

The Inspection Panel



Investigation Report

**Paraguay – Reform Project for the Water and
Telecommunications Sector (Loan No. 3842-PA); Argentina –
SEGBA V Power Distribution Project (Loan 2854-AR)**

February 24, 2004

About The Panel

The Inspection Panel was created in September 1993 by the Board of Executive Directors of the World Bank to serve as an independent mechanism to ensure accountability in Bank operations with respect to its policies and procedures. The Inspection Panel is an instrument for groups of two or more private citizens who believe that they or their interests have been or could be harmed by Bank-financed activities to present their concerns through a Request for Inspection. In short, the Panel provides a link between the Bank and the people who are likely to be affected by the projects it finances.

Members of the Panel are selected “*on the basis of their ability to deal thoroughly and fairly with the request brought to them, their integrity and their independence from the Bank’s Management, and their exposure to developmental issues and to living conditions in developing countries.*”¹ The three-member Panel is empowered, subject to Board approval, to investigate problems that are alleged to have arisen as a result of the Bank having ignored its own operating policies and procedures.

Processing Requests

After the Panel receives a Request for Inspection it is processed as follows:

- The Panel decides whether the Request is prima facie not barred from Panel consideration.
- The Panel registers the Request—a purely administrative procedure.
- The Panel sends the Request to Bank Management, which has 21 working days to respond to the allegations of the Requesters.
- The Panel then conducts a short 21 working-day assessment to determine the eligibility of the Requesters and the Request.
- If the Panel does not recommend an investigation, and the Board of Executive Directors accepts that recommendation, the case is considered closed. The Board, however, may approve an investigation against the Panel’s recommendation if it so warrants.
- Three days after the Board decides on whether or not an investigation should be carried out, the Panel’s Report (including the Request for Inspection and Management’s Response) is publicly available at the Bank’s Info Shop and the respective Bank Country Office.
- If the Panel recommends an investigation, and the Board approves it, the Panel undertakes a full investigation, which is not time-bound.

¹ IBRD Resolution No. 93-10; IDA Resolution No. 93-6.

- When the Panel completes an investigation, it sends its findings and conclusions on the matters alleged in the Request for Inspection to the Board as well as to Bank Management.
- The Bank Management then has six weeks to submit its recommendations to the Board on what actions the Bank would take in response to the Panel's findings and conclusions.
- The Board then takes the final decision on what should be done based on the Panel's findings and the Bank Management's recommendations.
- Three days after the Board's decision, the Panel's Report and Management's Recommendation are publicly available through the Bank's Info Shop and the respective Country Office.

TABLE OF CONTENTS

Table of Contents	iii
Acknowledgements	vii
Abbreviations	viii
Units and Currencies	viii
Executive Summary	ix
 Chapter One	 1
Introduction	1
Table of Contents	2
1. Request for an Investigation	3
1.1. Request for Inspection Submitted to the Panel	3
1.2. The Request	4
1.3. Management Response	5
1.4. Eligibility of the Request	6
1.5. The Board Decision	6
1.6. The Investigation	6
2. The Yacyretá Hydroelectric Project	8
2.1. Historical Background: 80 Years of Yacyretá	8
2.1.1. Treaty of Yacyretá	9
2.1.2. Entidad Binacional Yacyretá (EBY)	11
2.2. Project Financing	13
2.2.1. Local Funds	13
2.2.2. The Third Owners' Agreement	13
2.2.3. World Bank Financial Support for the Project	14
2.3. The Project Design	18
2.3.1. The Site of the Power Plant	18
2.3.2. The Resettlement Programs	19
2.3.2.1. The Programa Desborde de Arroyos (PDA)	20
2.3.3. The Environmental Mitigation Activities	21
2.4. 20 Years of Implementation	21
2.4.1. Implementation Problems	21
2.4.2. First Request for Inspection to the Panel	23
2.4.3. Action Plans A and B	23
2.4.4. Board Decision	24
2.4.5. The Panel Review and Assessment of the Action Plans	24
2.4.6. 1997 Amendment to the Bank Loan Agreements	27
2.5. Factors Affecting the Project's Completion	27
3. Applicability of the Bank Operational Policies to the Yacyretá Project	33
 Chapter Two	 35
Environmental Compliance	35
Table of Contents	36
4. Environmental Assessment	37
4.1. Environmental Screening	38

4.2. Preparation of Environmental Assessments.....	38
4.2.1. The First Yacyretá Hydroelectric Project	39
4.2.2. The Second Yacyretá Hydroelectric Project	39
4.2.3. The Water and Telecommunications Reform Project and SEGBA V Power Distribution Project.....	39
4.3. Consideration of Alternatives	40
4.3.1. Alternatives in First Yacyretá Hydroelectric Project	42
4.3.2. Alternatives in Second Yacyretá Hydroelectric Project	42
4.3.3. Alternatives in Resettlement: Water and Telecommunications Reform Project and SEGBA V Power Distribution Project.....	43
4.4. Consideration of Biophysical Environment	43
4.4.1. The Second Yacyretá Hydroelectric Project	43
4.4.2. The Water and Telecommunications Reform Project and the SEGBA V Power Distribution Project.....	46
4.5. Consideration of Urban and Peri-urban Environments.....	46
4.5.1. Layout and Logistics of Resettlement Townships and Villages	48
4.5.2. Roads and Road Networks	49
4.5.3. Water Supply, Sewerage and Sanitation, Urban Drainage	51
4.5.4. Implications of Non-Compliance with Environmental Safeguard Policies	52
5. Flooding of Urban Creeks.....	53
5.1. Relationship of Yacyretá Dam to Flood Levels of Paraná River at Encarnación	54
5.2. Flooding of the Potí'y, Mboy Caé, Santa Maria and Yacú Paso Creeks	61
6. Water Quality And Health Standards.....	63
6.1. Environmental Pollution and Water Quality.....	63
6.2. Health Problems	64
7. Wastewater Treatment Plant	66
7.1. Environmental Assessment for Plant Location.....	66
7.2. Plant Design	67
7.3. Sewerage Connection to Houses.....	68
7.4. Transfer and Supervision of Sewerage Reticulation and Treatment System....	69
Chapter Three.....	71
Social Compliance.....	71
Table of Contents.....	72
8. Identification of Affected People	73
8.1. Identification of Affected People	73
8.1.1. Census Procedures	74
8.1.1.1. First Census of the Affected Population: 1979-1980.....	74
8.1.1.2. The 1990 Census and Later Verifications.....	75
8.1.2. Adequacy of Census Procedures.....	76
8.2. Criteria for Inclusion in Specific Classes of Affected Persons	78
8.3. Grievance Procedures	79
8.4. Other Categories of Affected People	80
9. Resettlement and Compensation.....	81
9.1. Compensation.....	82

9.1.1. Procedure for Valuation of Homes and of Property	83
9.1.2. Compensation for Usufruct or Customary Rights to Land and Loss of Access to Resources and Public Services	84
9.1.3. Compensation Prior to Displacement.	84
9.1.4. Sequencing of Places Selected for Compensation.....	86
9.2. Resettlement.....	87
9.2.1. Alternative Sites	87
9.2.2. Restoration of Income Earning Capacity.....	88
10. Resettlement and Compensation of Specific Groups: Brick-makers and Tile-makers (Ceramists).....	90
10.1. Small-scale Brick-makers	92
10.2. Medium- and Large-Size Industries.....	95
10.3. Compensation to Workers of Brick- and Tile-making Industries.....	96
10.3.1. Rules and Procedures.....	96
10.3.2. Compensation Programs	99
10.3.3. Access to Clay Deposits.....	104
11. Adequacy of the Resettlement Plan.....	105
11.1. Influx of People into the Project Area	105
11.2. Delays and Uncertainties	107
12. Programa Desborde de Arroyos (PDA) - the Urban Creeks Program.....	109
 Chapter Four	113
Project Supervision And Monitoring	113
Table of Contents.....	114
13. Project Supervision Operational Directive 13.05	115
13.1. Supervision of Environmental Operations	116
13.2. Supervision of Resettlement Activities.....	117
13.2.1. Technical Quality Assurance: Standards of Design, Construction and Implementation	117
13.2.2.Consultation with Affected People	121
13.3. Level of Supervision.....	122
13.4. Expertise in Bank Supervision.....	123
13.5. Linkages Between Supervision Reports (Aide Memoires and Back-to-Office Reports), Progress Reports to the Board, and Management Response to Request for Inspection.....	125

Annexes

Annex A: Table of Findings

Annex B: Hydrological Analysis of the Causes of Floods in Encarnación Urban Creeks

Annex C: Biographies

Boxes

Box 1: A Brick-worker Waits at M'boi Caé

Box 2: Waiting in Barrio Santa Rosa

Maps

Map 1

Map 2

Map 3

ACKNOWLEDGEMENTS

The preparation of this report would not have been possible without the support and valuable contributions of many people and organizations. The Panel wishes to thank the Requesters, representatives of NGOs, and individuals who met with the Panel in the project areas, as well as Government officials in Argentina and Paraguay, EBY officials, and the Inter-American Development Bank staff. The Panel also wishes to extend its gratitude to former and current Bank staff. The Panel especially expresses its appreciation to the representatives of the Requesters for arranging visits with affected people and for showing the Panel areas of concern to them, to EBY for their cooperation in providing documents, discussing points of concern, and facilitating the Panel's work in the Project area, and to the Bank staff for their assistance in obtaining documents, providing the Panel with information, responding to written requests, and assisting with logistical arrangements. The Panel especially thanks the Regional Vice-President for his cooperation during the investigation.

The Panel wishes to extend its special thanks and gratitude to the Executive Director, Mr. Alieto A. Guadagni, representing the Governments of Argentina and Paraguay, and their staff, for the fruitful consultations throughout the investigation process. Ms. Maria Cristina Uehara and Mr. Victor Ignacio Vazquez Aranda deserve our special thanks for guidance and for arranging meetings with Government officials in Argentina and Paraguay. The Panel appreciated the informative meetings with these officials.

The Panel is grateful for the expert advice provided by Richard Fuggle, Chair of Environmental Studies at the University of Cape Town, South Africa, by Paul Taylor, Director of the Asian Cultural History Program in the Department of Anthropology at the Smithsonian Institution, Washington DC, and by Carlos Tucci, Professor at the Institute of Hydraulic Research of the Federal University of Rio Grande do Sul, Brazil. The Panel appreciates the professionalism exhibited by them during the field visits and back-to-office consultations.

Finally, the Panel wishes to convey its gratitude and appreciation to the members of its Secretariat for their efficient handling of this investigation, particularly to Eduardo Abbott, Tatiana Tassoni and Serge Selwan for their expertise and professional assistance. The Panel also thanks Rut Simcovich, Lillian Gentile, Marina Pou, and Fernanda Font for the excellent interpretation services provided during Panel missions.

ABBREVIATIONS

BP	Bank Procedures
EA	Environmental Assessment
EBY	Entidad Binacional Yacyretá
EIA	Environmental Impact Assessment
EMP or PMMA	Environmental Management Plan (or Plan de Manejo del Medio Ambiente)
FEDAYIM	Federación de Afectados por Yacyretá de Itapúa y Misiones
GOA	Government of Argentina
GOP	Government of Paraguay
IBRD	International Bank for Reconstruction and Development
IDB	Inter-American Development Bank
NGO	Non-Governmental Organization
OD	Operational Directive
OP	Operational Policy
PDA	Programa Desborde de Arroyos (Urban Creeks Program)
Plan A	Pending Action Program (November 1996)
Plan B	Base Program (November 1996)
REMP	Resettlement and Environmental Management Plan
RRAP or PARR	Action Plan for Resettlement and Rehabilitation (or Plan de Acción para el Reasentamiento y la Rehabilitación)
SAR	Staff Appraisal Report
SEAM	Secretary of Environment of Paraguay
SEGBA	Servicios Eléctrico Del Gran Buenos Aires, S.A.

UNITS AND CURRENCIES

Km	Kilometer
M ³ /s	Cubic meter per second
Masl	Meter above sea level
MW	Megawatt
MWh	Megawatt per hour
US\$	United States Dollars
PYG or Gs	Paraguay Guaraníes

EXECUTIVE SUMMARY

Introduction

On May 17, 2002, the Inspection Panel received a Request for Inspection from communities in Paraguay alleging that the Bank had violated its own policies and procedures in relation to the design and implementation of the Yacyretá Hydroelectric Project in Argentina and Paraguay.

The Federación de Afectados por Yacyretá de Itapúa y Misiones (FEDAYIM), a Paraguayan non-governmental organization, submitted the Request on behalf of more than 4,000 families who believe their lives and environment to be seriously harmed by the Project. Six coordinators of affected people in the San Cosme y Damián, Distrito Cambyreta, Barrio Pacu Cúa, Barrio Santa Rosa Mboy Caé, Arroyo Potiy, and Barrio Santa Rosa areas of Paraguay also signed the Request.

The Requesters claim that the raising of the Yacyretá power plant's reservoir to 76 meters above sea level (masl) has had severe environmental impacts, such as constant flooding of urban creeks, a higher water table, and the spreading of disease, which has forced them to live in unbearable conditions. They allege that the proposed wastewater treatment plant, to be built under the Project, would further pollute the environment because its location and design are based on a defective environmental assessment and are in violation of national environmental laws. According to the Requesters, the resettlement and compensation programs are not being properly implemented. Families affected by the raising of the reservoir have not been properly identified. The resettlement and compensation program has left hundreds of affected families and businesses with no or inadequate compensation, poor resettlement housing and facilities, and prolonged economic hardship. The Requesters allege that employees of brick and ceramic factories have not been compensated for their loss of income.

The Inspection Panel registered the Request and, after receiving Management's Response to the Request and visiting the affected area, recommended to the Board of Executive Directors that an Inspection be conducted. The Board approved this on September 9, 2002.

The Yacyretá Hydroelectric Project is a joint venture between Argentina and Paraguay, which was in the planning stages many years before the Bank entered into its first loan agreement for the Project in 1979. In 1973, Argentina and Paraguay had already concluded a treaty for the Yacyretá Hydroelectric Dam, which set forth the terms of the joint undertaking and created a semi-autonomous bi-national entity, the Entidad Binacional Yacyretá (EBY), to implement the Project. The treaty granted EBY full juridical, financial and administrative capacity and assigned it the technical responsibility to study, plan, direct and execute the hydroelectric Project.

The Project's civil works consist of two 40 meters (m) high, five kilometers (km) long, concrete dams and 65 km of embankment dam. The works also include a 1.2 km long powerhouse containing 20 turbines, spillways and a navigation lock. The dam was designed to be maintained at a level of 83 meters above mean sea level (masl). At this height the reservoir is estimated to cover an area of about 1650 km² and inundate about 1,500 hectares (ha) of cultivated land and 500 ha of urban land in cities and towns. When the first Bank loan was made in 1979, it was anticipated that the inundation at the design level of 83masl would cause the involuntary resettlement of about 33,000 persons, mostly from the cities of Posadas and Encarnación. This number has increased very significantly over the years. By 1992, when the second Bank was made, the number had increased to 42,000. There has been a steady influx of people into the Project area.

Dam construction began in December 1983. By 1992, most civil works were complete. However, only about half of the resettlement and environmental activities had been completed. Because of persistent difficulties in obtaining the financing necessary to complete the project, Argentina and Paraguay sought further loans from the Bank. As a condition of the Bank loans the two countries agreed to a phased filling of the reservoir (*Cronograma de obras*) so as to allow the power plant to start operation. In 1994, the reservoir was filled to 76 masl, but filling of the reservoir to a higher level was subject to Bank approval, which was subject to the countries meeting their resettlement and environmental obligations. As of February 2004, the reservoir remained at 76 masl, and consequently the power plant was generating energy at only 60% of its capacity.

In 1996 the Panel received its first Request for Inspection concerning the Yacyretá Hydroelectric Project, which alleged that many activities that should have been completed prior to filling the reservoir were still pending. In February 1997, at the Board meeting held to discuss the Panel's recommendation to investigate the 1996 Request, Management presented two Action Plans (Plan A and Plan B) to address the Project's outstanding problems. Plan A provided for the completion of the resettlement and environmental actions that should have been, but were not, implemented before raising the reservoir's water level to 76 masl. Plan B aimed at dealing with several problems arising from the reservoir level being held at 76 masl.

Consequently, the Board did not approve the Panel's recommendation to carry out an investigation. Instead it requested that the Panel assess the proposed Action Plans and undertake a review of the existing Project's resettlement and environmental problems. The Panel issued its report on these matters on September 16, 1997.

The Yacyretá Project extends more than two decades and hence has had several sources of Bank financing. The social and environmental parts of the project are partly financed under the Argentina-SEGBA V Power Distribution Project (Loan 2854-AR) and the Paraguay-Reform Project for the Water and Telecommunications Sector (Loan 3842-PA). The World Bank also provided financial support for Yacyretá under three additional loans, closed at the time of the 2002 Request to the Panel: Loan 1761-AR financing the Yacyretá Hydroelectric Project, Loan 2998-AR financing the Electric Sector Power

Project and Loan 3520-AR financing the so-called Second Yacyretá Hydroelectric Project.

This report concludes the Panel's investigation into the matters alleged in the Request for Inspection submitted to the Panel in May 2002. The current Panel's chairperson, Ms. Edith Brown Weiss, led the investigation. Three expert consultants on environmental, hydrological and social issues assisted the Panel in its undertaking.

This report examines the merits of the claims presented in the Request. It also considers Management's response to the claims. During its investigation the Panel interviewed Bank staff in Washington, D.C., visited the project area on four occasions, met with the Requesters and other project affected people throughout the area, and met with local and national authorities in both Argentina and Paraguay as well as with EBY officials. The Panel also identified and carefully reviewed relevant project documents that the Requesters, Bank staff, Inter-American Development Bank (IDB) staff, EBY officials and other sources provided to the Panel.

Applicable Bank Policies and Procedures

The Panel finds that the following policies and procedures are relevant to the Request:

Environmental Assessment OD 4.01 (October 1991)

Involuntary Resettlement OD 4.30 (June 1990)

Project Supervision OD/OP/BP 13.05 (March 1989 and July 2001)

Monitoring and Evaluation OD 10.70 (November 1989)

The Second Yacyretá Hydroelectric Project, was financed by Loan 3520-AR, which was approved in 1992. This loan is thus subject to the Bank policies relating to Environmental Assessment, OD 4.01, to Involuntary Resettlement, OD 4.30, and to Project Supervision, OD/OP/BP 13.05 and to Monitoring and Evaluation, OD 10.70. Before the loan was approved, the Bank requested the preparation of an Environmental Assessment as part of the conditionality for the loan. The resettlement plan that the Borrower prepared and the Bank reviewed in 1992 remains the operative plan for resettlement.

In 1995, the Bank approved the Asunción Sewerage Project, Loan 3842-PA, which was later renamed the Reform Project for the Water and Telecommunications Sector. The resettlement component of the Yacyretá Project financed by this loan is also subject to the above Bank policies and procedures.

The SEGBA V project, financed under Loan 2854-AR, was initiated before the Bank's safeguard policies came into force. However, the policies were in effect in 1994 and 1997 when the Loan was changed to allow funds to be applied to the resettlement components of the Yacyretá Project. The Environmental Assessment and Involuntary Resettlement policies thus apply to the resettlement activities of the Yacyretá project funded by Loan 2854-AR.

In addition to the above sources of Bank financing, the IDB has approved loans for the Yacyretá Project. The Project is thus also subject to the IDB policies and procedures.

Environmental Compliance

The Panel addresses the following Bank environmental compliance issues raised by the Requesters complaint: the adequacy of environmental assessments, the relationship between the level of the reservoir and urban creek flooding and ground water levels, the water-related health problems, and the location and design of the sewage treatment plant.

Environmental Assessment.

The environmental safeguard policies of OD4.01 require environmental screening and proper environmental assessment

Environmental Screening

The Bank assigned the Second Yacyretá Project and the Asunción Sewerage Project (later renamed the Reform Project for the Water and Telecommunications Sectors) to category A, under OD 4.01. Category A projects require a full environmental impact assessment. **The Panel finds that the environmental screening process for phase two of the Yacyretá Project and for the Asunción Sewerage Project was appropriate.**

Preparation of Environmental Assessments

Before bringing the Second Yacyretá Project to the Board for approval in 1992, the Bank had a full environmental assessment prepared. An Environmental Management Plan (PMMA or EMP) as well as an Action Plan for Resettlement and Rehabilitation (PARR or RRAP) accompanied the assessment. **The Panel finds that the Bank thus met the requirement of OD 4.01 at that time.**

OD 4.01 requires that environmental assessments be prepared for the resettlement activities financed by the Bank. During most of its investigation, it appeared to the Panel that Management had not provided for the preparation of these environmental assessments. However, in November 2003 Management provided to the Panel environmental assessments that were prepared by EBY consultants as evidence that the proper environmental assessments had been undertaken. The Assessments relate to the resettlement sites of Itá Paso, Arroyo Porá, and Carmen del Paraná, and include a General Summary of a Resettlement and Rehabilitation Action Plan conducted in terms of the Urban Creeks Program. **The Panel has reviewed the Assessments and finds that they are very inadequate. They do not comply with the requirements of OD 4.01. The range of environmental matters addressed is limited; alternative resettlement sites are not considered; few mitigation measures are suggested, and affected parties were not consulted. The safeguard envisioned to be in place through OD 4.01 has therefore failed.**

Consideration of Alternatives

OD 4.01 requires that an Environmental Assessment analyze alternatives to those proposed in the project.

The EA for the Second Yacyretá Hydroelectric Project contains a section titled “Analysis of Alternatives.” The Assessment analyzes alternative operational levels of the dam and the Aguapey barrage and the likely consequences of implementing the Yacyretá project. Given the history of the project before the Bank became involved, the Assessment understandably does not examine the full suite of possible project alternatives, such as the siting of the dam, but it does realistically consider alternatives for other aspects of the project. **With respect to the consideration of alternatives the Environmental Assessment for the Second Yacyretá Hydroelectric Project is in compliance with OD 4.01.**

Consideration of the Biophysical Environment

Consistent with OD 4.01, the Environmental Assessment discussed a number of biophysical parameters. The Panel observes that the biophysical environment affected by the Yacyretá dam and reservoir is being managed competently and that the initial environmental problems that arose when the reservoir was first filled have been satisfactorily resolved.

The Panel finds that the future environmental management of the Yacyretá Project is critically threatened, however, by the Project’s financial position and that both the natural environment and project-affected people will suffer additional harm if the project’s environmental management practices deteriorate.

Consideration of Urban and Peri-urban Environments

The Panel finds that the EA for the Second Yacyretá Project was inadequate in several respects in its consideration of urban and peri-urban environments. The EA did not adequately consider the effects of population growth on Encarnación, or the effects of the resettlement developments on the city’s infrastructure. The Panel finds that the safeguards to assess the implications for water supply, sewers, and urban drainage, which ought to have been in place via OD 4.01, were by-passed. Thus, Management is not in compliance with the requirements of OD 4.01.

More generally, the Panel finds that Management’s failure to assess the impact of the resettlement sites on the overall urban system is not in compliance with OD 4.30 as well as OD 4.01. The Panel notes, however, that in the context of the PDA, Management has advised EBY to co-ordinate resettlement in urban development plans.

OD 4.01 calls for an EA to consider the environmental effects of “induced development.” This includes effects on villages above the level of flooding associated with movements of population, including effects on their economies and livelihoods of their people. **The Panel finds that environmental and social assessments should have anticipated the induced effects associated with the Yacyretá Project.**

Implications of Non-compliance with Environmental Safeguard Policies

In part as a consequence of the Bank’s failure to observe its safeguard policy on environmental assessment, affected persons are dissatisfied with the Bank’s resettlement schemes, the resettlement schemes have given rise to problems of storm-water run-off and overloading of sewerage lines, and the limited resources of the local municipal authorities are being taxed. This is a situation which neither Bank staff, project proponents, or affected persons desire or with which they are satisfied. **This Project demonstrates that taking short-cuts with the Bank’s safeguard policies is counterproductive for all concerned.**

Flooding of Urban Creeks

The Panel finds that the construction of the Yacyretá dam has a negligible effect on the water level of the Paraná river at Encarnación, especially in times of flood.

The Panel also finds that the Yacyretá reservoir is frequently operated under conditions that produce a water level in excess of 76 masl at Encarnación and that this is not consistent with both the loan agreement and the Third Owners Agreement, as amended.

The Panel found that Management has accepted an error in the calculation of water level at Encarnación. From its analysis the Panel finds that the contention of affected persons that the Yacyretá reservoir is frequently operated under conditions that produce a water level in excess of 76 masl at Encarnación is correct. The excess, however, is limited to one meter or less.

Although it is clear that the urban creeks of Encarnación are flooding and causing severe hardship, the Panel finds that the Requesters contention that this flooding is a consequence of the Yacyretá reservoir itself cannot be sustained. The hydrological assessments show that neither the Paraná River floods nor backwater in the M’boi Caé is sufficient to cause the levels of flooding experienced in the urban creeks.

The urban creek flood conditions are mainly due to local conditions, such as upstream urbanization, lack of urban storm water drainage, and waste accumulation impeding water flow in the creeks, in that order. The contribution of specific resettlement areas to flood peak downstream is estimated as low. But the sum of all urbanization done upstream during the last years has increased the frequency and the peak level of the floods.

Environmental Pollution and Water Quality

The Panel confirms the Requesters contention that flooding of the urban creeks makes the drinking water wells on the flood plain unsuitable for use. However, the Panel finds that the alleged causal relationship between the level of the Yacyretá reservoir and pollution of wells and flooding of latrines is not correct.

With respect to the claim that the Yacyretá reservoir has caused environmental pollution, **the Panel finds that Bank Management has ensured that proper monitoring of water quality has been conducted in the reservoir.** Water quality monitoring has been an ongoing activity since before the filling of the Yacyretá reservoir. **The Panel verified the existence of the water quality monitoring data and the reasonableness of Management's claim that "the reservoir's water quality is constantly monitored, [and] falls within satisfactory parameters."**

Health Problems

The Requesters allege that the reservoir has caused severe health problems. In response Management refers to the disease monitoring program undertaken by the Ministry of Health and Social Welfare of Paraguay. The bimonthly reports provided by this Ministry indicate no per capita increase in the diseases that have been monitored since the filling of the reservoir. **The Panel verified the existence of the monitoring program, reviewed its findings, and found no evidence contradicting the findings.**

A frequent complaint to the Panel during site visits was that women suffer constantly from itchy skin, particularly on their hands and arms. This is attributed to the use of polluted water for washing clothes. **The Panel notes that** the Yacyretá reservoir is not the cause of the polluted water used by the complainants for washing clothes and that **there are potentially many different reasons why such skin irritations might occur.**

The Panel notes that it is not disputed that disease vectors are present in the Paraná river system. The question is whether there has been an increase in their abundance since the Yacyretá reservoir was created. The Ministry of Health and Social Welfare of Paraguay has a long-term ongoing study that shows no increase in abundance or species composition of disease vectors. **The Panel verified the existence and findings of this study and found no evidence to the contrary.**

The Panel confirmed that the Ministry of Health and Social Welfare of Paraguay adequately monitors the incidence of both disease and disease vectors.

Wastewater Treatment Plant

The conditions for sewage discharge in Encarnación have been very poor for many years, with numerous discharges of wastewater directly into creeks and other water bodies. **The Bank has required that a sewerage treatment system be provided for Encarnación before the reservoir is raised above 76 masl.** The first step required

under Bank policy is a proper environmental assessment of the proposed wastewater treatment plant.

While the Requesters are opposed to the location selected for the planned wastewater treatment plant, **the Panel finds that the site selected is not inappropriate for the purpose and that the environmental assessment for the wastewater treatment plant is not defective either procedurally or substantively.**

The Panel finds that the environmental assessment of the design for the wastewater treatment plant complies with OD 4.01. The Panel notes its great concern, however, that although the sewerage system has been designed to cover the city of Encarnación, the works described in current bidding documents seem to cover only the southern part of the city (zona sur).

The Requesters claimed that the sewerage system will not cover some of the resettlement areas. The Panel finds that it is planned that the resettlement areas in question will be linked to the reticulated sewerage system. The Panel notes, however, that confusion may have arisen over the coverage of the wastewater treatment because the detailed drawings of the planned sewerage reticulation system for Encarnación were not publicly available in the EBY information office.

Importantly, the Panel finds that responsibility for the cost of connection to the sewer system may become a significant source of conflict in the not too distant future. If the matter is not resolved in a way that will enable the vast majority of households to be connected to the sewer lines, the entire exercise of providing a sewer network will be largely negated. The Panel finds that this issue needs the urgent attention of Bank Management and that an effective means for financing the connection of houses to the sewer network is required, especially for poor communities.

The Panel finds that Management must give urgent attention to the practicalities of transferring operation and maintenance of the sewage treatment system away from EBY and to ensuring that the new operators are provided with adequate staff, budget and training to be able to run the sewage system efficiently and effectively. This is especially urgent, because the sewage system includes a bypass at each pumping station that will dump raw sewage into neighboring urban creeks in cases of pump malfunction or overflow.

Social Compliance

Identification of affected people

To identify the families eligible for compensation or resettlement, EBY conducted two censuses: in 1980 and in 1990. The latter was done in response to population growth and change. OD 4.30 on Involuntary Resettlement requires that resettlement plans be based on recent information about the scale and impact on displaced populations and requires a

socio-economic survey that records the names of the affected families. The Requesters claim that thousands of eligible families are not included in the census and thus have been excluded from the compensation and mitigation programs provided under the project's resettlement programs. **The Panel finds persuasive evidence that a number of people who were present at the time of the 1990 census were erroneously omitted and that they fear they will be ineligible for the Project compensation and resettlement benefits.**

Population has increased very substantially since 1990 in the areas to be flooded. **The Panel finds that before the water level is raised further, the Bank must confirm that the existing census and survey data will be updated and verified, in a manner consistent with the requirements of OD 4.30.** The survey needs to pay special attention to the accuracy of the geographical and topographical boundaries of the affected areas to allow proper identification of the affected people.

The Requesters claim that there are errors in the census information because a person's eligibility for certain kinds of compensation for lost productive income is partly determined by the person's "primary occupation" listed in the 1990 census. This overlooks those who lost significant income but did not designate the source as a "primary occupation," which especially affects brick and tile-makers and fishermen. **The Panel finds that the restoration of income-earning capacity under OD 4.30 may not be achieved when compensation for income losses is based solely on the "principal occupation" of the affected persons, because a person could have several occupations that contribute substantially to their overall personal income. The Panel is aware, however, of the practical problems of restoring income for more than one principal occupation.**

The Panel finds that the sole reliance in the 1990 census on an individual's principal occupation as the basis for restoration of income does not satisfy OD 4.30's requirement for many affected people.

Grievance Procedures

A number of the concerns raised by the Requesters would normally be settled with an appropriate conflict resolution mechanism provided as part of a resettlement plan. OD 4.30 provides for such a mechanism.

Although the Panel was informed that there were some procedures to rectify any omissions in the 1990 census, **the Panel finds that at best these procedures were *ad hoc* arrangements that allowed some corrections to the census. Most people who felt excluded did not have a clear and objective procedure for bringing their concerns to EBY. The Panel further finds that procedures for correcting the census or other resettlement related omissions and errors are inadequate, and notes that a standard and transparent appeals procedure is not available to affected people. This does not comply with OD 4.30, paragraph 8 footnote 11 and paragraph 17).**

Other Categories of Affected People

The Panel finds evidence that host populations near resettlement sites are, in some cases, adversely affected by the design and construction of the resettlement sites, or by added burdens on local infrastructure due to the influx of resettled population. OD 4.30 and OD 4.01 require that such impacts be assessed and mitigated. The Panel has already noted its finding that new resettlement construction should have had adequate environmental and social impact assessments.

The Panel also finds that there was inadequate effort on the part of the Bank to ensure that the host population was informed and consulted with in planning and carrying out construction of the resettlement sites, as required by OD 4.30, paragraph 9.

Resettlement and Compensation

To analyze the claim that the Bank has not complied with OD 4.30, the Panel addresses separately the two major issues: compensation and resettlement. These issues are inter-related.

Compensation

OD 4.30 expressly requires that displaced persons should be compensated for losses at full replacement cost and prior to their actual move.

EBY has in the past employed a two-stage process in the valuation of homes and property: a provisional or estimated appraisal and a final appraisal that should be done at time of expropriation. The estimated appraisals had no validity as a component of the final valuation procedure.

The Panel finds that the use of provisional appraisals is not inconsistent with Bank policies. However, because affected people did not receive adequate information about the procedure and did not participate in its implementation, there has been considerable confusion about the purpose and use of the provisional appraisals. OD 4.30 calls for the Bank to monitor the actual appraisal values that will be paid when these properties are involuntarily expropriated if the water level is raised.

Compensation for Customary Rights to Land and Loss of Access to Other Resources

Many of the displaced people do not hold title to the land upon which their houses or resources are located. OD 4.30 requires compensation for both property to which people hold title and property to which they do not. The 1992 resettlement plan provided for compensation to all displaced persons, regardless of whether they had title to their

properties. **The Panel finds this provision in the 1992 resettlement plan is in compliance with the requirement of OD 4.30 regarding usufruct or customary rights to land.**

The loss of access to natural resources that must be compensated in this Project include access to clay deposits. **The Panel finds that to the extent that the resettlement plan provides for compensation for loss of access to these resources, the Bank is in compliance with the requirements of OD 4.30. However, implementation procedures may have resulted in denying compensation to some affected people.**

Compensation Prior to Displacement

OD 4.30 requires that full compensation be paid to displaced people prior to their actual move. **Not all persons flooded out of their property in the 1994 flooding of the reservoir to the 76 meter level were properly compensated beforehand. In 1997, Management assisted EBY in developing the so-called “Plan A.” The Panel views Plan A as a remedy for this violation of OD 4.30.**

The Panel, however, found many instances after Plan A was in effect, in which people whose homes were flooded when the water level was raised in 1994, still feel inadequately compensated. People had either to accept the amount offered by EBY and in doing so agree to forego any further claim to additional funds, or take the matter to court. If they took the matter to court, they would have no access to the funds until after a court decision. Thus, **the Panel finds that the grievance procedures in effect during and since the time when the reservoir was raised to the 76 meter level were not in compliance with OD 4.30’s requirement for fair compensation.** The Panel notes, however, that Paraguay adopted a new law governing expropriations in January 2001. **The Panel finds that the provision of the new law granting access to funds during appeal is consistent with OD 4.30².**

The Sequencing of Places Selected for Compensation

The Requesters have expressed concern that while there are still many “pending debts” for people who had to move from below the 78 masl level, EBY is picking and choosing properties between 78 and 84 masl for relocating and compensating owners and that this is being done in a non-transparent process. The presumption of OD 4.30 is that compensation and resettlement will happen relatively quickly. **When the presumption that resettlement will happen relatively quickly fails, Bank Management must ensure, consistent with the purpose of OD 4.30, that there is a rationale for the sequencing of resettlement and that the sequencing process is transparent and fair.**

² There are a number of questionable aspects of the new law on which the Panel does not comment.

Resettlement

Alternative Sites

The Requesters claim that this Project has generally failed to examine adequately a range of alternative resettlement sites. The Panel finds that Management needed to ensure that alternative sites were considered in the Environmental Assessment for the resettlement areas. **The failure to consider acceptable resettlement alternatives is not in compliance with OD 4.30.**

Restoration of Income Earning Capacity

The Requesters claim that inadequate programs were developed for the economic and productive rehabilitation of the affected families. **While recognizing that there have been commendable efforts to develop productive projects, the Panel finds that the measures for restoring income earning capacity have been inadequate.** Some people were moved far from the market for their products and services, while others have found transportation to their place of work difficult and costly. Few who lost their livelihood have been offered adequate training to replace their lost source of income. The Panel recognizes that a severe economic crisis occurred in the area. However, this does not negate the importance of restoring income earning capacity through long term measures rather than temporary fixes.

Resettlement and Compensation of Specific Groups: Brick-makers and Tile-makers (ceramists)³

The Requesters complain that, while EBY provided compensation for several brick- and tile-making establishments, it relocated others to areas far away from the clay deposits. Moreover, when EBY paid compensation to the factories, it benefited only the factory owners and left a large number of workers without jobs or compensation. The Requesters urge the Bank to compel EBY to create a program of job retraining for these affected communities.

OD 4.30 requires that all affected people who lose their sources of income as a result of a Bank-financed project be compensated for their losses even in cases where they have not been physically displaced. The Panel notes that, as early as 1997, in the context of its Review and Assessment of Action Plans of the Yacyretá project, it urged the Bank to ensure that affected workers who lost their jobs as a result of the raising of the level of the reservoir be compensated as required by Bank policy.

³ The terms “tile -makers”, tile and “ceramists” are used in this report interchangeably to refer to the same type of production unit.

Small Scale Brick-makers

The Project's Resettlement and Rehabilitation Action Plan (PARR) identified industries dedicated to brick and tile-making – commonly called *oleros* – as among those that would be affected by the raising of the reservoir.

One compensation option was to provide the *oleros* private plots which did not contain clay and to supply them with clay from other sources for five years. This option was adopted for the San Pedro resettlement site. **The Panel found in its visit to the San Pedro site that while families had reestablished their brick making activities, many complained about losses in their income level and about lack of continued access to raw material because the five-year clay supply had ended.**

Another compensation option for small artisan brick makers was to receive cash compensation based on their “production capacity” together with a house and plot. The Resettlement Plan did not recommend this option, and it was expected that few would opt for it. However, the number of families who elected cash compensation was substantial. The option encouraged more people to settle in the area and to begin small brickworks in the hope of additional cash compensation, since the raising of the water level was postponed.

Medium and Large-size Industries

The 1992 PARR considered that large-scale industries had the capacity to relocate on their own, if provided indemnification for the property lost, and thus did not consider resettlement as an option under the plan. In 1995 EBY approved an alternative compensation solution for roof-tile industries, the so-called “self relocation” option. If the establishment chose to self relocate, it would be paid for improvements it had made and for the cost of a five-year supply of clay in accordance with the establishment's customary production levels.

The Panel finds that the industry owners could be expected to make an informed decision as to the value and prospects of their clay deposits and to be able to choose freely whether to accept the compensation package offered. However, the Panel expresses concerns about the adequacy of providing only a five year supply of clay, as this appears to be a temporary mitigation measure rather than a solution that would allow the activity to continue in the long-term.

Compensation to the Workers of Brick and Tile-making Industries

The Request for Inspection claims that EBY compensated the owners of brick and tile-making industries, but the workers did not receive any compensation. Management's Response emphasized that the employer, not EBY, is responsible for compensating its workers and that industry owners who “*were compensated but did not continue*

production had to give workers severance pay” in accordance with the Paraguayan labor laws.⁴

To address the Panel’s requests for clarifications, Management requested a Paraguayan law firm, Estudio Mersan Abogados, to prepare a legal review and analysis of Paraguayan law. The legal opinion concluded that workers (formal and informal) have a right to severance payment if their contract is rescinded. The payment obligation binds the employer, not EBY.

The Panel repeatedly requested Bank information on EBY’s procedures to compensate the owners and received conflicting statements from Management and EBY. During the Panel’s visit in December 2003, EBY officials clearly described the reimbursement procedure. EBY calculates the value of severance payments to the workers based on the employer’s declaration regarding the number and status of employees in the firm. The owner is to pay the properly registered workers their severance payments, which EBY subsequently reimburses up to the predetermined amount. Such reimbursement is, however, conditional on the employer providing evidence that each employee had been properly registered and social security taxes paid.

Many brick and tile-maker workers who lost their source of income as a consequence of the Yacyretá project belong to the category of informal workers, for whom employers did not keep official employment records or pay social security taxes. **The Panel finds that the large number of informal workers who worked in large, mechanized industries as well as in small-scale brick-making facilities were in practice excluded from the compensation system that the Bank approved, even though they suffered the adverse impacts of the project.**

Based on the foregoing, **the Panel finds that the compensation program approved by the Bank was not consistent with OD 4.30 because it excluded in practice compensation for a specific category of economic losses that affected one of the poorest segments of the area population – that is, the informal workers of the brick and roof-tile industries.**

The Panel is very concerned that the Bank approved compensation methods whereby workers, especially informal workers, must go to court to enforce their rights if their employer does not follow the law.

The Panel is surprised to read in Management documents provided to the Panel that “[t]o the extent that we are aware, there has not been a single legally recognized claim by a terminated employee against his or her employer.” Many claims brought by terminated employees against their employer were brought to the attention of the Panel on its visits.

⁴ Management Response, ¶ 135.

The Panel notes that with respect to the employers, if EBY estimates an inadequate amount of compensation for the owner's workers, and the workers successfully obtain higher compensation through the courts, the amount EBY will eventually reimburse the employer who paid workers will only be the one included in the EBY worksheet.

Access to Clay Deposits

The Panel finds that the Bank-approved provision of five years access to clay has not fully met OD 4.30's requirement that project-affected people have their pre-resettlement income earning capacity improved or at least restored. In stating this, the Panel recognizes that a severe economic crisis has occurred in the area. While recognizing that there have been efforts to retrain the brick-makers for other vocations, the Panel finds that for many people their income earning capacity seems not to have been restored.

Adequacy of the Resettlement Plan

The Panel finds that there is a detailed resettlement plan, timetable, and budget for this project *“aimed at improving or at least restoring the economic base for those relocated,”* as required by OD 4.30, paragraph 4. Thus, the Bank is in formal compliance with this requirement of OD 4.30. However, the plan, budget, and particularly the timetable envisaged within that plan have not worked as originally intended, creating a compliance issue for other aspects of this OD.

Influx of People into the Project Area

OD 4.30 requires that after the area affected by the project and the displaced population have been identified, the host government ensure that persons ineligible for compensation do not come into the identified affected area. In the Yacyretá project, there has been a large influx of people into the area.

The Panel finds that the resettlement plan as designed could not prevent the influx of ineligible population, because the legal framework was inadequate for doing so. This does not comply with OD 4.30 paragraph 12.

Delays and Uncertainties

An issue of broad concern is that there has been an extraordinary amount of uncertainty and delay due to the long-term postponement in raising the reservoir's water level. These delays are themselves the source of severe hardship for many people. They do not know if and when they will be resettled; they are unable to sell or expand their properties; and in many ways they have to adjust the normal social organization of their households in order to remain eligible for compensation. This has occurred despite the requirement of OD 4.30 that any resettlement plan accepted by the Bank be “time bound.”

The Panel finds that in the complex situation of this project, with its very long delays in implementation, the Bank should have recognized that its resettlement plan was potentially not time bound. It should have made adequate allowances in the 1992 plan and later modifications of it for the extreme hardships that have occurred as a result of uncertainties and delays in implementing the plan. Where a person can document a loss directly attributable to the very long delay in resettlement, such loss should be recognized under OD 4.30, but the Panel recognizes that in practice this will be very difficult to implement.

Programa Desborde de Arroyos (PDA) – the Urban Creeks Program

The Request raises a number of issues related to the design and implementation of the Urban Creeks Program (PDA), which provides for resettling families who live in serious unsanitary conditions along urban creeks in areas between 78 and 84 masl before they would otherwise be. The Requesters are concerned that the PDA will not benefit those for whom it was intended and that EBY did not adequately consult the affected people in preparing the PDA program.

The Panel notes that both Management Response and EBY officials confirm that alternative sites for relocating these families were not considered in the context of the PDA program, even as future possibilities. As indicated previously, **the Panel finds that the failure to consider acceptable resettlement alternatives does not comply with OD 4.30. The Panel further finds that the resettlement sites that they were offered did not ensure access to employment and services comparable to their old neighborhoods.**

The Panel also interviewed many people who were extremely confused about the PDA program, its purpose, who was included and when, and whether they were supposed to relocate. The Panel finds that under OD 4.30 Management must ensure that affected people are systematically informed and consulted about their options and rights during the preparation and implementation of the PDA program.

Project Supervision and Monitoring

OD 13.05 states that project supervision is one of the Bank's most important activities.

The Requesters claim that the Bank has violated its policies on project supervision and project monitoring and evaluation, in particular in the implementation of the resettlement activities. In the Requesters' view, this meant that the Bank allowed the power plant to begin its operations before completing, in the first place, the resettlement of the affected population, leaving thousands of people worse off than before the Project started.

Supervision of Environmental Operations

A distinction must be made between the supervision of the environmental aspects of the main civil works components of the project and that of the resettlement activities. The

Bank's participation in the design, execution and supervision of environmental mitigation activities of the main works was quite successful. The frequent supervision missions were most of the time adequately staffed and a rather stable team was in charge. A number of corrective measures were taken to avoid or mitigate harm during project execution. **The Panel therefore finds that the Bank met the requirements of OD 13.05 with regard to the environmental aspects of the main civil works components of the Project.**

Supervision of Resettlement Activities

The Request primarily addresses problems related to the location and design of the resettlement sites, the quality of workmanship, and the lack of consultations with, and options provided to, those who must be resettled.

After reviewing the evidence presented by Requesters, Management's Response and the Panel's independent observations, the Panel finds that supervision of resettlement by the Bank is inadequate in two important respects: a failure to ensure sound technical quality in the design, construction, and implementation of resettlement programs, and inadequate consultation with affected people.

Technical Quality Assurance: Standards of Design, Construction, and Implementation

The Panel found that supervision of the design and construction of infrastructure for the resettlements associated with the Yacyretá Project, including those financed under the Paraguay Reform Project for the Water and Telecommunications Sectors, the SEGBA V project, and the Programa Desborde de Arroyos (PDA) has been inadequate. Supervision missions appear to have given little attention to technical quality assurance. This does not comply with paragraph 29 of OD 13.05.

During the Panel's visits, the Panel saw numerous examples of poor quality construction of houses as well as poor drainage systems, extremely poor road construction leading to easily lifted cobblestones and major pothole damage even on new roads, with severe problems caused apparently by storm water drainage. In at least one case, the quality of site construction was so poor that a new class of affected people around the site has been created. **The Panel finds that if supervision had been stronger, Bank staff would have spotted the poor quality of construction within resettlement sites.**

The Panel finds that there is clear need for more effective supervision of technical design and construction in all facets of the Yacyretá resettlement scheme and notes the necessity for adequate supervision of technical design and supervision in resettlement schemes generally.

After many visits to the area by the Inspection Panel and follow-up interviews with Bank staff members, the supervision mission of October 2003 noted in its Aide Memoire that *"there is no integration of environmental management into the design and construction of urban civil works, mostly in the resettlement sites."* The Aide Memoire urged a number

of steps be taken to redress the situation. This contrasts with Management's statements in its memorandum to the Panel on January 13, 2004 that "Bank oversight has ensured that EBY's capacity to apply those criteria and procedures [appropriate environmental criteria and procedures] was sufficient" and that "the Task Team verified the success of their approach through regular visits to the resettlement locations during supervision." The memorandum also noted that "[t]he approach used throughout this period has been consistent with Bank policy and practice toward projects and their sub-projects that have minimal environmental impacts (such as the Itá Paso and Arroyo Porá resettlement sites, as well as other minor PDA-associated infrastructure.)"⁵

The Requesters claim that the resettlements built by the Project at Buena Vista and San Pedro have aggravated the environmental and health situation by directly discharging into the creeks. Management Response notes that the solution to this problem is the construction of the wastewater treatment plant, to which the resettlement sites at Buena Vista and San Pedro will in due course be connected. **The Panel finds that given the foreseeable delays in the construction of the wastewater treatment plant, Management should have anticipated the problem of delay and ensured that appropriate interim arrangements for discharge of the wastes were made until the plant was built and all house connections made.**

The Panel finds that Management's failure to ensure sound technical quality of work on the resettlement project and to encourage needed design changes as circumstances change is not in compliance with OD 13.05 on Project Supervision.

Consultation with Affected People

BP 13.05 makes explicit the principle that effective supervision necessarily includes consultation with project affected people. The Panel is concerned that the Bank's supervision missions have not interacted meaningfully with affected people or thoroughly monitored the resettlement sites

The Panel finds that there is a wide discrepancy between the recollections of affected people in the Project area, who insist there have been no meaningful consultation or thorough on site visits and the Bank's statements about its supervision missions. The Panel finds that Management must ensure that it consults with and interacts meaningfully with affected people and that consultations must be in settings where affected people feel able to convey effectively their concerns to Bank staff. Bank supervision missions should clearly state the places they visited during field inspections and the conditions under which they visited (e.g. with Project staff or accompanied by representatives of NGOs, etc.), in order to better document not only that supervision missions were present in the area, but that the supervision team members actually had contact with affected persons and investigated matters directly dealing with issues of social safeguard policies.

⁵ Memo, January 13, 2004 re: Yacyretá Inspection: follow up memo dated December 10, 2003.

Level of Supervision

The Panel observes that during field visits to the Project area many people affected by the project strongly expressed their own *perception* that corruption pervades the political life of the Project area and includes those responsible for, and benefiting from, resources provided by EBY.

The Panel is not in a position to comment on the accuracy of the perception of corruption. However, under these circumstances, the Panel finds that the Bank needs to expect a higher than usual level of supervision in order to ensure that corruption does not occur and to assure affected people that this is so. While a larger than average number of supervision missions, which included three High Level Supervision Meetings, demonstrates more intense supervision than is usual, it may not be an adequate response to alleviate the perceptions and suspicions of project-affected persons. The supervision missions appear to have been inadequate in meeting directly with affected persons in appropriate settings, and in focusing on social safeguard issues. This has contributed to the affected people's apparent hostility towards the Bank staff.

Expertise in Bank supervision

The Panel points to the need for Management to ensure that the missions have the requisite technical expertise to adequately review the design and construction of urban resettlements and the impact of the resettlement areas on neighboring areas and to the need to ensure that reviews are conducted in an integrated way.

As the Yacyretá Project proceeded, the resettlement issues became progressively more important and difficult to address. **The Panel notes that Bank supervision of the Yacyretá Project's resettlement and rehabilitation activities did not adapt effectively to this change by using more technical and social expertise to address these problems, as is required to carry out OD 13.05, paragraph 1 (b).**

According to the Aide Memoire, there has not been and there is not yet any clear strategy to counteract the negative perceptions that the population has of the project. **The absence of an effective communication strategy has significantly damaged relations between those concerned with implementing the project and the affected civilian population.**

The Panel notes that the October 2003 supervision mission's conclusions and recommendations regarding the social aspects of the project, as presented in the related Aide Memoire, reflect those that Bank policies require. The problem is that these detailed recommendations were given after 20 years into the project implementation, rather than before approving the projects' resettlement plan and related documents. Indeed, they seemed to have come only after the Panel had completed most of its investigation.

Linkages Between Supervisions Reports (Aide Memoires and Back-to-Office Reports), Progress Reports to the Board, and Management Response to Request for Inspection

Given the serious delays in implementing the resettlement programs and the social and environmental problems associated with resettlement, the Panel inquired into whether the supervision reports reflected these conditions and whether the Progress reports to the Board reflected the content of the supervision reports. The Panel is concerned that the progress reports to the Board are more optimistic than the supervision reports in certain respects. It is also concerned that Management's response to the Requesters is more optimistic than the supervision reports.

There are at least three ways in which some of the reports Management prepared for the Board presented a more optimistic outlook than the Aide Memoires and the circumstances merited: by continued reference to virtual completion of Plan A, even though it is still not fully complete; by setting forth dates for the completion of the resettlement that were too reassuring, and by describing over a number of years the construction of the waste treatment plant "as soon to be started and completed", even though construction has yet to begin in 2004.

Based on the foregoing, the Panel finds that Management has in some respects been too optimistic in informing the Board on the future of project implementation. The Panel understands that it is difficult to accurately predict when certain aspects of the project will be completed. It believes some of the reporting has understated serious difficulties in project implementation. The Panel especially notes that only after it had conducted its own field research from January through December 2003 and conducted follow-up staff interviews did Management produce an Aide Memoire (October 23-30, 2003) that identified many of the problems the Panel had found and the remedial actions which need to be taken.

Factors Affecting Project Completion

The Panel understands that presently Argentina and Paraguay are trying to reach a final decision on the level of the reservoir. A decision to raise the reservoir to the design level of 83 masl or to any height between the current 76 masl and the design level will have significant social, economic, and environmental impacts on many of the Requesters as well as important financial implications. The taking of a final decision could provide an end to years of uncertainty regarding when and to what level the reservoir will be filled and operated.

According to evidence received by the Panel, the Bank maintains its position that the raising of the reservoir must be preceded by the mitigation and resettlement measures agreed upon between the Bank, the IDB, the governments of Argentina and Paraguay and the EBY. **The Panel notes that a number of essential social and environmental activities have yet to be completed in order to raise the water level beyond the current 76 masl.** Although up-to-date estimates of the investment cost required to

complete these activities are not available, the latest figures in the 2002 Strategic Plan prepared by EBY show that to raise the reservoir from its present level to 78 masl would cost about US\$282 million. To raise it to 80masl, an additional amount of about US\$298 million would be required, and to bring the reservoir to its design level of 83 masl, US\$134 million more would be required. To this US\$740million, an amount of about US\$200 million must be added to complete a number of additional investments provided under the Yacyretá treaty. All of these amounts are expressed in July 2002 prices and have not been independently verified by the Bank. EBY is preparing revised cost estimates that are expected to be lower than those in the 2002 Strategic Plan. Raising the reservoir to its design level would increase EBY generation capacity substantially but, given current and projected electricity market demand and prices, EBY's generation of revenue would be highly unlikely to cover these investments in the foreseeable future. The financial sources for the required investments have yet to be determined and remain a major constraint for any decision to raise the reservoir above its present level of operation.

The Panel finds that the long delays that have already occurred in implementing the resettlement and environmental mitigation activities have brought substantial costs and serious hardships to the affected populations. The Panel further notes the urgent need for a decision to define the final operating level of the reservoir. The Panel wishes to highlight the economic and social costs associated with any decision regarding the level of the reservoir if it is not politically or otherwise feasible to implement the decision fully and in a timely manner. The governments' decisions as to whether, how much, and when to raise the operating level of the reservoir will directly affect the ability of the Bank to bring this project into compliance with its operational policies and procedures.

Chapter One

Introduction

TABLE OF CONTENTS

Chapter One	1
Introduction.....	1
Table of Contents.....	2
1. Request for an Investigation	3
1.1. Request for Inspection Submitted to the Panel.....	3
1.2. The Request.....	4
1.3. Management Response	5
1.4. Eligibility of the Request	6
1.5. The Board Decision	6
1.6. The Investigation.....	6
2. The Yacyretá Hydroelectric Project.....	8
2.1. Historical Background: 80 Years of Yacyretá.	8
2.1.1. Treaty of Yacyretá	9
2.1.2. Entidad Binacional Yacyretá (EBY).....	11
2.2. Project Financing	13
2.2.1. Local Funds.....	13
2.2.2. The Third Owners' Agreement	13
2.2.3. World Bank Financial Support for the Project	14
2.3. The Project Design.....	18
2.3.1. The Site of the Power Plant	18
2.3.2. The Resettlement Programs	19
2.3.2.1. The Programa Desborde de Arroyos (PDA).....	20
2.3.3. The Environmental Mitigation Activities	21
2.4. 20 Years of Implementation.....	21
2.4.1. Implementation Problems	21
2.4.2. First Request for Inspection to the Panel	23
2.4.3. Action Plans A and B.....	23
2.4.4. Board Decision.....	24
2.4.5. The Panel Review and Assessment of the Action Plans	24
2.4.6. 1997 Amendment to the Bank Loan Agreements	27
2.5. Factors Affecting the Project's Completion	27
3. Applicability of the Bank Operational Policies to the Yacyretá Project	33

1. REQUEST FOR AN INVESTIGATION

1.1. Request for Inspection Submitted to the Panel

1. On May 17, 2002, the Panel received a Request for Inspection (“the Request”)⁶ alleging that the World Bank (“the Bank”) violated its own policies and procedures in relation to the design and implementation of the Yacyretá⁷ Hydroelectric Project (“the Project”) situated in Argentina and Paraguay. As stated in the Request, this alleged violation resulted in harm to the local people and the environment in Paraguay. As described below,⁸ the Yacyretá Hydroelectric Project has been partly financed by several Bank loans, including the Argentina-SEGBA V Power Distribution Project and the Paraguay-Reform Project for the Water and Telecommunication Sector. The Project consists of a 65 kilometer (km) earthen dam in the main channel of the Paraná River about 80 km from the cities of Posadas, Argentina, and Encarnación, Paraguay (see Map 1). It comprises a low-head hydroelectric facility (with 20 Kaplan turbines of 155 megawatts (MW) each for a total generating capacity of 3,100 MW), as well as a navigation lock, a fish passage, and other support facilities. The Project also provides for a large program of infrastructure relocation, population resettlement, and environmental impact mitigation. The earthen dam, with a uniform height of 86 m, creates a reservoir of 1065 square km, which, if filled to its design level of 83 masl, will flood over 107,000 hectares⁹ and have major impacts on the urban areas of Encarnación and Posadas. In 1992, the dam was estimated to affect about 10,600 families in both countries.¹⁰ Because of the constant influx of people into the project area, the number of people that will be affected by Yacyretá had climbed in 2002 to nearly 18,000 families.¹¹ Presently the dam operates at approximately 60 percent of its capacity, at a reservoir level of 76 masl.
2. **The Federación de Afectados por Yacyretá de Itapúa y Misiones (FEDAYIM)**,¹² a Paraguayan non-governmental organization, submitted the Request for Inspection on its own behalf as well as on behalf of more than 4,000 families who believe that their lives and well-being are affected by the Yacyretá

⁶ Request for Inspection: Paraguay Reform Project for the Water and Telecommunication Sectors Argentina SEGBA V Power Distribution Project, received on May 17, 2002, in Panel Report and Recommendation, August 28, 2002, Annex 1, English translation, [hereinafter “Request”].

⁷ “Yacyretá” is the Guaraní name that the pre-Columbian native population gave the island in the Paraná River where the main project facilities have been constructed. It means “moon land.”

⁸ See *infra* § 2.2.3.

⁹ Yacyretá Hydroelectric Project, *Informe de Evaluación Ambiental: Proyecto Hidroelctrico* [sic] *Yacyretá* (Environmental Assessment), July 31, 1992, 117 [hereinafter “1992 EIA Yacyretá Project”].

¹⁰ *Ibid.*, 103, Table No. 47.

¹¹ International Bank for Reconstruction and Development, “Management Response to the Inspection Panel Request,” Argentina/Paraguay: Yacyretá Hydroelectric Project, INSP/RQ02/1 (July 10, 2002), 22, Table 5.1 [hereinafter “Management Response”].

¹² The English translation of the NGO’s name is “The Federation of People of Itapúa and Misiones Affected by Yacyretá.” This report will refer to FEDAYIM and the people it represents as “the Requesters.”

Hydroelectric Dam. Six coordinators of affected people in the Paraguayan areas of San Cosme y Damián, Distrito Cambyreta, Barrio Pacu Cúa, Barrio Santa Rosa, M'boy Caé, Arroyo Potí'y, and Barrio Santa Rosa also signed the Request.

3. On May 30, 2002, the Panel registered the Request and notified the Bank's Board of Executive Directors (the "Board") and the President of its receipt.

1.2. The Request

4. According to the Request, more than 4,000 families "*affected by pending liabilities*"¹³ living in the areas directly affected by the Yacyretá Hydroelectric Project are suffering adverse social and environmental consequences because of the raising of the Yacyretá power plant's reservoir to 76 masl or, allegedly, higher. The Requesters claim that the raising of the reservoir to its current level has had severe environmental impacts, such as constant flooding of urban creeks, a higher water table, contamination of the Paraná River and the creeks, and spreading of diseases. The Requesters allege that this has forced them to live in unbearable conditions.
5. The Request also contends that a proposed wastewater treatment plant, to be built under the Project, would further pollute the environment because its location and design are based on a defective environmental assessment and are in violation of national environmental laws.¹⁴
6. According to the Requesters, the families affected by the raising of the reservoir were neither appropriately identified nor adequately quantified. As a result, thousands of them were excluded from existing compensation and mitigation programs, in spite of the fact that they have owned and occupied lands affected by the construction of the dam for more than twenty years.
7. The Request states also that the resettlement programs, provided under the Yacyretá Hydroelectric Project and partially financed with various Bank loans, are not being properly implemented. This has left hundreds of affected families and businesses with no or inadequate compensation, poor resettlement housing and facilities, and prolonged economic hardship. The Request gives particular attention to the situation of the employees of the brick-making and ceramic factories who allegedly have not been compensated for their loss of income because only factory owners, and not their workers, were compensated for their losses.

¹³ Request, 1. The Request uses the term "*pending liability*" to refer to social and environmental activities that the Entidad Nacional Yacyretá (EBY) needed to implement before raising the reservoir to 76 masl but, according to the Requesters, has not.

¹⁴ The Panel does not comment on matters related to compliance with national legislation of Bank member countries.

8. The Requesters allege that the Bank's actions and omissions constitute violations of various provisions of Bank Policies and Procedures: OD 4.01 on Environmental Assessment; OD 4.30 on Involuntary Resettlement; OD/OP/BP 13.05 on Project Supervision; OD 10.70 on Project Monitoring and Evaluation; OD 13.40 on Suspension of Disbursements; and OD 4.00 Annex B on Environmental Policy for Dam and Reservoir Projects.

1.3. Management Response

9. On July 10, 2002, the Panel received the Management Response to the Inspection Panel Request, which is briefly summarized below.
10. In its Response, Management asserts that it has complied with all relevant Bank policies and procedures and that it strives to address all social and environmental concerns of the people living in the project areas. It acknowledges, however, that the Project's implementation has encountered serious problems over the years and that these have yet to be fully resolved. Management states that it has maintained its financing of and engagement in the Yacyretá Project and has avoided exercising the available legal remedies against the Borrower because, in Management's judgment, the Project is best served by such actions.
11. Management emphasizes that there is no causal relationship between a number of the problems documented in the Request and the raising of the reservoir's level to the current 76 masl. Consequently Management contends that the problems of urban creek flooding, water contamination, environmental pollution, and adverse health impacts on the population have not been caused by the reservoir. Management attributes these problems either to natural factors, such as increased rainfall, or to human actions unrelated to the reservoir, namely clogging of the creeks with garbage.
12. The Response also emphasizes that EBY will finance and supervise the construction of a new sewage collection system and a wastewater treatment plan in Encarnación, Paraguay, whose location, although strongly disputed by some segments of the population, is based on an adequate environmental assessment and the advice of independent consultants.
13. In response to the claim that thousands of families have been excluded from the compensation and mitigation programs, Management states that appropriate compensation and adequate resettlement have been provided to all the affected families and businesses that were identified through censuses conducted in 1980 and 1990. With regard to the issue of lack of compensation to brick-makers and ceramists, the Response contends that "[d]uring the period 1994 to 1996, when discussion about compensation to brick and roof tile makers was under way [sic], the Bank as well as EBY worked under the assumption that Paraguayan labor laws would be applied effectively. As a result, analysis and discussion were focused on compensating owners of brick and tile making businesses and it was

assumed that employers would proceed according to the law and properly compensate their employees.”¹⁵

1.4. Eligibility of the Request

14. To determine the eligibility of the Request and the Requesters, the Panel reviewed the Request for Inspection and the Management Response and, in July 2002, visited Encarnación, Paraguay, and other relevant Project areas, including Posadas, Argentina.
15. During the field visit, the then Panel Chairman¹⁶ Edward S. Ayensu met with representatives of the FEDAYIM, government officials, local officials, and affected people in the project area and with government and EBY officials in Asunción. In Buenos Aires, Argentina, he met with government and EBY officials and NGO representatives. Before and after the visit to Argentina and Paraguay, the Panel consulted with the Bank’s Executive Director and the Alternate Executive Director representing Argentina and Paraguay and with their staff.
16. The Panel determined that the Request fulfilled the eligibility requirements for Inspection. Because the Request and the Management Response contain conflicting assertions and interpretations concerning the issues, the facts, compliance with Bank policies and procedures, actual harm, and potential harm, the Panel recommended an investigation to the Board of Executive Directors.

1.5. The Board Decision

17. On September 9, 2002, the Board approved the Panel’s recommendation to conduct an investigation into the matters alleged in the Request for Inspection. The Request, the Management Response, and the Panel’s Report and Recommendation were made public shortly after the Board decided to authorize the inspection sought by the Requesters.

1.6. The Investigation

18. The purpose of the investigation was to establish whether the Bank violated its own policies and procedures in the design and implementation of the Yacyretá Hydroelectric Project—and of the Asunción Sewerage Project to the extent that it relates to Yacyretá¹⁷—and whether, if violations were found, they caused, or are likely to cause, harm to the Requesters and the people they represent.

¹⁵ Management Response, ¶ 135.

¹⁶ Because of the expiration of his term of office as a Panel member, Professor Ayensu’s chairmanship of the Panel ended on July 31, 2003. He was succeeded by Professor Edith Brown Weiss.

¹⁷ The Asunción Sewerage Project, financed by Loan No. 3842-PA approved on February 14, 1995, is aimed at, *inter alia*, improving the living conditions of 3,000 inhabitants of Encarnación, who were to be resettled under the Second Yacyretá Hydroelectric Project, by providing related infrastructure works. In

19. Panel Chairman Edith Brown Weiss led a two-part investigation. The first part involved detailed research into Bank records related to the Project and interviews with Bank management and staff. The second part took the form of four in-country fact-finding visits. To assist in its investigation, the Panel hired three consultants, who are internationally recognized experts in their respective fields: Professor Richard Fuggle, environmental scientist, Dr. Paul Taylor, social scientist, and Professor Carlos Tucci, hydrologist.¹⁸
20. Panel member Edith Brown Weiss, accompanied by Executive Secretary Eduardo Abbott, initially visited Argentina and Paraguay in October 2002. A second visit to the project area followed in January 2003. Then Panel Chairman Edward S. Ayensu and the expert consultants, supported by the Panel Secretariat, accompanied Lead Inspector Edith Brown Weiss. The Panel conducted additional visits in May 2003 and December 2003 to clarify and to verify information gathered in the course of the investigation.¹⁹
21. In its investigation, the Panel identified and carefully reviewed all documents relevant to the case that the Requesters, Bank staff, IDB staff, EBY officials, and other sources provided to the Panel. The Panel also analyzed other evidence gathered during the field visits or otherwise in its research.
22. The Panel conducted interviews with the Bank's staff in Washington, D.C. before and after visiting the project affected areas. During its field visits, the Panel met extensively with the Requesters, with high officials of the governments of Argentina and Paraguay, and with EBY officials and staff, who had an open and frank dialogue with the Panel and were very helpful in assisting in its investigation. Consistent with its mandate, it independently visited the project areas and consulted with affected people.
23. This Report presents the results of the Panel's investigation. Chapter One presents the history of the Project and identifies significant factors affecting the Project's completion. Chapters 2 – 4 address specific issues raised in the Request for Inspection or presented to the Panel during its visits to the Project's affected areas.

2000, the Asunción Sewerage Project was restructured and renamed "Reform Project for the Water and Telecommunications Sectors." See *infra* §§ 2.2.3, 4.2.3, 4.3.3, and 4.4.2 for an analysis of this project in connection with Yacyretá.

¹⁸ See Annex C for biographies.

¹⁹ During the Panel's visits, Panel members were assisted by Panel Executive Secretary Eduardo Abbott, Professor Richard Fuggle, Professor Carlos Tucci, and Dr. Paul Taylor, consultant Tatiana Tassoni, and interpreters Rut Simcovich, Lillian Gentile, Marina Pou, and Fernanda Font.

2. THE YACYRETÁ HYDROELECTRIC PROJECT

24. The Yacyretá Hydroelectric Project, a joint venture between Argentina and Paraguay, is a multi-billion US dollar hydroelectric facility constructed on the Paraná River along the border between the two countries. At design capacity (and a reservoir level of 83 masl), Yacyretá would generate 3,100 MW of electricity. Currently it operates at about 60 percent of its capacity with a reservoir level of 76 masl. To implement the project, a semi-autonomous, bi-national entity, the Entidad Binacional Yacyretá (EBY), was created in 1973, with equal representation of the two countries on its Board of Directors as well as at other administrative levels.

2.1. Historical Background: 80 Years of Yacyretá.

25. The Paraná River is a tributary of the Rio de la Plata, which borders Argentina and Brazil. The idea of damming the Paraná river in the vicinity of the Yacyretá island to improve navigation through the Apipé rapids was first conceived in 1920, when the Argentine government commissioned a series of studies focused initially on improving navigation and eventually on assessing the rapids' hydroelectric potential as well.²⁰ In 1926, Argentina and Paraguay laid the basis for the future Yacyretá project by signing a protocol that envisaged using common waters to generate and share energy.²¹ In 1958, Argentina and Paraguay formed the Comisión Mixta Técnica Paraguayo-Argentina (CMT), a bi-national entity that can be considered the predecessor of the EBY.²² The CMT was charged with conducting the pre-feasibility study of Yacyretá, which was completed in 1964.²³
26. In 1971, CMT hired an international consortium of consultants, Harza y Consorcios ("Harza"), to prepare a feasibility study for a Yacyretá hydroelectric project.²⁴ The study was completed in December 1973.

²⁰ World Bank, Staff Appraisal Report, "Argentina-Paraguay: Yacyretá Hydroelectric Project," Report No. 2342-AR (September 21, 1979), 15 [hereinafter "1979 SAR"]; Gustavo Lins Ribeiro, *Transnational Capitalism and Hydropolitics in Argentina: The Yacyretá High Dam* (Gainesville: University Press of Florida, 1994), 31.

²¹ Acuerdo Sobre El Mejoramiento De La Navegabilidad Del Rio Alto Paraná Y Utilización De Las Caídas De Agua En Apipé Suscripto Ad Referendum De Los Gobiernos. The protocol authorized Argentina to conduct the work and the studies needed to utilize the common waters in the Paraná River. It established as well that, in the case of Yacyretá, the rapids utilized to exploit part of the energy were jointly owned by the two countries. Finally, the protocol foresaw the possibility of making use of Paraguayan territory to execute the project, and the need to expropriate lands.

²² See infra § 2.1.2.

²³ Ribeiro, *Transnational Capitalism and Hydropolitics in Argentina*, 35.

²⁴ *Ibid.*, 35–36. The author reports that in 1969 the then West German government made a loan to Argentina to carry out studies for the development of the future Yacyretá project. The competitive bidding, in which five consortia of firms participated, was launched in early 1971. By mid-1971, CMT announced the winner: Harza y Consorcios, a consortium comprised of Harza Engineering, a firm from Chicago, one German firm, two Argentine firms, and one Paraguayan firm.

27. On the basis of these studies, Argentina and Paraguay signed during the same month the Tratado de Yacyretá (Treaty of Yacyretá), formalizing the agreement to construct the dam and undertake the hydroelectric project.²⁵ In 1974, Harza was once again contracted to prepare the Project's final design.²⁶ Construction began in 1983.
28. The Yacyretá dam is but one of three dams that have been proposed to exploit the hydroelectric potential of the Paraná River. The other two proposed dams were at Itaipú, and Corpus. Only the Yacyretá and Itaipú dams have been built.²⁷
29. The Itaipú Dam links Brazil and Paraguay in exploiting the Paraná River. The two countries agreed on common exploitation of the river in 1966.²⁸ In April 1973, they concluded the Treaty of Itaipú for the '*hydroelectric development of the [river's] hydraulic resources.*'²⁹ The Itaipú dam, constructed pursuant to this treaty, is located upstream from the Yacyretá dam on the Paraná River.
30. The third proposed dam, Corpus, has yet to be built. If built, Corpus will be co-owned by Argentina and Paraguay and will create '*hydrologic interdependency between these three dams.*'³⁰ Recognition of this potential interdependency led in 1979 to the signing of a trilateral agreement between Argentina, Paraguay, and Brazil for the exploitation of the Paraná's hydroelectric potential.³¹

2.1.1. Treaty of Yacyretá

31. On December 3, 1973, Argentina and Paraguay ("the Parties") concluded the Treaty of Yacyretá.³² It includes three annexes dealing respectively with statutes,

²⁵ For the text, see Entidad Binacional Yacyretá, "Tratado de Yacyretá y Normas Complementarias, (Edición 1998)"

²⁶ Ribeiro, *Transnational Capitalism and Hydropolitics in Argentina*, 36.

²⁷ J. Eliseo da Rosa, "Economics, Politics, and Hydroelectric Power: The Paraná River Basin," *Latin American Research Review*, Vol. 18, Issue 3 (1983), 79.

²⁸ Acta de Foz de Iguazú (Ata das Cataratas), signed in June 1966; da Rosa, "Economics, Politics, and Hydroelectric Power," 84–85.

²⁹ Treaty of Itaipú, April 26, 1973, Art. I.

³⁰ Ribeiro, *Transnational Capitalism and Hydropolitics in Argentina*, 42–43. See also da Rosa, "Economics, Politics, and Hydroelectric Power," 96; *Obras Hidroeléctricas Binacionales en América Latina* (Buenos Aires, Argentina: Banco Interamericano de Desarrollo, Instituto Para La Integración de America Latina, 1985), 43.

³¹ See Da Rosa, "Economics, Politics, and Hydroelectric Power," 96 (citing Accord Itaipú-Corpus, October 19, 1979, Ciudad Presidente Stroessner, Paraguay); Ribeiro, *Transnational Capitalism and Hydropolitics in Argentina*, 43. See also *Obras Hidroeléctricas Binacionales en América Latina* (Buenos Aires: Banco Interamericano de Desarrollo, Instituto Para La Integración de America Latina, 1982), 43 (also citing the same agreement).

³² The Treaty was approved with Law no. 433/74 in Paraguay and Law no. 20646/74 in Argentina, in Entidad Binacional Yacyretá, "Tratado de Yacyretá y Normas Complementarias, (Edición 1998)" [hereinafter "Tratado de Yacyretá and Normas Complementarias"].

- project components, and financial arrangements.³³ The Parties have subsequently amended the Treaty and expanded their commitments through letters of agreement (in Spanish, *cartas* or *notas reversales*) exchanged between the two countries.
32. The Treaty provides for: (a) exploiting the hydroelectric potential of the Paraná River; (b) improving navigation in the vicinity of Yacyretá Island; and (c) mitigating the effects of severe river floods.³⁴ As part of the Treaty, Argentina and Paraguay agreed, *inter alia*, to establish the EBY as a bi-national government entity responsible for implementing the hydroelectric project.³⁵ The countries are to share equally ownership of the dam and all related works,³⁶ including the energy generated.³⁷ The Treaty provides that the energy produced by the hydroelectric facility will be divided in equal parts between the two countries and that each country will have a preferential right to acquire the energy not used by the other.³⁸ The Treaty further requires that Argentina and Paraguay guarantee free navigation on the natural course of the Paraná and through the planned locks.³⁹ The Treaty also mandates that the Parties declare the areas necessary for the hydroelectric development as essential for public utility and places the responsibility for the demarcation of such areas on the Yacyretá bi-national entity.⁴⁰ The bi-national entity will also be responsible for payment of compensation for expropriated lands.⁴¹
33. Annex B of the Treaty addresses the hydroelectric project. The project's main structure, an earthen dike, would be located in the vicinity of Yacyretá Island. The dike and two concrete closure dams across the Paraná River would create a reservoir normally at 83 masl, when full, in the area between the power plant and Posadas/Encarnación.⁴² The Parties also agreed that the works set forth in Annex B could be modified, subject to approval by EBY's Board of Directors, should this be technically necessary or required by the energy market.⁴³ Indeed, in 1979

³³ Tratado de Yacyretá and Normas Complementarias. Annex A of the treaty includes the statute of the Entidad Binacional Yacyretá. Annex B contains the general description of the installations for the production of electric energy and improvement of conditions of navigability, and of complementary works for the development of the Paraná River; in other words, it lays out the project. Finally, Annex C consists of the bases for financing and for provision of electricity services by Yacyretá.

³⁴ Tratado de Yacyretá, Art. I.

³⁵ Ibid., Art. III.

³⁶ Ibid., Art. V.

³⁷ Ibid., Art. XIII.

³⁸ Ibid., Art. XIII.

³⁹ Ibid., Art. VII.

⁴⁰ Tratado de Yacyretá, Art. XVII.

⁴¹ Ibid., Art. XVII.

⁴² The original treaty, at Annex B, provided for a maximum water level of 82 masl. In 1979, Annex B was modified by Letter of Agreement No. 11 (August 30, 1979) to allow an additional elevation of 0.70 masl. Finally, in 1989, Letter of Agreement No. 3 (April 26, 1989) provided that "*according to the latest studies, the maximum inundation of Paraguayan territory will not be greater than 815 km², determined with the level 83 masl as the inundation level in the area between the Yacyretá power plant and Posadas/Encarnación.*"

⁴³ Tratado de Yacyretá, Annex B, Art. I.

Annex B was amended in order to modify the original dam alignment, following a lingering dispute between Argentina and Paraguay over the amount of Paraguayan territory slated to be flooded because of the dam.⁴⁴ Pursuant to the amendment, the maximum inundation in Paraguay would not be more than 815 km², as opposed to the 910 km² originally established in the Treaty.

34. As noted above, Argentina and Paraguay amended and expanded the provisions of their original accord through the exchange of letters of agreement. The Panel notes here two of the most important:
- In 1979 the parties amended Annex C, which regulates their financial arrangements in relation to the project. As amended, the Treaty grants Argentina and Paraguay the right to be compensated in proportion to the amount of land to be flooded in their respective countries.⁴⁵
 - In January 1992 (pending the approval of the third Bank loan in support of the Yacyretá project, Loan 3520-AR), Argentina and Paraguay agreed with a *nota reversal* to start power generation between March and September 1994. The amendment also set out a work plan for filling the reservoir (in Spanish, *Cronograma de obras*). It was agreed that the filling was to be carried out on a reduced scale to dam level 76 masl in the first year, to 78 masl in 1995.⁴⁶ The *Nota* does not indicate precisely when the Project would reach 84masl.⁴⁷ However, the 1992 Staff Appraisal Report for the Second Yacyretá Hydroelectric Project stated that the project “*would be completed in its entirety by June 1998*”.⁴⁸

2.1.2. Entidad Binacional Yacyretá (EBY)

35. Article III of the Treaty of Yacyretá created a bi-national entity, Entidad Binacional Yacyretá (EBY). EBY was formally established on September 6, 1974, with headquarters in Asunción, Paraguay, and Buenos Aires, Argentina. EBY’s statute is included in Annex A of the Treaty.
36. The Treaty granted EBY full juridical, financial, and administrative capacity and assigned it the technical responsibility of studying, planning, directing, and executing the hydroelectric project.⁴⁹ The Treaty determined that Agua y Energía

⁴⁴ See Letter of Agreement (August 30, 1979), “Define el proyecto y establece un nuevo texto para el Anexo ‘B’ del Tratado de Yacyretá,” Normas Complementarias, 107.

⁴⁵ See Letter of Agreement (August 30, 1979), “Introduce modificaciones en el Anexo ‘C’ del Tratado de Yacyretá,” Normas Complementarias, 121.

⁴⁶ See Letter of Agreement (January 9, 1992), “*Cronograma de Obras*,” Normas Complementarias, 231–235.

⁴⁷ The letter of agreement refers to a “project level” of 84masl instead of a “reservoir level” of 83masl.

⁴⁸ World Bank, Staff Appraisal Report, “*Argentina: Yacyretá Hydroelectric Project II*,” Loan 3520-AR, Report No. 10696-AR (August 31, 1992), 19 [hereinafter “1992 SAR”].

⁴⁹ Tratado de Yacyretá, Art. III. For a study on the juridical nature of EBY, see, for example, Oscar R. Marino and Marcos Rebas, “*La personalidad internacional de las entidades binacionales Yacyretá e Itaipú y de la Comisión Técnica Mixta de Salto Grande*,” Integración Latinoamericana, Instituto para la

Electrica of Argentina (AyE), the Argentine national power company, and Administración Nacional de Electricidad of Paraguay (ANDE), the Paraguayan national power company, were to form EBY with equal participation in its capital.⁵⁰

37. EBY is administered by a Board of Directors (Consejo de Administración) and an Executive Committee (Comite Ejecutivo), whose functions and responsibilities are spelled out in Annex A of the Treaty. The Board of Directors establishes the general policies of Yacyretá and approves important proposals made by the Executive Committee, such as loans and other contracts. It has eight members, four from each country. The Executive Committee includes the Executive Director from Argentina and the Executive Director from Paraguay. They are assisted by Chiefs of Departments (Technical, Finance, Administrative, and Environment and Resettlement) and are in charge of carrying out the administrative duties for the execution of the project.
38. According to documents made available to the Panel, EBY's mirror-like management organization, where Argentina and Paraguay equally share responsibilities, has proven to be inefficient and cumbersome.⁵¹ Management itself acknowledges, in its response to the Request for Inspection, that EBY's management structure *"was not ideally suited to implement the important but difficult aspects of the Yacyretá Project outside the technical sphere."*⁵² It adds that *"[a]lthough EBY was able to put in place and retain highly qualified and experienced technical staff, it does not have the necessary management expertise and skills to implement the environmental mitigation and social protection measures which are an integral part of the project."*⁵³
39. Increasingly, EBY has had to assume public responsibilities that usually would be taken on by local and national governments and that are well beyond its original tasks as project implementing agency.⁵⁴ EBY has been entrusted with providing basic services to the local population as well as with responsibilities ranging from health, sanitation, and safety to flood mitigation and river basin protection. It has gradually turned into *"a government authority without parallel in the local region,"*⁵⁵ whose shortfalls, however, have naturally led to profound distrust from affected people, community leaders, and NGOs, particularly in Paraguay.

Integración de América Latina y el Caribe, 1982, 7:41, 48. The study concludes that EBY can be considered an *"empresa pública internacional"* (public international entity) that is subject to a special juridical regime, which differentiates it from other public or private entities in both Argentina and Paraguay. The study also cites contradicting articles.

⁵⁰ Tratado de Yacyretá, Annex C.

⁵¹ See, for example, 1992 SAR, 23.

⁵² Management Response, ¶ 6.

⁵³ Ibid., ¶ 6.

⁵⁴ See "International Advisory Panel Report on the Argentina-Paraguay Yacyretá Hydroelectric Project" (October 1999), V. Blanlot Soza, M. de Castro, J. Kelman, A. Kupcis, J. Weiss, and F. Arjona Hincapie, also known as the "Blue Ribbon Report," 13, [hereinafter "Blue Ribbon Report"].

⁵⁵ Ibid., 13.

40. EBY's institutional weakness, the excessively broad range of its activities, and the mistrust of the area's affected people are considered by many to be key factors that have adversely affected Project execution and have created a situation that seems very difficult to solve.

2.2. Project Financing

2.2.1. Local Funds

41. Under the Treaty, the government of Argentina agreed to be initially the sole financier of the Yacyretá Hydroelectric Project. Paraguay would pay its share after the Project was completed and operational. The Treaty established that AyE and ANDE, the two companies forming EBY, would provide the necessary capital.⁵⁶ Each of the two contracting parties, provided the other consented, would advance the necessary resources under conditions to be mutually established.⁵⁷ Pursuant to these provisions, in December 1973 Argentina agreed, in letter of agreement no. 21, to lend ANDE, the Paraguayan national power company, US\$50,000,000. This money was to be used by ANDE in contributing its share of EBY's capital.⁵⁸ In an additional letter of agreement, Argentina agreed to guarantee any credit obtained by EBY to purchase goods and services required for the Project's execution.⁵⁹ In 1976, a further letter of agreement designated the Banco de la Nación Argentina as the financial institution that would open the credit line to Paraguay's ANDE for the purpose of contributing its share of capital to EBY.⁶⁰

2.2.2. The Third Owners' Agreement

42. The Bank and the governments of Argentina and Paraguay entered into three successive Owners' Agreements. The first two (dated November 6, 1979, and November 18, 1988) dealt with the establishment and operation of EBY and the carrying out of the Yacyretá Hydroelectric Project. The Third Owners' Agreement, signed on November 16, 1992, as amended on December 11, 1997, added specific obligations for both countries with regard to, *inter alia*, the social and environmental mitigation measures included in the so-called "Base Program"

⁵⁶ Tratado de Yacyretá, Art. VIII.

⁵⁷ Ibid., Art. VIII.

⁵⁸ Letter of Agreement (December 3, 1973), "Apertura de un crédito a ANDE por el Gobierno Argentino para la integración del capital de Yacyretá," Normas Complementarias, 59. See also *infra* § 2.1.2. Art. III of the treaty provides that EBY is formed by the Argentinean national power company (AyE) and the Paraguayan one (ANDE), which, according to Art. VIII, will also provide the resources necessary to constitute the capital of Yacyretá. Art. VIII also establishes that either contracting party can advance, with the consent of the other, the resources to constitute the capital of EBY, under mutually agreed-upon terms.

⁵⁹ Letter of Agreement No. 21 (December 3, 1973), Normas Complementarias, 65.

⁶⁰ Letter of Agreement (July 27, 1976), "Comunica que el Banco de la Nación Argentina es el organismo que abrirá el crédito previsto en la Nota Reversal del 3/12/73," Normas Complementarias, 83.

and the “Pending Action Program” (also known as Plans A and B⁶¹), which relate to the raising of the reservoir to 76 masl and its prolonged operation at this level.⁶² The Third Owners’ Agreement, as amended, also established specific conditions for the raising of the reservoir beyond 76 masl and provided that Argentina and Paraguay would finance the resettlement of the so-called “additional families” living in the project areas in Argentina and Paraguay but not included in the 1989/1990 census (in Spanish, the *‘extra-censales’*).⁶³ Finally, both countries committed themselves not to transfer the ownership or operation of the Project unless the execution of all social and environmental mitigation programs is adequately guaranteed by EBY’s successor.⁶⁴

2.2.3. World Bank Financial Support for the Project

43. Because of the Project’s size and cost, Argentina and Paraguay sought financial support in 1976 from, *inter alia*, the Bank.⁶⁵ In 1979, the Bank approved the first loan financing the Yacyretá Project—Loan 1761-AR—as part of a Bank program aimed at supporting the expansion of Argentina’s power sector.⁶⁶
44. From the very beginning, the Project encountered substantial financial problems and implementation difficulties. These ranged from a dispute between the Bank and the government of Argentina over procurement issues, to Argentina’s economic recession and high inflation during 1983 and 1984,⁶⁷ to legal and institutional constraints on EBY’s work, especially in Paraguay.⁶⁸
45. Although the Project remained essentially the same over the years, to address emerging problems the Bank’s support took a number of forms, ranging from direct lending to amendment and reallocation of funds of existing loans. In 1988, the Bank approved a new Bank loan to finance civil works and other engineering contracts.⁶⁹ The loan was granted after a new Argentine government reassessed the Project and proposed some adjustments to its design and implementation.

⁶¹ See *infra* § 2.4.3.

⁶² Loan 2854-AR (SEGBA V Power Distribution Project), Amendments to the Loan Agreement, Loan 3520-AR (Second Yacyretá Hydroelectric Project), Amendments to the Loan, Project and Third Owners’ Agreements, (December 11, 1997), ¶¶ 48, 50, 53 [hereinafter “1997 Amendments”].

⁶³ *Ibid.* Paragraph 16 (Loan Agreement amendments) and paragraph 47 (Third Owners’ Agreement amendments), define additional families as “*families requiring resettlement as a result of the raising of the level of the reservoir of the Yacyretá power plant, which families settled in the area of the reservoir subsequent to completion of the census that served as a basis for preparing the original EMP and were thus not covered by said census.*”

⁶⁴ *Ibid.*, ¶ 56.

⁶⁵ 1979 SAR, 9.

⁶⁶ According to the 1979 SAR, in 1962 the Bank approved the first of a series of loans aimed at supporting the Argentine power sector. In particular, the report states that the Bank was instrumental in helping Argentina to prepare a national power expansion program based on least-cost criteria for the period 1985 to 2000. 1979 SAR, 3–4.

⁶⁷ 1992 SAR, 17.

⁶⁸ Management Response, ¶ 6.

⁶⁹ Loan Agreement (Electric Power Sector Project) between the Argentine Republic and International Bank for Reconstruction and Development, Loan No. 2998-AR, November 18, 1988.

46. Argentina's overall financial problems, far from being solved, gradually worsened. In 1991, the Argentinean government decided yet again to reassess the Yacyretá Project, which was still affected by long delays in implementation.⁷⁰ Based on the determination of the governments of Argentina and Paraguay that project completion was justified on economical and financial grounds, the Bank decided in 1992 to renew its support for Yacyretá by approving a new loan, Loan 3520-AR, which financed the so-called Second Yacyretá Hydroelectric Project.⁷¹
47. Two years later, in 1994, undisbursed funds from an additional Bank loan approved in 1988 to support Argentina's power expansion program—Loan 2854-AR financing the SEGBA V Power Distribution Project—were reallocated to allow US\$135 million equivalent to be used for Yacyretá. In particular, these funds were to be used to ensure appropriate environmental protection and efficient handling of the social aspects of the Project.⁷²
48. Loans 3520-AR and 2854-AR were subsequently amended in 1997 to grant Yacyretá increased financial support.⁷³ The amendment also financed two new Action Plans, Plan A and Plan B, which the Bank and the two countries concluded to deal with the severe difficulties affecting the project.⁷⁴ Plan A provided for the completion of the resettlement and environmental actions that should have been, but were not, implemented before raising the reservoir's water level to 76 masl. Plan B was to deal with several problems emerging as a consequence of the prolonged staying of the water level at 76 masl.
49. In addition, a Bank loan to the government of Paraguay (Loan 3842-PA for the Asunción Sewerage Project) provided financial support for a component of the Project's resettlement program. The Asunción Sewerage Project—now called "Reform Project for the Water and Telecommunication Sectors"—was approved by the Bank in 1995 and included, *inter alia*, the financing of infrastructure works for the benefit of about 3,000 people to be resettled under the Project. Specifically, Part C of the Project's description, set forth in Schedule 2 to the Loan Agreement, reads, "*Civil Works in Encarnación...[c]onstruction of infrastructure works, including, inter alia, (a) a water supply and sewage disposal facilities, (b) roads; (c) storm water drainage and solid wastes disposal facilities;*

⁷⁰ 1992 SAR, 17.

⁷¹ Loan Agreement (Second Yacyretá Hydroelectric Project) between the Argentine Republic and International Bank for Reconstruction and Development, Loan No. 3520-AR, November 16, 1992, [hereinafter "Loan No. 3520-AR"].

⁷² Loan Assumption Agreement (SEGBA V Power Distribution Project) between Argentine Republic and Servicio Eléctrico del Gran Buenos Aires and International Bank for Reconstruction and Development [hereinafter "Loan Assumption Agreement"], amending Loan Agreement (SEGBA V Power Distribution Project) between Argentine Republic and the International Bank for Reconstruction and Development, Loan No. 2854-AR, June 30, 1988 [hereinafter "Loan no. 2854-AR"].

⁷³ 1997 Amendments.

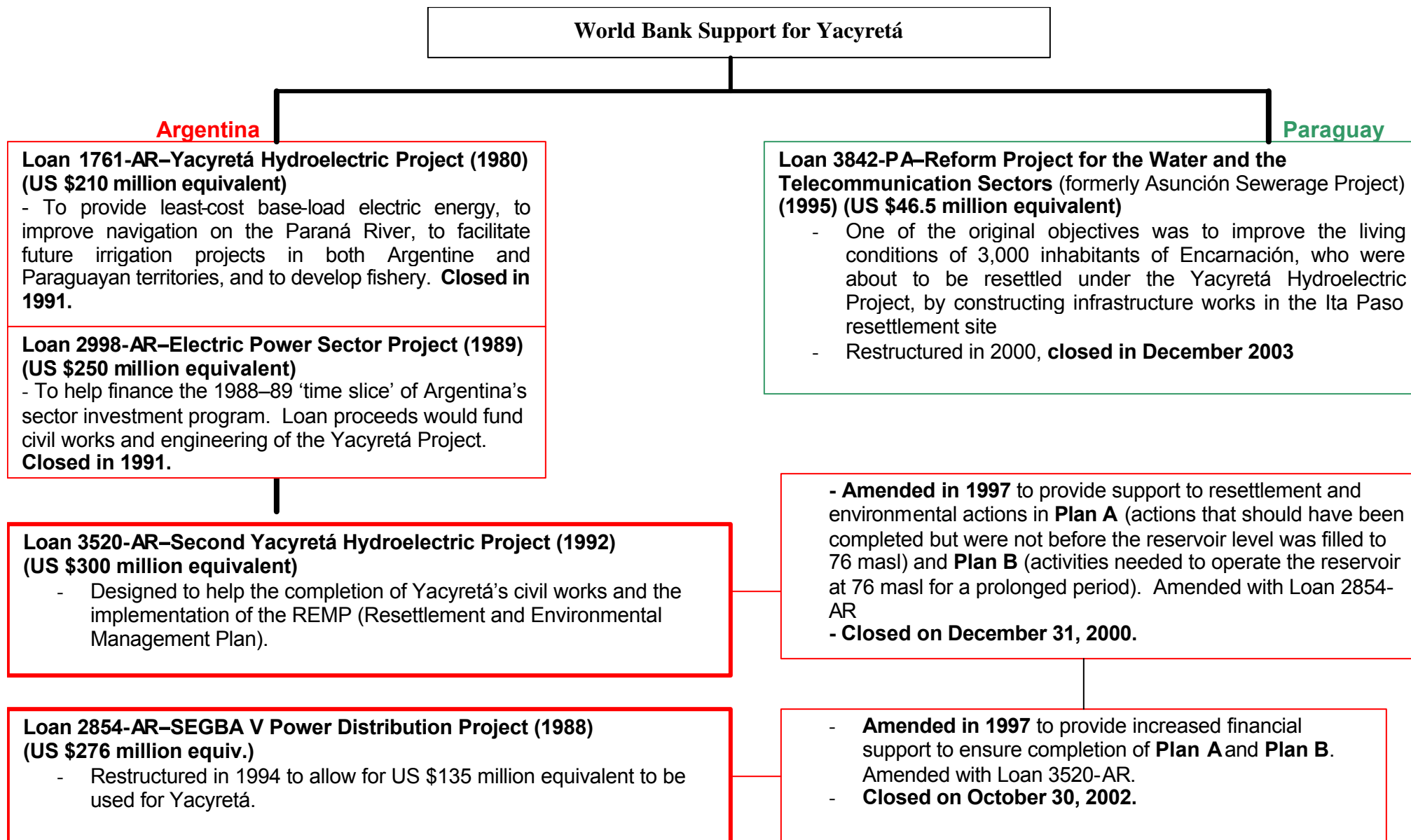
⁷⁴ See *infra* § 2.4.3.

and (d) a power distribution system for the benefit of about 3,000 people to be resettled under the Second Yacyretá Hydroelectric Project.”⁷⁵

50. Because of major implementation problems, the original Asunción Sewerage Project was restructured and renamed in January 2000, but the component related to Yacyretá (Part C) remained unchanged. This loan closed on December 31, 2003.
51. The following chart illustrates the Bank’s financial support to the Yacyretá Hydroelectric Project.

⁷⁵ Loan Agreement (Asunción Sewerage Project) between Republic of Paraguay and International Bank for Reconstruction and Development, Loan No. 3842-PA, February 14, 1995 [hereinafter “Loan No. 3842-PA”].

The Yacyretá Project is partially financed by a series of loans from both the World Bank and the Inter-American Development Bank to the Republic of Argentina. The Loan 3242-PA referred to in the Request for Inspection was made to the Republic of Paraguay to finance, *inter alia*, complementary investments related to the Yacyretá Project.



2.3. The Project Design

52. The Yacyretá Project's civil works consist of two 40-meter-high, five-kilometer-long concrete closure dams, 60 kilometers of embankment dam with a maximum height of 41 meters and a uniform crest level of 86 masl,⁷⁶ and a 56-kilometer-long trench of cement bentonite slurry to cut off foundation seepage.⁷⁷ The works also include a 1.2-kilometer-long, 77-meter-wide powerhouse, spillways, and a 270-meter-long, 27-meter-wide navigation lock on the main branch of the river.⁷⁸ The dam was designed to be maintained at a level of 83 masl and for a flood height of 84.5 masl.⁷⁹
53. At full capacity, the water level in the reservoir would reach 83 masl, but raising the reservoir to that level would require resettlement of all affected populations to sites above 84 masl.⁸⁰ At 83 masl, the reservoir will cover an area of 1663 km², inundating 1076 km² of land and 574 km² of existing river. Of the land area inundated, close to 73 percent would be in Paraguay and 27 percent in Argentina.⁸¹ At this level, 1,500 hectares of cultivated land will be flooded as well as 500 hectares of urban land in cities and towns. It was initially anticipated that the inundation would cause the involuntary resettlement of about 50,000 persons, mostly from the cities of Posadas and Encarnación.⁸² This number has been significantly increasing over the years, however, because of a constant, uncontrolled influx of people into the project area (see Map 2).

2.3.1. The Site of the Power Plant

54. Annex B of the Yacyretá Treaty describes the components of the hydroelectric project and establishes that the power plant, the principal structure, would be located on the Paraná River near Yacyretá Island.⁸³ The island divides the river into two channels, the Aña Cua and the principal branches where two closure dams and spillways have also been built. With a normal elevation of 83 masl, the water from the reservoir will flood approximately 1,663 km², of which 852 are in

⁷⁶ 1992 EIA Yacyretá Project, I Frame of Reference, ¶ 2.5.

⁷⁷ Montgomery Watson Harza, "Yacyretá Multi-Purpose Project," at http://www.mwhglobal.com/case_Yacyretá.asp.

⁷⁸ Montgomery Watson Harza, "Yacyretá Multi-Purpose Project," at http://www.mwhglobal.com/case_Yacyretá.asp.

⁷⁹ See supra ¶ 33, note 42; ¶ 34, note 41.

⁸⁰ Management Response, ¶ 2.

⁸¹ Calculated from data from 1992 EIA Yacyretá Project.

⁸² 1992 EIA Yacyretá Project, ¶ 8.

⁸³ Tratado de Yacyretá, Annex B, Part II, Art. 1. Annex B, as included in the 1973 Treaty, was later modified with respect to certain components of the project design through letters of agreement in 1979 and in 1989. See Tratado de Yacyretá y Normas Complementarias.

Paraguayan territory, 230 are in Argentina, and 581 are already covered by the river and its channels.⁸⁴



Figure 1 The Yacyretá Dam and Navigation Lock

55. When Argentina and Paraguay sought World Bank financing for the Project in 1976, one of the Project's critical decisions, the location of the principal structure, had already been taken and fixed by the Treaty of Yacyretá. In the opinion of experts the location chosen for the Yacyretá power plant was highly unsuited for the construction and operation of a dam. It is located on the flood plain of a major river thereby causing inundation of a large area and displacement of many people.

2.3.2. The Resettlement Programs

56. According to the 1992 Staff Appraisal Report (SAR), at the elevation of 78 masl, the reservoir was to displace about 3,250 families (16,250 persons) in the cities of Posadas, Argentina, and Encarnación, Paraguay.⁸⁵ If the reservoir were to be filled to 83 masl, about 5,050 families (25,250 persons) were originally to be resettled.⁸⁶ However, these figures have increased considerably over the years because of a constant influx of people into the project affected areas. The families affected by the Yacyretá project are referred to as "affected population."
57. Under the resettlement programs, the affected population was defined as *'all persons who lose their home, means of livelihood, or both as a result of the*

⁸⁴ 1979 SAR, Annex A, 52. At 78 masl, the reservoir would inundate about 38,000 hectares of sparsely populated wildlands in Paraguay, and at full operation (83 masl) it would inundate another 78,000 of these hectares.

⁸⁵ 1992 SAR, Annex 2.7, Attachment 1, ¶ 1

⁸⁶ Ibid.

*construction of the Yacyretá civil works, whether or not they are owners of the home or land expropriated by the project*⁸⁷”, and who were identified as affected in the 1989/1990 resettlement census.⁸⁸ The Appraisal Report states that families migrating to the project affected area after the census were not to be covered under the Bank-approved resettlement plan, because their resettlement is the responsibility of the respective local governments with EBY’s assistance and in a form acceptable to the Bank.⁸⁹ In addition, the Bank-approved resettlement program⁹⁰ established that the “*population affected by loss of home, means of livelihood or both will be entitled to a choice of monetary compensation or a full replacement at no cost to the affected persons*”⁹¹”

2.3.2.1. The Programa Desborde de Arroyos (PDA)

58. The Programa Desborde de Arroyos (Urban Creeks Program or PDA) was developed in 1998 to resettle people affected by frequent flooding of urban creeks in both Posadas and Encarnación. The program addresses the situation of families who live in serious unsanitary conditions along urban creeks in areas between 78 and 84 masl and provides for their advanced resettlement. These families are comprised of affected people who would be relocated anyway under the main resettlement program (the 1992 RRAP) in the context of the plans to raise the reservoir to 83 masl. Under the PDA, the relocation of these people has been assigned a higher priority so as to minimize the impact of future creek floods.⁹² According to Management, the PDA program constructs houses and infrastructure for resettled families and provides assistance to these families before, during, and after their relocation.⁹³
59. The PDA program also includes the construction of 674 houses for families already living in the resettlement site of Itá Paso. Families resettled in Itá Paso belong to the so-called “*extra-censales*” group whose resettlement is financed by the government of Paraguay under the Third Owners’ Agreement.⁹⁴ Although these families were not affected by urban creek flooding, they have been included in the PDA. The government of Paraguay had provided Itá Paso with inadequate services and poor infrastructure, and by including these families in the program, their living conditions could be improved.⁹⁵

⁸⁷ Ibid., 30.

⁸⁸ Ibid.

⁸⁹ Ibid.

⁹⁰ Ibid., Annex 2.7, Attachment 1, ¶ 5.

⁹¹ 1992 SAR, 31.

⁹² Management Response, ¶ 53.

⁹³ Ibid., ¶ 54.

⁹⁴ See supra § 2.2.2.

⁹⁵ Management Response, ¶ 60

60. Management reports that in 2000 the Bank “expressed to EBY its willingness to amend Loan 2854-AR to allow use of resources from this loan in support of the PDA.” However, notes Management, “EBY did not pursue this avenue.”⁹⁶

2.3.3. The Environmental Mitigation Activities

61. The Environmental Assessment (EA) was prepared in 1992 during the preparation of the Second Yacyretá Hydroelectric Project to be financed by Loan 3520-AR and identified the Project’s impact on, *inter alia*, the aquatic life, water quality, wildlands and biodiversity, forestry, water-borne diseases, and cultural property. A subsequent Environmental Management Plan (EMP) was designed to address and mitigate the Project’s negative impacts. The Bank would finance, *inter alia*, design studies for the management of the protected areas created by the Project, design studies for water supply and sewerage and sanitation systems for the city of Encarnación and Posadas, design studies for reservoir water release management, and the monitoring of disease vectors. EBY agreed to implement the EMP according to a timetable of dates between 1992 and 1998.⁹⁷
62. According to Project documents, if the governments of Paraguay and Argentina agreed to raise the level of the reservoir above 78 masl, EBY would review the Resettlement and Environmental Management Plan (REMP) accordingly. The Bank would only endorse the decision to raise the reservoir level if it deemed that implementation of the new REMP and its financing were satisfactory.⁹⁸

2.4. 20 Years of Implementation

2.4.1. Implementation Problems

63. The execution of Yacyretá’s main civil works began in December 1983, a decade after Argentina and Paraguay concluded the Yacyretá Treaty. More than twenty years into the implementation, the completion of the project remains a distant goal. The execution of the environmental and social activities has constantly stumbled from a lack of funds, EBY’s weak and transient managerial capacity, and the two countries’ economic and political turmoil. The following paragraphs present a brief account of the Yacyretá Project’s implementation history to illustrate the context in which the present Request for Inspection and the one submitted to the Panel in 1996 developed.
64. When the Bank first appraised the Project in September 1979, the execution of the main civil works was scheduled to start shortly thereafter and the filling of the reservoir was planned to begin in 1985. However, because of disputes between Argentina and Paraguay over the dam alignment, and Argentina’s financial and

⁹⁶ Ibid., ¶ 57.

⁹⁷ 1992 SAR, Annex 2.7, Attachment 2.

⁹⁸ Ibid., 32.

- political problems, the start of the civil works was postponed.⁹⁹ Construction finally began in late 1983. Almost ten years later, in 1992, when the Bank re-appraised the project for a new loan in support of Yacyretá, 80 percent of the civil works had been completed, while EBY had implemented only 60 percent of the resettlement and environmental activities provided under the hydroelectric project.¹⁰⁰
65. In January 1992, the continuing difficulties in obtaining financing to complete the project forced Argentina and Paraguay to opt for a phased project implementation. Accordingly, after lengthy negotiations, and with the assistance of Bank staff, the countries agreed upon a work plan to fill the reservoir in stages. The water level would be raised to 76 masl in 1994, to 78 masl in 1995, and to 83 masl in 1998.¹⁰¹
 66. The Yacyretá reservoir was filled to 76 masl in May 1994, as anticipated. EBY moved ahead with the implementation of the reservoir-filling schedule after obtaining approval from the Bank and IDB but prior to completing the required resettlement and environmental measures.
 67. After the reservoir was raised to 76 masl, severe drawbacks in the execution of the resettlement operations, including lack of a proper expropriation law in Paraguay, practically stopped the phased implementation. In 1996, when the Panel received the first Request for Inspection concerning the Yacyretá Hydroelectric Project, many activities that should have been completed prior to filling the reservoir were still pending, and the prolonged staying of the water level at 76 masl had created unexpected environmental and social problems that have yet to be fully solved.
 68. A few years later, in 1998, an Independent Advisory Panel assembled by the Bank to advise on “*options surrounding future reservoir operating levels*”¹⁰² noted that “*every time a decision had to be made about additional financing, the continued viability of the project depended on timely and cost effective implementation. However, this history also shows that after financing was secured, the efficiency preconditions were never met.*”¹⁰³
 69. Presently, the future of Yacyretá remains unclear. The problems affecting the execution of the social and environmental activities persist, making project completion a difficult challenge. In spite of this, EBY and the governments of Argentina and Paraguay are still considering whether to bring the reservoir’s water level to its design height of 83 masl, for which, however, the Bank must

⁹⁹ 1979 SAR, 17.

¹⁰⁰ Ibid. These figures differ substantially from the findings of the Panel in its prior 1997 review of the Project. See *supra* § 2.4.5, ¶78.

¹⁰¹ See 1992 SAR, 19. The report states that the initial operation of the reservoir at a reduced level would have allowed the postponement of investments in, for example, resettlement, environmental mitigation and land acquisition.

¹⁰² Blue Ribbon Report, Executive Summary, i.

¹⁰³ Ibid., 13.

issue its “no objection” endorsement.¹⁰⁴ In this regard, it is worth noting that Management confirmed to the Panel during the investigation that the implementation of the environmental and social activities remains the essential requirement that EBY must fulfill before the Bank will consider issuing its approval to fill the reservoir beyond its current 76 masl level.¹⁰⁵

2.4.2. First Request for Inspection to the Panel

70. On September 30, 1996, the Panel received a Request for Inspection from SOBREVIVENCIA-Friends of the Earth Paraguay representing affected people concerning the Yacyretá Hydroelectric Project.¹⁰⁶ The Requesters alleged that adverse environmental, health, and socioeconomic impacts had occurred as a result of the filling of the Yacyretá reservoir to 76 masl and of the Bank’s failure to supervise adequately the environmental mitigation and resettlement activities conducted under the Project. In December 1996, the Panel recommended that the Bank’s Board of Executive Directors authorize the investigation into the matters alleged into this Request for Inspection.

2.4.3. Action Plans A and B

71. On February 1997 at the Board meeting held to discuss the Panel’s recommendation, Management presented two action plans agreed upon with Argentina and Paraguay, the “Pending Action Program” and the “Base Program” (so-called Action Plans A and B), developed to address the Project’s outstanding problems. Plan A related to those actions that should have been completed, but were not, before filling the reservoir to 76 masl. Plan B proposed the implementation of activities necessary to continue the operation of the reservoir at 76 masl in a socially and environmentally sound manner.
72. In Paraguay, Plan A included actions such as the indemnification of brick- and tile-makers in Encarnación, the issuance of property titles to resettled families, and the completion of infrastructure works and housing for the rural settlement of San Juan del Paraná.¹⁰⁷ According to the July 2002 Management Response, albeit with delays Plan A was fully completed in 1999.¹⁰⁸
73. Plan B identified several social and environmental activities necessary for the prolonged operation of the reservoir at 76 masl. With respect to the resettlement program, Plan B required the relocation of all families included in the 1990 census who lived in the areas up to 78 masl; the resettlement of all post-1990

¹⁰⁴ 1997 Amendments, ¶ 34.

¹⁰⁵ Memorandum, from Director, LCSES, to Chairman, Inspection Panel, Subject: Reservoir Level Raising, May 6, 2003 [hereinafter “Memorandum, May 6, 2003”].

¹⁰⁶ Request for Inspection, Sobrevivencia/Amigos de la Tierra, Paraguay, September 12, 1996, in Panel Report and Recommendation Argentina/Paraguay: Yacyreta Hydroelectric Project (September 30, 1996).

¹⁰⁷ 1997 Amendments, Schedule 2 to the Project Agreement.

¹⁰⁸ Management Response, Annex R.

census families up to 78 masl; and tangible actions by the local governments to prevent further settlement in the affected areas. As to the environmental mitigation activities, the plan included, *inter alia*, construction of the sewerage system for the city of Encarnación, relocation of the city's slaughterhouse, construction of the municipal market in Encarnación, conduction of various biodiversity activities, and completion of hydro-geological studies of ground water in the Paraná River Basin.¹⁰⁹ According to Management, the implementation of Plan B is nearing completion.¹¹⁰

74. Plans A and B were incorporated into the legal documents for Loans 2854-AR and 3520-AR through amendments dated December 11, 1997.¹¹¹

2.4.4. Board Decision

75. In view of the agreement between Management and the government of Argentina and Paraguay on the action plans, the Board did not authorize the investigation recommended by the Panel. Instead, the Board asked the Panel *“to undertake a review of the existing problems of the Yacyretá Hydroelectric Project in the areas of environment and resettlement and provide an assessment of the adequacy of the Action Plans as agreed between the Bank and the two countries within the next four months.”* The Board also decided that *“independent of the above decision the Inspection Panel [was] expected to look at the extent to which the Bank staff had followed Bank procedures with respect to this project.”*¹¹²
76. As the February 1997 Board decision referred only to “Bank procedures” (as opposed to Bank policies and procedures), and the Board did not clarify the precise extent and scope of its decision in spite of the Panel's request for clarification, the Panel did not look into possible violations of Bank policies and procedures. Rather, the Panel limited itself *“to highlight the major areas where staff performance could or should have better followed”* the Bank's operational statements.¹¹³ Without conducting an investigation of these particular matters, the Panel identified *“three main areas of concern,”* (a) participation of affected people, (b) supervision, and (c) institutional strengthening.¹¹⁴

2.4.5. The Panel Review and Assessment of the Action Plans

77. In the following four months the Panel conducted the review the Board had asked for, returning to the Yacyretá project site twice (in May and July 1997). During

¹⁰⁹ 1997 Amendments, Schedule 2 to the Project Agreement.

¹¹⁰ Management Response, ¶ 68.

¹¹¹ See 1997 Amendments, Schedule 2 to the Project Agreement.

¹¹² Inspection Panel, Review of Present Project Problems and Assessment of Action Plans, Argentina/Paraguay Yacyretá Hydroelectric Project (September 16, 1997), ¶ 1–2 [hereinafter “Panel Assessment”].

¹¹³ *Ibid.*, ¶ 248.

¹¹⁴ *Ibid.*, ¶ 245–48.

the Panel's review, it received a number of additional Requests for Inspection concerning specific aspects of the Project's implementation.¹¹⁵ The Panel, after consulting with the Board, included in its report the issues raised by these additional requests, such as the replacement of housing on the Argentine side, quality of housing and community infrastructure on both sides of the reservoir, and the economic situation of fishermen, *oleros*, and workers in the brick-making industry. The Panel's Report, submitted to the Board in September 1997, was structured in four parts, including a review of the Yacyretá Project's problems, an assessment of the adequacy of the action plans presented by the Bank's Management, the additional Requests, and a summary review of the Bank's compliance with its procedures.¹¹⁶

78. One of the fundamental problems of the Yacyretá Project identified by the Panel was the imbalance between the execution of civil and electromechanical work on the one hand and resettlement and environmental measures on the other.¹¹⁷ While at the time of the Panel's review the former measures were 99.8 percent complete, less than a third of the environmental and resettlement plans had been completed. This imbalance led to increasing social and environmental "liabilities" with mounting financial costs. The Panel considered this imbalance to be exacerbated by the Bank's usual practice of financing mostly civil works and leaving resettlement and environmental measures for counterpart funding and urged the Bank to reconsider this practice.¹¹⁸
79. In terms of the delays, the Panel also noted that a number of issues raised in the Request could have been dealt with earlier in project execution and concluded: *"The lack of participation of affected people and local authorities in project related activities and a tendency by Bank supervision missions to ignore or take lightly the concerns of area people may be at the root of these problems."*¹¹⁹
80. The Panel's review also revealed that the Yacyretá Project lacked sufficient financial resources for project completion.¹²⁰ Project costs were initially estimated by the Bank's Staff Appraisal Report in 1979 to be US\$3.7 billion, while the Panel's review, on the basis of figures provided by Bank Management, estimated that the costs would surpass US\$8.5 billion, more than double of the initial estimated amount. The Panel also found that the expenses of effective mitigation measures had been underestimated significantly. The project's financial difficulties increased in the mid-1990s, when—because of the Mexican Peso Crisis—the Government of Argentina, facing difficult macroeconomic conditions, decided to cut off and finally suspend all financial support for the Project and to seek private capital to complete and operate the facility.¹²¹

¹¹⁵ Ibid., ¶ 3.

¹¹⁶ Ibid.

¹¹⁷ Ibid., ¶ 253-54.

¹¹⁸ Panel Assessment, ¶ 255.

¹¹⁹ Ibid., ¶ 238.

¹²⁰ Ibid., ¶ 22-23.

¹²¹ Ibid., ¶ 24.

However, in 1996 the legislation to privatize Yacyretá had failed to obtain approval in the congresses of both Argentina and Paraguay. As the Panel's report envisaged, this led to a complete paralysis of the Project's complementary works for almost two years.¹²²

81. Regarding socioeconomic impacts, the Panel found that thousands of residents, including fishermen and brick-makers, lost their jobs and sources of income as a result of the construction of the dam and that scores of those people had not received any kind of compensation. Moreover, the Panel found that less than 25 percent of the people who would be affected by the dam had been resettled prior to the filling of the reservoir.¹²³
82. The Panel also assessed the adequacy of the Bank's action plans presented during the February Board meeting.¹²⁴ Plan A intended to remedy actions that should have been carried out prior to filling the reservoir in 1994, with projected costs of up to US\$16 million. This plan included expropriations, provision of a potable water supply to resettled populations, construction of urban and rural housing, indemnification of tile-makers, and issuance of property titles to resettled people.¹²⁵
83. In its review, the Panel highlighted the fact that not all of Plan A's envisioned commitments, such as hydro-geological studies, could be completed by the completion date of December 1997.¹²⁶ The Bank's second action plan, "Plan B," contained required complementary works needed to permit prolonged operation of the reservoir at 76 masl, all at a projected cost of US\$117 million.¹²⁷ The Panel's assessment revealed that Plan B dealt only with some of the existing problems; according to many people the Panel interviewed, the plan was "by no means" complete. The Panel noted, *"The process of implementing the so-called 'solutions' has not been adequate."*¹²⁸ The Panel's assessment also showed that major decisions had not been finalized regarding construction of wastewater treatment plants in Posadas and Encarnación, mitigation of the effects of the dam on fisheries, and provision of long-term supplies of clay to the regional industry.
84. Concerning resettlement and environmental issues, the Panel's assessment found that the number of people to be involuntarily resettled—originally estimated to be 50,000—had increased to at least 70,000 people.¹²⁹ Among the difficulties in the entire process identified by the Panel were changes to the Bank's policy regarding resettlement standards, the project's weak programs of social communication, and the lack of adequate identification of vulnerable groups who required special

¹²² Ibid., ¶ 254.

¹²³ Panel Assessment, ¶ 1.

¹²⁴ Ibid., ¶ 205-33.

¹²⁵ Ibid., ¶ 206.

¹²⁶ Ibid., ¶ 28.

¹²⁷ Ibid., ¶ 209.

¹²⁸ Ibid., ¶ 220.

¹²⁹ Panel Assessment, ¶ 218.

assistance. In the Panel review, the Panel urged the Bank to include the inflow of people from new areas in any future plans.¹³⁰

85. As for environmental issues, the Panel identified the lack of institutional support in EBY and financial shortages as major reasons for the difficulties in implementing the environmental mitigation measures.¹³¹ The Panel also found the reserves and biodiversity programs to be deficient and the linkages between environmental and health effects to be not well established. The Panel concluded that *“a long history of delays and noncompliance tolerated by the Bank does not allow the Panel to provide a realistic assessment of future Project performance with any degree of confidence.”*¹³²

2.4.6. 1997 Amendment to the Bank Loan Agreements

86. In 1997 the legal documents of Bank Loan No. 2854-AR and Loan No. 3520-AR were amended to include, *inter alia*, a detailed description of Plans A and B and the activities to be completed to raise the reservoir’s water level to 78 masl.¹³³ In addition, as amended, the legal agreements provide that raising the water level beyond 78 masl is subject to the completion of the social and environmental activities set forth in the Project’s Environmental Management Plan (EMP). For the Bank to approve the filling of the reservoir above 78 masl, EBY needs to submit a satisfactory revision of the EMP containing a program to mitigate the environmental impact of, and to resettle the population to be affected by, such raising of the reservoir and to fully implement this revised EMP in a manner satisfactory to the Bank.¹³⁴
87. Finally, it should be noted that, according to the General Conditions Applicable to Bank Loans and Guarantee Agreements, the aforementioned obligations will be binding upon the Borrower until the principal amount, interest, and any other charges accrued on the loan are fully repaid.¹³⁵

2.5. Factors Affecting the Project’s Completion

88. As Management states in the Response, *“[a] great deal has transpired in the nearly thirty years since the launching of the project, including much that is positive. First, despite lengthy delays, the hydroelectric facility itself is well-*

¹³⁰ Ibid., ¶ 225.

¹³¹ Ibid., ¶ 227.

¹³² Ibid., ¶ 217.

¹³³ 1997 Amendments, Schedule 2 to the Project Agreement.

¹³⁴ Ibid., ¶ 53 (Section 9(b))

¹³⁵ IBRD, General Conditions Applicable to Loan and Guarantee Agreements for Currency Pool Loans, as amended through October 6, 1999, Section 12.05 Termination of Loan Agreement and Guarantee Agreement on Full Payment, *“If and when the entire principal amount of the Loan withdrawn from the Loan Account and the premium, if any, on the prepayment of the Loan and all interest and commitment charges which shall have accrued on the Loan shall have been paid, the Loan Agreement and the Guarantee Agreement and all obligations of the parties there under shall forthwith terminate.”*

*constructed and has been operated relatively efficiently, though only at two-thirds of capacity due to resettlement driven financial constraints to raising the reservoir to the final design level of 83 masl.”*¹³⁶ This matter has been the subject of a long debate, and even the Panel’s report on the adequacy of Plan A and B referred to it in 1997.¹³⁷ At the time of the Panel’s report, the privatization of the power generation facilities built under the project seemed to be a logical alternative to the parties concerned. However, the privatization option did not materialize, as the congresses of both Argentina and Paraguay did not approve it. Today, the completion of the project continues to face uncertainties.

89. The decision to raise the reservoir above the current level of 76 masl, whether to 78 masl, 80 masl or to the design level of 83 masl, will have important social, economic and environmental impacts on many of the Requesters as well as important financial implications.
90. The raising of the reservoir has been the subject of extensive technical, economical, and financial analyses and the authorities have been working with several scenarios. These scenarios are based on different hypotheses, including different projections of internal (national) energy demand, external (international) energy demand, gas and electricity prices and alternative expansion plans for the energy sector. The Bank recently commissioned a study by a prominent Argentinean consulting firm that has not been endorsed by the Bank or by the governments of Argentina and Paraguay.¹³⁸ The study shows that, to achieve the long-run marginal costs—expressed as the price at which investors may agree to build and operate an additional plant—the electricity sold by Yacyretá should reach prices that are substantially above the present price for electricity generated by hydropower plants set by Argentina.¹³⁹ According to the study, as of June 2002, under the formula provided by the Treaty, the price that Argentina needs to pay EBY is US\$29.40/MWh.¹⁴⁰

¹³⁶ Management Response, ¶ 5.

¹³⁷ Panel’s Review and Assessment, p 7-9.

¹³⁸ Mercados Energéticos, *Actualización y Análisis de Los Escenarios de Inversión y Períodos de Repago de Diferentes Elevaciones de Cotas de Yacyretá*, Informe Final, Buenos Aires, October 2003 [hereinafter “Mercados Energéticos Study”]. This study is unpublished.

¹³⁹ See Mercados Energéticos Study. According to the October 2003 Bank Supervision Mission’s Back to Office report, as of October 2003, GOA’s Secretary of Energy had established through a resolution that the price of electricity generated by hydropower plants is US\$2/MWh. This has reduced substantially EBY’s annual operational income and created an annual shortfall of about US\$50 million in the resources to cover the project’s operating and maintenance costs, figures that do not include any further investments. Argentina may make up for this shortfall by issuing letters of credit.

¹⁴⁰ Annex C of the Treaty, as modified by the Letter of Agreement dated August 30, 1979, discusses the bases of financing and lending for electricity services. Annex C establishes a formula for calculating the price per unit of electricity (in US\$/kWh) and stipulates that this price, set initially in the year that the plant begins service, will be maintained at a constant value in accordance with the formula set forth in Planilla 2 of the annex. See Annex C, Chapters IV and VI. In a subsequent letter of agreement, the two governments set an initial price of electricity of US\$ 0.30/kWh (US\$30.00/MWh), at a constant value of December 1991. Letter of Agreement, “Tarifa y Financiamiento Proyecto Yacyretá,” (January 9, 1992), Normas Complementarias, 237.

91. As shown in the table below, there is a direct correlation between the raising of the reservoir to different levels and the expected increases in the dam's generating capacity.

Table I-1: Increased Generation Capacity/Reservoir Level¹⁴¹

Reservoir Elevation (masl)	Increased Capacity (MW)
From 76 to 78	+195
From 78 to 80	+367
From 80 to 82	+400
From 82 to 83	+338
Total Increase	+1,300

92. The Panel has received evidence that the Bank maintains its position that the raising of the reservoir must be preceded by the mitigation and resettlement measures agreed upon between the Bank, the IDB, the governments of Argentina and Paraguay, and EBY.¹⁴² Presently, according to legal agreements in force, a number of social and environmental activities have yet to be completed in order to raise the water level beyond the current 76 masl, including:

- Plan A, which requires completion of activities that were to be implemented before filling the reservoir **up to 76 masl**, is not yet complete because some titles to plots in the resettlement sites still need to be issued. The Panel understands that the delay in the issuance of these titles stems mainly from pending lawsuits related to entitlements, but it also notes that the solution to this problem may take considerable additional time.
- Plan B provides for implementation of activities necessary to operate the reservoir **at 76 masl for a prolonged period of time**. It has not yet been completed. Some property titles remain to be issued. The relocation of the municipal slaughterhouse and the municipal market is almost completed, but these entities must be transferred from EBY to the municipality for operation and maintenance. In its Aide Memoire, related to the October 2003 supervision mission, Management expressed concerns about the delay in transferring the infrastructure works to the local authorities, as this contributes to increasing project costs.¹⁴³ This Aide Memoire states that the construction of the sewage system in Encarnación¹⁴⁴ is expected to begin in early 2004. As of January 2004 this had not begun.

¹⁴¹ Mercados Energéticos Study, 12, Table 5 (citing Plan Estratégico Yacyretá 2002).

¹⁴² Management Memorandum, May 6, 2003.

¹⁴³ Aide Memoire, October 23-30, 2003.

¹⁴⁴ There seem to be some conflicting interpretations about the content and extent of this obligation. Some stakeholders told the Panel that this obligation was limited to the construction of the wastewater treatment plant, while others expressed the view that the system also included all ancillary works, including sewage collectors, interceptors, and the necessary works for house connections.

- To raise the water level **up to 78 masl**, all actions outlined in Plan A and Plan B must be completed. In addition, “*all actions set forth in the EMP and all actions set forth in Schedule 2 to the project agreement*” must be “*completed in a manner satisfactory to the Bank.*”¹⁴⁵ With respect to social activities, EBY must, *inter alia*, indemnify and transfer the population living in the areas between 76 and 78 masl, issue property titles, and implement rehabilitation programs in the new settlements, such as health programs and food assistance, if needed. To date, EBY has resettled all the people living at levels between 76 and 78 masl, but a number of property titles have yet to be conveyed to entitled families. Environmental mitigation activities such as the sewage collection and treatment systems, including the construction of the wastewater treatment plant in Encarnación, have also not begun as noted above.
- To raise the water level **any higher than 78 masl**, EBY has to complete a host of resettlement and environmental mitigation activities required for each meter of elevation plus its corresponding buffer zone. According to the Bank’s Aide Memoire of October 2003, in Paraguay “*around 600 families out of the remaining 2,110 are located in levels 78 and 80.*”¹⁴⁶ Current data show that a total of 5,108 urban families must be relocated in order to complete the project, 2,078 (38 percent) of which have already been resettled and 1,249 of which are “*planned to be relocated in the next years, thus achieving a progress of 61% [of people relocated].*”¹⁴⁷

In the Bank’s Aide Memoire, however, Management clarifies that these data are based on the 2000 survey/verification and that “*there are no estimations regarding the population that has settled in the area required for the projects in the last years.*”¹⁴⁸ The Aide Memoire also notes that the above “*data are not completely consistent with the information previously submitted to the Bank*” and that the Bank has provided EBY with a chart format so that EBY follows unified criteria when providing information about both river banks.¹⁴⁹ The mission reported that “[a] significant number of new dwellings and olerias [brick maker facilities] below inundation levels were observed” during a visit to the municipality of Carmen del Paraná and that, in Encarnación, “*no progress has been made regarding the relocation of the commercial area, which includes more than 300 plots and 700 stores.*”¹⁵⁰ The commercial area is located above the 80-masl level. A new market building, however, has been constructed above the affected area, with the access road and parking spaces still to be completed as of December 2003.¹⁵¹ At the higher reservoir levels, a system to monitor

¹⁴⁵ Third Owners’ Agreement, as amended in December 1997, Section 9, (a)(i).

¹⁴⁶ Aide Memoire, October 23–30, 2003.

¹⁴⁷ The data refers to Paraguay. According to EBY, in Argentina a total of 6,668 urban families need to be relocated. 70 percent have already been resettled, while 1,218 are scheduled to relocate in 2004, thus reaching 87.6 percent of relocations. 500 of these families are located between 78 and 84 masl.

¹⁴⁸ Aide Memoire, October 23–30, 2003.

¹⁴⁹ Ibid.

¹⁵⁰ Ibid.

¹⁵¹ Ibid.

underground water in Encarnación and Posadas will also be essential for urban environmental management.¹⁵² All of these measures represent a very substantial undertaking.

93. Management provided the Panel with the most recent estimates of the investment costs to raise the level of the reservoir.¹⁵³ These estimates, which have not been independently verified by the Bank, are contained in the Strategic Plan prepared by EBY in July 2002.¹⁵⁴ As shown in Table I-2 below, EBY needs: (i) US\$282 million to raise the level to 78 masl, (ii) an additional US\$298 to reach 80 masl, and (iii) an additional US\$134 million to raise the level of the reservoir to its final level (83 masl). This total of US\$714 million would include the investment costs for expropriations, civil works, and environmental and social programs required to raise the reservoir level to the different masl levels, as well as associated contingency and supervision costs.¹⁵⁵
94. In addition to these investment costs, however, the Treaty of Yacyretá calls for about US\$200 million in additional works to be carried out after the reservoir is raised to its final level, including investments for a railroad, port, and complementary coastal works in Argentina, as well as a railroad and an international airport in Encarnación, Paraguay.¹⁵⁶ As a result, the total estimated cost to complete the project, in July 2002 prices, was US\$914 million.
95. According to Management, EBY is currently revising and updating its investment cost calculations and plans to submit, by March 30, 2004, to both the Argentine and Paraguayan Governments an updated investment plan for raising the reservoir level to 83 masl. These updated calculations will be the basis for the governments' up-coming discussions and could include revisions or postponements of certain items (such as the additional works referred to above). That would result in savings of about 10 to 15 percent of present estimates.¹⁵⁷

¹⁵² Project Detailed Analysis, World Bank supervision mission, October 22–30, 2003, Annex 3.

¹⁵³ Memorandum, from Vice President, LCR, to Chairman, Inspection Panel, Subject: Yacyretá Hydroelectric Project: Estimated Investment Costs to Raise the Reservoir Level to 83masl", February 10, 2004.

¹⁵⁴ Ibid., (including the Table 2 from Entidad Binacional Yacyretá, "Plan Estratégico Yacyretá 2002," July 31, 2002, Chapter 10, Attachment1).

¹⁵⁵ Ibid.

¹⁵⁶ It should be noted that, although these works are not technically directly linked to raising the reservoir to its final level, they are required by the Treaty of Yacyretá.

¹⁵⁷ Management notes that, for example, some recent bids for selected civil works (including the Aguapey Channel and the sewerage system and wastewater treatment plant in Encarnación) have been lower than previously estimated.

Table I-2: Estimated investments required to raise the reservoir level and comply with Treaty obligations (Millions of US\$, July 2002 constant prices)

Concept	Country	Investments required to raise reservoir level			Subtotal	Additional works (Treaty agreements)	Total
		to 78 masl	to 80 masl	to 83 masl*			
Expropriations/Indemnifications	Argentina	28.32	24.62	1.23	54.17	-	54.17
Expropriations/Indemnifications	Paraguay	45.25	101.03	16.97	163.25	-	163.25
Civil works	Argentina	34.61	23.35	11.52	69.48	-	69.48
Civil works	Paraguay	37.52	31.15	60.57	129.25	-	129.25
Civil works	Both	38.76	40.14	20.00	98.90	-	98.90
Environmental programs	Argentina	1.08	0.45	0.92	2.44	-	2.44
Environmental programs	Paraguay	1.63	1.11	1.02	3.76	-	3.76
Environmental programs	Both	0.48	0.50	0.47	1.44	-	1.44
Social programs	Argentina	6.33	3.38	1.32	11.03	-	11.03
Social programs	Paraguay	12.67	12.45	2.88	28.00	-	28.00
Social programs	Both	2.32	2.02	1.37	5.71	-	5.71
Resettlement housing	Argentina	16.94	6.63	-	23.57	-	23.57
Resettlement housing	Paraguay	23.52	17.02	-	40.53	-	40.53
AR: Railroad, port, complementary coastal treatment, roads, others. PY: Railroad, airport, others	Both	-	-	-	-	177.27	177.27
Subtotal		249.42	263.85	118.27	631.54	177.27	808.81
Contingencies (10%)		24.94	26.39	11.82	63.15	17.73	80.88
Supervision		7.48	7.92	3.55	18.95	5.32	24.26
Total		281.84	298.16	133.64	713.64	200.32	913.95

* Investments would be carried out up to 84 masl (a one-meter buffer zone).

96. Despite planned investments, there is no consensus among stakeholders on whether in the foreseeable future there will be sufficient market demand for electricity at price levels that would justify the investment cost necessary to increase Yacyretá's generation capacity. This situation poses a number of questions and requires several key decisions from the governments of Argentina and Paraguay. The cost of raising the reservoir, including, *inter alia*, the cost of the social and environmental commitments of both governments with the Bank and other co-financiers, may not be justified at this time on financial grounds alone. However, one political justification may be that the expansion of the generating capacity of Yacyretá could be used by both governments both as a reliable source of electricity supply and, perhaps, as a price control instrument.
97. **The Panel finds that the long delays that have already occurred in implementing the resettlement and environmental mitigation activities have brought substantial costs and serious hardships to the affected populations. The Panel further notes the need for a decision to define the final operating level of the reservoir. The Panel wishes to highlight the economic and social costs associated with any decision regarding the level of the reservoir if it is not politically or otherwise feasible to implement the decision fully and in a**

timely manner. The governments' decision as to whether, how much and when to raise the operating level of the reservoir will directly affect the ability of the Bank to bring this project into compliance with its operational policies and procedures.

3. APPLICABILITY OF THE BANK OPERATIONAL POLICIES TO THE YACYRETÁ PROJECT

98. The complex chronology of events of the Yacyretá Project, as outlined in this section, shows that the history of this Project starts long before any Bank involvement. However, since the late seventies the Bank has financially committed to Yacyretá through five loans—Loan 1761-AR approved in 1979; Loan 2998-AR approved in 1989; Loan 3520-AR approved in 1992; Loan 2854-AR approved in 1987 and reallocated to Yacyretá in 1994; and Loan 3842-PA.
99. The first loans financing the Yacyretá Hydroelectric Project were approved before the Bank's relevant safeguard policies came into force. OD 4.00 Annex B on Environmental Policy for Dams and Reservoirs entered into effect in 1989, and OD 4.01 on Environmental Assessment took effect in October 1991. The location of the civil works, the height of the embankments, the extent of ultimate inundation, and the environmental and social consequences of these actions were thus not subject to formal environmental assessments early in the project cycle. Neither was there formal consideration and evaluation of realistic project alternatives; formal assessment and prediction of the likely effects of project actions; independent review of environmental impact statements; nor public disclosure of the results of environmental assessments. Similarly, as OD 4.30 on Involuntary Resettlement took effect in June 1990, its provisions do not apply to the first resettlement plan, which was approved in 1979.
100. By contrast, Loan 3520-AR to finance the so-called Second Yacyretá Hydroelectric Project was approved in 1992 and is therefore subject to OD 4.01 on Environmental Assessment and OD 4.30 on Involuntary Resettlement. Consistent with these directives, before approving the loan, the Bank requested the preparation of an Environmental Assessment and a Resettlement and Rehabilitation Plan as part of the conditionality for this loan. The resettlement plan, prepared by the Borrower and reviewed by the Bank in 1992, remains the operative plan for the resettlement operations still being carried out under the Yacyretá Project.
101. Loan 3842-PA, which finances the Paraguayan Reform Project for the Water and Telecommunications Sector, formerly the Asunción Sewerage Project, is also subject to the full range of the Bank policies mentioned above, as it was approved in 1995.
102. Loan 2854-AR (SEGBA V project) was approved in 1989, before the Bank's safeguard policies came into force. However, at the time the loan was changed to allow funds to be applied to the Yacyretá project, OD 4.01, OD 4.30 and other

safeguards policies were already applicable to this project and the use of funds from this loan did not change the policy framework for the project *vis-à-vis* the Bank.

103. More specifically, the policies that are applicable to the Yacyretá Project for the purpose of the Panel's investigation are:

- **Environmental Assessment OD 4.01** (October 1991)
- **Involuntary Resettlement OD 4.30** (June 1990)
- **Project Supervision OD/OP/BP 13.05** (March 1989 and July 2001)
- **Monitoring and Evaluation OD 10.70** (November 1989)

Chapter Two

Environmental Compliance

TABLE OF CONTENTS

Chapter Two	35
Environmental Compliance.....	35
Table of Contents.....	36
4. Environmental Assessment	37
4.1. Environmental Screening.....	38
4.2. Preparation of Environmental Assessments.....	38
4.2.1. The First Yacyretá Hydroelectric Project	39
4.2.2. The Second Yacyretá Hydroelectric Project	39
4.2.3. The Water and Telecommunications Reform Project and SEGBA V Power Distribution Project.....	39
4.3. Consideration of Alternatives	40
4.3.1. Alternatives in First Yacyretá Hydroelectric Project	42
4.3.2. Alternatives in Second Yacyretá Hydroelectric Project	42
4.3.3. Alternatives in Resettlement: Water and Telecommunications Reform Project and SEGBA V Power Distribution Project.....	43
4.4. Consideration of Biophysical Environment	43
4.4.1. The Second Yacyretá Hydroelectric Project	43
4.4.2. The Water and Telecommunications Reform Project and the SEGBA V Power Distribution Project.....	46
4.5. Consideration of Urban and Peri-urban Environments.....	46
4.5.1. Layout and Logistics of Resettlement Townships and Villages	48
4.5.2. Roads and Road Networks	49
4.5.3. Water Supply, Sewerage and Sanitation, Urban Drainage	51
4.5.4. Implications of Non-Compliance with Environmental Safeguard Policies	52
5. Flooding of Urban Creeks.....	53
5.1. Relationship of Yacyretá Dam to Flood Levels of Paraná River at Encarnación	54
5.2. Flooding of the Potí'y, Mboy Caé, Santa Maria and Yacú Paso Creeks	61
6. Water Quality And Health Standards.....	63
6.1. Environmental Pollution and Water Quality.....	63
6.2. Health Problems	64
7. Wastewater Treatment Plant	66
7.1. Environmental Assessment for Plant Location.....	66
7.2. Plant Design	67
7.3. Sewerage Connection to Houses.....	68
7.4. Transfer and Supervision of Sewerage Reticulation and Treatment System.....	69

4. ENVIRONMENTAL ASSESSMENT

104. The Request for Inspection contends that the Yacyretá project has caused harm to the local people and the environment due to an inadequate analysis of the project's social and environmental impacts. In the Requesters' view, faulty identification and assessment of the project impacts have led to the exclusion of thousands of people from the compensation and mitigation programs that they would otherwise be entitled to, and have caused environmental contamination, flooding, and unsafe health conditions.
105. The Panel notes that the Requesters' claim introduces the issue of the adequacy of the Yacyretá project's environmental assessment (EA), prepared under the guidance of the Bank in 1992. While the Requesters indicate it as the root of their concerns, the Management Response does not address the adequacy of the project's environmental impact studies. Management focuses instead on specific subjects, such as *"the quality of water in the reservoir," "health conditions in the reservoir's area of influence"*¹⁵⁸, and the urban creeks' flooding events.
106. The detailed Management Response regarding these specific issues is analyzed in the relevant sections of this Report.¹⁵⁹ In general, however, Management asserts that *"it has carried out its obligations in accordance with its relevant policies and procedures,"*¹⁶⁰ and that *"many of the matters raised by the Requesters are not attributable to the project, but are related to situations which existed before the project began."*¹⁶¹
107. Consistent with the Panel's mandate—to respond to complaints by individuals who believe that they have been harmed by a Bank-financed project because the Bank has not followed its policies and procedure—this section analyzes the environmental assessment, which the Bank approved and reviewed, in the light of the relevant applicable Bank policy, OD 4.01 on Environmental Assessment. The Borrower prepared the EA¹⁶² in the preparation stage of the so-called Second Yacyretá Hydroelectric Project and in 1992 submitted it to the Bank for its review, as required by OD 4.01.¹⁶³
108. The policy on Environmental Assessment outlines the Bank standards for procedures and content of environmental assessments and of related types of environmental analysis. The Policy states that the *'EA is a flexible procedure, which should vary in breadth, depth, and type of analysis depending on the*

¹⁵⁸ Management Response, Executive Summary, ¶4.

¹⁵⁹ See *infra* Section 6.

¹⁶⁰ Management Response, Executive Summary, ¶9.

¹⁶¹ Management Response, ¶ 35.

¹⁶² EIA, Second Yacyretá Project.

¹⁶³ See World Bank Operational Manual, Operational Directive 4.01, "Environmental Assessment" (October 1991), Annex D, ¶8 [hereinafter "OD 4.01"].

project.”¹⁶⁴ OD 4.01 adds that “[t]he purpose of [the] EA is...to ensure that the project options under consideration are environmentally sound and sustainable” and requires that “[a]ll environmental consequences should be recognized early in the project cycle....”¹⁶⁵ It follows that the nature of an EA is to “identify ways of improving projects environmentally, by preventing, minimizing, mitigating, or compensating for adverse impacts.”¹⁶⁶ In addition, OD 4.01 goes beyond stating policy that must be observed and specifies the details of the procedures, which must be implemented. The paragraphs below present the Panel’s analysis of these aspects.

4.1. Environmental Screening

109. Screening for Environmental Assessment is required by paragraph 17 of OD 4.01 “to decide the nature and extent of the EA or environmental analysis to be carried out.” Screening assigns a project to one of three categories:

Category A: A full environmental assessment is required.

Category B: Environmental analysis is required but not a full environmental Assessment.

Category C: No environmental assessment or environmental analysis is required.

110. Phase two of the Yacyretá Project was assigned category A by the Bank¹⁶⁷ and category IV by the Inter-American Development Bank.¹⁶⁸ The Asunción Sewerage Project (later renamed the Reform Project for the Water and Telecommunications Sectors) was also assigned category A by the Bank.¹⁶⁹ Both projects thus require full environmental impact assessment as envisaged by OD 4.01. **The Panel finds that the environmental screening process for phase two of the Yacyretá Project and for the Asunción Sewerage Project was appropriate.**

4.2. Preparation of Environmental Assessments

111. OD 4.01 requires that Environmental Assessment take place during project preparation so that all environmental consequences are recognized early in the project cycle.¹⁷⁰

¹⁶⁴ OD 4.01, ¶1.

¹⁶⁵ Ibid., ¶2.

¹⁶⁶ Ibid., ¶2.

¹⁶⁷ 1992 EIA, Yacyretá Project.

¹⁶⁸ 1992 EIA Yacyretá Project, Environment and Resettlement in Yacyretá, Executive Summary, February 1993, page 3.

¹⁶⁹ World Bank, Staff Appraisal Report, Paraguay, Loan 3842-PA, “Asunción Sewerage Project,” Report No. 13028-PA, January 17, 1995, ¶3.1.

¹⁷⁰ OD 4.01, ¶1–2.

4.2.1. The First Yacyretá Hydroelectric Project

112. It is clear that ‘the project cycle’ was already far advanced by the time OD 4.00 Annex B (Environmental Policy for Dam and Reservoir Projects) and OD 4.01 (Environmental Assessment) took effect so that these provisions cannot be applied to the First Yacyretá Hydroelectric Project. The Project documents, however, require “*the Governments of Argentina and Paraguay and YACYRETÁ...to carry out an environmental program acceptable to the Bank to minimize the environmental impact of the project*”¹⁷¹ and to “*carry out the resettlement component according to programs and timetables satisfactory to the Bank*.”¹⁷²

4.2.2. The Second Yacyretá Hydroelectric Project

113. When the Second Yacyretá Project was placed before the Bank in 1992, a formal environmental assessment had been undertaken.¹⁷³ This was accompanied by an Environmental Management Plan (EMP or PMMA)¹⁷⁴ as well as an Action Plan for Resettlement and Rehabilitation (RRAP or PARR).¹⁷⁵ **The Panel finds that Management thus met the requirement of OD 4.01 at that time.**

4.2.3. The Water and Telecommunications Reform Project and SEGBA V Power Distribution Project

114. The Asunción Sewerage Project focused on providing improved sewerage services for Asunción.¹⁷⁶ However, the project also included the provision of infrastructure for a resettlement site, Itá Paso, in Encarnación¹⁷⁷. In 1994 the Bank agreed that US\$135 million of undisbursed funds from the SEGBA V Power Distribution Project to Argentina (Loan No. 2854-AR) could be reallocated to the Yacyretá Project for environmental protection and social aspects.¹⁷⁸ Funds from the two loans were to be used to fund resettlement sites in Encarnación with water supply and sewage disposal facilities, roads, storm water drainage, solid waste disposal facilities, and power distribution. These activities on the resettlement sites clearly needed an environmental assessment that would identify impacts at the resettlement site and on surrounding communities. While the Asunción Sewerage Project had an environmental assessment, it was for the sewerage system in Asunción¹⁷⁹. Similarly the SEGBA V Power Distribution

¹⁷¹ 1979 SAR, ¶ 4.22; ¶ 8.01 (g).

¹⁷² Ibid., ¶ 4.35; ¶ 8.01 (h).

¹⁷³ 1992 EIA Yacyretá Project.

¹⁷⁴ Environmental Management Plan (EMP), July 31, 1992 [hereinafter “EMP”]

¹⁷⁵ Plan de Acción para el Reasentamiento y la Rehabilitación (PARR).

¹⁷⁶ Loan 3842-PA, Schedule 2 to the Project Agreement.

¹⁷⁷ Ibid.

¹⁷⁸ Loan Assumption Agreement, ¶ 13(a).

¹⁷⁹ Sir William Halcrow & Partners Ltd., *Estudio de evaluación de opciones para mejoras del sistema de alcantarillado, diseño detallado y evaluación del impacto ambiental del proyecto de alcantarillado*

Project to Argentina did not have an environmental assessment that covered these activities in Encarnación.

115. During most of its research period for this investigation the Panel found that the Bank could not locate any environmental assessment of the impacts that would result from providing resettlement sites in Encarnación with water supply and sewage disposal facilities and the infrastructure noted above. Interviews with staff did not reveal such an assessment. In November 2003, after repeated calls for all relevant documents, Management provided the Panel with copies of environmental assessments undertaken by various consultants to EBY. The studies relate to the resettlement sites of Itá Paso, Arroyo Porá, and Carmen del Paraná. The Panel also received a General Summary of a Resettlement and Rehabilitation Action Plan for the Urban Creeks Program.¹⁸⁰ In a memo of January 14, 2003, Management indicated that the Bank had ensured that EBY's "*capacity to apply those [environmental] criteria and procedures was sufficient,*" which implies that the EBY consultants who prepared the environmental assessments had the requisite capability to do so.
116. **The Panel has reviewed the environmental assessments and finds that they are very inadequate. They do not comply with the requirements of OD 4.01. The range of environmental matters addressed is limited; affected parties were not consulted; and no mitigation measures are suggested. As discussed later, no alternative resettlement sites were considered. The safeguard envisioned to be in place through OD 4.01 has therefore failed.**
117. The Panel notes that if the Bank did not require environmental assessments for the provision of infrastructure in Encarnación, as it appeared to the Panel throughout its research, Management did not comply with OD 4.01. If the assessments, which were prepared by EBY consultants are intended to constitute the required assessments, as Management now contends, they are highly inadequate. Thus, the Panel finds that Management is not in compliance with **OD 4.01 with respect to the Encarnación portion of Loan 3842-PA and Loan 2854 - AR.**

4.3. Consideration of Alternatives

118. If there is no alternative, there can be no choice. This basic principle was recognized in environmental assessment more than three decades ago.¹⁸¹ The purpose of environmental assessment is to improve decisions by making

sanitario de la cuenca del Itay (1995); World Bank, Asunción Sewerage Project, Loan 3842-PA, Environmental Assessment Summary, May 5, 1994 [hereinafter "Asunción EAS"].

¹⁸⁰ Entidad Binacional Yacyretá, Departamento de Obras Complementarias, Sector Reasentamiento, Plan de Acción Para el Reasentamiento y Rehabilitación, "Programa Desborde de Arroyos: Resumen General," (1999) [hereinafter "PDA Resumen General"].

¹⁸¹ See e.g., U.S. National Environmental Policy Act of 1969 (NEPA), 42U.S.C. § 4332 (c)(iii) (1998); Proposed Principles and Guidelines on Environmental Impact Assessment, U.N. Doc. No. UNEP/WG. 152/2 (1986); Economic Commission for Europe Convention on Environmental Impact Assessment in a Transboundary Context, done at Espoo, Finland on 25 February 1991, 30 ILM800 (1991); IELMT 991.

appropriate choices. It follows that careful comparison of realistic alternatives is an important feature of environmental assessments. Without systematic consideration of realistic alternatives, any environmental assessment is seriously flawed.

119. The Bank's directives clearly recognize the need to consider alternatives. Paragraph 4c of OD 4.01 of October 1991 states that project specific EA's should normally cover: "*systematic environmental comparison of alternative investments, sites, technologies and designs.*" This is amplified in paragraph (f) of Annex B of OD 4.01:

"The EA report should include the following items:

*(f) Analysis of alternatives. Systematic comparison of the proposed investment design, site, technology and operational alternatives in terms of their potential environmental impacts.... For each of the alternatives, the environmental costs and benefits should be quantified to the extent possible, and economic values should be attached where feasible. The basis for the selection of the alternative proposed for the project design must be stated."*¹⁸²

120. To ensure that the importance of alternatives is fully understood, Task 5 of the Bank's Sample Terms of Reference (TOR) for Environmental Assessment states as follows:

"Task 5. Analysis of Alternatives to the Proposed Project. Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives, which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Compare alternatives in terms of potential environmental impacts; capital and operating costs; suitability under local conditions; and institutional, training, and monitoring requirements. When describing the impacts, indicate which are irreversible or unavoidable and which can be mitigated. To the extent possible, quantify the costs and benefits of each alternative, incorporating the estimated costs of any associated mitigating measures. Include the alternative of not constructing the project, in order to demonstrate environmental conditions without it."

121. The Bank's policies and directives leave no room for doubt as to the need for a careful and systematic consideration of different types of alternatives, including investment alternatives, alternative sites, alternative project designs, and alternative implementation plans.

¹⁸² Paragraph 2 of OP 4.01 of January 1999 expands on the earlier directive: "EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation ..."

4.3.1. Alternatives in First Yacyretá Hydroelectric Project

122. No systematic analysis of alternatives—locations, technical designs, or modes of implementation—is available or appears to have been made. However, the First Yacyretá hydroelectric project was not subject to OD 4.01, on Environmental Assessment.

4.3.2. Alternatives in Second Yacyretá Hydroelectric Project

123. With Bank funds, EBY commissioned an environmental assessment in late 1991. The designated consultants completed an *Environmental Report of the Yacyretá Project* in January 1992. This document served as the basis for the development of the Environmental Management Plan (PMMA) and the Action Plan for Resettlement and Rehabilitation (PARR). These documents were circulated at a workshop amongst some 90 participants representing 40 institutions and NGOs in Ayolas, Paraguay in July 1992. Modifications to the PMMA and the PARR were made as a result of the workshop. EBY directors approved these documents in December 1992.
124. From these documents an “Environmental Summary” titled *‘Environment and Resettlement in Yacyretá’* was produced and approved in February 1993. The purpose of the document was to consolidate the PARR and PMMA as integral parts of the Yacyretá project so as to ensure that environmental and social safeguards were observed in project implementation. The document thus serves more as a background for the preparation of environmental management plans than as an evaluation.
125. The EA for the Second Yacyretá Hydroelectric Project contains a section titled “Analysis of Alternatives.”¹⁸³ Here the fact that the dam is in an advanced stage of construction at a site that holds many environmental disadvantages is stated, as is the limited opportunity for environmental considerations to influence dam design. The alternatives available for consideration were a) permanent operation of the Yacyretá reservoir at a level lower than 83 masl and b) completion of the project without the Arroyo Aguapey barrage. The subsequent analysis concluded that:

*“Permanent operation of the Yacyretá reservoir at a lower level (such as 76 or 78) would significantly reduce environmental costs.”*¹⁸⁴

“The alternative of completing the Yacyretá Project (with operation at EL 83) without the planned Arroyo Aguapey barrage would be environmentally much less desirable (although it might well be desirable from a strictly economic standpoint). Without the planned barrage...(very roughly) 40,000 ha of natural grasslands, wetlands, and riverine forests, ...lost to the Yacyretá Project.... One endangered

¹⁸³ 1992 EIA Yacyretá Project, Executive Summary, ¶51–56

¹⁸⁴ Ibid., ¶53.

species of bird... occurs in the area that would be flooded.... An additional 1,000 rural people would need to be resettled if the barrage were not built.”¹⁸⁵

126. Apart from this analysis of operational levels and the Arroyo Aguapey barrage, the document is an analysis of the likely consequences that would follow from implementing the Yacyretá project. The history of the Yacyretá development makes it understandable why the document does not examine the full suite of possible project alternatives. Realistic alternatives are nevertheless considered. **With respect to the consideration of alternatives under the Second Yacyretá Hydroelectric Project the environmental assessment is in compliance with OD 4.01.**

4.3.3. Alternatives in Resettlement: Water and Telecommunications Reform Project and SEGBA V Power Distribution Project.

127. As noted above, after repeated requests for documentation, Management provided the Panel with copies of documents that were proffered as environmental assessments for some of the resettlement sites associated with the project.¹⁸⁶ The studies, which were undertaken by various consultants to EBY, relate to the resettlement sites of Itá Paso, Arroyo Porá, and Carmen del Paraná. The Panel also received a General Summary of a Resettlement and Rehabilitation Action Plan conducted in terms of the Urban Creeks Program.¹⁸⁷
128. **The Panel finds that these documents do not consider alternative resettlement sites as required by OD 4.01.** The failure to consider alternative sites for the resettlement developments in the vicinity of Encarnación has meant that locations have been selected that are sub-optimal in terms of soil types, drainage, proximity to existing infrastructure, and distance to places of employment.

4.4. Consideration of Biophysical Environment

4.4.1. The Second Yacyretá Hydroelectric Project

129. The environmental assessment for the Second Yacyretá Hydroelectric Project discussed the following biophysical parameters:

Impact on flora and fauna¹⁸⁸
Impact on water resources¹⁸⁹
- water quality¹⁹⁰

¹⁸⁵ Ibid., ¶ 55.

¹⁸⁶ Management Memorandum, Subject: Yacyretá, November 14, 2003.

¹⁸⁷ PDA Resumen General.

¹⁸⁸ 1992 EIA Yacyretá Project, 47, 66, 117.

¹⁸⁹ Ibid., 108.

¹⁹⁰ Ibid., 44.

- thermal stratification¹⁹¹
 - aquifers¹⁹²
 - eutrophication¹⁹³
 - aquatic weed proliferation¹⁹⁴
 - sedimentation and erosion¹⁹⁵
 - Impact on ichthyic (fish) resources¹⁹⁶
 - Health risks¹⁹⁷
 - Infrastructure affected¹⁹⁸
 - Impact on the Aguapey Valley¹⁹⁹
 - Regional seismicity²⁰⁰
130. The Environmental Management (PMMA) developed to address the concerns and forecasts made in the environmental assessment aimed to “...*prevent, mitigate and offset damage to ecosystems, human populations and services infrastructure from construction and operations connected with the Yacyretá hydroelectric project, and to protect areas of high ecological and cultural value in the project’s impact area.*”²⁰¹ Apart from “*human populations,*” these objectives have been achieved to a remarkable degree. This has been done through a combination of supervision, monitoring, research, institutional strengthening, institutional coordination, involvement of affected parties, use of outside expertise, and regular program evaluation.
131. The Panel interviewed Bank officials responsible for project environmental management.²⁰² While conducting Panel members on site visits, EBY environmental staff also explained the activities in which they were involved.²⁰³ The Panel’s consultants reviewed the complete series of PMMAs for the project available in the Bank’s collection of Yacyretá documentation. In addition, the Independent Review²⁰⁴ of the PMMAs undertaken for the Bank and EBY were carefully studied, with the translation from the Spanish conducted by a consultant fluent in Spanish.²⁰⁵ The independent reviewer’s comments with respect to the high quality of the data relating to reservoir water quality, the excellence of the

¹⁹¹ Ibid., 108.

¹⁹² Ibid., 112.

¹⁹³ Ibid., 110.

¹⁹⁴ 1992 EIA Yacyretá Project, 111.

¹⁹⁵ Ibid., 25.

¹⁹⁶ Ibid., 122.

¹⁹⁷ Ibid., 89, 124.

¹⁹⁸ Ibid., 134.

¹⁹⁹ EIA Yacyretá Project, Environment and Resettlement in Yacyretá, ¶ 4.57.

²⁰⁰ Ibid., ¶ 4.58.

²⁰¹ Ibid., ¶ 5.5.

²⁰² Staff Interviews, Washington, DC, 2002, 2003.

²⁰³ Interviews, Encarnación, January 2003.

²⁰⁴ Methodology prepared in April 1998 by Luiz Fernando Galli. Review undertaken in 1999 by Fernando Ferreira de Camargo.

²⁰⁵ Fernando Ferreira de Camargo, Antonio Carlos, França, Paulo da Silva Noffs, Evaluación Independiente del PMMA, Informe Final, Septiembre 2002.

technical work in ecosystem management, and the model technical capacity of the public health monitoring were noted. So too were the reviewer's comments on the desirability of a regional approach to water quality monitoring and the need for monitoring that would provide evidence of cause and allow preventive action to be undertaken. The reviewer also noted the successful establishment of nature reserves, the incorporation of NGOs into their management, and the increased cooperation of local people with reserve policies. The Panel's observations made during its field visit to the reserve areas are consistent with these findings.

132. From the documentation studied, the independent review of the PMMA, the interviews with Bank and EBY staff, and personal observations, **the Panel observes that the biophysical environment affected by the Yacyretá dam and reservoir is being managed competently and that the initial problems that arose when the reservoir was first filled have been satisfactorily resolved.** The early problems of floating mats of vegetation, proliferation of aquatic weeds, gas super-saturation downstream from spillways, inadequate water supply to the Aña Cua, illegal fishing, and poaching in nature reserves have all been satisfactorily addressed and are no longer deemed to be significant problems. The ongoing attention that Bank staff have paid to these issues during supervisory missions is well documented in supervisory mission reports and back-to-office memoranda.²⁰⁶
133. The Panel is, however, seriously concerned that the present sound environmental management practices²⁰⁷ will deteriorate, because EBY has to reduce the level of funding needed to maintain them. Both Bank staff and NGOs alerted the Panel to this possibility. The reserves established to ensure biodiversity conservation would become vulnerable should the level of funding provided for their support decrease. Similarly, concern was expressed that the present level of control over fishing could not be maintained if the support given by the Paraguayan Navy were to be withdrawn. Bank staff responsible for environmental oversight of the Yacyretá project informed the Panel of their concern that the mechanism for the recovery of costs for environmental management, although in place, is inadequate. Examples were cited of payments for monitoring contracts being long delayed and of staff action being required for payments to be effected. The supervision mission reports mention difficulties due to delays by EBY in disbursements to organizations providing environmental monitoring services.²⁰⁸ The view was expressed that without ongoing Bank supervision, the money required for protected area maintenance, fishery control, and environmental monitoring would not be forthcoming.²⁰⁹

²⁰⁶ The matters addressed in supervisory missions since 1997 are summarized in Annex B of Management Response.

²⁰⁷ These include reservoir operation, gas super-saturation management, water quality and disease vector monitoring, nature reserve maintenance, and fisheries management.

²⁰⁸ Joint Bank/IDB missions of November 2–9, 1999 and April 9–14, 2000.

²⁰⁹ Staff Interviews, Washington, DC, 2002.

134. The Panel's concern about funding has been increased by the October 2003 Bank Supervisory Mission Report,²¹⁰ which outlines the critical financial position of the Yacyretá project. *"The critical condition of the project financing is jeopardizing the continuity of project execution. Annual projections indicate that Yacyretá's annual income will be reduced to approximately US\$23 to 35 million. This figure is much below the project operation and maintenance costs that in 2002 amounted to US\$ 49 million. Under these conditions there will be a deficit to cover the compensation payments to Paraguay... the salaries of EBY's employees, payments to consultants, the cost of the dam's insurance, and other operational costs that will not be covered by revenues from power sales."*²¹¹
135. **The Panel finds that the future environmental management of the Yacyretá project is critically threatened by the Project's financial position and that both the natural environment and project-affected people will suffer additional harm if the Project's environmental management practices deteriorate.**

4.4.2. The Water and Telecommunications Reform Project and the SEGBA V Power Distribution Project

136. The problems pertaining to environmental assessments for these projects have already been covered.²¹² Because the resettlement locations appear to have been located almost entirely on sites that have been subject to human use, no irrevocable loss of biodiversity is likely to have been occasioned by the resettlements. In terms of water resources, however, field observation showed that resettlement sites have been developed with apparent disregard for drainage lines and wetlands. The suitability of soils and terrain for low-cost resettlement also appears not to have been assessed.

4.5. Consideration of Urban and Peri-urban Environments

137. The social component of EBY (and most of the social studies in the project) is focused entirely on resettlement and compensation, in an effort to meet the requirements of OD 4.30 (Involuntary Resettlement).²¹³ The *"induced development and other socio-cultural aspects"* of the Project, consideration of which is required by OD 4.01 on Environmental Assessment, were largely

²¹⁰ Aide Memoire, October 23–30, 2003.

²¹¹ Aide Memoire October 23–30, 2003.

²¹² See § 4.2.3.

²¹³ Even in examining the administrative chart of EBY, provided to the Panel in January 2003, it appears that all social science work is concentrated in the so-called "Resettlement Sector" of the Department of Complementary Works. While recognizing that staff of any named office can have multiple duties, the name itself leads us to the same conclusion as does an observation of the project's history: that the Project's social science seems entirely dedicated to arranging for *resettlement* rather than to the broader assessment of the project's social impact required by the Bank's operational directives.

- neglected in the EA.²¹⁴ For example, there was inadequate consideration of population growth and changes in the urban and peri-urban population density along with increased demands on the urban infrastructure of Encarnación. No consideration was given to the fate of the large number of workers attracted to the project at Ayolas, who continue to live in EBY-built housing there amid extremely high unemployment, after the primary hydrological works have been completed.
138. Questioned as to an apparent lack of urban planning for resettlement in Encarnación, a former staff member told the Panel²¹⁵ that, although the Yacyretá project had always had an urban component, Encarnación had grown beyond all expectations during the time the project has been underway and that the urban impact had been increased due to project delays, the regional economic recession, and a transfer of responsibility for urban areas from national to local governments.
 139. With respect to the Second Yacyretá Hydroelectric Project, Section F of the document *Environment and Resettlement in Yacyretá: Environmental Summary*²¹⁶ briefly addressed the urban and peri-urban environment affected by the Yacyretá Project. The analysis was, however, focused mainly on the numbers of affected persons and the loss of economic opportunities. The structure and balance of the 1992 environmental assessment indicated that at that time the Yacyretá Project was deemed to have consequences mainly of an ecological nature, with social components related to a loss of access to clay by brick- and tile-makers.
 140. That the Project would give rise to significant urban resettlement complexities appears not to have been appreciated. A Bank staff member indicated to the Panel that while ideally, in the modern concept of environmental assessments, one would look at these kinds of issues, the broader development context of the city probably was not considered at the time the EA was done.²¹⁷ Another staff member confirmed to the Panel²¹⁸ that for Encarnación there had been no forward planning, no consideration of the effects of resettlement sites on transport routes or on land use. The land had already been selected. There was no analysis of alternative sites.
 141. In short, urban and peri-urban environmental concerns have not been considered at all for Encarnación. No environmental assessment was made of the impacts that would result from either selection of sites for potential resettlement or providing resettlement sites in Encarnación with water supply and sewerage

²¹⁴ OD 4.01, Annex A, Item (h). The requirements for assessment of social issues within OD 4.01 could have been met either by including them in the Environmental Impact Assessment or within a separate Social Assessment.

²¹⁵ Staff Interview, Washington, DC, 2003.

²¹⁶ Approved by the IDB on February 26, 1993.

²¹⁷ Staff Interview, Washington, DC, 2003.

²¹⁸ Ibid.

disposal facilities, roads, storm water drainage, solid waste disposal facilities, or power distribution.

142. **The Panel finds that in the EA for the Second Yacyretá Project there was inadequate consideration of population growth and the effects this would have on Encarnación. The Panel also finds that Management did not ensure that EBY considered the effects that the resettlement developments would have on Encarnación and its infrastructure .**
143. OD 4.01 requires that the Bank assist in the study of environmental effects of “*induced development*” within environmental impact assessments:
“*Secondary growth of settlements and infrastructure, often referred to as ‘induced development’ or ‘boomtown’ effects, can have major indirect environmental impacts, which relatively weak local governments may have difficulty addressing.*”²¹⁹
144. **The Panel finds that environmental and social assessments should have anticipated the induced effects associated with the Yacyretá project.** This analysis would also include development consideration of the multiplier effects of impacts caused by the construction of the dam and reservoir and a study of the additional loads on the sewage system, roads, and resettlement sites with all their infrastructure and resulting likely population increases. This includes effects on villages above the level of flooding associated with movements of population, including effects on their economies and livelihoods of their people.

4.5.1. Layout and Logistics of Resettlement Townships and Villages

145. Affected persons who addressed the Panel in Encarnación²²⁰ complained that available sites suitable for resettlement closer to the city center had not been considered and, as a consequence, they were having to endure the extra expense of transport to and from the city and their places of work. In the Panel’s meeting with Cambyretá Municipal Authorities,²²¹ local authorities complained that the sites within their municipal area chosen for the Yacyretá project resettlement were not suitable for the purpose and that no approval for their development had been granted by the municipality. They stated further that the sites had been planned without those responsible ever having visited the locations for site inspections. One official stated: “*The entire planning situation in Encarnación is crazy.*”²²²
146. In contrast to these views, at a Panel meeting with EBY staff²²³ the Panel was told that an environmental master plan for the City of Encarnación had been prepared in 1999, that this plan had been approved by the Encarnación municipality, and

²¹⁹ OD 4.01, Annex A, Item (h).

²²⁰ Meeting with Requesters, Encarnación, January 2003.

²²¹ Meeting with Cambyretá Municipal Authorities, Encarnación, January 2003.

²²² Ibid.

²²³ Meeting with EBY staff, Encarnación, January 2003.

that it was the basis for resettlement planning. The Panel was unable to view this plan, although it was provided with a 1999 Environmental Management Plan for Encarnación.²²⁴ The Environmental Management Plan deals with some anticipated problems associated with raising the reservoir level to 83 masl, but it does not discuss the advantages and disadvantages of possible alternative resettlement sites nor the effects the new developments would have on city structure, land-use patterns, or transport routes.

147. The safeguard envisaged under OD 4.01 to ensure informed planning that would not be to the detriment of the environment or affected communities has not worked in the case of resettlements due to the Yacyretá Project. **The Panel finds that the environmental assessment of resettlement sites that was undertaken for the Second Yacyretá Project failed to give due regard to possible alternative sites and the effects that the new developments would have on the infrastructure of Encarnación. The Panel notes, however, that in the context of the PDA, Management advised EBY to co-ordinate resettlement in urban development plans.**²²⁵

4.5.2. Roads and Road Networks

148. No environmental assessment of the effects that the Yacyretá reservoir would have on the road network of Encarnación at various levels of inundation has been undertaken. An engineer from the Encarnación municipality confirmed this to the Panel.²²⁶ The Panel was told that EBY's plans for roads and bridges at an 83 masl reservoir level took little account of traffic flows and loads. The routes of the new roads had been highly influenced by such considerations as which local authority would benefit from road tolls and had given little consideration to how major new roads would shape the city. Neither Cambyreta municipal officials nor local NGOs had been consulted with respect to route selection, bridge placements, and road alignments.
149. During site inspections, the Panel observed the construction of a new bridge across the M'boi Caé that is proceeding without any regard to environmentally and ecologically inappropriate placement of a supporting pillar directly in the main channel of the stream. The lack of application of sound environmental planning was self-evident. The Panel is concerned that Bank Management approved a design of this nature.

²²⁴ Plan Director de Medio Ambiente de la Ciudad de Encarnación, Informe Final, Informe Final Anexo and Informe Final Resumen Ejecutivo, Elitec Consultores Asociados and EIT Estudios de Ingeniería y Transporte S.R.L., Asunción, 1999.

²²⁵ Management Response, ¶ 58.

²²⁶ Interviews, Encarnación, January 2003.



Figure 2 Arroyo Porá Resettlement Site: Poor Quality of Road Construction and Design

150. During site inspections of resettlement locations close to Encarnación, the Requesters took the Panel to numerous sites at which roads were in a very bad state of disrepair. Most frequently the basalt paving cobbles had sunk due to the erosion of the sand foundation and clay packing, apparently by large volumes of storm water flowing on the road, since there was no provision for storm water drainage other than on the road.
151. Leading a site inspection, the Cambyreta Municipal Engineer showed the Panel examples of clearly inappropriate road and drainage design.²²⁷ Roads in the course of construction had a sand bed of less than 0.15 m and newly packed cobbles could easily be lifted by hand. No provision was being made for storm water runoff despite the frequency of intense storms that characterize the region. (Rainfall statistics indicate that falls of over 100 mm in 24 hours occur routinely.²²⁸) Drainage channels from resettlement areas were inappropriately designed. In one instance, the stone-lined channel terminated abruptly high up on a slope, giving rise to a significant erosion gully below the emission point. In another, a lined channel about one square meter in section was directed straight down the slope for some 50 meters before making a right-angled turn to flow under a road via a culvert that had a cross-section significantly smaller than the channel leading to it. The consequence of the latter was flooding of properties and houses at considerable remove from the resettlement site itself.

²²⁷ Site inspection, Arroyo Porá, Encarnación, January 2003.

²²⁸ Roger Monte-Domecq et al., "Paraguay," in *Inundações Urbanas na América do Sul*, ed. Carlos E. M. Tucci and Juan Carlos Bertoni (Associação Brasileira de Recursos Hídricos, 2003).



Figure 3 Arroyo Porá Resettlement Site: Inappropriate Design of Drainage Channel

152. The Panel finds that there are many examples of inappropriate road and drainage design in the proposed resettlement areas, which could have been avoided through proper environmental assessments and stronger Bank supervision. The problems with Bank oversight of the construction of housing and civil works are discussed in more detail in chapter four.

4.5.3. Water Supply, Sewerage and Sanitation, Urban Drainage

153. Despite formal recognition of the fact that Encarnación needs to be provided with a piped sewerage system ahead of any increase in the operating height of the Yacyretá reservoir beyond 76 masl,²²⁹ no environmental assessment has been undertaken for this development.



Figure 4 Arroyo Porá Resettlement Site: Poor Quality Construction of Road Recently Built

²²⁹ Loan Agreement 2854-AR and 3520-AR, Amendment 4, Schedule 2 to the Project Agreement, December 11, 1997.

154. Further, despite regular flooding of the urban arroyos and the institution of the Programa de Desborde de Arroyos (PDA)-“Urban Creeks Program” in 1998, the documents provided and/or found by the Panel do not appear to constitute a formal environmental assessment for the program.²³⁰ Similarly, the extent to which the problem of the flooding of urban creeks is related to increased urbanization and densification in Encarnación has not been anticipated or studied.
155. Although an analysis of the cause of the apparently exacerbated flooding of the urban creeks will not solve the problem, it would contribute directly to proper apportionment of responsibility for addressing the problem. At present the flooding of the urban creeks is assumed by NGOs and the Encarnación municipal officials to be a consequence of the flooding of the Yacyretá reservoir, so they are looking to EBY or the Bank for redress. Bank officials are, however, of the opinion that the flooding of the urban creeks is unrelated to the Yacyretá inundation to 76 masl.²³¹ The absence of a definitive analysis of the problem has led to delays in its resolution and to the suffering of the affected persons being considerably prolonged.
156. **Among other shortcomings, the Panel finds that there was no evaluation of the consequences of the provision of reticulated water and sewerage facilities to resettlement sites in Encarnación, nor was there provision for either drainage to accommodate the discharge or adequate storm water drainage.**
157. **The Panel finds that the safeguards to assess the implications for water supply, sewers, and urban drainage, which ought to have been in place via OD 4.01, were by-passed. Management is not in compliance with the requirement of OD 4.01.**

4.5.4. Implications of Non-Compliance with Environmental Safeguard Policies

158. The failure to conduct a proper environmental assessment leads to a failure to identify and evaluate unintended consequences. For example, the lack of analysis of the consequences of developing new resettlement sites near Encarnación has resulted in *ad hoc* approaches to solving the consequent problems of water supply, sewerage disposal facilities, roads, storm water drainage, solid waste disposal, and power distribution, all of which should have been addressed in a properly conducted environmental assessment.
159. Because problems of this nature are now associated with the Yacyretá resettlement schemes, a great deal of time and effort must be expended to rectify

²³⁰ 1999 PDA Resumen General; Universidad Católica Ntra. Sra. De la Asunción, Sede Regional Itapúa, Estudio de Impacto de la Relocalización de las Familias Objeto del Programa Desborde de Arroyos Urbanos (PDA), Informe de Síntesis Final, Quinto Informe, April 2002. These documents do not address most of the matters of importance in an environmental assessment, such as a consideration of alternative sites, and a broader assessment of the consequences of the developing the selected sites and related precautionary or mitigating activities.

²³¹ Management Response, ¶ 48.

the situation that has arisen as well as to design mitigation measures. The consequences are unnecessary expenditure of resources that could have been used to ensure that more affected persons were being helped than is the case.

160. Failure to observe the Bank's safeguard policy on environmental assessment is having the consequences of the affected persons being dissatisfied with the Bank's resettlement schemes, the resettlement schemes giving rise to problems of storm-water run-off, overloading of sewerage lines, and the limited resources of the local municipal authorities being taxed. This is a situation, which neither Bank staff, project proponents, or affected persons desire or with which they are satisfied. Instead of a Bank-supported project reflecting positively on the Bank and its borrowers, the opposite has occurred. **This Project demonstrates that taking short-cuts with the Bank's safeguard policies is counterproductive for all concerned.**

5. FLOODING OF URBAN CREEKS

161. The Requesters complain that since the raising of the water level in the Yacyretá reservoir in 1994, the creeks, such as Poti'y, M'boi Caé, Santa Maria and Yacú Pasu, which cross the city of Encarnación, flood whenever it rains. This creates unbearable conditions for those who live on the banks of the creeks.
162. The Requesters contend that this flooding is caused by the Yacyretá reservoir affecting creek flow and that the situation is further exacerbated by wastewater spills from the housing developments built by EBY in Buena Vista and San Pedro.
163. Management denies any *"causal relationship between urban creek flooding and raising the level of the reservoir to 76 masl."*²³² It also asserts that the Requester's claims are based on *"insufficient understanding of the hydrology of the reservoir and neighboring urban creeks."*²³³ Management acknowledges the *"continuing social and human costs experienced by the population living along urban creeks"* but states that this situation is exacerbated by other causes than the Yacyretá reservoir, such as the clogging of the creeks with garbage and the frequent phenomenon of El Niño, which brings about heavy rainfalls.²³⁴
164. Management also argues that, from a hydrological standpoint, the flooding is not influenced by the current water level of the reservoir, and that the *"[c]reeks are flowing at the same rate they would without a reservoir at 76 masl."*²³⁵ In response to this complaint, Bank Management has presented a long flow series in

²³² Management Response, ¶ 48.

²³³ Ibid., ¶ 48.

²³⁴ Ibid., ¶ 49.

²³⁵ Ibid., ¶ 81.

the Paraná River at Posadas/Encarnación.²³⁶ Table II-1, cited in the Management Response, shows these values. These show the flood levels without the effect of the reservoir operation.

Table II-1 Return period for flood levels in Encarnación-Posadas²³⁷

Recurrence period Years ²³⁸	Level in Encarnación-Posadas (masl)
2	77
5	78
10	79
20	80
50	81
100	81,6
200	82,5

Source: Argentine Navy

165. To address properly the complex issues that the Requesters and Management Response raise, the Panel's hydrological expert has conducted two analyses. The first determined whether the construction of the Yacyretá dam has changed the flood levels of the Paraná river. The second examined whether the filling of the reservoir has increased the flood levels of the urban creeks. Annex B of this report presents the full analysis.

5.1. Relationship of Yacyretá Dam to Flood Levels of Paraná River at Encarnación

166. **The Panel finds that the construction of the Yacyretá dam has a negligible effect on the water level of the Paraná river at Encarnación, especially in times of flood.**
167. **The Panel also finds that the Yacyretá reservoir is frequently operated under conditions that produce a water level in excess of 76 masl up to one meter at Encarnación, which is not consistent with the provisions of both the loan agreement and the Third Owners' Agreement, as amended.**
168. **The Panel found that Management has accepted an error in the calculation of the water level at Encarnación shown in Management's Response. When the water level is properly calculated, the Panel found that the reservoir is**

²³⁶ Ibid., ¶ 82.

²³⁷ Sir William Halcrow & Partners, "Estudio de Regulación del valle Aluvial de los Ríos Paraná, Paraguay y Uruguay para el Control de Inundaciones" (Ministerio del Interior, Sub Unidad Central de Coordinación de la Emergencia, Argentina, September 1994), cited in Management Response, ¶ 82.

²³⁸ The return period is a measure of how likely it is that a flood of a particular size will occur. It is expressed mathematically as $1/P_{(x)}$ where $P_{(x)}$ is the probability of a particular flow being exceeded. The return period (sometimes termed "recurrence interval") should be thought of as a statistical probability rather than a finite number of years. If the return period is 2 years, a flood of this size will occur often. If the return period is 100 years, it will occur very seldom.

being operated so as to exceed a water level of 76 masl by up to one meter at Encarnación. The following paragraphs provide the detailed analysis.

169. After closure of the Paraná River, about 80 km downstream of Encarnación and Posadas, the dam changed the natural river-level profile at the cities due to a “backwater effect”. (This is the effect, which a dam or other obstruction has in raising the surface of the water **upstream** from the obstruction – illustrated in figure II-1 below).
170. The extent of the backwater effect varies as a consequence of both the water level at the dam (controlled by the discharge of water through turbines and sluice gates) and the volume of water flowing in the river. This complex relationship can be shown in a three variable graph. Figure II-1 shows the level of the Paraná River at Encarnación, allowing for backwater effect.

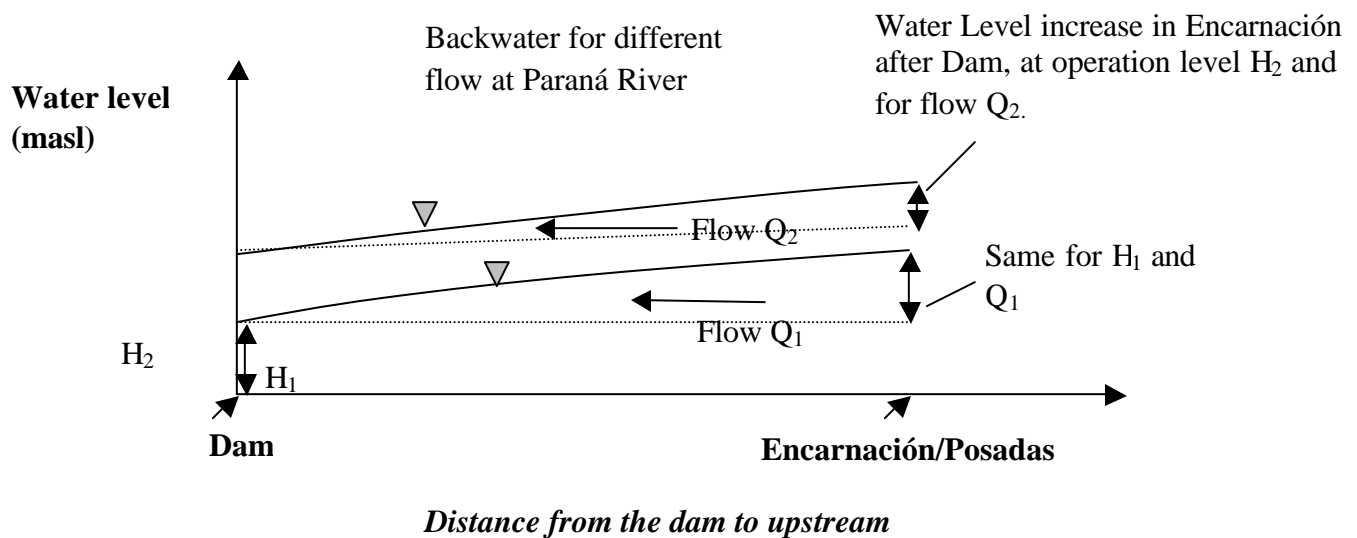


Figure II-1 Water level in the reach between the Dam and Encarnación/Posadas for the scenarios with Dam and without the Dam and the water level increase.

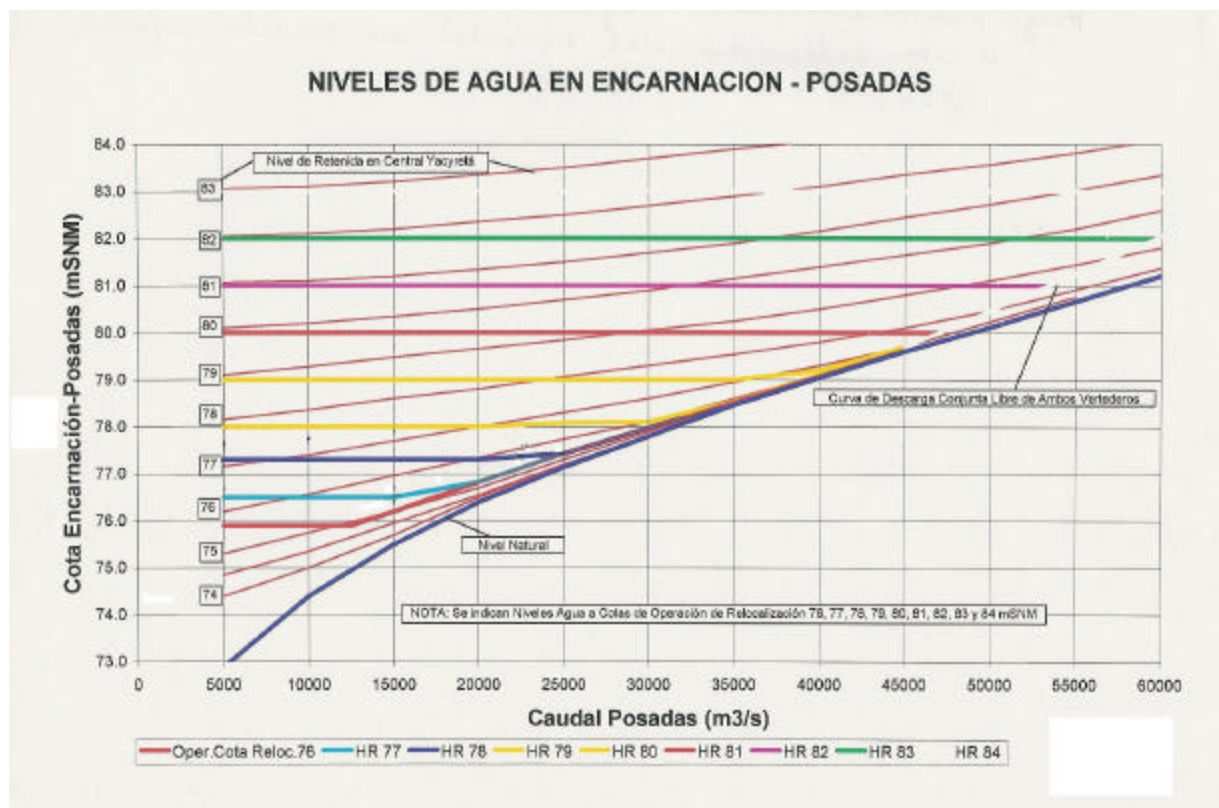
171. The Management Response attempts to demonstrate the effect that dam operation has on water level at Encarnación.²³⁹ In Management’s analysis the dam operational level in masl is defined relative to the water level at Encarnación and Posadas, not water level at the dam site,²⁴⁰ thus the dash curve in Management Response figure 6.1, should be at 76 masl at Encarnación and not 75.7 masl, as shown.²⁴¹ The dash curve in the Management response is 0.3 masl lower than it should be, thus underestimating the actual river level at Encarnación.

²³⁹ Management Response, ¶ 81.

²⁴⁰ Ibid.

²⁴¹ Ibid., Figure 6.1.(Water Level in Encarnación at Different Flow Rates of the Paraná River).

172. According to Management, “for flows less than or equal to 13,000 m³/s the water level at Encarnación–Posadas will remain at or below 76 masl.” As the flows increase closer to 13,000 m³/s, water levels in Encarnación–Posadas will essentially be those corresponding to natural river conditions without the presence of the Yacyretá Dam. **This is incorrect.**
173. When the Panel pointed out this error during its May 2003 visit, EBY provided updated and corrected information showing the operating level at the dam, the level of the river at Encarnación, and the flow of the Paraná River. This information is from the Harza report²⁴² (Figure II-2 below). The ordinate [y-axis] shows river level at Encarnación with due allowance for backwater effect, the abscissa [x-axis] shows river flow or volume in cubic meters per second, and each curve represents the water level at Encarnación under different operating levels at the dam and for varying river flows.
174. **As can be seen from this figure, with a river flow of 13,000 m³/s the level at the dam has to be near 75 masl for a water level of 76 masl to occur at Encarnación.** (The original mistake in the Management Response was that the curve shown by Management represented the operation rule adopted by EBY and not the actual water level in the reservoir at Encarnación.)



²⁴² Harza y Consorciados, 2002. Proyecto Yacyretá. Studio de Operación a Cota Intermedias del Embalse de Yacyretá. Informe 1252-I-31.3.00 RO, July 2002.

Figure II-2 Water level at Posadas/Encarnación as a function of flow in Paraná River and the operating level at the Dam (Harza y Consorciados, 2002).

175. The first curve of Figure II-2 (black) represents the relationship without the dam (natural conditions). The other curves are for the reservoir being operated at 74, 75, 76 masl and so on. Figure II-2 also shows the operational curves. These operational curves are shown as horizontal lines. The first operation curve shows that the level at Encarnación is kept near to 76 masl until the discharge reaches about 13,000 m³/s, after that it follows the 75 masl curve at the dam. These curves show that the reservoir produces an increase in water level (backwater effect) at Encarnación of about 1m above the river level that would have occurred in the absence of the dam when the river flow is 15000 m³/s. But the dam only serves to increase the water depth at Encarnación by 0,2m (20 centimeters or eight inches) when the river flow is 30,000 m³/s. **At higher flow rates the dam has virtually no effect at all on river height at Encarnación. The Panel consequently finds that the construction of the Yacyretá dam has a negligible effect on the water level of the Paraná river at Encarnación, especially in times of flood.**

176. Two periods of recorded data were sampled to verify the level of dam operation. The first period corresponded to a small flood in the Paraná together with very intense rainfall in Encarnación. In the second sample the Paraná was close to median flow, and there was very intense rainfall in Encarnación. The characteristics of these two floods were:
 - (1) *December/January of 97/98:* (12/21/97 to 01/10/98) During this period the Paraná River was flowing between 22,000 to 25,000 m³/s. On 12/29/97 Encarnación experienced its greatest rainfall in one day (268 mm) for 50 years (1954-1998). Table II-2 shows the levels at the dam and at Encarnación for this 1997 flood. The highest level at the Dam was 75.98 masl and at Encarnación the level for the same day was 77.58 masl. It can be seen from Table II-2 that, under natural conditions, this level would have been about 76.8 masl. **This data shows that during this period the operation rule being used was such as to maintain a water level of 77 masl at Encarnación and Posadas.**

Table II-2 Levels in Paraná River during flood of 1997²⁴³

Date	Level at Dam (masl)	Level at Posadas (masl)
20/12/97	75.75	77.29
21/12/97	75.74	77.36
22/12/97	75.74	77.40
23/12/97	75.83	77.50
24/12/97	75.80	77.44
25/12/97	75.80	77.37
26/12/97	75.80	77.36
27/12/97	75.79	77.37
28/12/97	75.81	77.34
29/12/97	75.87	77.20
30/12/97	75.97	77.56
31/12/97	75.98	77.58
01/01/98	75.81	77.35
02/01/98	75.68	77.11
03/01/98	75.69	77.00
04/01/98	75.66	77.01
05/01/98	75.60	77.07
06/01/98	75.61	77.00
07/01/98	75.67	77.04
08/01/98	75.60	77.04
09/01/98	75.55	76.94
10/01/98	75.45	76.93

Source: Argentine Navy

- (2) *January 2003: (01/15/03 to 01/19/03).* During this period the Panel was visiting Encarnación and observed flooding of Encarnación's urban creeks at first hand. The Paraná River flow was $\approx 15,000\text{m}^3/\text{s}$ (close to long term mean flow) and in Encarnación-Posadas there was heavy rainfall ($>100\text{ mm}$ in 24 hours). This is the second situation to be analyzed, it produced flooding in the M'boy creek and its tributaries. [Photos of this flood are presented in the annex A.] **Using figure II-2 and these data, it may be inferred that the dam was being operated so as to maintain a level of 76.5m at Encarnación. This is confirmed in table II-3 below.**

²⁴³ Information provided to the Panel by Argentine Navy in May 2003.

Table II-3 Levels at Paraná River in January of 2003²⁴⁴

Date	Level at Dam (masl)	Level at Posadas (masl)
15/01/03	75.40	76.43
16/01/03	75.41	76.37
17/01/03	75.48	76.40
18/01/03	75.59	76.44
19/01/03	75.78	76.52
20/01/03	75.84	76.60
21/01/03	75.86	76.72
22/01/03	75.64	76.72
23/01/03	75.57	76.57
24/01/03	75.59	76.77
25/01/03	75.67	76.71
26/01/03	75.74	76.66
27/01/03	75.70	76.62
28/01/03	75.47	76.52
29/01/03	75.38	76.54

Source: Argentine Navy

177. As can be seen from tables II-2 and II-3, with the dam operating between 75 and 76 masl (water level as measured at the powerhouse) the flood level in Encarnación remained below 78 m. These levels were double checked with information from the Paraguay Navy for the same period²⁴⁵. During May 2003 the Panel requested that it be provided with two years of water-level data for Posadas–Encarnación. This request was made to both EBY and Bank staff. The data was requested to verify the operational procedures actually being used in the Yacyretá reservoir. This information was finally received in September 2003.
178. Using the data from the period of 6/1/2001 to 7/31/2003, received from EBY, the following residuals (variances) were calculated:
$$Y = Y_{\text{pos}} - Y_{\text{op}}$$
where:
Y is the height in meters above or below the agreed operational curve during a day;
 Y_{pos} is the recorded level at Posadas/Encarnación ;
 Y_{op} is the agreed operational level (the operational level can differ from 76,0 m because of variable river discharge) obtained from the chart presented by EBY.
179. Figure II-3 shows the difference between the observed level of the river at Encarnación and the agreed operational level of the river. A 30 day moving average is also shown.

²⁴⁴ Information provided to the Panel by Argentine Navy in May 2003.

²⁴⁵ Data supplied by Dra. Angela Vergara, President of FEDAYIM, during May 2003 Panel's visit to the project area.

The figure shows:

- From April to October of 2001 the actual water level fluctuated around 0,30 m above the agreed operational level;
- From October 2001 to February 2002 it increased to near 0,40-0,50 m;
- Between May and September 2002, as in 2003, there is a decrease in the operational levels and for short periods the actual river level is below the operational level (possibly because of floods or a decrease in energy production);
- From September 2002 to May 2003 there is a steady increase in the residual, reaching 1.0 m above the 76.0 m operational curve.

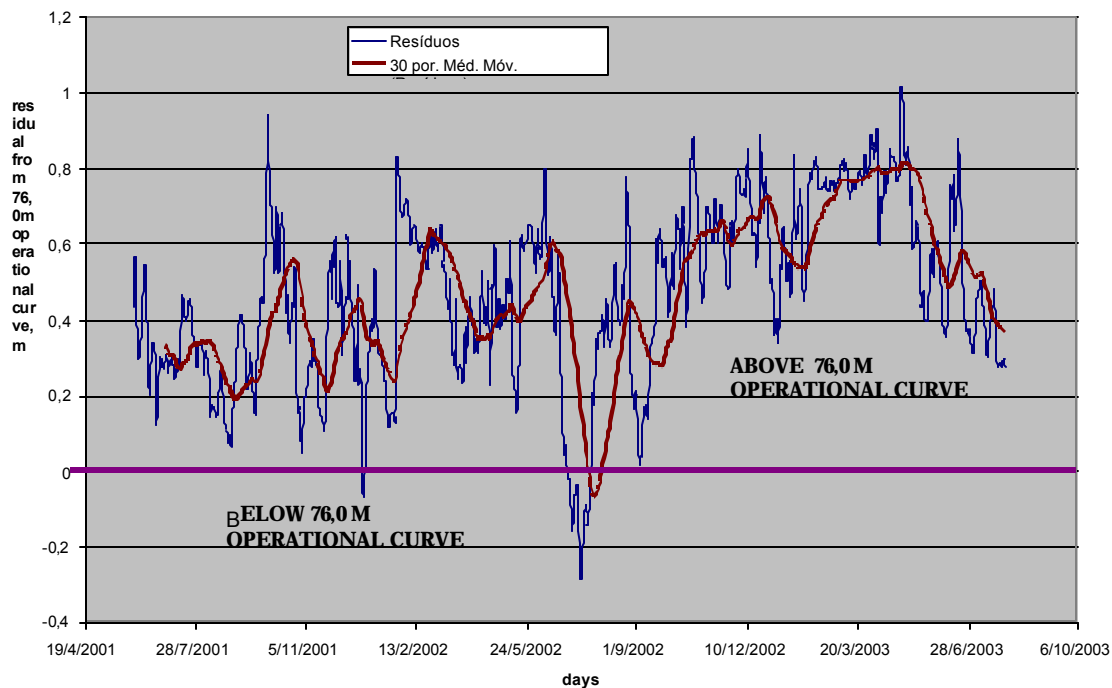


Figure II-3 Variance between observed river level and operational curve

From the two samples analyzed as well as from an analysis of the long-term records, the Panel draws the conclusion that the reservoir is being operated so as to exceed a water level of 76 masl at Encarnación, but not at a level that would cause flooding of urban areas (78 masl).

180. **From the above analysis the Panel finds that the contention of affected persons that the Yacyretá reservoir is frequently operated under conditions that produce a water level in excess of 76 masl at Encarnación is correct.²⁴⁶ The excess, however, is limited to one meter or less.**
181. The correction in the method of calculation has been accepted by EBY engineering staff. While this error has not yet had any serious direct consequences

²⁴⁶ Interviews, Encarnación, January 2003; Staff Interviews, Washington, DC, 2003.

for the Project, continued use by EBY and the Bank of an incorrect value for the water height at Encarnación would further erode local confidence in the reliability of official pronouncements concerning the dam and its operations.

5.2. Flooding of the Potí'y, Mboy Caé, Santa Maria and Yacú Paso Creeks

182. The Requesters have claimed that the water level at which the reservoir of the Yacyretá Dam is being operated is causing the urban creeks in Encarnación to flood.
183. Rainfall records for Encarnación show that precipitation in excess of 100 mm in a day occurs, on average, several times per year. This is evident in the record long before the construction of the Yacyretá dam. Rainfall of this intensity will give rise to rapid surface runoff, especially in areas over clay surface deposits, such as the weathered basalt on which much of Encarnación is situated. With the steep terrain of Encarnación this runoff will rapidly reach the creeks and cause them to overflow onto their flood plains. This is a normal occurrence, which should be anticipated and expected.
184. The Requesters attribute both an increase in flood frequency and depth to the inundation of the Yacyretá reservoir in 1994. No rationale is provided for this assertion other than that the water table in the vicinity of the reservoir will have been raised by its presence. This is likely to be true in wetlands and unconsolidated sediments in close proximity to the reservoir. It is not likely to be true for the basaltic rocks on which most of Encarnación is situated.
185. Bank Management dispute a causal relationship between flooding of the urban creeks and the Yacyretá reservoir.²⁴⁷ Instead they attribute urban flooding to garbage clogging the urban creeks thus reducing their efficacy in discharging intense rainfall.²⁴⁸ They attribute the increased frequency of floods to increased El Niño events, and the increased social cost, to the poorly controlled influx of persons to the urban floodplains.²⁴⁹
186. Direct observation of the urban creek flooding which occurred on 22 January 2003 and inundated houses on the flood plain of the Arroyo Potí'y and the M'boi Caé indicated rapidly flowing water in the creeks and their floodplains. The marked red colored sediment load in the creek waters contrasts with the gray-green color of the water in the Yacyretá reservoir. This strongly suggests that the urban creek flooding is not being caused by floodwater in the creeks being backed-up from the Yacyretá reservoir. A technical analysis of the extent to which the Yacyretá reservoir effects flow in the urban creeks at Encarnación is given in Annex A.

²⁴⁷ Management Response, ¶ 48.

²⁴⁸ Ibid., ¶ 49.

²⁴⁹ Ibid.

187. From the analysis in Annex A it can be concluded that at a water level of 76 masl the reservoir has no effect on the floods in the M'boi Caé. With the reservoir at 78 masl the effect will be minimal ($\approx 1\text{cm}$) and confined to the section in the neighborhood of the juncture of the M'boi Caé with the Paraná River.
188. For the Potí'y Creek at Villa Candida the increased flooding is not due to the Yacyretá reservoir, as at a reservoir range of 76 to 78 masl the reservoir has no backwater influence on the water levels in the Potí'y Creek.
189. The hydrological assessments show clearly that flood impacts in the urban creeks in the city of Encarnación are not caused by the reservoir or its operations. Neither Paraná River floods nor backwater in the M'boi Caé is sufficient to cause the levels of flooding experienced in the urban creeks. **Thus although it is clear that the urban creeks of Encarnación are flooding and causing severe hardship, the Panel finds that the Requesters contention that this flooding is a consequence of the Yacyretá reservoir cannot be sustained. The hydrological assessments show that neither the Paraná River floods nor backwater in the M'boi Caé is sufficient to cause the levels of flooding experienced in the urban creeks.**
190. **The urban creek flood conditions are mainly due to local conditions, such as upstream urbanization, lack of urban storm water drainage, and waste accumulation impeding water flow in the creeks, in that order of importance. The contribution of specific resettlement areas to flood peak downstream is estimated as low. But the sum of all urbanization done upstream during the last years has increased the frequency and the peak level of the floods.**²⁵⁰ Failure to anticipate the flooding due to increased urbanization is another aspect of the deficiencies in the EA discussed in section 4.5 of this Report.



Figure 5 Villa Candida, Encarnación, on sunny and rainy days.

²⁵⁰ It has been established in other cities and other studies that urbanization increases impervious surfaces such as streets, roofs, walk ways etc. This in turn may increase the mean annual peak flood by as much as six times over that which occurs in former rural conditions. See Luna Bergere Leopold, *Hydrology for Urban Land Planning: A Guide Book on the Hydrologic Effects of Urban Land Use*, U.S. Geological Survey Circular 554, (Washington: U.S. Geological Survey, 1968).

6. WATER QUALITY AND HEALTH STANDARDS

191. The Requesters claim that the reservoir has caused contamination of ground water and severe health problems. This potentially violates a number of requirements in OD 4.01 regarding environmental assessment.

6.1. Environmental Pollution and Water Quality

192. Environmental studies undertaken in 1992²⁵¹ indicated that the water quality of the urban creeks, especially in Encarnación, was poor. The Panel observed that the problem still exists. The Panel observed discharge of untreated domestic sewage into the creeks, as well as water contamination by domestic and commercial wastes.
193. The Requesters believe that the construction of the dam caused environmental pollution and *‘forced numerous families to live in a totally contaminated and unhealthful environment.’*²⁵²
194. They contend that the Yacyretá reservoir has caused pollution of their drinking water wells and flooded their pit latrines. For this to be factually correct the ground water table in Encarnación must have been raised by the Yacyretá reservoir, and this will only occur if the reservoir has raised the level of the Paraná river and the creeks flowing into it. It was shown above that this has not occurred. **The Panel finds that the alleged causal relationship between the level of the Yacyretá reservoir and pollution of wells and flooding of latrines is thus not correct.**²⁵³ **The Panel confirms, however, the Requesters’ statements that flooding of the urban creeks renders drinking water wells on the flood plain unsuitable for use. This is a matter of simple observation and is uncontestable.** The Panel observed first-hand that the open roadside drains passing through the poor neighborhoods of Encarnación were carrying sewage and domestic waste directly to the creeks, which had recently overflowed into, wells and latrines.
195. With respect to the Requesters’ claim that the Yacyretá reservoir has caused environmental pollution Management responds that the dam has neither caused nor increased environmental pollution in the area of Encarnación-Posadas.²⁵⁴ Management states that the water quality monitoring programs demonstrate that there are no significant water quality issues in the reservoir, and that monitoring shows that, after filling the reservoir to 76 masl there have been no significant changes in key physical and chemical parameters in the main water body of the

²⁵¹ 1992 EIA Yacyretá Project, January 1992.

²⁵² Request, 2.

²⁵³ See supra ¶ 158.

²⁵⁴ Management Response, ¶ 78.

reservoir at Encarnación or Posadas.²⁵⁵ Management further claims that the reservoir's water quality is oligotrophic, very low in nutrient and organic materials, mainly because of the reservoir's low hydraulic retention time (less than five days).²⁵⁶

196. The meaning of the term “*environmental pollution*” may be subject to interpretation. In the context in which it is used it is taken to apply to water quality. **The Panel observed that reservoir water quality monitoring has been an ongoing activity contracted out by EBY and checked by Bank staff since before the filling of the Yacyretá reservoir. The Panel verified the existence of the monitoring data and reasonableness of Management's claim that “the reservoir's water quality is constantly monitored, falls within satisfactory parameters...”**²⁵⁷ This was done by studying the relevant reports on file in Washington D.C. as well as in the EBY database in Encarnación.²⁵⁸ **The Panel finds that Bank Management has ensured that proper monitoring of water quality has been conducted in the reservoir.**

6.2. Health Problems

197. The Request alleges that the “*reservoir has caused severe health problems,*” because “*the lake filled with stagnant, polluted water with sewage waste, is an ideal habitat for microorganisms [sic] that are vectors of serious disease such as malaria...*” The Requesters state that “*since the reservoir was filled, people living in the area of influence have complained of a high incidence of fever.*”
198. In the Requesters' view, the alleged adverse health impacts the reservoir caused on the population living in the project area were not adequately monitored. They claim that “*there were no programs for monitoring and controlling disease causing microorganism, and if this remains unresolved it could lead to an alarming and catastrophic health situation.*”
199. Management asserts that, since 1997, the reservoir has not caused health problems and that there is no evidence that the situation has changed. Management attributes water-related diseases and diarrhea to the pre-existing condition of lack of potable water supply and sanitation services. In addition, none of the diseases mentioned in the claim have increased on a per capita basis within the project area since the reservoir filling. Management also notes that the urban families resettled by the Yacyretá Project have access to potable water and adequate sanitation, which substantially reduces water-borne diseases.²⁵⁹

²⁵⁵ Ibid.

²⁵⁶ Ibid., ¶ 79.

²⁵⁷ Ibid., ¶ 4.

²⁵⁸ Monitoreo Ambiental Calidad de Agua, EBY, 27/11/95.

²⁵⁹ Management Response, ¶ 107–108.

200. Management also recognizes that disease vectors are endemic to the Paraná River basin, adding that these vector species were present in the Yacyretá Project area long before dam construction began. Furthermore, Management claims that the Yacyretá Project has provided assistance to the Ministry of Public Health and Social Welfare in Paraguay to improve its capacity for disease vector monitoring, while the EMP proposes sanitation programs for the urban centers, as well as intensive monitoring programs of vector and health conditions in the area. According to Management the systematic vector monitoring is carried out by the Ministry of Public Health and Social Welfare on a regular basis.²⁶⁰
201. Management claims that, since 1992, EBY has provided funds to SENEPA in the Ministry of Public Health and Social Welfare of Paraguay to carry out systematic and continuous monitoring of insect vectors of diseases and the outbreaks of certain diseases. Management also states that the EMP supports the recurrent costs of monitoring public health (vectors and diseases), water quality, aquatic vegetation, and fish populations and migrations, along with the conservation of protected areas, fisheries, and endangered species.²⁶¹
202. **The Panel confirmed that the Ministry of Health and Social Welfare of Paraguay adequately monitors the incidence of both disease and disease vectors.** The Ministry of Health Documents reporting on health related matters are available to interested parties from the public information office of EBY. Under the EMP, EBY is required to meet the costs of public health monitoring in the area affected by the Yacyretá Project.²⁶²
203. Management refers to the disease monitoring program being undertaken by the Ministry of Health and Social Welfare of Paraguay. The bimonthly reports provided by this Ministry²⁶³ indicate no per capita increase in the diseases that have been monitored since filling of the reservoir. **The Panel verified the existence of the monitoring program, reviewed its findings, and found no evidence contradicting the findings.**²⁶⁴
204. A frequent complaint to the Panel during site visits was that women suffer constantly from itchy skin, particularly on their hands and arms. This is attributed to the use of polluted water for washing clothes. The Panel notes that the Yacyretá reservoir is not the cause of the polluted water used by the complainants for washing clothes. **There are potentially many different reasons why such skin irritations might occur.**
205. The Panel notes that it is not disputed that disease vectors are present in the Paraná river system. Disagreement focuses on whether there has been an increase

²⁶⁰ Ibid., ¶ 104–106.

²⁶¹ Management Response, ¶ 109–110.

²⁶² EMP, 13-17.

²⁶³ EMP, 14.

²⁶⁴ Informe Bimestral No. 29, July-August 2002, § 2.5.

in their abundance since the Yacyretá reservoir was created. Management refers to the vector monitoring program being undertaken by the Ministry of Health and Social Welfare of Paraguay. This long-term ongoing study shows no increase in abundance or species composition of disease vectors. **The Panel verified the existence and findings of this study and found no evidence to the contrary.**

7. WASTEWATER TREATMENT PLANT

206. The conditions for sewage discharge in Encarnación have been poor for many years, with numerous discharges of wastewater directly into creeks and other water bodies. Accordingly, and to avoid contamination of the lateral embayment that will be formed with the reservoir at 83 masl, the Bank has required that a sewage treatment system be provided for Encarnación so as to avoid more such pollution. In doing this, the first step required under Bank policy is that a proper environmental assessment be done for the construction of a new wastewater treatment plant.²⁶⁵

7.1. Environmental Assessment for Plant Location

207. The Request emphasizes that the claimants are opposed to the location selected for the planned wastewater treatment plant. The Requesters claim that the site “*will not allow for future expansion*”, thus precluding “*appropriate sanitation networks*” for future generations. The Request also complains that the decisions related to the treatment plant were taken in violation of environmental laws of Paraguay and were based on a defective environmental assessment, as no consultations with affected people and NGOs have taken place during the preparation of the plant’s environmental assessment.
208. Management acknowledges that a number of residents of Encarnación are opposed to the site selected for the wastewater treatment plant. However, Management supported its construction because the plant will bring long-term health benefits to the local community as it will be connected to the projected sewer network.²⁶⁶
209. Management states that the Bank reviewed the Environmental Impact Assessment for the plant and that the EA included analysis of alternative sites and treatment options. It also claims that “*meaningful public consultation was carried out regarding the site and design for the wastewater treatment plant early on in the process.*”²⁶⁷ According to the Response, the Secretary of Environment of Paraguay (SEAM), which issued the relevant environmental license, also reviewed and approved the environmental impact study. In addition, international

²⁶⁵ The term “sewerage” can also be used to refer to the removal of wastewater and refuse by means of sewers, or a system of sewers.

²⁶⁶ Management Response, ¶ 100.

²⁶⁷ Ibid., ¶ 101.

consultants that the Bank contracted “concluded that the proposed site is adequate and that the plant [would] not pose any risks to the surrounding communities and environment.”²⁶⁸

210. The Panel reviewed the environmental assessment documentation; it studied the independent consultant’s report,²⁶⁹ visited the site²⁷⁰ and examined a map showing the alternative sites. The Panel also questioned both Bank²⁷¹ and EBY²⁷² staff that had been involved in decisions pertaining to the siting of the sewage treatment plant. Affected parties also raised the matter during consultations with the Panel while it was in Encarnación.
211. The Panel understands the concerns of the residents of La Esperanza, the peri-urban neighborhood that is closest to the site for the sewage treatment plant. The Panel notes that the design and layout of the plant makes provision for it to be screened and separated from the cultural monument erected to record the site on which the Pope celebrated Mass. Provision has been made for the site to be elevated above extreme flood levels in the Paraná River and for the outfall to the river to be well away from the shoreline. No reasonable threats from the plant to the health or safety of the residents of La Esperanza or any other neighborhood, or to the children’s hospital or to the technical university could be substantiated. **The Panel finds that the site selected for the sewage treatment plant is not inappropriate for the purpose and that the associated environmental assessment is not defective either procedurally or substantively.** The Panel notes, however, that although the selection of the plant’s location complied with Bank policies and procedures, nearby residents may continue to be concerned lest a bad odor emanate from the treatment plant and pumping stations, which would affect the quality of life of the people living in the neighborhood and the value of their properties.

7.2. Plant Design

212. The environmental pollution the Requesters complain about worsened, in their view, when EBY built the housing developments of Buena Vista and San Pedro, because the houses’ wastewaters allegedly spill into the urban creeks and contaminate them. The Request claims also that this situation will not be solved because, FEDAYIM holds, “*the planned Wastewater Treatment Plant will not benefit these neighborhoods build by EBY nor others affected by the rise of the water table.*”

²⁶⁸ Ibid., ¶ 100-101.

²⁶⁹ Gustavo Gonzales Londoño, Visita a Encarnación-Paraguay (Asunto: Sistema de Alcantarillado y Tratamiento de Aguas Residuales de Encarnación-Paraguay) (June 19, 1997).

²⁷⁰ Field visit, Encarnación, January 2003.

²⁷¹ Staff Interviews, Washington, DC, December 2002.

²⁷² Interviews, Encarnación, January 2003.

213. Management acknowledges the poor conditions of sewage discharges' in Encarnación and the numerous discharges of wastewater to creeks and other water bodies. However, Management adds that to overcome the sanitation problems, *"CORPOSANA²⁷³ and the Municipality of Encarnación designed and will undertake construction of the sewerage system and wastewater treatment plant. The sewerage systems are intended to cover 100 percent of all urban areas in Encarnación, including housing developments not built by EBY. The system designed includes waste discharges from Buena Vista and San Pedro areas, which are being discharged into creeks until the sewerage system is completed."* (emphasis added).²⁷⁴ Management adds that the IDB loan no. 760, which is also financing the Project, *"will finance the wastewater treatment plant, interceptors, pumping station and sewerage network. The construction of the sewerage system will facilitate a full recovery of urban creeks (particularly when coupled with appropriate waste disposal) and is a condition for increasing water levels in the reservoir."*²⁷⁵
214. The Panel notes that the conditions listed in the Project Agreement (Loan 3520-AR) as *"[a]ctivities to be Completed to Raise the Reservoir Level Above El 76m to EL 78m (Party responsible for this [sic] activities: EBY)"*²⁷⁶ include the following: *"(a) sewage collection and treatment systems completed in Posadas and Encarnación, including construction of: (i) primary sewage collectors and interceptors; and (ii) sewage treatment plants of other adequate facility."*²⁷⁷
215. **Confusion may have arisen over the coverage of the wastewater treatment plant because the detailed drawings of the planned sewerage reticulation system for Encarnación were not available in the EBY public information office.** On request the Panel was provided with the detailed drawings for the sewerage system. **The Panel found that it is planned that the resettlement areas in question will be linked to the reticulated sewerage system.**
216. **The Panel finds that the design and environmental assessment of the sewage and wastewater treatment plant is in compliance with OD 4.01. The Panel notes with great concern, however, that although according to Management the sewerage system has been designed to cover the city of Encarnación, the works described in the current bidding documents for the construction of the system seem to cover only the southern part of Encarnación (zona sur).**²⁷⁸

7.3. Sewerage Connection to Houses

²⁷³ (Corporación de Obras Sanitarias – government of Paraguay-owned Water and Sewerage Company)

²⁷⁴ Management Response, ¶ 96–97.

²⁷⁵ Ibid., ¶ 99.

²⁷⁶ 1997 Amendments, Schedule 2 to the Project Agreement to the Project Agreement, Part C.

²⁷⁷ Ibid., ¶ 4(a)(Water Quality)

²⁷⁸ Plan Estratégico Yacyretá 2002, Licitación Pública Internacional No. 265, April 24, 2003.

217. Although the sewer system to serve Encarnación is under construction and construction of the wastewater treatment plant is due to commence in early 2004, the Panel could not elicit a definite answer as to who will be responsible for connecting domestic users to the new sewer network. EBY staff informed the Panel that the residents of Encarnación will themselves be responsible for connecting their houses to the system.²⁷⁹ This provision is likely to negate the purpose of the sewerage reticulation scheme as few of the residents of the poorer neighborhoods will have the capital, or disposable income, to pay for their connection to the network. They are thus likely to continue to discharge sewage to open drains or to septic tanks. Bank staff are also of this opinion. One Bank staff member noted that if the connection of houses to sewers must be paid for by the owners, it will never happen.²⁸⁰
218. Based on interviews with affected people, EBY, and Bank staff, **the Panel finds that responsibility for the cost of connection to the sewer system may become a significant source of conflict in the not too distant future.** If the matter is not resolved in a way that will enable the vast majority of households to be connected to the sewer lines, the entire exercise of providing a sewer network will be largely negated. **The Panel finds that this issue needs the urgent attention of Bank Management and that an effective means of financing the connection of houses to the sewer, plant and network is required, especially for poor communities.**

7.4. Transfer and Supervision of Sewerage Reticulation and Treatment System

219. As noted above the sewer system for Encarnación is under construction, and work on the sewerage treatment plant will start during the first months of 2004. The Panel was told by EBY²⁸¹ that they will finance and supervise construction of the new sewage collection and treatment plant but that the operation and maintenance of the system is to be transferred to either CORPOSANA or the Encarnación local authorities.
220. Officials of one Encarnación local authority expressed the concern²⁸² that although CORPOSANA had the necessary technical expertise to run the sewage treatment system, this body was based in Asunción, Paraguay, hundreds of kilometers away and that it is impractical for the day-to-day operation of the Encarnación sewage plant to be run from another city. They also told the Panel that although it would be desirable for them to assume responsibility for the sewage treatment system as they were locally based they did not have the necessary expertise, budget or staff to do so. In their view these matters need to be addressed in order for them to assume this responsibility effectively.

²⁷⁹ Interviews, Encarnación, January 2003.

²⁸⁰ Staff Interviews, Washington DC, 2003.

²⁸¹ Interviews, Encarnación, January 2003.

²⁸² Ibid.

221. **The Panel finds that Management must give urgent attention to the practicalities of transferring operation and maintenance of the sewage treatment system away from EBY and to ensuring that the new operators are provided with adequate staff, budget and training to be able to run the sewage system efficiently and effectively. This is especially urgent because the sewage system includes a bypass at each pumping station that will dump raw sewage into neighboring urban creeks in cases of pump malfunction or overflow.**

Chapter Three

Social Compliance

TABLE OF CONTENTS

Chapter Three.....	71
Social Compliance	71
Table of Contents.....	72
8. Identification of Affected People	73
8.1. Identification of Affected People	73
8.1.1. Census Procedures	74
8.1.1.1. First Census of the Affected Population: 1979-1980.....	74
8.1.1.2. The 1990 Census and Later Verifications.....	75
8.1.2. Adequacy of Census Procedures.....	76
8.2. Criteria for Inclusion in Specific Classes of Affected Persons	78
8.3. Grievance Procedures	79
8.4. Other Categories of Affected People	80
9. Resettlement and Compensation.....	81
9.1. Compensation.....	82
9.1.1. Procedure for Valuation of Homes and of Property	83
9.1.2. Compensation for Usufruct or Customary Rights to Land and Loss of Access to Resources and Public Services	84
9.1.3. Compensation Prior to Displacement.	84
9.1.4. Sequencing of Places Selected for Compensation.....	86
9.2. Resettlement.....	87
9.2.1. Alternative Sites	87
9.2.2. Restoration of Income Earning Capacity.....	88
10. Resettlement and Compensation of Specific Groups: Brick-makers and Tile-makers (Ceramists).....	90
10.1. Small-scale Brick-makers	92
10.2. Medium- and Large-Size Industries.....	95
10.3. Compensation to Workers of Brick- and Tile-making Industries.....	96
10.3.1. Rules and Procedures.....	96
10.3.2. Compensation Programs	99
10.3.3. Access to Clay Deposits.....	104
11. Adequacy of the Resettlement Plan.....	105
11.1. Influx of People into the Project Area	105
11.2. Delays and Uncertainties	107
12. Programa Desborde de Arroyos (PDA) - the Urban Creeks Program.....	109

8. IDENTIFICATION OF AFFECTED PEOPLE

8.1. Identification of Affected People

222. The Request claims that thousands of eligible families have been excluded from the compensation and mitigation programs provided under the Project's resettlement programs. According to the Request, many families have received no compensation despite owning or occupying lands in the project area for more than twenty years. In the Requesters view, this has resulted from a failure correctly to identify the people that would be affected by Yacyretá.
223. Many families the Panel met during its visits to the Yacyretá Project area claimed that they were simply missed in the 1990 census (the means for identifying affected people) though, they said, they were present at the time of the census. They asserted that, as a result, they had not received compensation. They are worried that they will never receive compensation as involuntarily displaced persons.
224. Management states that the Requester's claim that not all the affected people have been properly identified *"is not supported by available evidence."*²⁸³ In fact, according to the Response, *"[f]amilies affected by the raising of the level and/or operation at 76 masl have been properly identified and compensated, even though some families remain dissatisfied with the solutions provided."*²⁸⁴
225. Management Response states that in 1980 EBY conducted the first census of the people to be resettled and/or compensated, and in 1990 it organized a second census that took into consideration demographic changes that had occurred in the preceding ten years.²⁸⁵ According to Management, *"[a]ll families included in the updated census of 1990 who were living in areas below 78 masl have been compensated and/or relocated"*²⁸⁶ via the pre-1992 resettlement plan, the RRAPP adopted in 1992, and Plans A and B.²⁸⁷ In addition, the Third Owners' Agreement²⁸⁸ established that the government of Paraguay would be responsible, using its own funds, for the resettlement of the families not included in the 1990 census.²⁸⁹ Finally, Management reports that, because of the time since the latest census, the data about the affected people are being updated, especially in relation to the people living between 78 and 83 masl. EBY estimates that the completion of the project would require resettling 5,454 people in Argentina and 6,380 in Paraguay, where 360 commercial properties containing 700 businesses would also need to be relocated (see Map 3).²⁹⁰

²⁸³ Management Response, ¶ 37.

²⁸⁴ Ibid.

²⁸⁵ Ibid.

²⁸⁶ Ibid., ¶ 38.

²⁸⁷ Ibid.

²⁸⁸ See supra, § 2.2.2.

²⁸⁹ Management Response, ¶ 39.

²⁹⁰ Ibid., ¶ 42.

226. The relevant operational policy under which claims related to censuses and surveys should be addressed is OD 4.30 on Involuntary Resettlement. The objective of this OD is primarily to “*ensure that the population displaced by a project receives benefits from it.*”²⁹¹ The policy objectives for achieving this are to avoid resettlement where feasible²⁹² and, in cases where resettlement is unavoidable, to develop adequate resettlement plans that are conceived and executed as development programs.²⁹³ In order to do so, OD 4.30 requires that resettlement plans be “*based on recent information about the scale and impact of resettlement on the displaced population*” and emphasizes that “[s]ocioeconomic surveys, recording the names of affected families, should be conducted as early as possible to prevent inflows of population ineligible for compensation.”²⁹⁴ Accordingly, socioeconomic surveys should include, *inter alia*, standard household characteristics, the magnitude of the displacement, and information on the full resource base of the affected population.

8.1.1. Census Procedures

227. In order to consider the Requesters’ claims, it is essential to evaluate the procedures used in conducting the censuses over the last twenty-five years.

8.1.1.1. First Census of the Affected Population: 1979-1980

228. “*In 1980 EBY conducted the first census of all families that needed to be resettled and/or compensated as a result of raising the level of the reservoir up to 83 masl.*”²⁹⁵ Following preliminary studies from 1973 to 1979, EBY undertook the first household census of affected areas population in Argentina in 1979 and in Paraguay in 1980. This was the first of a series of censuses and surveys of the affected population. The 1979 to 1980 household census identified 7,700 beneficiaries, of whom 6,000 were urban (4,100 in Argentina and 1,900 in Paraguay) and 1,700 were rural (300 in Argentina and 1,400 in Paraguay).²⁹⁶
229. At the time of the 1980 census, EBY acknowledged the population identified in the 1979 Argentine census and the 1980 Paraguayan census as “beneficiaries” of the Project. During interviews with Bank staff, one expert emphasized that the expectation conveyed to the people that those who were included in the 1980 census would benefit from the project was a major “technical error” on the part of EBY, adding that it would have been much better for EBY to have said that the census was intended merely to gather data because of the possibility that the region might be affected by the hydroelectric project.²⁹⁷

²⁹¹ OD 4.30, ¶ 3.

²⁹² *Ibid.*, ¶ 3(a).

²⁹³ *Ibid.*, ¶ 3(b).

²⁹⁴ *Ibid.*, ¶ 11.

²⁹⁵ Management Response, ¶ 37.

²⁹⁶ Interviews, Encarnación, January 2003.

²⁹⁷ Staff Interviews, Washington, DC, 2003.

230. Bank and EBY officials agree that by identifying all persons residing in the area as “beneficiaries” eligible to receive favorable compensation from the hydroelectric project, they encouraged the population residing in the affected area to increase dramatically as the hydroelectric works were constructed. Without the Yacyretá Project, many people would have probably moved to the project area as part of a normal movement of population and then on to an urban environment or better land at a higher elevation. However, when people became identified as beneficiaries, there was much less incentive for people who would “normally” have moved out to do so. Similarly, the new incentives introduced by the resettlement plans encouraged changes in the developmental cycles of local households. Children who had moved away returned to take up residence so as to become eligible for compensation and a new house (even though they may have been away at the time of the census). When marriages occurred with persons from outside this area, the spouse who was ineligible for compensation moved into the area to stay with or near the spouse’s parents to await compensation, rather than move the family to the other spouse’s home or region.
231. As years passed and resettlement was postponed, children growing up in these households were less likely to follow what would have been a normal pattern of movement to work, marry, and live in other places, because they feared losing their eligibility for compensation.

8.1.1.2. The 1990 Census and Later Verifications

232. The growth and changes in the population of the area after 1980 led to a new census in 1989 to 1990. This census “*established the baseline of those requiring eventual resettlement as a result of the Yacyretá Project.*”²⁹⁸ Management states that “*in compliance with OD 4.30 EBY’s resettlement and/or compensation obligations established in the RRAP and in Plans A and B are limited to the 1990 census families.*”²⁹⁹ However, despite the Bank’s efforts to encourage the government of Paraguay to restrict immigration into the area, there has been a substantial increase since 1990 in the population of the areas to be flooded. This is due to normal social mobility and family changes, as well as to the movement of poor people into the floodplain specifically to become eligible for compensation. Since 1990, EBY has continued surveying and mapping efforts to document the size of households and to map the property improvements, including most recently a “*verification*” survey of 2000, to determine anew the numbers of people to be compensated and the values of property needing to be expropriated.

²⁹⁸ Management Response, ¶ 2.

²⁹⁹ Ibid., ¶ 43.

8.1.2. Adequacy of Census Procedures

233. During the Panel's visits, people provided 1980 census documents indicating their presence in the project area at that time and in some cases also documents showing their presence after 1990. These people claim to have been present at the time of the 1990 census but to have been missed by census-takers. They state that they have been unable to be included retroactively in the 1990 census. While it was impossible for the Panel to determine exactly why all of the people were not included in the 1980 or 1990 census, the Panel reviewed documents showing, for example, that individual children were left out of a household's census even though the child's baptismal certificate showed that he/she was part of the household at the time of the 1990 census.
234. The Panel brought the examples of persons excluded from the census to the attention of EBY during its January 2003 visit to the project area. EBY acknowledged that, as with censuses in any country, no census is perfect, but stated that there is a procedure for someone missed in the census to be effectively put back in, for example by bringing evidence that the person was in a hospital or jail, etc. In December 2003, EBY staff further clarified that EBY recognized that it had erroneously omitted approximately ten to twelve households from the 1990 census. While they could not be retroactively included in the 1990 census, EBY assured the Panel that those households will be treated as if they had been included.
235. These statements, however, contrasted sharply with the statements by many affected villagers who complained that they had repeatedly tried to be included on the census lists but were turned away. In one case, a cattle farmer was reportedly told that the consultants hired to do the census had left so it was too late to be included. In other cases, villagers told the Panel that they had repeatedly visited EBY offices trying to get included but had been told that the census was already completed.
236. **The Panel finds persuasive evidence that a number of people who were present at the time of the 1990 census were erroneously omitted and that they fear they will be ineligible for the Project's compensation and resettlement benefits.** This finding is based upon statements both by those who claim they were excluded and their neighbors and (in some cases) on documentary and other evidence of their presence in the affected area before and after 1990. The Panel interviewed a significant number of people residing in the area who showed documentary evidence of inclusion in the 1980 census but who were not included in the 1990 census in spite of their continuous presence in the area, which was independently verified by the Panel.
237. In accordance with the Third Owners' Agreement, however, all people who were not recorded in the 1990 census but appear in the later eligibility surveys will

receive compensation.³⁰⁰ The difference is that the costs of compensation or resettlement for these “extra-censales” (persons who were not in the 1990 census but appear in later surveys) will be borne by the governments of Paraguay (on the Paraguayan side of the river) and by Argentina (on the other side), rather than by EBY. People missed by the 1990 census will thus not be denied compensation. This point was also made by EBY officials when the Panel provided them with examples of people whose documents indicated they were almost certainly present in 1990 and that the 1990 census passed them by. The point can be taken to justify why EBY does not expend great resources trying to retroactively tinker with the 1990 census—the compensation will be the same, except that EBY funds would not be used for the “extra-censales.”

238. There are several reasons, however, why affected persons are concerned by their non-inclusion in the 1990 census. One is the local perception, as stated to the Panel, that if payment is the responsibility of the government of Paraguay (rather than EBY under Bank auspices), they may not receive compensation because of the country’s limited budgetary resources. Another is the concern that they would have less recourse to appeal. The Panel requested information from EBY offices in Encarnación about the means by which the government of Paraguay would pay for relocation of all the extra-censales, and was provided a copy of a ministerial letter that confirmed an agreement by which EBY would pay for the relocation costs of the extra-censales population at the time they are moved.³⁰¹ These costs would then be reimbursed to EBY by the government of Paraguay via deductions from the portion of the electricity sale royalties that would eventually accrue to the government of Paraguay.³⁰²
239. Since there are very different perceptions as to whether people have been erroneously omitted from the 1990 census, and since this affects the source of funds available for compensation, the Panel finds that the Bank needs to insist that EBY clearly publicize the criteria and the procedures for correcting census information and develop a standard set of forms of evidence. Because EBY’s own officials insist that there is a procedure that has been followed, **the Panel finds that there would be much to gain from clarifying the procedure that is to be used and developing a standard application form that would allow claimants to provide documents or testimonial evidence and to request a correction to information contained in census documents.**
240. The Panel is also concerned about whether the topographical contours used to identify the affected areas at different levels of reservoir operation are in all cases correct. The Panel visited the area of Resquin Cué, in the vicinity of the town of Coronel Bogado, and interviewed the residents. They showed the Panel their red folders indicating that they were included in the 1980 census as affected people

³⁰⁰ 1997 Amendments, ¶ 47.

³⁰¹ Ministerio de Hacienda, Republica del Paraguay, Letter to Joaquin Rodriguez, Director, Entidad Binacional Yacyretá, Asunción, February 26, 1999.

³⁰² Ibid.

living between 78 and 83 masl level, but their lands, as shown to the Panel, were already partially flooded at the time of the Panel's visits in May and December 2003. If they were identified as living below 78 masl, they would have been eligible for resettlement and compensation before those living above 78 masl. This situation raises the issue of whether the topographical contours of the affected area in relation to the several levels of flooding were correctly drawn.

241. The Panel brought this issue to EBY's attention during the December 2003 visit. EBY officers agreed to look into the problem and also told the Panel that, should the claims have merit, they would include the affected people from Resquin Cué in existing compensation programs, such as the PDA.³⁰³ Recently, the EBY informed the Panel that it is carrying out a cadastral survey of the area.
242. **The Panel finds that before the water level is raised further, the Bank must ensure that the existing census and survey data will be updated and verified in a manner consistent with the requirements of OD 4.30. The survey needs to pay special attention to the accuracy of existing geographical and topographic boundaries of the affected areas to allow proper identification of the affected people.** The Panel notes that the Requesters have proposed that a new, corrective "*general and participatory census*" be undertaken. The Panel also notes that the Aide Memoire signed by the members of the Bank supervision mission of October 2003 also recommends updating the RRAP (Resettlement and Rehabilitation Action Plan), including updating the census of the population to be displaced by the project.³⁰⁴

8.2. Criteria for Inclusion in Specific Classes of Affected Persons

243. A person's eligibility for certain kinds of compensation for lost productive income is partly determined by the person's "primary occupation" specifically listed in the 1990 census. This is the case for brick-makers and fishermen. The Requesters claim that the definition of who constitutes a brick-maker or fisherman for purposes of compensation does not necessarily reflect the fact that many people not so listed lost significant income from their brick-making and fishing activities. As a result, that lost income has not been compensated due to the criteria used to define these classes of affected persons.
244. For example, although for many people fishing was not their principal occupation, as defined in the respective compensation instrument,³⁰⁵ they can nevertheless

³⁰³ EBY officers told the Panel that at least one case similar to the ones that allegedly occurred in Resquin Cué has been identified in the area of Caraguatá, Paraguay. EBY officers also stated that the affected person whose property was inundated has already been properly compensated.

³⁰⁴ See *infra* §12.4.

³⁰⁵ Entidad Binacional Yacyretá, Reun. Ord. No. 136, Resolution No. 930/99, Procedimiento para el "*Programa de Apoyo a la Actividad Desarrollada por los Pescadores del Embalse de Yacyretá en la Margen Derecha*." The Resolution states that fisherman is considered "*any person for whom the fishing activity in the area of the Yacyretá Reservoir is the principal source of income and family sustenance*." In order to have the right to be considered fishermen, in order to be a part of the program of support, one

prove that they have lost substantial income or income-equivalent due to a loss of access to fishing resources.

245. **The Panel finds that the restoration of income-earning capacity under OD 4.30 may not be achieved when compensation for income losses is based solely on the “principal occupation” of the affected persons. The Panel notes that a person could have other occupations that contribute substantially to their overall personal income. The Panel is aware, however, of the practical problems of restoring income for more than one principal occupation.**
246. **The Panel finds that the sole reliance on an individual’s principal occupation as a basis for income restoration does not satisfy the OD 4.30’s requirement for many affected people.**

8.3. Grievance Procedures

247. OD 4.30 acknowledges that *“Disputes of varying kinds may arise in the process of implementation of the agreed resettlement plan. These conflicts could take the form of appeals related to the compensation payable to affected persons, conflicts between the displaced persons and the host population, appeals to the agency charged with the implementation of the resettlement with regard to services promised, etc.”*³⁰⁶ OD 4.30 provides that *“It is therefore important to devise schemes for conflict resolution for all resettlement plans. Such schemes should, as far as possible, take into account existing procedures for settling disputes in the country or area concerned.”*³⁰⁷
248. Affected people would normally resolve a number of their concerns through an appropriate conflict resolution mechanism provided as part of a resettlement plan consistent with the provision of OD 4.30. As discussed above, a number of people feel that they have been left out of the censuses that were carried out by EBY to identify people affected by the project and to determine the benefits or compensation that they should receive under the project. Although the Panel was informed that there were some procedures to rectify any omissions and entries in the 1990 census, **the Panel finds that at best these procedures were *ad hoc* arrangements that allowed some corrections to the census. Most people who felt excluded did not have a clear and objective method to bring their concerns to EBY.**
249. **The Panel further finds that the procedures for correcting the census and other resettlement related omissions and errors are inadequate and notes**

must fulfill any of the following conditions: to be registered by the 1990 census as a fisherman and not have been compensated for any other productive activity or to have the fisherman’s card from the navy or the agricultural ministry (dated) until July 1998.”

³⁰⁶ OD 4.30, ¶ 8, Fn 11.

³⁰⁷ Ibid.

that a standard and transparent appeals procedure is not available to affected people. This does not comply with OD 4.30.³⁰⁸

8.4. Other Categories of Affected People

250. The Yacyretá Project has also affected people already living in areas near the resettlement sites. During the January 2003 field visit, the Panel met with affected “*host populations*” at resettlement sites. These included a group of people who were at that time organizing themselves to seek recognition as “affected persons” harmed by the Project. In their view, the poor drainage at the new resettlement site of Arroyo Porá caused flooding of their properties.
251. OD 4.30 requires that host communities should be informed and consulted and states that “*conditions and services in host communities should improve, or at least not deteriorate.*”³⁰⁹
252. As already noted in the chapter related to the environmental assessment, the Panel observed that, because of extremely poor drainage installed at Arroyo Porá, the nearby area (a neighborhood called “Barrio América”) suffered frequent flooding from rain water runoff from the new construction resettlement site. Effectively, the inhabitants of this neighborhood, who live well above the 84 masl level but just below the new resettlement site, have become a new population of adversely affected people, at least until the drainage and flooding problems are corrected.
253. The Panel observed a similar situation in December 2003 when it visited the Arroyo Porá II site at an early stage of construction. The site lies close to, though at a slightly higher elevation than, a neighborhood called Barrio Tacuary. The site had already been initially prepared by earth movements that filled a wetland area near the source of the creek that provides water to this Barrio. A sewage pumping station was being constructed that included a bypass canal, which, according to local residents, had been designed to dump raw sewage into the creek in case of system overflow. The residents of that Barrio stated that for the prior six months there had been considerable siltation and pollution of the local wells and the creek that arise from the spring. They considered this to be due to the large amount of exposed soil. EBY officials later admitted to the Panel that construction had begun on this new resettlement site neighborhood before the required approvals from the Ministry of the Environment had been obtained, though papers required for approvals had been submitted.
254. It appears that Bank staff had not checked whether site selection and construction was consistent with Bank’s policies and local environmental requirements. EBY staff expressed the opinion that the siltation was probably a temporary effect of the construction. In any event, construction already has had a severe negative

³⁰⁸ OD 4.30, ¶ 8 note 11 and ¶ 17.

³⁰⁹ Ibid., ¶ 9.

impact on the affected host population for about six months, and no Bank action seems to have been taken.

255. The school at San Cosme y Damian offers another example of a host population adversely affected by the project. According to letters provided to the Panel, the school has become very crowded and is operating beyond its capacity. The large influx of resettled families with children has reportedly caused the quality of schooling services and education to decline. The Panel believes that an appropriate consultation process and the timely design of mitigation measures might have prevented such negative impact.
256. **The Panel finds evidence that host populations near resettlement sites are in some cases adversely affected by the design and construction of the resettlement sites, or by added burdens on local infrastructure due to the influx of resettled population. OD 4.30 and OD 4.01 require that such impacts be assessed and mitigated. The Panel has already noted its finding that new resettlement construction should have had adequate environmental and social impact assessments.**
257. **The Panel also finds that there was inadequate effort on the part of the Bank to ensure that the host population was informed and consulted with in planning and carrying out construction of the resettlement sites as required by OD 4.30.**³¹⁰

9. RESETTLEMENT AND COMPENSATION

258. The Request claims that the Bank has failed to ensure proper compensation and resettlement to the affected people.
259. According to the Management Response, *“Management believes that proper compensation and resettlement has been provided to all families, both census as well as post-census families, living in areas up to 78 masl...through actions included in: (a) the Resettlement and Social Action Plan that was applied until 1992; and (b) the RRAP after 1992”*³¹¹ as required by OD 4.30. Management states that *“[a]ll the affected people in the project area, whether or not they formally own the affected property, are entitled to a new house and a lot with utilities at no cost.”*³¹² As a result, up to July 2002 (the date of the Management Response), *“EBY has resettled 5,378 families in new houses or farms... including*

³¹⁰ Ibid.

³¹¹ Management Response, ¶ 111.

³¹² Ibid., ¶ 113.

191 brick-makers, in both countries.”³¹³ The Response also states that the RRAP is independently monitored and evaluated on an annual basis.³¹⁴

260. OD 4.30 outlines the Bank policy objectives, the first of which is to avoid or minimize involuntary resettlement “*where feasible.*”³¹⁵ The directive provides that “[w]here displacement is unavoidable, resettlement plans should be developed. All involuntary resettlement should be conceived and executed as development programs, with resettlers provided sufficient investment resources and opportunities to share in project benefits [emphasis in original]. Displaced persons should be (i) compensated for their losses at full replacement cost prior to the actual move; (ii) assisted with the move and supported during the transition period in the resettlement site; and (iii) assisted in their efforts to improve their former living standards, income earning capacity, and production levels, or at least to restore them. Particular attention should be paid to the needs of the poorest groups to be resettled.”³¹⁶
261. To analyze the claim that the Bank has not complied with OD 4.30, the Panel addresses separately two issues: compensation and resettlement. These issues are interrelated.

9.1. Compensation

262. The Requesters claim that many people, particularly those living in barrio Santa Rosa, have been offered “*negligible*” amounts for their homes.
263. Management summarizes its response to the charge that compensation levels are low as follows: “*Home appraisal of affected houses is low because 87% of the people are occupants without titles that [sic] have small lots and shanty houses. This is why the RRAP provides land, housing and support at no cost to the families.*”³¹⁷ Management indicates that “*87 percent of affected urban families are occupants without titles of small lots with precarious houses that are located in areas with no running water, no sewerage lines, and no garbage collection.*”³¹⁸ The Response states that “*a high percentage of the affected families have very low incomes.*”³¹⁹ According to Management, a socioeconomic impact study financed under Loan 2854-AR “*has found a situation of extreme poverty within the project area, with 50 percent of the population living below the poverty line.*”³²⁰ Under these circumstances, EBY compensated “[a]ll families resettled as part of Plans A and B, as well as those families in Itá Paso, Santa Rosa and Arroyo Porá” with

³¹³ Ibid.

³¹⁴ Ibid., ¶ 114. According to the Response, sixteen independent international evaluations have been conducted since 1994.

³¹⁵ OD 4.30, ¶ 3(a)-(e).

³¹⁶ Ibid., ¶ 3(b).

³¹⁷ Management Response, 18, Table 4.1.

³¹⁸ Ibid., ¶ 119.

³¹⁹ Ibid.

³²⁰ Ibid.

*“properties and constructions that were above the replacement cost of their former lots and homes.”*³²¹ Management states that in general the people had high levels of poverty and *“the values of the properties they occupied were extremely low.”*³²² However, Management maintains that where the replacement values were higher than the value of the houses EBY provided, the families received the monetary difference.³²³

264. OD 4.30 expressly requires, as noted above, that displaced persons should be compensated for losses at full replacement cost and prior to their actual move.

9.1.1. Procedure for Valuation of Homes and of Property

265. In the past, EBY employed a two-stage process to value homes and property: first a provisional or estimated appraisal and then a final appraisal at the time of expropriation. In response to difficulties associated with estimated appraisals, EBY has now abandoned the use of provisional appraisals. Under OD 4.30, the basic reference point, valuations must be *“full replacement cost prior to the actual move.”*³²⁴ This is normally determined by reference to market value. As is widely recognized, many difficulties plague market determination.
266. The Panel visited the homes of many of the Requesters who had yet to be resettled and talked with their “coordinators” in areas around Encarnación.³²⁵ Many of these houses were far from “shanty” houses, and the inhabitants consistently voiced their concerns that the house valuations EBY had provided them were low. EBY informed the Panel that these evaluations should be considered *“provisional”* or *“estimated”* appraisals done prior to a finished worksheet and appraisal process; they have no status other than as preliminary information given to the owner.³²⁶ EBY also told the Panel that they had stopped using provisional evaluations because they caused so much misunderstanding. EBY officials insisted that at the time of the move (or expropriation of property) or when funds were available to offer people an early move, there would be a full, proper appraisal. The Panel was provided with examples of appraisal worksheets and finished appraisals for houses that had been purchased, as well as with a large document containing guidelines for appraisals.³²⁷
267. Given what the Panel learned in sample interviews, it is very understandable that local people would often object to an “estimated appraisal”, which even EBY officials would not defend and have stopped using. Because the movement of some of the people has been postponed or extended indefinitely pending the raising of the water level, the values of the homes and property are changing. In

³²¹ Ibid., ¶ 120.

³²² Management Response, ¶ 120.

³²³ Ibid., ¶ 121.

³²⁴ OD 4.30, ¶ 3(b).

³²⁵ Interviews, Encarnación, January 2003.

³²⁶ Ibid.

³²⁷ Ibid.

the absence of a final estimate for their properties, local people cannot seriously assess whether it would be better to take monetary compensation, take the house in the new settlement, or propose an alternative solution for an entire neighborhood of houses. Yet it is practically impossible for EBY to provide detailed appraisals until it is known when a group of houses will be moved.

268. The terms of OD 4.30 are clear and require a “valuation procedure” applicable to the assets and the type of land tenure enjoyed by affected persons.³²⁸ **The Panel finds that the use of provisional appraisals is not inconsistent with Bank policies. However, because affected people were not consulted and did not receive adequate information about the purpose and use of the provisional appraisals there has been considerable confusion. OD 4.30 calls for the Bank to monitor the actual appraisal values that will be paid when these properties are expropriated if the water level is raised.**

9.1.2. Compensation for Usufruct or Customary Rights to Land and Loss of Access to Resources and Public Services

269. Many of the displaced people do not hold title to the land upon which their houses or resources are located. OD 4.30 requires that titled and untitled property should be treated as equally as possible in devising compensation rules.³²⁹ The first resettlement plan of 1979 to 1980 was not consistent with this requirement, because it made a strong distinction between those with formal title to their land and those merely occupying the land under a traditional system used in the area. By contrast, the 1992 resettlement plan provides for compensation to all displaced persons, regardless of whether they have title to their properties. **The Panel finds that this provision in the 1992 resettlement plan is in compliance with the requirement of OD 4.30 regarding usufruct or customary rights to land.**
270. Loss of access to natural resources that must be compensated in this Project includes access to clay deposits. **The Panel finds that to the extent that the resettlement plan provides for compensation for loss of access to these resources, the Bank is in compliance with the requirements of OD 4.30. However, as detailed in this report³³⁰ the procedures set forth by EBY for compensation may have resulted, in practical terms, in a denial of compensation to some affected people.**

9.1.3. Compensation Prior to Displacement.

271. OD 4.30 requires that full compensation be paid to displaced persons prior to their actual move. Not all persons flooded out of their property when the reservoir was

³²⁸ OD 4.30, ¶ 17.

³²⁹ See *ibid.*

³³⁰ See *supra* § 8.2.; *supra* § 10.

raised in 1994 to the 76 masl level were properly compensated beforehand.³³¹ **In 1997, Management assisted EBY in developing the so-called “Plan A” in part to compensate for this violation of OD 4.30.**

272. The Panel, however, found many instances in which people whose homes were flooded when the water level was raised in 1994, after Plan A was in effect, still feel inadequately compensated. In part this is because the grievance procedure in place at that time for people to object to the valuations offered for their property was inadequate. People without adequate resources to live when denied access to their property were asked either to accept the amount offered by EBY and in doing so agree to forego any further claim to additional funds, or to take the matter to court. If they took the matter to court, they would have no access to the funds until after a court decision. The Panel emphasizes that by accepting the payment offered and thus having access to the funds, a person had to sign that this was full valuation for the property lost. It is unreasonable for a person losing access to his/her home or livelihood resources by flooding to be given no better grievance procedure than taking the matter to court and to have no means of livelihood during the potentially protracted court battle.³³²
273. **Thus, as noted above, the Panel finds that the grievance procedures in effect during and since the time when the reservoir was raised to the 76 masl level were not in compliance with OD 4.30’s requirement for fair compensation.**³³³
274. The Panel notes that for people whose property is to be expropriated at present, the new law governing expropriation that Paraguay adopted in January 2001 has set forth new expropriation procedures.³³⁴ Under the new law, if people are offered compensation that they consider to be too low, they do not need to accept it in order to receive the funds during an appeal. EBY may pay the officially determined amount into an account in the name of the person to be compensated without obtaining that individual’s agreement not to contest the amount. The period of time given to vacate the land starts on the date of the deposit. An

³³¹ Management Response to the first Request for Inspection submitted to the Inspection Panel in 1996 in paragraph 1.8 states “We do not agree that the problems which have occurred and their possible consequences for the local population are the result of any alleged Management violation of Bank policies and procedures...all resettlement and environmental mitigation activities required prior to reaching the current reservoir level of 76 masl have been met (except some pending matters which are being addressed through appropriate financing and supervision).” (emphasis added)

³³² On several occasions during the Panel’s visits, affected people told the Panel that EBY officers had sometimes threatened that affected people will receive no compensation at all if they do not accept the terms of compensation offered, saying that if their terms are not accepted, the families will not be compensated at all, losing all their rights. The Panel was unable to verify this.

³³³ OD 4.30, ¶ 8 note 11 and ¶ 12, 14, and 17.

³³⁴ Republic of Paraguay, Law No. 1681, “*Que declara de utilidad pública y expropia áreas delimitadas a ser afectadas por el aprovechamiento hidroeléctrico de Yacyretá, sus obras auxiliares y las obras complementarias*,” Asunción, January 15, 2001. Law No. 1681 was amended by Law No. 1814 “*Que modifica los artículos 4, 7, 10, 11 y 13 y amplía la ley No. 1681/01 que declara de utilidad pública y expropia áreas delimitadas a ser afectadas por el aprovechamiento hidroeléctrico de Yacyretá, sus obras auxiliares y las obras complementarias*,” Asunción, October 30, 2001.

individual contesting the amount in court would have access to the funds to subsist while the case is pending. The court could increase—but not decrease—the officially determined compensation. **The Panel finds that the provision of the new law regarding access to funds during appeal is consistent with OD 4.30.³³⁵ However, this provision, because it refers to judicial proceedings, does not provide an accessible, simple and effective grievance procedure available to affected people to settle disputes about these matters.**

275. The Panel discusses examples of failures to compensate particular groups of people for their losses at full replacement cost elsewhere in the report.

9.1.4. Sequencing of Places Selected for Compensation

276. The Requesters have expressed concern that even while (from their perspective) there are still many ‘*pending debts*’³³⁶ owed to people who had to move from below the 78 masl level, EBY is picking and choosing properties between 78 and 84 masl in a non-transparent process, and those properties are being compensated when their owners move. This concern applies both to houses and to businesses.
277. The issue of the sequencing of those to be resettled also arises in the design and implementation of the *Programa Desborde de Arroyos* or Urban Creeks Program. As explained above,³³⁷ this program is in the process of voluntarily resettling affected people who live in areas between 78 and 84 masl and who are severely affected by the flooding of urban creeks. These individuals are already eligible for resettlement when and if the completion of the filling of the reservoir occurs. The Requesters criticize the selection of people under this program, alleging that it resulted in the resettlement of affected people who are not harmed by the creeks’ flooding.
278. The Panel saw many cases where some houses or businesses were missing on streets because individual plots had been vacated and the land was now owned by EBY, while other properties nearby were still occupied by their owners. The Requesters claim that, many other far more deserving people and neighborhoods, who are living in very difficult situations and want to move and be resettled, have not been able to obtain compensation or new homes.
279. Bank and EBY staff told the Panel that, because the limited financing did not allow EBY to attend to all affected families, EBY tried to give priority to hardship cases, such as those who are elderly or infirm and need to sell their property in order to obtain money to treat their illnesses.³³⁸ In the area that is scheduled for

³³⁵ There are a number of questionable aspects of the new expropriation law, as amended, about which the Panel does not comment.

³³⁶ See supra §1.2.

³³⁷ See supra §2.3.2.1.

³³⁸ Interviews, Encarnación, January 2003.

flooding, it is impossible to sell property other than to EBY. This is one of the problems arising from the long delay in raising the water level.

280. OD 4.30 does not provide guidance regarding “fairness” in selecting a “proper” sequence of houses to be compensated, as long as all are adequately compensated in the course of the move. OD 4.30 does establish that the resettlement plan must be “time-bound,”³³⁹ and the presumption seems to be that, in whatever sequence the compensation and resettlement occurs, it will be done a this time-bound fashion and in consultation with those eligible for resettlement.
281. **When the presumption that resettlement will happen relatively quickly fails, the Bank Management needs to ensure, consistent with the purpose of OD 4.30, that there is a rationale for resettlement sequencing and that the sequencing process is transparent and fair.**

9.2. Resettlement

282. The Panel has examined selected issues related to payment of compensation above. The following section considers selected claims and responses regarding the other option available to those who would be displaced, namely resettlement. Other sections of this report consider additional aspects of both options.

9.2.1. Alternative Sites

283. The Requesters expressed to the Panel their concern that this Project failed in considering alternative resettlement sites. According to the Requesters, EBY has not gathered (through consultations with the population to be resettled) alternative ideas about the resettlement process and procedures.
284. OD 4.30 states, “[t]he identification of several possible relocation sites and the demarcation of selected sites is a critical step for both rural and urban resettlement.”³⁴⁰ Elsewhere, OD 4.30 also encourages the development of alternative designs through community participation³⁴¹ and notes the importance for the resettlement plan of obtaining the eligible population’s “attitudes on resettlement options.”³⁴²
285. The Panel met with some families who complained to the Panel that EBY offered only two options (resettlement within a developed resettlement site and payment of compensation) and did not consider the affected people’s alternative proposals. These people showed the Panel copies of letters they had sent EBY proposing that they be allowed to purchase a site near their existing properties. They claim that this solution would be cheaper for EBY than the cost of the resettlement site

³³⁹ OD 4.30, ¶ 30.

³⁴⁰ Ibid., ¶ 13.

³⁴¹ Ibid., ¶ 8.

³⁴² Ibid., ¶ 11.

houses, and would let them stay near their church and community. Some of these families could have relocated under the PDA program but refused to move in the hope of negotiating a better solution with EBY.³⁴³ However, according to the affected people, EBY responded that only the resettlement sites of Itá Paso and Arroyo Porá were available at that moment and that alternative sites could be considered if and when the water rises.³⁴⁴

286. **The Panel finds that the failure to consider acceptable resettlement alternatives is not consistent with OD 4.30.**

9.2.2. Restoration of Income Earning Capacity

287. The Requesters claim that inadequate programs were developed for the economic and productive rehabilitation of the affected families. Many affected families complained about a lack of training programs that could help them to restore their lost livelihoods or income.
288. Management believes that the Requesters base their allegations on “*incomplete and outdated information about the way the RRAP is structured and is currently operating,*” as, according to Management, the resettlement plan also includes a social and economic rehabilitation program.³⁴⁵
289. Management Response states that “*urban families relocated close to workplaces have generally recovered their former levels of income following resettlement.*”³⁴⁶ Management acknowledges, however, that unexpected problems surfaced for many resettled people when the economic crisis hit Paraguay in 1996, because the 1992 RRAP had not planned economic reestablishment for urban people. It also states that in 1992 “*there was no evidence of loss of income in urban resettlements carried out by EBY.*”³⁴⁷ Presently, however, the people who live in areas relatively distant from the commercial center of Encarnación are having difficulty restoring their pre-resettlement incomes.³⁴⁸
290. To address these problems, Management states that EBY and the GOP have designed a series of activities that include creation of a Productive Fund to support productive projects proposed by families and communities;³⁴⁹ encouragement by EBY of private contractors under contract to EBY to promote employment of resettled families; subsidization of transport for families for the first six months after resettlement; design and development of family gardens; creation of a community plantation in Arroyo Porá; offer of training and capacity-building workshops for various trades (hairstylist, carpenter, electrician, etc.);

³⁴³ Interviews, Encarnación, January 2003.

³⁴⁴ Ibid.

³⁴⁵ Management Response, ¶ 122.

³⁴⁶ Ibid., ¶ 115.

³⁴⁷ Ibid., ¶ 123.

³⁴⁸ Ibid., ¶ 116.

³⁴⁹ It is envisaged that US\$6 million equivalent will be allocated to the Productive Fund.

and offer of free school and/or subsidized transportation for a certain period of time.³⁵⁰ With respect to peri-urban families, Management claims that the brick-makers have achieved “*levels of productivity similar to or higher than those prior to resettlement,*” while the majority of rural families have “*significantly improved living conditions and increased assets.*”³⁵¹

291. Bank policy on involuntary resettlement, OD 4.30, recognizes that normally “*general economic growth cannot be relied upon to protect the welfare of the project-affected population.*” For that reason, “*alternative employment strategies are needed for nonagricultural displaced people.*” This paragraph counsels that “[v]ocational training, employment counseling, transportation to jobs, employment in the main investment project or in resettlement activities, establishment of industries, incentives for firms to locate in the area, credit and extension for small businesses or reservoir aquaculture, and preference in public sector employment should all be considered where appropriate.”³⁵²
292. The Request for Inspection and Requesters’ discussions with the Panel refer to numerous specific examples where the productive infrastructure of subgroups of the resettled population has been damaged and no plans or inadequate plans are available to restore income level or infrastructure. For example, fishermen who were compensated were expected to retrain for other jobs. However, they complained to the Panel that they were not provided with guidance or job-training opportunities. Brick-makers offer another example. According to the Requesters, many of them were inadequately compensated for their loss of access to high-quality clay deposits and were not given good opportunities for job retraining.
293. The Requesters are also concerned about adequate transportation to reach their place of employment. While Management Response to the Request states that there is a plan for providing transportation for workers displaced by the Project, the Request for Inspection includes specific examples where such transportation is considered inadequate. An example is the municipal slaughterhouse workers (municipal employees of the city of Encarnación), who must arrive at the slaughterhouse so early in the morning that public transportation is not available. They are asking for compensation in the form of motorcycles or bicycles that would allow them to arrive on time or, in the case of older workers unable to reach the slaughterhouse at its new location, for suitable arrangements to retire.
294. **While recognizing that there have been commendable efforts to develop productive projects, the Panel finds that the measures for restoring income earning capacity have been inadequate. Some people were moved far from the market for their products and services, while others have found transportation to their place of work difficult and costly. Few of those who lost their livelihood have been offered adequate training to replace their lost**

³⁵⁰ Management Response, ¶ 124.

³⁵¹ Ibid., ¶ 115.

³⁵² OD 4.30, ¶ 18.

source of income. The Panel recognizes that a severe economic crisis has occurred in the area. However, this does not negate the importance of restoring pre-resettlement income earning capacity with long-term measures rather than temporary solutions such as a temporary free transportation or five-year access to clay deposits. Thus the Panel finds that to the extent the measures are inadequate the Bank is not in compliance with OD 4.30.

10. RESETTLEMENT AND COMPENSATION OF SPECIFIC GROUPS: BRICK-MAKERS AND TILE-MAKERS (CERAMISTS)³⁵³

295. The following section analyzes the claims related to a specific category of affected people: the brick-makers and the tile-makers. It first discusses the resettlement and rehabilitation options offered to small brick-makers and medium-to-large mechanized roof-tile makers. The report then focuses on compensation to the formal and informal workers.
296. The Requesters complain that, while EBY provided compensation for several brick- and tile-making establishments, it relocated others to areas too far away from the clay deposits. Moreover, when EBY paid such compensation, it benefited only the owners of the factories and neglected the personnel, leaving a large number of people without jobs. This caused many former employees to set up their own brick-making businesses. However, their current situation is very precarious because, as EBY owns the clay deposits, they must purchase the raw material from EBY or other landowners who still have their own clay supply and to pay a substantial amount for its transportation. The Request, therefore, urges the Bank to ask EBY to create programs for job retraining or support productive alternative activities for these affected individuals.³⁵⁴
297. The Management Response lays out the options included in the resettlement plan that were offered to brick- and tile-makers. It also presents a summary of the number of brick and tile makers that were compensated and/or resettled during the period 1994 to 1996.³⁵⁵
298. The Response states that the first option for small brick-makers included, among other things, a plot for a production unit, five years of clay trucked into the plot, a house plot, and a house with services such as water, electricity, drainage, and so forth. According to Management, this helped 97 resettled families to reestablish their brick-making businesses. Of these, “92 now constitute the San Pedro Industrial Park in Encarnación... and 5 were re-established in Coronel Bogado Municipality.”³⁵⁶ The Response also explains that the “majority of those

³⁵³ The terms “tile-makers”, “roof-tile makers” and “ceramists” will be used interchangeably in this report to indicate the same type of production unit.

³⁵⁴ Request for Inspection.

³⁵⁵ Management Response, ¶ 128–131 (including Tables 7.2 and 7.3).

³⁵⁶ Ibid., ¶ 132.

- compensated were family owned businesses with some temporary or seasonal laborers.*³⁵⁷ A 1993 study found “2.2 workers per brick making enterprise”; according to the study, *“the owner and a relative were the most common situation.”*³⁵⁸ Management further states that for those who did not continue their brick-making activity, EBY offered training courses *“on various marketable skills.”*³⁵⁹ However, the Response adds, *“the impact on employment has not been very significant due to the recession in the country and region.”*³⁶⁰
299. As to the tile-makers, the options and rights of the industries’ owners depended on whether the locations of their establishments and/or the clay deposits were above or below 84 masl.³⁶¹ With respect to these industries’ workers, Management maintains that those industries that had to relocate or that continued production in the same place *“did not have to fire employees,”* and that *“those that were compensated but did not continue production had to give workers severance pay as stipulated in Articles 78, 79, 80 and 91 of Law 213 (Work Code of the Paraguayan Republic, 1993...).”*³⁶² Accordingly, *“the Bank as well as EBY worked under the assumption that Paraguayan labor laws would be applied effectively”* and that *“employers would proceed according to the law and properly compensate their employees.”*³⁶³
300. Management acknowledges that *“this assumption was optimistic, because the Bank supervision team assumed effective application of the law.”*³⁶⁴ In Management’s view, however, *“there are limits to how far EBY (and thus indirectly the Bank) can and should be required to monitor the ultimate use of the compensation paid.”*³⁶⁵
301. In its Response, Management also states that *“[t]he actions taken until 1996 resolved all of the cases of brick factories below 84 masl (recorded in 1993), and included compensation to all those at higher levels who would be affected by subsequent lack of access to clay deposits, in accordance with OD 4.30 on Involuntary Resettlement.”*³⁶⁶
302. The Bank policy on involuntary resettlement applicable to this project, OD 4.30, requires that all affected people who lose their sources of income as a result of a Bank-financed project be compensated for their losses, even in cases where they have not been physically displaced. The Panel addressed this issue in its Uganda investigation and concluded that:

³⁵⁷ Ibid., ¶ 133.

³⁵⁸ Ibid.

³⁵⁹ Management Response, ¶ 133.

³⁶⁰ Ibid.

³⁶¹ The different options will be examined in the next paragraphs of the report.

³⁶² Management Response, ¶ 135.

³⁶³ Ibid.

³⁶⁴ Ibid., ¶ 136.

³⁶⁵ Ibid.

³⁶⁶ Ibid., ¶ 138.

“A review of existing documentation on this issue reveals that the Bank has consistently taken the position that the compensation and rehabilitation called for under OD 4.30 extend not only to people physically displaced by a project but also to those who suffer other kinds of losses, such as the dismantling of production systems, the loss of productive assets or income sources, as well as any increased difficulties accessing, among other things, public services, customers and fishing and grazing.”³⁶⁷ Paragraph 2 of OD 4.30 for example describes the severe social, economic, cultural and environmental problems which people may face as a consequence of development projects and paragraphs 11, 14 (c) and 15 address several factors that may disturb the resource base used by affected people: partial loss of assets that render households economically unviable and loss of access to, among other things, public services, customers, and fishing and grazing.”³⁶⁸

303. The Panel notes that, as early as 1997, in the context of its Review and Assessment of Action Plans of the Yacyretá Project, it urged the Bank to ensure that affected workers who lost their jobs as a result of the filling of the reservoir be directly compensated as required by Bank policy. At that time the Panel wrote:

“It is a fact that clay deposits of the quality and amount of the deposits lost because of the reservoir elevation have not been found... and therefore it is difficult to accept that the workers lost their jobs because of a simple decision of owners of olerias to change economic activities. There seems to be enough prima facie evidence that the loss of jobs by brick factory workers has been caused mainly—if not directly—by the filling of the reservoir. If this is the case, the workers should be compensated according to Bank policy.”³⁶⁹

10.1. Small-scale Brick-makers

304. The Project’s Resettlement and Rehabilitation Action Plan (PARR), approved by the Bank in 1992, identified industries dedicated to brick- and tile-making—commonly called *oleros*—among those that would be affected by the raising of

³⁶⁷ This position has been articulated in internal Bank memoranda. See also Ibrahim Shihata, “Legal Aspects of Involuntary Population Resettlement,” in *Anthropological Approaches to Resettlement: Policy, Practice and Theory*, ed. Michael Cernea and Scott Guggenheim (1991), and Ibrahim Shihata, ed., *The World Bank in a Changing World: Selected Essays* (Martinus Nijhoff, 1991), 135–180. It should be noted, however, that OP/BP 4.12 on Involuntary Resettlement (issued in December 2001) does not provide for compensation of this type of loss because the new policy “covers direct economic and social impacts” resulting in relocation, loss of assets or access to assets, or loss of income sources or means of livelihood “caused by involuntary taking of land or the involuntary restriction of access to legally designated parks and protected areas.” OD/BP 4.12, ¶ 3.

³⁶⁸ Inspection Panel Investigation Report, Uganda: Third Power Project (Credit No. 2268-UG), Fourth Power Project (Credit No. 3545-UG), and Bujagali Hydropower Project (PRG No. B003-UG), May 30, 2002, ¶ 306.

³⁶⁹ 1997 Panel Assessment, ¶ 240(iv).

the reservoir.³⁷⁰ The PARR noted that many of the principal clay deposits on the Paraguayan side of the river would be flooded, particularly identifying the M'boi Caé neighborhood in Encarnación as one in which the majority of the families were involved in brick- or tile-making industries.³⁷¹ The size of the production units ranged from small, family-run businesses to large, mechanized industries with salaried workers.³⁷² Accordingly, the PARR determined that, because of the *olerías* families' different socioeconomic and cultural profiles, different solutions needed to be found for each subgroup of *olerías* families.³⁷³

305. The issue of compensating medium and large industry owners, as distinct from artisanal brick- and tile-makers, was the subject of a meeting of EBY's Executive Directors on June 9, 1994. This meeting approved the "Policy Declaration for Encarnación," which offered solutions to compensate brick and tile industry owners on the Paraguayan side of the river. Priority was to be given to compensating the most vulnerable families—identified as mostly artisanal brick-makers—either through resettlement in areas above 84 masl or through assistance in changing their means of employment. On the other hand, the mechanized industry owners—identified as mostly roof-tile makers or ceramists—were deemed to have the resources and capacity necessary to reestablish themselves.
306. The compensation provisions for brick-making industries are described in detail in the PARR and the aforementioned "Policy Declaration for Encarnación" and summarized in the Management Response.
307. The Management Response lists four options for brick-makers (which according to the Bank were mostly small, family-owned businesses). Option 1 provided a house and a plot for a production unit, while Option 2 offered rural relocation with a plot of 7.5 hectares and a house in a new rural resettlement. This option enabled the brick-makers to receive technical agricultural assistance, social assistance, inputs for production, and food supply for six months. Option 3 was an urban house and compensation for a change of economic activity, and Option 4 granted cash compensation.³⁷⁴ The Management Response additionally notes that many brick-makers above the 84 masl line had also demanded compensation based on lost access to clay obtained from areas that were about to become flooded by the Project.³⁷⁵

³⁷⁰ RRAP, 34. The PARR identified 245 *olerías* families in Paraguay that would be affected by the raising of the reservoir, 70 of which were artisanal and 175 of which were semi-mechanized. (Note that "the figures do not include rural *olería* families on the Paraguayan bank, for which clear information is not available.") Ibid., 93. 27 percent of brick- and tile-making families had title to the land on which their industries were located, while 73 percent were occupants.

³⁷¹ Ibid.

³⁷² Ibid.

³⁷³ RRAP, 34.

³⁷⁴ Management Response, ¶ 128.

³⁷⁵ Ibid., ¶ 130.

308. The compensation options for small brick-makers are also discussed in an article authored by the Bank consultant who helped develop the resettlement plan, María Clara Mejía.³⁷⁶ Her study distinguishes five options, only three of which were available for small brick-makers in Paraguay.
309. In the first of the three options EBY gave the *oleros* private plots without clay, but supplied them with riverbank material. This option was used at the San Pedro resettlement site. The second option involved brick-makers and their production units at San Cosme y Damian and at Coronel Bogado, Paraguay. These *oleros* were given communal clay deposits and equipment to be managed through legal cooperative arrangements. In these cases, a cooperative association was established. Ten hectares of communal clay deposits were to be used on a quota basis by the cooperative members, and two trucks and a tractor were provided to haul clay to individually owned production units.
310. **The Panel found in its visits to the San Pedro resettlement site that while families had reestablished their brick-making activities, many complained about losses in their income level and about the lack of continued access to raw material at a reasonable cost because the five-year clay supply had ended.**
311. The third option for small artisanal brick-makers included cash compensation. This provided a cash sum based on “production capacity” as well as a house and plot. The cash compensation option was not recommended in the resettlement plan, but nevertheless “*it was expected that a small number of families, because of age, health problems, shortage of family labor, and so on, were not going to continue the activity...[and thus]...would only settle for cash compensation.*”³⁷⁷ In practice, however, the number of families who chose cash compensation was substantial.³⁷⁸ This option also encouraged more people to settle in the area and to begin small brickworks in the hope of receiving additional cash compensation before the reservoir level was raised.

³⁷⁶ María Clara Mejía, “Economic Recovery After Involuntary Resettlement: The Case Of Brickmakers Displaced By The Yacyretá Hydroelectric Project,” in *Risks And Reconstruction: Experiences Of Resettlers And Refugees*, ed. Michael M. Cernea and Christopher McDowell, (Washington, D.C.: World Bank, 2000), 144–164.

³⁷⁷ Mejía, “Economic Recovery,” 160.

³⁷⁸ Ibid. The article notes that studies of people who received compensation showed that 30 percent of those compensated at San Cosme used the money to pay previous debts; 30 percent used the money to buy food and cover other immediate needs; only a few invested in restoring their brick-making production; and some simply deposited the money in interest-bearing accounts in a bank that failed, thus losing the money entirely. Of those who were compensated and used up or lost all their money without investing in restoring their brick-making capacity, some were (in 2000) working as paid labor in the relocated *olerias*, while others have returned to the banks of the river, “in the area already cleared [for flooding], hoping for a second resettlement package.” Ibid., 158–9. Mejía concludes, “[D]uring the 12-year resettlement process, the implementing agency lost credibility in the eyes of the affected population because of mounting delays. Political opportunists at all levels (sometimes even involving local nongovernmental organizations) sought to exploit the fear and distrust of the *oleros*. The binational agreement favored different treatment of similar problems, creating inconsistencies in the rehabilitation process....” Ibid., 160.

10.2. Medium- and Large-Size Industries

312. EBY identified medium and large industries in the project area, mostly roof-tile makers. The 1992 PARR that the Bank approved did not consider resettlement as an alternative for large industries, because it was considered that they had the capacity to relocate on their own to a site of their own choosing, if they were provided indemnification for the property lost. According to Management, the PARR proposed solutions to permit the industries to continue their production,³⁷⁹ which EBY was required to implement pursuant to the Project's legal agreements.
313. In the "Policy Declaration for Encarnación," EBY laid out the following compensation alternatives for the roof-tile industry owners:
- (i) Establishments located above 83 masl, which owned lands with clay deposits below 83 masl would receive payment for those lands. If the establishment used clay from lands it did not own, it would be remunerated for the cost of a five-year supply of clay, with due regard to the establishment's customary production levels.
 - (ii) Establishments located below 83 masl, would receive payment for the establishment, the land on which the establishment was located, if owned, and any additional property containing clay deposits owned by the establishment. If lands containing clay deposits were not owned, payment would be provided exclusively for the improvements. If the establishment chose to self-relocate, it would receive, in addition to payment for improvements, remuneration for the cost of a five-year supply of clay in accordance with the establishment's customary production levels.
314. The conclusions of the "Policy Declaration" were refined, with administrative procedures regulating their application, by EBY Resolution No. 2824/95, dated September 28, 1995, which established an alternative compensation solution for roof-tile industries, so-called "self-relocation." EBY considered that this solution would allow the industries to continue their production, would avoid unemployment, and was also consistent with the Paraguayan Expropriation Law No. 394/94.³⁸⁰
315. Under the self-relocation proposal, production would be relocated to a nearby site and the owner would receive, *inter alia*, payment for the property value and replacement costs of improvements, payment for the machinery of equipment that could not be transferred, and "*recognition of the value of severance payments that the roof-tile owner should provide to personnel that did not relocate to the new*

³⁷⁹ Memorandum, April 22, 2003, from Director, LCSES to Chairman, Inspection Panel; subject: "Yacyretá Hydroelectric Project: Management Response to the Inspection Panel Request of July 10, 2002: Compensation provided to Roof-tile Makers," [hereinafter "Management Memorandum, April 22, 2003"].

³⁸⁰ Ibid.

*establishment, in accordance with the employment and accounting registers that the industry owner was legally required to maintain.”*³⁸¹

316. In its Response, Management states that an independent evaluation from 1997 to 1998 found that of the roof-tile industries, thirteen had relocated and eleven of them continued their activity, sixteen industries continued their production in the same spot where they were before, and twenty-five had been discontinued.³⁸²
317. **The Panel finds that the industry owners could be expected to make an informed decision of the value and prospects of their clay deposits and to be able to choose freely whether to accept the compensation package offered.** However, the Panel expresses concerns about the adequacy of the provision of a “five-year supply of clay in accordance with the establishment’s customary production levels,” as this appears to be a temporary measure rather than a long-term solution.

10.3. Compensation to Workers of Brick- and Tile-making Industries

318. The Request for Inspection claims that although EBY compensated the owners of brick and tile making industries, it neglected to pay the workers.

10.3.1. Rules and Procedures

319. As mentioned above, Management Response to the Request emphasized that the workers’ compensation is a responsibility of the employers, not of EBY. In fact, the Management Response claims, the industries’ owners who “*were compensated but did not continue production had to give workers severance pay*” in accordance with Paraguayan labor laws.³⁸³
320. On several occasions during the investigation the Panel requested Management to clarify this issue, both in general and with reference to specific cases of employers and employees who alleged they had not received any form of compensation. As a result, Management sent to the Panel a number of memoranda³⁸⁴ containing detailed information regarding compensation, mainly concerning the cases of large, mechanized roof-tile makers.
321. The different memoranda include seemingly conflicting assertions with regard to EBY’s obligation to compensate employers for the severance pay owed to the workers. In an April 2003 memorandum, Management states that “*compensation to roof-tile employees who did not continue working with a self-relocated industry or whose labor contract was rescinded was recognized under [EBY’s] Resolution*

³⁸¹ Ibid (citing EBY Resolution 2824/95 of Sept 25, 1995).

³⁸² Management Response, ¶ 134.

³⁸³ Ibid., ¶ 135; see also supra ¶ 299.

³⁸⁴ Management sent the Panel memoranda on April 22, 2003; May 13, 2003; July 8, 2003; December 22, 2003; January 13, 2004; and January 14, 2004 (two Memoranda).

2824/95.”³⁸⁵ It adds that, in 2001, EBY stated that it had received claims from 211 employees who had worked in industries below 84 masl whose employers were relocated via self-relocation, and from seven workers whose employer had been compensated via indemnification.³⁸⁶ Management states that “*both...were compensation methods [self-relocation and indemnification] that recognized severance payments to personnel whose contracts were terminated.*”³⁸⁷ By contrast, in May 2003, a subsequent memorandum stated that “*although EBY quite correctly provided compensation for the costs of industry relocation, it does not logically follow that EBY would have to extend this compensation to cover severance payments to employees terminated because of an owner’s choice not to pursue the available self-relocation option.*”³⁸⁸ Similarly, in a memorandum dated July 8, 2003, Management claims that under the self-relocation framework, “*EBY provided severance compensation only to those industry workers who were not able to relocate with the industry. No compensation was provided to those workers who had lost their jobs due to the closing of an enterprise, as the compensation strategy was designed to promote continuation of production.*”³⁸⁹

322. The Panel notes that apparently only after the submission of the second Request for Inspection and the Panel’s repeated requests for additional information and clarifications in relation to the compensation of the workers did Management look more deeply into the rights and obligations of EBY, if any, *vis-à-vis* the employees of the brick- and tile-making industries.
323. To address the Panel’s requests for clarifications, Management requested a Paraguayan law firm, Estudio Mersan Abogados, to prepare a legal review and analysis of Paraguayan law to determine, *inter alia*, the rights of the workers *vis-à-vis* their employers and with respect to EBY. The Bank’s request for the legal opinion defined the term “worker” as “*an employee who has a written contractual labor relationship with his/her employer*” and “*an employee who does not have a written contractual relationship but received salary compensation for work done (i.e. informal employee).*”³⁹⁰
324. The legal opinion analyzed the employers’ and EBY’s obligations and the rights of the workers under both Paraguay’s labor code and civil code. The review determined that, in case of business closure, the employer owes the employees severance payments, the amount of which is established based on the labor code’s provisions. These payments are due to both formal and informal workers, because the worker is not responsible for the employer’s negligence in

³⁸⁵ Management Memorandum, April 22, 2003.

³⁸⁶ Ibid.

³⁸⁷ Ibid.

³⁸⁸ Management Memorandum, May 13, 2003, from Vice President, LCR, to Chairman, Inspection Panel, subject: Yacyretá Hydroelectric Project,” [hereinafter “Management Memorandum, May 13, 2003”].

³⁸⁹ Management Memorandum, July 8, 2003, from, Director, LCSES, to Inspection Panel; subject: “Yacyretá Hydroelectric Project: Legal Review by Estudios [sic] Mersan Abogados” [hereinafter “Management Memorandum, July 8, 2003”].

³⁹⁰ Ibid.

- maintaining the records. Informal workers, however, need to prove in court their work relationship should the employer dispute their rights. In the specific case of the self-relocation option, the opinion states that, while the workers have a right to sue their employer if they have not received severance pay, no provision gives them standing in court against EBY because the obligation EBY assumed to compensate the employer for the cost of the employees' severance payment stems from a contract between EBY and the employer. According to the legal opinion, EBY has no direct obligation to compensate the workers.³⁹¹
325. In terms of the amount of compensation to industry owners, EBY officials told the Panel during its visits that EBY calculates the value of severance payments to the workers based on the employer's declaration regarding the number and status of employees in his firm. The owner is to pay the properly registered workers their severance payments, which EBY would subsequently reimburse up to an amount listed as a separate line item on the worksheets that detail the compensation owed to the industry owner. Such reimbursement is, however, conditional on the employer's provision of evidence that each employee has been properly registered and his/her social security taxes paid.³⁹²
326. During the course of its investigation, the Panel repeatedly requested the Bank for information on EBY's procedures to compensate the owners and received conflicting statements from both Management and EBY. The Panel notes that EBY officials clearly described this reimbursement procedure to the Panel team only during its December 2003 visit.
327. In fact, during a meeting with several EBY officials, in January 2003, EBY's then legal advisor in Paraguay told the Panel that EBY paid compensation to each employer in one installment. The total amount received included the compensation for the employer's assets or other rights as well as the amount necessary to pay the workers' compensation. The employer was then obligated, under Paraguayan labor law, to pay severance payments to the terminated employees. Under such circumstances, therefore, after EBY paid the owner the total amount of compensation in accordance with the law, whether the employer in turn paid its workers was outside of EBY's responsibilities. The Management Response seems to confirm this when it states that *'there are limits to how far EBY (and thus indirectly the Bank) can and should be required to monitor the ultimate use of the compensation paid.'*³⁹³ **Statements of this nature have given**

³⁹¹ Management Memorandum, May 13, 2003. In a very exceptional case, however, the worker, like any other creditor who is owed an amount certain and immediately enforceable ("*suma liquida y exigible*"), could subrogate the owner and sue EBY in lieu of his/her employer for the compensation he has a right to, provided that he can prove that the employer has been negligent or not acted against EBY to obtain or collect any compensation owed to the employer under the expropriation law. This action would be the subject of a very lengthy and complex civil procedure, which normally would not be affordable to a worker.

³⁹² Interviews, Encarnación, December 2003.

³⁹³ Management Response, ¶ 136.

the Requesters the impression that the owners were retaining the money that EBY paid them to compensate their employees even if not the case.

10.3.2. Compensation Programs

328. The Panel's visits to the project area, the review of the documents, and the interviews with Bank staff all revealed that a large number of workers who lost their source of income as a consequence of the Yacyretá Project belong to the category of informal workers, for whom employers did not keep official employment records or pay social security taxes. **The Panel finds that the Bank should have taken this fact into account when it reviewed and approved the Project's resettlement programs.**
329. EBY's procedures to reimburse the employer for the severance payments awarded to the former employees require verification of whether the employer submitted the correct employment records. On this basis, Management maintains that EBY reviewed the claims it received from some employees and concluded in most cases that the industry workers were ineligible for compensation. For example, an EBY Memorandum dated February 27, 2001 states, based upon the examination of documentation for 430 roof-tile workers claiming to be affected by the reservoir rising, *'[N]one of the workers possessed a card from the Institute of Social Benefits nor an employment contract registered with the Ministry of Labor.'*³⁹⁴ EBY further concludes that, from the documents reviewed, *'none of the tile-making employees from the industries located below 84 masl that received self-relocation compensation could be considered affected on the basis of Resolution 2824/95.'*³⁹⁵
330. Based on the foregoing, **the Panel finds that the large number of informal workers who worked in large, mechanized industries as well as in small-scale brick-making facilities were in practice excluded from the compensation system that the Bank approved, even though they suffered the adverse impacts of the project.** They therefore had to rely on their employer complying with the law and/or the court recognizing their status and rights.

³⁹⁴ Management Memorandum, April 22, 2003 (citing EBY Memorandum 20/2001, February 27, 2001).

³⁹⁵ Ibid.

A Brick-worker Waits At M'boi Caé

Leaning on a shade tree next to the simple wooden shed he uses to store bricks near his home at M'boi Caé, Mr. A,¹ aged 49, displays the census documents showing he lived here in M'boi Caé in 1980 and also in 1990. He is one of the former brick industry employees now seeking compensation for their loss of employment in M'boi Caé's brick making industries. Besides being an "affected person" due to his loss of employment, he is also "affected" in another way, because he resides in the area that will be flooded when the water rises to 83 meters above sea level (masl). Mr. A explains that, "until the water rose" [to 76 masl, in 1994], there were many brick- and tile-making industries at M'boi Caé. But they all closed down and moved away when the riverbank areas from which they got their clay was flooded, and Mr. A lost his employment. So he has turned to making his own bricks, using clay he purchases by the truckload from nearby Pacu Cúa. Asked about what company he worked for and whether that company compensated him, he points out that since there were over 50 brick working industries here in M'boi Caé, he worked for many of them. There was no shortage of work precisely because there were so many employers. So, like many of his neighbors, Mr. A was an informal worker, not an employee of just one firm. Recently, Mr. A has joined a group of former brick industry workers demanding compensation.

¹ Mr. A is a fictitious name.

331. Under Paraguayan law and EBY policy, formal workers—for whom employers kept appropriate employment records and paid social security contributions—who did not relocate with the roof-tile industry had a right to receive severance payment, and their employers were to be compensated for such payments. However, the amount of the employer's compensation was determined unilaterally by EBY based on the information initially provided by the employer. EBY staff stated that this determination was not subject to revision even when there was a court judgment providing higher amounts of compensation to the workers.
332. **Under such circumstances, the Panel wishes to emphasize that it is a matter of considerable concern that the Bank would accept, in a notoriously weak institutional setting, a compensation system that is based on the "assumption that Paraguayan labor laws would be applied effectively" by employers.³⁹⁶ The system essentially penalizes the workers because, if the employer has not complied with all legal and social securities obligations, it does not provide any compensation to the workers.**
333. The Panel is troubled that the Bank approved compensation procedures whereby workers must go to court to enforce their rights if their employer does not follow the law and have no effective recourse against EBY. In this respect, the Panel observes that the law firm, which prepared the legal opinion upon Management's request acknowledges that even though it is legally possible for the employees to subrogate a passive owner and sue EBY, that option is not a simple lawsuit but one with a restricted scope and an ample range of defenses available to EBY. In

³⁹⁶ Management Response, ¶ 135.

- addition, based on the Treaty,³⁹⁷ the workers would also have to travel from Encarnación to Asunción, Paraguay—five hours away—to file and follow such a lawsuit.
334. Based on the foregoing, **the Panel finds that the compensation program approved by the Bank was not consistent with OD 4.30 because it excluded in practice compensation for a specific category of economic losses that affected one of the poorest segments of the area population—that is, the informal workers of the brick- and tile-making industries.**
335. A specific case the Panel investigated illustrates these observations.³⁹⁸ The Panel received detailed information about the workers of a large roof-tile industry in Encarnación, whose owner—hereinafter referred to as “Family A”—rejected the self-relocation option and shut down the factory.
336. Because of Family A’s decision to close down the tile making business, EBY conducted expropriation proceedings. The Panel reviewed the appraisal documents and EBY’s Resolution authorizing the compensation payments to Family A.³⁹⁹ The Panel learned that EBY paid one member of Family A US\$1,289,620 for his ceramics firm and paid US\$1,450,419 for his and other family members’ lands that contained clay deposits. These amounts together totaled **US\$2,740,039**. According to the appraisal worksheet, EBY also estimated the amount Family A owed to the factory’s workers as severance payments, but the worksheet indicated that *“the amount of Gs. 100,250,268 [about US\$50,000] for the indemnification of workers of the tile-making industry”* was *“not included”* in the total.⁴⁰⁰ This means that Family A was to pay the workers their severance payments and submit to EBY the required documentation in order to recover those payments.
337. The Panel interviewed one member of Family A who was accompanied by the family’s attorney.⁴⁰¹ The Panel learned that, after the roof-tile industry shut down, the former employees brought a lawsuit against Family A for severance payments. The judge awarded the workers a total amount of approximately **US\$80,000**.

³⁹⁷ Tratado de Yacyretá, Article XIX(1).

³⁹⁸ Aside from the specific cases explained below in this report, there are others where the employer did not receive compensation for workers. For example, in a January 14, 2004 memorandum to the Panel, Management describes the case of an owner that received a compensation of PYG 304,689,212 to self-relocate his industry and later an additional amount of PYG. 4,705,331 to account for exchange rate differences. The owner had to make severance payments to his workers totaling PYG 100,609,500 but received no compensation from EBY because he did not submit the required documentation that would entitle him to reimbursement under EBY’s resolution 2824/95. EBY refused to compensate him in spite of the fact that he had submitted the employees’ resignation letters and corresponding payments receipts, together with an affidavit by the workers’ attorney stating that the employees were indeed paid the amount shown in the receipts.

³⁹⁹ EBY, Resolution No. 2916/96, January 11, 1996 and Resolution 686/96.

⁴⁰⁰ This would equal US\$50,760 at the exchange rate of PYG 1975 = US\$1 in effect at the time of the assessment, on September 6, 1995.

⁴⁰¹ Interviews, Encarnación, May 2003.

After paying this amount, Family A contacted EBY to obtain the reimbursement; the Panel viewed at least two letters to EBY requesting reimbursement. EBY never reimbursed Family A because, EBY officials and Management claim, adequate employment records were never presented.⁴⁰²

338. The Panel has received a report on legal complaints against another roof-tile industry, hereinafter referred to as “Industry B”, owned by “Owner B”, which raises a different issue. These are legal cases brought by workers of a tile-making industry that was compensated for its loss of access to clay in flooded areas (though the industry itself was not flooded because it is located above 84 masl). Owner B states that EBY paid him an amount to allow him to continue his activity and also provided access to different clay deposits. Owner B, however, found he was unable to keep his tile-making industry profitable in the new environment after losing access to the higher-quality clay, and he therefore had to furlough workers. This resulted in lawsuits in which the workers claim as compensation a sum greater than the entire amount he had been awarded by EBY for his losses resulting from the Project.⁴⁰³
339. A citation from the petition of Owner B will illustrate the problems this situation poses, in terms that put the application of the Bank’s social safeguard policies in human context:

“The Yacyretá Bi-National Entity gave to Owner B the sum of Gs. 476,449,636 (four hundred seventy-six million, four hundred forty-nine thousand, six hundred thirty-six guaraníes), per the Agreement for payment of Ceramicists located above the 83 Water Level, based on Resolution No. 3195/97, which supposes a technological retrofitting for processing different clay and a recognition of greater transportation distance for ten years. Nevertheless, with the receipt of money they give us responsibility for the promise to continue working and to give guarantees to the personnel connected to the establishment, and exempting Yacyretá from all responsibility to the workers of the affected [party]. The payments, in that moment, were made with much haste, and we were without the opportunity to analyze the consequences of what we were signing. [...]

We have invested in the retrofitting of our factory, improving our Installations and Machines, and have roamed through many places to carry good clay from distances up to 80 Km. All was in vain; we could not produce at acceptable costs to provide our local markets and [those] of Misiones, Argentina. As a consequence, we remain without economic means, after negotiating the voluntary retirements with compensation of eleven of our workers, leaving fifteen of them working. With the intention of salvaging this situation, and supported by the labor laws in our country, we solicited a labor suspension in our Factory for fifteen days, which opportunity our workers took to demand of us, as compensation for unjustified dismissal, the sum of Gs. 495,000,000 (four hundred ninety-five million guaraníes). Appearing in all of the instances as a documentary basis for the demands, is the EBY Agreement for payment to Owner B.

I have already paid a sum greater than Gs. 300,000,000 (three hundred million guaraníes), in compensations, and I have yet to pay eight of the workers with the most seniority whose sums I don’t know because they are waiting for [a] Resolution by the Supreme Court of the

⁴⁰² Ibid., Memorandum, April 22, 2003.

⁴⁰³ Interviews, Encarnación, May 2003.

Republic of Paraguay. I wish to say only that in payment of compensation to my workers I have spent more money than the total that EBY gave me for losses on my factory.

Now my factory has turned into ruins. I am a man of 65 years. These circumstances oblige me to sell a house, a rural tract of land belonging by inheritance to my wife, the family car.... I run the risk of losing the home that I built forty years ago and where all of my children were born and raised.

I have been through very difficult times in terms of my health: an open heart surgery that resulted in two by-passes; and a prostate operation detecting a second-degree cancer that, according to periodic examinations, thanks to God, appears to have been cured.

This is the actual situation of a man who, being a worker for 25 years, started a small Factory with much effort and dedication. I feel proud of having manufactured for many years if not the best, some of the best roof tiles and bricks in the area.”⁴⁰⁴



Figure 6 Roof-tile Making Factory Closed Because of Lack of Raw Material

340. **The Panel is surprised to read in documents provided to the Panel by Management that “[t]o the extent that we are aware, there has not been a single legally recognized claim by a terminated employee against his or her employer.”⁴⁰⁵ Many claims brought by terminated employees against their employers were brought to the attention of the Panel on its visits.⁴⁰⁶**
341. Finally, since OD 4.30 calls for compensation of all losses resulting from involuntary resettlement, the Panel finds that Management’s statements, included in the May 2003 and July 2003 memoranda, that roof-tile industries’ owners would not recover severance payments made to their workers, regardless of the workers’ legal status, because “[n]o compensation was provided to those workers

⁴⁰⁴ Statement provided to the Panel during its May 2003 visit to the project area.

⁴⁰⁵ Management Memorandum, May 13, 2003.

⁴⁰⁶ The Panel notes, however, that in a January 14, 2004, Memorandum to the Panel, Management refers to the situation of a tile industry owner whose employees filed a law suit against him to obtain the severance payments owed to them.

who had lost their jobs due to the closing of an enterprise, as the compensation strategy was designed to promote continuation of production” is inconsistent with the Bank’s resettlement policy.⁴⁰⁷ This strategy does not maintain employment sources.

10.3.3. Access to Clay Deposits

342. The Requesters acknowledge that EBY compensated a large number of brick-makers and ceramists but allege that many of these people had to relocate to areas that are too far from clay deposits. As a result, this group of affected people now lives under difficult economic conditions because EBY allegedly owns the clay deposits and the people are forced to buy raw material from EBY or from others who still own their land. The Requesters therefore ask that a program of income restoration be put in place for these families.
343. The Management Response claims that the relocation option offered to the displaced persons included, *inter alia*, a plot for a production unit, five years of clay trucked into the plot, social and technical assistance, and a grant of US\$2,500 for lost time.⁴⁰⁸ Management claims that “[t]he great majority of those compensated were family owned businesses with some temporary or seasonal laborers...For those who selected cash compensation, EBY began in 1994 to offer training courses to the brick makers through the Servicio Nacional de Promoción Profesional. These courses on various marketable skills were very well attended, but the impact on employment has not been very significant due to the recession in the country and region.”⁴⁰⁹
344. The Bank policy on involuntary resettlement, OD 4.30, establishes that land, housing, infrastructure, and other compensation should be provided to populations who may have usufruct or customary rights to land or access to other resources taken by the project, regardless of the absence of legal title to land by such groups.⁴¹⁰ In addition (and as noted above in Section 9.2.2) OD 4.30 establishes the importance of vocational training and similar initiatives for displaced people who lose their livelihood.⁴¹¹
345. **The Panel finds that the Bank-approved provision of five years access to clay has not fully met OD 4.30’s requirement that project-affected people have their pre-resettlement income earning capacity improved or at least restored. In stating this, the Panel recognizes that a severe economic crisis has occurred in the area. Although there have been efforts to retrain the brick-makers for other vocations, the Panel finds that for many people their income earning capacity seems not to have been restored.**

⁴⁰⁷ Management Memorandum, July 8, 2003.

⁴⁰⁸ Management Response, ¶ 132.

⁴⁰⁹ Ibid., ¶ 133.

⁴¹⁰ OD 4.30, ¶ 3(e).

⁴¹¹ Ibid., ¶ 18.

11. ADEQUACY OF THE RESETTLEMENT PLAN

346. Bank policy on involuntary resettlement applicable to the Yacyretá Project, OD 4.30, provides that, when large-scale displacement of populations cannot be avoided, such displacement should proceed based on a detailed resettlement plan, a timetable, and a budget, all aimed at improving or at least restoring the economic base for those relocated.⁴¹²
347. In 1992 the Bank required implementation of a new resettlement policy, which led to the second “Resettlement and Rehabilitation Action Plan” (PARR), the resettlement plan now being implemented. Only the population registered in the census of 1989 to 1990 (the so-called “1990 census”) was eligible for Bank compensation or resettlement.⁴¹³ According to this PARR, all affected people, regardless of tenure, were entitled to a new plot and house at no cost—terms consistent with OD 4.30 and also much better (for the majority of non-titled residents) than those that had been offered under the original relocation plan of 1979. The PARR distinguished between urban and rural resettlement populations and sites. Ninety-two percent of the population to be resettled under this plan was urban, and eighty-seven percent lacked titles to their homes.⁴¹⁴
348. **The Panel finds that the Bank approved a detailed resettlement plan, timetable, and budget for this project aimed at improving or at least restoring the economic base for those relocated. Thus, in this sense the Bank was in compliance with the requirement of OD 4.30. However, the plan, budget, and particularly the timetable envisaged within that plan have not worked as originally intended, creating a compliance issue for other aspects of this OD.**
349. In accordance with the Third Owners’ Agreement, the status of the “extra-census” population, those that arrived after the 1990 census, is that the governments of Paraguay and Argentina will fund their resettlement or compensation, each government funding the extra-census resettlement projects for its residents.⁴¹⁵ This is in accordance with OD 4.30.

11.1. Influx of People into the Project Area

⁴¹² OD 4.30, ¶ 4.

⁴¹³ Management Response, ¶ 43.

⁴¹⁴ Ibid., ¶ 119.

⁴¹⁵ The “Third Owners’ Agreement” between Argentina, Paraguay, and the Bank, as amended in 1997 when the legal agreements for Loans 2854-AR and 3520-AR were updated, established that any family not included in the 1990 census and living in areas up to 84 masl (“post-census families”) would be resettled and/or compensated by the governments of the respective countries with their own funds.

350. OD 4.30 requires that under Bank-approved resettlement plans, the affected area and the displaced population be identified. The host government should develop mechanisms to prevent “*illegal encroachers and squatters*” from participating in the benefits and compensation arrangements.⁴¹⁶ Clearly that has not happened in this case. One reason is the lack of an adequate expropriation law in Paraguay. Paraguay allegedly did not have the power to expropriate all land to be flooded under the Project and to prevent people from settling on it because the original expropriation law was limited to properties within the area to be flooded up to 76masl. This permitted a great increase in population, and thus increased the number of claimants who now need to be resettled (the increase began after the 1980 census and has continued to the present). In December 2003, EBY confirmed to the Panel that, to their knowledge, no other legal method existed (for example, residence permits) that could have been used to prevent this influx.
351. There has also been a large increase in people with minimal connections to the area. In a poor region where many people have few other alternatives, there is considerable attraction in becoming eligible for compensation or for a new house, by moving to the area about to be flooded. During site visits, for example, the Panel met with an association of brick-workers who felt that they had been unfairly denied compensation but also admitted that many of them had recently come to the area seeking work. In other cases, people were attracted to the area by the work offered by the hydroelectric project itself. The large number of people left unemployed at Ayolas after the hydroelectric dam works had been completed is a case in point. The Panel was informed that some of these people had been living in the area long enough to be included in later censuses (including the 1990 census) as affected persons.⁴¹⁷
352. OD 4.30 notes that socioeconomic surveys, such as the census, should be conducted as early as possible “*to prevent inflows of population ineligible for compensation.*”⁴¹⁸ OD 4.30 also requires a “*clear understanding of the legal issues involved in resettlement*” in order “*to design a feasible resettlement plan. An analysis should be made to determine the nature of the legal framework for the resettlement envisaged, including (a) the scope of the power of eminent domain.*”⁴¹⁹
353. **The Panel finds that within the prevailing legal setting the resettlement plan as designed could not prevent the influx of ineligible population, because the legal framework was inadequate for this purpose. The Panel finds that the analysis of legal issues in resettlement, including analysis of the power of**

⁴¹⁶ OD 4.30, ¶ 14.

⁴¹⁷ Panel’s interviews with affected people, Panel’s visit, January 2003.

⁴¹⁸ OD 4.30, ¶ 11.

⁴¹⁹ Ibid., ¶ 12.

eminent domain either did not occur or was inadequate at the time the Bank approved the resettlement plan. This is not in compliance with OD 4.30.⁴²⁰

11.2. Delays and Uncertainties

354. An issue of broad concern is that the long-term delays in raising the reservoir's water levels have caused an extraordinary amount of uncertainty among affected people.⁴²¹ These delays are the source of problems and serious hardship for many people left "in limbo" (as some Bank staff described it in interviews with the Panel). They do not know if and when they will be resettled; they are unable to sell or expand their properties; and in many ways they have to adjust what would be a normal social organization of their households in order to remain eligible for compensation. This has occurred despite the requirement of OD 4.30 that any resettlement plan accepted by the Bank be "*time-bound*."⁴²²
355. The inadequacy of the existing resettlement plan (of 1992) for handling lengthy delays is mainly due to the fact that it was designed for the relatively speedy raising of the water level of the reservoir to 83 masl. The initially planned phased reservoir filling schedule was to raise the water from its normal 68 masl level to 76 masl for one year beginning in 1994, then to 78 masl in 1995 for three years, and then to the full 83 masl by 1998.⁴²³ The water is currently at 76 masl. To raise the water to this height and provide for a buffer area, all evictions have taken place to the 78 masl level.⁴²⁴ However, the reservoir has had to remain at the 76 masl height since 1994, leaving a large population that lives between 78 and 84 masl (the latter figure includes a 1 masl buffer zone above the 83 masl water level) with the hardship of uncertainty for which they have received no compensation other than the promise or hope of possible resettlement (or cash compensation in lieu of resettlement) at some uncertain future date.
356. As will be detailed more fully below, this long-term uncertainty (at least ten years so far, and an unknown amount of time to come) leaves the large population that has long been awaiting resettlement with losses and hardships. The Panel met many people who are unable to sell homes or property in the area scheduled for flooding but not yet flooded, as buyers can seldom be found for property that may or may not be flooded in the future. These people are unsure whether they will be compensated for improvements or additions to their already-surveyed homes, including "normal" changes they would make to accommodate their growing families.⁴²⁵ If they had certainty as to how many years they would be able to occupy their homes, they could make informed decisions about whether it is

⁴²⁰ OD 4.30, ¶ 12. The Panel notes, however, that the Project was under execution when OD 4.30 became applicable to it.

⁴²¹ See *supra* § 2.4.

⁴²² OD 4.30, ¶ 30.

⁴²³ Tratado de Yacyretá, Letter of Agreement (January 9, 1992), "Cronograma de Obras," Normas Complementarias, 231–235.

⁴²⁴ Interviews, Encarnación, December 2003.

⁴²⁵ Interviews, Encarnación, January 2003.

worthwhile to invest in improvements, even if they would not be compensated for them.

357. The Panel also met many people who dare not move away for fear of losing their right to future compensation. In some cases, elderly parents remained living with many married children and their families in the same house, rather than have grown children risk losing their status as part of the original resettlement-eligible household by moving out or building another house of their own. Many of the most heart-rending cases of poverty and also anger on the part of the affected people who talked with the Panel were those who had been approved for resettlement but are currently unable to be resettled until the project proceeds with raising the water level at some unknown date in the future.

Waiting in Barrio Santa Rosa

Mr. B,¹ 83 years old, and his wife, 80 years old, have lived in their house in Barrio Santa Rosa for 38 years. They are above the 78 meter level, but will be included in the expropriations when the water rises to 83 meters above sea level (masl). Like many others who live in Barrio Santa Rosa, they feel that the urban flooding they experience is directly related to the raising of the water level (a claim reflected in the Request for Inspection). They would very much like to get an advanced indemnification for their home and move out of the area under the Urban Creeks Program (PDA). They are worried that, if their compensation is delayed, they will die before the compensation arrangements are made, leaving the matter unfinished and eligibility (or access to their compensation) in question for their children. They have been sending to EBY medical information about their illnesses. Mr. B has been unable to work at his carpentry profession since 1977. Their son, has “replaced” the father as a carpenter by building a new carpentry shop in the yard of his parents’ home. So when the property is expropriated, the value of the plot of land and house will go to Mr. B’s parents, and a separate indemnification for the value of his own “improvement” on the property (that is, his carpentry shop) will go to their son. But the son complains that ever since the water rose to 78 m, they have been trying to make a living while awaiting expropriation, however, there is much less work for carpenters because so many people have already left in the first round of expropriations to the 78 m level. Mr. and Mrs. B, as well as their other children have not moved out because they fear losing their status as affected persons. The whole family has been waiting for the expropriation of this house in order to move to a new home near their daughter’s home. Though their current house is in an area that will be flooded, it had a central location and, they insist, a high value in the past, when this was considered a good neighborhood of Encarnación, before the recent frequent flooding. Mr. and Mrs. B say they would like to have sold their home already and moved, but since all potential buyers know that this area could be flooded any time, there is no market for selling the property, and EBY has not come through with any compensation for it. So they continue trying to make do.

¹ Mr. B is a fictitious name.

358. The Panel finds that OD 4.30 on Involuntary Resettlement did not clearly anticipate the long delays and uncertainties in implementing the resettlement plan. There is clearly a requirement that the resettlement plan be time-bound, and the required components of a resettlement plan include a detailed implementation schedule and a means of monitoring that schedule to assure that it is kept.⁴²⁶ These hardships and negative impacts caused by an unduly long transition period prior to the move could be considered to be part of the “losses” for which the affected population should be compensated. Without adequate planning for this eventuality, the large population left “in limbo” by this uncertainty exemplifies the situation referenced in OD 4.30: *‘Involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are carefully planned and carried out.’*⁴²⁷
359. Again, OD 4.30 envisages a rapid movement of people, even in large-scale resettlement, but also emphasizes the importance of sustaining “*existing patterns of group organization*”⁴²⁸—the kind of patterns of group organization that have been interrupted and unnaturally deformed by the extended uncertainties of the Yacyretá Project’s resettlement plan.
360. **The Panel finds that in the complex situation of this project, with its very long delays in implementation, the Bank should have made adequate allowances in the 1992 plan and later modifications of it for the severe hardships that have occurred as a result of uncertainties and delays in implementing the plan. Where a person can document a loss directly attributable to the very long delay in resettlement, such loss should be recognized under OD 4.30, but the Panel recognizes that in practice this will be very difficult to implement.**

12. PROGRAMA DESBORDE DE ARROYOS (PDA) - THE URBAN CREEKS PROGRAM

361. The Request raises a number of issues related to design and implementation of the PDA program. The Requesters believe that some families living in neighborhoods such as Pacu Cuá, Santa Rosa, M’boi Caé, Itá Paso, and San Blas are benefiting from the PDA program although they are not suffering the conditions of those living along the creeks, for which the program was indeed created. The Request cites the specific example of 110 families who live in the District of Cambyreta, on the banks of the Potí’y creek whose houses are inundated whenever it rains. The Request alleges also that there are “*ravaged lands*” in the Cambyreta district on the banks of the Potí’y creek that “*are now unused because of the current elevation above sea level.*” The Requesters also claim that EBY did not adequately consult the affected people in preparing the PDA program.

⁴²⁶ OD 4.30, ¶ 20-21

⁴²⁷ Ibid., ¶ 2.

⁴²⁸ Ibid., ¶ 7.

362. The Management Response explains that the PDA was developed in 1998 for *“families between 78 and 84 masl that were living along urban creeks and were exposed to excessively high risks and thus could not wait until a plan to reach 84 masl was agreed and implemented.”*⁴²⁹ According to the Response, in 1998 EBY defined high risks areas below 84 masl as *“those neighborhoods along the main urban creeks”* and *“other areas not necessarily affected by natural urban creeks but exposed to similar high environmental risks located near open rain water and sewage channels.”*⁴³⁰ Management states that EBY carried out an assessment in 1999 and identified *“1,101 families in Encarnación below 84 masl, including families living along the Potí’y (308), M’boi Caé (589) and M’boi Tesa (204) Creeks.”*⁴³¹
363. Management maintains that the Bank *“has been actively involved in the supervision of the PDA in order to ensure that it is implemented in compliance with OD 4.30 on Involuntary Resettlement.”*⁴³² In fact, although the Bank does not finance the PDA program, *“its interest and commitment...results from the fact that it constitutes a subset of the resettlement contemplated by the Yacyretá Project’s legal agreements.”*⁴³³ Management also *“considers that the decisions adopted by EBY are consistent with applicable safeguard policies.”*⁴³⁴
364. In response to the specific claims, Management states that, based on the Bank’s advice, *“EBY has modified its methodologies allowing for increased participation of families to be resettled by the PDA.”*⁴³⁵ Since 1999, EBY has conducted information meetings with local authorities as well as representatives from affected neighborhoods.⁴³⁶ In these meetings it has explained the program, its objectives, the criteria for inclusion, and the methodologies adopted. In addition, *“[f]amilies have also been incorporated into the process of managing and planning some resettlement activities.”*⁴³⁷
365. Management is aware that some families who were not included in the program may be dissatisfied with the exclusion. It notes that families living between levels 78 and 84 masl at “relatively close distance” from urban creeks but not exposed to high risk will be resettled as part of any plan to raise the reservoir level to 83 masl. Other families who live along urban creeks but above 83 masl who have demanded to be included in the PDA will not be because Management asserts there is no causal link between the reservoir and urban creek flooding.⁴³⁸

⁴²⁹ Management Response, ¶ 50.

⁴³⁰ Ibid., ¶ 52.

⁴³¹ Ibid., ¶ 53.

⁴³² Ibid., ¶ 51.

⁴³³ Ibid.

⁴³⁴ Management Response, ¶ 62.

⁴³⁵ Ibid., ¶ 58.

⁴³⁶ Ibid.

⁴³⁷ Ibid.

⁴³⁸ Ibid., ¶ 59.

366. With respect to the neighborhoods listed in the Request that, according to the Requesters, are not affected by the flooding, Management states that the Pacu Cúa, Santa Rosa, and M'boi Caé neighborhoods are indeed at high risk of flooding. The Management Response also indicates that the PDA program included the construction of 674 houses for families already living in the resettlement site Itá Paso, although these families are not affected by flooding. They were included in the PDA program to improve their living conditions, as the GOP had provided Itá Paso with inadequate services and poor infrastructure.⁴³⁹ Families resettled to Itá Paso belong to the so-called extra-censales group whose resettlement is financed by the government of Paraguay under the Third Owners' Agreement.⁴⁴⁰
367. As to the special case of the 110 families from the Cambyreta district that the Requesters mention,⁴⁴¹ according to Management, they are included in the PDA but "*did not agree with the proposed resettlement site*"⁴⁴² and suggested a different site that would require EBY to purchase new land.⁴⁴³ However, the Response states that as the PDA was designed under "*clear budget and land restrictions*," the affected people's site proposal "*was considered as an option to be analyzed as part of the resettlements planned in regard to the raising of the level of the reservoir to 83 masl.*"⁴⁴⁴ Management adds that the Bank "*had recommended to EBY that the PDA provide a more flexible menu of resettlement options.*"⁴⁴⁵ However, EBY had pointed out that more flexibility in the implementation of the programs would lead to further delays that a range of site options was available (Itá Paso, Arroyo Porá or cash compensation instead of resettlement), and that "*any future resettlement program will be designed with more flexibility.*"⁴⁴⁶
368. The Panel met with representatives of the 110 families who refused to move to the resettlement site offered by EBY.⁴⁴⁷ Several people presented the Panel with other ideas for movement of their communities. They showed the Panel copies of letters they had sent proposing that they be allowed to purchase sites in a housing development closer to their existing properties, which would let them stay near their work places, church and community rather than move to the more distant resettlement site. The people interviewed had difficulties in understanding the reasons why such a distant resettlement site had been selected. They claim also that the purchase of the nearby sites they had proposed would be cheaper than the cost of EBY's proposed resettlement site.

⁴³⁹ Management Response, ¶ 60.

⁴⁴⁰ See supra §2.2.2.

⁴⁴¹ The Management Response claims that the number of families living in the affected block is 68 and not 110. Management Response, ¶ 60.

⁴⁴² Ibid., ¶ 59.

⁴⁴³ Ibid., ¶ 60.

⁴⁴⁴ Ibid.

⁴⁴⁵ Ibid., ¶ 58.

⁴⁴⁶ Management Response, ¶ 58.

⁴⁴⁷ Interviews, Encarnación, January; December 2003.

369. These families did not accept a move to the resettlement site, even though they were suffering frequent flooding and poor living conditions in their present homes, because they hoped to negotiate their suggested alternative. According to the people, EBY's response on this matter was that they only had one resettlement site to offer. They did not deny the other option but pointed out that, since the water level has not risen yet, that option could be considered when and if the water rises.
370. The Panel notes that both Management Response and EBY officials confirm that alternative sites for relocating these families were not considered in the context of the PDA program, even as future possibilities. As indicated previously, the Panel finds that the failure to consider acceptable resettlement alternatives violates OD 4.30. The Panel further finds, as noted earlier, that the resettlement sites that were offered did not ensure access to employment and services comparable to the old neighborhoods.
371. The Panel also interviewed many who appeared to be extremely confused about what the PDA program is about, why it was created, whether they were included in it, and when and if they were supposed to relocate. Management itself acknowledges that some of the claims are *"based on partial and incorrect information [and] misunderstanding about the scope of the PDA."*⁴⁴⁸
372. **The Panel finds that, under OD 4.30, Management must ensure that affected people are systematically informed about the objectives of the PDA program and consulted with regards their options and rights during the preparation and implementation of the program. Many affected people were not.**

⁴⁴⁸ Management Response, ¶ 48.

Chapter Four

Project Supervision And Monitoring

TABLE OF CONTENTS

Chapter Four	113
Project Supervision And Monitoring	113
Table of Contents	114
13. Project Supervision Operational Directive 13.05	115
13.1. Supervision of Environmental Operations	116
13.2. Supervision of Resettlement Activities.....	117
13.2.1. Technical Quality Assurance: Standards of Design, Construction and Implementation	117
13.2.2.Consultation with Affected People	121
13.3. Level of Supervision.....	122
13.4. Expertise in Bank Supervision.....	123
13.5. Linkages Between Supervision Reports (Aide Memoires and Back-to-Office Reports), Progress Reports to the Board, and Management Response to Request for Inspection.....	125

13. PROJECT SUPERVISION OPERATIONAL DIRECTIVE 13.05⁴⁴⁹

373. In their submission to the Panel, the Requesters claim that the Bank has violated its policies on project supervision and project monitoring and evaluation. They allege that the Bank has failed in supervising the project, in particular the implementation of the resettlement activities. The Request emphasizes that, while the main civil works advanced during the last twenty years, the environmental and resettlement activities were left behind. In the Requesters' view, this meant that the Bank allowed the power plant to begin its operations before completing the resettlement of the affected population. This harmed thousands of people and forced them to live in an unhealthy environment.
374. Management contends that it has exercised sound supervision as required by OD 13.05 on Project Supervision. It has had frequent contact with Government officials of both countries and with EBY personnel, made repeated field visits to the project site, and made sustained analysis of project issues.⁴⁵⁰ The Response adds that the Bank's supervision efforts have kept the Project moving in a positive direction. Management also states that it has periodically informed the Board about the evolution of the project and the challenges that it has faced during project implementation.
375. Management adds that *"Following the Board's endorsement of the Panel's recommendations of 1997, Management took several actions aimed at strengthening project supervision. Management reiterated its commitment to stay the course and protect the well-being of the affected people, consistent with the Panel's recommendations as endorsed by the Board, namely that 'Bank assistance will be vital to sustainable outcomes.' The Bank, the Borrower and EBY have moved to address the concerns reflected in the Panel's Review. Nevertheless, while some aspects have gone well, others are subject to the frequent changes in EBY's management and political climate, and restricted by the chronic institutional weaknesses of EBY, and its insufficient commitment to consultation and participation."*⁴⁵¹
376. Management asserts that the supervision efforts have included *"...(a) close field supervision since 1999 by assigning the Task Manager to Buenos Aires and contracting a social expert based in Asunción, and (b) intensified supervision through the use of a more diversified supervision strategy. In addition to standard supervision missions, supervision visits to Posadas and Encarnación were conducted regularly by the Task Manager based in Buenos Aires and the social*

⁴⁴⁹ World Bank Operational Manual, Operational Directive 13.05, "Project Supervision" (March 28, 1989) [hereinafter "OD 13.05, Project Supervision"]. Unless specifically noted, reference to standards and requirements of OD 13.05 includes references to the same in OD 10.71 and OP/BP 13.05

⁴⁵⁰ Management Response, ¶ 142-43.

⁴⁵¹ Ibid., ¶ 67 (citing The Inspection Panel, *Review of Problems and Assessment of Action Plans: Argentina/Paraguay: Yacyretá Hydroelectric Project*, September 16, 1997).

expert in Asunción.”⁴⁵² It adds that it developed a joint supervision instrument with IDB “to allow for senior Management to review problems and progress in project implementation, including resettlement and the PDA.”⁴⁵³ Three High Level Supervision Meetings were held from 1999 to 2002, in which the Regional Vice President and other senior regional staff discussed project issues with high level government officials from Argentina and Paraguay and EBY. Management Response states that the Regional Vice Presidents made three visits to the project sites. The Panel notes that, although these high level supervision meetings reflect the serious concerns of senior regional management for the Project, these concerns were not apparent in the day-to-day supervision of the Project, as discussed below.

377. Management Response contains also an Annex B, presenting information on the number of supervision missions conducted during the period 1999-2001, as well as a summary of Management’s supervision of the Yacyretá Project in the period after the Inspection Panel’s 1997 Report. Management Response notes that “*Management believes that the Requesters are not fully aware of previous and ongoing Bank supervision efforts as well as the specific positive results these efforts have generated.*”⁴⁵⁴
378. OD 13.05 states that project supervision is one of the Bank's most important activities.⁴⁵⁵ According to OD 13.05, the main purpose of supervision is to “(a) *ensure that the borrower implements the project with due diligence to achieve the agreed development objectives and in conformity with the loan agreement; (b) to identify problems promptly as they arise during implementation and help the borrower resolve them... (c) to take timely action to cancel a project if its continuation is no longer justified, particularly if it can no longer be expected to achieve the desired development objectives.*”⁴⁵⁶ The OD adds that adequate resources must be allocated to supervision and the Regions should allocate resources “*commensurate with the nature, complexity, and size of each project, with the problems experienced, and with the borrower's institutional capabilities and needs.*”⁴⁵⁷ These principles were not changed in OP/BP 13.05

13.1. Supervision of Environmental Operations

379. In the Panel’s view, a distinction must be made between the supervision of the environmental aspects of the main civil works components of the project and that of the resettlement activities. As shown in chapter 2 of this report, the Bank’s participation in the design, execution and supervision of biophysical mitigation activities of the main works was quite successful. The frequent supervision

⁴⁵² Ibid., ¶ 72.

⁴⁵³ Ibid., ¶ 73.

⁴⁵⁴ Ibid., ¶ 66.

⁴⁵⁵ Ibid., ¶ 1.

⁴⁵⁶ Ibid., ¶ 1 (a)-(c).

⁴⁵⁷ Ibid., ¶ 4.

missions were appropriately staffed, and a stable team of staff members have monitored the project's biophysical consequences. The relationship with EBY was strong and a number of corrective measures were taken to avoid or mitigate harm during project execution. These measures included, *inter alia*, improvement in coastal treatment activities to prevent contamination and negative impacts on health in Encarnación; the carrying out of a sedimentation study; the construction of baffle plates in the spillway to deal with gas over-saturation of water; a program to deal with the declining population of the Aylacostoma snail genus; aquatic weed control; and protected area (native reserve) control. **The Panel therefore finds that the Bank met the requirements of OD 13.05 with regard to the environmental aspects of the main civil works components of the project.**

13.2. Supervision of Resettlement Activities

380. Aside from the overall claim about the failure of the Bank in overseeing the implementation of the project resettlement component, the Request primarily addresses problems related to the location and design of the resettlement sites, the quality of workmanship, and the lack of consultations with, and options provided to, those who must be resettled. The Management Response, by contrast, reviews supervision on a wide number of issues, including the shortcomings and late approval of Paraguay's Expropriation Law and the slow progress in constructing the new municipal market, a new slaughterhouse, a wastewater treatment plant, and in other activities.
381. **After reviewing the evidence presented by Requesters, Management's Response and the Panel's independent observations, the Panel finds that supervision of resettlement by the Bank is inadequate in two important respects: a failure to ensure sound technical quality in the design, construction, and implementation of resettlement programs, and inadequate consultation with affected people.**

13.2.1. Technical Quality Assurance: Standards of Design, Construction and Implementation

382. **The Panel found that supervision of the design, standards and construction of infrastructure for the resettlements associated with the Yacyretá Project has been inadequate. Supervision missions appear to have given little attention to technical quality assurance. This does not comply with Paragraph 29 of OD 13.05, as detailed below.**
383. The Panel's own observations during visits to resettlement sites in and around Encarnación is that problems of sewers overflowing, pump stations malfunctioning, inadequate control of storm water, poor road construction, and poor house construction are easily seen. During its visits, the Panel saw clear evidence of a lack of supervision of construction activities.

384. When addressing the Panel, technical staff of the Cambyreta municipality were highly critical of the design and construction standards being accepted by EBY and the Bank for the resettlement sites.⁴⁵⁸ Their criticism extended to design of the sewerage reticulation system, especially the gauge and diameter of pipes through which sewage would be pumped under pressure, the capacity of holding tanks, and the number and location of pumping stations. They were also critical of the design standards being used for road construction as well as the lack of provision for storm water drainage other than via the road surface itself. With respect to house construction, their criticism was that building standards were simply not being enforced: specific mention was made of roofing beams and trusses being under-sized, timber being inadequately cured, and damp courses being omitted above foundations and concrete slabs. For each of the above complaints, the Panel was taken and shown actual examples of defects and associated problems that were occurring in resettlement sites before they had even been occupied!
385. The technical staff also expressed the view that Bank staff satisfied themselves as to the standards being applied by studying documents and failed to monitor whether these standards were actually applied during construction. In their view, in the absence of Bank oversight there is no incentive for EBY to adhere to good standards, as upon completion the civil works they are constructing are passed to other authorities, national or local, for operation and maintenance, and to the beneficiaries. The consequences and costs of poor design and construction thus shift away from EBY. The Panel was told that although the municipality had attempted to have EBY conform to their regulations, *‘EBY does as it wills,’* claiming either that works are of a temporary nature and that deficiencies will be corrected before completion, or that the municipality has no jurisdiction until such time as the project is completed.
386. When the question of design standards was raised with EBY staff, they indicated that EBY did not have specifications or standards of their own and therefore relied on consultants, contractors, and local authorities observing any applicable Paraguayan national standards.⁴⁵⁹
387. **The Panel found ample evidence of poor quality construction within resettlement sites.** Although the facilities look quite good at first sight, the Panel saw during its visits numerous examples of poor quality construction of houses as well as poor drainage systems, extremely poor road construction leading to easily lifted cobblestones and major pothole damage even on new roads, with severe problems caused apparently by the lack of, or defective, storm water drainage.
388. In one case seen by the Panel, the quality of the design and construction on the site was so poor that it has effectively created a new class of affected people

⁴⁵⁸ Interviews, Encarnación, January 2003.

⁴⁵⁹ Ibid.

around the site, who may claim compensation. Due to extremely poor drainage at Arroyo Porá, the nearby areas, (well above the 84 masl level, lying just below the new resettlement site) suffered flooding from rainwater runoff from the resettlement site. The Panel observed a similar situation in December 2003 when it visited the early stage of construction of Arroyo Porá II site, which lies close by a neighborhood called Barrio Tacuary.⁴⁶⁰ **The Panel finds that if supervision had been stronger, Bank staff would have spotted the poor quality of design and construction of resettlement sites.**

389. Bank staff are divided as to whether or not they carry responsibility for problems arising from poor or inappropriate design. One Bank staff member in a responsible position expressed the view that it is not the responsibility of Bank staff to check project designs and that it was certainly not their job to be “*construction inspectors*.”⁴⁶¹ This contrasts sharply with the view of another Bank staff member, also in a responsible position, that it is the responsibility of Bank staff to ensure that detailed project designs and standards being applied are appropriate to the circumstances, and further, that it is their duty to make site visits to inspect the quality of work that has been undertaken with Bank funding.⁴⁶²
390. A similar difference of opinion between Bank staff occurs with respect to the Bank’s responsibility to ensure that standards being applied in civil works are appropriate. One view is that it is not the Bank’s responsibility to check technical specifications or to ensure that national specifications accord with international best practice.⁴⁶³ The opposing view is that Bank staff do have the responsibility of checking technical standards being applied in Bank funded projects.⁴⁶⁴
391. OD 13.05 on Project Supervision is specific that it is the responsibility of the Bank’s technical departments to “*exercise a quality assurance role in the supervision process*” but qualifies this statement by adding “*for which detailed procedures and responsibilities are defined by each Region*.”⁴⁶⁵ OD 13.05 provides also for Bank staff to visit the project sites and facility.⁴⁶⁶
392. **The Panel finds that there is clear need for a greater level of supervision of technical design and construction in all facets of the Yacyretá resettlement scheme and notes the necessity for adequate supervision of technical design and supervision in resettlement schemes generally.**
393. After many visits to the area by the Inspection Panel and follow-up interviews with Bank staff members, the supervision mission of October 2003 noted in its

⁴⁶⁰ See § 8.5.

⁴⁶¹ Staff Interviews, Washington, DC, 2003.

⁴⁶² Ibid., 2003.

⁴⁶³ Ibid.

⁴⁶⁴ Ibid.

⁴⁶⁵ Ibid., ¶ 29.

⁴⁶⁶ OD 13.05, Project Supervision, ¶ 11.

Aide Memoire that “*there is no integration of environmental management into the design and construction of urban civil works, mostly in the resettlement sites. This lack of integration is evident in the urban plan of many neighborhoods, such as Arroyo Porá where partial consideration was given to urban environmental parameters as the development of the whole taking into account level curves and natural drainage protection. In this last respect, the forced channeling works of the main creek, with deep and wide ditches that run in between and in front of houses, represent a high-risk situation for children and elderly people who must use small wooden bridges to reach the street.*” The Aide Memoire recommended that “*immediate action should be taken to cover up these ditches in the most critical parts to prevent tragedies that would place the EBY in an increasingly fragile position before the community.*”

394. This is in sharp contrast with Management’s statements in its memorandum to the Panel on January 13, 2004 that “... *Bank oversight has ensured that EBY’s capacity to apply those criteria and procedures [appropriate environmental criteria and procedures] was sufficient... the Task Team verified the success of their approach through regular visits to the resettlement locations during supervision.*” The memorandum also noted that “[t]he approach used throughout this period has been consistent with Bank policy and practice toward projects and their sub-projects that have minimal environmental impacts (such as the Ita Paso and Arroyo Porá resettlement sites, as well as other minor PDA-associated infrastructure.)”⁴⁶⁷
395. One of the specific issues mentioned in the Request, which relates directly to supervision of resettlement site construction, is the claim that resettlements built by the Project at Buena Vista and San Pedro have aggravated the environmental and health situation by directly discharging wastewater and refuse into the nearby creeks. Management Response notes that the solution to this problem is the construction of the wastewater treatment plant, to which the resettlement sites at Buena Vista and San Pedro will in due course be connected. **The Panel finds that given the foreseeable delays in the construction and operation of the wastewater treatment plant, Management should have anticipated the problem of delay and ensured that appropriate interim arrangements for discharge of the waste were made until the plant was built and all house connections made.**
396. **The Panel finds that Management’s failure to ensure sound technical quality of work on the resettlement project and to encourage needed design changes as circumstances changed is not in compliance with OD 13.05 on Project Supervision.** The fact that belatedly at the end of 2003 the Bank suggested some design changes with respect to a resettlement site does not yet bring the Bank into

⁴⁶⁷ Management Memorandum, Yacyretá Inspection: Follow-up to Your Memo dated December 10, 2003, Concerning certain Resettlement-related Components, January 13, 2004.

compliance, especially since Management suggested in its later memo to the Panel on January 13, 2004, that the site conditions were fine.⁴⁶⁸

13.2.2.Consultation with Affected People

397. BP 13.05 makes explicit the principle that effective supervision necessarily includes consultation with project affected people. This is both to ensure that affected people have a voice as well as to ensure that problems affecting the project are uncovered. The Panel was struck by the large number of people at resettlement sites who insisted that no one from the Bank had ever come to visit, or discuss problems directly with the them, but rather had held meetings with EBY staff and some “leaders” of the affected people only in hotels or offices. The Panel is concerned that the Bank’s supervision missions seem not to have interacted meaningfully with affected people or reviewed thoroughly the resettlement sites. A review of supervision mission reports indicates they do not generally include any minutes or records of on-site meetings with affected people. The Panel is further concerned that in any pre-arranged visit to a resettlement site with Project staff, the Bank may have seen the places where things were proceeding well and neither saw nor sought out the examples of where the project was not proceeding well. Effective consultation with affected people, in a setting in which they feel comfortable in providing information, may reveal project flaws and inadequacies in implementation.
398. Some Bank staff interviewed by the Panel, however, insisted that they had visited resettlement sites, sometimes on their own and sometimes with EBY staff, and met directly with affected people, although they had not included records of such meetings within their supervision reports. Bank staff also mentioned several specific problems that they heard from affected people and brought to EBY for resolution, following up later to make sure that a resolution had been obtained. The Panel notes Management’s statement that the High Level Meetings in 2000 and 2001 included meetings with civil society groups and NGOs.
399. **The Panel finds that there is a wide discrepancy between the recollections of affected people in the project area, who insist there have been no meaningful consultations or thorough on-site visits, and Management’s statements about supervision missions. The Panel finds that Management must ensure that it consults with and interacts meaningfully with affected people and that consultations must be in settings where affected people feel able to convey effectively their concerns to Management. Bank supervision missions should clearly state the places they visited during field inspections and the conditions under which they visited (e.g. with Project staff or accompanied by representatives of NGOs, etc.), in order to better document not only that supervision missions were present in the area, but that the supervision team members actually had contact with affected persons and looked into matters directly dealing with issues of safeguard policies.**

⁴⁶⁸ Ibid.

13.3. Level of Supervision

400. **Under the conditions prevalent in the area and given the Project's protracted execution and its controversial nature, the Bank should have expected the need for a higher level of supervision and ensured that it was effective.** The Panel observes that during field visits to the Project area many people affected by the project strongly expressed their own *perception* that corruption pervades the political life of the Project area and includes those responsible for, and benefiting from, resources provided by EBY. Some requesters and other persons met during field visits frequently expressed their suspicions of corruption in the awarding of contracts associated with the Project, in the sequencing in which affected people received compensation (including resettlement), and sometimes in the determination of which persons were compensated and the amounts of compensation received for resettlement.
401. Aside from this widespread *perception* of corruption that was conveyed to the Panel, there is also considerable widely available published information about the history of the Yacyretá project that explores various accusations of corruption in the history of the Project itself as well as the political and institutional structures within which the Project operates.⁴⁶⁹
402. **The Panel is not in a position to comment on the accuracy of the perception of corruption. However, under these circumstances, the Panel finds that the Bank needs to expect a higher than usual level of supervision in order to ensure that corruption does not occur and to assure affected people that this is so.**
403. While a larger than average number of supervision missions, which included three High Level Supervision Meetings, demonstrates more intense supervision than is usual, it may not be an adequate response to alleviate the perceptions and suspicions of project-affected persons. Inadequate on site reconnaissance and supervision seems to be one of the biggest problems of this Project in terms of complying with Bank policies. This kind of finding has been a common thread in other Inspection Panel cases. This may have contributed to the affected people's apparent hostility towards the Bank staff. Many perceive that the only "Bank people" the affected people have met and talked with were the Panel and its staff, even though this may not be the case.

⁴⁶⁹ See generally, Helvio Ildefonso Botana, *El Caldero de Yacyretá* (Buenos Aires, Peña Lillo, 1982); Norberto Burmúdez, *Perros de Presa* (Buenos Aires, Javier Vergara, 2001); Jorge Carrettoni, *De Frondizi a Alfonsín: el BID, Yacyretá, la Constituyente* (Buenos Aires, Catálogos, 1998); Carmen A. Ferradás, *Power in the Southern Cone Borderlands: an Anthropology of Development Practice* (Connecticut, Bergin & Garvey, 1998); Magno Ferreira Falcón, *El Complejo Hidroeléctrico Yacyretá: Histórico y Polémico Proyecto Binacional* (Asunción, Colegio de Graduados en Ciencias Económicas, 1990); Gustavo Lins. Ribeiro, *Transnational Capitalism and Hydropolitics in Argentina: the Yacyretá High Dam* (Gainesville, University Press of Florida, 1994); Héctor Sánchez, *Yacyretá: Una Lucha Sin Tregua* (Buenos Aires, Ediciones Espartaco, 1989).

13.4. Expertise in Bank Supervision

404. The Panel is concerned that while the Bank sent many supervision missions to the Project area, the teams did not identify or address the problems of technical quality in the resettlement sites identified earlier. The Aide Memoire of November 2003 acknowledged clearly for the first time the *“need for better integration of environmental considerations in the design and construction of urban civil works, principally in resettlement neighborhoods.”* **The Panel points to the need for Management to ensure that the supervision missions have the requisite technical expertise to review adequately the design and construction of urban resettlements and the impact of the resettlement areas on neighboring areas and to the need to ensure that reviews are conducted in an integrated way.**⁴⁷⁰
405. The Panel also notes that as the Yacyretá Project proceeded, the resettlement issues became progressively more important and difficult to address. **The Panel notes that Management’s supervision of the Yacyretá Project’s resettlement and rehabilitation activities did not adapt effectively to this change by using more technical and social expertise to address problems of technical and social nature, as required to carry out by OD 13.05, paragraph 1 (b).**
406. The Panel analyzed Management Response to the Request for Inspection, including the attached matrix that lists the supervisions missions undertaken from April 1997 through October 2002.⁴⁷¹ In addition, it reviewed the supervision reports related to most of those missions, i.e. Aide Memoires and Back to Office reports.⁴⁷² The review focused on the composition of the supervision teams - in terms of number of people and their expertise - vis-à-vis the emerging project problems relating to resettlement.
407. The records show that within the time frame June 1997- February 2003, supervision seems to have been particularly intense for a two-year period - between late 1999 and early 2002, when the then project’s Task Manager, who was based in Buenos Aires, Argentina, and a social consultant based in Asunción, Paraguay, visited the project area very frequently. However, the Panel observes that from 1997 to 2003, while the problems in carrying out the resettlement activities continued to increase⁴⁷³ - the number of Bank staff concerned with the social issues who were supervising the project’s implementation remained

⁴⁷⁰ See § 12.2.1.

⁴⁷¹ Management Response, Annex B. In addition to the standard missions, the matrix reports 29 visits to Encarnación and Posadas from late 1999 to early 2002 conducted by either then Task Manager based in Buenos Aires, a social specialist/civil society liaison based in Asunción, or both.

⁴⁷² Not all the reports related to the frequent short visits conducted by the Task Manager and the Civil Society Liaison between 1999 and 2002, referred to in footnote 471, were found in Bank files or were made available for the Panel’s review.

⁴⁷³ There were many reasons for this, such as the constant influx of new people in the project area, the growing number of complaints and requests of compensation directed to EBY, the delays in relocating eligible affected people and the social issues related to the flooding of urban creeks.

substantially the same over time. With very few exceptions, only one person concerned with these issues was included in each visit (see figure IV-1). This contrasts sharply with the pattern for environmental experts, who were greater in number earlier in the project life cycle when environmental concerns were more dominant and who were fewer in number and visited less frequently as these issues became less critical.

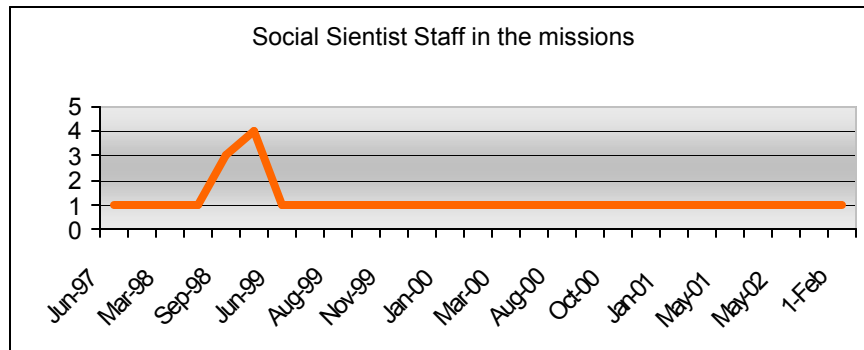


Figure IV-1 Bank Social Specialists in Supervision Missions from June 1997 to February 2003

408. **The Panel notes that the supervision missions appear to have been locked into formats established early in the project's life and to have not adapted to changing project needs.** Thus, since project supervision initially focused on plants, animals and biodiversity issues, supervision appears to have continued to concentrate on them even though the project's central problems changed from biophysical concerns to problems of a social nature. Bank staff seemed to rely too much on documents rather than being in the area to try to solve timely problems and/or contingencies, and lacked frequent "reality checks" as part of the supervision activities. The emergence of the PDA⁴⁷⁴ – in itself a very positive development as a tool to deal with the dreadful conditions of people living above 78 masl affected by frequent flooding – should have called for an increased supervision effort in the context of this controversial project but it did not. The Panel observes that developing a mechanism to allow both for continuity in supervision but also to adapt to changing situations would best help the Bank to comply with its policies on supervision.
409. According to the Aide Memoire of October 2003, there has not been and there is not yet any clear strategy to counteract the negative perceptions that the population has of the project. This image is exacerbated by political manipulation of the Project. **The absence of an effective communication strategy has significantly damaged relations between those concerned with implementing the project and the affected civilian population.**
410. The Panel draws attention to the recent supervision mission conducted in October 2003. **The Panel notes that the supervision mission's conclusions and recommendations regarding the social aspects of the project, as presented in**

⁴⁷⁴ See § 2.3.2.1.; 12.

the related Aide Memoire of October 2003, reflect those that Bank policies require. The problem is that these detailed recommendations were given after twenty years of project implementation, rather than before approving the projects' resettlement plan and related documents. Indeed, they seemed to have come only after the Panel had completed most of its investigation and raised these issues with Management during the course of its investigation.

411. The above mentioned supervision report acknowledges that the social impacts have never been identified and analyzed properly and that therefore no strategies have ever been designed to handle this type of situation. It adds that the issues related to urban, employment and other impacts were never tackled, while the urban impacts of resettlement were not defined and local authorities were not involved (until very recently) in the decisions on these matters. Although the resettlement and rehabilitation plans were requirements of the Bank's policies, the Aide Memoire recognizes that the baseline data were not established in due time and the censuses were not updated with the necessary frequency. Likewise, the fact that no enforceable cutoff dates were established encouraged the influx of population into the areas to be flooded.
412. The report further states that the absence of baseline data produced diverse criteria for identifying the actual leaders of the affected community. Local governments did not assume their role in a timely fashion, and NGOs and non-representative associations took over representational functions within the affected community. According to the report, EBY and the World Bank had to "empower" these new leaders, with their own individual interests, who seem to have set up a complaint-based "business" in the area. Most of the complaints were based on impacts not related to the Project. Despite the bi-national character of the Project, no conflict resolution mechanisms were developed. Some mediation mechanisms have been implemented, but they have had a low degree of credibility and legitimacy with the population, and therefore a low probability of success.

13.5. Linkages Between Supervision Reports (Aide Memoires and Back-to-Office Reports), Progress Reports to the Board, and Management Response to Request for Inspection

413. Given the serious delays in implementing the resettlement programs and the social and environmental problems associated with resettlement, the Panel inquired into whether the Aide Memoires and Back-to-Office reports reflected these conditions and whether the Progress reports to the Board reflected the content of the Aide Memoires and the Back-to-Office reports. The Panel is concerned that the some of the progress reports to the Board are more optimistic than the supervision reports in important respects. It is also concerned that Management's Response to the Request is more sanguine than the supervision reports.

414. The Panel has reviewed Back-to-Office reports and the related Aide Memoires of the supervision missions conducted between June 1997 and February 2003. It has compared them with the statements included in Management's Response to the Request for Inspection and the Progress Reports on the Yacyretá project presented annually to the Bank's Board of Executive Directors. The Panel notes that there are discrepancies among the different types of reports and that, in relation to specific issues, the progress reports to the Board have given a more optimistic account of the situation on the ground, than the Aide Memoires. Moreover, not until October 2003, after several visits by the Panel to the area, did an Aide Memoire accurately identify the many widespread and difficult problems in implementing the project and set forth in a realistic way the measures that need to be taken to comply with Bank safeguard policies.
415. There are at least three ways in which some of the reports Management prepared for the Board presented a more optimistic outlook than the Aide Memoires and the circumstances merited: by continued reference to virtual completion of Plan A, even though it is still not fully complete; by setting forth dates for the completion of the resettlement that were too reassuring; and by describing the construction of the wastewater treatment plant "as soon to be started and completed", even though construction has yet to begin in 2004. The Panel also notes that the 2001 report⁴⁷⁵ contains a significant amount of material that is taken verbatim from the 2000 report, which raises a question of whether the report adequately reflected conditions a year later.⁴⁷⁶
416. The Panel refers to several examples to illustrate the point above. Management Response, at Annex R, states that Plan A (actions pending from the raising of the reservoir to elevation 76 m) is "*fully completed in both Argentina and Paraguay as of 1999.*" Management Response elsewhere indicates that "*Plan A and Plan B are almost fully implemented, albeit with delays.*"⁴⁷⁷ The 1999 and the 2000 Progress Reports to the Board repeat that "*virtually all activities included under Plan A... were completed by December 1998.*"⁴⁷⁸ By contrast, the Aide Memoire dated April 16, 1999, reports that some actions related to the completion of Plan A are still outstanding, i.e. property titles still have to be conveyed to some of the relocated families, and sanitation works provided for the city of San Juan del

⁴⁷⁵ Management's Response includes Annex Q, Progress Reports to the Board, which in turn includes the Progress Reports for 2001 and earlier. It appears, however, that the 2001 Progress Report was never formally distributed to the Board.

⁴⁷⁶ Compare paragraphs 23-25 of the 2001 report with paragraphs 18 and 19 of the 2000; paragraph 32 of the 2001 report with paragraph 25 of the 2000; paragraph 38 of the 2001 report with paragraph 29 of the 2000 report; and paragraph 30 of the 2001 report with paragraph 22 of the 2000 report. In the last case, paragraph 30 appropriately notes, "As previously reported" to indicate that the substance of the report is similar to that which was previously reported. The Panel notes that none of the material that is taken verbatim from the earlier report appears in quotation marks, which makes it harder to identify the repetition.

⁴⁷⁷ Management Response, ¶ 68.

⁴⁷⁸ Progress Report to the Board, May 14, 1999, ¶ 17; Progress Report to the Board, January 20, 2000, ¶ 15. At the same time, the 2000 Progress Report noted that USD\$90,000 remained in Plan A, Progress Report to the Board, January 20, 2000, ¶ 15.

Paraná have yet to be completed. The Aide Memoire dated April 2000 included similar conclusions.

417. With regard to titling of plots, the progress report in year 2000 indicated that all titling would be done by December 2000, while the 2001 report noted that the titling is practically complete, though 142 cases were still not done.⁴⁷⁹ The Aide Memoire in October 2003 noted that dozens of these cases were still pending.⁴⁸⁰
418. The 2000 and 2001 progress reports to the Board were too optimistic in anticipating the completion dates for resettlement plans under Plan A and Plan B, although the Panel recognizes that it is difficult to anticipate completion dates.⁴⁸¹ With regard to the resettlement program generally under the Project, the Aide Memoire of October 2003 lays out in detail the many things that still need to be done before the resettlement plans are complete.⁴⁸²
419. The Project provides for the construction of a wastewater treatment plant. Management's progress report in 1999 indicated that the construction of the wastewater treatment plant would begin in January 2000 and be completed by mid-2001. The progress report for the year 2000 indicated that construction of the plant would begin in June 2000. As of January 2004, construction had not started on the plant.
420. **Based on the foregoing, the Panel finds that Management has in certain respects been too optimistic in informing the Board on the future of project implementation. The Panel understands that it is difficult to predict accurately when certain aspects of the project will be completed. It believes the reporting has understated serious difficulties in project implementation. The Panel especially notes that only after it had conducted its own field research from January through December 2003 and conducted follow up interviews, did Management produce an Aide Memoire (October 23-30, 2003) that identified many of the problems the Panel had found and the remedial actions, which need to be taken.**

⁴⁷⁹ Ibid., ¶ 32.

⁴⁸⁰ It appears from the Aide Memoire that 87 of these 142 cases are still pending.

⁴⁸¹ See Progress Report to the Board, January 20, 2000, ¶ 25; Progress Report to the Board, 2001, ¶ 32. The 2000 report indicated that the resettlement plan was 72.1% complete and would be fully completed by April 2000, according to plan. The 2001 report indicated that resettlement plans for affected families in Paraguay was 93% complete and would be fully completed by June 2002 according to plan. Both dates were premature.

⁴⁸² Aide Memoire, October 23-30, 2003. The Aide Memoire notes, for example, that in Itá Paso, "*no actions have been implemented by EBY since August 2002,*" on the rehabilitation programs.

Annex A

Table of findings

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
		Environment
Environmental screening	No response provided.	<i>Environmental screening process for phase two of Yacyretá Project and for the Asunción Sewerage Project was appropriate.</i>
Preparation of environmental assessments	No response provided. In November 2003 Management offered to the Panel documents prepared by EBY consultants EAs for specific resettlement sites. Management assured Panel that EBY had the capacity to apply environmental criteria and procedures.	<i>Management met requirements of OD 4.01 at time of bringing the Second Yacyretá Hydroelectric Project to Board approval in 1992. For specific resettlement sites documents presented as EAs are very inadequate and do not comply with OD 4.01. Range of environmental matters addressed is limited; alternative resettlement sites are not considered; no mitigation measures are suggested, and affected parties were not consulted.</i>
Consideration of alternatives	No response provided.	<i>Environmental Assessment for the main works of Second Yacyretá Hydroelectric Project is in compliance with OD 4.01.</i>
Consideration of the biophysical environment	No response provided.	<i>Consistent with OD 4.01, EA discusses a number of biophysical parameters. Biophysical environment affected by Yacyretá dam and reservoir is being managed competently and initial environmental problems that arose when the reservoir was first filled have been satisfactorily resolved. Future environmental management of Yacyretá Project is critically threatened by the Project's financial position. Both natural environment and project affected people will suffer additional harm if Project's environmental management practices deteriorate.</i>
Consideration of urban and peri-urban areas	Although Yacyretá Project always had an urban component, Encarnación grew beyond all expectations during the time the project was underway. Environmental master plan for Encarnación prepared in 1999, which municipality approved. Plan was the basis for resettlement planning.	<i>EA for the Second Yacyretá Project did not consider the effects of population growth on Encarnación or effects of resettlement sites on Encarnación infrastructure. Management's failure to assess the impact of the resettlement sites on the overall urban system and the induced effects associated with the Yacyretá Project is not in compliance with OD 4.30 and OD 4.01.</i>
Urban creeks flooding	Flooding of the urban creeks is unrelated to Yacyretá inundation to 76 mæsl.	<i>The Yacyretá dam has negligible effect on the water level of Paraná River at</i>

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
	<p>No causal relationship between urban creek flooding and raising the level of the reservoir to 76 masl. Flooding due to other causes than the Yacyretá reservoir, such as clogging of creeks with garbage and El Niño, which brings heavy rainfalls. Creeks are flowing at the same rate they would without a reservoir at 76 masl.</p>	<p><i>Encarnación, especially in times of flood. The Yacyretá reservoir is frequently operated under conditions that produce a water level in excess of 76 masl at Encarnación, which is not consistent with loan agreement and Third Owners Agreement, as amended. The excess, however, is only up to one meter higher. The contention that flooding is the consequence of the reservoir itself cannot be sustained. The urban creek flood conditions are mainly due to local conditions. Sum of all urbanization done upstream during the last years has increased the frequency and peak level of the floods.</i></p>
Water quality and health standards	<p>The dam has neither caused nor increased environmental pollution in the area of Encarnación-Posadas. Water quality monitoring programs show that, after filling the reservoir to 76 masl, there have been no significant changes in key physical and chemical parameters in the main water body of the reservoir at Encarnación or Posadas. Reservoir's water quality is oligotrophic, very low in nutrient and organic materials, mainly because of the reservoir's low hydraulic retention time (less than five days).</p>	<p><i>Flooding of the urban creeks makes drinking water wells on flood plain unsuitable for use. However, no causal relationship between present level of Yacyretá reservoir and pollution of wells and flooding of latrines. Management has ensured proper monitoring of water quality in the reservoir. Monitoring has been ongoing activity since before the filling of the reservoir and falls within satisfactory parameters.</i></p>
Health problems	<p>Since 1997, reservoir has not caused health problems and there is no evidence that situation has changed. Water-related diseases and diarrhea are attributable to pre-existing condition of lack of potable water supply and sanitation services. None of diseases mentioned in claim have increased on per capita basis within the project area since the reservoir filling. Since 1992, EBY has provided funds to SENEPA in Ministry of Public Health and Social Welfare of Paraguay to carry out systematic and continuous monitoring of insect vectors of diseases and outbreaks of certain diseases.</p>	<p><i>Ministry of Health and Social Welfare of Paraguay adequately monitors the incidence of both disease and disease vectors. Monitoring showed no per capita increase in diseases monitored since filling of reservoir. Panel found no evidence to the contrary. Potentially many different reasons why women suffer from itchy skin. Ministry of Health and Social Welfare's long-term ongoing study shows no increase in abundance or species composition of disease vectors and Panel found no evidence to the contrary.</i></p>
Wastewater treatment plant	<p>International consultants contracted by the Bank concurred that the proposed site is adequate and that the plant would not pose any risks to the surrounding communities and environment. Meaningful public consultation was carried out regarding the site and design for the wastewater treatment plant early on in the process. The Secretary of Environment of Paraguay (SEAM) reviewed and approved the environmental impact study.</p>	<p><i>Site selected for wastewater treatment plant is not inappropriate for purpose and environmental assessment is not defective either procedurally or substantively. Design and environmental assessment of the wastewater treatment plant is in compliance with OD 4.01. Resettlement areas in question are to be linked to the reticulated sewerage system. Bidding documents, however, only apply to southern zone of city, which is of concern. Responsibility for cost of connecting</i></p>

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
		<p>resettlement areas to reticulated sewage system needs Management's urgent attention. Effective means for financing the connection of houses to the sewer network is required, especially for poor communities. Urgent attention also needed to practicalities of transferring operation and maintenance of the sewage treatment system away from EBY and to ensuring that new operators are provided with adequate staff, budget and training to be able to run sewage system efficiently and effectively. This is especially urgent because sewage system includes a bypass at pumping stations that will dump raw sewage into neighboring urban creeks in cases of malfunction or overflow.</p>
		Social
Identification of affected people	1990 census identified all people affected up to 83 masl. Families included in updated census of 1990 that were living in areas below 78 masl have been properly identified and compensated and/or relocated. EBY, with support and advice from the Bank and in compliance with the provisions of legal agreements, is preparing a geo-referenced map of housing between 78 and 84 masl levels.	Persuasive evidence exists that a number of people who were present at time of 1990 census were erroneously omitted.
Criteria for inclusion in specific classes of affected people Updated Census and Surveys	Identification and quantification of affected people is being updated, focusing on those families who would be affected if and when the level of the reservoir is raised to 83 masl.	<p>1990 census sole reliance on an individual's principal occupation as basis for income restoration was inadequate and does not satisfy OD 4.30.</p> <p>Bank must confirm that existing census and survey data will be updated and verified in a manner consistent with OD 4.30.</p>
Grievance Procedures	Bank supervision has included special actions promoting several important steps to ensure that all families affected are properly identified, resettled and/or compensated, such as providing advice to EBY for creation of conflict resolution mechanism	Inadequate procedures for correcting census omissions and errors. Standard and transparent appeal procedure is not available. Grievance procedures do not comply with OD 4.30
Host populations at resettlement sites: other categories of affected people		Host populations near resettlement sites are adversely affected by design and construction of resettlement sites or by added burden on local infrastructure due to resettled population.
Host populations at resettlement sites: information and consultation requirements		Inadequate effort on the part of Bank to ensure that host population was informed and consulted with in planning and carrying out construction in resettlement sites.

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
Compensation: procedures for valuation of homes and properties	No response provided	<i>Use of provisional appraisals is not inconsistent with OD 4.30. Inadequate information to affected people has resulted in confusion about the appraisals.</i>
Compensation: usufruct or customary rights to land and loss of access to other resources and public services	Home appraisal of affected houses is low because 87% of the people are occupants without titles that have small lots and shanty houses. This is why the RRAP provides land, housing, and support at no cost to the families.	<i>1992 Resettlement Plan provides for compensation to all displaced persons regardless of whether they have title. This complies with OD 4.30. Bank is in compliance with OD 4.30 to the extent that the resettlement plan provides for compensation for loss of access to natural resources. Implementing procedures have resulted in denying compensation to some affected people.</i>
Compensation prior to displacement	Management agreed with EBY and the Argentine and Paraguayan authorities on two action plans (Plan A and Plan B) designed to address outstanding resettlement and environmental issues affecting the project. Plan A aimed at completing some actions, which should have been finished prior to the raising of the reservoir to 76 masl. Plan B aimed at addressing problems, which surfaced because of the unexpectedly prolonged permanence of the reservoir water level at 76 masl.	<i>The Panel regards Management assistance to EBY to develop Plan A as remedy for violating OD 4.30, since not all persons flooded out of their property in 1994 had been compensated beforehand.</i> <i>Grievance procedures not in compliance with OD 4.30's requirement for fair compensation. Provision of new expropriation law giving affected people access to funds during judicial appeal is consistent with OD 4.30. Panel does not comment about technically questionable aspects of new law.</i>
Alternative resettlement sites	Most important factors forcing relocation to chosen sites removed from the Encarnación commercial center are lack of an appropriate Expropriation Law in Paraguay, increased number of post-census families that have had to be relocated as part of Plan B and the PDA; growing budget limitations of Government of Paraguay and resulting difficulties in buying lands near the city center and along urban expansion axes for resettlement of post-census families.	<i>Failure to consider acceptable resettlement alternatives not in compliance with OD 4.30</i>
Sequencing of places/families selected for compensation	EBY adopted Resolution No. 959/86 that allows for anticipated or early expropriation of legally titled home owners whose property is located below 84 masl, provided that he/she makes a formal request to EBY. Under Resolution 959/86, once EBY has received a request for early expropriation, it proceeds with assessment of the property and its improvements, and then compensates the owner for the expropriation according to replacement cost, as required by the RRAP and OD 4.30 on Involuntary Resettlement.	<i>OD 4.30 presumes resettlement will happen relatively quickly. When the presumption fails, as in this project, the Bank must ensure that, consistent with of OD 4.30, there is a rationale for the sequencing of resettlement and that the sequencing process is transparent.</i>

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
Restoration of income earning capacity	<p>Bank supervision has been proactive in dealing with situation, searching for solutions when feasible. EBY's resettlement plan includes a rehabilitation program. PDA Social and Productive Rehabilitation Plan includes communication, training, support for development of micro-enterprises and technical assistance. Bank endorsed plan and required a detailed formulation of programs.</p> <p>EBY and Paraguayan Government created Productive Fund (US\$6 million) as a safety net and to support productive projects proposed by families and communities. However, independent evaluations have also made it clear that there are unanticipated problems for urban families resettled on sites relatively distant from the commercial center of Encarnación to restore their income.</p>	<p><i>While there have been commendable efforts to develop productive projects, inadequacies exist in the efforts to restore income earning capacity. Panel recognizes severe economic crisis has occurred in area but this does not negate importance of restoring pre-resettlement income earning capacity through long-term measures rather than by temporary fixes.</i></p>
Compensation to brick makers and ceramists: the case of small brick makers	<p>Relocation option included a 0.5 hectare plot for production unit, five years of clay trucked into plot, house plot and house with water, electricity, drainage and sewerage, community buildings, schools, health center, food supply for six months, social and technical assistance, grant of US\$2,500 in compensation of lost time. 92 family business brick making resettled in San Pedro Industrial Park.</p>	<p><i>In San Pedro resettlement site, while some families had reestablished their brick - making activity, many complained about losses in their income level and about lack of continued access to raw materials at a reasonable cost because the five-year clay supply option has ended.</i></p>
Compensation to brick makers and ceramists: medium and large sized industries	<p>Regarding roof tile makers, independent evaluation done from 1997 to 1998 found that 13 industries had relocated, 11 of those continued producing, 16 did not move and continued production in the same spot in which they had been, and 25 had been discontinued.</p>	<p><i>Medium- and large-size owners who were offered and accepted self-relocation option made informed choice. Five-year clay supply provision was temporary mitigation measure rather than a long term solution.</i></p>
Compensation to workers of brick and tile making industries	<p>Great majority of brick makers compensated were family owned businesses with some temporary or seasonal laborers.</p> <p>Tile making industries that relocated or continued producing in the same place did not have to fire employees and those that were compensated but did not continue production had to give workers severance pay.</p> <p>Brick and tile making companies were compensated by EBY and were legally bound to compensate their workers (EBY does not deal directly with the individual employees)</p>	<p><i>Compensation program not in compliance with OD 4.30 because it excluded in practice compensation for specific category of economic losses that affected one of poorest segments of population—that is, informal workers of the brick - and roof-tile industries.</i></p>
Compensation to brick	Under pressure from Bank, EBY made	<i>While there have been efforts to retrain the</i>

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
makers and ceramists: access to clay deposits	major efforts to compensate those affected, not just enterprises and self-employed brick-makers, but those who relied on clay deposits that would no longer be available.	<i>brick-makers for other vocations, income earning capacity for many people has not been restored.</i>
Adequacy of resettlement plan	No response provided.	<i>Bank in compliance with OD 4.30 because it had approved a resettlement plan, timetable, and budget for this project. However, plan and timetable have not worked as intended and this has created compliance issues with other aspects of OD 4.30.</i>
Influx of people into the project area	Despite improved controls in areas between 76 and 78 masl problem of new arrival into area persist. Because of lack of expropriation law, EBY was not able to acquire additional land for urban resettlement. Bank supervision however, repeatedly noted to EBY need for such a law. Eventually, Bank rated project as unsatisfactory because of lack of control in affected area. The situation improved in area up to 78 masl but between this level and 84 masl the situation needs further improvements. Bank supervision continues to discuss existing problem with EBY.	<i>Resettlement plan as designed could not prevent influx of ineligible population. Legal framework was inadequate. This does not comply with OD 4.30.</i>
Delays and uncertainties in the carrying out of the resettlement plan	Management repeatedly expressed to EBY and the Governments of Argentina and Paraguay that, in light of delays in implementing agreed strategy for flooding the reservoir incrementally over three phases, any future raising will require updating the resettlement and environmental plans, as specified in the legal agreements.	<i>Bank should have made adequate allowances in the 1992 plan and later modifications of it for hardships that occurred as a result of uncertainties and delays in implementing the plan. Where a person can document a loss directly attributable to the very long delay in resettlement, such loss should be recognized in accordance with OD 4.30, but the Panel recognizes that in practice this will be very difficult to implement.</i>
PDA (Programa Desborde de Arroyos): alternative resettlement sites	EBY has modified its methodologies allowing for increased participation of families to be resettled by the PDA. Since 1999, EBY has conducted information and consultation meetings with provincial and municipal authorities as well as with representatives from affected neighborhoods. In these meetings, EBY has explained PDA, its objectives, criteria for inclusion, solutions, and methodology. To promote better understanding of the PDA, EBY has organized visits of affected families to new resettlement site. Families have also been incorporated into the process of managing and planning some	<i>Under OD 4.30, Management must ensure that affected people are systematically informed about the objectives of the PDA program and consulted with regard to their options and rights during the preparation and implementation of the program. This has not always occurred.</i>

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
	resettlement activities.	
		Supervision
Supervision of environmental operations	Due diligence has been exercised in supervision of resettlement, environmental and other issues related to Project. Following Inspection Panel Report in 1997 important measures adopted. Change in supervision has produced important positive results for project, Bank, and affected people.	<i>Supervision of the environmental aspects of main civil works components of the Project in compliance with OD 13.05.</i>
Supervision of resettlement activities: technical quality assurance - standards of design, construction, and implementation	Bank shown diligence in requiring EBY to carry out program to clean up urban creeks and shut down latrines and wells in areas between 76 and 78masl Bank has reviewed EIA for wastewater treatment plant, including analysis of alternatives and alternative treatment options.	<i>Ample evidence of poor quality construction within resettlement sites. Need for a greater level of supervision of technical design and construction in all facets of the Yacyretá resettlement scheme. Failure to ensure sound technical quality of work on the resettlement project and to encourage needed design changes as circumstances changed is not in compliance with OD 13.05 on Project Supervision.</i>
Supervision of resettlement activities: consultation with affected people	Bank placed emphasis on broadening its dialogue with civil society, particularly people most affected by Project. Bank has offered financial and technical assistance for creation of office of affected people. Bank sought assistance directly from important NGOs and hired organizations to provide guidance on critical issues. All communications and/or complaints addressed to Management and project team have been properly responded to. Project team has been proactive, maintaining periodic contacts with affected people, including those presenting the Request for Inspection, to learn of their concerns. Views and demands of affected people and other stakeholders have been used as input to supervision and dialogue with EBY and governments NGOs have been contracted by Bank to advise on key issues	<i>Wide discrepancy between recollections of affected people in the Project area, who insist there have been no meaningful consultation or thorough on site visits, and Bank's statements about its supervision missions. Bank supervision missions need to indicate places visited and affected people met with. Management must ensure that it consults with and interacts meaningfully with affected people in settings where they feel able to convey effectively their concerns.</i>

ISSUE	MANAGEMENT RESPONSE	PANEL'S FINDINGS
Supervision of resettlement activities: level and expertise of supervision	<p>Over the past ten years, clear evolution with marked increase in supervision intensity beginning at time of Request in 1996. Bank supervision intensified on number of missions and field visits. Supervision shifted to field, social expert based in Paraguay hired for dealing with civil society. Regional Vice President of Latin America has visited project for field based review and consultation three times since 1999. These efforts were reinforced by Country and Senior Director with four missions during since 1997.</p>	<p><i>Under conditions prevalent in Project area, Management has higher than usual burden of supervision. Supervision of resettlement activities did not adapt to expertise needed to identify and confront adequately problems of social nature. Absence of a communication strategy has significantly damaged relations between those concerned with implementing the project and the affected civilian population.</i></p>
Linkages Between Supervisions Reports, Progress Reports to the Board, and Management Response to Request for Inspection	<p>Bank's Board of Executive Directors endorsed 1997 Panel's recommendations and advised Management "to continue its follow-up on the implementation of Action Plans A and B and to report to the Board on progress made." Consistent with Board's advice, Management has since supervised the project intensively and frequently reported to the Board on project status.</p>	<p><i>Management has been too optimistic in informing the Board on status of project implementation. After Panel had conducted its own field research and conducted follow up staff interviews, Management produced an Aide Memoire (October 23-30, 2003) that identified many of the problems the Panel had found and accurately described remedial actions that needed to be taken.</i></p>

Annex B

Hydrological Analysis of the Causes of Floods in Encarnación Urban Creeks

Dr. Carlos Tucci

1. Floods in the urban creeks of Encarnación and neighboring municipalities take place in the M'boi River and its tributaries as well as in some urban creeks, which flow directly to the reservoir. In general floods occur due to two main causes:
 - *Downstream conditions*: reduction of flow capacity downstream of a stream section will decrease the flow at the upstream section and thus increase its level so that water will overflow onto the flood plain. This could occur due to reduction of the flow capacity, section constriction, or an increase in the level of the water body into which the stream discharges. This could be sea-level, reservoir level, or the level of a major river into which the stream or creek flows.
 - *Lack of local conveyance capacity*: If the amount of water arriving at a river section is greater than the section's local flow capacity the water cannot be carried away so the water level increases. This causes water to flow across the flood plain. This type of flood impact is called *local flood conditions* in this annex.
2. What must be determined is which of these is causing the flooding of the Encarnación urban creeks.

A.1 Analysis of river (downstream) conditions

1. Paraná River levels and M'boi Caé floods

3. The Yacyretá reservoir will impact the Encarnación urban creeks only if the *downstream conditions scenario*, described above, occur. The following evaluation examines the situation.
4. The procedure to study the effect of the reservoir effect on Encarnación and Posadas is based a consideration of: (a) levels of the Paraná River at times that the M'boi Caé flooded before dam construction, and; (b) the level of the Paraná River when the M'boi Caé flooded after dam construction. According to the Lotti and Associates study⁴⁸³, "the floods in the areas of the influence of those creeks are not due to the current reservoir level, but rather are primarily due to rainfall in the catchments area of the creeks."
5. However, this study was done for the proposed future reservoir level of 83 masl and not for the current operational level of 76 masl so this contention must be examined. Lotti (1999) present a simulation of Paraná River levels before dam construction (natural conditions) together with M'boi Caé flood recurrence

⁴⁸³ C. Lotti & Associati (1999)

intervals of 5, 10, 25 and 100 years. The selected discharge for the Paraná River was $38,000\text{m}^3/\text{s}$, with a river height of 78.8 masl at the mouth of M'boi Caé. These boundary conditions were for the situation *before dam construction*. The condition used by Lotti for *after dam construction* was with the Paraná River at 83m. (This simulation was done in order to determine the limits of reservoir influence after it has been filled to 83 masl.)

6. The first of these Paraná River flow scenarios (i.e. 78.8m) has a recurrence time greater than 5 years (less than a 20% chance in any one year). This is not a frequent condition in the Paraná River. The probability of a five year flood in the M'boi-Caé occurring simultaneously with a five year event in the Paraná is less than 4%.

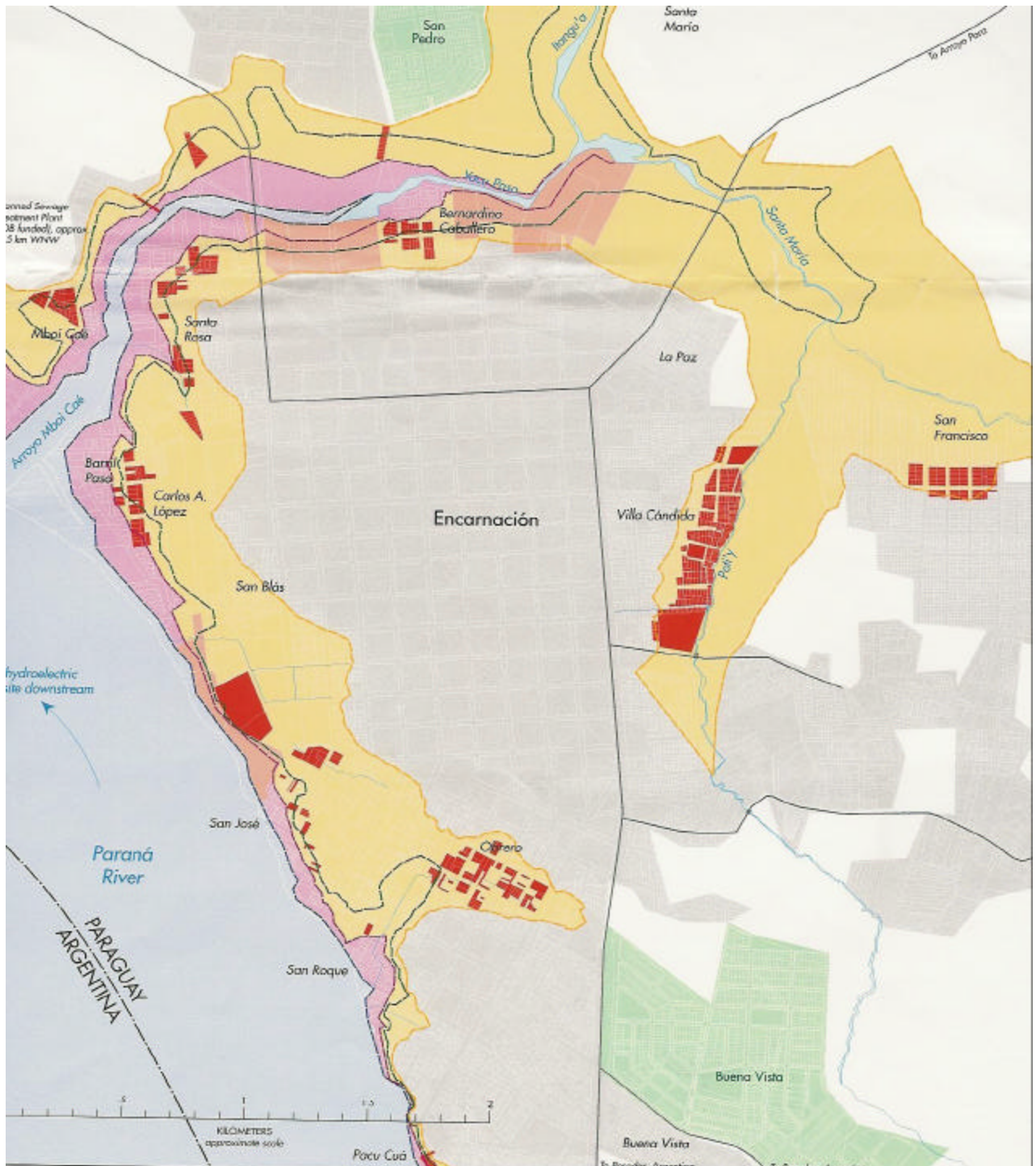


Figure A-1. Encarnación, M'boi Caé and tributaries (source: World Bank)

7. Using the flow data for the Paraná River at Posadas for the period 1901-1994⁴⁸⁴, a flow duration curve was calculated. This curve is presented in figure A-2. This curve shows the period of time for which a flow is above a particular value. For

⁴⁸⁴ Date obtained from Sub-Secretary of Water Resources from Argentina

instance, this curve shows that $\approx 50\%$ of the time the river flow is above 11,000m³/s (this would equate to a river level of above 74.7 masl).

8. Using the rating curve for natural conditions in Posadas, and the frequency of flow, the frequency of different river levels at Posadas was also calculated. This is presented in figure A-3. It can be see that for natural conditions the level of the Paraná River is mostly below 75.5 masl, and most frequently between 74.2 and 75.4 masl. These levels are those that occurred naturally in the Paraná River *before the dam was constructed*.

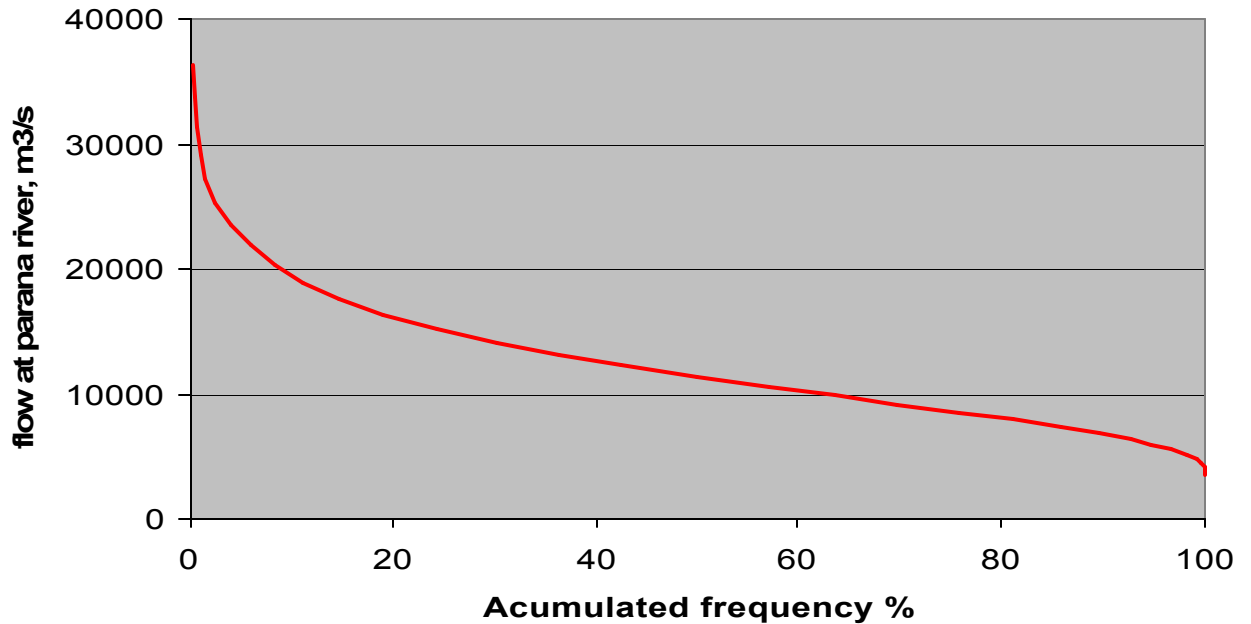


Figure A-2. Flow duration curve for the Parana River at Posadas

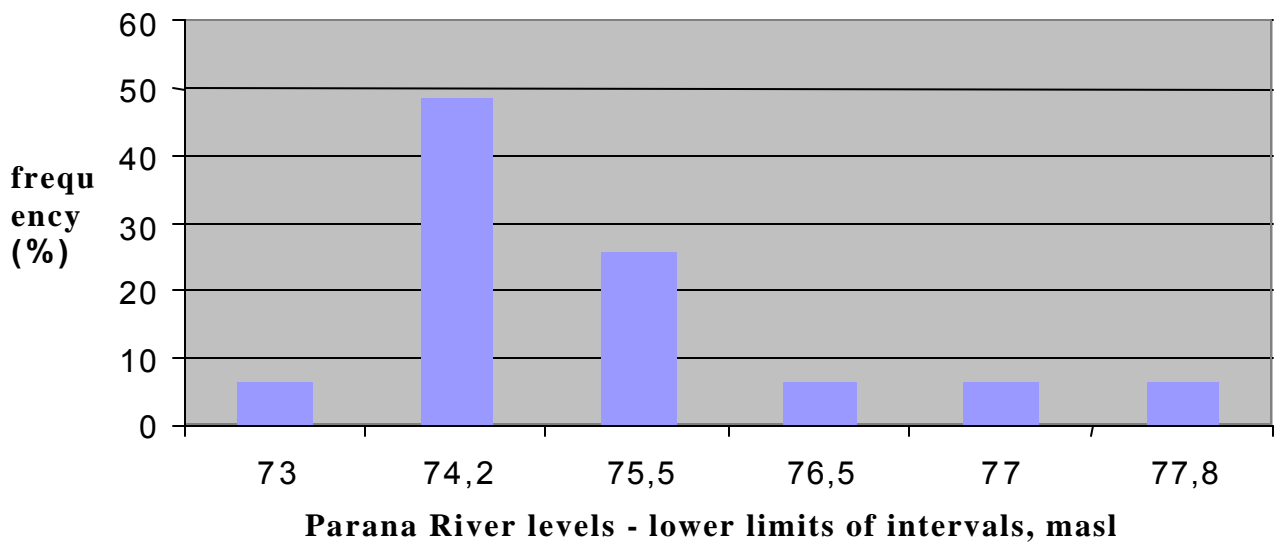


Figure A-3. Frequency of levels in Paraná River at Posadas.

2. Evaluation of combined conditions of Flood in Paraná River and Heavy Rainfall in the M'boi Caé catchments.

9. In order to choose the boundary conditions for simulation of the water levels in M'boi Caé, the question is:
- *What are the levels of the Paraná River at Encarnación when there are heavy rainfall events in Encarnación?*

10. In figure A-4. the relationship between the largest rainfall events at Encarnación and Paraná River flows on the same day are shown. It can be seen that there is no correlation between the events, they are independent of each other.

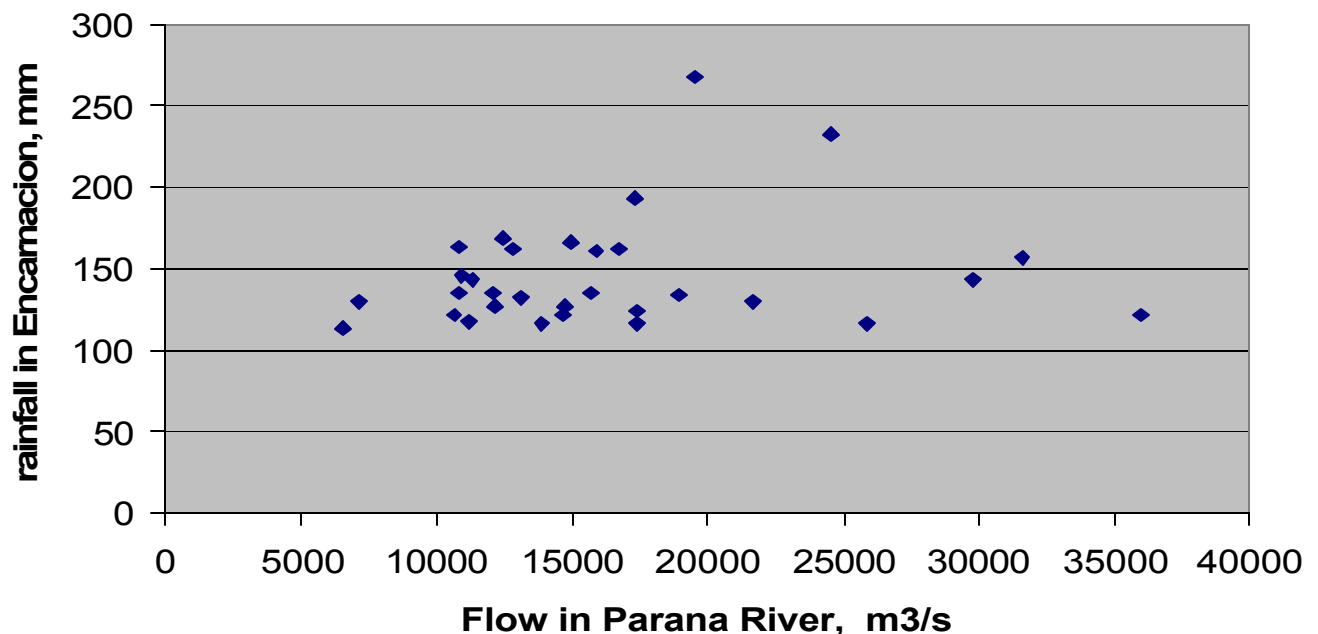


Figure A-4. Relationship between rainfall in Encarnación and the flow of the Paraná River

3. Analysis of the impact of the reservoir on floods in the M'boi Caé and other creeks

11. Lotti (1999) surveyed river sections along the M'boi Caé and other creeks. These sections have been used in this analysis to simulate the levels of this river. Figure A-5. presents a schematic of the M'boi Caé River and its tributaries and the sections used in the Lotti (1999) report. In this present study analyses were undertaken for the following areas: the Poty river; the M'boi Caé; and for the creeks which flow directly into the Paraná River.

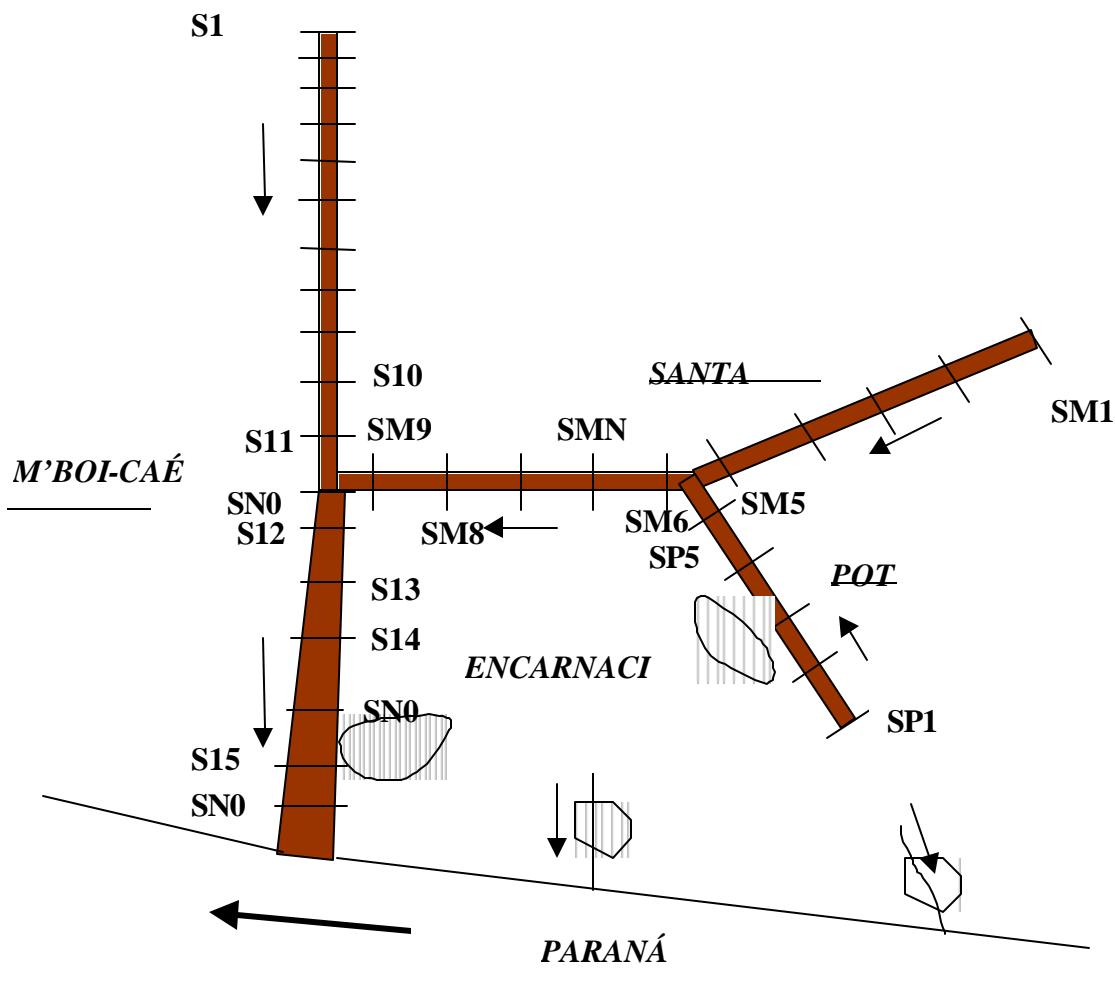


Figure A-5. Schematic configurations of the sections and some of the claim flood areas in Encarnación

12. Poty River: In Figure A-6. the profile of the river bottom for the Poty is shown. It can be seen that the levels are all above 82 masl. It is thus clear that for a reservoir range of 76 to 78 masl the reservoir will have no influence on the floods in the Poty river. To support this it is noted that during the Panel visit to the site the flow velocity was estimated by floating material and determined to be near to uniform flow velocity. When a river is flowing close to uniform flow velocity the implication is that there is no downstream control on flow and no impact from the reservoir.
13. The Panel nevertheless observed the flooded houses on the flood plain of Poity creek. There is no doubt that flooding does occur. The question arises, what causes the flooding if it is not due to the reservoir?

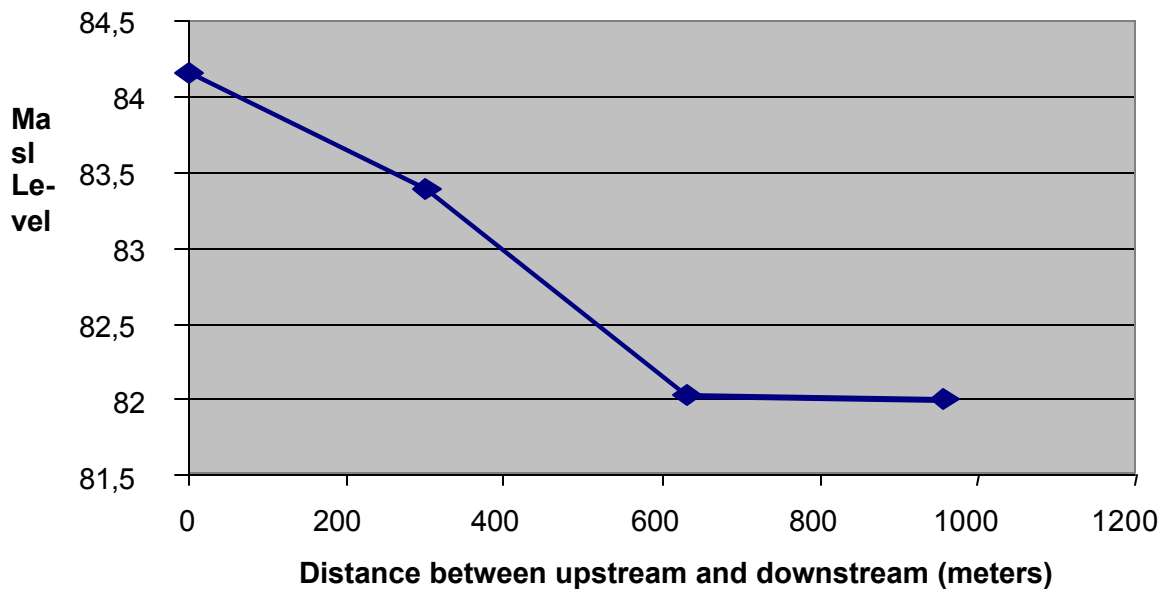


Figure A-6. Poty River bottom profile (SP2-SP5 of figure A-4.)

14. Upstream of the Poty basin a resettlement area know as Buena Vista has been developed (see figure A-1.). It is possible that this resettlement may have contributed to the flood peak downstream due to an increase in impervious areas leading to more rapid surface run-off. However, the area of Buena Vista represents only about 4% of the Poty Basin so this is most unlikely to be the main cause of the flooding of the Poty river. It is much more likely that the cause of the floods in this area is the sum of all urbanization that has occurred upstream in recent years. It has been established elsewhere that urbanization increases impervious surfaces such as streets, roofs, walk ways, etc. This in turn increases the mean annual peak flood by as much as six times over that which occurs in former rural conditions (Leopold, 1968). The likely cause of the increased Poty flooding is thus deemed to be increased urbanization of the creek's catchment and not the construction of the Yacyretá reservoir.
15. M'boi-Caé: In the reach of sections S12 to SN03 a river level profile simulation was used to study the impact of the reservoir. The procedure was: Use of a conventional model used for a steady state level profile (Chow, 1959). This is the same type of the model described in Lotti (1999) which simulated the river profile for a steady state condition.
16. Upstream conditions were taken to be peak flow for different recurrence intervals as presented in Lotti (1999); Using the four sections from Lotti (1999). The last section is about 2 km from the mouth of the M'boi-Caé into the Paraná River. In order to simulate the M'boi-Caé until near the Paraná River, a section close the mouth was constructed based on section S15 with its bottom displaced 1.90 m

below that of the S15 bottom. This level was based on the slope of the river bottom profile. The section's characteristics were assumed equal to those of section S15 (the last surveyed section before reaching the Paraná River). This is a simplification, but it is a conservative procedure since the section near to the Paraná River would be larger than that used.

17. The downstream boundary condition must be the level of the Paraná River. The most probable level of the river would be between 74.2 and 75.5 masl, but the lowest level in a river section would be for the uniform flow condition for a known flow volume. Using the upstream flood discharge, the uniform flow level was therefore calculated. These levels were determined to always be greater than the probable level (see Tables A-1 and A-2) so were used in the determinations.
18. The simulations are presented in tables A-1 and A-2 and in figures A-7 and A-8. As can be seen there is no flood level increase due to reservoir operation until the Paraná River reaches 78 masl. When downstream river conditions reach 79 masl they start to have a small impact (<20 cm) on upstream levels. In May of 2003 during the Panel's visit to Encarnación EBY presented an updated result from Harza (Harza y Consorciados, 2003) for the simulation at flow in M'boi-Caé. These results were from an updated survey which included more river sections. The results are similar to those obtained in this report.

Table A-1. Levels in masl for a simulation of recurrence time of 5 years and discharge of 760m³/s

Section	Natural condition	With reservoir at 78 masl	With the reservoir at 79 masl
S12	80,76	80,76	80,83
S13	80,35	80,35	80,46
S14	79,89	79,90	80,08
S15	79,40	79,41	79,71
Downstream section	77,616	78,00	79,00

Table A-2. Levels in masl for a simulation of recurrence time of 10 years and discharge of 863m³/s

Section	Natural condition	With reservoir at 78 masl	With the reservoir at 79 masl
S12	80,97	80,98	81,02
S13	80,57	80,57	80,65
S14	80,12	80,12	80,26
S15	79,63	79,64	79,84
Downstream section	77,80	78,00	79,00

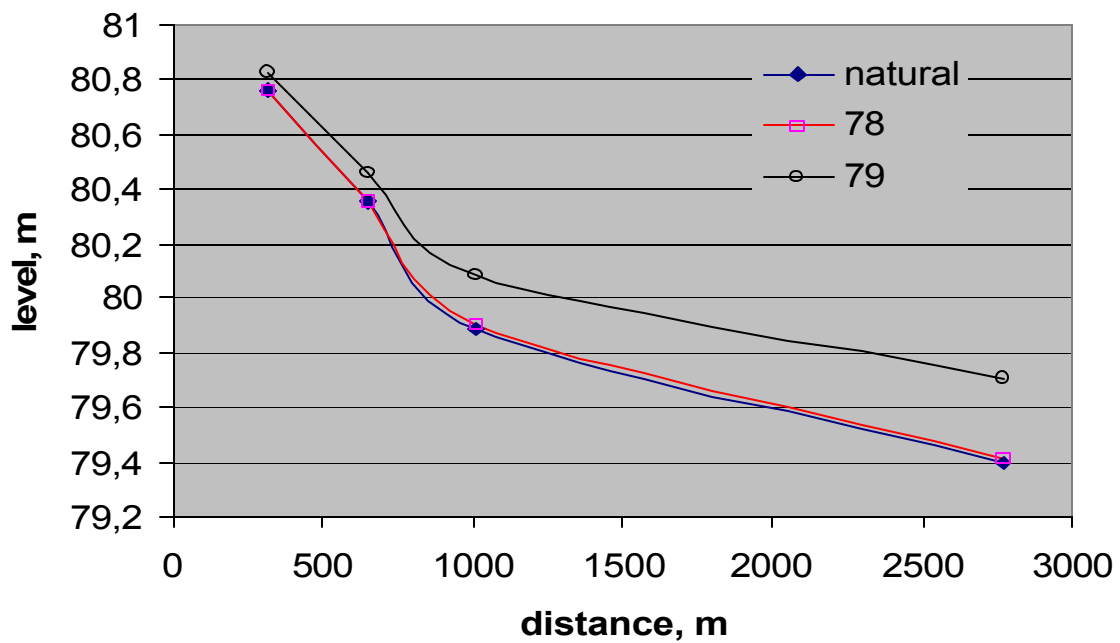


Figure A-7 Levels of M'boi-Caé for return period of 5 years from sections S12 to S15

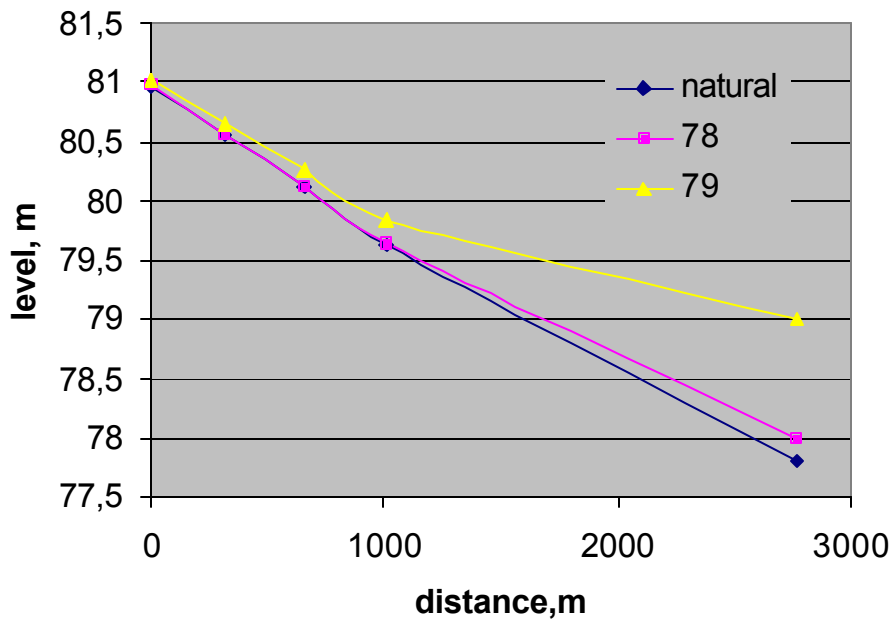


Figure A-8. Levels of M'boi-Caé for return period of 10 years from sections S12 to S15.

19. *Conclusions:* From these results it can be concluded that with the reservoir at 76 masl there will be no effect from the reservoir on the floods in the M'boi-Caé. With the reservoir at 78 masl the effect will be minimal ($\approx 1\text{cm}$) and confined to the section in the neighborhood of the juncture of the M'boi-Caé with the Paraná

River. For the Poty River area of Vila Candida the increased flooding is not due to the Yacyretá reservoir but due to the urbanization that has occurred upstream in the Poty River basin and the recent settlement which has occurred on of the creek's flood plain.

A.2 Reflections on local flood conditions

20. Since the floods in the urban creeks have been shown not to be due to the level of the Paraná River and the effect of the Yacyretá reservoir the question remains, what could be the main causes of the floods along the urban creeks? The following observed elements of increased urbanization will be contributing to these local flood conditions:

- *Lack of storm sewers:* Encarnación surface water flows through the streets and in open drains to the creeks and rivers. The lack of a storm water network to discharge storm water into the Parana River increases the flood impact in the creeks downstream of the city. The steep slopes leading from the main urban center to the creeks exacerbate the situation.
- *Rainfall intensity, duration and recurrence interval:* Rainfall intensity statistics for Encarnación are given in table A-3. The critical one hour duration values are also presented in table A-3. Table A-4 gives data on extreme rainfall events in Encarnación over the past half-century. This table shows that extreme rainfall events have increased since 1980. Figure A-9 shows that most of the flood events in Encarnación have also occurred after 1980. Thus there does appear to be a relationship between increased heavy rainfall and local flooding. But it must be remembered that the period since 1980 is also the period during which Encarnación has experienced population increase and increased urbanization;
- *Increase in impervious surfaces:* With the increase in construction of houses, buildings, and paved streets, there is a consequential increase in impermeable areas. In general, one person is responsible for about 50 m² of impermeable area for population densities below 120 inhabitants per hectare (Tucci, 2001a). The increase in impermeable surfaces results in a large increase in the flood flow. Leopold (1968) showed that the mean annual flow can increase up to 7 times after the areas has been paved. Tucci (2001b) also showed an increase of 6 times in the mean annual flood of the Belém Basin in Curitiba, Brazil due to 60% of impervious areas in this basin of 42 km²; this effect of urbanization should thus not be underestimated. It is likely to be a most significant factor affecting the flooding of Encarnación's urban creeks.
- *Steep slopes:* with steep slopes, such as those occurring in Encarnación, the flow velocity is high, creating potential danger to the population during high rainfall flood events. Encarnación has been developed from high to lower topographic levels. The rainfall from high levels flows downstream to lower areas, i.e. between 78 and 83 m. These low lying areas are now occupied by a poor people seeking a place to live. Flow velocities are high due to the steep slopes and impermeable surfaces. The

peak and volume of the floods in these areas is increased due to the urbanization (impermeable areas). With the urbanization of the upper part of the city the frequency of the floods events in the lower levels areas has increased together with their impacts;

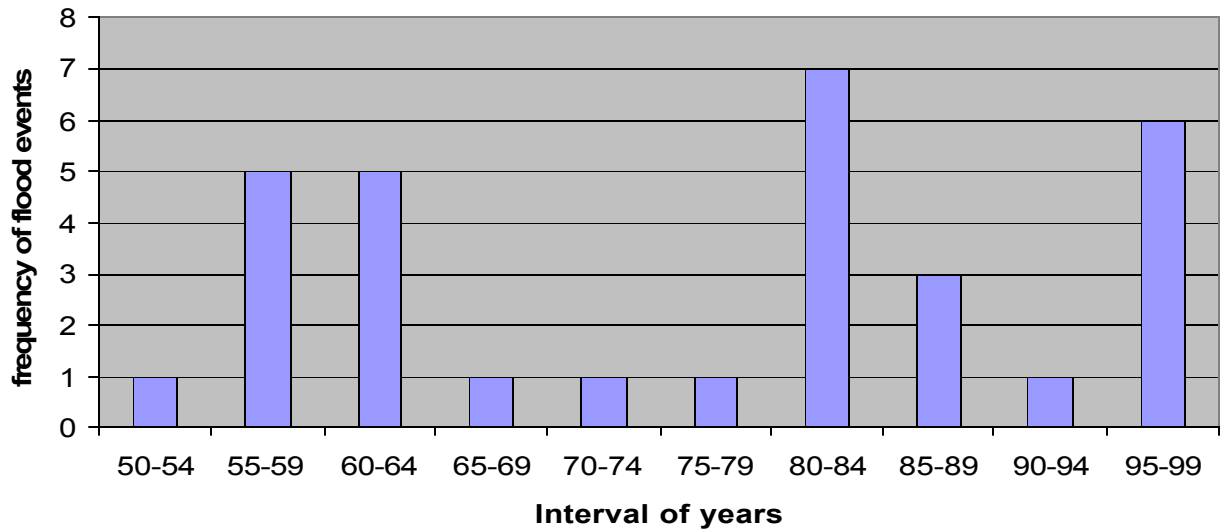


Figure A-9 Frequency of events above 114 mm in a day in Encarnación (data from Lotti, 1999)

Table A-3 Rainfall intensity in Encarnación (Lotti, 1999)

Time of recurrence	Rainfall	Intensity
years	1 hour	Mm/hr 24 hour
5	68	159
10	76	172
25	86	202
50	94	224
100	101	246

Table A-4 One-day large events in Encarnación (Domeq et al, 2003)

Date (day/month/year)	Rainfall Mm
29/12/1997	268
14/2/1959	232.1
9/10/1997	193.4
16/3/1959	168.7
14/9/1994	166.2
12/10/1955	162.9
17/5/1961	162.6
10/11/1982	162
7/11/1963	160.3
15/2/1983	157

22/11/1961	146.2
16/12/1982	143,5
29/6/1986	143
21/3/1963	135.2
11/9/1973	135
14/4/1985	135
10/2/1982	134.2
12/12/1999	132
19/12/1968	130
23/11/1997	129.2
17/3/1959	127.4
9/5/1984	127
22/4/1961	124
21/9/1975	122
2/11/1982	122
26/2/1983	121.2
31/10/1957	117.8
9/10/1996	116.6
14/4/1998	115.8
16/2/1958	115.7
26/4/1954	114

- *The effect of garbage:* The large amount of garbage along the streets and curbs of Encarnación shows that the city's system of garbage collection is not appropriate. The volume of waste accumulating in the streets and inside storm water conduits, decreases their flow capacity and increases the flood frequency. In the downtown market there are some major drains. During the Panel inspection it was noted that portions of the drainage system were completely blocked by garbage or other dumped materials. In that reach, water was observed to be flowing out from the conduit on to the surface, flowing through the streets and under market stalls, before re-entering the conduit some distance downstream (see photograph). In Encarnación garbage obstruction to storm water flow is contributing to flooding in specific locations. This condition occurs mainly in the downstream reaches where the slope decreases and water velocity no longer has the capacity to transport the waste being carried in the water.
- *Obstruction of flow:* There are works in the city such as bridges, land fills, road constrictions, among others, which were observed to decrease the cross-sections of many urban creeks in Encarnación. These conditions also contribute to flood frequency and depth upstream of these constrictions.

21. The above observations demonstrate that the floods in the Encarnación urban creeks will have been affected by the urbanization that occurred after 1980, possibly increased extreme rainfall events, and garbage reducing stream flow. Taken together these factors have increased the flood frequency in Encarnación's urban creeks.

1. The Encarnación Urban Creeks which flow directly to the Paraná River

22. The urban creeks that flow through Encarnación directly into the Paraná River all have steep gradients. Due to the slope the Yacyretá reservoir level cannot increase the flood levels in these streams. In these locations the increased flooding is due to a combination of the factors discussed above:
- Lack of urban drainage and storm-water sewers;
 - Excess garbage accumulation in stream sections;
 - Upstream urbanization

2. Observations on urban drainage in the resettlement areas

23. During the Panel inspections the resettlement area of Arroyo Porá was visited. Several problems related to urban drainage were observed: This area has been developed without a network of storm sewers; Since the slope of this area is very steep the street pavements, made by stone blocks, had already been damaged by storm water flowing down the street; Downstream of the resettlement area, down a steep slope, the channel which receives the water from the streets was poor designed. The consequence was that the channel had overflowed and flooded houses and fields below the new and as yet only partially occupied resettlement site.
24. The urban drainage planned for the new development has clearly not taken into account the flood increase that will occur in the downstream creeks as a consequence of the resettlement site urbanizing a previously rural and vegetated location. The net effect is to transfer the problem of excess storm water from the resettlement area to those living downstream from the new development.
25. These problems should have been identified if there had been an Environment Assessment Report on the resettlement site. OD4.01 Paragraph 8 indicates that for some small investments (such as housing developments) a full EA is not required (paragraph 8 item c) but this case “*environmental sitting criteria, construction standards, and inspection procedures for housing projects*” must be observed. The OD does not mention which criteria should be followed. Paraguay legislation for this type of construction does not require the provision of an urban drainage network, or control of downstream peak flow, as many cities in developed countries do. However, in the view of the Panel the lack of Paraguayan standards for urban drainage control does not justify the development of housing which creates impacts on neighbours cannot be accommodated in the World bank Safeguard Policies.
26. During the Panel’s visit to Encarnación in May 2003 it visited the same places as illustrated in the photographs and observed the following: The damaged stone blocks of some streets had been repaired; In flooded houses downstream of the resettlement site there had been minor changes to the street drainage (part of the

surface street flow was being diverted onto land adjacent to the streets. In the Panel's view these are palliatives to the problem and do not resolve the bad channel design. It must therefore be anticipated that the houses down slope from the resettlement site will continue to be flooded after future intense rainfall. No effort had been made to damp the urban drainage hydrograph for the resettlement site in order to minimize, if not prevent, flooding of areas downstream from the newly urbanized resettlement location.

Annex C

Biographies

Edith Brown Weiss, Chairperson, appointed to the Panel September 1, 2002. Ms. Brown Weiss is currently Francis Cabell Brown Professor of International law at Georgetown University Law Center where she has been on the faculty since 1978. Prior to that, Professor. Brown Weiss was on the faculty of Princeton University. She has taught and published widely on international law and policy, including environmental and compliance issues. She has won many prizes for her work, including the Elizabeth Haub prize from the Free University of Brussels, the IUCN for International Environmental Law, and the American Bar Association Individual Award for Distinguished Achievement in Environmental Law and Policy. She served as President of the American Society of International Law and as Associate General Counsel for the U.S. Environmental Protection Agency, where she established the division of international law. She is a member of nine editorial boards, including the American Journal of International Law and the Journal of International Economic Law; and has been a Trustee, Director or Advisor for the Center for International Environmental Law, the Japanese Institute for Global Environmental Strategies, the Cousteau Society, and the National Center for Atmospheric Research, among others. Ms. Brown Weiss has served as Special Legal Advisor to the North American Commission on Environmental Cooperation and has been a member of the U.S. National Academy of Sciences' Commission on Geosciences, Environment and Resources, and the Water Science and Technology Board, and the Committee on Sustainable Water Supplies in the Middle East. She has been elected to membership in the American Law Institute, the Council on Foreign Relations, and the IUCN Commission on Environmental Law. She received a B.A. degree from Stanford University with Great Distinction. She earned an LL.B. (J.D.) from Harvard Law School and a Ph.D. in political science from the University of California at Berkeley and received an honorary Doctor of Laws from Chicago-Kent College of Law.

Maartje van Putten, appointed to the Panel October 1999. Ms. van Putten was a member of the European Parliament from 1989 to 1999. Ms. van Putten was the Rapporteur of the Parliament on: the effects of the GATT/Uruguay Round on the developing countries, fair trade, the EU budget line for Asia and Latin America, the EU tropical forest policy, the EU policy on the convention of Endangered species and European policies towards indigenous peoples. She is active with non-governmental organizations. Ms. van Putten has closely worked with the WWF European policy Office as a key political partner to promote better EU conservation and sustainable development policies. She was also a member of the ACP (African, Caribbean and Pacific Group)-European Union Joint Assembly. Ms. van Putten was a freelance multimedia journalist for most of her professional career, and was a Senior Fellow of the Evert Vermeer Foundation from 1981 to 1989. She produced a TV film documentary and is the author of many articles and books on globalization, international division of labor and on gender issues. Currently a Vice-Chairperson of the European Center of Development Policy Management, Ms. van Putten is President of the Board of European Network of Street Children Worldwide (ENSCW). She holds a HBO degree in community development from Sociale Academie Amsterdam, and a master's degree in social sector management from Protestantse Voortgezette Opleiding (PVO) Amsterdam. At present, she is working on a dissertation at the Catholic University of Tilburg in the Netherlands.

Tongroj Onchan, appointed to the Panel in September 2003. He is an agricultural and resource economist with a Ph.D. in agricultural economics from the University of Illinois. Professor Onchan taught in the Faculty of Economics at Kasetsart University in Thailand for 26 years, including a term as Dean. He later served as Vice President of Huachiew Chalermprakiat University; then joined the Thailand Environment Institute (TEI) as Vice President. In 1998, Mr. Onchan was appointed President of TEI. He helped establish and was appointed President of the Mekong Environment and Resource Institute (MERI) in 2000. He has served as advisor to the Prime Minister and to the Minister of Science, Technology and Environment, as member of the National Environmental Board, Chairman of the National EIA Committee, and member of

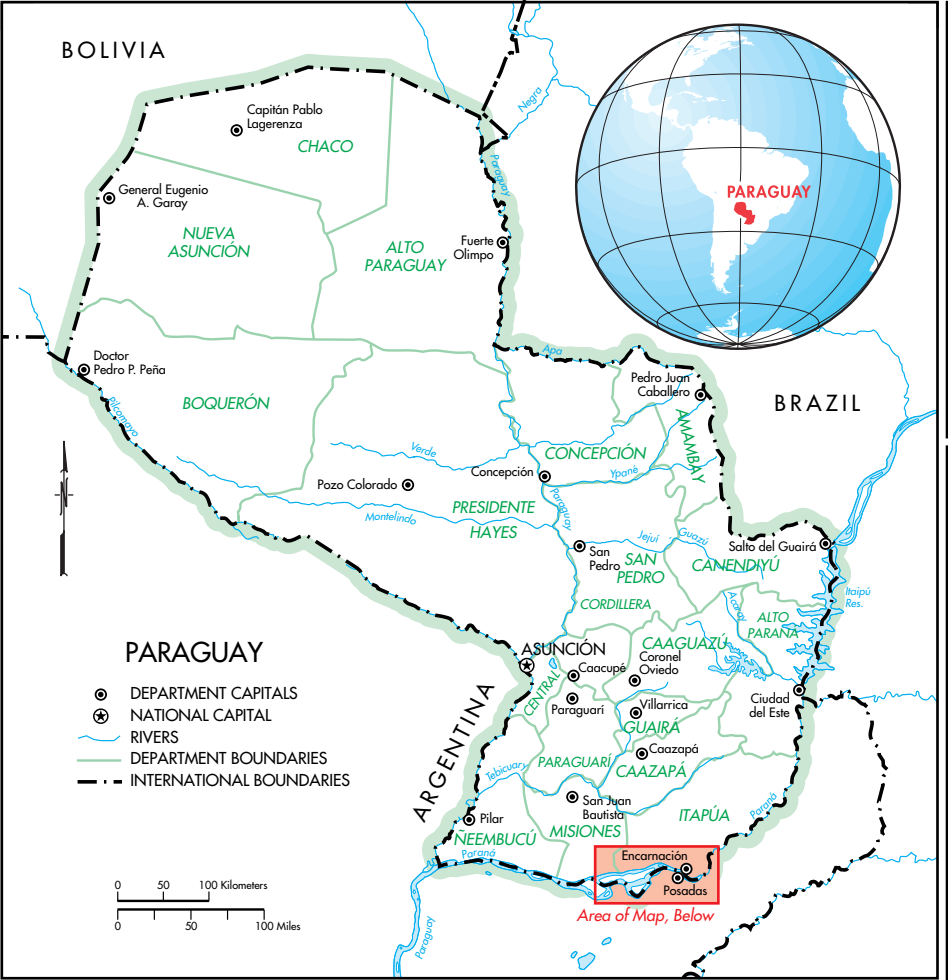
the National Audit Committee. Mr. Onchan is on many editorial boards, among them the Asian Journal of Agricultural Economics and the International Review for Environmental Strategies. He has consulted for a number of international organizations, including the Asian Productivity Organization, ESCAP, the World Bank, the Asian Development Bank, the Food and Agriculture Organization, the International Labor Organization, USAID and the Ford Foundation. He has been Project Director of over thirty research projects and author or co-author of numerous technical and research papers on rural development, natural resources and environmental management. Currently, he serves in several capacities: Chairman of the Board of Directors of the MERI, Chairman of the Committee on the Preparation of State of the Environment Report for Thailand, member of National Research Council for economics, and a Director of the International Global Environment Strategy (IGES) based in Japan. Mr. Onchan was recently appointed as *eminent person* to serve as a member of the Asia and Pacific Forum for Environment and Development (APFED).

* * *

Richard F. Fuggle, holds the Shell Chair of Environmental Studies at the University of Cape Town. He is a Professor in the Department of Environmental and Geographical Science and is Director of the Environmental Evaluation Unit. He is a Founder Member of the Academy of Science of South Africa and is a Registered Natural Scientist and Professional Member of the South African Institute of Ecologists and Environmental Scientists. He serves on the Board of Directors for the Network for Environment and Development in Africa and is President-elect of the International Association for Impact Assessment. He has received both national and international awards for his contributions to the advancement of Environmental Assessment. He has assisted the Inspection Panel in its investigations of the Western China Poverty Reduction Project, the Lake Victoria Environmental Management Project, the Uganda Third Power Project and the Proposed Bujagali Hydropower Project, as well as the India: Coal Sector Environmental and Social Mitigation Project and the associated Coal Sector Rehabilitation Project. He received a M.Sc. degree from Louisiana State University with Great Distinction, and a Ph.D. from McGill University, Montreal, Canada, in 1971.

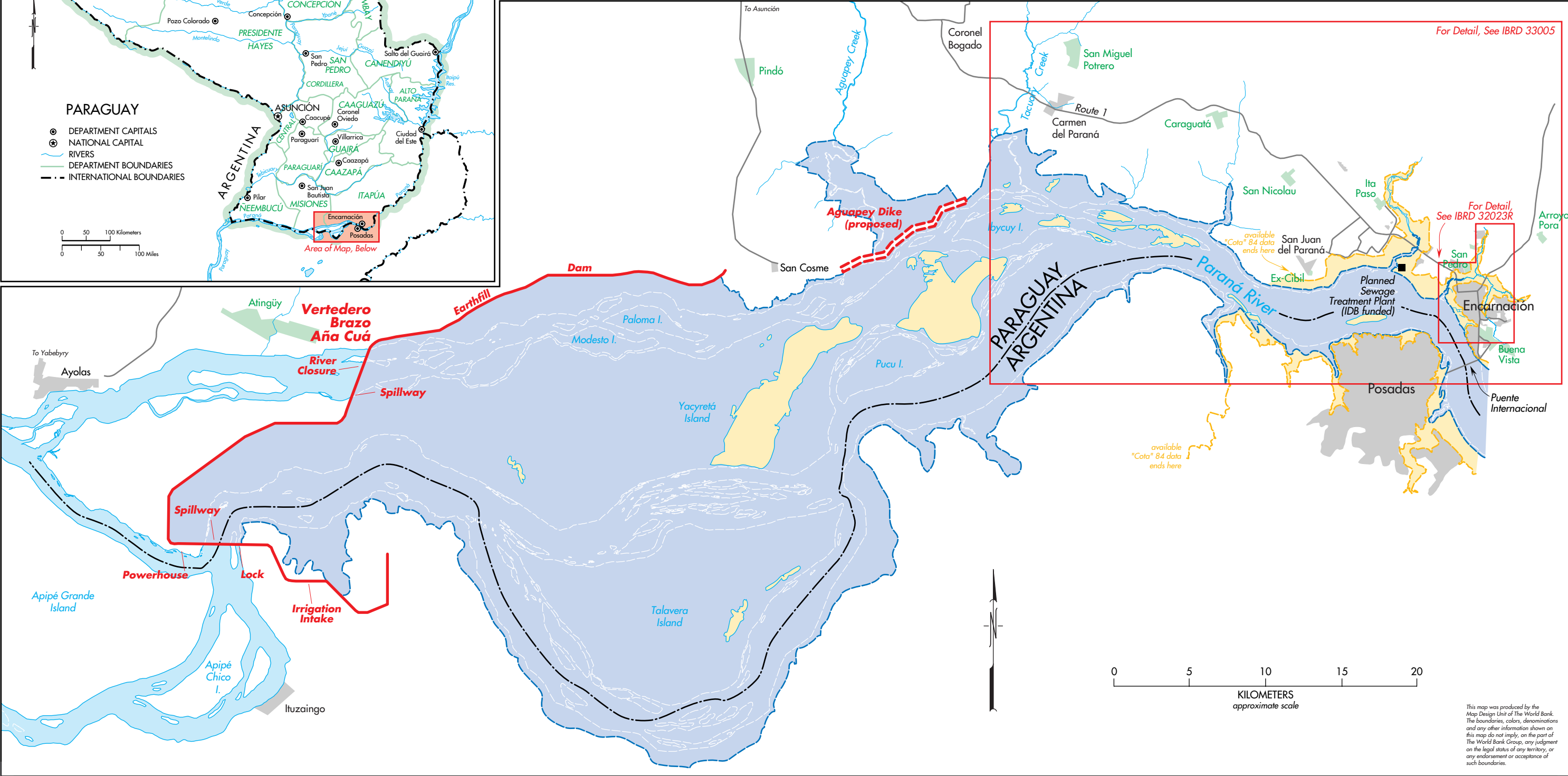
Paul Michael Taylor, holds a Ph.D. from Yale University, 1980. Mr. Taylor is a cultural anthropologist based in Arlington, Virginia. He served while on leave from his position as research anthropologist and Director of the Asian Cultural History Program (Department of Anthropology), Smithsonian Institution. He has produced four books and numerous other scholarly publications on the ethnography, ethnobiology, and languages of Asia, especially Indonesia; he has also curated sixteen museum exhibitions and served as anthropological consultant for five films. The recipient of numerous international grants and awards, he has served on the Board of Directors of the Association for Asian Studies, and currently serves on the Advisory Board of the US-Indonesia Society. His research on rural social and ecological issues has included living for over three years in rural village or tribal communities of Southeast Asia. Dr. Taylor also served as senior consultant for social and resettlement issues during the Inspection Panel's investigation of the Qinghai component of the China: Western Poverty Reduction Project.

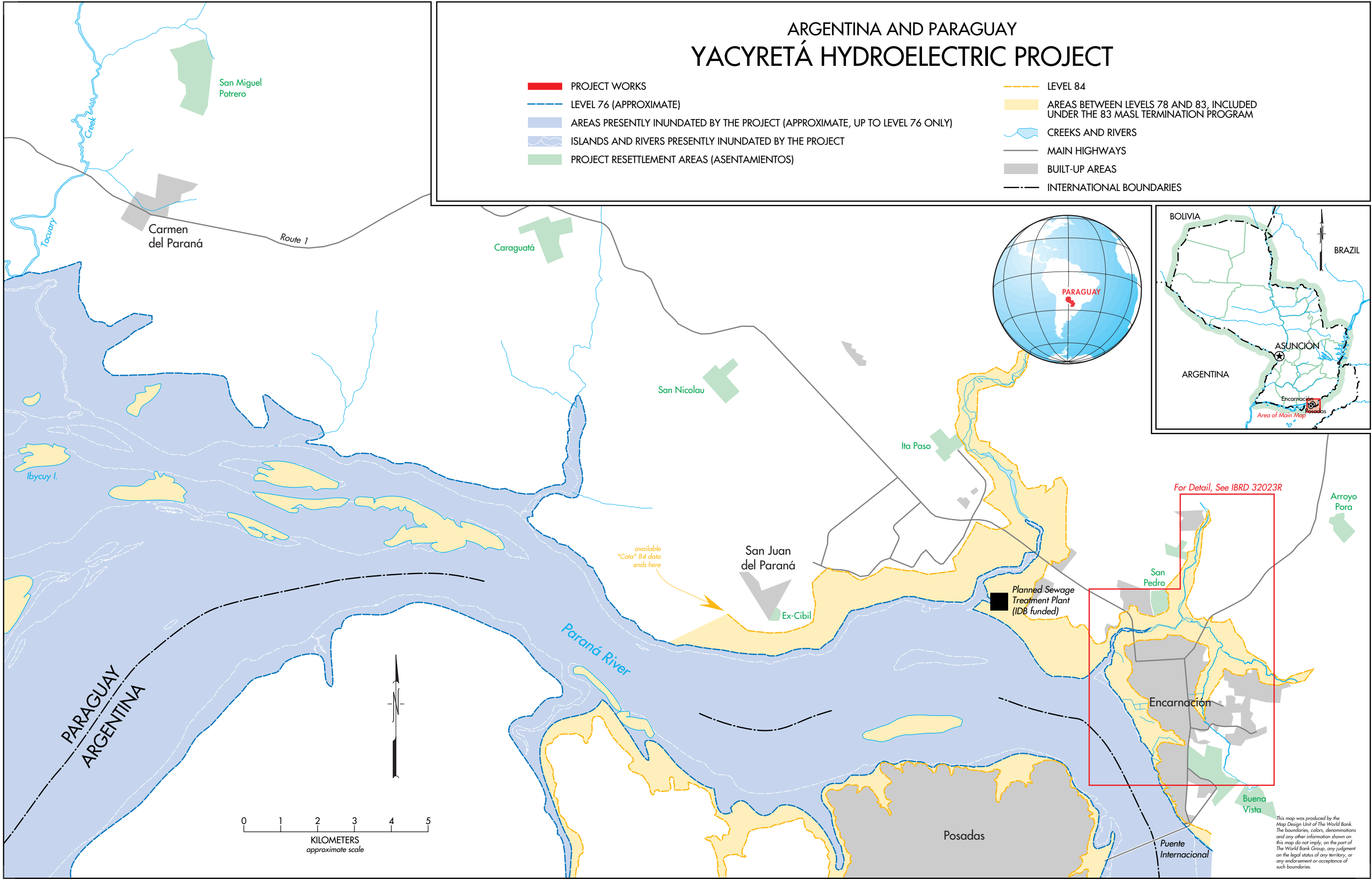
Carlos E. M. Tucci, Civil Engineer and Professor at the Institute of Hydraulic Research of the Federal University of Rio Grande do Sul. Mr. Tucci holds a Ph.D. from Colorado State University, 1978. He is currently the president of the GWP Global Water Partnership for South America. He is also a former vice-president of the International Association of Hydrologic Science, a former president of the Brazilian Water Resources Association, and a former executive secretary for the Water Resource Research and Investment fund in Brazil. He is now Chief-editor of the Brazilian Water Resources Journal. Mr. Tucci has about 300 publications in books, book chapters, papers in journals, essays and conferences. He was honored by the Civil Defense of the State of Rio Grande do Sul and for the best scientific book published in 1993 in the State of Rio Grande do Sul.

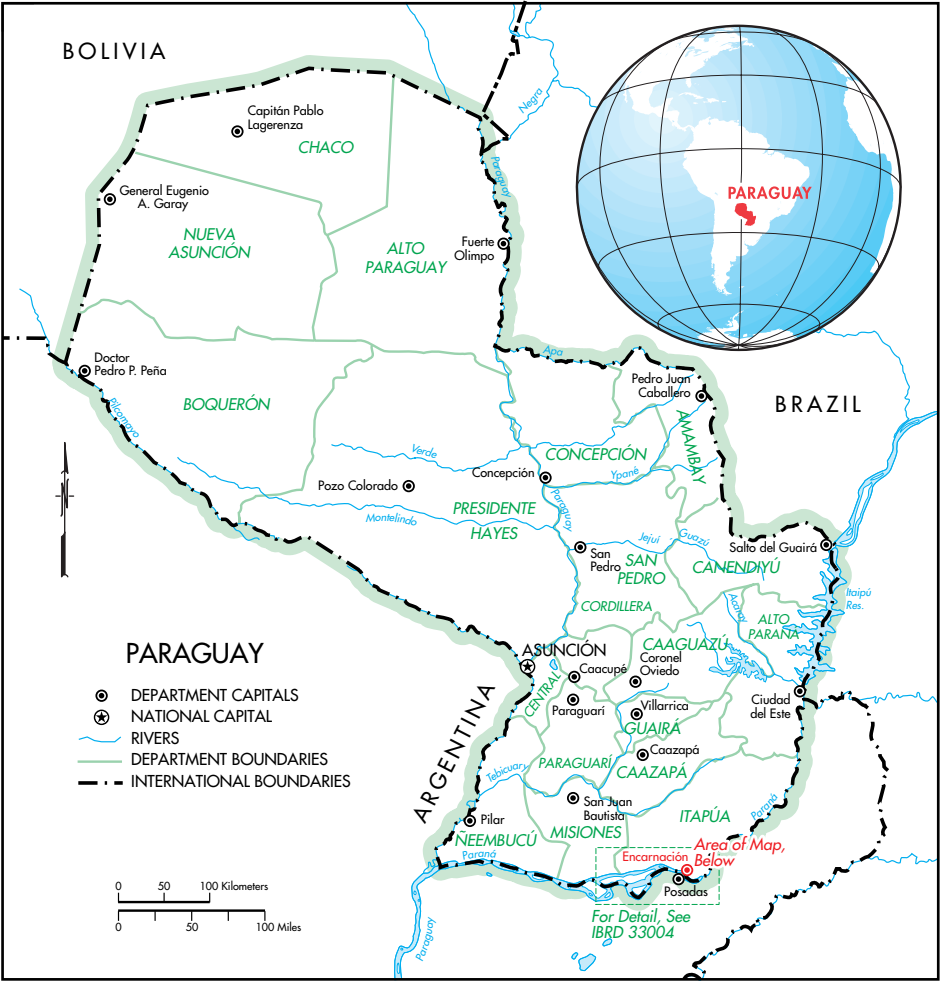


ARGENTINA AND PARAGUAY YACYRETÁ HYDROELECTRIC PROJECT

- PROJECT WORKS
- LEVEL 76 (APPROXIMATE)
- AREAS PRESENTLY INUNDATED BY THE PROJECT (APPROXIMATE, UP TO LEVEL 76 ONLY)
- ISLANDS AND RIVERS PRESENTLY INUNDATED BY THE PROJECT
- PROJECT RESETTLEMENT AREAS (ASENTAMIENTOS)
- LEVEL 84
- AREAS BETWEEN LEVELS 78 AND 83, INCLUDED UNDER THE 83 MASL TERMINATION PROGRAM
- CREEKS AND RIVERS
- MAIN HIGHWAYS
- BUILT-UP AREAS
- INTERNATIONAL BOUNDARIES







PARAGUAY

YACYRETÁ HYDROELECTRIC PROJECT

City of Encarnación

- "COTA" 76 (APPROXIMATE)
- "COTA" 78
- "COTA" 80
- "COTA" 84
- AREAS PRESENTLY INUNDATED BY THE PROJECT (APPROXIMATE, UP TO LEVEL 76 ONLY)
- PROPERTIES BETWEEN LEVELS 76 AND 78 MADE VACANT BY THE PROJECT (NO PDA ACTIONS CONTEMPLATED)
- PROPERTIES COVERED UNDER PDA AND THE 83 MASL TERMINATION PROGRAM
- PROPERTIES AFFECTED BY LEVEL 78 BUT NOT COVERED UNDER "PROGRAMA BASE"
- PROJECT RESETTLEMENT AREAS (ASENTAMIENTOS)
- PROPERTIES BETWEEN LEVEL 78 AND 84, INCLUDED UNDER THE 83 MASL TERMINATION PROGRAM
- CREEKS AND RIVERS
- MAIN HIGHWAYS
- BUILT-UP AREAS
- INTERNATIONAL BOUNDARIES

