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R2016-0015/1

February 4, 2016

**Closing Date: Wednesday, February 24, 2016  
at 6 p.m.**

FROM: Vice President and Corporate Secretary

**Brazil**  
**Teresina Enhancing Municipal Governance and Quality of Life Project**  
**Additional Financing**

**Project Paper**

Attached is the Project Paper regarding a proposed additional loan to the Municipality of Teresina, with a sovereign guarantee from Brazil for the Teresina Enhancing Municipal Governance and Quality of Life Project (R2016-0015), which is being processed on an absence-of-objection basis.

Distribution:

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Report No: PAD1136

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT PAPER

ON A

PROPOSED ADDITIONAL LOAN

IN THE AMOUNT OF US\$88 MILLION

TO THE

MUNICIPALITY OF TERESINA

WITH THE GUARANTEE OF

THE FEDERATIVE REPUBLIC OF BRAZIL

FOR THE

TERESINA ENHANCING MUNICIPAL GOVERNANCE AND  
QUALITY OF LIFE PROJECT

February 1, 2016

Water Global Practice  
Latin America and the Caribbean Region

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## CURRENCY EQUIVALENTS

(Exchange Rate Effective January 1, 2016)

Currency Unit = Brazilian Real  
R\$3.96 = US\$1.00  
US\$0.25 = R\$1.00

FISCAL YEAR  
January 1 – December 31

## ABBREVIATIONS AND ACRONYMS

AGESPISA	Piauí State Water Utility
APP	Permanent Preservation Area ( <i>Área de Preservação Permanente</i> )
BMLP	Brazil Municipal Lending Program
CMPM	Municipality's Coordination Unit for Policies for Women
CONAMA	Brazilian National Environment Committee ( <i>Conselho Nacional do Meio Ambiente</i> )
CPS	Country Partnership Strategy
ESMP	Environmental and Social Management Plan
GDP	Gross Domestic Product
GRS	Grievance Redress Service
IBGE	Brazilian Institute for Geography and Statistics ( <i>Instituto Brasileiro de Geografia e Estatística</i> )
INCC	National Construction Index ( <i>Índice Nacional da Construção Civil</i> )
IRR	Internal Rate of Return
NPV	Net Present Value
OP	Operational Policy
PAC	Program for Acceleration of Growth ( <i>Programa de Aceleração do Crescimento</i> )
PDO	Project Development Objective
PMT	Teresina Municipal Government ( <i>Prefeitura Municipal de Teresina</i> )
PMU	Project Management Unit
RPF	Resettlement Policy Framework
SEMPPLAN	Municipal Secretariat for Planning and Coordination
UASB	Upflow Anaerobic Sludge Blanket
UGP	Project Management Unit ( <i>Unidade de Gestão do Projeto</i> )
WSS	Water Supply and Sanitation

Vice President:	Jorge Familiar
Country Director:	Martin Raiser
Senior Global Practice Director:	Jennifer J. Sara
Practice Manager:	Wambui Gichuri
Task Team Leader:	Lizmara Kirchner
	Jean-Martin Brault



## **BRAZIL**

### **ADDITIONAL FINANCING – TERESINA ENHANCING MUNICIPAL GOVERNANCE AND QUALITY OF LIFE PROJECT**

#### **CONTENTS**

Project Paper Data Sheet	1
Project Paper	
I.    Introduction	5
II.   Background and Rationale for Additional Financing	5
III.  Proposed Changes	8
IV.  Appraisal Summary	13
V.   World Bank Grievance Redress	16
Annexes	
1.  Revised Results Framework and Monitoring Indicators	17
2.  Detailed Description of Modified or New Project Activities	19
3.  Economic Analysis	29
4.  Safeguards	37
5.  Map	43



## ADDITIONAL FINANCING DATA SHEET

*Brazil*

*BR AF Teresina Enhancing Municipal Governance and Quality of Life Project ( P146870 )*

*LATIN AMERICA AND CARIBBEAN*

*WATER GLOBAL PRACTICE*

Basic Information – Parent									
Parent Project ID:	P088966	Original EA Category:	A - Full Assessment						
Current Closing Date:	30-Jun-2016								
Basic Information – Additional Financing (AF)									
Project ID:	P146870	Additional Financing Type (from AUS):	Cost Overrun						
Regional Vice President:	Jorge Familiar	Proposed EA Category:	A - Full Assessment						
Country Director:	Martin Raiser	Expected Effectiveness Date:	15-Dec-2016						
Senior Global Practice Director:	Jennifer J. Sara	Expected Closing Date:	15-Dec-2021						
Practice Manager/Manager:	Wambui G. Gichuri	Report No:	PAD1136						
Team Leader:	Lizmara Kirchner and Jean-Martin Brault								
Borrower									
Organization Name	Contact	Title	Telephone	Email					
Municipality of Teresina	Washington Bonfim	Secretary of Planning	+55 (86) 3215-7528	lagoasdonorte@gmail.com					
Project Financing Data–Parent ( BR Municipal APL: Teresina Enhancing Municipal Governance and Quality of Life Project-P088966 )									
Key Dates									
Project	Ln/Cr/TF	Status	Approval Date	Signing Date	Effectiveness Date	Original Closing Date	Revised Closing Date		
P088966	IBRD-75230	Effective	27-Mar-2008	24-Jul-2008	03-Sep-2008	31-Jul-2013	30-Jun-2016		
Disbursements									
Project	Ln/Cr/TF	Status	Currency	Original	Revised	Cancelled	Disbursed	Undisbursed	% Disbursed
P088966	IBRD-75230	Effective	USD	31.13	31.13	0.00	31.13	0.0	100%

<b>Project Financing Data –Additional Financing BR AF Teresina Enhancing Municipal Governance and Quality of Life Project ( P146870 )</b>					
<input checked="" type="checkbox"/>	Loan	<input type="checkbox"/>	Grant	<input type="checkbox"/>	IDA Grant
<input type="checkbox"/>	Credit	<input type="checkbox"/>	Guarantee	<input type="checkbox"/>	Other
Total Project Cost:		176.00		Total Bank Financing: 88.00	
Financing Gap:		0.00			
<b>Financing Source – Additional Financing (AF)</b>				<b>Amount</b>	
Borrower				88.00	
International Bank for Reconstruction and Development				88.00	
Total				176.00	
<b>Policy Waivers</b>					
Does the project depart from the CAS in content or in other significant respects?				No	
Explanation: Not applicable					
Does the project require any policy waiver(s)?				No	
Explanation: Not applicable					
<b>Team Composition</b>					
<b>Bank Staff</b>					
<b>Name</b>	<b>Role</b>	<b>Title</b>	<b>Specialization</b>	<b>Unit</b>	
Lizmara Kirchner	Team Leader (ADM Responsible)	Senior Water & Sanitation Specialist	Water supply and sanitation	GWA04	
Jean-Martin Brault	Team Leader	Water & Sanitation Specialist	Water supply and sanitation	GWA04	
Danilo Pereira de Carvalho	Procurement Specialist (ADM Responsible)	Procurement Specialist	Procurement	GGO04	
Joao Vicente Novaes Campos	Financial Management Specialist	Financial Management Specialist	Financial management	GGO22	
Soraya Simão Melgaço	Safeguards Specialist	Consultant	Social	GSURR	
Pery Nazareth	Team Member	Consultant	Engineering	GWA04	
Carlos Eduardo Morelli Tucci	Team Member	Consultant	Integrated urban water management specialist	GWADR	
Pilar Clemente Fernandez	Safeguards Specialist	Senior Environmental Specialist	Environment	OPSPF	
Flavia Fonseca Carbonari de Almeida	Team Member	Consultant	Crime and violence prevention	GGO16	
Luz Maria Gonzalez	Team Member	Consultant	Finance and economics	GED04	
Patricia Miranda	Team Member	Senior Counsel	Legal	LEGOP	
Martin P. Gambrill	Team Member	Lead Water and Sanitation Specialist	Water supply and sanitation	GWASP	
Ndeye Awa Diagne	Team Member	Junior Professional Associate	Operations	GWA04	
Pamela Sofia Duran Vinueza	Team Member	Consultant	Operations	GSU04	

Tatiana Cristina O. de Abreu Souza	Team Member	Finance Officer	Finance	WFALN	
Waleska Magalhaes Pedrosa	Team Member	Paralegal	Legal	LCC5C	
Blanca Lopez-Alascio Granero	Team Member	Consultant	Operations	GWASL	
<b>Non-Bank Staff</b>					
<b>Name</b>		<b>Title</b>		<b>City</b>	
Alexandre Fortes		Environmental Safeguard Specialist		Brasilia, Brazil	
<b>Locations</b>					
<b>Country</b>	<b>First Administrative Division</b>	<b>Location</b>	<b>Planned</b>	<b>Actual</b>	<b>Comments</b>
Brazil	Estado do Piaui	Teresina		X	
<b>Institutional Data</b>					
<b>Parent (BR Municipal APL: Teresina Enhancing Municipal Governance &amp; Quality of Life Project-P088966 )</b>					
<b>Practice Area / Cross Cutting Solution Area</b>					
Water					
<b>Cross Cutting Areas</b>					
[ ] Climate Change					
[ ] Fragile, Conflict & Violence					
[ ] Gender					
[ ] Jobs					
[ ] Public Private Partnership					
<b>Sectors / Climate Change</b>					
Sector (Maximum 5 and total % must equal 100)					
Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %	
Water, sanitation and flood protection	General water, sanitation and flood protection sector	60			
Health and other social services	Other social services	22			
Public Administration, Law, and Justice	Sub-national government administration	10			
Transportation	Urban Transport	4			
Industry and trade	Housing construction	4			
Total		100			
<b>Themes</b>					
Theme (Maximum 5 and total % must equal 100)					
Major theme	Theme	%			
Urban development	Urban services and housing for the poor	25			
Urban development	Municipal governance and institution building	25			
Urban development	City-wide Infrastructure and Service	24			

	Delivery			
Social protection and risk management	Natural disaster management		13	
Environment and natural resources management	Pollution management and environmental health		13	
Total			100	
<b>Additional Financing BR AF Teresina Enhancing Municipal Governance and Quality of Life Project ( P146870 )</b>				
<b>Practice Area / Cross Cutting Solution Area</b>				
Water				
<b>Cross Cutting Areas</b>				
[ ] Climate Change				
[ ] Fragile, Conflict & Violence				
[X] Gender				
[ ] Jobs				
[ ] Public Private Partnership				
<b>Sectors / Climate Change</b>				
Sector (Maximum 5 and total % must equal 100)				
Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Water, sanitation and flood protection	Sanitation	40	5	
Water, sanitation and flood protection	Flood protection	30	30	
Public Administration, Law, and Justice	Sub-national government administration	15		
Health and other social services	Other social services	10		
Transportation	Urban Transport	5		
Total		100		
<b>Themes</b>				
Theme (Maximum 5 and total % must equal 100)				
Major theme	Theme	%		
Urban development	Municipal governance and institution building	25		
Urban development	Urban services and housing for the poor	20		
Urban development	City-wide Infrastructure and Service Delivery	25		
Environment and natural resources management	Pollution management and environmental health	20		
Social protection and risk management	Natural disaster management	10		
Total		100		
<b>Consultants (Will be disclosed in the Monthly Operational Summary)</b>				
Consultants Required? Consulting services will be required				

## I. Introduction

1. This Project Paper seeks the approval of the Executive Directors to provide an additional loan in the amount of US\$88 million to the Municipality of Teresina (PMT), with a sovereign guarantee from the Federative Republic of Brazil, for the Teresina Enhancing Municipal Governance and Quality of Life Project (P088966, Loan 7523-BR).
2. The proposed additional financing will be used to cover a financing gap in the ongoing US\$31.13 million loan, and enable the completion of originally planned activities. This financing gap resulted from cost overruns originating from: (a) inflation in the Brazilian civil construction sector – since the project was appraised, the national index of civil construction (INCC) increased by 73 percent; (b) the appreciation of the Brazilian Real (R\$) against the US Dollar (US\$) during the execution of works – which accounted for about US\$7 million in funding losses; and (c) an underestimation of the costs during preparation – as these costs were originally estimated based on conceptual designs, and increased once the basic and detailed engineering designs were prepared.
3. The additional loan will finance integrated interventions in drainage, sanitation, urban requalification and resettlement in the *Lagoas do Norte* region of Teresina, all of which were planned under the original loan, and have been updated to conform to the current on-the-ground reality. These interventions will further catalyze the transformation of the Region’s low income neighborhoods, bringing additional economic, social and quality of life improvements to local residents, while consolidating and tying-in the *Lagoas do Norte* region within the social fabric and urban dynamic of the rest of the city. There will be no changes in the Project’s component structure or safeguard category.

## II. Background and Rationale for Additional Financing in the amount of US\$88 million

4. *Background.* With an estimated population of 840,000 residents,<sup>1</sup> Teresina, the capital of the State of Piauí, ranks 25<sup>th</sup> among the 27 Brazilian state capitals in terms of income per capita. In the past 10 years, as part of its strategic planning process, the PMT has focused efforts on *Lagoas do Norte* – an environmentally and socially vulnerable region of the city requiring special interventions. The frequent flooding and social exclusion have resulted in the need to design and implement a specific investment program for the *Lagoas do Norte* region, which suffers from housing, health, environmental, social and economic problems that set it apart from the rest of the city.
5. As such, the project was designed to respond to the main development challenges facing the PMT in general, with a focus on addressing the urban-environmental-social and perennial flooding problems encountered in the *Lagoas do Norte* region, one of the most vulnerable and poverty-stricken regions of the city. A survey undertaken in 2012 revealed that unemployment rate in the *Lagoas do Norte* region was 13.5 percent, that only 15 percent of the population has university degrees, and only 50 percent of the region’s adult residents have graduated from high school.

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<sup>1</sup> Brazilian Institute for Geography and Statistics (IBGE), 2014

6. The US\$31.13 million original loan was approved on March 27, 2008, and declared effective on September 3, 2008, with an original estimate of US\$13.34 million in counterpart financing. The PMT was able to obtain an additional US\$10 million from the Brazilian Federal Government (through the *Programa de Aceleração do Crescimento – PAC*) to start implementing activities that were at an advanced stage of preparation, indicating their high level of commitment to the project and its timely implementation.
7. The Project is the third in a series of projects under the Brazil Municipal Lending Program (BMLP) Umbrella (horizontal). The BMLP was structured as a Horizontal Adaptable Program Loan (APL) [known now under OP10.00 as a Series of Projects (SOP)] consisting of up to 8 operations for key cities with a common focus on poverty alleviation, urban environment, local economic development, and municipal management. These themes were selected by the federal government and the participating municipalities as priorities.
8. The original Project development objectives are to: (i) modernize and improve the management capacity of Teresina Municipal Government in the financial, urban environmental, service-delivery, and economic development fields, and; (ii) improve the quality of life of the low income population of the *Lagoas do Norte* region of the city. Higher than anticipated costs resulted in the need to restructure the original project in July 2013 to (i) modify its scope and activities in line with available resources which, although impacting the Project targets, did not alter the PDO or the structure of components; and (ii) extend the loan's closing date from July 31, 2013 to December 31, 2014. Subsequently, the closing date was extended again to December 31, 2015 and June 30, 2016. Overall Project implementation is satisfactory, and the project was showcased as a good practice example of green and inclusive growth by the Brazilian Government at the Rio+20 Conference.
9. Under Component 1 (Municipal Management Modernization, City Development and Project Management), the Municipality has made progress with modernizing its financial system, resulting in a direct increase of 35 percent in revenue collection. This new system set the stage for municipal revenues to increase from R\$54 million in 2007 to R\$115 million in 2013. A Public Expenditure and Financial Accountability (PEFA) review was carried out in early 2015 and the Municipality's overall aggregate score improved from C+ (in 2005) to B. The new financial system is faster, more reliable and has allowed for faster internal processing, as well as better financial and budget planning. A new system was also implemented by the Municipal Administration Secretariat substantially improving human resource management.
10. The municipal Drainage Master Plan and the municipal Water Supply and Sanitation Plan were finalized with the project's support, the approval of the latter ensuring that the provision of water supply and sanitation services in the Municipality is in compliance with the federal water supply and sanitation law. The Municipality is in the process of approving important legislation proposed by the Drainage Master Plan that will pave the way for important non-structural measures to deal with issues of urban flooding, and the PMT has also been able to mobilize funding to prepare engineering designs for the eight priority works identified in the Plan. In addition, the Teresina Municipal Agency for Public Services Regulation was created and technical assistance was provided under the project for its structuring and strengthening.
11. Most of the works implemented under Component 2 (Integrated Urban-Environmental Development in the *Lagoas do Norte* region), have been finalized. In total, 493 families have been resettled from areas with high risk of flooding, and 168 families have benefited from

housing improvements. The drainage and sanitation works are in the final phase of execution, and once finalized, they will: (i) provide access to sanitation to 6,302 households, 24,493 people in Area 1, (ii) improve the quality of water services to 36,000 people throughout the *Lagoas do Norte* region; and (iii) protect the population residing in Area 1 of *Lagoas do Norte* from floods of up to a 50-year recurring interval. As a result of the financing gap, these results represent a portion of the targets of the original loan. Originally 1,288 families were planned to be resettled and 422 families were to benefit from improved housing. The percentage targets on improved access to water (100%) and sanitation (90%) as well as flood protection (100%) were achieved, but for a reduced project area. The *Lagoas do Norte* Park was inaugurated in July 2012, and since then, has been widely used by the low income surrounding community and others throughout the city. The Park has provided much needed leisure space to the area's population, and has become a source of pride for them.

12. Implementation of Component 3 (Social and Economic Development), is progressing satisfactorily. Numerous social mobilization and outreach activities related to the project, especially with regards to the use and upkeep of the *Lagoas do Norte* Park, have been and continue to be implemented. The *Teatro do Boi* cultural space continues to be extensively used by the community. Overall, the PMT continues to explore and develop appropriate structures for the sustainable management of public spaces with support from the local community, and with the intention of helping foster and instill a local culture of ownership and care of public spaces.

13. *Rationale for the Additional Financing.* The overall aim of the project is to improve the living conditions of the most vulnerable and poverty-stricken region of Teresina, by eliminating perennial flooding, reducing pollution, improving sanitation, roads, and providing leisure areas. The project will also finance specific social and economic interventions to improve health and quality of life, as well as promote job creation and local economic growth. The PMT realizes that although the interventions financed by the original loan had a significant impact, they will not, by themselves, have the transformative effect envisaged in the design of the original loan for the *Lagoas do Norte* region and the city of Teresina. This is mainly because not all of the planned interventions could be undertaken as envisaged due to a funding gap. The project will benefit 92,000 vulnerable people in a marginalized area by providing them with access to better services. The additional loan will consolidate the interventions already built under the first phase and further catalyze the transformation of these low-income neighborhoods in the *Lagoas do Norte* region. In addition, the activities financed by the additional loan will be a central element in integrating the *Lagoas do Norte* region within the social fabric and urban dynamic of the rest of the city.

14. The proposed additional financing is consistent with The World Bank Group's Brazil Country Partnership Strategy (CPS), 2012-2015, (Report No. 63731-BR), discussed by the Executive Directors on November 1, 2011, specifically supporting the following CPS strategic objectives: (a) *Improve quality and expand provision of public services for low income households* - expanded affordable housing and improved living conditions for low-income and vulnerable groups; and (b) *Promote regional economic development through strategic investments and policies* - expanded access to improved water supply, sanitation, drainage and solid waste management, including actions in basin management, urban development and upgrading, housing, disaster risk management (as most disaster risks in Brazil are flood-related) and poverty alleviation.

### III. Proposed Changes

<b>Summary of Proposed Changes</b>	
The changes entail modifications to activities under each component to finance the original project concept and design and conform to the current on-the-ground reality.	
<b>Project Components</b>	
<i>Component 1: Municipal Management Modernization, City Development and Project Management.</i> Strengthening of the Municipality's environmental management capacity and activities, consolidating and improving the efficiency of the Municipality's financial and budget management and planning capacity are being re-inserted into the project's scope.	
<i>Component 2 – Integrated Urban-Environmental Development in the Lagoas do Norte Region.</i> The scope of this component will be reverted to what was planned under the design of the original loan, incorporating the lessons learned during implementation. Comprehensive, integrated interventions (drainage, sanitation, urban requalification, and resettlement), will be undertaken in Areas 2 and 3.	
<i>Component 3 – Social and Economic Development of the Lagoas do Norte Region.</i> The implementation of the original loan demonstrated a need to support the municipal government to develop crime and violence prevention activities, focused at the most vulnerable populations (e.g., afro-descendant youth and women), and strengthening its capacity to implement and monitor them. As such, specific activities targeting these issues have been incorporated under this component.	
Change in Implementing Agency	Yes [ ] No [ X ]
Change in Project's Development Objectives	Yes [ ] No [ X ]
Change in Results Framework	Yes [ ] No [ X ]
Change in Safeguard Policies Triggered	Yes [ ] No [ X ]
Change of EA category	Yes [ ] No [ X ]
Other Changes to Safeguards	Yes [ ] No [ X ]
Change in Legal Covenants	Yes [ ] No [ X ]
Change in Loan Closing Date(s)	Yes [ ] No [ X ]
Cancellations Proposed	Yes [ ] No [ X ]
Change in Disbursement Arrangements	Yes [ X ] No [ ]
Reallocation between Disbursement Categories	Yes [ ] No [ X ]
Change in Disbursement Estimates	Yes [ X ] No [ ]
Change to Components and Cost	Yes [ X ] No [ ]
Change in Institutional Arrangements	Yes [ ] No [ X ]
Change in Financial Management	Yes [ ] No [ X ]
Change in Procurement	Yes [ ] No [ X ]

Change in Implementation Schedule					Yes [ X ] No [ ]	
Other Change(s)					Yes [ ] No [ X ]	
Development Objective/Results						
Project's Development Objectives						
Original PDO						
The objective of the Project is to modernize and improve the management capacity of the Municipality of Teresina in the financial, urban, environmental, service-delivery, and economic development fields and to improve the quality of life of the low-income population of the <i>Lagoas do Norte</i> Region.						
Compliance						
Covenants - Additional Financing ( BR AF Teresina Enhancing Municipal Governance and Quality of Life Project - P146870 )						
Source of Funds	Finance Agreement Reference	Description of Covenants	Date Due	Recurrent	Frequency	Action
IBRD	Schedule 2, Section I, A, 1(a) - Implementation Arrangements - Institutional	At all times during execution of the project, the Borrower shall maintain, until completion of the project a unit within SEMPLAN, to be responsible for the overall coordination and implementation of the project (the "PMU"), such PMU to maintain staffing, functions and responsibilities satisfactory to the Bank as set forth in the Operational Manual.		<input checked="" type="checkbox"/>	Continuous	New
IBRD	Schedule 2, Section I, A, 1(b) - Implementation Arrangements, Institutional	The Borrower shall maintain until completion of the project a Project Steering Committee (or "PSC"), presided by the Borrower's Mayor or its designated representative, with the overall responsibility for providing policy oversight and guidance for the implementation of the Project and with powers and composition acceptable to the Bank as set forth in the Operational Manual.		<input checked="" type="checkbox"/>	Continuous	New

IBRD	Schedule 2, Section I, B - Implementation Arrangements - Operational Manual	Without limitation to the provisions of Section 5.01 of the General Conditions, the Borrower shall cause the Project to be carried out in accordance with the provisions of a manual, satisfactory to the Bank (the “Operational Manual”), which shall detail the procedures and guidelines for the execution, monitoring and evaluation of the Project.		☒	Continuous	New
IBRD	Schedule 2, Section I, D, 1 - Implementation Arrangements - Safeguards	Without limitation to the provisions of Section 5.01 (b) of the General Conditions, the Borrower shall carry out the Project in accordance with the provisions and recommendations of the Environmental and Social Assessment , a respective ESMP, the Resettlement Policy Framework, the resulting Resettlement Plans and the procedures outlined in the Operational Manual, when applicable.		☒	Continuous	New
IBRD	Schedule 2, Section I, D, 2 - Implementation Arrangements - Safeguards	Prior to initiating bidding procedures for works, the Borrower shall, when applicable, submit to the Bank for its review and approval a Resettlement Plan for the population affected by the relevant works, to be prepared in accordance with the Resettlement Policy Framework. Prior to initiating works in selected Project areas, implement the Resettlement Plan in a manner satisfactory to the Bank.		☒	Continuous	New
IBRD	Schedule 2, Section I, D, 3 - Implementation Arrangements - Safeguards	The Borrower shall ensure that any contractors that will carry out civil works under the Project shall perform their work in accordance with the technical, environmental and social practices for the Project, as set forth in the Environmental and Social Assessment and respective ESMP.		☒	Continuous	New

IBRD	Schedule 2, Section I, D, 4 (a) - Implementation Arrangements - Safeguards	The Borrower shall maintain a dam safety panel with experts and terms of reference satisfactory to the Bank, which shall review the detailed engineering designs for works for the flood control dike along the Parnaíba river under Part 2(d) of the Project prior to commencement of works.	31-Dec-2018	<input type="checkbox"/>		New						
IBRD	Schedule 2, Section I, D, 4 (b) - Implementation Arrangements - Safeguards	The Borrower shall ensure that contractors that will carry out said works shall follow the safety standards and recommendations of the dam safety panel referred to in paragraph (a) above.		<input checked="" type="checkbox"/>	Continuous	New						
<b>Conditions</b>												
<table border="1"> <thead> <tr> <th>Source Of Fund</th> <th>Name</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>IBRD</td> <td>Effectiveness</td> <td>Effectiveness</td> </tr> </tbody> </table>							Source Of Fund	Name	Type	IBRD	Effectiveness	Effectiveness
Source Of Fund	Name	Type										
IBRD	Effectiveness	Effectiveness										
<b>Description of Condition</b>												
The Additional Legal Matter consists that the Loan has been validly registered by the Guarantor's Central Bank.												
<b>Risk</b>												
<b>Risk Category</b>						<b>Rating (H, S, M, L)</b>						
1. Political and Governance						Moderate						
2. Macroeconomic						Moderate						
3. Sector Strategies and Policies						Moderate						
4. Technical Design of Project or Program						Moderate						
5. Institutional Capacity for Implementation and Sustainability						Moderate						
6. Fiduciary						Low						
7. Environment and Social						Moderate						
8. Stakeholders						Moderate						
OVERALL						Moderate						
<b>Finance</b>												
<b>Loan Closing Date - Additional Financing ( BR AF Teresina Enhancing Municipal Governance and Quality of Life Project - P146870 )</b>												
<b>Source of Funds</b>				<b>Proposed Additional Financing Loan Closing Date</b>								
International Bank for Reconstruction and Development				15-Dec-2021								

<b>Change in Disbursement Arrangements</b>										
Explanation: New disbursement categories, SOE limits, Minimum Value of Application and Designated Account requirements were agreed for the Additional Financing loan. The relevant legal document and disbursement letter reflect such changes.  Retroactive Financing: Payments made prior to the Signing Date of the Loan Agreement but on or after March 1, 2015 for Eligible Expenditures, up to an aggregate amount not to exceed US\$16,000,000 equivalent, will finance some of the eligible activities that are at an advanced stage of preparation.										
<b>Change in Disbursement Estimates (including all sources of Financing)</b>										
Explanation: Disbursement schedule changed to incorporate disbursements up until the closing date of the additional financing loan.										
<b>Expected Disbursements (in USD Million)(including all Sources of Financing)</b>										
Fiscal Year	2017	2018	2019	2020	2021	2022				
Annual	2.00	8.00	15.00	25.00	30.00	8.00				
Cumulative	2.00	10.00	25.00	50.00	80.00	88.00				
<b>Allocations - Additional Financing ( BR AF Teresina Enhancing Municipal Governance and Quality of Life Project - P146870 )</b>										
Source of Fund	Currency	Category of Expenditure	Allocation		% of Expenditures to be financed					
			Proposed		Proposed					
IBRD	USD	(1) Goods, works, non-consulting services, consultants' services, Training and Operating Costs under Component 1		7,100,000.00		100.00				
IBRD		(2) Goods, works, non-consulting services, consultants' services and Operating Costs under Component 2		74,800,000.00		100.00				
IBRD	USD	(3) Goods, works, non-consulting services, consultants' services, Training and Operating Costs under Component 3		5,880,000.00		100.00				
		(4) Front-end fee		220,000.00						
		(5) Interest Rate Cap or Interest Rate Collar premium		0.00						
		<b>Total:</b>		88,000,000.00						

Components				
<b>Change to Components and Cost</b>				
Explanation: The structure of the components will not change. The activities to be implemented under each of the components with the proposed additional financing loan will largely conform to the original project concept and design and to the current on-the-ground reality. A detailed description of the activities to be financed under each Component can be found in Annex 2.				
Current Component Name	Proposed Component Name	Current Cost (US\$M)	Proposed Cost (US\$M)	Action
Management Modernization and Development	Management Modernization and Development	4.37	14.93	Revised
Integrated Urban-Environmental Development	Integrated Urban-Environmental Development	36.07	154.96	Revised
Social and Economic Development	Social and Economic Development	1.91	5.89	Revised
	<b>Total:</b>	42.35	175.78 <sup>2</sup>	
Other Change(s)				
<b>Change in Implementation Schedule</b>				
Explanation: The additional financing loan will be implemented from December 2016 to December 2021.				

#### IV. Appraisal Summary

Appraisal Summary
<b>Economic and Financial Analysis</b>
<p>A cost-benefit analysis was carried out to determine the economic feasibility of the works to be implemented under the additional financing. Hedonic price approach was used to estimate benefits of urban-environmental development. Even though the sanitation and water subcomponents are included in the urban development analysis, they were also evaluated separately, yet their benefits were not added to avoid double counting. Benefits were estimated using avoided cost approach for water and sewerage, and willingness to pay for wastewater treatment.</p> <p>Results show that <i>the overall investment will positively impact the development of Teresina</i>, given that benefits are 14 percent higher than the associated costs. The present value of net benefits is US\$29 million and the overall expected internal rate of return is 18 percent.</p> <p><i>Justification for public sector provision.</i> The interventions will be implemented in one of the most vulnerable and poverty-stricken regions of Teresina. They will improve living conditions and safeguard the population against the problem associated with perennial flooding, and will also bolster local economic development and improve municipal governance. Public financing and public subsidies are needed, as households cannot afford</p>

<sup>2</sup> Excludes the front-end fee of US\$220,000

to pay for these improvements.

*Bank value added.* The World Bank has been supporting the Municipality through the original loan, which is about to be fully disbursed, and the PMT has asked the Bank for additional guidance and financing to cover the funding gap. The proposed additional financing is grounded in a rich analytical framework and policy dialogue between the Bank and the PMT with regards to urban development, municipal fiscal policy, land management, housing, basic urban services to the poor, and decentralized environmental management. World Bank participation can also foster the inclusion of environmental and social safeguards in municipal projects, promoting a holistic approach to municipal planning and investment (integrated investment in infrastructure with social and governance elements such as monitoring and evaluation).

### **Technical Analysis**

The proposed project relies on approaches, methodologies and technical designs appropriate for the Brazilian context and no significant technical obstacles are expected during implementation.

The original loan is financing the preparation of detailed engineering designs for all of the drainage, sanitation, urban upgrading and road improvement interventions in the *Lagoas do Norte* region. These designs are being prepared based on updated hydrological simulations for the entire drainage systems of the *Lagoas do Norte* region, taking into account what has been built with financing from the original loan. These simulations have been verified for potential floods with a recurrence interval of 50 years, and through this study, it has been determined that maintaining a level of 55 meters for the *Lagoa dos Oleiros* is the best operational scenario, as it minimizes the need for resettlements and allows for maintaining adequate water levels year-round throughout the different lagoons in the region.

The infrastructure works for which detailed engineering designs are currently being prepared have been prioritized for inclusion under the proposed additional financing in a way that maximizes the positive impact on the *Lagoas do Norte* region and, consequently, makes the greatest contribution to the achievement of project development objectives. Extensive discussions have been undertaken during preparation with regards to the alternatives available for the treatment of the wastewater that is to be collected through the sanitation interventions in Phase 2. Agreement was reached on the implementation of the best alternative, which is to rehabilitate and increase the treatment capacity of the existing Pirajá wastewater treatment plant using a complementary Upflow Anaerobic Sludge Blanket (UASB), eliminating not only the need to build a collector of large diameter and extension, but also the need to acquire additional land for the construction of a new wastewater treatment plant, as was originally contemplated.

Engineering designs and associated costs of infrastructure works have been reviewed during preparation, taking into consideration the cost analysis as well as the cost parameters developed as a result of the original loan's implementation experience.

The proposed implementation period is considered adequate, given the large number of families to be resettled (2,206), and considering that the resettlement will be implemented in stages as the new residential areas that will be built under the project become available. A general implementation plan can be found in Annex 2.

### **Social Analysis**

The Project consists of a range of activities that benefit the Municipality of Teresina as a whole, but with the bulk of activities directly focused on the population living in the *Lagoas do Norte* region. This region concentrates a lower-income population, where public services and opportunities for economic development are less in evidence. The project will bring positive social impacts to the region through better access to public services as well as green and leisure spaces. In addition, the implementation of a tourism complex where the Parnaíba and Poti rivers meet will provide new economic opportunities in the area.

About 92,000 people live in *Lagoas do Norte*, distributed within 13 neighborhoods, of which 65 percent earn

about US\$1.5/person/day. The percentage of women living in this area is higher than in the city overall, with 53.4 percent being women according to the 2010 IBGE census. A survey undertaken in 2012 revealed that the unemployment rate in the *Lagoas do Norte* region is 13.5 percent, and that only 15 percent of the population has university degrees, while 50 percent of the region's adult residents have graduated from high school. Informal economic activities account for half of the income in the region, particularly in the service sector. The main problems undermining the quality of life in the area include the urban degradation and lack of access to basic services, and the resulting health and environmental problems that are prominent in *Lagoas do Norte*.

The proposed additional financing includes activities intended to help the low-income population of the region cope with the daily challenges directly affecting them, and to contribute to improving their quality of life, including: (i) resettlement of the population at risk; (ii) provision of urban and social services; (iii) provision of new housing and programs for improving existing housing; and (iv) economic and social development programs aimed at supporting the generation of employment and income, as well as social promotion activities.

### **Environmental Analysis**

The Project remains classified as Category A, as the proposed additional works under the additional financing were already envisaged under the original loan and were subject to an environmental evaluation during its preparation. As a result, the same safeguard policies will be triggered: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Physical Cultural Resources (OP/BP 4.11), Involuntary Resettlement (OP/BP 4.12), and Safety of Dams (OP/BP 4.37). The Project's Environmental and Social Assessment (including the Environmental and Social Management Plan - ESMP) as well as the Resettlement Policy Framework have been revised to reflect the updated project scope as well as lessons learned during the implementation of activities under the original loan. These documents were disclosed at the World Bank's external website and made available to the public locally on October 24, 2014.

Local public consultations were held on November 4, 2014. About 170 people from the local community participated in the three-hour meeting. Most of the questions and feedback received was positive with concerns related to the timeline of implementation, such as when will the resettlement take place and who will be impacted as well as when will construction begin. The PMT shared with the audience the existing tentative schedule and has kept the local communities informed of changes since then. A number of questions were also relative to the expansion of the project interventions to an area adjacent to the Project interventions and the Municipality informed the audience the resources available were not enough to cover the area in question, and that they were looking for other sources of financing to expand the interventions to the area in question. Annex 4 has a more detailed description of the environmental aspects of the proposed Additional Financing.

**Risk**

*Project cost estimates:* In order to minimize the risk of cost overruns, the Bank and PMT have undertaken a detailed diagnostic and breakdown of the factors which combined to increase the cost of activities financed under the original loan (a summary of this analysis is included in Annex 2). An engineering consulting firm has already been contracted to prepare the detailed engineering designs for the interventions to be financed under the proposed Additional Financing Loan. This consulting firm is doing a thorough review of the costs based on this detailed diagnostic as well as on other relevant cost parameters, as described in Annex 2. In addition, the PMT will carry out the bidding processes based on detailed engineering designs, as opposed to the experience in the original loan, under which the works were contracted with basic engineering designs.

*Lawsuit under the original loan:* The court excluded the Bank from the lawsuit against the Borrower regarding land ownership and compensation of one property in Area 1 of the project under the original loan. The Bank had been added as a party to the lawsuit by the Plaintiff to, as expressly stated in the Plaintiff's filings, keep the Bank informed of the Municipality's actions. Nevertheless, the Bank team has reviewed the related claim and concluded that the Municipality complied with the Bank's safeguards and with the Project's Resettlement Framework. The team will continue to monitor the situation and follow-up on the status of this lawsuit with the Borrower. This lawsuit does not impact the areas under the project affected by the activities proposed under the Additional Financing. Further information is available in Annex 4 – Safeguards

*Stakeholders:* During the implementation of the original project 493 families were successfully resettled and the PMT was able to institute a productive engagement with the local community in the *Lagoas do Norte* region through the establishment of a local committee with elected representatives from each neighborhood, and by physically placing a social project unit in the affected area, which has become a reference point for engagement and accountability vis-à-vis the local community. Under the proposed additional financing it is estimated that 2,206 families will need to be resettled, most of which are in areas of risk or areas of environmental preservation. Given the larger number of families affected, it is possible for the PMT to encounter resistance by some of the local population in their resettlement efforts. In order to minimize this risk, the PMT is undertaking an extensive communication campaign in the *Lagoas do Norte* region as a whole, using the media, engagement with local community leadership and using an experienced social team in their communication efforts. This campaign has a specific communication strategy for the people that are part of the resettlement cadaster, in which door-to-door visits will be made to explain the project and how the resettlement process will work in detail. The PMT is also drawing on testimony and support from leaders and population that benefitted from resettlement under the original loan as part of the communication strategy.

**V. World Bank Grievance Redress**

Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).

## Annex 1: Results Framework

<b>Project Development Objective (PDO):</b>								
The objective of the Project is to modernize and improve the management capacity of the Borrower in the financial, urban, environmental, service-delivery, and economic development fields and to improve the quality of life of the low-income population of the <i>Lagoas do Norte</i> Region.								
Results Indicators*	Core	Unit of Measure	Baseline	Actual Values End of Phase 1 – Jun 2016	Cumulative Target Values End of Phase 2 – Dec 2021	Frequency	Data Source/ Methodology	Responsibility for Data Collection
<b>PDO Level</b>								
<b>Municipal Management</b>								
Improve the Municipality's aggregate PEFA score.	<input type="checkbox"/>	ABCD scale	C+ (2005)	B	B	Final report	Consultant analysis/survey	PMU/PMT
PMT compliance with new federal water supply and sanitation law, including: (i) Preparation of a municipal WSS plan. (ii) Creation and strengthening of a municipal WSS regulating body. (iii) Formalization of WSS service delivery contractual arrangement.	<input type="checkbox"/>	Yes/No	No	(i) yes (ii) yes (iii) yes	(i) yes (ii) yes (iii) yes	Progress reports, MTR and final report	Consultant analysis/survey and audit	PMU/PMT and WSS regulatory entity
Increase the collection efficiency of municipal revenues as a result of the modernization activities implemented under the project	<input type="checkbox"/>	% (R\$M)	0 (R\$54M)	35 R\$18.9M (increase) /R\$72.9M total)	50 R\$27M (increase) /R\$81M (total)	Every six months	SEMF	SEMF/PMU
Families living in at risk or environmental preservation areas in Areas 1, 2, and 3 resettled.	<input type="checkbox"/>	Number	0	493	2,699			
Direct project beneficiaries	<input checked="" type="checkbox"/>	Number	0	26,000 <sup>3</sup>	92,000	Annual	Progress Reports	PMU
Female beneficiaries	<input checked="" type="checkbox"/>	%	0	53	53	Annual	Progress Reports	PMU
<b>INTERMEDIATE RESULTS</b>								
<b>Component One: Municipal Management Modernization, City Development and Project Management</b>								
Municipal drainage master plan completed, and associated legislation adopted.	<input type="checkbox"/>	Yes/No	No	Master plan completed; legislation not adopted	Master plan completed, legislation adopted	Mid-Term	PMT Annual Report	PMU
Municipal revenue that is spent on staff costs	<input type="checkbox"/>	%	New indicator baseline = end of Phase 1	50	48	Annual	(staff costs/net current revenue) x 100	PMU
Restructuring plan for the municipal environmental secretariat developed and priority actions implemented	<input type="checkbox"/>	Yes/No	No	Plan developed not implemented	Plan developed and priority actions implemented	Annual	Progress reports	PMU

<sup>3</sup> The number of people directly benefiting from the interventions in Area 1 only

Results Indicators*	Core	Unit of Measure	Baseline	Actual Values End of Phase 1 – Jun 2016	Cumulative Target Values End of Phase 2 – Dec 2021	Frequency	Data Source/ Methodology	Responsibility for Data Collection
Following improvements to municipal management implemented: i. Management Information system for administrative, financial and human resource management ii. Internal control systems iii. Unified system for management of human resources iv. Electronic receipts system (to facilitate collecting of tax revenues)	<input type="checkbox"/>	Yes/No	No	i. Yes ii. Yes iii. Yes iv. Yes	i. Yes ii. Yes iii. Yes iv. Yes	Every six months	Progress Reports, MTR report	PMU
<b>Component Two: Integrated Urban-Environmental Development in the Lagoas do Norte Region</b>								
Families benefiting from upgrading/improvements of their current households	<input type="checkbox"/>	Number	0	168	668	Every six months	Progress Reports, MTR report	PMU
People provided with access to improved sanitation facilities under the project.	<input checked="" type="checkbox"/>	Number	9,500	20,000	60,000	Every six months	Progress Reports, MTR report	PMU
New household sewer connections constructed under the project	<input checked="" type="checkbox"/>	Number	0	6,846	14,000	Every six months	Progress Reports, MTR report	PMU
Kilometers of non-rural roads rehabilitated	<input checked="" type="checkbox"/>	km	0	10	58	Every six months	Progress Reports, MTR report	PMU
Reduction in the pollution levels of the lagoons in the Project Area (DO - dissolved oxygen) <sup>4</sup>	<input type="checkbox"/>	(mg/l)	DO: 0.2 – 4.34	DO: 4	DO: 5	Every six months	Progress Reports, MTR report	PMU
Increase in permanently protected and recovered areas for leisure and collective use in the Project Area	<input type="checkbox"/>	m <sup>2</sup> / habitant	1.3	2.4	5	Annual	End of Phase 1: Increase = Baseline + (100,000 m <sup>2</sup> /92,000h) End of Phase 2: Increase = Baseline + (340,000 m <sup>2</sup> /92,000h)	PMU
<b>Component Three: Social and Economic Development in the Lagoas do Norte Region</b>								
Annual attendance levels of events in the <i>Teatro do Boi</i> .	<input type="checkbox"/>	Number	0	5,000	5,000	Annual	Progress reports	PMU
Socio-environmental activities implemented in the project's area of intervention, including schools	<input type="checkbox"/>	Number	0	30	80	Every six months	Progress Reports	PMU
Gender aspects mainstreamed in the Municipal Violence Prevention Plan	<input type="checkbox"/>	Yes/No	No	No	Yes	Annual	Progress Reports	PMU

<sup>4</sup> Agreement has been reached on the monitoring of DO in the following lakes: Cabrinha, Lourival and Pantanal.

## **Annex 2: Detailed Description of Modified or New Project Activities**

1. Overall, the structure of the project components remains the same. The activities proposed under the additional financing loan were largely part of the Project's original concept and design, which had to be reduced via a restructuring as a result of the financing gap. Detailed estimated project costs can be found at the end of this Annex. The activities proposed to be financed under each of the components are:

### ***Component 1: Municipal Management Modernization, City Development and Project Management.***

2. This component aims to strengthen the PMT's management and technical capacity, including, *inter alia*:

- (i) Consolidating and improving the efficiency of PMT's financial and budget management and planning capacity;
- (ii) Strengthening PMT's environmental management capacity, including the introduction of an environmental licensing and enforcement control system;
- (iii) Reviewing and implementing PMT's organizational structure to deliver services and meet development needs;
- (iv) Strengthening the PMT's procurement management capacity;
- (v) Strengthening PMT's institutional capacity to manage water supply, sanitation and drainage, including the preparation of procedures for supervising works, operate and maintain selected related infrastructure;
- (vi) Preparing engineering designs for selected strategic and priority works for the PMT;
- (vii) Carrying out Project management, monitoring and evaluation, to support the PMU to carry out the procurement, financial management, environmental, social and other requirements of the Project; and
- (viii) Strengthening the PMU's capacity in implementing the Project.

### ***Component 2: Integrated Urban-Environmental Development in the Lagoas do Norte Region.***

3. This component will finance activities to improve the delivery of basic urban services and the overall environmental conditions in the *Lagoas do Norte* region, including, *inter alia*:

- (i) Interventions to optimize water supply delivery;
- (ii) Implementation of wastewater collection, transmission and treatment systems;
- (iii) Execution of critical urban macro- and micro-drainage interventions;
- (iv) Actions to recuperate the natural environmental aspects of the region's lagoon and canal network, and the adjacent banks of the Parnaíba and Poti rivers;
- (v) Interventions in urban upgrading, and the rehabilitation and construction of green spaces, parks, and leisure and community spaces;
- (vi) Interventions to improve the local road network, traffic flow, access and safety in the region; and
- (vii) Undertaking resettlement of beneficiary families from areas of risk and from other areas of Project intervention, and implementing housing improvements for other eligible households.

***Component 3: Social and Economic Development in Lagoas do Norte Region.***

4. Interventions under this component will continue to complement those of Component 2, and include, *inter alia*:
  - (i) Actions to strengthen community associations and other community groups in order to improve the access of eligible families to the project's social programs, crèches, basic health and education services, etc.;
  - (ii) Undertaking of environmental and sanitary education and promotion activities;
  - (iii) Promotion of employment and income generation programs;
  - (iv) Renovation, expansion and construction of community facilities;
  - (v) Promotion and facilitation of community mobilization and participation in all aspects of the project; and
  - (vi) Actions and activities aimed at preventing violence in the *Lagoas do Norte* region and targeting selected vulnerable groups, and strengthening the Borrower's capacity to manage citizen security programs, including, *inter alia*: (a) institutionalizing an integrated gender approach to social and economic development in selected vulnerable areas of *Lagoas do Norte* region; (b) developing a diagnostic of violence against women in the Borrower's territory; (c) developing a plan for violence prevention in the Borrower's territory; (d) implementing selected programs focused on youth at risk; and (e) developing a crime and violence prevention capacity building program.
  
5. Some of the activities proposed for implementation under this component include:
  - (i) Design and construction of a space that will become a historical and cultural reference in the city. This space will address the importance of environmental preservation, the relationship of the area with the foundation of the city, as well as the relationship with many cultural traditions and activities in the area;
  - (ii) Organization of commercial activities around the Park and training of local small entrepreneurs, aimed at providing better customer service and products;
  - (iii) Implement a tourism hub, with an associated development and marketing plan, aimed at creating a reference point/image for the city in order to foster and attract private investments to the region, which will help ensure additional income and sustainability to the project's interventions;
  - (iv) Training and capacity building of local labor force in tourism-related activities, in anticipation of the implementation of the tourism hub where the Parnaíba and Poti rivers meet; and
  - (v) Support local programs of revitalization and strengthening of existing community orchards in the project area, as well as the revitalization of the existing pottery hub, which will form part of the tourism hub to be developed.
  
6. The implementation of the proposed violence prevention activities will focus on mainstreaming an integrated gender approach in government social and economic development policies; and on enhancing government capacity to prevent crime and violence. They will place a strong emphasis on population at higher risks of victimization in the Project's areas of

intervention, including women and afro-descendant youth. Below are additional details on the design of the proposed activities:

- (i) *Institutionalize an Integrated Gender Approach to Social and Economic Development* – Promote the institutionalization of an integrated gender mainstreaming approach that aims at promoting female empowerment, inclusion and protection. This will be done through the implementation of “*Teresina Mais Mulher*”, a transversal project that aims at empowering and protecting women from the most vulnerable areas of *Lagoas do Norte* by providing ongoing job training in areas of high demand in the city, such as construction and information technology; promoting public awareness about domestic violence; and providing psychological and judicial support to victims of violence. This program will also include specific capacity building activities for the Municipality’s Coordination Unit for Policies for Women (CMPM), in charge of ensuring gender mainstreaming across municipal policies.
- (ii) *Develop a Diagnostic of Violence Against Women in Teresina* – This study will be the first thorough analysis carried out in the city looking at this issue. It will serve as an input to the development of Teresina’s Basic Integrated Plan (*Plano Básico Integral de Teresina*), required as part of the city’s adoption of the National Pact to Combat Violence against Women, as well as to the overall strategy and action plan followed by CMPM. It will include a stocktaking analysis of current services available to victims as well as prevention interventions and recommendations on how to fill the gaps in service provision.
- (iii) *Develop a Municipal Plan for Violence Prevention* – Design of a municipal plan for violence prevention and technical assistance for the development of the Plan. The Plan will be used to identify priority areas and tasks related to citizen security; bring together different key actors involved in crime prevention and build strong partnerships and collaboration; and establish a systematic approach and monitoring system to ensure coordination and management of crime prevention initiatives. The Plan will incorporate the *Juventude Viva* Action Plan and its targeted interventions focused on youth, as well as specific recommendations provided by the diagnostic on violence against women.
- (iv) *Implement Programs Focused on Youth at Risk* – Financing of specific violence prevention projects, such as “*Se liga na Ideia*”, designed and coordinated by young people selected from the 5 most violent neighborhoods in the city; and “*Juventude Conectada*”, which will focus on the same areas and will provide training in new technologies to youth in *Lagoas do Norte* to create online projects addressing drug use prevention.
- (v) *Develop a Crime and Violence Prevention Capacity Building Program* – This activity will be directly linked to the development of the Municipal Plan, and will include areas identified as priorities for the PMT and its partner secretaries and community organizations in *Lagoas do Norte* for the development of the Plan, such as: (a) how to fundraise, prepare, monitor and evaluate projects to prevent violence; (b) engaging the private sector in violence prevention; (c) prevention of violence against women; and (d) school-based violence prevention.

### Detailed Cost Estimates by Component<sup>5</sup>

Components	TOTAL		WB Financing		Counterparts Funds	
	(US\$)	%	(US\$)	%	(US\$)	%
<b>1. Municipal Management Modernization, City Development and Project Management</b>	<b>14,931,075</b>	<b>8.49%</b>	<b>7,111,111</b>	<b>8.08%</b>	<b>7,819,964</b>	<b>8.88%</b>
1.1 - Modernization and Reform of the PMT	4,033,333	2.29%	4,033,333	4.59%	0	0.00%
1.1.1 - Overall reorganization of the Municipality	2,400,000	1.37%	2,400,000	2.73%	0	0.00%
1.1.2 - Strengthening municipal procurement	300,000	0.17%	300,000	0.34%	0	0.00%
1.1.3 - Strengthening municipal environmental management	500,000	0.28%	500,000	0.57%	0	0.00%
1.1.4 - Institutional strengthening – drainage and sanitation	1,000,000	0.57%	1,000,000	1.14%	0	0.00%
1.2 - Detailed designs for future infrastructure investments	10,397,742	5.92%	2,577,778	2.93%	7,819,964	8.88%
1.2.1 - Strategic basic and detailed engineering designs	2,577,778	1.47%	2,577,778	2.93%	0	0.00%
1.2.2 - Detailed engineering designs for drainage interventions identified as priority in the master plan	7,819,964	4.45%	0	0.00%	7,819,964	8.88%
1.3 - Strengthening of UGP/SEMPPLAN	500,000	0.28%	500,000	0.57%	0	0.00%
<b>2. Integrated Urban-Environmental Development in Lagoas do Norte</b>	<b>154,954,419</b>	<b>88.16%</b>	<b>74,745,202</b>	<b>84.97%</b>	<b>80,209,217</b>	<b>91.12%</b>
2.1 - Water Supply and Sanitation	31,982,207	18.20%	22,799,846	25.92%	9,182,361	10.43%
2.1.1 - Water supply system - AREA 1	2,584,202	1.47%	0	0.00%	2,584,202	2.94%
2.1.1.1 - Water supply system of zones A and B	2,584,202	1.47%	0	0.00%	2,584,202	2.94%
2.1.2 - Sewerage network	26,954,902	15.33%	20,356,743	23.14%	6,598,159	7.50%
2.1.2.1 - Sewerage network - Area 1	3,842,603	2.19%	0	0.00%	3,842,603	4.37%
2.1.2.2 - Sewerage network - Area 2	8,598,985	4.89%	8,598,985	9.78%	0	0.00%
2.1.2.3 - Sewerage network - Area 3	5,749,161	3.27%	5,749,161	6.54%	0	0.00%
2.1.2.4 - Rehabilitation and expansion of the Pirajá wastewater treatment plant	8,764,153	4.99%	6,008,598	6.83%	2,755,556	3.13%
2.1.3 - Macrodrainage	2,443,103	1.39%	2,443,103	2.78%	0	0.00%
2.1.3.1 - Macrodrainage - Area 2	2,254,378	1.28%	2,254,378	2.56%	0	0.00%
2.1.3.2 - Macrodrainage - Area 3	188,725	0.11%	188,725	0.21%	0	0.00%
2.2 - Road System	25,858,250	14.71%	12,524,917	14.24%	13,333,333	15.15%
2.2.1 - Road System- Area 1	3,990,206	2.27%	3,990,206	4.54%	0	0.00%
2.2.1.1 - Almirante Tamandaré Street	788,373	0.45%	788,373	0.90%	0	0.00%
2.2.1.2 - Pedro Brito Street	837,742	0.48%	837,742	0.95%	0	0.00%
2.2.1.3 - Jornalista Jim Borralho Street	204,588	0.12%	204,588	0.23%	0	0.00%
2.2.1.4 - Boa Esperança Avenue	2,159,502	1.23%	2,159,502	2.45%	0	0.00%
2.2.2 - Road System - Area 2	8,534,711	4.86%	8,534,711	9.70%	0	0.00%
2.2.2.1 - Domingos Mafrense Road (roundabout)	177,778	0.10%	177,778	0.20%	0	0.00%
2.2.2.2 - Rui Barbosa Street	894,544	0.51%	894,544	1.02%	0	0.00%
2.2.2.3 - Manoel Aguiar Street	1,639,944	0.93%	1,639,944	1.86%	0	0.00%
2.2.2.4 - Boa Esperança Avenue	5,156,904	2.93%	5,156,904	5.86%	0	0.00%
2.2.2.5 - Mario Augusto Freitas Street	333,331	0.19%	333,331	0.38%	0	0.00%
2.2.2.6 - Des. Flávio Furtado Street	332,211	0.19%	332,211	0.38%	0	0.00%
2.2.3 - Bridge - Santa Maria da Codipi – Second Bridge	13,333,333	7.59%	0	0.00%	13,333,333	15.15%
2.3 - Urban Sector	28,677,240	16.31%	25,428,161	28.91%	3,249,079	3.69%
<b>2.3.1 - Urban requalification</b>	<b>24,606,885</b>	<b>14.00%</b>	<b>24,606,885</b>	<b>27.97%</b>	<b>0</b>	<b>0.00%</b>
<b>2.3.1.1 - Urban requalification - Area 1</b>	<b>1,669,435</b>	<b>0.95%</b>	<b>1,669,435</b>	<b>1.90%</b>	<b>0</b>	<b>0.00%</b>
2.3.1.1.1 - Margins of Pantanal lake	674,217	0.38%	674,217	0.77%	0	0.00%
2.3.1.1.2 - Margins of Mazerine lake	624,049	0.36%	624,049	0.71%	0	0.00%

<sup>5</sup> Exchange rate used for conversion of the costs was R\$2.91 to US\$1 (February 28, 2015)

Components	TOTAL		WB Financing		Counterparts Funds	
	(US\$)	%	(US\$)	%	(US\$)	%
2.3.1.1.3 - Margins of Padre Eduardo Canal (Vila Bom Jesus)	371,168	0.21%	371,168	0.42%	0	0.00%
<b>2.3.1.2 - Urban requalification- Area 2</b>	<b>20,491,042</b>	<b>11.66%</b>	<b>20,491,042</b>	<b>23.29%</b>	<b>0</b>	<b>0.00%</b>
2.3.1.2.1 - Urbanization of Av. Hiroshima square	58,979	0.03%	58,979	0.07%	0	0.00%
2.3.1.2.2 - Margins of São Joaquim lake	744,623	0.42%	744,623	0.85%	0	0.00%
2.3.1.2.3 - Margins of Oleiros lake	15,325,612	8.72%	15,325,612	17.42%	0	0.00%
2.3.1.2.4 - Margins of Piçarreira lake	2,086,731	1.19%	2,086,731	2.37%	0	0.00%
2.3.1.2.5 - Margins of Jacare lake	2,032,892	1.16%	2,032,892	2.31%	0	0.00%
2.3.1.2.6 - Topographical recovery and drainage of Draga II lake	242,205	0.14%	242,205	0.28%	0	0.00%
<b>2.3.1.3 - Urban requalification- Area 3</b>	<b>2,446,408</b>	<b>1.39%</b>	<b>2,446,408</b>	<b>2.78%</b>	<b>0</b>	<b>0.00%</b>
2.3.1.3.1 - Margins of Cachorros e Cerâmica Poty lagoons	2,446,408	1.39%	2,446,408	2.78%	0	0.00%
<b>2.3.2 - Community Equipment</b>	<b>212,462</b>	<b>0.12%</b>	<b>212,462</b>	<b>0.24%</b>	<b>0</b>	<b>0.00%</b>
2.3.2.1 - Construction of space for holding a street market	212,462	0.12%	212,462	0.24%	0	0.00%
<b>2.3.3 - Social Equipment</b>	<b>3,249,079</b>	<b>1.85%</b>	<b>0</b>	<b>0.00%</b>	<b>3,249,079</b>	<b>3.69%</b>
2.3.3.1 - Building a basic health unit in Matadouro	237,037	0.13%	0	0.00%	237,037	0.27%
2.3.3.2 - Building a basic health unit in Poti Velho	296,296	0.17%	0	0.00%	296,296	0.34%
2.3.3.3 - Rehabilitation of the basic health unit Dr. Evaldo Carvalho	100,009	0.06%	0	0.00%	100,009	0.11%
2.3.3.4 - Construction of a basic health unit by the Airport	343,556	0.20%	0	0.00%	343,556	0.39%
2.3.3.5 - Construction of a basic health unit in Vila Mocambinho	343,556	0.20%	0	0.00%	343,556	0.39%
2.3.3.6 - Rehabilitation of the Minha Casa municipal school	274,627	0.16%	0	0.00%	274,627	0.31%
2.3.3.7 - Rehabilitation of the Antonio Gaioso municipal school	538,728	0.31%	0	0.00%	538,728	0.61%
2.3.3.8 - Construction of sports facility at the Moacir Madeira school	226,382	0.13%	0	0.00%	226,382	0.26%
2.3.3.9 - Construction of a Commercial Center for sales of Handicraft	311,111	0.18%	0	0.00%	311,111	0.35%
2.3.3.10 - Rehabilitation of São Joaquim market	577,778	0.33%	0	0.00%	577,778	0.66%
<b>2.3.4 - Household Improvements</b>	<b>608,814</b>	<b>0.35%</b>	<b>608,814</b>	<b>0.69%</b>	<b>0</b>	<b>0.00%</b>
2.3.4.1 - Household improvements - Area 1	23,061	0.01%	23,061	0.03%	0	0.00%
2.3.4.2 - Household improvements - Area 2	470,448	0.27%	470,448	0.53%	0	0.00%
2.3.4.3 - Household improvements - Area 3	115,306	0.07%	115,306	0.13%	0	0.00%
<b>2.4 - Involuntary resettlement</b>	<b>58,632,489</b>	<b>33.36%</b>	<b>4,188,045</b>	<b>4.76%</b>	<b>54,444,444</b>	<b>61.85%</b>
2.4.1 - Involuntary resettlement – construction of houses (includes acquisition of land, construction of houses, paving, and urbanization)	51,111,111	29.08%	0	0.00%	51,111,111	58.06%
2.4.2 – Compensation	6,666,667	3.79%	3,333,333	3.79%	3,333,333	3.79%
2.4.3 - Moving of 2,206 families (1,756 households)	476,832	0.27%	476,832	0.54%	0	0.00%
2.4.4 - Demolition of houses (1,756)	377,879	0.21%	377,879	0.43%	0	0.00%
<b>2.5 - Complementary activities</b>	<b>9,804,232</b>	<b>5.58%</b>	<b>9,804,232</b>	<b>11.15%</b>	<b>0</b>	<b>0.00%</b>
2.5.1 - Management and supervision of works - 7% (items: 2.1 / 2.2 / 2.3 of the Loan)	4,252,705	2.42%	4,252,705	4.83%	0	0.00%
2.5.2 - Physical Contingencies (9%) (Items: 2.1 to 2.3 of the Loan)	5,551,528	3.16%	5,551,528	6.31%	0	0.00%
<b>3. Socio Economic Development in Lagoas do Norte</b>	<b>5,888,889</b>	<b>3.35%</b>	<b>5,888,889</b>	<b>6.69%</b>	<b>0</b>	<b>0.00%</b>
3.1 - Support to associations and environmental education	1,644,444	0.94%	1,644,444	1.87%	0	0.00%
3.2 - Support to job and income creation	333,333	0.19%	333,333	0.38%	0	0.00%

Components	TOTAL		WB Financing		Counterparts Funds	
	(US\$)	%	(US\$)	%	(US\$)	%
3.3 - Economic and social development interventions, including those of crime and violence prevention	1,688,889	0.96%	1,688,889	1.92%	0	0.00%
3.4 - Teresina Cultural/Traditions Center	1,777,778	1.01%	1,777,778	2.02%	0	0.00%
3.5 - Detailed engineering designs	479,242	0.27%	479,242	0.54%	0	0.00%
<b>Front-end Fee</b>	<b>220,000</b>	<b>0.13%</b>	<b>220,000</b>	<b>0.25%</b>	<b>0</b>	<b>0.00%</b>
<b>GRAND TOTAL (1+2+3)</b>	<b>176,029,182</b>	<b>100.00%</b>	<b>88,000,000</b>	<b>100.00%</b>	<b>88,029,182</b>	<b>100.00%</b>
<b>PERCENTAGES</b>	<b>100.00%</b>		<b>49.98%</b>		<b>50.02%</b>	

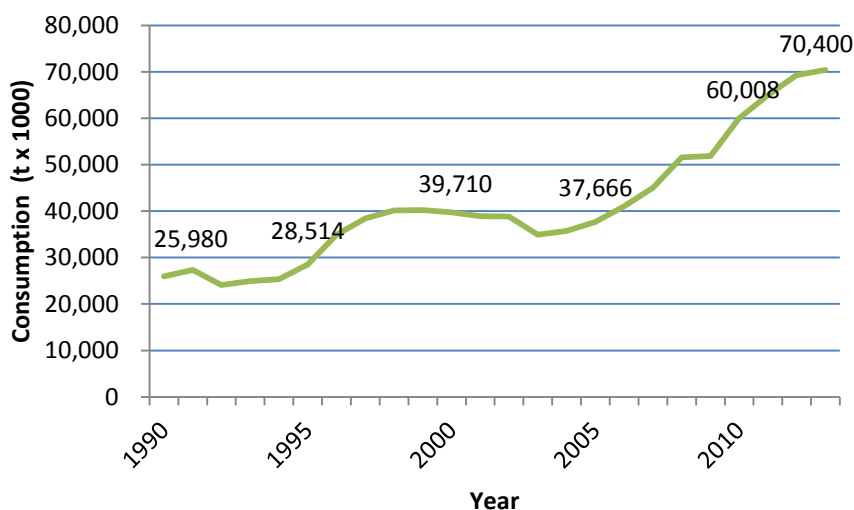
### Summary of the Cost Analysis for the Original Loan

7. A review and analysis of the cost overruns for the original loan has been undertaken by an experienced civil engineer. The methodology used in the analysis consisted of thoroughly reviewing the contracts and unit costs of the interventions undertaken in Area 1, as well as carrying out field visits to the Project area, discussions with the Project Management Unit (PMU), technical consultants and Bank staff. A database on the historical exchange rate between the Dollar (US\$) and the Brazilian Real (R\$) and inflation in the construction industry in Brazil for the given time period was also consulted. The main assumptions of the study were the following:

- the exchange rates between the R\$ and the US\$ considered are the ones used by the Brazilian Central Bank;
- inflation is estimated as the one measured by the National Index of Construction Costs (INCC) of the Brazilian Institute for Geography and Statistics (IBGE), which is frequently used to measure inflation of construction in Brazil.

8. Overall, the analysis showed that the cost overruns resulted from inflation in the construction industry, fluctuation in the R\$/US\$ exchange rate, and cost underestimation of the initial engineering designs. The imbalance between supply and demand in the Brazilian construction industry hampered the ability of the PMT to obtain satisfactory bids for the detailed engineering designs and main construction works of the activities to be financed under the original Project. There was an increase in demand for construction materials in Brazil; from 2005 to 2013, the annual consumption of cement in Brazil has nearly doubled (Figure 1). The level of maturity and interest of the civil engineering consulting and construction industry in the Northeast in general, and in Teresina in particular, to cost, design and implement integrated urban water management (IUWM) interventions greatly affected the implementation of the Project. The contract for the R\$37 million works in Area 1 was bid out five times before a contractor with a reasonable cost was selected.

Figure 1: Annual Cement Consumption in Brazil

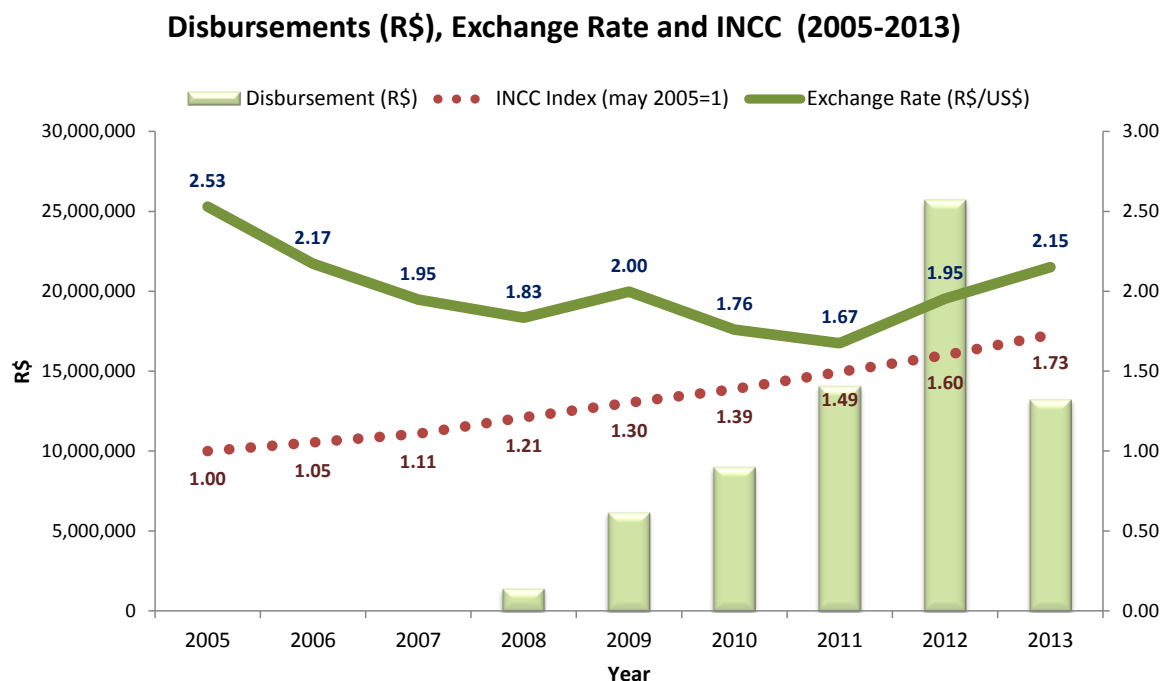


9. This heated construction market, and the resulting construction inflation rate of 73 percent, represented losses of 35 percent of the planned investment as summarized in Table 1. Financial losses were also incurred as a result of the fluctuation in the R\$/US\$ exchange rate, representing 16% of the planned investment (Table 1). Both inflation and the variation of the exchange rate negatively affected the project during its execution phase, as illustrated in Figure 2. The cost estimates were defined in 2005, with an original exchange rate of R\$2.53/US\$1. The dollar remained undervalued against the Real during nearly the entire implementation and disbursement periods.

Table 1: Financial Losses due to Inflation and Fluctuation of the Exchange Rate

Items	Costs May 2005 - (PAD) (R\$)	Costs December 2013 (R\$)	Relative Percentage to values in PAD (%)
<b>Planned Investment (PAD)</b>	112,509,100	198,241,635	100
<b>Investment Made</b>	55,373,526	97,568,448	49
<b>Losses due to Inflation in R\$</b>	(39,582,351)	(69,744,315)	(35)
<b>Losses due to Exchange Rate R\$ x US\$</b>	(17,553,223)	(30,928,873)	(16)

Figure 2: Disbursements, Exchange Rate, and National Construction Cost Index (INCC)



10. A three-year lapse occurred between Project Appraisal and Board Approval during which the costs were never revised. The Project was appraised with conceptual engineering designs and bid out based on basic engineering designs. The designs suffered significant changes when the detailed engineering designs were prepared and as the works progressed, especially in the case of the macro-drainage and urban requalification works (Table 2). This subsequently led to significantly higher implementation costs than anticipated in 2005, and the need to reduce the scope of the project interventions to match them to the resources available.

Table 2: Cost Summary of the Contract for the Urban-Environmental Interventions in Area 1

Item	Original Value (R\$)	Actual Value (R\$)	Percent Increase (%)
Water Supply and Sewerage	11,898,753	6,792,318	(43)
Urbanization (includes macro-drainage)	17,289,422	31,665,076	83
Streets and Paving	3,948,010	2,412,532	(39)
Total	33,136,185	40,869,926	23

11. In order to avoid cost overruns under the additional financing, appraisal was carried out on the basis of detailed engineering designs. The works will be bid out only once the detailed engineering designs are finalized. A thorough review of the costs of the planned interventions under the additional financing is currently being conducted based on the findings of this study, as well as on other relevant cost parameters.

**Methodology Used for Costing the Additional Financing Engineering Interventions**

12. The cost estimates for the implementation of the planned interventions under the additional financing are employing the following premises:

- The Average Transport Distance for the transport of landfill and other works residue from the works sites is assumed to be 10 km.
- For the **wastewater** interventions, the following costs are being considered: mobilization; ground leveling and laying of water and sewage networks; earth movements including excavation, backfill, loading, transportation and unloading; shoring; pipe laying; manhole installation; concrete structures; electromechanical installations; and urbanization around pumping stations. The cost of the collection networks is estimated to be R\$300 per linear meter. The costs of removing and replacing roads/pavements are included where the same would be dug up. For household sewage connections, the costs of providing intra-household connections are considered for 50 percent of total connections, of which 45 percent include the provision of sanitary modules and 5 percent do not. To estimate the costs of the expansion of the Pirajá Wastewater Treatment Plant, the implementation of pre-treatment, a UASB reactor, the cleaning of the existing lagoons and the acquisition and implementation of aeration equipment, as well as the implementation of the effluent outfall, are considered.
- For the **macro-drainage** interventions, the prices of single, double, and triple concrete galleries (as applicable) are considered, including for culvert openings. To estimate the costs of the interconnections between lagoons the following are considered: mobilization; positioning and leveling of works; earth movement, including excavation, backfill, loading and unloading; shoring; removal of existing culverts; provision and installation of metal piles. The costs for the **cleaning of the lagoons** consider: mobilization; clearing/removal of stumps and of areas with trees of up to 0.25 meters in diameter, and the loading, transport and unloading of debris. For the Oleiros lagoon, the total area was considered; for the remaining lagoons a strip of 15 meters is considered (5 meters within the waterline and 10 meters outside of it), as well as the total cost of water hyacinth removal at a volumetric rate of R\$0.2 m<sup>3</sup>/m<sup>2</sup>.
- For the **urban requalification** interventions, the following costs were considered: positioning; earth movement; tree planting and planting of green cover; installation of pavements and sidewalks; roughcast, plaster, wallboard, painting, lighting, roofing and other services.
- The costs of the **involuntary resettlement** are estimated at R\$61,000 per family according to the guidance from Caixa Economica Federal.

13. In the development of the **unit costs** the following indices/data are being considered:

- *System for Highway Costs* - DNIT, December 2014, Northeast Region, State of Ceará (not published for the State of Piauí).
- National System for Civil Construction Cost Research and Indices - SINAPI, October 2015.
- The unit price of bituminous materials according to DNIT (bibliographic research).
- The unit costs of different works interventions as actually practiced by PMT in Area 1 under the original loan, corrected for inflation to the month of October 2015.
- Prices of different services at local and regional market prices (survey).
- Basic unit cost of civil construction as provided by SINDUSCON Teresina, October 2015.

14. In addition all cost estimates use a fixed overhead index (BDI) of 25.09 percent, as indicated by the PMT.

***Project Implementation Plan***

<i>Activity</i>	<i>Year 0</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
1. Design and construction of residential complex 1 (1,054 families)						
2. Detailed engineering designs for drainage, urban requalification, transport, water supply and sanitation finalized						
3. Resettlement of families – stage 1						
4. Phase 1 – bidding of works						
5. Phase 1 – construction works						
6. Design and construction of residential complex 2 (368 families)						
7. Resettlement of families – stage 2						
8. Phase 2 – bidding of works						
9. Phase 2 – construction works						
10. Design and construction of residential complex 3 (758 families)						
11. Resettlement of families – stage 3						
12. Phase 3 – bidding of works						
13. Phase 3 – construction works						

### Annex 3: Economic Analysis

#### Ex-ante Economic Evaluation – Additional Financing Loan

1. *Methodology.* The evaluation was carried out for Component 2, integrated urban-environmental development, adding the costs of Components 1 and 3, as they are required to attain all the expected benefits. The urban development component is a comprehensive program, which includes drainage, housing, roads, sewerage, water, and wastewater treatment. The works for water and sanitation were evaluated as well, yet the benefits were not added to avoid double counting.
2. Cost-benefit analysis was used for the evaluations. Economic benefits were measured through: a) hedonic price approach<sup>6</sup> to estimate the appreciation on properties value as result of urban development; b) willingness to pay to measure benefits from wastewater treatment; and c) savings on operating costs, to measure benefits from water and sewerage interventions.<sup>7</sup> From water intervention, reduction of physical losses is expected, which lowers operating costs to AGESPISA, the State water utility. From sewerage intervention, households will save on operating costs of in-site sewage disposal systems when connecting to sewerage network.
3. A discount rate of ten percent was used and the investment was assumed to have a 30-year lifetime. Costs and benefits were expressed at 2014 prices.
4. *Costs.* Total cost is expected to be US\$176.0 million (Table 1). Urban-Environmental development component includes works to be implemented in Areas 2 and 3 and consists of water, sanitation, roads, park, housing improvement, housing resettlement for 1,756 households, and drainage.

Table 1. Investment Cost

	(000 R\$)	(000 US\$)
1. Municipal Management Modernization	33,595	14,931
2. Integrated Urban-Environmental Development		
Sanitation:		
Sewerage	40,929	18,191
Wastewater Treatment	19,719	8,764
Total Sanitation	60,648	26,955
Water	5,814	2,584
Other works for Urban Improving (drainage, housing, roads, etc.)	273,111	121,383
Supervision	9,569	4,253
Total Component 2	349,142	155,174
3. Social Component	13,250	5,889
<b>TOTAL ADDITIONAL FINANCING</b>	<b>395,987</b>	<b>175,994</b>

5. Sanitation consists of sewerage and wastewater treatment. The first includes sewerage expansion to Areas 2 and 3; while the second includes improvement and expansion of the

<sup>6</sup> Hedonic pricing method is used to assess the value of an environmental feature (clean air, clean water, etc.) by examining actual markets where the feature contributes to the price of a marketed good. It is most commonly applied to variations in housing prices that reflect the value of local environmental attributes. The basic premise of this method is that the price of a marketed good is related to its characteristics or the services it provides. Therefore each individual characteristic, such as an environmental amenity, can be valued in terms of its affectation of the price of a residential property.

<sup>7</sup> This approach corresponds to the Avoided Cost Technique, which estimates the costs that would have been incurred if the project were not implemented. Those costs are transformed in benefits once the project is operational.

wastewater treatment plant of Pirajá. Sewerage costs include collectors and secondary network, as well as removing and replacing roads/pavements and costs of providing intra-household connections for 50 percent of total connections, of which 45 percent include the provision of sanitary modules and five percent do not. Water interventions consists of replacement of main water pipelines.

6. *Beneficiaries.* The *Lagoas do Norte* region is sub-divided into four areas, consisting of 13 neighborhoods, in which reside about 92,000 people. The works to be implemented with the additional financing will benefit Areas 2 and 3, which correspond to about 9,000 households with a population of approximately 34,000.

*Table 2. Population Lagoas do Norte Region*

	Population	Houses
Area 1	24,493	6,620
Area 2	18,563	5,017
Area 3	15,122	4,087
Area 4	33,838	9,145
Total Region	92,016	24,869

7. The aim of the project is to improve the living conditions of the most vulnerable and poverty-stricken region of Teresina, by eliminating perennial flooding, reducing pollution, improving sanitation, roads, and, providing areas for relaxation and recreation. The communities will also have improvements in health, economic growth, and quality of life.

8. To measure the expected benefits of urban development, the hedonic price approach was used to determine the extent that the price of the houses can be affected with the project. Actual property values used for this evaluation were obtained from information provided by real estate assessors working for the Municipality. The number of houses to benefit from the project was obtained from the Geographic Information System of the cadaster department of the Municipality. The areas were split into two sections to have a better sense of the properties' value. The first section corresponds to the area by the lagoon up to a distance of 100 meters, where about 33 percent of the total houses are located, while the second section corresponds to the area farther than 100 meters of the lagoon where the remaining 67 percent of the houses are located.

9. Hedonic price approach was also used to evaluate the first phase of this project, in which Area 1 benefited. Results of the hedonic price study conducted during appraisal of the original project showed an increase of R\$33,700 per house at 2005 prices, which corresponds to about R\$53,000 at 2014. After the first phase has been implemented in Area 1, the average increase in the price of houses was R\$84,000 per house.

*Table 3. Actual Appreciation of properties value in Area 1.*

Increase of Property value	Without Intervention	With Intervention	Incremental
<u>2005 Prices:</u>			
Property Value (R\$/house) according to hedonic price study conducted at appraisal	22,257	55,968	33,712
Property Value (R\$/house) Actual value	22,257	70,697	48,440
<u>Actual Values at 2014 Prices</u>			
Property Value (R\$/house)	39,000	123,500	84,500

10. The price increase is about three times the price of the property before the intervention. The reason for this high price is that the area has been subject to a comprehensive improvement in services that were not available before its implementation, such as: sewage collection, floods risk reduction, roads improvement, recreation facilities, training centers, elimination of bad odors, elimination of pollution, nice view of the lagoon, nice leisure and gathering spaces, integration with the urban areas of Teresina, all of which have become a source of pride for the population in the region, among others.

11. The real state assessors of the Municipality perceive that the impact of the project will be seen in a larger extended area, and properties value can increase beyond Areas 2 and 3. Moreover, inhabitants of other neighborhoods will enjoy the recreational areas that will be available for the general public. To be on the conservative side, this evaluation did not include benefits beyond Areas 2 and 3.

12. Results show that appreciation of properties values will be enough to cover all the costs associated with the project. The expected return will be US\$29 million and IRR of 18 percent. Benefits are 14 percent higher than total costs. If increase in property values were 12 percent lower than assumed, the project would still be viable generating 10 percent rate of return. If benefits are reduced by 20 percent, the investment would yield a 5 percent return.

*Table 4. Results of Economic Evaluation of the Overall Urban Improvement*

	Present Value of Flows (000 US\$)			
	Costs	Benefits	Net Benefits	IRR
Base case scenario	192,256	219,551	29,295	18%
Including market distortions				
10% reduction of benefits	192,256	197,596	7,266	12%
12% reduction of benefits	192,256	192,327	71	10%

13. *Water interventions.* The interventions consisted of replacing main water pipelines. The objective of this intervention is to reduce physical losses. AGESPISA, the State water utility will receive the benefits, through lower operating costs that result from reducing the volume of water produced.

14. According to information provided by AGESPISA, the physical losses in this region are about 40 percent, and the production cost is about R\$1.15 per m<sup>3</sup> of water produced. The volume of water lost in the Area was estimated using the number of water customers and their consumption. There was no information available of the impact that the interventions will have on reducing physical losses in the area. Benefits were quantified for a range of possible loss reduction.

15. Results show that reduction of physical losses has to be higher than 5 percent to yield economic returns higher than 10 percent. If physical losses were reduced by 3 percent, the investment would yield 5 percent return. According to information given by the PMU, the losses are expected to decrease by at least 10 percent.

*Table 5. Results of Economic Analysis for Water interventions according to water losses reduction*

Water Losses Reduction	Present Value of Flows (000 US\$)			EIRR
	Costs	Benefits	Net Benefit	
5%	2,788	2,666	(122)	10%
7%	2,788	3,621	832	13%
10%	2,788	4,950	2,162	18%

16. *Sewerage Component.* Sewerage intervention will benefit households living in Areas 2 and 3. Benefits were measured as resource savings when substituting septic tanks by conventional sewerage connection. Only the cleaning cost of septic tanks was included as the investment already exists in the houses and hence is a sunk cost. A cleaning cost of R\$140 every six months was used and corresponds to the actual cost charged by private operators in the area. Results show that benefits from savings on cleaning costs alone do not compensate the costs of the intervention. Results show a net loss of US\$ 6 million, and 5 percent return.

*Table 6. Results of the Economic evaluation of Sewerage (000 US\$)*

	Present Value of Flows (000 US\$)			IRR
	Costs	Benefits	Net Benefits	
Sewerage	16,842	10,803	(6,039)	5%

17. The included benefits do not show the whole picture, as additional benefits will be obtained though not quantified. Impact on health improvement, clean environment, convenience of having appropriate sewage collection, are among the multiple advantages and benefits that sewerage connection will bring to the households.

18. *Wastewater Treatment.* A willingness to pay approach was used to measure the benefits using the results obtained at appraisal of the original project. Result of the willingness to pay obtained then was R\$10/household/month, which corresponds to R\$16/household/month at 2014 prices. The benefits were applied after the 5-year implementation period to the population of Areas 2 and 3 and then to the additional population until the capacity of the wastewater treatment plant is fully utilized. Results show benefits similar to its costs and a return of 9 percent.

*Table 7. Results of the Economic evaluation of wastewater treatment (000 US\$)*

	Present Value of Flows (000 US\$)			IRR
	Costs	Benefits	Net Benefits	
Wastewater treatment	10,113	9,677	(436)	9%

19. *Summary of Results.* Component 2 as a whole will target urban and environmental improvement of Areas 2 and 3. Results show that *the investment will impact positively the development of Teresina*, given that benefits are 14 percent higher than the associated costs. Present value of net benefits is US\$27 million and the expected return is 18 percent.

*Table 8. Results of the Economic evaluation. Additional Financing (000 US\$)*

	Present Value of Flows (000 US\$)			IRR
	Costs	Benefits	Net Benefits	
Urban Upgrading (total component 2)	192,256	219,551	27,295	18%

20. *Results* also show that the water component is economically viable with a return of US\$2 million and EIRR of 18 percent, when losses are reduced by 10 percent. Wastewater treatment shows returns close to the 10 percent discount rate used. Sewerage shows a 5 percent return; however, expected benefits would be higher if additional benefits, such as health, clean environment, and convenience of having appropriate sewage collection were included.

*Table 9. Results of the Economic evaluation of water and sanitation (000 US\$)*

	Present Value of Flows (000 US\$)			IRR
	Costs	Benefits	Net Benefits	
Sanitation				
Sewerage	16,842	10,803	(6,039)	5%
Wastewater treatment	10,113	9,677	(436)	9%
Total sanitation	26,955	20,479	(6,475)	7%
Water	2,788	4,950	2,162	18%

### Distributive Analysis

21. The economic analysis of urban upgrading showed that economic benefits will be US\$220 million, 60 percent of which (US\$132 million) will go to the low-income population and the remaining 40 percent (US\$88 million) to the middle income population. The estimation was done with the following assumptions: a) 65 percent of the beneficiary population is in the lower income level, representing 5,918 houses, with an expected benefit of about R\$78 thousand per house; (b) 35 percent of population is in the middle income level, representing 3,186 houses, with an expected benefit of about R\$96 thousand per house.

### Sensitivity and Risk Analysis of the additional financing to fluctuation of the Brazilian Real

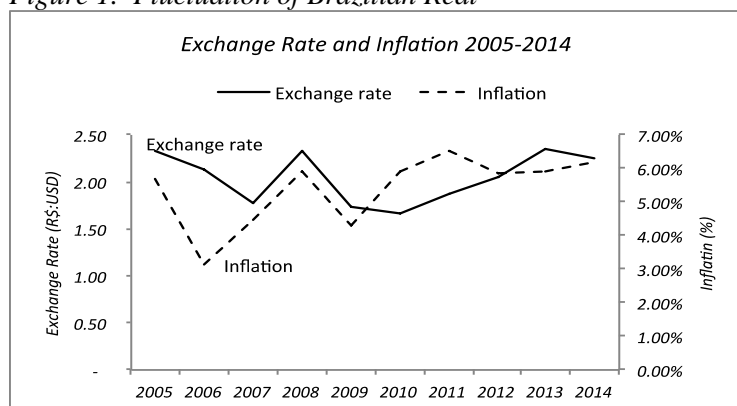
22. The expected cost of the new operation is US\$176 million, 50 percent of which will be financed by IBRD and 50 percent with counterpart funds. The equivalent cost in Brazilian Real is R\$397 million using the current exchange rate of R\$2.25:1US\$. This cost can vary during implementation due to fluctuation of the Brazilian Real, caused by either exchange rate variations or the inflation rate.

23. Exchange rate fluctuation affects only the portion funded by the World Bank. If depreciation occurs, the Brazilian Real loses value against US\$ and so the Municipality of Teresina will receive more Brazilian Reais per US\$ disbursement thus benefiting the project; the contrary occurs when appreciation takes place, in this case the Brazilian Real gets stronger and the Municipality of Teresina will receive less Brazilian Reais per US\$ disbursement. Inflation on the other hand, affects all funds (World Bank and counterpart funding), as local currency partially loses its value, and so, its purchasing power. Inflation has an adverse effect on the project, as it requires more Brazilian Reais to buy each item.

24. Sensitivity analysis was carried out to measure the impact on project costs of fluctuation of the local currency. Historic information on the exchange rate shows 4 percent appreciation of the Brazilian Real against US\$, in the period 2005-2014. Yet, the exchange rate shows high volatility during the period as Figure 1 presents. Most of the time the Brazilian Real appreciated; however in 2009, 2012, and 2013 it depreciated 12 percent on average per year. In 2010, the exchange rate reached the lowest value of R\$1.67:1US\$; from 2010 to 2014, the Real depreciated 35 percent.

25. Inflation has been 73 percent during the project implementation period when using the construction price index, and 60 percent when using consumer price index, which corresponds to an average of 6 percent per year (Figure 1).

Figure 1. Fluctuation of Brazilian Real



26. For the sensitivity analysis three scenarios were built: a) assuming the Brazilian Real will depreciate at the same annual rate of the last five years (2010-2014), that is: 6.1 percent; and same inflation rate, 5.6 percent on average; b) assuming that the Brazilian Real will appreciate at the same pace as it did from 2005-2014, 1 percent on average per year, with an annual inflation of 5.4 percent per year; and c) assuming appreciation of 1 percent and inflation of 5 percent.

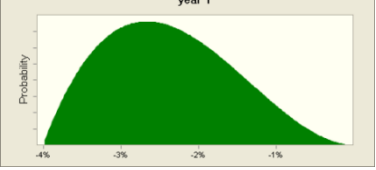
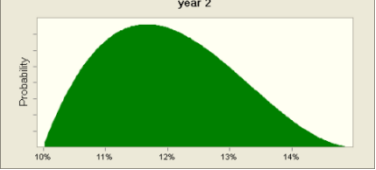

27. Results show that: a) Scenario 1: 5.6 percent of the annual depreciation of the Brazilian Real will bring 9 percent more funds to the project. However, annual inflation of 6.1 percent will make the project 16 percent more costly, thus offsetting all the gains attained with depreciation, and bringing a net loss of 7 percent of the funds. This means that additional financing will be needed to pay for the project (about R\$36 million); b) Scenario 2 shows that 1 percent depreciation will bring 1 percent additional funds to finance the project; yet inflation of 5.4 percent will make the project 14 percent more costly, resulting in a 13 percent net loss; c) Scenario 3 shows that appreciation of 1 percent will result in 1 percent loss of available funds. Inflation will do the same and the net losses will be 14 percent, which requires an additional R\$56 million (Table 10). The project cost estimates have allocated 7 percent of the value of planned works as contingencies. In addition, the Municipality has a high level of commitment to the project and has expressed its willingness to finance with its own resources or approach the Federal Government for resources to complement the proposed additional financing in case the exchange rate and/or inflation negatively affect the project's availability of resources.

Table 10. Impact on Project Cost of exchange rate fluctuation and inflation

	Fluctuation/year	Impact on funds		
		World Bank	Counterpart	Total
<i>Scenario 1 (average of 2010-2014 period)</i>				
Exchange rate Depreciation (+) Appreciation(-)	5.6%	17%	0%	9%
Inflation (+) Deflation (-)	6.1%	-19%	-13%	-16%
<i>Total Impact under Scenario 1</i>		-2%	-13%	-7%
<i>Scenario 2 (average of 2005-2014 period)</i>				
Exchange rate Depreciation (+) Appreciation(-)	1.0%	3%	0%	1%
Inflation (+) Deflation (-)	5.4%	-16%	-12%	-14%
<i>Total Impact under Scenario 2</i>		-14%	-12%	-13%
<i>Scenario 3 (including appreciation of the BRL)</i>				
Exchange rate Depreciation (+) Appreciation(-)	-1%	-3%	0%	-1%
Inflation (+) Deflation (-)	5%	-15%	-11%	-13%
<i>Total Impact under Scenario 3</i>		-18%	-11%	-14%

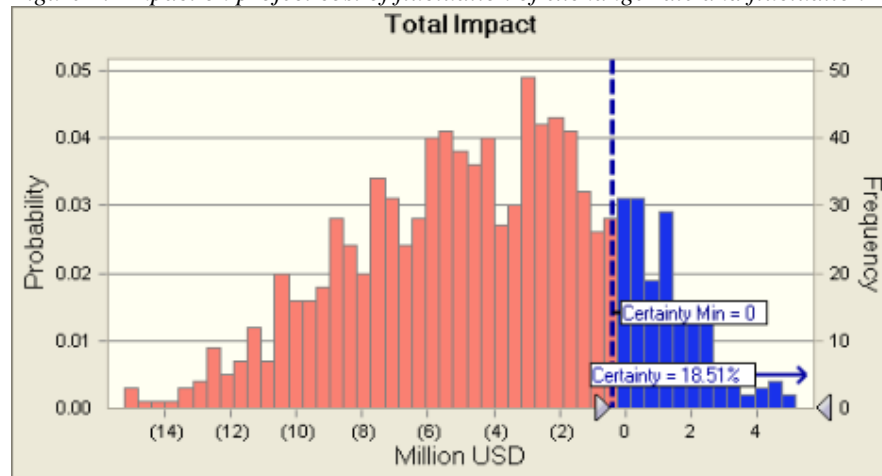
28. Risk Analysis was conducted to measure the impact on the project of simultaneous variation of exchange rate and inflation, as it occurs in the real world. The variation was represented with probabilistic distributions as Table 2 shows. Appreciation was assumed to occur one year, while depreciation was assumed to occur in the additional implementation years. The probability functions were based on the historic variation of both. A Monte Carlo Simulation was run using Crystal Ball to find the expected impact on the project.

Table 11. Probability Distribution selected for exchange rate and inflation

<p>Exchange Rate (When Appreciates)</p>		<p>Beta distribution with parameters: Minimum -4% Maximum 0% Alpha 2 Beta 3</p>
<p>Exchange Rate (When depreciates)</p>		<p>Beta distribution with parameters: Minimum 10% Maximum 15% Alpha 2 Beta 3</p>
<p>Inflation Rate</p>		<p>Beta distribution with parameters: Minimum 5% Maximum 8% Alpha 2 Beta 3</p>

29. Results of the risk analysis show that there is 81 percent probability of getting losses with the fluctuation of the Brazilian Real. The average expected loss would be US\$4 million, which would be covered by the price contingencies already factored into the project investment costs. Figure 2 shows the expected losses and their respective probabilities.

Figure 2. Impact on project cost of fluctuation of exchange rate and fluctuation



Summary of Ex-post Evaluation – Original Loan

30. During appraisal of the original project, a cost benefit analysis was conducted to evaluate the project. Benefits were measured using: a) willingness to pay, to estimate benefits from wastewater treatment; b) Hedonic Price Method to estimate benefits from urban upgrading (sewerage, drainage, paved streets, land titles); and c) avoided cost approach from damages and losses was used for water, and sewerage components. The expected rate of return was 24 percent.

31. Actual works consisted of interventions on: a) water networks; b) urban upgrading, which included: a linear park, resettlement, sewerage, drainage, improvement of streets and access to the area, sidewalks, etc.; and c) upgrading of *Teatro do Boi*. The ex-post evaluation was conducted for all the interventions using same methodologies used at appraisal that is: cost benefit analysis for the evaluation, and hedonic prices, willingness to pay, and avoided cost for measuring the benefits. Same discount rate of 12 percent was used. Costs and benefits were transformed to 2005 prices to make them comparable to those used at appraisal. Overall, the project had positive impact on Teresina's population as benefits were twice as much as costs, and generated a 76 percent return, which was higher than the 24 percent estimated at appraisal.

*Table 12: Results of Ex-post economic Evaluation (works already implemented)*

	Present Value of Flows (000 US\$)				B/C
	Costs	Benefits	Net Benefits	IRR	
Water	3,326	4,439	1,112	16%	1.33
Urban Upgrading	30,235	65,298	35,063	90%	2.16
Theater do Boi	1,153	1,400	247	15%	1.21
<i>Total</i>	<i>34,715</i>	<i>71,138</i>	<i>36,423</i>	<i>76%</i>	<i>2.05</i>

32. *Other Benefits.* Interventions of Institutional Strengthening of the Municipal Government can be seen in various areas of the administration, such as: financial, administrative, human resources, training, and procurement. The activities carried out for the Municipality under Component 1 of the original project have enabled the Municipality to increase its revenues twofold from 2007 to 2012, going from R\$54 million in 2007 to R\$115 million in 2012.

## Annex 4: Safeguards

1. The original loan was classified as Category A and triggered five safeguard policies: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Physical Cultural Resources (OP/BP 4.11), Involuntary Resettlement (OP/BP 4.12), and Safety of Dams (OP/BP 4.37). The safeguard policy documents related to the Project (the Integrated Safeguards Datasheet, the Environmental and Social Assessment, the Environmental and Social Management Plan, and the Resettlement Policy Framework) were prepared and disclosed at the World Bank's external website according to Bank policy on March 30, 2007. The documents were translated into Portuguese and disclosed in-country by the PMT.
2. During design and preparation of the original loan, the *Lagoas do Norte* region was subdivided into four areas and the original project scope intended to undertake interventions in all four areas constituting the *Lagoas do Norte* region of Teresina, which were properly evaluated in the Project's Environmental and Social Assessment. However, due to a financing gap resulting from cost overruns, the scope of physical interventions in the *Lagoas do Norte* region was reduced to undertake integrated interventions in Area 1, partial drainage interventions in Area 2 (to ensure proper working of the interventions in Areas 1) and minor macro-drainage interventions in Area 4. As such, the PMT has requested an additional financing loan in order to consolidate the original loan's interventions and further catalyze the transformation of these low income neighborhoods, bringing additional economic, social and quality of life improvements to the local residents, while consolidating the tying in of the *Lagoas do Norte* Region within the social fabric and urban dynamic of the rest of the city. To date, the overall safeguards compliance of the Project is deemed satisfactory.
3. The Project remains classified as Category A, as the proposed additional works under the additional financing loan were already envisaged under the original loan, and were subject to an environmental evaluation during its preparation. As a result, the same safeguard policies will be triggered. The Project's Environmental and Social Assessment (including the Environmental and Social Management Plan - ESMP) as well as the Resettlement Policy Framework have been updated to reflect the updated project scope as well as lessons learned during the implementation of activities under the original loan. The updated safeguard documents have already been disclosed in the World Bank's external website, made available to the public locally, and local public consultations were held on November 4, 2014.

### Environmental Assessment

4. The Project triggered OP 4.01, and the implementation and operation of the urban-environmental infrastructure resulted in positive environmental outcomes. The main benefits include: (i) the collection and treatment of 100 percent of the wastewater in Area 1 of the *Lagoas do Norte* region of the city; (ii) the recuperation of the quality of the water of two of the lagoons in the *Lagoas do Norte* region of the city in Area 1; (iii) the recuperation and optimization of the micro and macro drainage system in *Lagoas do Norte* such that flood events are minimized; (iv) the recuperation of natural vegetation along the banks of the lagoons where interventions have taken place; (v) improving the immediate local environment of families through their removal from areas of risk to new housing, as well as improvements to sanitary facilities of 77 existing

houses in Area 1; and (vi) the recuperation and construction of green spaces, parks and other community leisure equipment in Area 1.

5. No major environmental issues have arisen during the implementation of the original loan and the provisions of the Environmental and Social Management Plan (ESMP) have been largely complied with. The only pending issue related to the ESMP is that the institutional strengthening of environmental management at the municipal level was not implemented, due to lack of resources under the original loan. However, the original loan financed the formulation of a comprehensive environmental management strengthening program at the municipal level and resources have been allocated under the additional financing loan for its implementation.

#### Analysis of Alternatives for the Additional Financing Loan

6. The designs of the main infrastructure interventions to be implemented under the additional financing loan are being prepared based on updated hydrological simulations for the entire drainage system of the *Lagoas do Norte* region, taking into account what has been built with financing from the original loan. These simulations have been verified for potential floods with a recurrence time of 50 years, and through this study, after simulation of various alternative levels for the lagoons, it has been determined that maintaining a level of 55 meters for the *Lagoa dos Oleiros* is the best operational scenario, as it minimizes the need for resettlements and allows for maintaining adequate water levels year-round throughout the different lagoons.

7. In addition, during project design, two scenarios were considered for the urban requalification works: (i) in which the permanent preservation areas were fully reconfigured with an extension of 30 meters based on the hydrological simulations, plus a 10 meter range to build road and sanitation infrastructure – within this 40 meter range a linear park would be built – this scenario resulted in the need for relocation of 1,214 households; and (ii) which allowed for some of the more consolidated households to stay in the permanent preservation areas – in accordance to the criteria in CONAMA's (Brazilian National Environment Committee) resolution 396/2006 – implementing the concept of landscape windows with the main objective of minimizing the need for resettlement without compromising the main urban-environmental concepts – this scenario – was the one chosen and resulted in the need for relocation of 763 households, reducing therefore the number of households that need to be resettled by 451.<sup>8</sup>

8. During the design of the original loan, the conceptual designs proposed that the wastewater to be collected from Areas 2, 3 and 4 be sent to a new treatment plant to be built in an area north of the *Lagoas do Norte* region. During project implementation and the preparation of the additional financing loan, discussions have taken place as to the various alternatives for the treatment of this wastewater, particularly given the fact that the Water utility recently included in its master plan, the construction of a water treatment plant downstream of the area originally envisaged for the construction of the wastewater treatment plant. As a result, agreement was reached that the best alternative for wastewater treatment would be the rehabilitation and expansion of the existing Pirajá wastewater treatment plant, using a complementary UASB, eliminating not only the need to build a collector of large diameter and

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<sup>8</sup> Additional households will be resettled as a result of other interventions in the project area for a total of 1,756 households.

extension, but also the need to acquire additional land for the construction of a new wastewater treatment plant, as was originally being contemplated. The final capacity of the Pirajá wastewater treatment plant with the project intervention will be 360 l/s; with a provision for further expansion to 500 l/s.

### Natural Habitats

9. The Project triggered OP 4.04 because interventions were envisaged in important ecosystems (the group of lagoons and their areas of permanent preservation, APPs, which are protected by law). The Project interventions are expected to revitalize the natural environments in the *Lagoas do Norte* region, mainly by recovering the water quality of the heavily polluted lagoons and re-establishing lake- and river-side flora. In Area 1, the margins of the lagoons were vacated to enable the surrounding lake habitats, including the water bodies themselves, to be rehabilitated, drainage works and sanitation improvements to allow the lagoons to revert to their natural state. The same is expected for Areas 2 and 3 which will benefit from proposed interventions from the additional financing loan.

### Physical Cultural Resources

10. In terms of Physical Cultural Resources, the main activity undertaken was the restoration of the *Teatro do Boi*, an important cultural space for the region. The activities implemented under the original loan and proposed for the additional financing loan are not expected to interfere with any archaeological sites. Nevertheless, chance find procedures have been and will be included in the instructions to contractors under all civil works bidding and contractual documentation. Under the additional financing, the construction of a suitable space of worship and celebration for Afro-Brazilians cults is being considered, given the rich cultural activities in the *Lagoas do Norte* region linked to the Afro-Brazilian culture.

### Involuntary Resettlement

11. The Project triggered OP 4.12 because it included the resettlement of families living in areas of risk for perennial flooding. A Resettlement Policy Framework (RPF) was prepared by PMT and reviewed by the Bank. During the implementation of the original loan 493 families have been resettled (327 were moved to a new residential area, while the remainder received financial compensation). The PMT followed the provisions of the RPF, prepared satisfactory resettlement plans and successfully concluded resettlement activities under the project.

12. The resettlement work conducted under the Project was satisfactory due to: (a) the extensive effort undertaken to reach out and involve the affected population to ensure that their concerns and questions were addressed in a timely manner, and (b) the overall planning and execution of the moving of the families affected to the new residential area. An ex-post evaluation of the resettlement was carried out and found an overall resident satisfaction rate of 71 percent regarding the size and configuration of the new houses when compared to the old ones, and of 92 percent satisfaction rate with the new location of their houses; while 94 percent of residents demonstrated satisfaction with the resettlement process. Lessons learned from the

resettlement process are outlined in the resettlement framework with a few lessons highlighted in the section below.

13. Under the proposed additional financing, as stated in the analysis of alternatives above, care was taken in the evaluation of the technical options to minimize the number of households that need to be resettled as a result of the project. Overall about 1,756 households will be resettled, totaling 2,206 families. The resettlement framework for the project has been updated, incorporates lessons learned from the previous resettlement experience and was disclosed prior to the public consultations that took place on November 4, 2014. The framework has been structured as a roadmap to be followed by the PMU in the resettlement process, spelling out all the steps that will be followed from beginning to end. A draft resettlement action plan for the resettlement that needs to take place before the start of the first phase of the works has been prepared and will be finalized in the next 4 months.

14. In mid-2013, a lawsuit was filed in the Brazilian court system in which the plaintiff claims ownership of a piece of property that was subject to resettlement under the original loan and not being properly compensated for it. In the claim, the plaintiff requests that the courts authorize the registration of the land, and to be justly compensated by the Municipality for the resettlement, including the devolution (with interest) of taxes and fees paid.

15. The plaintiff was not able to register the sale of the property because the Federal Government is claiming property rights along a strip of land in the margins of the Parnaíba River. The Municipality is disputing this situation, as their understanding is that this claim is only valid along rivers that are subject to navigation, which, also in the Municipality's understanding, is not the case of the Parnaíba River. This dispute is being held in the Brazilian courts and is affecting not only the plaintiff, but the entire population that lives along the Parnaíba River, as no one living in the area in question is able to register officially the sale and purchase of property. The Bank team has reviewed the situation, and the information provided by Borrower shows compliance with Bank safeguards and with the Project's Resettlement Framework.

16. The Bank was added as a party to the lawsuit by the Plaintiff to, as expressly stated in the Plaintiff's filings, keep the Bank informed of the Municipality's actions. The Bank asserted its privileges and immunities and the court excluded the Bank from the lawsuit. The Project supervision team will continue to monitor the situation and follow up on the status of this lawsuit with the Borrower.

### Safety of Dams

17. The Safety of Dams safeguard policy was triggered because of the existence of flood control dikes lining the rivers Parnaíba and Poti in the *Lagoas do Norte* region. A safety assessment of the existing dikes was undertaken in 2005. The report, which studied their structural, geological and hydrological hydrodynamic safety, concluded that the stability of the slopes of the dikes and the risks of rupture were nonexistent.

18. The proposed works on Boa Esperança Avenue – the flood control dike along the Parnaíba river in the *Lagoas do Norte* region, as well as the proposed implementation of a tourism hub where the Parnaíba and Poti rivers meet will require special care to ensure that the works do not compromise the safety of the dike. A dam safety panel has been formed to review the detailed engineering designs before the works are implemented.

#### *Institutional Arrangements*

19. The PMT was responsible for the implementation of the safeguards through the PMU. In that regard, the PMU was staffed with environmental and social specialists and a Social Project Unit was placed in the area of intervention in order to establish a close link with the local community. This Social Unit was instrumental in the implementation of the resettlement as well as a mechanism to maintain a constant communication channel with the local community, including the receiving and addressing of complaints by local residents. All of the environmental studies and licensing requirements have been complied with.

20. For the additional financing loan the PMT, through the PMU and the Social Project Unit, will continue to be responsible for the implementation of the safeguard policies, the PMU will count with an environmental specialist that will closely work with them and the Social Project Unit and monitor the implementation of the ESMP, including the environmental licensing of works and environmental provisions stipulated in the works contracts. Given the larger scale of the interventions proposed under the additional financing and based on the lessons learned from the original loan, the PMU will receive technical assistance from a consulting engineering firm, including in the areas of environmental and social management.

#### *Bank Implementation Support*

21. Since the beginning of Project design and implementation the Bank team included social and environmental specialists based in Brazil. These specialists participated in implementation support missions, engaged with the client in the preparation and follow-up of specific actions related to social and environmental safeguards. Environmental and social safeguard compliance and management performance have been consistently rated as satisfactory throughout implementation. These arrangements will continue for the supervision of the proposed additional financing loan.

#### **Main lessons learned during the implementation of the original loan**

- The capacity of the PMT in dealing with themes of urban and environmental requalification, land management and resettlement has improved and allowed for the Municipality to access financing from other funding programs promoted by the Federal Government.
- The improvement in the PMT's institutional capacity and the participatory process undertaken during the interventions of the program allowed for an improved and expanded level of environmental awareness in the urban space and of the importance of the lagoons as a public space with the main goal of flood management.

- Project interventions were highly complex given their multidisciplinary nature and their high level of interrelation. These types of interventions need to be designed together. During the execution of the original project the main issues that arose were related to the fact that the drainage works were contracted separately and not well-articulated with the design of the remaining interventions. This issue demanded additional efforts from the Municipality and the Bank teams, and was successfully resolved during the construction phase.
- Similarly, the execution of works must be planned anticipating these interrelations between the different interventions. The consultants in charge supervision of works should have a multidisciplinary team, which should include environmental and social specialists.
- The results in terms of impact on the environment/water resources of some interventions, such as the wastewater system, need additional time to be verified; i.e., improvements will not be noticed right after the conclusion of works, but only after a minimum of 12 to 18 months after the works have been concluded. These also depend on the levels of connection to the wastewater network and its proper management.
- The establishment of a Social Project Unit in the local area of intervention allowed for the adoption of a diverse number of socio-environmental actions in the area, proximity with the local community, thereby fostering their participation and follow up on the execution of works, through the committee of representatives from the local community which was formed for this purpose.
- The Social Project Unit was also instrumental in establishing a relationship between the project's social workers and the local community, generating a high level of commitment to the residents while keeping in mind the project's objectives and the complying with Bank safeguards.
- The new residential complex where 327 families were resettled was situated in a prime location within the project area, close to the original area where these families resided before. This was a very positive aspect in the degree of acceptance and satisfaction with the resettlement outcome.
- Some families were not satisfied with the size of the houses (34 m<sup>2</sup>) in the residential complex, due to a large number of their members. In the resettlement under the proposed project, the size of the dwellings has been increased to 41m<sup>2</sup> for houses and 43 m<sup>2</sup> for apartments.
- Some of the payments for families that opted for financial compensation under the resettlement process experienced delays in the processing. In the resettlement under the proposed project, the Social Project Unit will closely follow up and support the processing of these payments and will have dedicated staff to follow up on these issues.
- The participation of the community during the elaboration of the detailed engineering designs and works execution guaranteed better quality and feedback to the interventions.
- For the urban and landscape conception, one should look for the promotion of economic activities that are compatible with the local environment and can allow for generation of income that can be used for an autonomous and sustained management of the parks.

- Projects of this nature promote many benefits to the population, among them improvement of self-esteem, better accessibility to essential public services of quality, increased sense of security, promotion of local economic development, job creation and increase in property values.

