



## 1. Project Data

**Project ID**

P100438

**Project Name**

MX GEF Adaptation to Climate Change

**Country**

Mexico

**Practice Area(Lead)**

Environment &amp; Natural Resources

**L/C/TF Number(s)**

TF-96681

**Closing Date (Original)**

31-Oct-2015

**Total Project Cost (USD)**

23,500,000.00

**Bank Approval Date**

23-Nov-2010

**Closing Date (Actual)**

31-Oct-2016

**IBRD/IDA (USD)**
**Grants (USD)**

Original Commitment

4,500,000.00

4,500,000.00

Revised Commitment

4,500,000.00

4,201,973.93

Actual

4,201,973.93

4,201,973.93

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## 2. Project Objectives and Components

### a. Objectives

The Project Appraisal Document (PAD) (p.vii) and the Grant Agreement of May 11, 2011 (p. 8) states that the Global Environmental Objectives of the project were to i) promote adaptation to the consequences of climate impacts in the coastal wetlands of the Gulf of Mexico, through the implementation of pilot measures that will provide information about the costs and benefits of alternative approaches to reduce the vulnerability of said coasts to climate change; and ii) to assess the overall impacts of climate change on Recipient's national water resource planning, including the identification of potential response options, with a focus on coastal wetlands and associated watersheds."



**b. Were the project objectives/key associated outcome targets revised during implementation?**

No

**c. Will a split evaluation be undertaken?**

No

**d. Components**

The project included four components:

**Component 1: Design of selected adaptation measures and technical coordination of the project (appraisal estimate US\$2.8 million, actual US\$1.6 million):** This component was to finance the designing of adaptation measures to be implemented under the project and technical assistance to facilitate modeling, generation of data, analysis, and access to information and long-term remote sensing of pilot areas. This component was also to finance the facilitation of the technical coordination of the project.

**Component 2: Implementation of pilot adaptation measures in highly vulnerable wetlands (appraisal estimate US\$3.9 million, actual US\$3.3 million):** This component was to finance the development and implementation of comprehensive wetland management plans and land zoning for pilot areas, the implementation of a technical monitoring system and various adaptation measures for Tamaulipas, Veracruz, Tabasco and Quintana Roo.

**Component 3: Assessment of the impacts of climate change on water resources planning at the national level and in coastal wetlands (appraisal estimate US\$1.0 million, actual US\$1.0 million):** This component was to finance the development of climate change impact scenarios on Mexico's national water resources, hydrologic characterization of pilot emblematic basins with a focus on coastal wetlands and associated watersheds and identification of response options that could be adopted at a national level to incorporate the anticipated impacts of climate change on water resource planning.

**Component 4: Project Management (appraisal estimate US\$1.0 million, actual US\$1.2 million):** This component was to finance the coordination of administrative, financial management, procurement and safeguards aspects of the project.

**e. Comments on Project Cost, Financing, Borrower Contribution, and Dates**

**Project Cost:** The project was estimated to cost US\$23.5 million, actual cost was US\$7.1 million. The estimated costs in the PAD included contributions by the National Water Commission (CONAGUA) and Mexican Petroleum (PEMEX), which were separate from the project and were already disbursed before the project became effective.

**Financing:** The project was financed through a grant by the Global Environment Facility (GEF) in the amount of US\$4.5 million (actual US\$4.20 million), a grant by the Japanese Ministry of Finance in the amount of US\$0.54 million (actual US\$0.51 million), and a grant by the Japanese government in the amount of US\$0.54 million (actual US\$0.54 million).

**Borrower Contribution:** The borrower provided in kind contributions in the amount of US\$1.79 million.



**Dates:** The project was restructured on October 14, 2015 to: i) withdraw all activities and implementation arrangements associated with the pilot site in Tamaulipas due to security reasons; ii) reallocate grant proceeds in order to make use of released funds from the Tamaulipas pilot and enable remaining project activities to be finalized; iii) adjust the project counterpart from INE to INECC and modify the implementation arrangements accordingly; iv) modify the definition of operational costs; v) modify the definition of the proposed activities related to the pilot sites in Veracruz and Tabasco; vi) modify indicator in Results framework to better reflect and measure progress towards the project's objectives; vii) extend the closing date by 12 months to October 31, 2016 to allow for the completion of project activities.

### 3. Relevance of Objectives & Design

#### a. Relevance of Objectives

**High:** The project's objectives were highly relevant given Mexico's vulnerability to the impacts of climate change, especially in terms of water resources, drought and desertification, increase in sea surface temperature in the Gulf of Mexico and a continuous rise in sea level affecting its coastal areas and inland basins.

The objectives of the project were in line with the government's National Development Plan (2007-2012) and the National Strategy in Climate Change which included adaptation measures and actions to mitigate Mexico's greenhouse gas emissions. Also, the objectives of the project continue to be in line with the government's current National Development Plan (2013-2018) which focuses on strategies for disaster prevention, generation of community development schemes through social participation, integration of development policy which links environmental sustainability with social costs and benefits, sustainable management of water resources, conservation of natural patrimony, and strengthening of the national climate change and environment protection policy to transition to a competitive, sustainable, resilient, and low carbon economy. At the time of project appraisal, the project's objectives were also in line with the Bank's Country Partnership Strategy (2008-2013) which identified air and water pollution, greenhouse gas emissions, deforestation and loss of biodiversity as key environmental sustainability issue in Mexico.

The Bank's Country Partnership Strategy (2014-2018) at the time of project closing focused on promoting green and inclusive growth as one of its four main themes.

#### Rating

High

#### b. Relevance of Design

**Modest:** The project's components were relevant for addressing Mexico's vulnerability to the effects of climate change. Activities to promote adaptation to the consequences of climate impacts in the coastal wetlands of the Gulf of Mexico included the development of wetland management plans and land zoning for pilot areas, the implementation of a technical monitoring system and various adaptation measures for the



selected pilot areas. Activities to assess the overall impacts of climate change on Mexico's national water resource planning included the development of climate change impact scenarios on Mexico's national water resources, hydrologic characterization of pilot emblematic basins with a focus on coastal wetlands and associated watersheds and identification of response options. However, the project's scope was overly ambitious given Mexico's early stage in developing and implementing climate change adaptation measures. Also, some of the originally planned activities such as establishing sand barriers as coastal buffers were rejected due to their potentially irreversible changes in the coastal and estuary dynamics particularly related to increased erosion and biodiversity alterations.

**Rating**  
Modest

#### 4. Achievement of Objectives (Efficacy)

##### **Objective 1**

###### **Objective**

The GEF objective was: to promote adaptation to the consequences of climate impacts in the coastal wetlands of the Gulf of Mexico, through the implementation of pilot measures that will provide information about the costs and benefits of alternative approaches to reduce the vulnerability of said coasts to climate change:

###### **Rationale**

###### **Outputs:**

- 100 hectares of water fluxes were rehabilitated in the Sian Ka'an reserve.
- Six areas in the Sian Ka'an biosphere reserve were repopulated with temperature-resistant coral genotypes. The original target was significantly reduced since it was found that the targets were overly ambitious.
- The monitoring system was strengthened to include climate change parameters in Sian Ka'an.
- Mareographic and meteorological equipment was installed and is operating in Sian Ka'an, achieving the target.
- Two Sustainable Utilization Units (UMAs) were established in the Papaloapan mangrove ecosystem, surpassing the target of one UMA.
- Field visits and workshops were conducted to strengthen the capacity for climate change adaptation in Veracruz, achieving the target of doing so in at least one location.
- Field visits and workshops were conducted to strengthen the capacity for climate change adaptation in Tabasco, achieving the target of doing so in at least one location.
- The local land use plan was updated to incorporate climate change impacts and adaptation measures for flooding risk areas, evacuation routes, and areas where specific adaptation measures should be



implemented in the Tabasco, achieving the target.

- Infrastructure equipment for cleaning, desilting, and rehabilitation of at least three kilometers of water fluxes was installed and is operational in Tabasco, achieving the target in order to minimize the impacts of potential flooding, achieving the revised target.
- One management plan for wildlife conservation, management, and Sustainable Utilization Units (UMA) in mangrove ecosystems in Tabasco was completed but registry of the UMA is pending, not achieving the target of at least one UMA being established.

**Outcomes:**

The ICR does not report on any outcomes for this objective given the time it will take for those activities to show their impact.

**Rating**

Substantial

**Objective 2**

**Objective**

The GEF objective was: to assess the overall impacts of climate change on Recipient's national water resource planning, including the identification of potential response options, with a focus on coastal wetlands and associated watersheds:

**Rationale**

**Outputs:**

- Three design documents for pilot adaptation measures (which included sustainability strategies and guidance for prompt implementation and management provisions) were completed for all three pilot sites, achieving the revised target which was reduced from six design documents to three during the 2015 project restructuring.
- Two Land Use Planning Processes (LUPP) were completed and the LUPP for Tabasco was approved by local authorities, achieving the revised target.
- The protected area management plan for Sian Ka'an was revised to include climate change considerations.
- One national water response option that considers climate change impact scenarios was developed, achieving the original target. The option included an assessment under three different climate change scenarios with respect to surface runoff nationwide, a model analyzing the implementation of an adaptation measure related to water availability in an area in Veracruz and the development of hydrological flow models for the three pilot sites.
- Infrastructure and equipment to reduce the vulnerability to climate change was installed and is being operated in three pilot sites, achieving the target.



- 25 hectares of mangrove reforestation were concluded, and five hectares of riparian zones were restored in Tabasco to mitigate the negative impacts of extreme weather episodes, surpassing the target of 20 hectares of reforested mangrove and riparian forest.

**Outcomes:**

Contracting time was reduced from nine months to six months or less, disbursement level and committed resources were increased and coordination among key stakeholders was improved, achieving the target.

**Rating**

Substantial

## 5. Efficiency

**Modest:** The PAD (p. 21) states that it did not conduct a traditional Economic analysis given the long-term nature of the project's objective and the difficulty to identify one meaningful quantitative outcome indicator that best reflects the outcomes.

During project implementation the direction of Natural Resource Economics within INECC conducted a cost-benefit analysis on the mangrove reforestation investments in two of the pilot sites (Tabasco and Veracruz). The benefits of the investments included improved quantity and quality, including purification, of water supply, improved habitat for fish species, and increased forest products. Other benefits, which could not be monetized, included coastal protection against floods and erosion, carbon capture, species habitat, and aesthetic and recreational values. The analysis also identified several costs such as conducting diagnostic studies, land preparation, production materials, planting, technical assistance, monitoring and the opportunity cost of land use. The assumed time horizon for the flow and costs and benefits was 35 years. The analysis estimated Net Present Values (NPV) at a discount rate of 4%, 10%, and 7% for each pilot site. The highest NPV at 20.9 million Mexican pesos (discount rate of 4%) was estimated for the site in Veracruz, which also has the highest mangrove survival rate. For the site in Tabasco the NPV was 18.3 million Mexican pesos with a 4% discount rate. All sites' NPVS were at 5.6 million Mexican Pesos with a discount rate of 10% and a NPV of 13.2 million pesos for the site in Veracruz and 11.9 million pesos for the site in Tabasco with a discount rate of 7%. These NPVs indicate that the investments were worthwhile.

However, significant implementation delays due to the project's complex institutional implementation arrangements and weak capacity to perform the procurement function may indicate an inefficient use of project resources. Taking everything together, Efficiency is rated Modest.

## Efficiency Rating

Modest



a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

\* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome

The relevance of the objectives was High given Mexico's vulnerability to the impacts of climate change. The relevance of design was Modest due to the overly ambitious scope of the project and project activities that had to be cancelled due to their negative impact. Achievement of both objectives was Substantial. Efficiency was Modest due to significant implementation delays which may indicate an inefficient use of project resources. Overall, the project's outcome is rated Moderately Satisfactory.

### a. Outcome Rating

Moderately Satisfactory

## 7. Rationale for Risk to Development Outcome Rating

The investments made under the project such as the mareographic and meteorological instruments installed are fully operational and will be monitored by the National Autonomous University of Mexico (UNAM). Furthermore, it is expected that IMTA and CONAGUA will continue or expand the technical activities implemented under component 3. Community participation was strong in several sub-projects and complementary activities, which is likely to have a positive impact on the sustainability of the activities implemented. Infrastructure financed under the project will be maintained and operated by grassroots organizations that actively participated in the implementation. No follow-on project by the Bank is in the pipeline, however, the government has expressed interest in a new national ecosystem-based adaptation operation supported by the Green Climate Fund. Overall, the risk to development outcome rating is Modest.

### a. Risk to Development Outcome Rating

Modest





## 8. Assessment of Bank Performance

### a. Quality-at-Entry

The Bank team took lessons learned from other climate change adaptation operations into account and developed an innovative project. However, even though project preparation took three years, the project's background analysis did not sufficiently take relevant risk factors that could influence project implementation such as the fragile security situation of one of the pilot areas and whether the government had plans to establish new protected areas along the gulf coast, into account. Also, lack of commitment by the government and implementing agencies was not identified as one of the potential risks. Furthermore, the implementation arrangements were overly complex leading to delays.

The project was overly ambitious and its scope had to be reduced during the project's restructuring. Also, some of the planned activities such as establishing sand barriers as coastal buffers have been rejected due to their potentially negative impact on the coastal and estuary dynamics particularly related to increased erosion and biodiversity alterations.

#### Quality-at-Entry Rating

Moderately Unsatisfactory

### b. Quality of supervision

The Bank team had a diverse skill mix and included experts from all relevant areas. Implementation Status Reports were submitted on a regular basis and the team was able to support IMTA and INECC in building procurement and financial management capacity.

At the beginning of project implementation supervision missions were conducted on an irregular basis. However, since 2013 the Task Team Leader was based in the country which had a positive impact on the relationship with the counterparts. In October 2015 the Bank team restructured the project successfully by reducing the scope of several activities and improving the implementation arrangement. This led to a stronger commitment by the implementing agencies and therefore a better implementation results.

#### Quality of Supervision Rating

Moderately Satisfactory

#### Overall Bank Performance Rating

Moderately Satisfactory

## 9. Assessment of Borrower Performance

### a. Government Performance

The government's commitment during project preparation and the initial phase of project implementation was weak. The complex financial and institutional arrangements which included seven entities led to substantial implementation delays. The effectiveness of the grant was delayed by almost one year since the National Institute of Ecology (INE) and the Mexican Institute of Water Technology (IMTA) could not reach





an agreement in regards to the division of responsibilities for project implementation. The implementation was also negatively affected by the change in leadership and staff of National Institute of Ecology and Climate Change (INECC).

After the Mid-Term Review the government demonstrated a higher level of commitment and project implementation improved.

### **Government Performance Rating**

Moderately Unsatisfactory

### **b. Implementing Agency Performance**

The institutional implementation arrangements were very complex. The project was implemented by INECC, IMTA and National Development Banking Institution (NAFIN).

INE was responsible for the coordination and implementation of components 1 and 2 and the overall monitoring of activities through a joint INE-IMTA Project Implementation Team. IMTA was responsible for the implementation of component 3 in collaboration with CONAGUA, and component 4 and for all fiduciary responsibilities, including financial management and procurement. INE and IMTA were responsible for the compliance with environmental and social safeguards. Together with NAFIN they were also responsible for the provision of the Anti-Corruption guidelines. NAFIN was also the National Financing Agent. A Steering Committee consisting of the Ministry of Environment and Natural Resources (SEMARNAT) through INECC and CONAGUA, and IMTA and representatives from each of the participating states was responsible for the oversight of the project.

The complexity of the institutional implementation arrangements and weak commitment led to delays in project implementation and low disbursement. The agencies involved lacked a common methodology for processes such as issuing contracts. Project implementation was also negatively impacted by weak technical and administrative teams in INECC and IMTA. Also, INECC and IMTA were located in different cities, making coordination even more challenging.

During the Mid-Term Review a better functioning implementation system between INECC, IMTA, and NAFIN was established leading to more commitment and better performance by the implementing agencies improved. Also, the change in INECC's leadership in 2013 had a positive impact on the agencies' performance.

### **Implementing Agency Performance Rating**

Moderately Satisfactory

### **Overall Borrower Performance Rating**

Moderately Satisfactory

## **10. M&E Design, Implementation, & Utilization**

### **a. M&E Design**



The original Results Framework included five PDO indicators and 15 intermediate outcome indicators. The project's objectives were clearly specified. However, the selected indicators had several weaknesses. Some indicators were overly complex and ambitious and while others tried to measure several things at the same time such as the first PDO indicator "Design documents for pilot adaptation measures that facilitate prompt implementation and include sustainable strategy as well as monitoring provisions". Also, for some indicators it was not clear how their outcomes would contribute to the project's objectives.

The proposed data collection methods were appropriate and included data collection, field visits and interviews with beneficiaries, and the usage of photographic records, satellite images and geographic information system.

### **b. M&E Implementation**

IMTA and INECC were responsible for the M&E of the project. Both entities had adequate capacity to conduct M&E activities.

During the project restructuring in October 2015 the Results Framework was modified to make some indicators easier to measure and some targets more realistic. The Project Implementation Team conducted meetings with key stakeholders on a regular basis to assess progress towards the project's objectives, and identify and address challenges. The Project Implementation Team also conducted a cost-benefit analysis of the reforestation activities in two of the three pilot sites. Furthermore, the Project Implementation Team visited project sites to assess implementation progress and submitted progress reports on the project's financial and physical performance indicators to the Steering Committee and the Bank biannually.

### **c. M&E Utilization**

The Project Implementation Unit assessed the monitored data and evaluated progress towards the project's objectives. The data was used to inform decision making.

### **M&E Quality Rating**

Modest

## **11. Other Issues**

### **a. Safeguards**

The project was classified as Category B and triggered the Bank's safeguard policies OP/BP 4.01 (Environmental Assessment), OP/BP 4.04 (Natural Habitats) and OP/BP 4.36 (Forests). The project team prepared an Environmental Management Framework and performed Environmental Assessments at each of the pilot sites to assess the sites' vulnerability in regards to anticipated climate change impacts. Specific environmental management plans with adaptation measures were developed for each site. Furthermore, land zoning regulations and management plans were prepared to assess the potential direct and indirect effects of adaptation measures on local populations living in the affected areas. The ICR (p. 14) states that the project complied with all environmental safeguard policies throughout its implementation.



## **b. Fiduciary Compliance**

### **Financial Management**

A unit within the Mexican Institute for Water Technology (IMTA) was responsible for the financial management and procurement of the project. At the beginning of the project, IMTA's capacity was weak and faced difficulties to perform its role resulting in delays in the submission of disbursement applications for incurred expenses and inadequate coordination between IMTA and National Institute of Ecology and Climate Change (INECC), which was responsible for the technical aspects of project implementation. This led to slow budget execution and procurement processes. The Bank provided technical support to strengthen IMTA's capacity. All financial management provisions and requirements were complied with. Unaudited Interim Financial Reports were submitted with minor delays. The external auditor's opinions were clean and no internal control weaknesses were identified.

### **Procurement**

IMTA and INECC were responsible for the procurement of the project. Both entities had no experience in Bank procedures. Also, the project's complex implementation arrangements had a negative impact on the preparation of procurement plans during the initial phase of project implementation requiring an extension of the project's closing date to allow for the completion of project activities.

The Bank provided capacity building activities and the procurement performance improved throughout the implementation. Also, both entities improved their cooperation and were able to streamline procurement procedures to allow for a faster execution of funds.

## **c. Unintended impacts (Positive or Negative)**

N/A

## **d. Other**

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## **12. Ratings**

<b>Ratings</b>	<b>ICR</b>	<b>IEG</b>	<b>Reason for Disagreements/Comment</b>
Outcome	Moderately Satisfactory	Moderately Satisfactory	---
Risk to Development	Modest	Modest	---



Outcome			
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	---
Borrower Performance	Moderately Satisfactory	Moderately Satisfactory	---
Quality of ICR		Modest	---

### Note

When insufficient information is provided by the Bank for IEG to arrive at a clear rating, IEG will downgrade the relevant ratings as warranted beginning July 1, 2006.

The "Reason for Disagreement/Comments" column could cross-reference other sections of the ICR Review, as appropriate.

## 13. Lessons

The ICR (p. 27-28) included several lessons learned with some adaptation by IEG. The two most important lessons are:

- Complex institutional implementation arrangements can have a negative impact on project implementation. In this project, the involvement of a large amount of agencies and a relatively small sized amount of funds led to little commitment by the agencies resulting in implementation delays.
- Community involvement is critical for the successful implementation of local adaptation measures. In this project, community participation was important throughout the project implementation but will also be critical for the sustainability of the implemented activities.

## 14. Assessment Recommended?

No

## 15. Comments on Quality of ICR

The ICR provides a good overview of project preparation and implementation and is appropriately candid. The ICR does not provide an Economic analysis of the entire project but uses a cost-benefit analysis of an activity implemented under the project. Furthermore, the ICR is inconsistent and demonstrates project achievement through indicators which measure outcomes that do not seem to contribute to the project's objective.

### a. Quality of ICR Rating

Modest

