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The World Bank

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Report No: 32795-MX

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$25 MILLION

TO THE

UNITED MEXICAN STATES

FOR THE

MODERNIZATION OF THE WATER AND SANITATION SECTOR – TECHNICAL ASSISTANCE PROJECT

July 7, 2005

Finance, Private Sector and Infrastructure
Mexico and Colombia Country Unit
Latin America and Caribbean Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective April 22, 2005)

Currency Unit = Mexican Peso
MX$11.06 = US$1
US$0.09 = MX 1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AAA	Analytical and Advisory Activities
APAZU	Water Supply, Sewerage, and Sanitation in Urban Areas -*Agua Potable, Alcantarillado y Saneamiento en Zonas Urbanas*
BANSEFI	Financial Bank of National Savings and Services - *Banco del Ahorro Nacional y Servicios Financieros*
CEA	State Water Comission - *Comisión Estatal del Agua*
CNA	National Water Comission - *Comisión Nacional del Agua*
CSO	Civil Society Organizations
DIMP	Decentralized Infrastructure Management Project
DIRD	Decentralized Infrastructure Reform and Development Program
DIP	Integral Diagnosis of Planning - *Diagnóstico Integral de Planeación*
GICA	Integrated Management of Ground Water Reservoir and River Basins - *Gestión Integrada de Cuencas y Acuíferos*
GOM	Government of Mexico
IPER	Infrastructure Public Expenditure Review
NRW	Non-Revenue Water
PMIR	Irrigation Modernization Program - *Programa de Modernización Integral del Riego*
PMU	Project Management Unit
PROMAGUA	Program for the Modernization of Water Utilities - *Programa para la Modernización de Organismos Operadores de Agua*
PROMMA	Water Management Modernization Program - *Programa de Modernización del Manejo del Agua*
REDI	Recent Economic Developments in Infrastructure
SFA	Water Financial System - *Sistema Financiero del Agua*
SHCP	Ministry of Finance and Public Credit - *Secretaría de Hacienda y Crédito Público*
SIL	Sector Investment Loan
TAL	Technical Assistance Loan
UAPS	Water Supply and Sanitation Unit - *Unidad de Agua Potable y Saneamiento*
WSS	Water Supply and Sanitation

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Sector Director:	Makhtar Diop
Task Team Leader:	Gustavo Saltiel

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MEXICO

MODERNIZATION OF THE WATER AND SANITATION SECTOR TECHNICAL ASSISTANCE PROJECT

PROJECT APPRAISAL DOCUMENT

Latin America and Caribbean
LCSFW

Date: July 7, 2005	Team Leader: Gustavo Saltiel
Country Director: Isabel Guerrero	Sectors: Water Supply (50%); Sewerage (50%)
Sector Manager/Director: Makhtar Diop	Themes: Regulation and Competition Policy (P); Corporate Governance (S); Infrastructure Service for Private Sector Develop (S)
Project ID: P091695	Environmental screening category: C
Lending Instrument: Specific Investment Loan	Safeguard screening category: N/A

Project Financing Data

[X] Loan [ ] Credit [ ] Grant [ ] Guarantee [ ] Other:

For Loans/Credits/Others:
Total Bank financing: USD$ 25m
Proposed terms: FSL

Financing Plan (US$m)

Source	Local	Foreign	Total
BORROWER	30.2	0.00	30.2
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT		25.0	25.0
Total:	30.2	25.0	55.2

Borrower:
Government of Mexico

Responsible Agency:
Comision Nacional de Agua (CNA) – Unidad de Agua Potable y Saneamiento (UAPS)
Av. Insurgentes Sur #2416
Col. Copilco El Bajo
Delegacion Coyoacan
04340, Mexico, D.F.

Tel: 5174-4503 5174-4504

Estimated disbursements (Bank FY/US$m)									
FY	2006	2007	2008	2009					
Annual	5.0	8.0	8.0	4.0					
Cumulative	5.0	13.0	21.0	25.0					

Project implementation period: Start:11/01/2005 End:12/31/2008
Expected effectiveness date: 10/31/2005
Expected closing date: 06/30/2009

Does the project depart from the CAS in content or other significant respects? ***Ref. PAD A.3***	[ ]Yes [X] No
Does the project require any exceptions from Bank policies? ***Ref. PAD D.7***	[ ]Yes [X] No
Have these been approved by Bank management?	[ ]Yes [ ] No
Is approval for any policy exception sought from the Board?	[ ]Yes [ ] No
Does the project include any critical risks rated "substantial" or "high"? ***Ref. PAD C.5***	[ ]Yes [X] No
Does the project meet the Regional criteria for readiness for implementation? ***Ref. PAD D.7***	[X]Yes [ ] No

Project development objective ***Ref. PAD B.2, Technical Annex 3***

The proposed project objectives are: (i) to assist with the modernization of Mexico's water supply and sanitation sector through strengthening the sector policies at the federal and state level; and (ii) to develop and demonstrate replicable models of successful and sustainable provision of water and sanitation services, by supporting selected service providers and the municipalities of which they are a part in improving operational and financial performance.

Project description: ***Ref. PAD B.3., Technical Annex 4***
The proposed Project consists of two major components, as follows:

A. Modernization of the Water Supply and Sanitation Sector Institutions (14%)

This component includes the following main subcomponents:
(i) National Information System
(ii) Evaluation of existing programs in the water and sanitation sector
(iii) Strengthening of the State Water Commissions (CEAs)
(iv) Training Component
(v) Dissemination

B. Modernization of Water Utilities (86%)
This component will support the development of replicable models for an efficient and sustainable provision of water supply and sanitation services ("success cases"). The component will fund efficiency improvement programs in selected municipalities to strengthen and bring utilities to reasonable levels of management, operational efficiency and financial viability

Which safeguard policies are triggered, if any? ***Ref. PAD D.6, Technical Annex 10***
N/A

Significant, non-standard conditions, **if any**, for: ***Ref. PAD C.5*** Board presentation: August 2005 Loan/credit effectiveness: October 2005 The *Contrato de Mandato* between the Borrower and BANSEFI has been duly executed by the parties.

MEXICO

MODERNIZATION OF THE WATER AND SANITATION SECTOR – TECHNICAL ASSISTANCE PROJECT

CONTENTS

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and sector issues

1. In recent years, the attention of the Government of Mexico (GOM) has shifted from macroeconomic reforms - concentrated in the search for economic stability - to institutional reforms, particularly those aimed at satisfying basic needs. The Government of Mexico regards the water sector as a matter of national security, and the provision of adequate water supply and sanitation is considered an important element in the quest to reduce poverty in Mexico.

2. Between 1990 and 2001, important progress has been made as regards to service coverage, with water supply and sewerage coverage levels reaching 90% and 77% respectively. However, as the studies conducted under the Infrastructure Public Expenditure Review (IPER) show, this undeniable achievement masks several important weaknesses in the sector's performance:

- Poor service quality, as measured – among others - by a high incidence of intermittent supply affecting 55% of connected households according to the 2000 census.
- Low operating efficiency, as measured by high levels of non-revenue water (NRW) averaging 44% compared to less than 23% for well-run utilities and for the best utilities in Mexico.
- Low collection efficiency estimated at 69%, meaning that on average 31% of the amounts billed are never paid, compared to 98% for well-run utilities in Mexico and abroad.

3. The causes for this weak performance are multiple and include:

- Politicization and lack of autonomy of municipal service providers, coupled with short electoral cycles at the municipal level (3 years), resulting in absence of long-term planning, haphazard execution of investment programs, insufficient maintenance, frequent turnover of senior staff and degraded technical capacity, in particular in smaller service providers.
- Absence of a coherent policy formation framework. The Federal Government has undertaken important steps to strengthen the sector through the provision of matching grants, technical assistance for Master Plans and the promotion of private sector participation. However, progress has been uneven and existing programs are fragmented and of varying quality. The performance of states is equally uneven, while most municipalities are unprepared for the task. As highlighted by the Infrastructure Expenditure Review (IPER), there is a need for better vertical coordination in the sector.
- Absence of incentives for improved performance in the management of federal and state financing programs.
- Limited incentives for improved cost recovery and creditworthiness.
- Sector fragmentation into often very small municipal service providers, while inter-municipal utilities are quasi inexistent, resulting in a loss of economies of scale.

4. While the first issue – politicization of service providers – is widely acknowledged in Mexico as a root problem of the sector, the other issues still remain to be widely recognized as

key problems in the sector by the major stakeholders. Moreover, even when these problems are recognized, the solutions do not seem to be clear. Recent modifications to the National Water Law constitute a step in the right direction. These changes affect both water resources management as well as water supply and sanitation. The Law now mandates the decentralization of *Comisión Nacional del Agua* (CNA) through the creation of Basin Agencies, a change that is expected to primarily affect the water resources management function of CNA. The law also mandates the development of a national Water Financial System (*Sistema Financiero del Agua, SFA*), covering water resources management, irrigation as well as water supply and sanitation. In water supply and sanitation, the SFA provides an opportunity to analyze and possibly reform existing federal sector programs in order to strengthen their incentives for better performance.

5. For a more detailed description of institutions, performance, recent legal amendments and existing programs in the water and sanitation sector in Mexico please see Annex 1.

2. Rationale for Bank involvement

6. Although the sector financing needs are large, at this moment it would seem premature to develop a large investment or adjustment operation. This was indicated by the senior management of CNA and *Secretaría de Hacienda y Crédito Público*[1] (SHCP), by requesting a modest modernization loan with an important element of technical assistance at this point, with the expectation that it would set the stage for a substantial financing operation tentatively envisaged in the Country Partnership Strategy for FY08.

7. The Bank is well positioned to assist GOM in improving the institutional framework in the sector and in strengthening selected utilities based on: (i) its global experience in water and sanitation sector reform, public expenditure management, private financing mechanisms, water resources management, environmental issues, poverty targeting and its ability to integrate across these diverse and related topics; (ii) its comprehensive analytical work in Mexico, including the recently concluded Infrastructure Public Expenditure Review – (IPER), diagnostic studies for the SFA, an assessment of the legal, regulatory and institutional framework of the water sector, a study on poverty and water, and Master Plans carried out for 12 towns; and (iii) its previous engagement through lending for the water and sanitation sector in Mexico. In recognition of these assets, GOM has requested Bank support in the form of a technical assistance loan (TAL).

8. The Secretary of Finance (SHCP) has indicated concerns about the new legal framework related mainly to water resources management and the envisaged financial autonomy of the planned Basin Agencies. These concerns could, however, be addressed in the law's implementing regulations (*Reglamentos*). The activities and studies to be financed under component 1 are expected to assist in the elaboration of the *Reglamentos concerning water supply and sanitation.* SHCP considers that the proposed technical assistance from the Bank would be essential to support a long-term vision for the sector along the following lines:

- More sustainable, efficient and autonomous service providers;
- Reduced politicization of the sector;

[1] Ministry of Finance

- Federal and state sector institutions providing adequate support to service providers, linking assistance to performance;
- Improved monitoring and evaluation.

9. Lastly, it is important to note that at present, key federal programs (e.g. *Agua Potable, Alcantarillado y Saneamiento en Zonas Urbanas* (APAZU) and *Programa para la Modernización de Organismos Operadores de Agua* (PROMAGUA) are ostensibly targeted to support new infrastructure works. At the same time, significant investments are directed to non-reforming municipalities in response to political pressures, which has diluted incentives for states and municipalities to participate in such programs. Hence, the value added of this operation stems from the fact that it will make assistance available to water utilities on the basis of multi-annual commitments for efficiency and sustainability improvements and it will foster a broad sector debate about the nature and scope of the reform program.

3. Higher level objectives to which the project contributes

10. The project will support one of the pillars stated in the CAS (April 15, 2004): "to strengthen institutions" by assisting the Government of Mexico to develop tools and instruments needed to induce local authorities to improve financial sustainability and efficiency of water supply and sanitation services.

11. The project will also test a range of approaches and assistance to improve water supply and sanitation services, the lessons of which will be applied in the redesign of existing programs and of the development of new programs which will promote efficiency and more directly target poor households/communities. Moreover, monitoring and targeting will be essential elements in the design of the Information System and the evaluation of existing programs will feed the future design of the SFA.

B. PROJECT DESCRIPTION

1. Lending instrument

12. The instrument proposed for this operation is a Technical Assistance Loan (TAL) in response to the evident need to build capacity in the federal and state entities directly concerned with implementing water sector policies, financing, and reforms. The municipal utilities in charge of delivering water and sanitation services ("*Organismos Operadores*") also require technical assistance in order to provide the services in a sustainable manner, through the improvement of their technical, commercial and financial performance.

13. The Project will finance technical assistance needed to perform studies and activities related to the implementation of the reforms fostered by the new Water Law. In parallel, it will provide funds to finance a series of demonstrative projects at the utilities level, including urgently needed activities over the next 3 years that will enhance the performance of the utilities and hence serve as pilots for a broader reform program at the utilities level.

14. Through this approach, that will entail working with the Federal, State and Municipal levels, the project will further promote the improvement of the overall performance of the water sector and will foster the application of innovative approaches to service provision. The experience gained and the development of "success cases" will lay the foundation to prepare a large investment operation (scheduled for FY 08).

2. Project development objectives and key indicators

15. The proposed project objectives are: (i) to improve the efficiency of Mexico's water supply and sanitation sector through strengthening the sector policies at the federal and state level; and (ii) to develop and demonstrate replicable models of successful and sustainable provision of water and sanitation services, by supporting selected service providers and the municipalities of which they are a part in improving operational and financial performance.

16. Achievement of Project Development Objectives will be confirmed through the following key indicators: (i) improved Water and Sanitation Sector Information System to include funds received from CNA and with the possibility of registering funds from other sources and their impact; (ii) consensus reached with a majority of the State Water Commissions on their new roles and the establishment of an accreditation program for key water utilities personnel; and (iii) improved performance of pilot water utilities measured as net revenues per volume of water produced.

3. Project components

17. The proposed Project will provide funding for specific studies and activities covering different areas where technical assistance is needed. The total project cost is estimated at US$ 55.2 million (Bank's contribution, US$ 25.0 million). The project's components and amounts are as follows:

Component 1. Modernization of the WSS Sector Institutions (US$ 2.9 million)

18. This component will provide assistance to the Federal and State Governments for developing a series of studies and activities associated to the strengthening of the sector policy making and planning institutions through:

- Support to the implementation of recent changes to the Water Law, by providing an assessment of the current water supply and sanitation programs, an essential input for the design of the overarching financing framework for the sector (i.e. S*istema Financiero del Agua*);
- Strengthening of the existing national water and sanitation information system;
- support of the State Water Commissions (CEAs) in the strengthening of planning, technical assistance and overseeing capacities through a series of activities to be implemented under an agreement between CNA and *Asociación Nacional de Empresas de Agua y Saneamiento* (ANEAS);
- development of an accreditation program; and
- dissemination of the lessons learned in the project

A more detailed description of the activities to be financed under this component can be found in Annex 4.

Component 2. Modernization of Water Utilities (US$ 47.7 million)

19. This component will support the development of replicable models for an efficient and sustainable provision of water supply and sanitation services ("success cases") through institutional reforms and improvement of utility performance (technical, commercial and financial). This component will fund efficiency improvement programs in selected utilities to strengthen and bring utilities to reasonable levels of management, operational efficiency and financial viability. In some cases, and given the necessary social, political and financial conditions, this program would pave the way for some form of private sector participation in service delivery and financing.

4. Lessons learned and reflected in the project design

20. Bank experience in the Region shows that for sectoral reforms to happen there needs to be broad debate and consensus over the type, scope and direction of the reforms, avoiding to be over-ambitious and rather setting realistic objectives and time-frames. The recent reforms to the water law in Mexico constitute a first step that now requires further development, acceptance, and ownership by the relevant stakeholders and policy makers. Whilst we acknowledge that major changes and the full implementation of the mandate contained in the law will take time to materialize, we hope that this operation will help to create momentum by producing the analytical information, involving the relevant institutions and establishing an appropriate forum for the debate to take place. This will in turn allow us to remain engaged in the dialogue with the government in a critical period of sector development in Mexico. These lessons are reflected in the type of loan recommended (TAL) and the staging of assistance.

21. The Infrastructure Public Expenditure Review (IPER), recently completed, presents a series of recommendations, some of which are relevant for the proposed operation:

- **Better outcomes can be obtained by improving the manner in which investment programs are designed, projects selected, and funded**. Across sectors, federal budgetary resources tend to be allocated annually by formulae, and for large projects based on ex-ante benefit-cost calculations undertaken by the project proponents. Even with limited competition, regulation, and financial-market involvement, however, the government could still discipline operators' performance by making the size and type of transfers depend on the progress in realizing genuine improvements to efficiency and service. Such performance-based allocation could be applied in setting up the *Sistema Financiero del Agua,* which was stipulated in the recent modifications to the national water law but is yet to be established. The proposed project will support specific studies to review the main sector programs.

- **Greater accountability and better information on performance outcomes are required.** There is little systematic information on whether projects have had good or bad results, and such information rarely has any budgetary consequences. While sectoral agencies and sub-national governments are demanding greater autonomy in investment planning, execution and financing, there is not the effective accountability that should accompany autonomy. Indeed, without reliable, verifiable information on actual performance, it is risky to respond positively to demands for more autonomy. Rather, increments to autonomy should depend on improvements in accountability. The measures needed for performance tracking and information disclosure include standardized reporting on performance of water companies through an expansion of CNA's *Sistema de Información Nacional.* The TAL will finance a series of activities aimed at streamlining the existing information system.

5. Alternatives considered and reasons for rejection

22. Different Bank assistance options considered were the following:

Limiting Assistance to AAA. The breadth of issues which demand urgent attention and sustained support required to work with key actors to put in place sound policies and programs exceed what several pieces of AAA can hope to provide. The Mexican authorities have expressed a willingness and desire to borrow for this purpose, despite the budget ceilings and lack of "additionality" that characterize Bank lending to Mexico.

Sectoral Adjustment Lending. In the current context that is characterized by poorly focused programs and the recent modifications to the National Water Law, there is a high degree of uncertainty concerning the implementation of the reforms mandated by the law. Thus, an adjustment operation would not be opportune at this juncture, given that an important period of time could elapse before the Federal Government implements the reforms mandated under new legal framework.

Sectoral Investment Lending to States. Building on the experience with direct lending to the State of Guanajuato for multiple infrastructure sectors under the Decentralized Infrastructure Reform and Development Program (DIRD), WSS loans to states that are committed to reforming their WSS sector were considered, since municipalities and states are key players in the WSS sector. However, such lending would be premature pending the results of reforms at the federal level (see above), the further experience with the DIRD and willingness of SHCP to agree to further state-level lending.

Technical Assistance Loan (TAL). After considering the formal request of the Mexican Government to prepare a Technical Assistance Loan and reviewing the different options, the team recommendation is to proceed with the appraisal of the TAL as a first step in a more comprehensive assistance strategy. Once the implementation of the decentralization process is underway, the preparation of an investment lending or any other operation could be considered, in accordance with progress on improved policy formulation and program design and the recommendations of the studies and activities to be executed under the TAL.

C. IMPLEMENTATION

1. Institutional and implementation arrangements

23. The implementing agency will be CNA, more specifically the "*Unidad de Agua Potable y Saneamiento*" (UAPS), which is part of the "*Subdirección General de Infraestructura Hidráulica Urbana*" (SGIHU) of CNA. The UAPS will be supported by "*Subdirección General de Programación*" *and* "*Subdirección General de Administración*" in administration and disbursement matters, respectively All of them have extensive experience working with Bank and IDB projects. As is the case of other Bank-financed projects in Mexico, *Banco del Ahorro Nacional y Servicios Financieros* - BANSEFI will act as a financial agent. BANSEFI's responsibilities will include: (i) management of the special account; (ii) processing the disbursement requests; (iii) consolidating the progress reports and submitting them to the Bank; and (iv) organizing and carrying out of project audits.

24. For implementation of the "Strengthening of the State Water Commissions (CEAs)" Sub-component, CNA will sign an agreement with the National Association of Water Utilities (ANEAS)[2] through which ANEAS will organize a series of workshops and seminars that will bring together federal, state and municipal water sector decision makers in order to build consensus about reforms at the state level. CNA has estimated that the agreement with ANEAS will total circa U$ 400,000.

25. A Task Force will be established including representatives of CNA, BANSEFI, ANEAS, SHCP as well as participating service providers. The role of this Task Force will be to assure coordination among the institutions participating in the operation.

26. For component 2, the envisaged process for selected utilities to participate in the program is the following:

- Once compliance with eligibility criteria has been assessed, CNA will formalize the participation of the relevant municipality/utility through the signature of a **Memorandum of Understanding.**
- Based on existing planning documents, the relevant municipality/utility will submit a proposal to CNA and the Bank for an **efficiency improvement program** outlining priority actions to be funded under the project. Should a planning document not be available, the elaboration of the latter could be funded out of Project proceeds.
- During Project preparation, it was agreed with CNA that the proposal to be submitted by the relevant municipality or utility will include a financial analysis of the proposed efficiency improvement program as well as a procurement plan for the execution of the investments in compliance with Bank guidelines.
- Once the proposed efficiency improvement program has been assessed by CNA – and the Bank – and agreed upon with the relevant municipality/utility, the Federal and State Governments will subscribe the annexes[3] of a **Coordination Agreement (Financial Support Agreement),** which will establish on a multi-annual basis, amongst other things, the

[2] ANEAS: "*Asociación Nacional de Empresas de Agua y Saneamiento*" (in Spanish) is a non-governmental organization that represents the water utilities throughout Mexico.

[3] "*Anexos Técnico y de Ejecución*"

agreed-upon actions and requirements for utility modernization and the technical and financial support to be provided by the Federal Government to achieve it. The corresponding municipality/utility would also subscribe the agreement.

- The **executing agent** as indicated in the Agreement (Utility, Municipality) will be responsible for the execution of the Project and fulfillment of the Agreement. Appropriate control and incentive mechanisms will be put into place – for example utilities which meet their obligations for efficiency improvement would be eligible for further investment support by the Federal Government.

2. Monitoring and evaluation of outcomes/results

27. Monitoring will be undertaken based on bi-annual progress reports by the PCU and Bank supervision missions. The progress reports will summarize progress in procurement, physical execution as well as in the achievement of impact indicators as listed under Annex 3.

28. The indicators will be chosen among the same indicators that CNA will use to monitor progress in the sector at large, through its existing information system that will be strengthened through Component 1 of this operation.

3. Sustainability

29. The sustainability of the first component will be ensured by integrating activities closely with already existing initiatives and by ensuring full client ownership. The financial sustainability of these activities at the federal level is not expected to be an issue, given their limited size compared to the overall functions and budget of CNA. At the state level, careful consideration will be given to the size of activities and the financial capacity of the CEAs that are expected to continue activities beyond the duration of the project.

30. The activities under the second component are designed to strengthen the financial, technical and commercial capacity of the participating utilities and are thus designed with sustainability criteria in mind. The overall level of investments foreseen in each utility is fairly small compared to their past investment and future investment programs, thus reducing the likelihood that operation and maintenance of the relatively small works would exceed the capacity of the utilities. However, the risk of poor sustainability of the investments at the local level is real and is further discussed below.

4. Critical risks and possible controversial aspects

Risks	Mitigation	Risk Rating
Changes in utility management as a result of changes in municipal government	Choice of municipalities with recent changes in government. Promotion of institutional reforms that increase utility autonomy. Activities under Component 1 (water	Moderate

	sector information system and accreditation program) to provide incentives for improved management.	
Limited capacity of the current management and staff of selected utilities and CEAs	Capacity building activities included in the project design	Moderate
Reluctance to engage in or discuss reforms at the national level in anticipation of the 2006 Presidential elections	Project design focuses on capacity building at the utilities level and efficiency improvements. At the federal level, the project will finance a series of studies related to the modifications of the Water Law. Additionally, working with SHCP as a partner, in addition to CNA, would help further the impact of the TAL, particularly in the area of the program design and implementation.	Moderate
Delays in approvals for or insufficient counterpart funding	Assurance that budgetary funds at the federal level would be included in the 2006 budget For state and municipal counterpart funds, use of the mechanisms established under an existing program (APAZU), under which sub-sovereigns have shown to be able and willing to contribute CP funds	Low

31. Based on the results of the Financial Management Assessment (FMA), Financial Management (FM) did not identify any major risks; consequently FM does not request the inclusion of any FM-related risk.

5. Loan conditions and covenants

32. There is one condition of effectiveness: "the *Contrato de Mandato* between the Borrower and BANSEFI has been duly executed by the parties".

33. Based on the results of the FMA, FM does not request the inclusion of any FM-related effectiveness condition.

D. APPRAISAL SUMMARY

1. Economic and financial analyses

34. A financial analysis and a simplified economic analysis was carried out for a sample subproject from the first group of participating utilities. As shown in Annex 9, the base case of the analysis shows important net economic benefits above US$ 14 million, a financial internal rate of return of 52% and an economic rate of return of 60%.The sensitivity analysis performed confirmed the robustness of the results, given that in the pessimistic scenario, positive economic

benefits of around US$ 7.3 million and still very high financial - 32% - and economic - 37% - returns would be reached. The project will generate additional economic benefits, including intangible and more difficult to measure ones such as:

- Long-term environmental benefits and increased customer satisfaction
- Improved reliability and leakage management will reduce the level of illegal tampering and so reduce the cost of distribution maintenance.
- The Project will also have an impact on increasing the flexibility in the operational handling of the systems and improved pressure management, which will increase the economic life of the distribution network and therefore reduce the cost of maintenance

35. A complete discussion on the methodology and detailed results of the financial and economic analysis can be found in Annex 9.

2. Technical

36. The investment needs of the utilities in Mexico are very large. The specific needs and investment requirements in a number of municipalities and utilities *Organismos Operadores (OO)* have been recently assessed in detailed diagnostic studies prepared under PROMAGUA and a PHRD grant. The first one finances the elaboration of a comprehensive planning document with a view of incorporating the private sector in service delivery (*Diagnostico Integral de Planeación, DIP*), which outlines investment needs in all areas of service provision under a business-plan approach - and the PHRD grant has financed the preparation of thorough and in-depth Master Plans which outline the broad investment requirements for both water and sanitation services in 12 selected municipalities. This Project, however, will focus on financing those activities that will produce an immediate impact on the performance of the utilities in the next 3 years. These will include - though not limited to-: organizational reforms, training for managerial and operational staff, community participation programs; updates of the technical cadastral systems, equipment, macro and micro meters, rehabilitation of water and sewer networks, leak detection and control programs, efficiency improvement plans, updates of the commercial cadastral systems, modernization of accounting and financial systems, procedures for meter reading, billing and collection, modifications to the tariff structure and levels, and information systems.

37. The Project is envisaged to finance programs for efficiency improvement and modernization in different municipalities. Five utilities have already been pre-selected to participate in the Project and 2 utilities have produced detailed efficiency improvement programs as part of project preparation. The criteria used for the selection of these utilities include the following:

- Geographic representation of the different regions of the country
- Small and medium-sized municipalities (between 25,000 and 600,000 inhabitants)
- Strong likelihood of stability and continuity in the municipal authorities and/or management team of the utility
- Commitment of the utility and/or municipality to participate in the program

- Compliance with legal requirements, such as payment of exploitation rights *(Derechos de Uso)* and any other necessary legal conditions.

38. As stated above, the activities to be financed are focused around programs for improvement of operational and financial performance. Each of the participating utilities is currently defining - in collaboration with CNA, an efficiency-improvement investment program with priority actions to be financed under the Project. In the majority of the cases, the needs have already been identified in the corresponding *Diagnóstico Integral de Planeación* (DIP)s and Master Plans and the utilities are now working on prioritizing the different actions. It is envisaged that the implementation of the Project in each municipality will require three phases: (i) identification of priority actions to be financed under the project; (ii) preparation of detailed studies and project design; and (iii) execution or implementation of the actions. The first phase has been completed before appraisal for 2 of the participating utilities. Phases II and III will be funded out of the proceeds of the loan during project implementation.

3. Fiduciary

39. As part of project preparation an assessment of the financial management capacity of CNA to implement the Water Sector Modernization Technical Assistance Loan has been conducted and can be found in the Project Files.

40. The Bank carried out a Financial Management Assessment (FMA), which involved ensuring that project design allows for an appropriate level of transparency, facilitating oversight and control while also supporting smooth implementation. The FM team concludes the following: (i) although some project-specific mechanisms will need to be implemented for the new project, existing financial management arrangements for the Integrated Irrigation Modernization Project, which is currently under implementation, are operational and considered to form a sound basis for FM in this project; and (ii) although FM risk is Moderate, project implementation should be accompanied by a close supervision that allows early detection of financial management issues and ensures the proper use of the project funds. The risk is moderate based on the FMA of the proposed project and, on record of the project which is under implementation e.g. timely submission of information, external auditors had issued "unqualified" opinions, adequate disbursements' processing, Bank recommendations related to FM supervision missions had been properly implemented by CNA. The main risk is associated to the flow of funds for decentralized operations involving the *Organismos Operadores* at the Municipal level. Additional information on FM is provided in annex 7.

41. Annex 8 includes an explanation of the Procurement capacity assessment and related issues.

4. Social

42. The project is expected to have a positive social impact since it will provide the basis for developing sustainable utilities that will be in a position to provide better quality services to existing and new customers.

43. Also, on a demonstrative basis, the project will promote the inclusion of civil society in decision making processes in at least one of the participating utilities, as a means to generate a sense of ownership among the users of the services, thus facilitating implementation of reforms, and as an instrument to foster a more transparent relationship between the utility and the public.

5. Environment

44. The project has been rated as Category C by the Regional Safeguards Advisor.

6. Safeguard policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP/GP 4.01)	[ ]	[X]
Natural Habitats (OP/BP 4.04)	[ ]	[X]
Pest Management (OP 4.09)	[ ]	[X]
Cultural Property (OPN 11.03, being revised as OP 4.11)	[ ]	[X]
Involuntary Resettlement (OP/BP 4.12)	[ ]	[X]
Indigenous Peoples (OD 4.20, being revised as OP 4.10)	[ ]	[X]
Forests (OP/BP 4.36)	[ ]	[X]
Safety of Dams (OP/BP 4.37)	[ ]	[X]
Projects in Disputed Areas (OP/BP/GP 7.60)*	[ ]	[X]
Projects on International Waterways (OP/BP/GP 7.50)	[ ]	[X]

7. Policy Exceptions and Readiness

45. The operation complies with all applicable Bank policies.

* *By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas*

Annex 1: Country and Sector or Program Background

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

1. Institutional Structure of the Mexican Water and Sanitation Sector

1. The last section describes recent changes to the water law, including decentralization and the Sistema Financiero del Agua.

2. According to the Mexican constitution, since the decentralization of 1983 the primary responsibility for delivery of water supply and sanitation services rests with local government, constituted by 2,446 municipalities and almost 200,000 villages and hamlets. Concurrently, other important sector responsibilities remain vested at the state and federal levels. Through a recent amendment of the National Water Law, the basin agencies (*Organismos de Cuenca*) are deemed to play an important role in the sector . Functions of institutions at various levels of government overlap. In practice each level has different responsibilities in each state and in each municipality or village.

3. Institutions and their responsibilities at the three levels of government and at the basin level are described in more detail below, beginning at the local level.

1.1 Local Level

4. At the local level, as a result of different policies and programs, a variety of institutional arrangements for service provision can be found. Broadly they can be classified in four different categories as shown in Table 1 below:

- Reformed service providers (*organismos operadores*), including both public and private utilities;
- unreformed, but successful service providers;
- unreformed and largely unsuccessful arrangements, including service providers and direct provision by municipalities;
- other arrangements, including cooperatives and private small-scale providers.

5. The most frequently occurring category is the third one of unreformed and largely unsuccessful arrangements with limited commercial orientation and limited autonomy from the municipality. It is estimated that up to 90% of Mexicans with access to water and sewer services are served by operators in this category.

Table 1: Institutional Arrangements for Water and Sanitation Service Provision

Type	Commercial orientation	Autonomy from the state government	Autonomy from the local government	Occurrence	Examples	Size	Ownership
Reformed Service Providers							
A1 Fully autonomous Municipal Provider	Yes	Yes	Yes	Infrequent	Hermosillo (Sonora), León (Guanajuato)	Large	Public
A2 Mixed Municipal-Private Provider	Yes	Yes	Yes	One case	Saltillo (Coahuila)	Large	Mixed
A3 Concession	Yes	Yes	Yes	Two cases	Cancún, Aguascalientes	Large	Private
Successful Unreformed Service Providers							
B1 Local Provider dominated by State	Yes	No	Yes	Infrequent	Baja California,	Large	Public
B2 State Water Commission	To some extent	No	Yes	Infrequent	Querétaro, Nuevo León	Various	Public
Largely Unsuccessful Arrangements							
C1 Partly autonomous Municipal Provider	To some extent	Usually yes	Very limited	Frequent (about 360)	Numerous	Large	Public
C2 Nominally autonomous Municipal Provider	Limited	Usually yes	No	Frequent (about 620)	Numerous	Mid-sized	Public
C3 Provision by Municipality	No	Usually yes	No	Frequent (thousands)	Numerous	Small	Public
Other							
D Cooperatives	Limited	Yes	Yes	Infrequent		Small	Cooperative

Source: World Bank compilation

6. Most larger cities and some smaller towns have created decentralized municipal service providers (*Organismos Operadores*) with varying degrees of independence (categories C1 and C2). While service providers have their own legal personality and Board, in practice most are closely linked to the municipality which typically appoints most Board members and the service provider's Director (Category C2). According to CNA estimates, general managers of service providers hold their positions for an average of 1.5 years,[4] and most commonly do not survive political changes, resulting in frequent reorganizations and changes in strategy, which immediately undo the potential effectiveness of the previous strategy. There often are close financial links between service providers and municipalities, such as the contracting of debt and the payment of bills by the municipality on behalf of the service provider. Accounts are usually held on a cash basis, not on an accrual basis, and are seldom audited. There are usually no performance targets for the service providers.

7. Nevertheless, there are a few notable exceptions of service providers that are efficiently operated on a commercial basis. The best of these service providers self-finance a substantial proportion of their investments, have been rated by credit rating agencies (Categories A and B) and at least one – the service provider of Tlanepantla - has even issued a local currency bond.

8. In most smaller municipalities, however, water and sanitation services are performed directly by a municipal department (Category C3). The quality and efficiency of services in smaller municipalities tends to be lower than in larger municipalities. Inter-municipal service providers, which are a common institutional arrangement in some other countries to benefit from economies of scale in service provision among small towns or in large metropolitan areas, are quasi inexistent in Mexico.

9. In rural areas, water services are provided directly by local government (Category C3) or by user groups, which sometimes take the form of cooperatives (Category D). In some cases, the state water commission provides services in rural areas at the request of villages or municipalities (Category B2).

10. Most larger service providers are members of *Asociación Nacional de Empresas de Agua y Saneamiento de México (ANEAS)*. Founded in 1992, ANEAS represents the interests of service providers in the national political arena, promotes the exchange of experiences among service providers, strives to strengthen the autonomy of service providers and promotes environmental awareness (*cultura del agua*).

11. The degree of private sector participation in water supply and sanitation in Mexico has been limited so far, and the results have been mixed. A large number of contracts awarded have been ended prematurely for a number of reasons. In the case of Built-Operate-Transfer (BOT)contracts, which account for both the highest share of PSP contracts and the highest cancellation rate, according to a study conducted in 1999, the main reasons for cancellation include: financial problems (38% of cases), tariff issues (18%), political problems (14%), issues

[4] Kemper, Karin E. and Oscar Alvarado, "Water," in *Mexico: a comprehensive development agenda for the new era*, ed. Giugale, Lafourcade, and Nguyen (Washington DC, World Bank, 2001), p. 629.

concerning a lack of transparency in the bidding process (12%), legal guarantees (10%) and technical problems (8%).[5]

1.2 State Level

12. At the state level, institutional arrangements and the legal framework vary substantially among the 31 states. In 20 states the State Water Commission (*Comisión Estatal del Agua* - CEA), an autonomous entity that is usually under the authority of the State Ministry of Public Works, has an explicit mandate to support municipalities in the provision of services through technical assistance. In some states the CEA also monitors data on the performance of service providers, but seldom are these data aggregated into a comprehensive information system. The CEAs also have a role in channeling federal and state subsidies to service providers, although their level of discretion in administering federal funds is limited by the detailed operational rules of these funds.

13. However, the CEAs are not the regulators of service providers, since they do not approve tariffs. In a few states with important bulk water supply systems, the CEA also operates these systems. In 13 states, CEAs actually operate water distribution systems (Category B2). However, the number of municipalities is limited and the localities are usually small, with a few exceptions such as in the state of Querétaro. Almost all CEAs also have attributions in terms of water resources management. Three states have not created CEAs and the relevant State Ministries directly fulfill some of the functions otherwise attributed to CEAs.[6]

Table 2: Comparison of Functions of State Water Commissions in Mexico and Functions of Water Regulators in Other Countries

Country	Mexico	USA	United Kingdom	Colombia
Name	Comisiones o Institutos Estatales del Agua	Public Utility Commissions or Public Service Commissions	OFWAT	Superintendencia de Servicios Publicos y Comisión de Regulación del Agua
Geographic level	State	State	National	National
FUNCTIONS				
Tariff approval	No	Yes	Yes	Yes
Benchmarking	Usually no	No	Yes	Yes
Complaints	No	Yes	Yes	Yes
Water Resources Management	Usually yes	No	No	No
Operational Functions	Yes/no (depending on the state)	No	No	No

Source: World Bank Compilation

[5] Morales (1999), quoted in Solis et al. (2003), p. 223. It should be noted that "political" is defined narrowly as political problems arising because of a change in local or state government.
[6] Baja California, Tamaulipas and Yucatán.

1.3 National Level

14. At the national level, the *Comisión Nacional del Agua* (CNA) is the apex institution of the sector. Its mission is to "manage the nation's water resources with participation by the society, aiming at the sustainable use of resources". It also has major attributions in terms of water supply and sanitation, such as the channeling of federal funds to the sector and the provision of technical assistance. CNA is formally under the authority of the Ministry of Environment (SEMARNAT), but enjoys a considerable degree of de facto autonomy. Its President is nominated by the President of the Republic. Created in 1989 with a staff of 38,000 at the time, it now has 17,000 employees, most of whom work in the agency's 13 regional offices and 20 state offices.

15. CNA plays a key role in administering the financial flows of the overall sector, including water resources management, irrigation as well as water supply and sanitation.

16. The Mexican Water Technology Institute (IMTA), which is also under the authority of the Ministry of Environment (SEMARNAT) and was created in 1986, is in charge of research, development and transfer of water technologies.

17. A national training center for the staff of water and sanitation service providers, the *Centro Mexicano de Capacitación en Agua y Saneamiento* (CEMCAS), has been set up in 2000 with French assistance. The Center is governed by a Board presided by CNA.

1.4 Basin Level

18. In addition to the local, state and national level, **Basin Agencies** and **Basin Councils** are expected to play an increasing role in the Mexican water sector. The recently amended water law mandates a restructuring of key functions of CNA at the basin level through the creation of Basin Agencies (*Organismos de Cuenca*), which are administratively part of CNA. So far, only three Basin Agencies have been functionally created and others are in the process of being created. It is not clear if or to what extent the Basin Agencies will integrate the functions and the personnel of CNAs regional and state offices, thus introducing a considerable degree of uncertainty into the restructuring process of CNA.

19. In addition to the Basin Agencies, the Basin Councils (*Consejos de Cuenca*) are supposed to play a key role in the administration of the Water Financial System (SFA) introduced through the recent amendment of the Water Law.[7] Currently there are 25 Basin Councils covering almost the entire national territory. The Basin Councils' function is to formulate and execute activities to improve water resources management and to develop water infrastructure in their respective basin.[8] Most basin councils are of recent creation, the first one having been created in 1993 in the Lerma Basin and most others after 1999. More than half the members of the basin councils represent various levels of government, while up to half represent users and "society". The Basin

[7] The exact role of the basin level institutions in the SFA remains to be defined through the operating rules of the new system.

[8] The territory covered by some basin agencies (such as the Lerma Basin) covers up to five states, while on the other hand some states (such as Sonora) include territory covered by up to five basin agencies.

Councils are expected to guide, together with CNA, the work of the aforementioned Basin Agencies.

2. Features and Relevance of Key Federal Programs

20. Water supply and sanitation investment is characterized by a multitude of federal grant programs - each created at different times, having different objectives, using different funding sources and different operating rules. All of them require matching funding by lower levels of government. Table 4 summarizes these programs.

21. Compared to 2002, investments in 2003 increased by 12 %, excluding investments funded by Ramo 33's Fund to Support Social Infrastructure – (FAIS for which no 2003 figures are available. Federal investment subsidies increased by a stunning 85% to P4.2bn, and total subsidies from all sources increased at the even higher rate of 103%. The increases are primarily accounted by two programs, APAZU and PRODDER. There has been, however, a decline in investment by housing developers and in *Banco Nacional de Obras y Servicios Públicos* (BANOBRAS) lending to the sector, partially compensating for the substantial increase in federal programs.

Table 4: Major National Federal Funding Programs in Water and Sanitation

Acronym	Name	Objective	Volume	Terms	Beneficiaries	Creation	Funding	Implementation
PRODDER	Programa de Devolución de Derechos	Provide an incentive to operating entities to pay water abstraction fees	M$ 1,924m in 2002-03 (2 years)	Grants with co-financing requirements. Single sector.	1,190 public and private operating entities	2002	Through revenues from water abstraction charges	CNA
PROMAGUA	Fondo para la modernización de Organismos Operadores de Agua	Fund the WSS sector on the condition of structural reforms incl. PSP	So far only used for Integrated Planning studies	Grants with co-financing requirements. Single-sector.	Operators in cities with more than 50,000 inhabitants.	1999/2000	Fondo de Inversión en Infraestructura (FINFRA) and CNA grants	BANOBRAS/CNA
APAZU	Agua Potable y Saneamiento en Zonas Urbanas	"designed to provide WUs with a mix of loans and grants to encourage increased internal cash generation"	M$ 508m in 2002	Grants with co-financing requirements. Single-sector.	WB project 1994-2001 funded 70% of APAZU in that period. The program continues without Bank support.	1994	Used to be co-funded by the WB Water Supply and Sanitation II project	CNA
Ramo 33 / FAIS	Chapter 33 of the federal budget includes	earmarked to pay for (formerly) federal commitments	FAIS P26.8bn in 2002; share of FAIS spent on water and sanitation	Grants. Multi-sector.	All Mexican municipalities through the sub-program FISM, and all	Formerly known as Ramo	Federal Tax Revenue	SHCP

	a sub-program called Fondo de Apoyo para la Infraestructura Social (FAIS)	and transferred to the states and municipalities together with those commitments	unknown; could be 10%		states through the sub-program FISE	26		
SEDESOL	Secretaria de Desarrollo Social	11 targeted poverty alleviation programs, part of which is spent on water and sanitation	US$45m in 2002	Grants. Multi-sector.	Various	Various	Federal Tax Revenue?	SEDESOL
PROSSAPYS	Pr. para la Sostenibilidad de los Serv. de AP y de San. en Comm. Rurales	Rural water supply and sanitation	P761bn in 2002	Grants. Single-sector.	Rural Areas	1996	IDB and Federal Budget	CNA

Source: WB compilation based on data from CNA and other sources

Table 5: Investments in Water Supply and Sanitation by Sources (2003, m Pesos)

CONCEPTO	FEDERAL	ESTATAL	MUNICIPAL	CREDITO/IP/OTROS	TOTAL
Inversiones CNA	**3,302**	**2,076**	**1,829**	**152**	**7,360**
SGIHU	**2,767**	**1,608**	**1,746**	**152**	**6,273**
Agua Potable y Saneamiento en Zonas Urbanas	970	670	670	-	2310
Frontera Norte y B.C.	337	402	145	152	1036
Devolucion de Derechos	1,432	501	931		2,864
Agua Limpia	27	36			63
SGPRPS					
PROSSAPYS	536	467	83	1	1087
Otras Fuentes	**935**	**72**	**98**	**3,970**	**5075**
SEDESOL	459	69	72		600
CONAFOVI				3,600	3600
CONADEPI	160	3	26	1	190
Otros (CEAS/Otros Programas)				171	171
BANOBRAS	316			198	514
TOTAL	**4,237**	**2,148**	**1,927**	**4,123**	**12,435**

Source: CNA

22. Based on a preliminary assessment, the various programs are characterized by the following common characteristics:

- Most - perhaps even all - projects in the sector require co-funding by municipalities and state governments. This has provided a powerful incentive to raise the level of investment contributions from these sources, especially recently as major programs such as PRODDER have been initiated. On the other hand, the absence of differentiation of co-financing requirements according to the level of marginality makes it hard for service providers in poorer municipalities to fully tap those federal funds.
- A few programs – in particular PROSSAPYS and FAIS – specifically target poorer communities and states. This partly compensates for the above-noted drawbacks of other programs.
- All programs have detailed operating rules, specifying numerous pre-conditions, layers of approvals and reporting requirements. In practice, these are sometimes not being followed. This introduces an undesirable amount of political discretion, which probably favors states with better political connections.
- The complexity of programs may make access by states and service providers with limited administrative capacity more difficult. A simplification of operating rules may reduce that bias. However, the solution to that problem ultimately lies in the strengthening of local capacity through continuity of managerial staff and better insulation of service providers from undue political interference at the municipal level.
- There is limited flexibility in setting priorities among and within programs, although the degree of flexibility varies among programs. For example, the total amount and regional distribution of the largest program, PRODDER, are defined exclusively by payments of water abstraction rights by service providers. The program that allows the greatest flexibility in terms of setting rules is APAZU, a program that has been expanded significantly. However, it includes no incentives for improved performance and is not poverty-targeted.
- There are no regional or geographic priorities, except for the Frontera Norte program (a US-funded program for states bordering the US) and FAIS (targeted at poorer states, though not a water program by nature).None of the programs is conditional on changes in the governance structure of utilities or on policy/regulatory changes at the state level.
- None of the programs is performance-based, privileging service providers that have improved their performance and discriminating against those with stagnating or deteriorating performance. Instead, all service providers that fulfill certain formal criteria (size of city, co-financing, etc.) can participate.
- The only program that is conditional on a commitment for structural change is PROMAGUA. It requires a commitment to private sector participation and the elaboration of a long-term planning study before funds for works can be disbursed. However, the program has been very slow to be implemented and has been criticized for being ineffective. In particular, some cities that engaged into major reforms – such as Saltillo and Hermosillo – did so without participating in PROMAGUA, while in none of the participating cities a private sector contract has been signed so far. However, now that the planning studies for a number of cities have been completed, it remains to be seen if the program still can bear fruits.
- Some programs – such as FAIS – include no reporting requirements, making it difficult to assess their impact.

- There is only limited quality assurance. Cost-Benefit Analyses are pro forma exercises and are not used as a screening tool. Ex-post evaluations are rare and, if done, lack independence and critical assessment.
- There are attempts at monitoring outcomes, both at the federal level and in some states (e.g. Guanajuato). But these are hampered by several factors: (i) poor quality of financial and technical data (lack of metering) as collected by service providers; (ii) lack of incentives to improve the quality of data and to pass them on to state and federal entities; (iii) aggregated nature of data, without links to investments in specific programs.

23. The recent modifications to the water law foresee the introduction of the *Sistema Financiero del Agua* (SFA). According to those modifications, the instruments for the SFA are to be created by the CNA under the supervision of SHCP, through regulations that remain to be published. The law introduces a series of concepts that promote the principles of financial sustainability; cost recovery; spending monitoring, evaluation and accountability; efficiency; and others which are expected to contribute to rationalize the existing sector programs.

3. Sector Performance in International Perspective

24. Water service quality in Mexico – measured, among others, by continuity of supply – and operating efficiency – and by non-revenue water and billing efficiency – clearly fall short of the levels achieved in other OECD countries and upper middle-income countries.

25. According to the 2000 census only 45% of households connected to the water distribution network received a continuous supply of water, the remaining 55% suffer to various degrees from intermittent supply.[9] The incidence of intermittent supply is higher in smaller municipalities and for the poor.[10] While there are very limited data on drinking water quality at the tap, the intermittency of supply is likely to have a negative impact on drinking water quality, mitigating progress made in the disinfection of water at the source, which has now reached 95%. Intermittent supply also imposes costs for storage at the household level.

26. Water-related health indicators have shown a marked improvement, but still remain worse than those of other upper middle-income countries in Latin America (see Annex). The share of treated wastewater has increased to 30% in 2003,[11] significantly above the LAC average of 14% for 2000.[12] However, there are no data showing which share of the wastewater treatment plants complies with the norms for wastewater discharge.

27. Using non-revenue water (NRW) as an indicator, operating efficiency levels in Mexico are far below the average level attained in developed countries and below the level attained in the best-performing quartile of utilities in developing countries, as shown below.[13] For example,

[9] Own calculation, based on census data quoted in Avila (2004), spreadsheet named AnnexoI.CC_Agua
[10] Avila (2004) based on census data, as detailed in the Annex on water.
[11] CNA (2004), Situacion del Sub-Sector, p. A-76.
[12] PAHO/WHO (2001), Regional Report on the Evaluation 2000 in the Region of the Americas. Water Supply and Sanitation – Current Status Projects, p. 24 and p. 81
[13] Among the internationally most commonly used indicators to measure technical and commercial efficiency are: (a) non-revenue water (water produced-water billed)/water produced); (b) staff per 1000 connections; (c) working

the average level of non-revenue water (NRW) in Mexico is estimated at 44%,[14] while the best-performing quartile of 123 utilities in 44 developing countries achieve less than 23% of NRW. The average level in developed countries is about 15%. The level of NRW in Mexico varies between 22% in the best utilities and 65% in those with the poorest performance, proving that low levels of NRW are achievable in Mexico. However, it should be noted that characteristics such as extension of network relative to consumption levels, topography, continuity of supply and pressure all influence the attainable level of NRW, so that levels of NRW are not always comparable between cities and countries.

Table 6. Non-revenue water

Country (city)	Year	Non-revenue water (%)
Mexico (average)	2001	44
Mexico (Oaxaca)	2001	80
México (Acapulco)	2001	69
México (Mexicali)	2000	22
México (Guadalajara)	2000	41
Brazil (Sabesp: Sao Paolo)	2000	38
Latin America (average)	1998	42
Malaysia (Kuala Lumpur)	2001	43
Asian cities (average of 18)	2001	34
Tunis	2002	20
Best-performing quartile of 123 in developing countries utilities		<23
United Kingdom (average)	2000	14
United States	1996	15.5

Sources: CNA, *Situacion del subsector agua potable, alcantarillado y saneamiento a diciembre 2003;* CNA: Ciudades Estrategicas (2000), Barocio (2004); for Brazil SNIS Diagnostico 2000; Malaysia and Asian cities from ADB Water in Asian Cities, 2004; UK and US from IB-Net (International Benchmarking Network); Latin American average from WHO/UNICEF (2000), p. 25.

28. Average collection efficiency in Mexico is far below the levels achieved in developed countries and even in many developing countries. The level of collection efficiency in Mexico has been estimated by various sources at about 72%. In some small towns the collection efficiency is as low as 20%, while in the best-managed utilities it reaches 98%, again showing that high levels of performance are definitely achievable in Mexico.

ratio (total annual operating expenses, excluding depreciation and debt service/total annual pretax collections from billing and subsidies); and (d) collection or billing efficiency (accounts received/accounts billed). All these indicators are fraught with some limitations, including the lack of a universally accepted detailed specification of the definitions. For example, the current ratio can be calculated based on billed or collected revenues; and staff levels can fully or partially account for part-time staff and contractual workers.

[14] CNA (2004), Situación del sub-sector, p. 42. Calculated based on a sample of 157 service providers with reliable data.

Table 7. Collection efficiency

Country	Year	Billing/Collection (%)
Mexico (average, 2 sources)	2002	72
Mexico (Monterrey)	2004	98
México (Hermosillo)	1999	85
México (Matamoros)	1999	45
Malaysia (Kuala Lumpur)	2001	95
Asian cities (average of 18)	2001	88
Brazil (average)	2000	87
OECD average	1996	95

Sources: CNA, *Situacion del subsector agua potable, alcantarillado y saneamiento a diciembre 2001*, SMAPA (Tuxtla Gtz. O.O.) 2004 presentation, 1999 Capitol Advisors Ltd. Hermosillo Case Study, ADB, SNIS and OECD, Ciudades Estrategicas (2000).

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

1. Decentralized Infrastructure Reform and Development Program (DIRD)

1. This Project is designed to improve the performance of infrastructure services throughout the territory of Mexico while operationalizing the decentralization objectives of the national government, thereby enabling and catalyzing the efficient and sustainable development of selected infrastructure sectors at the sub-national level. The project supports comprehensive infrastructure sector strategies undertaken by states. The candidate states are those that are taking reform and development measures to catalyze and promote efficient and fiscally and financially viable infrastructure development in priority sectors, with poverty responsiveness and access of public services to the poorest segments o f the population. The first loan is for US$ 108.0 million to BANOBRAS to support the State of Guanajuato.

2. In the first stage, the Program will focus on three key infrastructure sectors, namely: (a) roads (including highways and rural roads); (b) water and sanitation (including wastewater treatment); and (c) urban and low-income housing. Based on the initial experience, and applying any lessons learned from the first stage, the Program could be extended to additional priority sectors and states and eventually, to municipalities.

3. The Program is a Sector Wide Approach (SWAP) that specially emphasizes sector strategies that: (i) promote access to services to the poorest segments of the population; (ii) incorporate market-based solutions that support private sector participation - whenever feasible - through an appropriate overall sector structure, regulatory and competition frameworks, suitable tariff and cost recovery policies; (iii) include the requisite attention to maintenance of infrastructure facilities and operational efficiency; and (iv) promote the strengthening of state environmental and social management capacity within key sectors. The sector strategies have to be consistent with the national sector development strategy, as articulated by the respective national sector entities. In the case of water and sanitation, the project will address the issues of absence of incentives for improved performance in the design of federal and state programs and limited incentives for improved cost recovery.

2. Irrigation & Drainage Modernization Project (PMIR)

4. This Project supports: (i) the modernization of existing irrigation infrastructure to promote a more efficient use of irrigation water within the framework of integrated irrigation investment plans; (ii) increased productivity of irrigated agriculture and diversification into high-value crops; (iii) consolidation of the transfer of irrigation infrastructure to water users; (iv) institutional strengthening of water users' organizations to enhance their participation in the O&M of irrigation infrastructure as well as in investment decisions; (v) consolidating the current cost recovery system for both operating and capital costs; and (vi) establishment of a comprehensive monitoring and evaluation system. Even when this is not a water supply and

sanitation project, it should be noted that these components address similar issues to those underlying the proposed TA operation.

3. Environmental Development Policy Loan ENVDPL II (under preparation)

5. This project, which builds upon the Programmatic Environment SAL I, aims to mainstream environmental concerns in key sectoral development agendas, and improve the effectiveness and efficiency of local environmental management processes. With respect to the water sector, the programmatic SAL *inter alia* supports the fiscal framework of the water sector, determining the economic value of water and implementing a tariff structure that reflects the marginal costs of supply as well as incorporates the marginal cost of the resource; supports the development of water availability data and an improved water rights registry as foundational steps in the implementation of a functioning water rights market; promotes the functioning of Water Basin Councils with self-management, as well as an increase number of functioning Aquifer Committees with independent administrative systems; and supports verification that concessions for public urban water use and discharges in municipalities are enforced and comply with environmental regulations. The project tackles the issues of efficiency, cost recovery and institutional strengthening.

4. Second Water Resources Management Project (GICA) (under preparation)

6. This project aims to: (a) improve conditions for sustainable integrated water resources management and use; and (b) detain the accelerated deterioration of water resources in selected areas. The project will support: preparation of comprehensive water resources sustainability plans in collaboration with water users, states, municipalities, *Comisión Nacional de Agua* – (CNA), *Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación* (SAGARPA), private sector, etc. The plans will include reaching agreement on aquifer regulations, entailing the reduction of water rights to sustainable levels and enforcement mechanisms. The plans will also include financing schemes that will involve financing from different state, federal and private sources and will include activities financed through other Bank-supported projects. The project addresses the financing issue, same as the proposed TAL.

5. Pilot Program for Institutional Development in the Water Supply and Sanitation Sector (Interamerican Development Bank, PR 1540/OC-ME)

7. The program's objective is to implement pilot projects to promote autonomy, efficiency, equitable access, citizen participation and financial sustainability at the providers of these water supply and sanitation services in small and mid-sized cities. The program seeks to: (i) demonstrate the real potential for improving service in the near term and with limited resources; (ii) build consensus and support for the needed measures within the community concerned; (iii) gain experience and share the lessons learned that will be useful in similar communities; and (iv) lay the groundwork for a larger-scale investment and institutional development program.

6. Sustainability of Water Supply and Sanitation Services in Rural Communities (Interamerican Development Bank, PR 1161/OC-ME)

8. The project aims at developing the water supply and sanitation sector in rural communities through activities that include: (a) institutional development; (b) community development and participation; and (c) water supply and sanitation infrastructure. The first subprogram supports decentralization by separating and strengthening sector functions and improving institutional mechanisms in approximately 20 states and 200 municipalities. The second subprogram strengthens or creates organizations in approximately 1,500 rural communities to operate and maintain water supply and sanitation services, with active participation of all groups in receiving instruction on water use and resource protection. The third subprogram supports the processes of institutional development, community development, and community participation by the building of new works and the rehabilitation and expansion of existing water supply and sanitation systems to benefit marginalized rural communities of up to 2,500 inhabitants.

Annex 3: Results Framework and Monitoring

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

PDO	Outcome Indicators	Use of Outcome Information
(i) To improve the efficiency of Mexico's water supply and sanitation sector through strengthening of sector policies at the federal and state level; (ii) To develop and demonstrate replicable models of successful and sustainable provision of water and sanitation services, by supporting selected service providers in improving technical and financial performance and efficiency of service provision.	(i) Improved Water and Sanitation Sector Information System to strengthen quality and quantity of selected performance indicators; (ii) Consensus reached with a majority of the State Water Commissions on their new roles and policies and the establishment of an accreditation program for key water utilities personnel; and (iii) Improved performance of pilot water utilities measured as net operational revenues over operational costs	Outcome information will be disseminated to service providers throughout Mexico, stimulating them to use similar approaches to improve water and sanitation services with the assistance of CNA, ANEAS and CEAs.
Intermediate Results One per Component	**Results Indicators for Each Component**	**Use of Results Monitoring**
Component One: Evaluation of existing programs in the water and Sanitation Sector managed by CNA in urban areas	**Component One:** Information of 5 CNA Programs	**Component One:** Measure and compare the impact on the sector of CNA channeled federal funds
Component Two: Improvement of operational and financial efficiency of service provision	**Component Two:** 5% improvement in the performance of pilot water utilities measured as net operational revenues over operational costs	**Component Two:** Disseminate improvement results to other *Organismos Operadores* (OOs)

Arrangements for results monitoring

		Target Values			Data Collection and Reporting			
Outcome Indicators	**Baseline**	**YR1**	**YR2**	**YR3**	**YR4**	**Frequency and Reports**	**Data Collection Instruments**	**Responsibility for Data Collection**
Results Indicators for Each Component								
Component one:								
1.1 Improvements to existing national WSS information system	December 2004 Information	5 utilities w/ revised standardized operational & financial info	5 additional utilities w/ revised standardized operational & financial info	10 additional utilities w/ revised standardized operational & financial info		Annual	SIS	CNA
1.2 Evaluation of existing programs in the water and Sanitation Sector managed by CNA in urban areas	Barocio, R (2005)	Study to assess existing programs commissioned	Study to assess existing CNA programs completed	Proposal of revised norms for CNA programs completed		Annual		CNA
1.3 Support State Water Commissions (CEAs) in their planning and regulatory functions	Environmental Resources Management Limited (ERM) (2004)	Study to review CEAs functions commissioned	Study to review CEAs functions completed	5 workshops organized to discuss with CEAs new roles and policies	Consensus reached with 6 CEAs on new roles and policies	Annual		CNA
1.4 Training	Will be determined during 1st year of project implementation	Assessment of profile and background of key personnel in OOs commissioned	Assessment of profile and background of key personnel in OOs completed	2 workshops organized to discuss with CEAs & OOs staff accreditation system	Consensus reached with 6 CEAs on staff accreditation			

		Target Values			Data Collection and Reporting			
Outcome Indicators	**Baseline**	**YR1**	**YR2**	**YR3**	**YR4**	**Frequency and Reports**	**Data Collection Instruments**	**Responsibility for Data Collection**
Component two: Working Ratio (operational revenues over operational costs)	Will be determined during 1st year of project implementation	Determine baseline Value	Maintain baseline Value	Maintain baseline Value	Improvement of 7% in average working ratio for participating OOs.	Annual	Regular OO and CNA reporting and semi-annual supervision missions	CNA
Recovery Tariff (revenues collected over volume of water produced)	Will be determined during 1st year of project implementation	Determine baseline Value	Maintain baseline Value	Maintain baseline Value	Improvement of 10% in average recovery tariff for participating OOs.	Annual	Regular OO and CNA reporting and semi-annual supervision missions	CNA
Unaccounted-for water (losses) reduced	Will be determined during 1st year of project implementation	Determine baseline Value	Maintain baseline Value	Maintain baseline Value	Reduction of 4% in unaccounted – for – water in average in participating OOs.	Annual	Regular OO and CNA reporting and semi-annual supervision missions	CNA

Annex 4: Detailed Project Description

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

1. The project will fund the following components and activities:

Project Component 1: Modernization of the Sector at the Federal and State level (Bank financed: $ 2.9 m).

2. This component will include the following subcomponents:

(i) **National Information System (US$ 0.8 m)** - The proposed project will fund an evaluation of the existing systems (both at a state and federal level), comparing them with the national information system for the water and sanitation sector (SNSS) in Brazil and other systems in other countries. This activity will cover both a diagnosis on the existing system and a proposed action plan. The action will include a detailed proposal with the relevant recommendations and needs assessment in terms of technology, manuals and training.

(ii) **Evaluation of Existing Programs in the Water and Sanitation Sector (US$ 0.4 m)** – This activity will fund a comprehensive study to review and asses the effectiveness and impact of existing financing programs at a federal level and propose the necessary changes to reflect the principles included in the new National Water Law.

(iii) **Strengthening of the State Water Commissions (CEAs) (US$ 0.4 m)** – To strengthen the capacity of the CEAs (Comisiones Estatales del Agua) through targeted technical assistance and the organization of seminars on specific areas relevant to their mission (tariffs, regulation, best industry practices, benchmarking, etc.) and conduct activities towards the dissemination of the lessons learned in the project.

(iv) **Training Component (US$ 0.7 m)** - To fund: (i) a comprehensive assessment study of the existing human resources and training needs in the water and sanitation sector; and (ii) the development of a detailed proposal for the establishment of an accreditation system in the sector. This component will also fund training requests from the relevant participating institutions (CEAs, ANEAS, CNA) to build up the needed specialized skills in the sector.

(v) **Project Dissemination (US$ 0.2 m)** – This activity will finance documentation of the lessons learnt through the project as well as a series of workshops and seminars for dissemination of the project.

(vi) **Project Management (US$ 0.4 m) -** To finance staff, consultant services and other expenses in order to execute, supervise and monitor the results of the Project. Activities to be financed under this component include staff to work as Project coordinators, CNA project supervision costs, information technology equipment, and other operating expenses for the project implementation unit within CNA.

Subcomponents (i) through (v) will be financed by the Loan, whereas subcomponent (vi) will be financed from CNA's budget.

Project Component 2: Pilot cases of Modernization of Water Utilities (U$ 47.7 m).

3. This component will support the development of replicable models for an efficient and sustainable provision of water supply and sanitation services ("success cases"). The component will fund efficiency improvement programs in selected municipalities to strengthen and bring utilities to reasonable levels of management, operational efficiency and financial viability.

4. The Bank will finance 100% of the federal contribution to the activities at the utilities level, which will be implemented in accordance with the prevailing operation rules of APAZU.

5. A first group of five utilities (table 1) has been proposed by CNA based on the following criteria:

- Geographic representation: the group represents different regions of the country.
- Small and medium-sized municipalities (between 25,000 and 600,000 inhabitants) to maximize the impact of the program in the overall level of service delivered to the population.
- Managerial stability: the participating utilities belong to municipalities where changes in the political cycle should not affect the permanence of managerial staff of the utility.
- Commitment to participate in the project: the utility and the municipality have expressed their willingness to participate in the technical assistance project and accept its conditions.
- Payment of water fees: participating utilities must be current on the water fees due to the Federal government as well as in compliance with any other legal requirement.
- Potential for dissemination of results: selected utilities must commit to participating in analysis and evaluation of the results achieved after implementation of the improvement programs, as well as to share the results of the activities undertaken under the project.

Table 1 – Municipalities Proposed (first phase)

Service Provider	Planning Document	Population (Inhabitants)
Colima-Villa de Álvarez, Col.	Yes (DIP)	196,318
Puerto Vallarta, Jal.	Yes (DIP)	151,432
Guaymas, Son.	No	97,593
Hermosillo, Son.	DIP Under preparation	545,928
Cd. del Carmen, Camp.	No	126,024

6. Existing diagnostic studies and detailed planning documents for each of the above utilities are available in the Project files. Additional utilities (in principle three other utilities) are expected to participate in the project based on the same criteria.

Table 2 – Key Efficiency Indicators for Selected Municipalities (first group)

	Ciudad del Carmen	Colima-Villa de Alvarez	Heroica Guaymas	Puerto Vallarta	Hermosillo
Number of Employees	206	210	212	389	816
Water Supply Coverage (%)	80	98	97	93	97
Sewerage Coverage (%)	6	97	72	83	92
Micro Metering (%)	60	7	48	88	94
Physical Efficiency (%)	44	58	30.6	61	56
Commercial Efficiency (%)	67	84	44	94	80
Annual Collection (US$ millions)	1.9	5.1	2.2	15	16

7. The component will fund efficiency improvement programs to strengthen and bring utilities to reasonable levels of management, operational efficiency and financial viability. The activities to be financed under this component are centered around programs for improvement of technical, commercial and financial efficiency, and each of the participating is defining - in collaboration with CNA and based on the existing planning documents where available- an investment program with priority actions to be financed under the project.

8. Though the investments envisaged under this component are not explicitly intended to be pro-poor, the investments assessed will benefit poor populations. Poverty classification in Mexico takes into consideration the access to and quality of public services received, so investments to improve basic water and sanitation services will benefit those with deficient levels of service. Also, and though investments will have system-wide benefits (including improved continuity, system pressure, reduced physical losses, etc.) and the operational and financial performance improvements which are expected to result from improved water service providers are not targeted directly at the poor, *per se*, experience in Mexico and throughout the region indicates that improved performance and financial situation, which will enable the utility to invest in the expansion of the services, will benefit the poor – the served and underserved. Small and medium sized municipalities included under component 2 comprise marginal and peri-urban areas where poverty is more acute. The project will permit testing and adapting a range of approaches and assistance to improving services in poorer areas, the lessons of which will be fed into the redesign of existing programs and or the development of new programs which more directly target poor households/communities.

Table 3 – Key Actions to be financed under the Project

Production and Distribution	Commercial Efficiency	Institutional Development
Efficiencies: - Hydraulic - Physical - Electromechanical - Water Quality	Efficiencies: - Cadastre and customer databases - Micro-metering - Consumption estimates - Billing - Collection - Tariff studies	Efficiencies: - Business organization - Human Resources development - Leadership - Staff Training and capacity building - Financial management - Customer service and relations

	- Control of supplies and stock management - Transport - Social communication and customer service	- External and internal communication - Accounting systems

Implementation Arrangements

9. The implementation of the project in each municipality will require three phases, the length of each depending on the level of progress that the utility has done against each of them already:

(i) identification of priority actions to be financed under the project (will be done during project preparation under the responsibility of CNA);
(ii) preparation of studies (including Business Plans for those utilities who do not have one), project design and bidding documents; and
(iii) execution or implementation of the improvement activities.

10. Under phase (ii), a Consultant will prepare the detailed studies and documents necessary to execute the priority activities identified in phase (i). In case a planning document would not be available, the Consultant would prepare a Business Plan identifying the activities that must receive priority attention in order to improve the performance of the utility.

11. In phase (iii), the utility will implement the activities previously identified, which will include some of the following: organizational reforms, training for managerial and operational staff, community participation programs; updates of the technical cadastral systems, equipment, macro and micro meters, rehabilitation of water and sewer networks, leak detection and control programs, efficiency improvement plans, updates of the commercial cadastral systems, modernization of accounting and financial systems, procedures for meter reading, billing and collection, modifications to the tariff structure and levels, and information systems.

12. The envisaged process for selected utilities to participate in the program is the following:

- Once compliance with eligibility criteria has been assessed, CNA will formalize the participation of the relevant municipality/utility through the signature of a Memorandum of Understanding.
- Based on existing planning documents, the relevant municipality/utility will submit a proposal to CNA and the Bank for an efficiency improvement program outlining priority actions to be funded under the project. Should a planning document not be available, the elaboration of the latter could be funded out of Project proceeds.
- Once the proposed efficiency improvement program has been assessed by CNA – and the Bank-and agreed upon with the relevant municipality/utility, the Federal and State Governments will subscribe a **Coordination Agreement (Financial Support Agreement)** which would establish on a multi-annual basis, amongst other things, the agreed-upon actions and requirements for utility modernization and the technical and financial support to be provided by the Federal Government to achieve it. The correspondent municipality/utility would also subscribe the agreement.

- The executing agent as indicated in the Agreement (Utility, Municipality or State) will be responsible for the execution of the Project and fulfillment of the Agreement. Appropriate controlling and incentive mechanisms will be put into place – for example utilities which meet their obligations for institutional improvement would be eligible for further investment support by the Federal Government.

Summary Project Details

13. We attach here-in a description of two of the proposed programs for 2 of the participating utilities:

CIAPACOV - Colima – Villa de Alvarez

14. The utility serving the Municipalities of Colima and Villa de Alvarez (CIAPACOV) has a planning document (DIP) prepared in 2003 under the program PROMAGUA. Estimated population in year 2003 is 220,000 inhabitants. Water coverage is 98% for water and 97% for sewerage. In 2002 the utility had efficiency levels of 56% (physical efficiency) and 84% (commercial). The quality of service is reasonable and production capacity is estimated to be sufficient to supply the population for the next 20 years. However, micro metering is low (25%) and continuity of service substandard given that a large proportion of the network is old and in need of rehabilitation or replacement. The following priority investments have been identified: (i) rehabilitation and replacement of water mains; (ii) rehabilitation of distribution network and accessories; (iii) macro and micro metering; and (iv) replacement of household connections.

15. The main operating and efficiency indicators in Colima are as follows:

	Colima-Villa de Alvarez
Number of Employees	210
Water Supply Coverage (%)	98
Sewerage Coverage (%)	97
Micro Metering (%)	7
Physical Efficiency (%)	58
Commercial Area Efficiency (%)	84
Annual Collection (US$ millions)	5.1

16. The investment plan discussed by Colima for financing under the TAL contemplates the following actions:

Management of Physical Losses

Action	Target	Rational	Tentative Cost (MXP)	Tentative Cost (mill US$)
Identification and fixing of leakages in household connections	15,000 new connections	Unaccounted –for water due to leakage is estimated to be 38%. Currently, a large proportion of the leakage and wastage occurs either along the service mains (19mm poly tube), or defective plumbing within the customers' premises. It s expected that by reducing leakage in the household connections, the figure of non-revenue water will also be reduced.	12	1.2
Zoning and sectioning of secondary networks (including valves)	56 "cruceros"	The objective is to set up zoned and distinct sections of the distribution system with clearly identified entry points from the transmission system. The volume, flow and pressure of water entering a section will be monitored at each of these entry points. This will enable the utility to identify plan, schedule and perform effective leakage reduction works	1	0.1
Zoning and sectioning of secondary networks (including valves)	225 "cruceros"	See above	4	0.4
Leakage detection in valve boxes in the urban area	80 boxes rehabilitated	Identification and fixing of existing leakages in valve boxes that are in need of rehabilitation.	1.5	0.15
Replacement of secondary network pipe in 5 locations	40,000 m	Pipe repair and replacement of defective lengths within the distribution system is needed for an effective implementation of the leakage strategy. The pipe is 50 years old and is suspected to present many unidentified leakage points.	20	2.0
Replacement of water source flow meters	14 flow meters	To effectively manage production and ensure information on 100% of production points.	0.6	0.06
Installation of flow meters at exit points of tanks	20 flow meters	To control the volume and balances of water, the flow	1	0.1

Action	Target	Rational	Tentative Cost (MXP)	Tentative Cost (mill US$)
		will be monitored at each of these exit points.		
Capacity building to increase physical efficiency	5 people	Training of technical staff in leakage detection	0.1	0.01
Updating of infrastructure inventories and details of the distribution network.	600 km	The update is needed so that the essential nature of effectively managing leakage is allowed for.	10.5	1.05
Total			**50.7**	**5.07**

Commercial Efficiency

Action	Target	Rational	Tentative Cost (MXP)	Tentative Cost (mill US$)
Update of customer cadastre	Updating of 92,000 connections in the urban and rural areas of the 2 municipalities	This action will enable: To identify illegal tampering and begin to bill unknown customers To bill properly The cost of operating the system will effectively be distributed amongst all the real users Support financial sustainability	3.5	0.35
Installation of MIS in: General Direction Operations Commercial Finance	Support the improvement of the utility's global efficiency by introducing modern information systems that will allow for the establishment and monitoring of targets in an efficient manner.	A reliable flow of information is needed so it can be fed in the decision making process and also serve as the basis for the planning function, staff performance, monitoring of activities and adoption of corrective measures.	10	1
Total			**13.5**	**1.35**

Puerto Vallarta - SEAPAL

Existing Situation

17. The utility SEAPAL provides service to the municipality of Puerto Vallarta with over 200,000 inhabitants and a large seasonal population. SEAPAL has a DIP financed in 2004 under PROMAGUA. Both water and sewerage coverage are currently close to 100%. The utility is showing very healthy indicators of efficiency (in 2002, physical efficiency was 96% and commercial efficiency was 90%). - SEAPAL is aware that a top utility needs to continue investing in maintaining and improving the efficiency indicators and has put together a plan (discussed with CNA and the Bank) to build on the existing achievements and further improve the physical and commercial efficiency by the introduction of innovative systems in the technological and commercial areas. The main operating and efficiency indicators in SEAPAL are as follows:

	SEAPAL
Number of Employees	389
Water Supply Coverage (%)	93
Sewerage Coverage (%)	83
Micro Metering (%)	88
Physical Efficiency (%)	61
Commercial Efficiency (%)	94
Annual Collection (US$ millions)	15

Investment Plan

18. The heart of SEAPAL's strategy is the setting up of distribution sectors in the current 18 pressure zones. These are zoned and distinct sections of the distribution system, with clearly identified entry points (one, or two at the most) from the transmission system. The volume, flow and pressure of water entering a sector will be monitored at each of these entry points. In addition, demand within the sector will be monitored by ensuring each household is metered. A comparison of supply and demand, as well an analysis of night-time flows and operating pressures will allow management to plan, schedule and perform effective reduction of non-revenue water (via identification and fixing of leaks) within each sector. In addition, measurements of daily consumption figures and flow profiles will be used to improve the accuracy of planning and design assumptions for future projects and demand management. This program will provide top notch implementation of an efficiency improvement strategy and constitute a consistent model for replication in other utilities.

19. The main actions contemplated in the investment plan discussed with Puerto Vallarta are the following:

SEAPAL's Efficiency Improvement Program

Action	Rational	Tentative Cost (MXP)	Tentative Cost (mill US$)
Teleprocessing	This will enable the instrumentation of 100% of the network in the existing 18 pressure zones to enable its remote control and management.	6	0.6
Network sectorization	The objective is to set up zoned and distinct sections of the distribution system with clearly identified entry points from the transmission system. The volume, flow and pressure of water entering a section will be monitored at each of these entry points. This will enable the utility to identify plan, schedule and perform effective leakage reduction works	20	2
Leakage Strategy	Identification and fixing of leaks in the network and household connections through pipe repairs and replacement of household connections.	20	2
Update of Customer Cadastre	This action will enable: To identify illegal tampering and begin to bill unknown customers To bill properly The cost of operating the system will effectively be distributed amongst all the real users - Support financial sustainability	4	0.4
Total		**50**	**5**

Annex 5: Project Costs

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

	Project Cost By Component and/or Activity	Counterpart US$ th.	Financed US$ th.	Total US$ th.
1	**Modernization of the Sector at the Federal and State Level**	**364**	**2,499**	**2,863**
1.1	National WSS Information System	0	762	762
1.2	Evaluation of existing programs in the water and sanitation sector	0	400	400
1.3	Strengthening of the State Water Commissions (CEAs)	0	455	455
1.4	Training Component	0	682	682
1.5	Dissemination activities	0	200	200
1.6	Project Management	364	0	364
2	**Pilot Cases of Modernization of Water Utilities**	**27,688**	**20,050**	**47,738**
	Subtotal: Components 1 and 2	**28,052**	**22,549**	**50,601**
	Contingency	2,201	2,201	4,402
	Total Project cost	**30,253**	**24,750**	**55,003**
	Front End Fee (1%)		250	250
	Total Project cost	**30,253**	**25,000**	**55,253**

Annex 6: Implementation Arrangements

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

1. The implementing agency will be CNA, more specifically the "*Unidad de Agua Potable y Saneamiento*" (UAPS), which is part of the "*Subdirección General de Infraestructura Hidráulica*" (SGIH) of CNA. The UAPS will be supported by "*Subdirección General de Programación*" *and* "*Subdirección General de Administración*" in administration and disbursement matters, respectively.

2. All of them have extensive experience working with Bank and IDB projects. As is the case of other Bank-financed projects in Mexico, BANSEFI will act as a financial agent. BANSEFI's responsibilities will include: (i) management of the special account; (ii) processing the disbursement requests; (iii) consolidating the progress reports and submitting them to the Bank; and (iv) organizing and carrying out of project audits.

3. A Task force will be established including representatives of CNA, BANSEFI, ANEAS, SHCP as well as participating service providers. The role of this task force will be to assure coordination among the institutions participating in the operation.

4. For component 2, the envisaged process for selected utilities to participate in the program is the following:

- Once compliance with eligibility criteria has been assessed, CNA will formalize the participation of the relevant municipality/utility through the signature of a **Memorandum of Understanding.**
- Based on existing planning documents, the relevant municipality/utility will submit a proposal to CNA and the Bank for an **efficiency improvement program** outlining priority actions to be funded under the project. Should a planning document not be available, the elaboration of the latter could be funded out of Project proceeds.
- During Project preparation, it was agreed with CNA that the proposal to be submitted by the relevant municipality or utility will include a financial analysis of the proposed efficiency improvement program as well as a procurement plan for the execution of the investments in compliance with Bank guidelines.
- Once the proposed efficiency improvement program has been assessed by CNA – and the Bank – and agreed upon with the relevant municipality/utility, the Federal and State Governments will subscribe the annexes[15] of a **Coordination Agreement (Financial Support Agreement)** which will establish on a multi-annual basis, amongst other things, the agreed-upon actions and requirements for utility modernization and the technical and financial support to be provided by the Federal Government to achieve it. The correspondent municipality/utility would also subscribe the agreement.
- The **executing agent** as indicated in the Agreement (Utility, Municipality or State) will be responsible for the execution of the Project and fulfillment of the Agreement. Appropriate

[15] "*Anexos Técnico y de Ejecución*"

controlling and incentive mechanisms will be put into place – for example utilities which meet their obligations for efficiency improvement would be eligible for further investment support by the Federal Government.

Annex 7: Financial Management and Disbursement Arrangements

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

1. **Background.** Project Financial Management (FM) arrangements will be consistent with Bank's principles and practices on the subject, and the proposed project will allow for the use of existing government FM arrangements (country systems that are satisfactory to the Bank), thus minimizing any additional program specific requirements. The FM section of the project Manual (OM) will include detailed information on the following evaluated areas (excluding the Financial Management Assessment section).

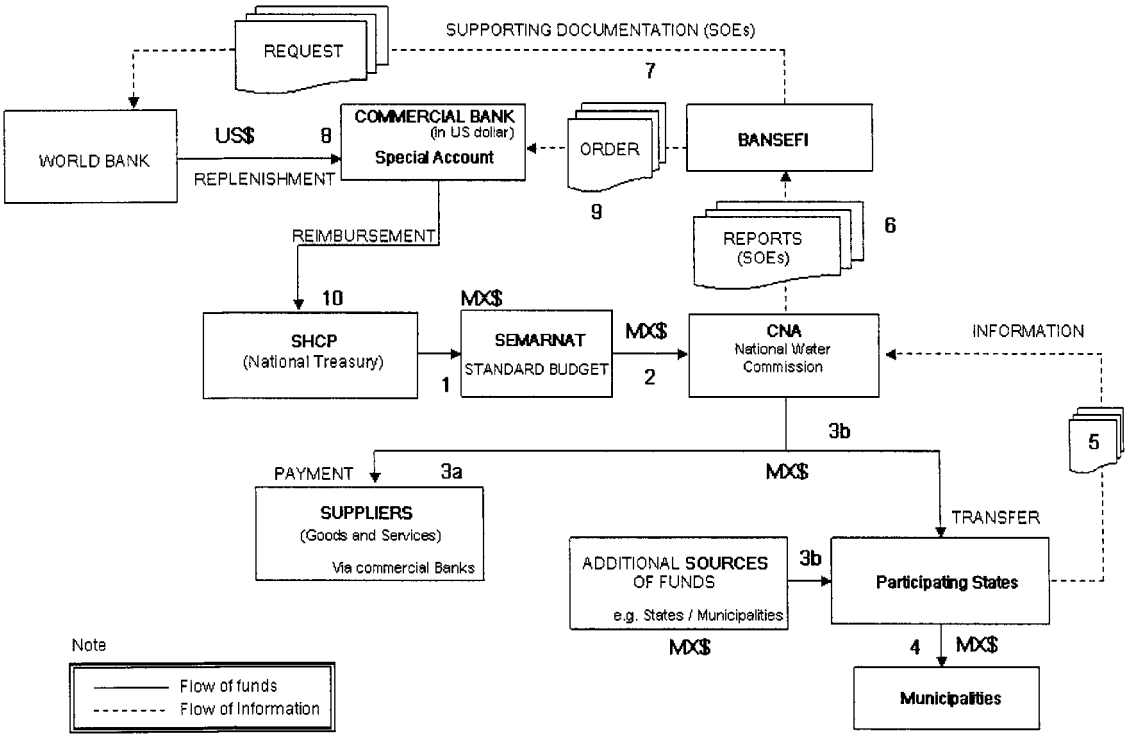
2. **Financial Management Assessment (FMA).** The Bank carried out a FMA of the institutional capacity of CNA. The main conclusions of the FMA are the following: (i) although some project-specific mechanisms will need to be implemented for the proposed project, existing FM arrangements for the Bank-financed project currently under implementation are operational and considered to form a sound basis for financial management in the proposed project; (ii) the *Gerencia* de *Recursos Financieros* under the *Subdirección* General de *Administración* has the capacity to manage the project financial matters; and (iii) the risk is moderate based on the results of the FMA, on record of the project under implementation, and on the design of the proposed project e.g. risk associated to the flow of funds involving the *Organismos Operadores* at the Municipal level.

3. **Implementing entity**. The national water commission CNA, which will implement the proposed project, has demonstrated high capacity for project implementation, including smooth interfaces with NAFIN and BANOBRAS (two governmental development banks appointed as financial agencies for previous Bank-financed projects implemented by CNA) and the Ministry of Finance (SHCP). The latter has appointed *Banco del Ahorro Nacional y Servicios Financieros* (BANSEFI) as the financial agency for the proposed project.

4. **Flow of funds and information**. Bank loan funds will flow from the Loan Account to a Special Account managed by BANSEFI and established in US dollars at a commercial bank (section on *Disbursement Arrangements and Retroactive Financing* provides information to complement this section). The Government of Mexico (GOM) will pre-finance project spending, thus the National Treasury TESOFE (via the *Secretaría de Medio Ambiente, Recursos Naturales y Pesca* – SEMARNAT) will transfer funds to CNA in local currency (Mexican Pesos) via the standard budget under the APAZU program. CNA and participating *Organismos Operadores* will pay to their corresponding suppliers of goods and services. At the end of the cycle, TESOFE will be reimbursed. See the following flowchart for additional information.

5. Counterpart funds are part of CNA's standard budget, are used to complement Bank funds and will include funds provided by subnational level entities. Bank funds and counterpart funds will be registered in the standard budget in two separated budgetary lines earmarked for the project.

FLOW OF FUNDS AND INFORMATION



6. The Bank will recognize expenditures as soon as payments to suppliers are made.

7. **Accounting Policies and Procedures**. CNA maintains records and accounts adequate to reflect, in accordance with accounting practices compatible with International Accounting Standards and in compliance with local requirements, its operations and financial condition, including records and separate accounts for the Integrated Irrigation Modernization Project (IIMP), a Bank-financed project which is currently under implementation by CNA. The same arrangements will apply to the proposed TA project.

8. **Information Systems**. CNA's existing systems (mainly the SIF version 5 and its modules), which are being utilized for the Bank-financed IIMP, which is currently under implementation, are considered acceptable to the Bank. These systems will track every project transaction and produce required information, including an important portion of the Financial Monitoring Reports (FMRs). The SIF will be operated at the subnational level as well. CNA, in coordination with the Bank and BANSEFI, will carry out training activities for the participating states/municipalities.

9. **Staffing (key FM staff)**. A project team in the *Gerencia* de *Recursos Financieros,* housed within the *Subdirección General de Administración*, is acceptable to the Bank, and this project team has qualifications and public sector experience adequate to undertake all FM tasks related to the proposed TA project. These arrangements are currently applied to the Bank-

financed project under implementation and are considered satisfactory to the Bank, so the same arrangements will be utilized by the proposed TAL project.

10. **Financial Reporting**. CNA will report to the Bank in the format of the above mentioned Financial Monitoring Reports (FMRs), which will be semiannually submitted through BANSEFI. The FMRs will sufficiently describe all project operations in a format which will include two sections: (a) narrative information; and (b) financial statements.

11. The FMRs will be complemented with the annual Financial Statements of both the entity and the project. These Financial Statements will be audited on annual basis. The project audit will be carried out in line with the Bank policy and requirements (see next subsection on Internal and External Audit). The FMRs will not form the basis of disbursement, as it is agreed that Statements of Expenditures (SOEs) will provide information for disbursement purposes (see corresponding section in this Annex).

12. **Internal and External Audit**. The Internal Audit Department of CNAA will include in its work program the review of the Bank-financed program APAZU.

13. The framework for all project audits in México is the MOU agreed between the GOM (through the *Secretaría de la Función Pública*) and the Bank. An external private auditor will carry out, in line with Bank policy and procedures, annual financial audits of the project. These audits will include operations at subnational level. As it is done for the Bank-financed project under implementation, the external private auditor will audit the entity's Financial Statements. CNA through BANSEFI will furnish the audit report to the Bank before June 30 of the year following the audited calendar year.

Audit Report	Due dates
Entity Financial Statements	Within the six months following the end of the audited year. Starting by **06/30/2007** (which will cover full calendar year 2006 and the corresponding portion of calendar year 2005) until **06/30/2009** (which will cover calendar year 2008). The standard covered period is the calendar year, that is, from January the 1st to December 31st.
Project Financial Statements	Same due dates as the above audit.
Special Account	Same due dates as the above audit; one Special Account report is submitted for all BANSEFI-administrated projects.

14. **Disbursement Arrangements and Retroactive Financing**. Disbursements (Loan withdrawal applications – WA) will be prepared in accordance with guidelines set out in the Bank's Disbursement Handbook.

15. **Method and supporting documentation**. The GOM will pre-finance project execution as the National Treasury (TESOFE) will provide funding for all project operations via CNA's

standard budget. The Bank will reimburse upon request and against Statements of Expenditures (SOEs).

16. **Thresholds and supporting documentation**. LOA will determine the threshold for submitting supporting documentation, which will be reviewed as part of the project audit. Documents in support of disbursements will be maintained by BANSEFI, CNA and all participating states / municipalities for at least until one year after the Bank has received the audit report for the fiscal year in which the last loan withdrawal was made. Such documents must be available for review by the auditors and Bank staff at all times.

17. **Special Account (SA)**. BANSEFI, the financial agency, will establish a Special Account in a commercial bank for the project. The SA will be in US dollars to be used to receive Bank funds to reimburse TESOFE. It may be possible to eventually disburse directly to TESOFE without utilizing the SA. While BANSEFI will be responsible for the management of the SA (thereby carrying out monthly account reconciliations, submitting Bank-Form 1903 and preparing monthly reconciliations), TESOFE will fund all project operations via CNA's standard budget. CNA will provide all needed information on project operations to both BANSEFI and TESOFE to ensure proper flow of funds.

18. **Retroactive Financing**. The project will be eligible to submit for retroactive reimbursement, documentation on expenditures totaling up to US$ 2,500,000 of the loan amount for eligible expenditures incurred during the period between the date of the official Project Appraisal and the signing of the Loan Agreement.

19. **Disbursement percentages**. A table which will indicate the component/category, amount of the loan allocated in US$ and the percentage of expenditures to be financed by the Bank, will be included before project negotiations. This table will be prepared based on final project costing and agreements on financing percentages (CNA requested a 100% Bank financing of the entire project, which includes subnational level contributions).

20. **Operational Manual (OM) and Written Procedures**. Project FM-related procedures will be documented in the OM, which will define the roles and responsibilities of CNA, BANSEFI and the subantional level entities e.g. *Organismos Operadores*. A draft of this manual should be submitted to the Bank for its approval before Negotiations to avoid it having to be included as an Effectiveness Condition in the Loan Agreement of the proposed project.

21. **Supervision Plan**. At least one FM supervision mission will be conducted each FY, and a Bank Financial Management Specialist will review the annual audit reports and the semi-annual FMRs.

Annex 8: Procurement Arrangements

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

A. The Project

1. The project consists of two components. The first component will support CNA's programs to assist with the modernization of Mexico's water supply and sanitation sector through strengthening the sector policies at the federal and state level. Through the first component, technical assistance and studies will be financed to support recent changes to the Water Law, including assistance in reviewing existing sector programs, strengthen and expand the national water and sanitation information system, support State Water Commissions (CEA's) in the strengthening of planning and regulatory capacities, develop training and accreditation programs and disseminate the lessons learned in the project. The second component will support pilot cases of modernization of water utilities, technical assistance for institutional reforms, performance improvement (technical, commercial and financial), design of business plans, and development of community participation mechanisms.

B. General

2. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, and the provisions stipulated in the Procurement Plan and the Legal Agreement. The Procurement Plan will be based under both components and will be updated at least annually or as required to reflect the actual project implementation needs and improvement in the institutional capacity.

C. Procurement Methods

3. ***Procurement of Works and Supply & Install:*** There will be small works under the Project to be carried out by the water utilities. In order to prepare the procurement plans the following threshold will be generally used: the procurement of works will be carried out through NCB procedures acceptable to the Bank up in individual contracts estimated to cost less than US$5 million. Contracts for smaller works in individual contracts estimated to cost less than US$300,000 will be carried through shopping. Contracts for Supply & Install will be carried through NCB procedures in individual contracts estimated to cost less than US $ 3 million.

4. ***Procurement of Goods:*** Goods include computer and networking equipment, peripherals, software, IT accessories and micro-metering devices. In order to prepare the procurement plan, the following thresholds will be generally used: contracts for goods in individual contracts estimated to cost more than US$500,000 will be carried out through ICB; packages for goods estimated to cost less than US$500,000 but more than US$100,000 will be procured through NCB procedures acceptable to the Bank; smaller packages for goods estimated to cost less than US$100,000 will be procured through shopping.

5. ***Procurement of Services (other than consultant services).*** All contracts for services not related to consultant services (logistics, organization of seminars, workshops, travel, printing

services) may be procured under same methodologies and thresholds specified for goods above, except for the ICB threshold that shall be US$250,000 in this category.

6. ***Hiring of Consulting Services: Firms.*** It is expected that the project will finance several studies, design of information systems, data collection and analysis, development of a monitoring and evaluation system and technical assistance. All contracts for firms would be procured using QCBS procedures except for small contracts for assignments of standard or routing nature and estimated to cost less than US$100,000 equivalent that would be procure using LCS. Single-source selection (SSS) procedures may be used, with prior agreement of the Bank, for hiring services that meet the requirements of paragraphs 3.10 of the Consultants' Guidelines, for assignments when only one firm is qualified or has experience of exceptional worth. The short list of consultants in contracts estimated to cost less than $500,000 equivalent, per contract, may be comprised entirely of national consultants, in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

7. ***Hiring of Consulting Services: Individuals***. Specialized advisory services would be provided by individual consultants selected by comparison of qualifications of at least three candidates and hired in accordance with the provisions of paragraph 5.1 to 5.3 of the Consultant Guidelines. Sole-source selection of individual consultants may be contracted, with Bank's prior agreement, in accordance with provisions of paragraphs 5.4 of the Consultants Guidelines.

8. ***Operating Costs***: Project implementation unit staff, office utilities, and sundry items, will be financed by the project and procured using CNA's administrative procedures which were reviewed and found acceptable to the Bank.

Procurement Methods/ Thresholds (US$)

Category	Contract Value (thresholds)	Procurement Method
Works	>5,000,000	ICB
	<3,000,000	NCB
	<300,000	Shopping
Goods	> 300,000 < 300,000 < 100,000	ICB NCB for CNA and beneficiaries Institutional regulations/ Shopping
Non- consultant services	>250,000	ICB
Non-consultant services	< 250,000 < 100,000	NCB Shopping
Consultant services (firms)	> 100,000	QCBS
Consultant services (individuals)		Paras. 5.1 to 5.4 Guidelines
Supply & Install	> 3,000,000	ICB

D. Assessment of the agency's capacity to implement procurement

9. The Bank carried out a procurement capacity assessment of central CNA for the proposed project. The overall procurement risk is average due to the participation of entities that are not familiar with the Bank's procurement rules. The assessment indicates that central CNA's headquarters in Mexico has well trained staff with experience in Bank procurement. If during the project implementation, there is any state or municipal utility which is expected to have

procurement actions in aggregate above US$2'000,000, CNA will carry out specific capacity assessment and risk assessment of the sub-national agency and would agree on an action plan to improve their performance in consultation with the Bank). The assessment conveys the fact that the institutional organization and staffing in the executing agency is satisfactory and will remain intact during execution of the Project. An Action Plan was agreed at Negotiations to improve the procurement planning tools and other key actions, including the availability of an Operational Manual. BANSEFI, as the financial agent for the project, will supervise procedures and contracts, including issuance of no objection to documentation and awards under the delegation the Bank makes of its fiduciary responsibilities (ex-post review) not included in the prior review arrangements.

E. Procurement Plan

10. For the Institutional Development component, CNA would maintain a procurement plan for project implementation which provides the basis for the selection of the procurement methods. This plan has been agreed between the Borrower and the Project Team on April 2005 and is available at *Unidad de Agua Potable, CNA*. It will also be available in the project's database and in the Bank's external website. The Procurement Plan will be updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

F. Frequency of Procurement Supervision

11. In addition to the prior review supervision to be carried out from Bank offices, the capacity assessment of CNA has recommended two supervision missions annually, one at CNA and other to visit the field to carry out post review of procurement actions.

G. Details of the Procurement Arrangements and Global Procurement Plan

1. Works, Goods and Non Consulting Services

12. The following items were identified as procurement of goods and services for the central CNA and two identified municipal utilities:

1	2	3	4	5	6	7	8
Ref. No.	**Contract (Description)**	**Estimated Cost**	**Procurement Method**	**P-Q**	**Domestic Preference (yes/no)**	**Review by Bank (Prior / Post)**	**Expected Bid-Opening Date**
1	Printing services	30,000	Shopping	No	No	No	Q1
2	Sundry items	10,000	Shopping	No	No	No	Q1
3	Study Tour	91,000	Shopping	No	No	No	Q1
4	Equipment Rental	10,000	Shopping	No	No	No	Q1
5	Communicati ons services	550.000	LPI	No	Yes	Yes	Q2
6	Civil works	4,000,000	NCB	No	No	Yes	Q2

	Vallarta						
7	Supply & Install Colima	5,000,000	LPI	No	No	Yes	Q2
8	Water meters	160,000	LPN	No	No	No	Q2
9	MIS equipment Colima	1,000,000	LPI	No	Yes	Yes	Q2

2. Consulting Services

13. Seemingly, the following consultant services were identified during appraisal for central CNA and two participant municipal utilities:

1	2	3	4	5	6
Ref. No.	**Description of Assignment**	**Estimated Cost**	**Selection Method**	**Review by Bank (Prior / Post)**	**Expected Proposals Submission Date**
1	TOR for benchmarking	44,000	I	Post	Q1
2	Benchmarking consultants	100,000	I	Prior	Q2
3	TOR FM	24,000	I	Post	Q1
4	FM services	86,000	I	Prior	Q2
5	MIS services	500,000	QCBS	Prior	Q4
6	Evaluation services	100,000	I	Prior	Q1
7	CEA Evaluation	100,000	I	Prior	Q1
8	ANEAS hiring	155,000	SS	Prior	Q1
9	HR evaluation	250,000	QCBS	Prior	Q5
10	Accreditation services	545,000	QCBS	Prior	Q5
11	Technical expert	200,000	I	Prior	Q1
12	Administrative expert	200,000	I	Prior	Q1
13	Documentation expert	56,000	I	Post	Q4
14	Three audit services	75,000	3 LCS	Post	Q4, Q8, Q12
15	Register Vallarta	400,000	QCBS	Prior	Q2
16	Register Colima	350,000	QCBS	Prior	Q2
17	Three Master Plan	300,000	3 QCBS	Post	Q1

14. The above identified contracts represent about 30% of the total cost of the Project. It is expected that the other participant municipal utilities will model their procurement arrangements following the same types of contracts.

H. Prior review

15. The prior review will be identified in the annual Procurement Plan and generally will follow these rules: consultancy services estimated to cost above US$250,000 per contract and single source selection of consultants (firms) as well as individual assignments estimated to cost above US$100,000 will be subject to prior review by the Bank. All ICB will be subject to prior review as well as the civil works contracts above US$ 3,000,000.

Annex 9: Economic and Financial Analysis

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

1. Objectives

1. The objectives of the Water Sector Modernization Project are: (i) to assist with the modernization of Mexico's water supply and sanitation sector through strengthening the sector policies at the federal and state level; and (ii) to develop and demonstrate replicable models of successful and sustainable provision of water and sanitation services, by supporting selected service providers and the municipalities of which they are a part in improving operational and financial performance.

2. Methodology

2. A cost benefit analysis was conducted on a sample subproject from the first group of participating municipalities and utilities, Puerto Vallarta, which was subjected to financial and economic analyses, which is deemed representative of the type of interventions that would be financed by the project. To determine the net incremental financial costs and benefits, "with" and "without" project scenarios were constructed. The "with" project situation assumed that all targets expected with the investment subproject would be met. The "without" project situation assumed that the performance and indicators of the utility would remain unchanged. On the basis of these scenarios, the incremental financial benefits and costs of the proposed investment programs were assessed. The stream of financial flows was then adjusted for the impact of taxes, subsidies, and externalities to arrive at the economic flows of costs and benefits. The study consisted of financial and economic analyses.

3. A similar methodology will be applied to municipalities and utilities interested in participating in the Project to establish subproject eligibility in terms of its financial feasibility. With this criteria, although the overall project was not analyzed, the project will guarantee at least a positive net present value of the interventions financed under this project.

3. Sample Selection

Sample selection

4. The analysis included the following utility with its corresponding investment program (described in detail in annex IV):

Table 1: Sample Subproject Evaluated

Area	Locality	Utility	Main Objectives of the project	Inv Costs (thousand US$)
Urban	Pto Vallarta	SEAPAL	To increase technical and commercial efficiency	5,000

4. Scenarios

5. To identify the incremental costs and benefits resulting from each subproject, "with" and "without" project scenarios were built for each of them. The "with" project scenario considered the proposed investment plan (described in detail in annex IV) and its associated targets and incremental benefits. The "without" project scenario considered the service would continue unchanged, that is, current performance, coverage, UFW levels and other operational indicators.

5. Assumptions

6. *Investment Costs.* The "with" project scenario also included all project costs including labor and the necessary equipment.

7. *Incremental Benefits.* The "with project scenario" considers the following:

- Increased revenues resulting from higher volume of water billed
- Increased revenues resulting from the reclassification of the customers database and cadastre updates
- Reduced operating costs resulting from the reduction of system operational losses

8. The project will generate additional economic benefits, including intangible and more difficult to measure environmental benefits and increased customer satisfaction. Improved reliability and leakage management will reduce the level of illegal tampering and so reduce the cost of distribution maintenance. The Project will also have an impact on increasing the flexibility in the operational handling of the systems and improved pressure management. This will reduce the level of current pipe burst-out - and therefore leakage - while increasing the economic life of pipeline and therefore reducing the cost of distribution maintenance. These additional benefits have not been considered in the analysis, thus the results presented in this Annex are a conservative estimate of the economic impacts of the financed investments.

9. *Operation and maintenance (O&M).* Includes the cost of labor, chemicals, power, and all administrative costs. Incremental O&M costs resulting from the project are considered to be compensated by the incremental benefits described above which have not been considered in the analysis.

10. *Collection Efficiency.* Collection efficiency was assumed to remain constant.

11. *Unaccounted for water.* It is defined as volume of water not billed over volume of water supplied. Its value has been projected according to targets on the project.

12. *The opportunity costs of raw water* were assumed equal to zero.

13. *The implementation schedule* of each project varies from 1 to 3 years depending on the type of project.

6. Incremental Costs and Benefits

14. Costs and benefits associated with the "with" and "without" project scenarios are projected for 25 years, that is, during the implementation period and until the full impact of the projects is obtained. The cash flows were discounted using a discount rate of 9% percent for the financial analysis which is estimated to be a proxy of Mexico's opportunity cost of capital.

7. Evaluation

15. The project is evaluated from two different perspectives. The financial viability of each of the projects is appraised measuring its flows of costs and benefits in market prices. Under a financial perspective, benefits are assumed equal to the estimated flow of financial revenues. The economic viability is appraised measuring the flows of costs and benefits in economic prices, which corresponded to stream of financial flows adjusted for the impact of taxes and subsidies.

8. Financial Analysis

16. The financial analysis of each subproject is based on the flow of costs and benefits for each subproject in market prices. Financial benefits were calculated as the increase in revenues generated in higher volume of water billed (resulting from a reduction of commercial losses and customer database cleansing and cadastre updates), and (ii) the reduction on operating costs due to decrease on UFW.

Results of the Financial Analysis

Area	Utility	Present Value of Flows (Thousand US$)			Internal Rate of Return (%)
		Benefits	Costs	Net Benefits	
Puerto Vallarta	SEAPAL	23.433	4,678	18,754	52%

9. Economic Analysis

17. The economic viability of each project is appraised converting financial cash flows into economic cash flows by using conversion factors, and then discounting these cash flows using a discount rate of 12 %, that was assumed as a *proxy* of Mexico's opportunity cost of capital.

Estimation of Economic Costs

18. For the estimation of economic costs, shadow prices were used to capture the effects to the economy of the use of goods and resources by the project. To convert market prices into shadow prices, conversion factors were used for the main inputs of the project: skilled and unskilled labor, domestic and imported inputs (pipes, equipment, and pumps) which are subject to different duties.

Table 2: Shadow Price Conversion Factors	
Item	*Conversion Factor*
Labor	
Unskilled	0.70
Skilled	0.95
Domestic Inputs	0.90
Imported Inputs	0.95

19. Once all financial costs were converted into economic costs, incremental costs were calculated based on the comparison of the "with" and "without" project scenarios.

Estimation of Economic Benefits

20. The project will have the following benefits: *(i) reduction of operating costs*, the operating cost will decrease due to lower volume of water produced due to decrease on UFW; and (iv) *continuity*, pressure and customer attention improvement. Conservatively, the economic benefits of the project are assumed equal to the savings the utility will have once the project is implemented.

Results of the economic analysis

Area	*Utility*	*Present Value of Flows (Thousand US$)*			*Economic Rate of Return (%)*
		Benefits	*Costs*	*Net Benefits*	
Puerto Vallarta	SEAPAL	18,413	3,933	14,480	60%

21. The results of the economic analysis show that the subproject is economically feasible and so it will have a positive impact on the economy.

10. Sensitivity Analysis

22. The leakage control program, was identified as the component conveying major risks to the expected outcome of the subproject, given that it accounts for 76% of the net benefits expected from the project. The analysis of this component assumes a reduction in UFW of 10% by year 4 of the project - reducing the current UFW from 35% to 25% and maintaining in that level thereafter.

23. The sensitivity analysis considered that only a 5% reduction of UFW is achieved - equivalent to 1.25 million m3 of water per year - , and that its achievement is postponed to year 5 of the Project. This has a significant impact on the results generated by the subproject, although they are still very positive results:

- internal rate of return for the project goes down from **52%** to **32%**
- economic rate of return for the project goes down from **60%** to **37%**
- net economic benefits go down from **US$14.4** million to **US$7.3 million**

24. Cost overruns may also affect the results, and will be monitored closely by the project implementation unit to ensure that it remains as a moderate risk to the project. This analysis confirms the robustness of the results presented in this Annex for the financial and economic analysis of the subproject.

Annex 10: Safeguard Policy Issues

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

1. The project has been rated as Category "C" by the Regional Safeguards Advisor

Annex 11: Project Preparation and Supervision

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

	Planned	Actual
PCN review		07/01/2004
Initial PID to PIC		12/20/2004
Initial ISDS to PIC		01/16/2005
Appraisal		05/09/2005
Negotiations		06/23/2005
Board/RVP approval	08/02/2005	
Planned date of effectiveness	10/31/2005	
Planned date of mid-term review	05/30/2007	
Planned closing date	06/30/2009	

Key institutions responsible for preparation of the project:
Comisión Nacional del Agua (CNA)

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Gustavo Saltiel	Task team leader	LCSFW
Jonathan Halpern	Lead Economist	EWDWS
Ventura Bengoechea	Lead Water Supply Specialist	LCSFW
Manuel Schiffler	Senior Economist	LCSFW
Patricia Lopez	Financial Analyst	LCSFW
Philippe Marin	Water & Sanitation Specialist	WBIEN
Martin Naranjo	Senior Financial Analyst	LCSFF
Efraim Jimenez	Lead Procurement Specialist	LCOPR
Juan Carlos Alvarez	Legal Counsel	LEGLA
Victor Ordonez	Financial Management Specialist	LCOAA
Gabriel Peñaloza	Procurement Analyst	LCOPR
Maria Angelica Sotomayor	Economist	LCSFW
Patricia Acevedo	Program Assistant	LCSFW

Bank funds expended to date on project preparation:

1. Bank resources: 110,000
2. Trust funds:
3. Total: 110,000

Estimated Approval and Supervision costs:

Bank resources: 300,000

Annex 12: Documents in the Project File

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

National Level

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5. Comisión Nacional del Agua, 2001, México – Informe sobre Agua Potable y Saneamiento en Zonas Rurales 2001.

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8. Comisión Nacional del Agua-CNA (2002), Manual de Operación del Programa de Agua Potable, Alcantarillado y Saneamiento en Zonas Urbanas.

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13. "Environmental Resources Management Limited" (Febrero 2004), Estudio Legal, Regulatorio e Institucional – Informe de Avance – Proyecto de Modernización del Sector de Agua y Saneamiento.

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15. Poggi, Luis (Diciembre 28, 2003), México - Análisis de la Situación del Sector de Agua Potable y Saneamiento, Versión Preliminar.

16. PRODDER, Lineamientos para el Otorgamiento de los Ingresos Federales obtenidos por el Uso, Explotación o Aprovechamiento de Aguas Nacionales, en la Realización de Acciones de Mejoramiento de Eficiencia y de Infraestructura de Agua Potable, Alcantarillado y Tratamiento de Aguas Residuales.

17. Secretaría de Medio Ambiente y Recursos Naturales (SEMRNAT), Banco Nacional de Obras y Servicios Públicos, S.N.C. (BANOBRAS), Comisión Nacional del Agua (CNA) (2002), Programa para la Modernización de Organismos Operadores de Agua (PROMAGUA), Diciembre 2002.

18. Unidad Política de Ingresos, Dirección General Adjunta de Derechos, Productos y Aprovechamientos (2002), Ley Federal de Derechos.

Baja California

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21. Comisión Estatal del Agua de Baja California, Comisión Nacional del Agua (CNA), CESPM, CESPE (2003), Informe 2003 – Proyecto de Infraestructura Hidráulica para el Saneamiento Ambiental y Suministro de Agua Potable en el Estado de Baja California, y el Programa de Fortalecimiento Institucional (PROFI) de las Comisiones Estatales de Servicios Públicos de Mexicali, Tijuana y Ensenada.

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Chiapas

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29. Water System of the San Cristóbal de Las Casas, third largest municipality in Chiapas (internal memo).

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32. Comisión Nacional del Agua, Programa Hidráulico Integral del Estado de México, Resumen Ejecutivo – 3. Diagnóstico de los Recursos y Servicios Hidráulicos.

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34. Comisión Nacional del Agua, Programa Hidráulico Integral del Estado de México, Resumen Ejecutivo – 5. Proyección de la Demanda del Agua.

35. Comisión Nacional del Agua, Programa Hidráulico Integral del Estado de México, Resumen Ejecutivo – 6. Planteamiento y Evaluación de Programas y Acciones.

36. Comisión Nacional del Agua, Programa Hidráulico Integral del Estado de México, Resumen Ejecutivo – 7. Identificación y Evaluación de Fuentes de Financiamiento.

37. Comisión Nacional del Agua, Programa Hidráulico Integral del Estado de México, Resumen Ejecutivo – 8. Desarrollo Institucional.

38. Comisión Nacional del Agua, Programa Hidráulico Integral del Estado de México, Resumen Ejecutivo – 9. Conclusiones y Recomendaciones.

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40. Gobierno del Estado de México, Secretaría de Agua, Obra Pública e Infraestructura para el Desarrollo, Comisión del Agua del Estado de México (CAEM); Microcircuito de Distribución de Agua Potable.

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Guanajuato

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Annex 13: Statement of Loans and Credits

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

			Original Amount in US$ Millions						Difference between expected and actual disbursements	
Project ID	FY	Purpose	IBRD	IDA	SF	GEF	Cancel.	Undisb.	Orig.	Frm. Rev'd
P074755	2005	MX State Judicial Modernization Project	30.00	0.00	0.00	0.00	0.00	30.00	0.00	0.00
P085851	2005	MX Basic Education Dev Phase III	300.00	0.00	0.00	0.00	0.00	300.00	0.00	0.00
P070371	2004	MX Afford.Housing & Urb.Pov.Prog. SECAL	100.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00
P080149	2004	MX Decentralized Infrastructure Developm	108.00	0.00	0.00	0.00	0.00	108.00	0.00	0.00
P087152	2004	MX Savings & Rurl Finance (BANSEFI	75.50	0.00	0.00	0.00	0.00	75.50	0.00	0.00
P035751	2004	MX Community Forestry II (PROCYMAF II)	21.30	0.00	0.00	0.00	0.00	21.09	1.59	0.00
P035752	2004	MX Irrigation & Drainage Modernization	303.03	0.00	0.00	0.00	0.00	300.00	38.47	0.00
P070108	2003	MX Savings & Credit Sector Strengthening	64.60	0.00	0.00	0.00	0.00	34.50	8.40	0.00
P074655	2003	MX Rural Finance Develop Struct Adj Loan	505.06	0.00	0.00	0.00	0.00	300.01	0.01	0.00
P060686	2003	MX Municipal Dev in Rural Areas	400.00	0.00	0.00	0.00	0.00	396.00	216.00	0.00
P059161	2003	GEF MX-Climate Measures in Transport	0.00	0.00	0.00	5.80	0.00	4.81	4.53	0.00
P065988	2002	GEF MX Consolidat.Prot Areas (SINAP II)	0.00	0.00	0.00	16.10	0.00	4.48	12.83	0.00
P077602	2002	MX Tax Admin Institutional Development	52.00	0.00	0.00	0.00	0.00	45.28	24.13	0.00
P066674	2001	GEF MX-Indigenous&Community Biodiversity	0.00	0.00	0.00	7.50	0.00	5.83	5.34	0.00
P066321	2001	MX: III BASIC HEALTH CARE PROJECT	350.00	0.00	0.00	0.00	0.00	319.22	127.72	0.00
P065779	2001	MX FEDERAL HIGHWAY MAINTENANCE PROJ.	218.00	0.00	0.00	0.00	0.00	44.93	44.93	0.00
P064887	2001	MX DISASTER MANAGEMENT (ERL)	404.05	0.00	0.00	0.00	200.00	181.27	288.22	0.00
P060908	2001	GEF MX-MESO AMERICAN CORRIDOR	0.00	0.00	0.00	14.84	0.00	15.23	7.97	0.00
P063463	2001	METHANE CAPTURE & USE AT A LANDFILL	0.00	0.00	0.00	6.27	0.00	0.93	5.86	5.27
P060718	2000	GEF MX ALTERNATIVE ENERGY	0.00	0.00	0.00	8.90	0.00	3.61	8.90	0.00
P066938	2000	MX GENDER (LIL)	3.07	0.00	0.00	0.00	0.00	1.13	1.13	0.17
P007610	1999	MX FOVI RESTRUCTURING	505.50	0.00	0.00	0.00	0.00	180.63	180.63	0.00
P044531	1998	MX KNOWLEDGE & INNOV.	300.00	0.00	0.00	0.00	0.00	51.52	51.52	-33.97
P049895	1998	MX HIGHER ED. FINANCING	180.20	0.00	0.00	0.00	0.00	61.52	61.52	0.00
P007713	1996	MX WATER RESOURCES MANA	186.50	0.00	0.00	0.00	54.00	27.00	81.00	18.99
		Total:	4,106.81	0.00	0.00	59.41	254.00	2,612.49	1,170.70	- 9.54

MEXICO
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
1998	Ayvi	5.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
	BBVA-Bancomer	27.50	0.00	0.00	0.00	27.50	0.00	0.00	0.00
1995/99	Baring MexFnd	0.00	1.88	0.00	0.00	0.00	1.88	0.00	0.00
1998	CIMA Mexico	0.00	4.80	0.00	0.00	0.00	4.80	0.00	0.00
1998	CIMA Puebla	6.75	0.00	0.00	0.00	3.25	0.00	0.00	0.00
	Chiapas-Propalma	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
2001/04	Compartamos	24.25	0.00	0.00	0.00	5.69	0.00	0.00	0.00
2003	Copamex	0.00	0.00	25.00	0.00	0.00	0.00	25.00	0.00
2003	Copamex CPG	57.00	0.00	0.00	46.00	53.57	0.00	0.00	46.00
2002	Coppel	30.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
1999	Corsa	6.50	3.00	0.00	0.00	6.50	3.00	0.00	0.00
2004	DTM	37.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	Ecomex	4.75	0.00	1.50	0.00	2.75	0.00	1.50	0.00
2000	Educacion	6.23	0.00	0.00	0.00	4.63	0.00	0.00	0.00
1997	Fondo Chiapas	0.00	3.35	0.00	0.00	0.00	0.11	0.00	0.00
1998	Forja Monterrey	7.43	3.00	0.00	7.43	7.43	3.00	0.00	7.43
2001	GFNorte	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1996	GIBSA	10.82	0.00	0.00	36.38	10.82	0.00	0.00	36.38
1996/00	GIRSA	35.36	0.00	0.00	47.14	35.36	0.00	0.00	47.14
1998/04	Grupo Calidra	22.00	0.00	0.00	0.00	11.26	0.00	0.00	0.00
1989	Grupo FEMSA	0.00	2.73	0.00	0.00	0.00	2.73	0.00	0.00
1997	Grupo Minsa	12.60	0.00	0.00	17.97	12.60	0.00	0.00	17.97
1996/99	Grupo Posadas	21.05	0.00	10.00	0.00	21.05	0.00	10.00	0.00
1998	Grupo Sanfandila	5.24	0.00	0.00	1.90	5.24	0.00	0.00	1.90
2004	HipNal	100.66	0.00	0.00	0.00	100.66	0.00	0.00	0.00
2000	Hospital ABC	30.00	0.00	0.00	14.00	10.29	0.00	0.00	7.21
2000	ITR	10.00	0.00	0.00	2.67	10.00	0.00	0.00	2.67
2000	Innopack	0.00	15.00	0.00	0.00	0.00	15.00	0.00	0.00
	Interoyal	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
2003	Lomas de Real	51.61	0.00	20.00	105.10	50.33	0.00	20.00	105.10
1998	Merida III	27.08	0.00	0.00	61.75	27.08	0.00	0.00	61.75
2003	Mexmal	0.00	0.00	10.00	0.00	0.00	0.00	10.00	0.00
1995/99	Mexplus Puertos	0.00	1.41	0.00	0.00	0.00	1.41	0.00	0.00
1996/99/00/01	NEMAK	0.00	0.00	1.51	0.00	0.00	0.00	1.51	0.00
2003	Occidental Mex	30.00	0.00	0.00	40.00	30.00	0.00	0.00	40.00
	Occihol	0.00	9.99	0.00	0.00	0.00	9.99	0.00	0.00
2003	POLOMEX S.A.	6.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
2000	Pan American	0.00	6.39	0.00	0.00	0.00	6.39	0.00	0.00
2002	Puertas Finas	12.19	0.00	0.00	0.00	12.19	0.00	0.00	0.00

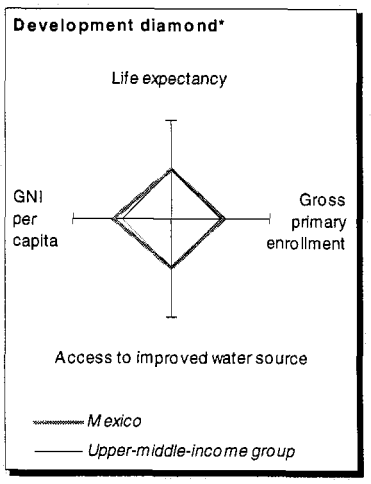
2002	Qualita	0.00	2.50	3.50	0.00	0.00	2.50	3.50	0.00
2000	Rio Bravo	46.62	0.00	0.00	53.22	46.62	0.00	0.00	53.22
2004	SSA Mexico	45.00	0.00	0.00	0.00	45.00	0.00	0.00	0.00
2000	Saltillo S.A.	33.00	0.00	0.00	38.77	33.00	0.00	0.00	38.77
2000	Servicios	8.25	1.90	0.00	7.50	8.25	1.90	0.00	7.50
2001/04	Su Casita	15.85	0.00	0.00	0.00	15.85	0.00	0.00	0.00
1997	TMA	1.53	0.00	2.89	5.30	1.53	0.00	2.89	5.30
2003	TMWC	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	Valle Hermoso	52.00	0.00	20.00	107.09	39.90	0.00	15.40	82.44
	ZN Mexico II	0.00	10.00	0.00	0.00	0.00	6.30	0.00	0.00
1998	ZN Mxc Eqty Fund	0.00	13.87	0.00	0.00	0.00	13.87	0.00	0.00
	Total portfolio:	842.27	80.83	94.40	592.22	679.35	73.89	89.80	560.78

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic.
2004	Calidra II	0.00	0.00	0.00	0.01
1998	Cima Hermosillo	0.01	0.00	0.00	0.00
2003	Copamex	0.00	0.00	0.00	0.00
2001	Ecomex	0.00	0.00	0.00	0.00
2000	Educacion	0.00	0.00	0.00	0.00
2001	GFNorte-CL	0.05	0.00	0.00	0.10
2003	Mexmal	0.00	0.00	0.01	0.00
2003	Polomex	0.00	0.00	0.00	0.00
	Total pending commitment:	0.06	0.00	0.01	0.11

Annex 14: Country at a Glance

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance

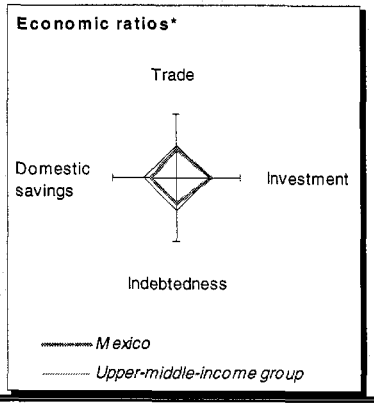
POVERTY and SOCIAL	Mexico	Latin America & Carib.	Upper-middle-income
2003			
Population, mid-year *(millions)*	102.3	534	335
GNI per capita *(Atlas method, US$)*	6,230	3,260	5,340
GNI *(Atlas method, US$ billions)*	637.3	1,741	1,788
Average annual growth, 1997-03			
Population *(%)*	1.4	1.5	1.2
Labor force *(%)*	2.4	2.1	1.8
Most recent estimate (latest year available, 1997-03)			
Poverty *(% of population below national poverty line)*	..	..	..
Urban population *(% of total population)*	75	77	76
Life expectancy at birth *(years)*	74	71	73
Infant mortality *(per 1,000 live births)*	24	28	19
Child malnutrition *(% of children under 5)*	8	..	..
Access to an improved water source *(% of population)*	88	86	89
Illiteracy *(% of population age 15+)*	9	11	9
Gross primary enrollment *(% of school-age population)*	110	129	104
Male	111	131	104
Female	110	126	104



KEY ECONOMIC RATIOS and LONG-TERM TRENDS

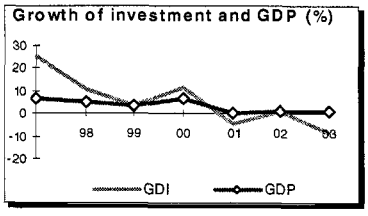
	1983	1993	2002	2003
GDP *(US$ billions)*	148.9	403.2	648.5	626.1
Gross domestic investment/GDP	20.8	21.0	20.7	19.8
Exports of goods and services/GDP	19.0	15.2	26.8	28.4
Gross domestic savings/GDP	30.3	17.1	18.8	18.2
Gross national savings/GDP	25.0	15.1	18.5	18.1
Current account balance/GDP	3.9	-5.8	-2.2	-1.8
Interest payments/GDP	5.5	1.4	1.6	1.6
Total debt/GDP	62.5	32.4	21.6	22.6
Total debt service/exports	45.3	35.7	23.2	20.0
Present value of debt/GDP	..	..	23.8	..
Present value of debt/exports	..	..	82.5	..

	1983-93	1993-03	2002	2003	2003-07
(average annual growth)					
GDP	2.4	3.2	0.7	1.3	3.6
GDP per capita	0.4	1.7	-0.7	-0.2	1.9

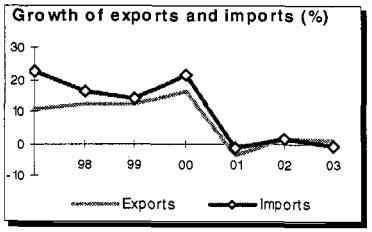


STRUCTURE of the ECONOMY

	1983	1993	2002	2003
(% of GDP)				
Agriculture	8.5	6.3	4.0	4.0
Industry	35.2	26.8	26.5	26.4
Manufacturing	21.3	19.0	18.5	18.1
Services	56.3	66.9	69.5	69.6
Private consumption	60.9	71.9	69.1	69.2
General government consumption	8.8	11.0	12.1	12.7
Imports of goods and services	9.4	19.2	28.7	30.1

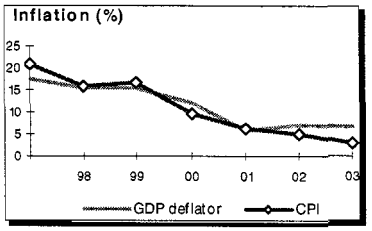


	1983-93	1993-03	2002	2003
(average annual growth)				
Agriculture	0.8	2.1	0.3	3.9
Industry	3.2	3.5	-0.3	-0.7
Manufacturing	3.5	4.0	-0.7	-2.0
Services	2.4	3.1	1.2	1.9
Private consumption	3.3	3.3	1.3	3.0
General government consumption	2.1	1.5	0.1	2.5
Gross domestic investment	4.7	4.6	0.7	-8.4
Imports of goods and services	14.2	11.2	1.4	-1.0



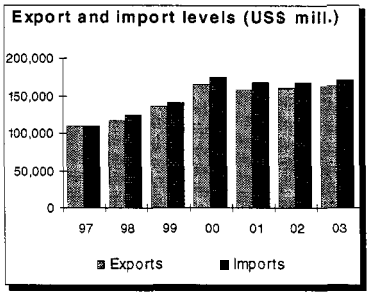
PRICES and GOVERNMENT FINANCE

	1983	1993	2002	2003
Domestic prices				
(% change)				
Consumer prices	101.9	9.8	5.0	2.9
Implicit GDP deflator	90.5	9.5	6.9	6.5
Government finance				
(% of GDP, includes current grants)				
Current revenue	31.8	23.1	22.2	22.7
Current budget balance	-1.6	3.6	2.0	2.6
Overall surplus/deficit	-7.3	0.7	-1.2	-0.5



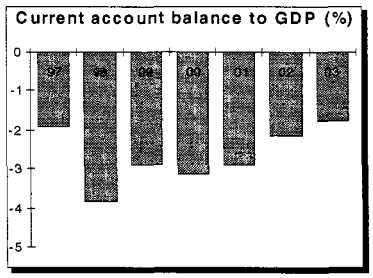
TRADE

	1983	1993	2002	2003
(US$ millions)				
Total exports (fob)	25,953	51,886	160,813	164,240
Oil	16,017	7,418	14,475	18,083
Agriculture	1,189	2,504	3,998	4,617
Manufactures	8,224	41,685	141,951	141,049
Total imports (cif)	11,848	65,367	168,949	169,634
Food	..	..	..	..
Fuel and energy	..	..	..	..
Capital goods	2,197	11,056	20,992	20,023
Export price index *(1995=100)*	119	88	106	109
Import price index *(1995=100)*	76	92	102	104
Terms of trade *(1995=100)*	156	95	103	104



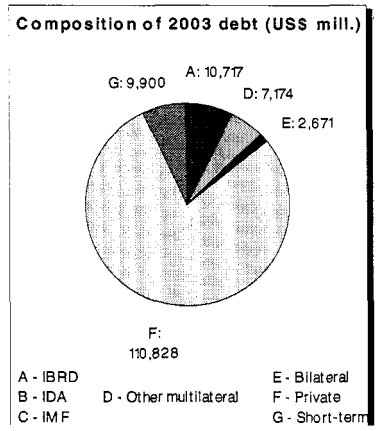
BALANCE of PAYMENTS

	1983	1993	2002	2003
(US$ millions)				
Exports of goods and services	30,027	61,305	173,454	177,597
Imports of goods and services	16,216	76,916	185,419	186,618
Resource balance	13,810	-15,611	-11,964	-9,021
Net income	-9,123	-11,429	-12,308	-14,732
Net current transfers	1,173	3,640	10,268	12,724
Current account balance	5,860	-23,399	-14,004	-11,030
Financing items (net)	-3,826	30,631	21,379	12,928
Changes in net reserves	-2,033	-7,232	-7,375	-1,898
Memo:				
Reserves including gold *(US$ millions)*	3,997	25,133	50,607	52,705
Conversion rate *(DEC, local/US$)*	0.1	3.1	9.7	10.8



EXTERNAL DEBT and RESOURCE FLOWS

	1983	1993	2002	2003
(US$ millions)				
Total debt outstanding and disbursed	92,974	130,520	140,164	141,290
IBRD	2,870	12,322	10,797	10,717
IDA	0	0	0	0
Total debt service	14,825	24,081	43,536	38,524
IBRD	399	1,895	2,071	1,951
IDA	0	0	0	0
Composition of net resource flows				
Official grants	47	53	42	..
Official creditors	-283	1	246	-363
Private creditors	2,639	2,546	-4,257	7,036
Foreign direct investment	2,192	4,389	14,622	..
Portfolio equity	0	10,716	-104	..
World Bank program				
Commitments	740	680	1,612	628
Disbursements	360	1,098	1,247	1,258
Principal repayments	183	991	1,334	1,338



Annex 15: Map

MEXICO: Modernization of the Water and Sanitation Sector – Technical Assistance


IBRD 34141
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MEXICO
MODERNIZATION OF THE WATER AND SANITATION SECTOR TECHNICAL ASSISTANCE PROJECT
DIVIDED HIGHWAYS
SELECTED MAIN ROADS
RAILROADS
PRINCIPAL AIRPORTS
RIVERS
SELECTED CITIES AND TOWNS
STATE CAPITALS
NATIONAL CAPITAL
STATE BOUNDARIES
INTERNATIONAL BOUNDARIES
0 100 200 300 400 500 Kilometers
0 100 200 300 Miles
UNITED STATES OF AMERICA
Gulf of Mexico
Bay of Campeche
PACIFIC OCEAN
Gulf of California
BELIZE
GUATEMALA
HONDURAS
BAJA CALIFORNIA
BAJA CALIFORNIA SUR
SONORA
CHIHUAHUA
COAHUILA
NUEVO LEON
TAMAULIPAS
SINALOA
DURANGO
ZACATECAS
SAN LUIS POTOSI
NAYARIT
AGUASCALIENTES
JALISCO
GUANAJUATO
QUERETARO
HIDALGO
VERACRUZ
COLIMA
MICHOACAN
MEXICO
D.F.
MORELOS
TLAXCALA
PUEBLA
GUERRERO
OAXACA
TABASCO
CHIAPAS
CAMPECHE
YUCATAN
QUINTANA ROO
Tijuana
Mexicali
Ensanada
Sonoita
San Felipe
Nogales
Agua Prieta
Ciudad Juárez
Hermosillo
Guaymas
Santa Rosalia
Ciudad Obregón
Navojoa
Loreto
Los Mochis
Guasave
La Paz
Cabo San Lucas
Culiacán
Mazatlán
Ojinaga
Chihuahua
La Perla
Parral
Torreón
Durango
Cd. Acuña
Piedras Negras
Nava
Nueva Rosita
El Sauz
Est. Hermanas
Frontera
Montclova
Castanos
Nuevo Laredo
Reynosa
Matamoros
Monterrey
Saltillo
Linares
Puerto Mexico
Cuencamé
San Roberto
Hidalgo
Barretal
Ciudad Victoria
Matehuala
El Huisache
Gonzalez
Llera
Rio Grande
Fresnillo
Zacatecas
Cd. Mante
Est. Manuel
Altamira
Cd. Madero
Tampico
Ventura
San Luis Potosi
Cd. Valles
Aguascalientes
Tepic
Leon
Guanajuato
Irapuato
Querétaro
Zapopan
Tlaquepaque
Guadalajara
PuertoVallerto
Salamanca
Celaya
Palmillas
Pachuca
Tulancingo
Tuxpan
Poza Rica
Pirámides
Morelia
Uruapan
Colima
Manzanillo
Tecomán
Apatzingan
MEXICO
Toluca
Cuernavaca
Tlaxcala
Puebla
Jalapa
Veracruz
Córdoba
Orizaba
Taxco
Lazero Cardenas
Zihuatenejo
Chilpancingo
Acapulco
Oaxaca
Pinotepa Nacional
Puerto Escondido
Tehuantepec
Juchitan
San Andrés Tuxtla
Coatzacoalcos
Minatitlan
Villahermosa
Tuxtla Gutierrez
Tapachula
Cd. del Carmen
Campeche
Progreso
Merida
Tizimin
Valladolid
Pto. Juárez
Cancun
Cozumel
Peto
Tulum
Chetumal
Colorado
Bravo
Grande
Conchos
Sonora
Yaqui
Fuerte
Salado
San Fernando
Pánuco
Lerma
Balsas
Grijalva
Usumacinta
110°
100°
90°
30°
20°
JULY 2005