Environmental Framework

for

PROPOSED GRANT FROM THE SPECIAL CLIMATE CHANGE FUND (SCCF)

IN THE AMOUNT OF USD {US$4.5} MILLION

FOR THE BENEFIT OF

MEXICO

THROUGH BANOBRAS

FOR THE

ADAPTATION TO CLIMATE CHANGE IMPACTS ON THE COASTAL WETLANDS IN THE GULF OF MEXICO

February 7, 2008

ENVIRONMENTAL MANAGEMENT OF THE PROJECT

The environmental management plan takes into account the previously described components as well as the project's classification as Category B. The supported activities may have minor environmental impacts from some on-the-ground investments. The project will make use of environmental best practices. The use of a framework approach has been successfully employed in the Colombia: Integrated National Adaptation Program and the Regional: Adaptation to Rapid Glacier Retreat in the Tropical Andes. The following table presents environmental issues and impacts.

Component	Environmental issues and impacts	Elements of the Environmental Management Plan
Detailed design of key selected adaptation measures		
Detailed design of key selected adaptation measures	Due to the characteristics of this component no direct or indirect negative environmental effect is likely to arise during its implementation. In all cases the designs contemplate the analysis of alternative measures to reduce the impacts of climate change. Measures will include interventions to increase the resilience of coastal ecosystems.	Key elements of the detailed formulation and design of site-specific adaptation interventions are the identification of potential environmental and social impacts, their characterization, and the definition of specific actions to improve, prevent, and control adverse outcomes. There are no institutional capacity issues as most participating agencies are associated with or are environmental authorities.
Implementation of pilot adaptation measures in four selected wetlands highly vulnerable to the effects of climate change.		
Sub-component 2.1: Wetlands-Panuco-Altamira (Tamaulipas). The project will support: (i) expanding the area under conservation around the Lagoon La Escondida, essential to maintain surface hydrology balance on the land side of the city of Tamaulipas; this would include the strengthening of land barriers and other conservation measures, (ii) implementation of a coastal zoning regulation that takes into account anticipated climate impacts. The implementation will be led by the State Environmental Agency. **Sub-component 2.2:** Wetlands of the Papaloapan Rivershed, Alvarado Lagoon (Veracruz). The project will support the: (i) integration of climate concerns in the conservation and management strategy of the Alvarado Lagoon; (ii) adoption and effective enforcement of a buffer zone around the lagoon; (iii) support for the construction of a pilot stabilization barrier to buffer extreme weather events and future sea level rise. The implementation will be led by INECOL, the State Environmental Agency in cooperation with local	Impacts are localized and limited to the sites where each pilot measure for climate change adaptation is implemented. In all cases the impacts are expected to be mostly positive because the measures are aimed at mitigating identified and documented problems caused by GCC impacts, favoring environmental best practices.	During pilot implementation the responsible agencies in each site will oversee the execution of the environmental management plan, as implemented by contractors. An overall monitoring plan will be developed to maintain adequate control of project implementation and of the implementation of all covenants, including the application of corresponding environmental guidelines. Given the limited size of the proposed interventions, and their pilot nature, the country's existing standards and procedures are rated acceptable and in agreement with the Bank's OP 4.01. Community involvement is an integral part of pilot implementation.

Component	Environmental issues and impacts	Elements of the Environmental Management Plan
NGOs. **Sub-component 2.3:** Wetlands of Carmen-Pajonal- Machona (Tabasco). The project will support: (i) reforestation with native species to create biological corridors, to enhance biodiversity conservation while supporting state and local reforestation efforts, (ii) strengthening of the sandbars that separate the coastal lagoons from the sea. Implementation will be coordinated by the State Climate Change Committee. **Sub-component 2.4:** The Siam Ka'an nature conservancy site (Punta Allen, Quintana Roo). The key interventions contemplated for this area are: (i) Strengthening the protected area monitoring system to include climate change parameters of interest. (ii) support the development of land use plans and (iii) pilot repopulation of coastal reefs to maintain their buffering capability and protection of the coastal wetland. The reserve is under the tutelage of CONANP, with a well trained and highly respected staff. It has attracted research institutes from all over the world whom are attracted by nature and socio-cultural setting.		
Internalization of climate change considerations on water resources planning at a national level (global overlay).		
This component will complement efforts – supported by the Bank and other IFI- to assess current and feasible policy options and measures that could be adopted at a national level to incorporate the anticipated impacts of climate change on water resource planning (global overlay). The component will update the diagnosis of current impacts and produce an analysis of recommended policy measures. The component will be carried out by SEMARNAT-INE and IMTA. The companion grant CCIG will generate data on the impacts of CC on the country's national water resources focusing on high priority watersheds. This component will specifically support the following activities: • Hydrological characterization of 13 regions of the country with CC scenarios • Selection of pilot regions for detailed analysis of CC impact on hydrological resources • Analysis of policy options to incorporate CC in planning and management of water resources	No negative environmental impacts will result from this component. This component will provide the data required to define policies to better plan and manage water resources in the face of CC impacts.	

Component	Environmental issues and impacts	Elements of the Environmental Management Plan
• Development of tools for climate prognosis of use of planning and management • institutional analysis for the implementation of adaptive management		
Monitoring and Evaluation systems		
The project will support the design and implementation of the corresponding monitoring and evaluation systems in order to analyze the effectiveness of the adaptation measures adopted under the project framework.	No significant impacts are expected because this component will only monitor and evaluate the measures taken and will not have any physical direct or indirect effect on the environment. Observation of wetlands will provide important data on changes in biomass and extension as a consequence of land use changes and climate change impacts. The companion CCIG activities will generate data on changes in water flows to the wetland and in water quality.	It is recommended that the M&E system specifically include environmental indicators to assess pilots environmentally induced impacts, most of which are expected to be positive. The use of ALOS as a monitoring tool will help detect any changes in biomass as a result of the project.

Taking into account the potential environmental impacts, the following table summarizes the environmental management for each component**.**

Component	Description	Field interventions	Environmental negative issues	Environmental control measures	Monitoring
Detailed design of key selected adaptation measures	Activities supported include: a) Technical, engineering design of adaptation pilots; (b) drafting of management plans; (c) M&E system design to measure the impacts of adopted measures; and (d) assessment of the economic implications of the impacts.	none	No negative impacts are expected from this activity. The design process will make sure that physical impacts of pilots are minimal and focused on strengthening of ecosystems and their services and on increasing their resilience to CC impacts.	Each pilot design will undergo environmental assessments to make sure benefits for ecosystems and benefits for people that depend upon these ecosystems are maximized.	Monthly progress reports on design;
	Public outreach and dissemination of information	none	No negative impacts are expected from this activity. This activity will help increase awareness about biological and human importance of preserving wetlands and their services, particularly raise awareness on the implications of CC impacts for these. This component will help share generated data on CC impacts on wetlands.	N.A.	Seminannual progress reports
Implementation of pilot adaptation measures in four selected wetlands highly vulnerable to the effects of climate change.	Wetlands-Panuco-Altamira (Tamaulipas). The project will support: (i) expanding the area under conservation around the Lagoon La Escondida, essential to maintain surface hydrology balance on the land side of the city of Tamaulipas; this would include the strengthening of land barriers and other conservation measures, (ii) implementation of a coastal zoning regulation that takes into account anticipated climate impacts.	Expanding conservation area; strengthening land barriers; Reforestation; implementation of coastal zoning regulation	Most expected environmental impacts are positive. There might be minor physical interventions that will apply appropriate environmental guidelines; Expanding conservation areas will imply strengthening of protected area status and strengthening of natural land barriers through reforestation and restoration efforts. Coastal zoning regulations will include better information and data on CC impacts which will	Use of best environmental practices; communities will be involved in the monitoring efforts. Agreements will be sought with landholders adopting coastal zoning regulations that take CC impacts into	Detailed supervision reports; Semiannual progress reports; ALOS images;

Component	Description	Field interventions	Environmental negative issues	Environmental control measures	Monitoring
			allow for improved decision making of preservation of ecosystems and on the intensity of land uses. Reforestation efforts will be carried out with native species and in areas previously forested. The areas will be selected based on satellite images from the past and based on analysis of major positive impacts for surface hydrology balance.	account.	
	Sub-component 2.2: Wetlands of the Papaloapan Rivershed, Alvarado Lagoon (Veracruz). The project will support the: (i) integration of climate concerns in the conservation and management strategy of the Alvarado Lagoon; (ii) adoption and effective enforcement of a buffer zone around the lagoon; (iii) support for the construction of a pilot stabilization barrier to buffer extreme weather events and future sea level rise.	Strengthened conservation efforts; Strengthened buffer zone pilot stabilization barrier	No negative environmental impacts are expected from this activity. Conservation plans will take CC impacts into account and thus have a longterm planning horizon, and address current and projected threats to make wetlands more resilient to CC. Buffer zones won't limit access to natural resources and will consider space for species to migrate under future sea level and extreme weather event scenarios. Stabilization barriers will include natural means to protect ecosystems. In case of physical interventions best environmental practices will be used.	Buffer zone will be strengthened through voluntary agreements with land holders. Environmental good practices will be followed for conservation efforts. Only native species will be used; stabilization barrier will use natural means.	Detailed supervision reports; Semiannual progress reports; voluntary agreements; Mainstreamed Conservation plans; reforestation plans; ALOS images;
	Sub-component 2.3: Wetlands of Carmen-Pajonal- Machona (Tabasco). The project will support: (i) reforestation with native species to create biological corridors, to enhance biodiversity conservation while supporting state and local reforestation	Reforestation Strengthening of sandbar	Reforestation will be done with native species and on areas previously forested and found adequate in order to strengthen ecosystem; Decision on location of biological corridors will address	Environmental good practices will be followed. Bidding documents for sand bar strengthening will incorporate	Detailed supervision reports; Semiannual progress reports; voluntary

Component	Description	Field interventions	Environmental negative issues	Environmental control measures	Monitoring
	efforts, (ii) strengthening of the sandbars that separate the coastal lagoons from the sea. Implementation will be coordinated by the State Climate Change Committee.		current root causes of biodiversity and ecosystem functioning loss as well as future CC scenarios, and will be established in harmony with local reforestation efforts; Strengthening of sand bar will undergo previous analysis of physical requirements to maintain natural separation between lagoon and sea under CC scenarios and implement strengthening measures by natural means: under consideration are to partly revert the artificial opening of "Boca de panteones" and to strengthen the existing sand bar in order to stabilize the sand deposits with regard to coastal currents. This work will be based on an analysis of currents and sedimentation, definition of areas of major instability, types of stabilizing structure etc.	EIA and EMP. If minor infrastructure works are required, detailed EIS will be prepared.	agreements; Reforestation plan; ALOS images; detailed supervision report (semiannual) application of good environmental practices.
	Sub-component 2.4: The Siam Ka'an nature conservancy site (Punta Allen, Quintana Roo). The key interventions contemplated for this area are: (i) Strengthening the protected area monitoring system to include climate change parameters of interest. (ii) support the development of land use plans and (iii) pilot repopulation of coastal reefs to maintain their buffering capability and protection of the coastal wetland. The reserve is under the tutelage of CONANP, with a well trained and	Strengthened monitoring system for protected areas Updated land use plans repopulation of coral reefs	No environmental negative effects will take place through this activity. This component will help expand monitoring efforts by considering CC data and will improve existing monitoring system. Land use plans will integrate better information related to probable future climate scenarios. Repopulation of coral reefs will be	Coral program will only consider native species and tested repopulation techniques.	Detailed supervision reports; Semiannual progress reports; mainstreamed monitoring systems and CC data generated

Component	Description	Field interventions	Environmental negative issues	Environmental control measures	Monitoring
	highly respected staff. It has attracted research institutes from all over the world whom are attracted by nature and socio-cultural setting.		done with native species that have shown resilience to past temperature increases.		
Internalization of climate change considerations on water resources planning at a national level (global overlay).	Selection of pilot regions for detailed analysis of CC impact on hydrological resources. Analysis of policy options to incorporate CC in planning and management of water resources. Development of tools for climate prognosis of use of planning and management	This is a modeling and analytical activity with no physical impacts.	Results will help define sustainable water policies under CC scenarios.	N/A	Generated data and policy options