of its cost, meeting that need is the most difficult activity for a disaster-stricken country to finance. During the preparation of most emergency loans, however, task managers confront intense debate about whether the Bank should finance a private good and to what extent disaster recipients of a replacement dwelling should be required to contribute to their own relief in the form of up-front contributions followed by repayments over time, i.e., a loan.

There are no ready-made designs for post-disaster interventions. Each country, culture, and disaster presents unique opportunities and constraints. But every appropriate response in a developing country must seriously consider the risk horizon of the individual. How important are natural hazards? How feasible is useful mitigation action? What other risks need to be considered? Natural hazards are typically low-frequency, high-consequence events, capable of delivering a knockout punch. There is also a distribution of responsibility from the individual to the community to the regional or national government. Responsibility for natural hazards mitigation is distributed over all levels. The Bank has a draft Natural Disaster Strategy in circulation. More discussion and a resolution of the issues that it raises is urgently required.

were recognized and acted upon, in spite of borrower resistance, but the cost-lowering revisions to the design of the drainage components may not enough have received sufficient Bank attention.

4. Findings and Lessons

4.1 The sustainability of infrastructure reconstructed after disaster is always in doubt when long-term measures to address disaster mitigation are absent. The project's high rates of return on vulnerability-reducing components and the reduction in the total floodable area achieved highlight ERLs' potential impact on sustainability: project benefits include greatly reduced vulnerability to the type of disaster statistically most likely to recur. The project experience shows that good overall urban management is the first and best mitigation measure against natural (and man-made) disasters. Priorities in funds allocation for environmental mitigation, operation and maintenance are more likely to receive priority when a municipality or state is well administered. The underlying issue of good governance includes both a sound administrative and financial environment (that includes *inter-alia*, a good land-use policy, enforcement of laws, an adequate financial base, sound overall financial policies and practices, and meaningful monitoring and evaluation.

4.2 Was the project the right size? If it had been smaller—and the ICR suggests that prevention activities should have been packaged in a separate loan—it is likely that the all-important vulnerability reducing activities would never have been funded. And during the heavy 1996 rainfalls, reconstructed areas would have experienced major damage once again. That this comprehensive emergency recovery loan had the implementation period of a regular investment project (which probably surprised very few people in the implementing agencies) argues strongly for greater realism in ERL project documents. When the catastrophe moved the GOB (at the highest political levels) to revisit the low priority it had been giving to infrastructure in Rio, it created an opportunity for state and municipal officials to borrow for activities that might not have been funded until some years later—such as dredging and channeling of rivers, construction of sewerage systems and treatment facilities, slope stabilization, and improvement of solid waste collection and disposal.

4.3 The project had to cope with truly significant obstacles: the 20-year lapse in lending in the Metropolitan Region, the overloaded institutional structure that was a carry-over from Rio's earlier status, and the need to deal with powerful and highly politicized stakeholders in a difficult resettlement situation. The quality of the best resettlement work and the creation of dynamic new neighborhoods merits further study and possible emulation. This first collaboration between the Bank and CEF became increasingly productive as time passed and counterpart funding problems were overcome, and the skills that staff acquired through this and the PROSANEAR project bodes well for future operations with the Bank and other international agencies.

4.4 Vigilance and follow-up actions will be required of the agencies involved in the project. Squatters are moving back into areas that need to be kept clear if canals are to be maintained. Providing squatters with the means to own land and housing (see box in this section on housing) improves their personal situation, but it also creates tremendous incentives for other families to engage in dangerous or socially undesirable behavior so that they too can be similarly benefited. Paving the access roads sooner rather than later will contribute to the sustainability of the drainage infrastructure (once the maintenance problems are finally resolved), and prevent the loss of public workers' access to expensively cleared land.

4.5 Concrete-lined canals built under the project are covered with tall weeds and grasses (down to the water line in some locations). Also, in the ongoing work financed by the state, the concrete liners that protect the canal banks are no longer being anchored in the subsoil in the manner originally envisaged. The steel-reinforced concrete beams now bridging them are already covered with trapped floating objects (due to neglected maintenance), which indicates that in a short time their flood-reducing capacity will have been dangerously diminished. Preserving the expensively constructed infrastructure and protecting vulnerable neighborhoods merit a higher priority than they have received to date. However, not even covenanting O&M and maintenance financing (Legal Agreement 2.09 [a and b]) is sufficient to cause governments to undertake these and similar activities (such as garbage collection) as long as the political gains from building new infrastructure are greater.

Lessons Learned

Disaster Vulnerability Reduction Can Work If Project Planners Understand the Recurrent Nature of Catastrophic Events. From the outset this project tried to do more than simply rebuild what had been lost. This proved prescient, had the brunt of the storm hit the project area, the 1996 flood would have destroyed all the reconstructed infrastructure again in the absence of well-designed mitigation measures. The same types of disaster strike the same areas repeatedly. Responding to severe natural events as though they were isolated aberrations leads to the waste of scarce public and private resources.

Anticipation of the Social Adaptations People Will Make to New Infrastructure Can Help to Prevent Problems. Small settlement planning measures have big impact in terms of the quality of life in resettled areas. Just adapting the corner units for commercial use creates business opportunities, small commercial areas, and quiet streets for play. A few square meters of dirt in the front yard eventually leads to amenity plantings and shady, tree-covered streets. Avoiding the creation of short-cuts for traffic through settled areas contributes to public safety in several ways. Similarly, preventing junk cars from being thrown in the canal, squatters from building on concrete beams, or homeless from reoccupying unpaved land can lead to long-term economies as well as cut down on unnecessary transactions with hard to handle groups. It is common for disaster reduction measures to create a dangerous sense of security among the poor. Extreme care is required to ensure that protection measures are not allowed to create new and greater vulnerabilities. The audit described the way that landslide protection infrastructure was used as a foundation for an apartment building. Such usage should have been prevented, but it puts relatively few lives in danger. In flood protection, good engineering practice varies by city as well as by country, but in general designers protect for the more frequently occurring return periods, say twenty years. Of course, the hundred year flood comes eventually, so that infrastructure design and related planning have to take overflow areas into account and ensure that they are not used for human settlements.

Expediently Pave Access Roads. Preventing the re-occupation of canal-side areas is essential if, once an institutional and budgetary mechanism can be found, maintenance and dredging can take place efficiently. In future projects the Bank should budget for access roads to be constructed on both sides of major drainage works, and they should be paved without delay once civil works are complete. The GOB should act expeditiously to preserve the gains that have been made.

Preventing Resale. The stability of the resettled neighborhoods in terms of unit resale suggests that something was done right. First and foremost was issuing title in the women's name, given the preponderance of woman-headed households. The four-year resale moratorium also played a role: it was short enough that the few people who needed to sell waited to get legal title, but long enough for the new community to stabilize.

Exploit Synergies with Stakeholders in the Community. Families whose houses previously had only pedestrian access but which now have frontage on a main avenue because of drainage works became the protectors of project-built access roads. More could be done to formalize this relationship and to provide prompt follow-up to their reports of illegal occupation of hazardous or operationally critical zones.

Basic Data Sheet

BRAZIL RIO RECONSTRUCTION AND FLOOD PREVENTION PROJECT (LOAN 2975-BR)

Key Project Data (amounts in US\$ million)

	Appraisal estimate	Actual or current estimate	Actual as % of Appraisal estimate
Total project costs	393.62	406.21	100.3
Loan amount	175	168.2	96

Cumulative Estimated and Actual Disbursements

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96
Appraisal estimate	95.50	168.00	174.00					
Actual	22.50	31.48	98.32	109.44	112.87	112.92	161.48	167.30
Actual as % of estimate	23.6	18.7	56.2	62.5	64.5	64.5	92.3	95.6
Date of Final Disbursement:	December 31, 1995							

Project Dates

	Original	Actual
Identification (Executive Project Summary)		4/12/88
Preparation/Preappraisal	4/18/88 ^a	4/18-20/88
Appraisal	5/1-6/88	5/1-6/88
Negotiations	5/23-25/88	5/31/88 – 6/6/88
Board approval	7/5/88	6/24/88
Signing	7/88	9/29/99
Effectiveness	8/1/88 ^b	12/29/88
Project Completion	9/30/90	End of 1996 ^c
Closing date ^d	3/31/91	9/30/95

^a Planned dates for preparation through negotiations are as per IEPS.

^b As per Memorandum of the president.

^c Investments in solid waste treatment and disposal facilities are yet to be completed.

^d Loan closing date was extended four times, as per the following amendments:

to March 31, 1992 under amendment of March 9, 1990

to March 31, 1993 under amendment of April 6, 1992

to December 31, 1994 under amendment of March 30, 1993

to September 30, 1995 under amendment of December 23, 1994.

ANNEX A

Staff Inputs (staff weeks)

<i>Stage of project cycle</i>	<i>Actual Weeks</i>	<i>Actual US\$'000</i>
Preparation to Appraisal	33.5	48.2
Appraisal	1.4	2.0
Negotiations through Board Approval	17.7	30.8
Supervision	251.7	480.0
Completion	12.1	32.5
Total	316.4	593.5

Mission Data

<i>Stage of project cycle</i>	<i>(month/year)</i>	<i>No. of persons</i>	<i>Days in field</i>	<i>Specializations represented</i>	<i>Performance Rating</i>		<i>Types of problems</i>
					<i>Implementation status</i>	<i>Development objectives</i>	
Preappraisal	3/88	7	9	Urban planner, engineer, other			
Appraisal	5/88	6	7	Urban planner, engineer, other			
Supervision 1	8/88	5	12	Urban planner, economist, Fin. Analyst, Engineer, disb. Officer	2	2	Counterpart funds, project management (SERLA)
Supervision 2	12/88	1	n.a.	Urban planner	No rating	No rating	Project management (CEF subproject review)
Supervision 3	2/89	2	13	Architect, procurement	2	1	Sub-loan approval by CEF
Supervision 4	5/89	1	n.a.	Procurement	No rating	No rating	No major issue reported (field review of procurement documentation)
Supervision 5	7-8/89	5	12	Urban planner (TM), economist, fin. Analyst, eng, disb. Off.	2	2	Counterpart funds, project management (CEF subloan approval); procurement (SERLA), resettlement (Rio Mun. land ownership)
Supervision 6	11-12/89	1	n.a.	Urban plan. (TM)	n.a.	n.a.	Project management (CEF subproject review, issue of operational manual)
Supervision 7	2/90	2	7	Urban planner (TM)	2	2	Counterpart funds, project management (CEF internal procedures)
Supervision 8	10/90	1	2	Urban planner (TM)	2	1	Project Management (CEF bureaucratic subproject approval procedures)
Supervision 9	1-2/91	6	9	Urban planner (TM), economist, fin. Anal., eng., arch.	2	2	Project management (inadequate control of drainage works contracts by SERLA< CEF and GEROE, CEF bureaucratic procedures (delaying Petropolis components)
Supervision 10	4/91	4	5	Economist, fin. Anal., eng.	2	2	Project management (CEF bureaucratic procedures), uneven progress of TA and studies

Annex A

Supervision 11	11/91	4	8	Urban Planner (TM), econ., eng.	3	2	Counterpart funds, project management (CEF and state bureaucratic procedures) work contracts execution (drainage)
Supervision 12	2/92	4	7	Urban, planner, econ., eng.	3	2	Counterpart funds, project management (CEF subproject approval)
Supervision 13	9/92	2	3	Urban Planner (TM), eng.	3	2	Counterpart funds, works contract implementation, Project management (CEF subproject approval).
Supervision 14	2/93	7	9	Urban Planner (TM), eng., resettlement, Inst. Dev., env. Educ	2	1	Resettlement, Project coordination (GEROE-contracts plans)
Supervision 15	9/93	5	4	Urban Planner (TM), Inst. Dev., Eng., Env. Educ.	2	2	Audit reports (State and Rio Munic.), resettlement, project coordination (GEROE and Rio Munic.)
Supervision 16	3/94	4	4	Urban Planner (TM), eng., eco.	2	2	Resettlement, audit report (Munic. Of Rio)
Supervision 17	7/94	1	3	Urban Planner (TM)	U	S	Audit (of SOEs under drainage component), procurement (env. Education)
Supervision 18	11/94	2	13	Urban Planner (TM), eng.	S	S	Resettlement
Supervision 19	2/95	5	5	Div. chief, Urban Planner (TM), op. Off., eng.	S	S	Resettlement
Supervision 20	6/95	2	6	Op. Off., eng.	S	S	No major issue reported
Completion	11/95	3	2				

Other Project Data

Borrower/Executing Agency:

FOLLOW-ON OPERATIONS

<i>Operation</i>	<i>Loan no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
CEF – Municipal & Low Income Areas	2983	80.0	1988
Rio Grande do Sul – Municipal Development	3129	100.0	1989
Ceara – urban Development and Water Resources Management	3789	140.0	1994