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The World Bank

Report No: ICR0000663

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(MULT-51287)

ON A

GRANT

IN THE AMOUNT OF US$ 1.14 MILLION

TO

FUNDACION BARILOCHE

FOR AN

ENABLING ACTIVITY FOR THE

SECOND NATIONAL COMMUNICATION OF THE ARGENTINE REPUBLIC

TO THE CONVENTION ON CLIMATE CHANGE

November 28, 2007

Sustainable Development Department
Argentina, Chile, Paraguay and Uruguay Country Management Unit
Latin America and the Caribbean Regional Office

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 30, 2007)

Currency Unit =
1.00 = US$ [0.31]
US$ 1.00 = [ARS 3.14]

FISCAL YEAR

ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy
CIMA	Centro de Investigación del Mar y la Atmosfera (Center for Atmospheric and Ocean Studies
CDM	Clean Development Mechanism
CNG	Compressed Natural Gas
COFEMA	Consejo Federal sobre el Medio Ambiente
COP	Conference of Parties
EEM	Energy Efficiency Measures
ELI	Efficient Lighting Initiative
ENARGAS	Ente Nacional Regulador del Gas (National Gas Regulatory Agency
ENRE	Ente Nacional Regulador de la Electricidad (National Electricity Regulatory Agency)
ENSO	El Niño Southern Oscillation
ESCO	Energy Services Company
FB	Fundación Bariloche
GEF	Global Environmental Facility
GHG	Greenhouse Gases
GOA	Government of Argentina
GTACA	Grupo de Trabajo Ampliado sobre Cuestiones Ambientales
IAS	International Accounting Standards
INA	Instituto Nacional del Agua (National Institute for Water)
INTA	Instituto Nacional de Tecnologia Agropecuaria (National Institute of Farming Technology)
IPCC	Intergovernmental Panel on Climate Change
LAC	Latin America and the Caribbean
LUCF	Land-use change and forestry activities
MEM	Mercado Electrico Mayorista (Wholesale Electric Power Market)
MTCE	Million Tons of Carbon Equivalent
NGO	Non-governmental Organization
NMP	National Mitigation Program
NMVOC	Non Methane Volatile Organic Compounds
OAMDL	Oficina Argentina del Mecanismo para un Desarrollo Limpio (Argentine Clean Development Mechanism Office)

OLADE	Organización Latinoamericana de Energia (Latin American Energy Organization)
PAEPRA	Programa de Abastecimiento Electrico a la Población Rural dispersa de Argentina (Program for electric energy supply for the rural dispersed population of Argentina)
PERMER	Proyecto de Energia Renovables en Mercados Rurales (Project of renewable energies in the rural market)
PIU	Project Implementation Unit
PNUD	Programa de las Naciones Unidas para el Desarrollo (UN Development Program)
RE	Renewable Energy
RCM	Regional Circulation Model
SAGPyA	Secretaria de Agricultura, Ganaderia, Pesca y Alimentos (Secretary of Agriculture, Livestock, Fisheries, and Food)
SAyDS	Secretaria de Ambiente y Desarrollo Sustentable (Secretary of Environment and Sustainable Development)
SECyT	Secretaria de Ciencia, Tecnologia, e Innovación Productiva (Secretary of Science,Technology, and Productive Innovation)
SNC	Second National Communication
UNFCCC	United Nations Framework Convention on Climate Change
URE	Uso Racional de la Energia (Rational Use of Energy)

Vice President:	Pamela Cox
Country Director:	Pedro Alba
Sector Manager:	Laura Tlaiye
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ARGENTINA
ENABLING ACTIVITY FOR THE
SECOND NATIONAL COMMUNICATION OF ARGENTINE REPUBLIC
TO THE CONVENTION ON CLIMATE CHANGE

CONTENTS

A. Basic Information

Country:	Argentina	Project Name:	Enabling Activity for the Second National Communication of the Argentine Republic to the Convention on Climate Change
Project ID:	P078143	L/C/TF Number(s):	MULT-51287
ICR Date:	12/01/2007	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERMENT OF ARGENTINA
Original Total Commitment:	USD 1.1M	Disbursed Amount:	USD 1.1M
Environmental Category: C		**Global Focal Area: C**	

Implementing Agencies:
Secretaria de Ambiente y Desarrollo Sustentable
UIP Segunda Comunicacion Cambio Climatico
Fundacion Bariloche
Ministerio de Relaciones Exteriores, Comercio Internacional y Culto
Secretaria de Ciencia y Tecnologia

Cofinanciers and Other External Partners: None

B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	04/11/2002	Effectiveness:	04/27/2004	02/09/2004
Appraisal:	12/11/2002	Restructuring(s):		
Approval:	12/18/2003	Mid-term Review:		
		Closing:	09/30/2006	03/31/2007

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes:	Satisfactory
Risk to Global Environment Outcome	Low or Negligible
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory

Overall Bank Performance:	Satisfactory	**Overall Borrower Performance:**	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
GEO rating before Closing/Inactive status	Satisfactory		

D. Sector and Theme Codes

	Original	**Actual**
Sector Code (as % of total Bank financing)		
Central government administration	100	100
Theme Code (Primary/Secondary)		
Biodiversity	Secondary	Secondary
Climate change	Primary	Primary
Environmental policies and institutions	Primary	Primary
Other environment and natural resources management	Secondary	Secondary

E. Bank Staff

Positions	**At ICR**	**At Approval**
Vice President:	Pamela Cox	Pamela Cox
Country Director:	Pedro Alba	Axel van Trotsenburg
Sector Manager:	Laura E. Tlaiye	John Redwood
Project Team Leader:	Walter Vergara	Juan Lopez-Silva
ICR Team Leader:	Walter Vergara	
ICR Primary Author:	Walter Vergara	
	Hernan M. Gonzalez Figueroa	

F. Results Framework Analysis
Global Environment Objectives (GEO) and Key Indicators(as approved)

To contribute to the development of country policies that will be a part of global efforts to mitigate climate change.

Revised Global Environment Objectives (as approved by original approving authority) and Key Indicators and reasons/justifications

Not applicable.

(a) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Institutional procedures in place to prepare National communications			
Value (quantitative or Qualitative)	First National communication to the UNFCCC	Second National Communication to the UNFCCC		Second National Communication completed
Date achieved	04/14/1995	09/15/2006		03/14/2007
Comments (incl. % achievement)	100%			
Indicator 2 :	Update GHG emission inventory and trend analysis			
Value (quantitative or Qualitative)	GHG emissions inventory	Updated GHG gas inventory		GHG inventory updated
Date achieved	01/15/2004	01/26/2006		01/30/2006
Comments (incl. % achievement)	100%			
Indicator 3 :	Local emission factors and carbon sequestration			
Value (quantitative or Qualitative)	Local emissions factors did not exist	Local emission factors		Local emission factors obtained
Date achieved	01/15/2004	12/31/2005		01/30/2006
Comments (incl. % achievement)	100%			
Indicator 4 :	Harmonized Energy Balance			
Value (quantitative or Qualitative)	Energy balance under no control	Harmonized balance		Energy balance harmonized
Date achieved	01/15/2004	04/30/2006		01/30/2006
Comments	100%			

(incl. % achievement)				
Indicator 5 :	Assessment of vulnerability of particular ecosystems to climate change			
Value (quantitative or Qualitative)	Two ecosystems were evaluated	Assessment of vulnerability		Vulnerability of four ecosystems and the energy sector completed
Date achieved	01/15/2004	12/31/2005		07/13/2006
Comments (incl. % achievement)	100%			
Indicator 6 :	Assessment of economic impact of Climate Change			
Value (quantitative or Qualitative)	Existing vulnerability studies	Assessment of Regional and national social vulnerability to CC		Study on economic and social impacts of climate change completed
Date achieved	01/15/2004	06/01/2005		07/14/2006
Comments (incl. % achievement)	100%			
Indicator 7 :	Design of adaptation measures			
Value (quantitative or Qualitative)	Proposed mitigation and adaptation strategies that have been developed as a result of vulnerability studies	Portfolio of adaptation strategies		Draft National Adaptation Plan completed
Date achieved	01/15/2004	08/28/2005		11/14/2006
Comments (incl. % achievement)	100%			
Indicator 8 :	Regional climate change projections from modified general circulation model			
Value (quantitative or Qualitative)	Scenarios SRESA2S RESB2 IPCC 2001	Update knowledge on probable effects of climate change		Regional circulation model completed and results from scenarios (SRES) obtained
Date achieved	01/15/2004	10/30/2005		01/30/2006
Comments (incl. % achievement)	100%			
Indicator 9 :	Assessment of Technologies and policies that aim at reducing the effects of climate variations			
Value (quantitative or Qualitative)	Available Technologies	Availability of Technologies aiming at reducing effects of Climate Change		Three studies on mitigation options in energy and transport sectors, energy efficiency and renewable energy completed
Date achieved	01/15/2004	03/30/2006		07/14/2006
Comments	100%			

(incl. % achievement)				
Indicator 10 :	Assessment of priorities and opportunities for mitigation carbon sequestration and technology transfer			
Value (quantitative or Qualitative)		Priorities and opportunities assessed		Study on opportunities for carbon sequestration completed
Date achieved		03/20/2006		07/14/2006
Comments (incl. % achievement)	100%			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Information gathering from various economic sectors / Data processing			
Value (quantitative or Qualitative)	Data from first GHG inventory	GHG emission inventory updated / Emission factors / Energy Balance harmonization		Data for all inventories collected, inventories completed
Date achieved	12/31/1995	01/26/2006		01/26/2006
Comments (incl. % achievement)	100%			
Indicator 2 :	Environmental indicators and data sets / Hydrological budget from various regions/ Mapping of several indicators / Identification of institutional capacity / Review of regulatory framework			
Value (quantitative or Qualitative)	Data available from regional authorities	Assessment of vulnerability in specific ecosystems / Evaluation of Climate Change impacts on Hydrological resources / Economic Impact assessment / Design adaptation measures/ Regional climate models		Nine studies (including Adaptation Plan and RCM)were completed under the Vulnerability component of the project
Date achieved	06/30/2002	06/22/2006		07/14/2006
Comments (incl. % achievement)	100%			
Indicator 3 :	EMM opportunities / Assessment of opportunities for energy efficiency in transport / Assessment of opportunities for carbon sequestration and substitution			

Value (quantitative or Qualitative)	Current development of transport sector	EEM opportunities / Energy efficiency in the transport sector / renewable energy Technologies / carbon sequestration and substitution / opportunities for reduction of enteric methane emissions		Five studies under the Mitigation component of the project completed
Date achieved	12/31/2002	06/15/2006		07/14/2006
Comments (incl. % achievement)	100%			
Indicator 4 :	Fostering awareness, Knowledge on how climate change functions, Attitudes regarding personal and environmental motivation, ability to identify and investigate climate change problems			
Value (quantitative or Qualitative)	First National Communication to UNFCC	Public involvement and awareness		Five seminars carried out, teaching material developed, TV and radio ads published, participation in TV interviews
Date achieved	12/31/1995	09/15/2006		09/15/2006
Comments (incl. % achievement)	100%			
Indicator 5 :	Compilation of environmental , economic and social indicators / Draft communication / Consultation with authorities and main stakeholders			
Value (quantitative or Qualitative)		Draft of the Second National Communication to UNFCC		Second National Communication completed
Date achieved		09/15/2006		03/14/2007
Comments (incl. % achievement)	100%			

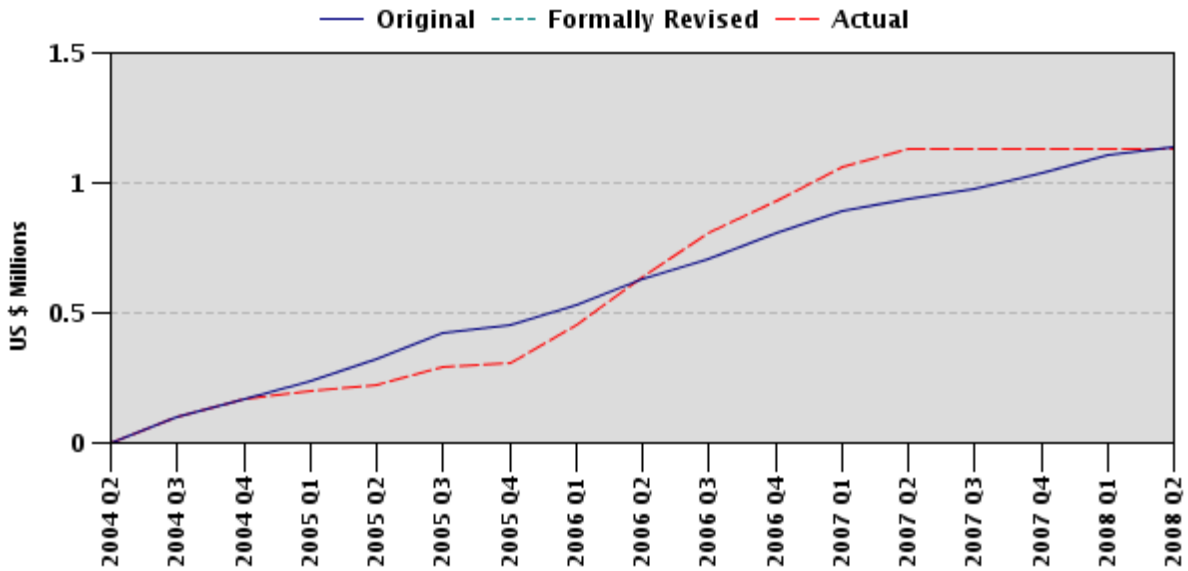
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	GEO	IP	Actual Disbursements (USD millions)
1	06/18/2004	Satisfactory	Satisfactory	0.17
2	12/10/2004	Satisfactory	Satisfactory	0.23
3	04/19/2005	Satisfactory	Satisfactory	0.30
4	05/01/2006	Satisfactory	Satisfactory	0.81

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile



1. Project Context, Global Environment Objectives and Design

(this section is descriptive, taken from other documents, e.g., PAD/ISR, not evaluative)

1.1 Context at Appraisal

(brief summary of country and sector background, rationale for Bank assistance)

Country Assistance Strategy. The 2000 Country Assistance Strategy (CAS) highlighted the need for Argentina to take measures aimed at promoting sustainable growth. The 2000 CAS recognized pollution reduction as a strategy to attain sustainable growth. In this regard, performance was measured in terms of the Government of Argentina's (GOA) fulfillment of its commitments to global environmental agreements. One such agreement is the United Nations Framework Convention on Climate Change (UNFCCC).
Outside the context of the UNFCCC, the project fit well with the Bank's overall Energy and Environmental Strategies since issues related to climate change are relevant to both sectors. The 2000 CAS further identified management of water resources as a development priority for Argentina, with financial support envisioned for funding of projects in water supply and sanitation, ground water management, flood control, drainage, and irrigation.

Sector Issues. The projected impacts of climate change include increasing temperatures, sea level rise, and changing precipitation patterns. A series of physical characteristics and cultural traits make Argentina particularly vulnerable to climate change. The following sections provide brief descriptions of national priority issues that needed to be addressed in order to reduce potential negative impacts of climate change.

- *Water resources.* The wide range of climatic conditions in Argentina result in complex water resource management issues. Argentina was repeatedly subjected to periods of extreme drought in the dry regions and to floods in the more humid zones. The various regions have considerably different water resource issues concerning their surface water bodies, groundwater supplies, and irrigation practices.

- *Land resources*. The lack of effective land management policies in Argentina was a contributing factor to the severity of the impacts from climate change-related events. Unsustainable land use, soil degradation (e.g. salinization) and deforestation contributed to the degradation of the natural vegetation cover, a factor that ultimately leads to erosion. Erosion of extensive productive areas increases their vulnerability to the damaging effects of extreme climatic incidents.

- *Human settlements*. Inadequate zoning regulations in urban areas of Argentina and the incomplete access to water and sanitation services were partly to blame for the expansion of the cities towards flood-prone areas. Settlements grew along the banks of major waterways without consideration to the risks of flooding. The infrastructure was, in many cases, precarious, aggravating the extent of the damages and the number of people affected during flooding events.

Emissions in Argentina. The 1997 inventory of GHG emissions revealed that between

1990-1994 and 1994-1997, GHG emissions increased by 13.7% and 6.2% respectively, a cumulative increase of 20.7%.[1] In 1990, the economy was undergoing a deep recession, followed by a period of rapid recovery starting in 1992. This recovery manifested itself by an increase in economic activity and a consequent raise in GHG emissions. The year 1997 marked the peak of economic activity for the decade, but the decreasing trend of emissions was already evident. A combination of factors contributed to this decreasing trend of emissions, of which the most influential were: i) increased power generation from clean energy sources; ii) replacement of the public transportation fleet with cleaner vehicles; and iii) reduction of total heads of cattle with a resulting decrease in enteric emissions.

Integration of climate change into national planning. Links between the scientific facts regarding climate change and preventive decision-making in Argentina remained weak at national, provincial, district, and private levels. Contributing factors included the prevalent dichotomy between policy and science, weak institutional capacity, and the lack of collaboration between public and private institutions on climate change issues. There was an urgent need to strengthen linkages between climate change issues and national planning through the development of a National Mitigation Program, a national pilot plan to promote public awareness of adaptation and mitigation strategies, and the development of an institutional framework to carry out public awareness activities.

Government Strategy to tackle climate change

First National Communication. The Government of Argentina submitted its First National Communication (FNC) to the UNFCCC in 1997. The project was led by the Secretaria de Ciencia, Tecnología, e Innovación Productiva (SECyT). The areas covered by the FNC and the main results are summarized as follows:

i. A GHG inventory was compiled following IPCC procedures.

ii. The FNC investigated the overall vulnerability of water resources to climate change. The main conclusions for this sector were:
   - A decrease in the amount of precipitation in the country would reduce the available water resources in most areas;
   - Higher precipitations would in turn increase the risks of flooding.

iii. The FNC evaluated the vulnerability of two specific ecosystems to climate change:
   - Water resources in the arid provinces of La Rioja, Sun Juan and Mendoza depend on snow melt from Andean mountain tops. Increasing temperatures resulting from

[1] Figures do not include emissions from changes in crop management or from forstry. GHG emissions in Argentina mainly originate from:

i. *Combustion of fossil fuels*. This sector released approximately 90% of the CO_2 emissions and around 42% of the country's total GHG emissions during 1997 (power generation (30%) and transport (33%) account for most of the energy-related GHG emissions);
ii. *Enteric fermentation*. This sector released 62% of methane emissions and 19% of total GHG emissions in 1997 (mainly cattle);
iii. *Management of agricultural land*. This sector released 95% of total nitrous oxide emissions and 21% of total GHG emissions in 1997.

climatic changes would decrease snow cover of Andean mountains and would therefore have impacts on the water supply in the region.

- Two areas along the Argentine coastline were found to be at risk from flooding due to increasing ocean levels: a) Bahia of Samborombón, in northern Buenos Aires province, where economic losses would be significant; and b) Bahia Blanca and the Rio Colorado delta in the south of Buenos Aires province.

iv. The vulnerability to climate change of the following two economic sectors was considered:
   - Agriculture - It was found that crops would be more affected than livestock activities. The net impact on crops and pastures was found to be negative.
   - Energy - A reduction in the volumes of water from snow melt was found to have significant repercussions for the electricity sector. Indeed, many hydroelectric facilities in the northeastern region of the country operate using water from local rivers, the flow of which is dependent of snow melt.

v. The FNC investigated the impact of climate change on public health. Results showed that higher temperatures could lead to increases in the number of the vectors of certain diseases (e.g., dengue, malaria, etc.)

GHG emissions inventories were updated in 1999, and a revised version of the First Communication was submitted to the UNFCCC.

Mitigation Strategies. Several projects had been implemented that have contributed to mitigating air pollution by the Argentine energy sector.[2] Additionally, pilot measures to reduce energy consumption and increase efficiency were supported by the GOA.[3] Even though these measures have large energy savings potential, they were not supported by policy initiatives and other measures aimed to overcome existing market barriers. Consequently, these measures were not adopted by either energy suppliers or consumers.

Finally, the GOA has also made efforts reduce emissions from deforestation. Several afforestation and reforestation programs are developing increasing interest, particularly within the framework of the Clean Development Mechanism (CDM). Technical cooperation programs from Germany and France evaluated the participation of NGOs and other institutions in projects that would improve carbon-sink capabilities in Argentina. The SAyDS participated actively in CDM initiatives and established the Oficina Argentina del Mecanismo para un Desarrollo Limpio (OAMDL), with the purpose of promoting projects that can be implemented within the context of the CDM.[4] The

[2] Among those projects were: i) the construction and operation of several hydropower plants and two nuclear power plants; ii) the replacement of coal and petroleum derivatives by natural gas for thermoelectric plants; iii) the promotion of compressed natural gas (CNG) as motor vehicle fuel; iv) the adoption of specific regulations to abate gas-flaring; and v) the reduction of natural gas flaring at its source.

[3] Those include i) initiatives of co-generation of electricity and heat in industry; ii) programs for energy-efficient drying of seeds and crops; iii) programs of efficient street lighting; iv) energy saving initiatives in public and commercial buildings; and v) energy-saving residential heating systems.

[4] SAyDS now hosts the Argentine Carbon Facility which is under development with the Bank's Carbon Finance Assist Program.

OAMDL was amongst the first non-Annex I CDM offices to formulate detailed guidelines for project preparation and conducted a series of workshops to advance in the formulation of LUCF-CDM projects.

1.2 Original Global Environment Objectives (GEO) and Key Indicators (*as approved*)

In this context, this project supported the development of Argentina's Second National Communication (SNC) to the UNFCCC. The SNC reported on strategies, plans, and programs in place to implement the Convention's objectives. This project complemented ongoing activities undertaken by the GOA to implement the UNFCCC requirements.

Global environmental objective. The global environmental objective of this project was to contribute to the development of country policies that would be a part of global efforts to mitigate climate change. This objective was achieved by financing incremental activities aimed at assessing the vulnerability of Argentine ecosystems to climate change and contributing to the development of a national mitigation plan aimed at reducing current levels of GHG emissions.

The project development objective was to support enabling activities for the preparation of the Second National Communication (SNC) of the Argentine Republic to the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC). The Government of Argentina submitted its First National Communication (FNC) in 1997 and a revised version in 1999. The SNC would enable the GOA to satisfy requirements under Article 12.1 of the UNFCCC, in accordance with decisions 10KP.2, 11KP.2 and 8KP.5. The SNC followed the new guidelines for the preparation of National Communications agreed in CP.8.

Key performance indicators

Component	Performance indicators
1. Updating of national GHG inventories	(a) Updated national inventory of GHG emissions and analysis of emission trends of major polluting sectors during the period from 1990 to 2000 (b) Development of local GHG emissions factors (c) Harmonized energy balances
2. Assessment of vulnerabilities to climate change	(a) Assessment of the impacts of climate change on the coastline of the Rio de la Plata, on water resources of the Litoral-Mesopotamia, the Pampa Húmeda, and Patagonia (b) Assessment of the vulnerability of agricultural productivity on the Pampa Húmeda to climate change (c) Assessment of socio-economic impacts of climate change on the various ecosystems (d) Proposal of national and regional mitigation and adaptation strategies to reduce the negative impacts of climate change (e) Assessment of the impact of climate change on the energy sector (f) Model simulations of future climate scenarios
3. National Mitigation Program	Development of a National Mitigation Program, including initiatives to reduce GHG emissions through energy efficiency, energy savings, substitution of fuel and energy sources, changes in transportation modes, and carbon sequestration programs
4. Promotion of public awareness	Development of national pilot plan to promote public awareness of the global impacts of climate change, as well as adaptation and mitigation strategies
5. Drafting of Second National Communication	(a) Second National Communication to the UNFCCC (b) Development of institutional framework and procedures necessary to continue updating of GHG inventories, preparing National Communications and carrying out public awareness activities

1.3 Revised GEO (*as approved by original approving authority*) and Key Indicators, and reasons/justification

The original GEO and performance indicators were not revised.

1.4 Main Beneficiaries
(original and revised, briefly describe the "primary target group" identified in the PAD and as captured in the GEO, as well as any other individuals and organizations expected to benefit from the project)

The primary beneficiaries of this project were:

- National and provincial governments, as their capacity for incorporating climate change dimensions into their planning was strengthened, both in terms of mitigation and adaptation responses;
- Stakeholders, whose awareness about climate change impact will allow informed decisions relating housing, water and energy use, and productive activities;
- Coastal and delta area communities and tourism interests directly affected by flooding, temperature changes, and sea level rise;
- General population from urban centers affected by air pollution and, in particular, vulnerable groups such as children and the elderly;
- NGOs, members of the public and academic institutions will benefit from additional training and information from project activities.

1.5 Original Components (*as approved*)

This project consisted of five major components:

i. Updating of national inventories of greenhouse gases (GHG).
ii. Assessment of the vulnerability of various ecosystems to climate change, including a formulation of possible adaptation strategies.
iii. Formulation of a National Mitigation Program, including measures to reduce national emissions of GHG.
iv. Promotion of capacity building and public awareness.
v. Drafting of the Second National Communication to the UNFCCC.

Below is a detailed description of each component.

i. National GHG Inventories

The main objectives of this component of the project were to: (i) update existing GHG emissions inventories, (ii) develop own emissions factors, and (iii) harmonize methodologies for developing energy balance and GHG emission inventories.

ii. Assessment of vulnerabilities

This component aimed to expand on a series of vulnerability assessments that was conducted as part of the First National Communication, which addressed potential impacts of climate change on various regions of the country.[5] These studies took advantage of the development of a high resolution Regional Circulation Model (RCM) by the CIMA (Centro de Investigación del Mar y la Atmósfera), at the National Scientific and Technological Center. This new RCM simulated the effects of climate change on hydrological conditions around the country and suggested adequate adaptation strategies.

iii. Formulation of National Mitigation Program

This component aimed to promote the development of a National Mitigation Plan (NMP), which would include measures for the reduction of national GHG emissions levels in the following areas: *1) Energy Efficiency Measures (EEM), 2) GHG Emission Mitigation in the Transport sector, 3) Renewable energy sources (RE), 4) Carbon dioxide sequestration,* and *5) Reduction of methane enteric emissions.*

iv. Promotion of Public Awareness

The objective of the public awareness program was to develop education and outreach programs that focus on the issue of climate change. This project component consisted of two sub-components, namely a communication campaign at the national level targeting a widespread audience and a training program for community leaders, as well as for all members of the community interested in the topic. These two components would be designed in accordance to guidelines agreed in CP.8.

v. Drafting of Second National Communication to UNFCCC

This component was specifically aimed to generate the Second National Communication. The document would compile results from the various project components and other publicly available information. The Second National Communication would include the following sections: i) national statistics; ii) national inventories and emission factors; iii) methodological review and comparative analysis of previous and current GHG inventories (1990-1994-1997-2000); iv) study of the possibilities to increase consistency between National Energy Balances and the Inventory of Emission Source Categories; v) vulnerability assessment and institutional strengthening for adaptation; vi) preliminary formulation of a National Mitigation Program (NMP); vii) development of circulation models and climate change scenarios; viii) statement of financial needs; ix) promotion of public awareness. The Second National Communication was to be drafted following new guidelines for the preparation of National Communications accorded in CP.8.

vi. Progress Reports and Workshops

Periodic progress reports on all project components will be routinely evaluated to assess the adequate advancement of the overall project. Four workshops have been projected with participation of all coordinators, experts, and assistants with the objective of (i) launching the project; (ii) assessing progress of various project components; (iii) exchanging information and

[5] Nine independent vulnerability studies were planned to be conducted: 1) Vulnerability of the coastal zone, 2) Vulnerability of the Pampa Bonaerense, 3) Vulnerability of agriculture production in the Pampa Húmeda, 4) Vulnerability of the water resources in the Litoral-Mesopotamia, 5) Vulnerability of the Patagonia, 6) Overall socio-economic impacts of climate change, 7) Vulnerability of the energy system and energy infrastructure, 8) National Adaptation Program and regional adaptation plans, and 9) Estimates of regional climate change scenarios through Regional Climate Models.

results from the various subprojects, particularly the NMP; and (iv) producing a final assessment. Lectures from experts have been envisioned as one additional method to verify advances in the completion of objectives.

1.6 Revised Components

Components were not revised, but the project was extended twice. First from March 31, 2006 to December 31, 2006 in order to allow the studies contracted to be completed, and to allow time for the main consultant to compile all the results and write the actual National Communication. All of the studies that would feed the SNC were contracted by the end of 2005, and their final delivery date was July 2006. The second extension was from December 31, 2006 to March 31, 2007, in order to allow the government to review the SNC (delivered by the consultant in December 2006).

1.7 Other significant changes
(in design, scope and scale, implementation arrangements and schedule, and funding allocations)

There were no other significant changes.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry
(including whether lessons of earlier operations were taken into account, risks and their mitigations identified, and adequacy of participatory processes, as applicable)

Lessons from earlier operations. The First Communication of the Parties was performed by UNDP in 1997. A revised communication was produced in 1999. Later that year, the Bank sponsored the first Argentine National Strategy Study (NSS) - a study on opportunities under the flexible mechanisms recently established by the Kyoto Protocol. Lessons learned from those involvements are summarized as follows:

- Participation of political stakeholders and decision makers in the development of policies and strategies is of critical importance, as this will ensure ownership of the project and commitment for the implementation phase. Since the project will help develop cross-sectoral strategies and programs, joint participation from all relevant governmental agencies since the project inception and during its development and implementation will ensure proper implementation and adequate mainstreaming in the different sectors.

- Close coordination and supervision of the studies is needed, in particular with relation to the vulnerability assessments implemented by local institutions. This will ensure coherence in the approach of the strategies devised under the study. For the SNC, it was necessary to develop capacity in the country to model future scenarios of climate change. This was done by developing a regional circulation model (RCM) instead of using existing General Circulation Models due to their shortcomings in the simulation of median and extreme precipitation in the La Plata river basin. (The latter do not reproduce adequately the magnitude, the annual cycle and the characteristics of extreme precipitation.) Regional scenarios of climate change for Argentina were based on an increase in greenhouse gases according to the IPCC “business-as-usual” emission scenario. This scenario was used to predict how emissions and the

atmospheric concentration of GHG might have evolved in the absence of global efforts to limit GHG emissions. Predictions of climate for South America were made over the period 1970 – 2050. In the case of the vulnerability studies, the planning horizon was selected as the period between 2020 and 2040. The results from the RCM were used to determine the impacts of climate change and the vulnerability of the different sectors.

- Development of local emission factors and carbon sequestration coefficients is important, as Argentina presents particularities not easy to standardize with general approaches.

- Development of regional circulation models is important to better estimate vulnerability of fragile and critical ecosystems.

- A strong consultative process with the general public will ensure that whatever voluntary commitments are assumed or ratified are fully endorsed by the general population and stakeholders.

All these recommendations from previous work have been included in the design of the project.

2.2 Implementation
(including any project changes/restructuring, mid-term review, Project at Risk status, and actions taken, as applicable)

There were no changes or restructuring of the project. The project risk status was always low. Nonetheless, as mentioned in Section 1.6, the project was extended twice in order to complete all the project activities and to allow sufficient time for the government to review the Second National Communication. Even though this was a very simple operation from the point of view of procurement (i.e. only studies were carried out, no investments or works contracted), the project experienced a slow start.

There were two main reasons for this delay. First, the Steering Committee (SC) had a strong role in the procurement process (see Section 2.3 for a description of the role of the SC). In the end, the SC approved every step of the consultant selection process (i.e. short/long lists, RFP, technical and financial reviews, contracting). The GOA faced a trade-off between country ownership of the project and speed of execution, and gave a higher weight to country ownership. In hindsight, the project could have limited the responsibilities of the SC to a more strategic scope and rely more on the Project Implementation Unit to handle the procurement processes. A second reason for the delay was that a Regional Circulation Model had to be developed in order to forecast weather changes and analyze the vulnerabilities of the country to climate change. Since contracting of the Regional Circulation Model was slightly delayed relative to the original schedule, the remaining activities under component B of the project were also delayed.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

The system for M&E of project performance consisted of a series of progress, evaluation, and completion reports for each of the outcomes and outputs. For instance, with respect to the CAS goal of promoting sustainable growth, pollution abatement, and the integration of global warming

objectives in local strategies, the progress is measured by the delivery of the Second National Communication, the National Mitigation Program, and other sector work by the World Bank.

With respect to outputs by each subcomponent, the project M&E also included the delivery of progress, evaluation, and completion reports. Implementation of M&E was the responsibility of the Project Implementation Unit (PIU) and the Fundación Bariloche, with the oversight of the Steering Committee (SC). The functions of the Steering Committee were to direct the planning, implementation, and monitoring stages of the project, by: (a) reviewing and defining terms of reference; (b) approving final structure of project documents; (c) overseeing the selection of consultants; (d) defining the procurement and implementation plans; (e) reviewing studies and implementation progress; and (f) setting strategic orientation for the project outputs.

The PIU routinely updated and submitted to the World Bank a report on the status of each component, the next steps, and estimated timeframe to carry them out. This report was in the form of a spreadsheet where each of the components was listed, and included the dates for each milestone in the procurement process as well as the dates when first, second, and final drafts were received by each of the consultants. Additionally, the PIU prepared a report at each step of the procurement process and in the review of report drafts and submitted it to the Bank. All these steps were necessary, because the Bank was required to, by design of the grant, approve the release of funds to consultants at each stage of the development of the studies. Finally, minutes from each meeting of the SC were also prepared describing the decisions made in each meeting.

2.4 Safeguard and Fiduciary Compliance
(focusing on issues and their resolution, as applicable)

Safeguards. The objective of the project was to carry out studies that led to the development of the Second National Communication, therefore none of the Bank's safeguard policies were applicable. The project was rated as environmental category C. There were also no social issues associated with the projects objectives.

Financial Management. During project implementation, the implementing agencies maintained acceptable accounting, financial reporting and auditing arrangements. The financial intermediary, Fundación Bariloche, supervised project implementation and compliance with all legal covenants related to financial management. All audit reports were submitted by the implementing agencies and found acceptable to the Bank.

Procurement. A Procurement Capacity Assessment was conducted by the Bank's Procurement Specialist (PS) during the appraisal and negotiation mission. The Overall Procurement Risk was considered high due to the lack of experience of FB in contracting consulting firms under Bank Guidelines. The PS's recommendations for improving FB's capacity and for mitigating risk included: a) the review and no objection by the Bank of the specific agreement between the Government of Argentina and FB regarding the implementation of this project would be a condition for grant effectiveness; b) the review and no objection by the Bank of the Project Operational Manual would be a condition for loan effectiveness; c) one experienced Procurement Specialist should be hired before the first Request for Proposals is submitted to Bank review; and d) all contracts with firms under every selection method should be subject to Bank prior review. As for individuals, all contracts to be defined in the Operational Manual should also be subject to

prior review. All of the above conditions were met during project implementation and there were no procurement issues during the life of the project.

2.5 Post-completion Operation/Next Phase
(including transition arrangement to post-completion operation of investments financed by present operation, Operation & Maintenance arrangements, sustaining reforms and institutional capacity, and next phase/follow-up operation, if applicable)

The Second National Communication (SNC) represents the current status of GHG emissions in the country, but it also establishes the road map of the areas they are interested in working over the short to medium term. Two key components of the SNC are the Draft National Adaptation Strategy to Climate Change (Chapter 6 of the SNC) and the National Mitigation Plan (Chapter 7 of the SNC). The Adaptation Strategy presents a preliminary list of the most vulnerable sectors to climate change and describes possible directions to address them. Annex 2 to this ICR presents a summary of these vulnerabilities and the country's adaptation strategy.

The GOA has expressed interest in working with the World Bank in further developing the country's Adaptation Strategy. In particular, one of the key ecosystems that are expected to be affected by climate change in Argentina are the Andean Oases. These oases are not only very important from a biodiversity point of view, but they also support very important economic sectors such as the agriculture, livestock, and energy sectors. The Cuyo region in Argentina is expected to face a critical lack of water resources for its economic activities in the medium term. In this context, the Bank has started discussions with the GOA on the possibility of developing an adaptation program using GEF funds in the Andean Oases.

Finally, the GOA has also expressed interest in preparing the Third National Communication to the UNFCCC with the support of the World Bank.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation
(to current country and global priorities, and Bank assistance strategy)

The project continued to be consistent with the country's current development priorities and the Bank's country and sectoral assistance strategies. Argentina has played an important role in the Climate Change Convention and the Subsidiary Meetings. Argentina is the third emitter of GHG in the region (0.9% of global emissions)[6] and a country that has shown substantial vulnerabilities to the impacts from Climate Change. The latest CAS identifies climate change as one of the key areas. Additionally, over last couple of years, the Bank has actively participated in Argentina by providing a strong stimulus and innovation in areas related to carbon finance and the GEF program. Furthermore, in the new CAS currently under preparation, the Bank expects to continue providing assistance to the country in key areas such as energy efficiency, sustainable transport

[6] WRI, Navigating the numbers, 2005.

and air quality, and carbon finance. These are all topics that have been analyzed under component C (National Mitigation Plan) of the SNC and are described in Annex 2 of the ICR.

Finally, the Bank understands that Latin America is very vulnerable to changes in global climate, therefore it is key to develop an adaptation strategy for the countries in the region. In this sense, the Republic of Argentina is quite advanced as component B included the development of a draft Adaptation Strategy. The Bank has also started contacts with SAyDS in order further the work done on adaptation options under the SNC.

3.2 Achievement of Global Environmental Objectives
(including brief discussion of causal linkages between outputs and outcomes, with details on outputs in Annex 2)

The Global Environmental Objective of the project was to support the development of country policies that will contribute to global efforts to mitigate climate change. This objective was achieved by financing incremental activities aimed at assessing the vulnerability of Argentine ecosystems to climate change and by contributing to the development of a national mitigation plan aimed at reducing current levels of GHG emissions. Both the vulnerability assessment and the national mitigation plan are included in chapters 6 and 7 of the Second National Communication, respectively.

The key outcome indicators for this objective were defined as, first, the measurements of variation of local climatic patterns, and second, results from simulations of global circulation models using regional indicators. Since the effects of any policies aimed at reducing climate change take a long period of time to be felt, the measurement of these indicators was not done during the lifetime of the project. These indicators may be measured in a long term horizon. The project may give a baseline at best in order to compare future emission measurements.

Other key outcome indicators for the project's development objective are:

- Institutional procedures in place to prepare national communications.

The Climate Change Unit (Dirección de Cambio Climático) within the Secretary of Environment and Sustainable Development (SAyDS) has been strengthened with professional staff. There is also a subgroup of professionals in charge of advancing with the preparation of the Third National Communication. The GOA has unofficially requested the Bank's support in this new endeavor. This unit now has an area dedicated to adaptation to climate change. The objective of this area is to develop and carry out a long term adaptation strategy for climate change. A second area within the Climate Change Unit has also been charged with the objective of preparing the Third National Communication.

- Updated GHG emissions inventory and trend analysis; Local factors of emissions and carbon sequestration; Harmonized Energy Balances.

A trend analysis of GHG emissions was made possible by using the results from component A of the project and harmonizing energy balances, developing local emissions factors and including carbon sequestration, and updating GHG emissions inventories for the years 1990, 1994, and 1997.

The results show that GHG emissions in Argentina for the year 2000, not including Land Use Change and Forestry (LUCF), were 282.0 million tons of CO_2-equivalent (see Table 1 in Annex 2). LUCF is a net sink, therefore when it is included, GHG emissions for 2000 equal 238.7 million tons CO_2-eq. Finally, the total GHG emissions not including LUCF have steadily increased from 231.1 million tons of CO_2-eq in 1990 to 282.0 million tons of CO_2-eq in 2000. When LUCF is included, GHG emissions decrease between 1997 (242.0 million tons of CO_2-eq) and 2000 (238.7 million tons of CO_2-eq). Annex 2 describes the results by component in further detail.

These results are very important as they establish a baseline of emissions for the last decade of the 20th century. Any new estimation of GHG emissions that are carried out can be added to the existing inventories and trends can be easily analyzed.

- Regional climate change projections from modified General Circulation Model; Assessment of vulnerability of particular ecosystems to climate change (coastal zone, Pampa, Patagonia), Assessment of Economic impact of climate change.

The Regional Circulation Model was aimed at contributing to the climate modeling efforts being carried out in Argentina. Simulations on future regional climate episodes were used, and the results were fed into the development of the regional and national climate change mitigation and adaptation strategies.

Results from separate general circulation models (GCM) models vary considerably when they are used for predictions of regional climatic patterns. The reason for the discrepancies is that regional distribution of climate variables, such as precipitation and temperature, are often strongly influenced by local features (i.e. topography). The spatial resolution of GCM is typically not sufficiently refined to capture these features, and consequently the uncertainty of the predictions increases. GCM results are typically statistically downscaled in order to obtain regional data.

Considering the constraint, limited-area models nested in global circulation models are used to refine model resolution. This was the methodology used by this project for the development of regional climate scenarios in Argentina. Regional scenarios of climate change for Argentina were based on an increase in greenhouse gases according to the IPCC “business-as-usual” emission scenario. This scenario was used to predict how emissions and the atmospheric concentration of GHG might have evolved in the absence of global efforts to limit GHG emissions. Predictions of climate for South America were made over the period 1970 - 2050.

Results for the vulnerability studies and the socio-economic impacts of climate change are summarized in the paragraph below and Annex 2.

- Design of adaptation measures

The conceptual framework and the methodological approach adopted for the development of the draft National Adaptation Strategy contain key concepts of the Adaptation Policy Framework[7]

[7] Complete Document and related information in: www.undp.org/cc/apf.htm

such as the mechanisms of interactive participation with relevant stakeholders, the inclusion of adaptation to future climate, as well as the presentation of climate variability. A distinctive conceptual aspect of the study carried out under the project was the inclusion of the adaptation to climatic change that has already occurred. This was necessary, because in the southern part of South America climate trends that have already occurred have affected local economic activities. Thus, automatic response by the affected people to the changes caused inadequate adaptation measures which were later corrected (for example, the expansion of the agricultural frontier to the west of the Pampa).

Four systems were analyzed in great detail in this subcomponent: agriculture, urban settlements, water resources, and energy systems. The selection of these systems was based on a set of criteria which responded to the conceptual framework. These systems are sensitive to potential climate changes, and will require substantial modifications to adapt to the changes. Likewise, these systems embody strong links between adaptation and development policies. Other systems that were also included were: (i) the vulnerability of the maritime and the La Plata River coasts to sea level rise; (ii) the problems, needs and opportunities of the transport system arising from present and future climatic trends; (iii) the vulnerability of the oases of the Andes mountain foothills in Cuyo; (iv) the vulnerability of Patagonia; and (v) the impacts on tourism and health as well as the need to undertake studies of the vulnerability of the ecological systems.

The most significant of these vulnerabilities (or in some cases, opportunities) due to the climatic and hydrologic changes over the last decades are: (i) increase of the mean annual precipitation in almost all of Argentina, especially in the Northeast and in the marginal western zone of the traditional humid region; (ii) increase in the frequency of extreme precipitation patterns in most of the east and centre of the country; (iii) increase of temperature in the Andean region of Cuyo and Patagonia with glacier retreats; (iv) increase of river stream flows, and floods in all the country except in San Juan, Mendoza, Comahue and the north of Patagonia; (v) decrease of discharges in the rivers of Andean origin in San Juan, Mendoza and Comahue.

The most significant vulnerabilities projected for the period 2020-2040 are: (i) reduction of the water level in the La Plata Basin rivers because of surface and air warming; (ii) increase of the water stress in all the north and part of the west of the country due to the same cause; (iii) potential water crisis in Mendoza, San Juan and Comahue; (iv) increase in maintenance costs due to high frequency of intense precipitation and floods in the zones currently affected; (v) further glacier retreat (vi) increased vulnerability of some locations on the maritime seaboard and on the coast of the La Plata River because of the predicted rise in sea level.

As mentioned before, Argentina has done significant work in the field of adaptation to climate change. Next steps would include the further examination of the results from the draft adaptation plan and the preparation of a project on adaptation on a topic of priority to the government. In this regard, the Bank has started discussions with the SAyDS on the preparation of an adaptation program in the Cuyo region.

- Assessment of technologies and policies that aim at reducing the effects of climatic variations

The National Mitigation Plan (Chapter 7 of the SNC) focuses on five different types of measures: (i) energy efficiency measures, (ii) mitigation measures in the energy and transportation sectors, (iii) mitigation measures through the use of renewable energy sources, (iv) mitigation of GHG

emissions through carbon sequestration, and (v) mitigation measures through reduction in the emissions of enteric methane. These measures combined have an estimated potential of reducing more than 60 million tons of CO_2-eq over a 15 to 20-year time horizon. Annex 2 presents a summary of the measures analyzed by sector. The size of emission reduction presents a possibility of new GEF or CDM operations in the country.

3.3 Efficiency
(Net Present Value/Economic Rate of Return, cost effectiveness, e.g., unit rate norms, least cost, and comparisons; and Financial Rate of Return)

This is a GEF Enabling Activity, thus a formal economic analysis for investment was not done either at appraisal or at completion.

3.4 Justification of Overall Outcome Rating
(combining relevance, achievement of GEOs, and efficiency)
Rating: Satisfactory

This rating reflects the fact that the project achieved all the measurable outcome indicators defined in the PAD. Specifically, the project developed Argentina's Second National Communication to the UNFCCC; a regional circulation model was developed at the CIMA; nine vulnerability studies covering the entire country were completed; an initial Adaptation Strategy for Argentina was developed; five mitigation studies were completed addressing the key sectors in the economy; a communication strategy and education manuals were developed; and dissemination of results were carried out. The institutional capacity was strengthened. The results of these outputs are contributing to the development of policies at national and regional levels to mitigate climate change and adapt to the impacts from the changes. A series of follow up activities are being planned. Thus, the project has achieved its objective.

3.5 Overarching Themes, Other Outcomes and Impacts
(if any, where not previously covered or to amplify discussion above)

(a) Poverty Impacts, Gender Aspects, and Social Development

Climate Change is expected to have negative impacts in Argentina. Typically, it hits the poor the hardest. The key impacts expected in Argentina are:

- The volume of water of the Plata river basin is expected to decrease due to an increase in temperature, which will bring problems such as an increase in pollutant concentration and difficulties with river navigation;
- Increase in temperatures is also expected to bring water stress in the northern and northwestern part of the country. This would affect farming and the supply of drinking water;
- Precipitation levels are expected to decrease in the Andes, disrupting hydroelectric generation in the provinces of Mendoza, Rio Negro and Tucuman. Additionally, the existing economic development model in Mendoza and San Juan is expected to be severely conditioned—this model is based on irrigation from rivers born in the Andean oases;

- Glaciers are expected to continue their retreat tendency in the Patagonia and Cuyo regions;
- The high frequency of intense rainfalls and floods is expected to continue in the areas currently affected by these precipitation patterns;
- The expected increase in the sea level is expected to affect the country's coastline as well as the coast in the Rio de la Plata.

The Draft National Adaptation Strategy highlights key vulnerabilities of the country to climate change. It establishes a preliminary list of activities and how these activities will become important in the long run. In other words, the list presents likely priorities among the impacts and the associated activities. This list of priorities represents a preliminary pathway to adapt to the changes in the climate and reduce the impacts of this change.

(b) Institutional Change/Strengthening
(particularly with reference to impacts on longer-term capacity and institutional development)

One key aspect of this project is that it developed the capacity of Argentina to develop circulation models in order to forecast the changes in climate. This is a key tool to develop scenarios in order to analyze the potential impacts of climate change. All of the vulnerability studies relied on these scenarios.

Though a wealth of information was developed in this project, the Secretariat of Environment does not have the capacity to update GHG inventories. The FB was in charge of updating the inventories and made this information available to the SAyDS. But there is no person formally trained to carry out these activities. It is also necessary to create this capacity in the near future in the SAyDS. This is a key issue that should be taken into consideration in further National Communication efforts.

Nonetheless, the SAyDS has strengthened its Climate Change Unit as a result of the project and now has two sectors dedicated exclusively to Adaptation to Climate Change and to the development of the Third National Communication. Additionally, the SAyDS has been working actively on CDM projects. The new existing capacity is key in the development of the two new steps that will follow in the short term: the development of an adaptation project and the development of the Third National Communication.

(c) Other Unintended Outcomes and Impacts (*positive or negative, if any***)**

None

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops
(optional for Core ICR, required for ILI, details in annexes)

4. Assessment of Risk to Development Outcome

Rating: low

The risk that the development outcome of this project will not be maintained is low. Both adaptation and mitigation strategies were outlined and the second national communication was

developed. The Bank and the GOA have engaged in talks to develop a project in adaptation (one of the priorities outlined in the Draft National Adaptation Plan), and more recently, the GOA requested the Bank to support it in the development of the Third National Communication.

5. Assessment of Bank and Borrower Performance

(relating to design, implementation and outcome issues)

5.1 Bank

(a) Bank Performance in Ensuring Quality at Entry

(i.e., performance through lending phase)

Rating: Satisfactory

The project was designed in a manner that involved a high level of involvement from the Bank during the development of the project. Given the lack of expertise from FB in procurement matters (though their technical capacity is beyond question), the Bank Procurement Team requested that all activities in the project require prior review by the Bank. Even though this demanded a greater effort on behalf of the Bank, it ensured that all procedures be followed correctly and it also gave the Bank an additional tool to monitor to development of the different stages of the project.

(b) Quality of Supervision

(including of fiduciary and safeguards policies)

Rating: Satisfactory

The role of the Bank was to help the government in the design of the TORs and provide comments to the documents as they were prepared. The Bank also participated in the two seminars where the first and final drafts of the studies were presented and assisted in the enhancement of the overall quality. The Bank carried out periodical missions and was in constant contact with the client. The Bank worked closely with the client to ensure that the objectives of the project were met.

(c) Justification of Rating for Overall Bank Performance

Rating: Satisfactory

As described above, the Bank team has provided the due attention and technical support to the client in the preparation and the implementation of the project. Thus, the overall performance is rated satisfactory.

5.2 Borrower

(a) Government Performance

Rating: Satisfactory

The overall government performance is satisfactory. The nature of the project required a strong sense of ownership. The Steering Committee had a strong presence in all intermediate steps of the project, causing it, on one hand, to slow down the implementation, but on the other hand, to ensure that the final products are satisfactory to the government. The Implementation Unit was composed of individuals with established reputations in the field of climate change. This ensured a high level of quality of the products and the outcomes.

(b) Implementing Agency or Agencies Performance
Rating: Satisfactory

The Fundación Bariloche had a dual role in the project. It acted as recipient of the funds, directly receiving the funds. While the PIU handled procurement processes, FB dealt with contracting and payments to the consultants. It was also in charge of component 1 (updating GHG emissions inventory, developing national emission factors, and harmonizing national energy balances and GHG emissions inventories). Its work was of very high quality and delivered in an appropriate timeframe. With regards to the management of funds, there were no issues reported by the annual audits. Their overall performance is therefore satisfactory.

(c) Justification of Rating for Overall Borrower Performance
Rating: Satisfactory

Given the performance of the Government and the implementing agency, the overall borrower performance is rated satisfactory.

6. Lessons Learned

(both project-specific and of wide general application)

Quality of SNC. The key to develop a high quality SNC rested in obtaining high quality products (i.e. inventory, vulnerability, and mitigation studies). Technical capacity of local consultants in Argentina is high on average; therefore the quality of the products was good. Additionally, the PIU worked closely with contracted firms as soon as they were selected, providing feedback on their proposals and early drafts ensuring these would meet their objectives using technically sound methods.

National Ownership. As described above, there was a trade-off between speed of execution and project ownership on behalf of the GOA. There was a strong presence of the SC in all procurement steps, causing it to slow down the process, while ensuring that the final products are satisfactory to the government. The project could have sought to redirect the focus of the SC to more technical aspects. But having a SC would still be useful. In this way, the different institutions can participate in the development of the strategic documents where there are many cross sectoral issues such as energy efficiency, forestry, socio economic impacts, etc. To complement, the role of the PIU should be stronger.

Development of Future Climate Scenarios. In the climate change context, the only methodology accepted by the international community to estimate future climatic conditions is the development of climate scenarios. The methodology most commonly used is the use of global climate model combined with high resolution regional models. Nonetheless, these models have some shortcomings in the simulation of median and extreme precipitation in the Plata river basin. These models do not reproduce adequately the magnitude, the annual cycle and the characteristics of extreme precipitation. The project opted to develop a regional circulation model that reduces the uncertainty found in global climate models when applied at the local scale.

Analysis of vulnerabilities was done based on two types of data—data on the changes in climate for the last 30 or 40 years and predictions of climate/rain/temperature patterns for the period 2020-

2040. It was possible to draw robust conclusions, as they are based on roughly 40 years worth of data. The summary of the conclusions are described in Section 3.2 and in Annex 10.

Results of Assessments. The project produced three key results that provide useful lessons for the future climate change planning:

a. Greenhouse gas emissions inventories

The revised emissions inventories for the years 1990, 1994, 1997, and 2000 show that GHG emissions increased steadily between 1990 and 2000[8]. Additionally, LUCF acts as a sink, and the energy and the agricultural and livestock sectors are responsible for over 90% of the country's total GHG emissions. These results are very important as they establish a baseline of emissions for the last decade of the 20th century. Any new estimation of GHG emissions that are carried out can be added to the existing inventories and trends can be easily analyzed. This will be very useful in the long term, for instance, when the Third National Communication is completed,

b. Adaptation strategy and National Mitigation Plan

An adaptation strategy was developed as part of the SNC. The results that compose the adaptation strategy are discussed in Annex 2. The vulnerabilities identified by the different studies show that the significant climate changes that have occurred over the last 40 years have lead to an increase of the agricultural and livestock sectors frontiers to the north and west of the traditional agricultural area. This adaptation measure has been successful in economic terms in the short term, but can have significant environmental impacts according to climate projections for the coming decades.

c. Capacity building

Capacity building and Public awareness was targeted to all interested stakeholders in Argentina. There were 5 seminars carried out that were open to all interested parties (NGOs, Academia, Government). It was important that the results from all the studies carried out in the SNC were discussed in different seminars carried out with all interested stakeholders. Also, some of the members of the PIU often appeared in TV and radio programs where they discussed current issues related to climate change. Additionally, training manuals were developed for schools (targeted for children) with the objective of including them into the school curricula. Also, the institutional strengthening of the Climate Change Unit is essential to take charge of the adaptation and mitigation programs. Now the Unit includes professionals with experience in the analysis of vulnerabilities to climate change and of designing adaptation and mitigation measures, as they were part of the PIU and followed the process of development of the SNC. Finally, members of the PIU have learned the Bank and GEF business processes.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

The role of the SC in the procurement process caused several delays in the execution of the project. Its participation in this area should be limited in time and explicitly included in the project

[8] Total Net emissions including sink from Land Use Change and Forestry (LUCF) dropped between 1990 and 2000.

schedule. It is necessary to include the possibility of an “un-tying” vote in the rules of the SC. Delays were also repeated at the end of the project as SC had to review and approve final reports.

Changes in the composition of the PIU due to differences in opinion between the coordinator and some members of the SC are not necessarily on the issues related to the project. Wages for the PIU members were very low from the beginning of the project due to reasons related to the project and because the World Bank did not want to include a clause in the contracts allowing the contracts to be adjusted over time. When the project concluded, this member continues participating actively in issues related to the project, even though he does not have a contract, including the drafting of the text included in this annex.

Changing the location of the PIU is not good for the project, especially during project execution. It can only bring delays, administrative problems, and possible loss of documentation.

The permanent contact with World Bank team and flexibility are very positive aspects of the experience. The approach allowed the team to carry out the activities and the details not originally included. It also gave the team confidence and security in handling complex issues related to the project.

(b) Cofinanciers

Not applicable.

(c) Other partners and stakeholders
(e.g. NGOs/private sector/civil society)

Not applicable.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Component	Budget in US$	Actual Expenses in US$
A. Update of National Greenhouse gas emissions inventories	**$ 240,000.00**	**$ 238,000.00**
B. Vulnerability Studies		
B1. Vulnerability of the coastal zone	$ 45,000.00	$ 43,793.10
B2. Vulnerability of the hydro resources in the El Litoral-Mesopotamia region	$ 40,000.00	$ 39,286.01
B3. Vulnerability of the hydro resources in the Pampa Humeda region	$ 45,000.00	$ 38,775.21
B4. Vulnerability of the agriculture production area at la Pampa	$ 45,000.00	$ 43,428.28
B5. Vulnerability of the Patagonia region	$ 47,000.00	$ 45,862.07
B6. Socio-economic impacts of climate change	$ 37,000.00	$ 38,552.53
B7. Vulnerability of the energy sector	$ 25,000.00	$ 25,360.00
B8. National adaptation plan and regional adaptation plan	$ 31,000.00	$ 31,000.00
B9. Regional circulation models	$ 40,000.00	$ 38,775.51
Total for Component B	**$ 355,000.00**	**$ 344,832.71**
C. Mitigation Studies		
C1. Energy efficiency measures	$ 40,000.00	$ 40,000.00
C2. Mitigation measures in the energy and transportation sectors	$ 60,000.00	$ 60,000.00
C3. Mitigation of greenhouse gas emissions through the use of renewable energy sources	$ 40,000.00	$ 40,000.00
C4. Mitigation of greenhouse gas emissions through carbon sequestration	$ 45,000.00	$ 49,122.80
C5. Mitigation of greenhouse gas emissions through reduction in the emissions of enteric methane	$ 30,000.00	$ 44,827.59
Total for Component C	**$ 215,000.00**	**$ 233,950.39**
D. Public Awareness		
D1. Communications campaign	$ 56,000.00	$ 38,175.00
D2. Training program	$ 35,000.00	$ 31,398.60
D3. Project website	$ 8,000.00	$ 8,000.00
D4. Technical Assistance	$ 6,000.00	$ 5,143.00
Total for Component C	**$ 105,000.00**	**$ 82,716.60**
E. Second National Communication	**$ 19,000.00**	**$ 19,000.00**
F. Project Management	**$ 176,000.00**	**$ 199,353.18**
G. Project Audit	**$ 30,000.00**	**$ 22,147.12**
Project Total	**$ 1,140,000.00**	**$ 1,140,000.00**

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower		0.50	0.50	100.00
Global Environment Facility (GEF)	Grant	1.14	1.14	100.00

Annex 2. Outputs by Component

a. National inventories of greenhouse gases

The main objectives of this component were to upgrade national inventories of GHG emissions and to develop indicators for evaluation of national emission trends. The Fundación Bariloche (FB) was responsible for carrying out this project. GHG emissions reported in the National Communication include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. In addition, SO_2 emissions and precursors for tropospheric ozone (CO, NMVOC, NO_X) are also reported.

The tables below contain the main results from the GHG inventory. Table 1 presents a summary of GHG emissions for the year 2000 by source. Table 2 compares the total GHG emissions (with and without land use change) for the 1990, 1994, 1997, and 2000 inventories. Finally, Table 3 provides a detailed GHG inventory by source.

The main conclusions from this component are:

- Estimated GHG emissions (not including Land Use Change and Forestry—LUCF) for the year 2000 are 282.0 million tons of CO_2-equivalent. When LUCF is included, emissions for the same year equal 238.7 million tons CO_2-eq.
- LUCF is a net sink, absorbing 43.9 million tons of CO_2-eq during the year 2000.
- Total GHG emissions (no including LUCF) have steadily increased from 231.1 million tons of CO_2-eq in 1990 to 282.0 million tons of CO_2-eq in 2000. When LUCF is included, GHG emissions decrease between 1997 (242.0 million tons of CO_2-eq) and 2000 (238.7 million tons of CO_2-eq).
- Total GHG emissions (in CO_2-eq), can be disaggregated by type of gas as follows: 45.5% corresponds to CO_2, 30.1% to CH_4, 23.9% to N_2O, and 0.5% to the remaining GHG.
- The key emitting sectors are, first, the energy sector, with 46.8% of the total GHG emissions, followed by Agriculture and Livestock with 44.3%, Waste 5%, and Industrial processes with the remaining 3.9%. The large proportion of GHG emissions coming from the Agriculture and Livestock sector reflect the production characteristics of the country.

Additionally, a list of revised emissions factors can be found in Annex II to the SNC. Revisions to the 1990, 1994 and 1997 inventories can be found in Annex III to the SNC. A table with uncertainties surrounding the estimated GHG emissions can be found in Annex IV to the SNC.

Table A1-1. GHG emissions inventory by source, 2000.
(in million tons of CO_2-equivalent)

Category	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Total
Total Net Emissions [(1)]	84.38	85.43	67.56	0.95	0.33	0.005	**238.70**
1. Energy	118.71	12.24	1.01				**131.96**
2. Industrial processes	9.61	0.003	0.15	0.95	0.33	0.005	**11.11**
4. Agriculture and livestock		59.53	65.39				**124.92**
5. Land use change and forestry[(1)]	-43.94	0.58	0.006				**-43.30**
6. Waste		13.05	0.96				**14.01**
International bunkers	4.66	0.004	0.004				**4.71**
CO_2 emissions from burning of Biomass	12.48						**12.48**
Emissions from burning of grasslands		4.38	0.80				**5.18**

[(1)] Total Net emissions include emissions from Land Use Change and Forestry (LUCF). Positive (+) quantities refer to emissions, while negative (-) quantities refer to links.

Total CO_2 - equivalent emissions excluding LUCF	**282.00**
Total CO_2 - equivalent emissions including LUCF	**238.70**

Table A1-2. GHG emissions between 1990 and 2000.
(in million tons of CO_2-equivalent)

Category	1990	1994	1997	2000
Total emissions, including LUCF	216.29	223.34	241.96	238.70
Total emissions, excluding LUCF	231.05	257.52	270.91	282.00

Table A1-3. Detailed GHG emissions by source, 2007

Year 2000	CO_2 (1)	CH_4	N_2O	HFCs	PFCs	SF_6	Total
Total (Net Emissions) (1)	**84.38**	**85.43**	**67.56**	**0.95**	**0.33**	**0.05**	**238.70**
1. Energy	**118.71**	**12.24**	**1.01**				**131.96**
A. Fuel consumption (per sector)	117.66	1.23	1.00				119.89
1. Energy Industry	35.57	0.17	0.31				36.05
2. Manufacturing Industry	15.06	0.08	0.16				15.30
3. Transport	38.97	0.87	0.39				40.24
4. Residential	17.14	0.08	0.03				17.25
5. Commercial	3.13	0.00	0.04				3.17
6. Agriculture and livestock	7.51	0.02	0.06				7.59
7. Othters	0.29	0.00	0.00				0.29
B. Fugitive Emissions	1.05	11.01	0.01				12.07
1. Mineral Carbon	0.00	0.23	0.00				0.23
2. Production of Oil and Natural Gas	1.05	10.78	0.01				11.84
2.1. Production of Oil	0.00	0.25	0.01				0.25
2.2. Production of Natural Gas	1.05	10.53	0.00				11.59
Production of Natural Gas	0.00	3.21	0.00				3.21
Transport and Distribution	0.01	4.41	0.00				4.43
Consumption other than Residential	0.00	1.66	0.00				1.66
Residential Consumption	0.00	0.23	0.00				0.23
Venting	1.04	1.02	0.00				2.06
2. Industrial Processes	**9.61**	**0.03**	**0.15**	**0.95**	**0.33**	**0.05**	**11.11**
A. Mineral Products	3.27	0.00	0.00				3.27
1. Cement Production	2.69	0.00	0.00				2.69
2. Lime Production	0.51	0.00	0.00				0.51
3. Use of Limestones and Dolomite	0.07	0.00	0.00				0.07
B. Chemical Industry	0.87	0.03	0.15	0.00	0.00	0.00	1.04
1. Ammonia Production – to produce Urea	0.73	0.00	0.00	0.00	0.00	0.00	0.73
2. Nitric Acid Production	0.00	0.00	0.15	0.00	0.00	0.00	0.15
3. Production of adipic acid	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Production of calcium carbide	0.08	0.00	0.00	0.00	0.00	0.00	0.08
5 Others (Petrochemical Industry)	0.06	0.03	0.00	0.00	0.00	0.00	0.09
C. Metal Production	5.48	0.00	0.00		0.33	0.00	5.81
1. Iron and Steel	5.06	0.00	0.00		0.00	0.00	5.06
2. Aluminum	0.42	0.00	0.00		0.33	0.00	0.74
3. SF6 used for fusing aluminum and magnesium	0.00	0.00	0.00		0.00	0.00	0.00
D. Other Productions	0.00						0.00
1. Foods and Drinks	0.00						0.00
E. Production of Halocarbon and SF_6				0.00	0.00	0.00	0.00

Table A1-3. Detailed GHG emissions by source, 2007

Year 2000	CO_2 (1)	CH_4	N_2O	HFCs	PFCs	SF_6	Total
F. Consumption of Halocarbon and SF_6				0.95	0.00	0.05	1.00
4. Agriculture and Livestock		**59.53**	**65.39**				**124.92**
A. Enteric Fermentation		57.53					57.53
B. Management of Animal Manure		1.20	0.16				1.36
C. Rice Paddy		0.65					0.65
D. Burning Savannah		0.00	0.00				0.00
E. Burning Agricultural Wastes		0.16	0.04				0.20
F. Use of Agricultural Soil		0.00	65.19				65.19
G. Others		0.00	0.00				0.00
5. Land Use Change and Forestry(1)	**-43.94**	**0.58**	**0.06**				**-43.30**
6. Waste		**13.05**	**0.96**				**14.01**
A. Solid Wastes and Landfill		7.50					7.50
B. Human Feces		0.00	0.00				0.00
C. Domestic Waste Water		3.43	0.96				4.40
D. Industrial Waste Water		2.11	0.00				2.11
International Bunkers	**4.66**	**0.00**	**0.04**				**4.71**
A. Maritime Transport	1.74	0.00	0.01				1.76
B. Air Transport	2.92	0.00	0.03				2.95
CO_2 emissions from burning of Biomass	**12.48**						**12.48**
Emissions from burning of grasslands	**0.00**	**4.38**	**0.80**				**5.18**

(1) The net emissions are reported for the emission of CO2 corresponding to change in the land use and forestry. For the purpose of the report, the symbols for capture are always "-" and for emissions are "+."

(2) According to the IPCC Guidelines (Volume 3. Manual of References, pp. 4.2, 4.87), the CO2 emissions from agricultural lands are included in the land use and forestry. At the same time, the *Summary Report* 7A (Volume 1. Instructions for the report, Table.27) allows reporting emissions and capture of CO2 from agricultural lands, either in the agriculture sector in D. Suelos Agrícolas or in the land use change and forestry in D. Emissions and removal from the land. The Parties can choose the place where to report these absorptions and emissions to avoid double counting. In this case, the emission and absorption of CO2 for the part of the agricultural lands are reported under the land use change and forestry.

Source and Sink of GHG		**CO_2 Emissions**	**CO_2 Absorptions**	**Net CO_2**	**CH_4**	**N_2O**	**Total**
Land Use Change and Forestry		**CO_2 Equivalent (Gg)**					
A. Change in forests and other stocks of woody biomass		0,00	-15.750,14	-15.750,14			-15.750,14
B. Conversion of forests and pastures		9.248,99		9.248,99	583,78	59,25	9.892,02
C. Abandonment of managed lands		0,00	-48.747,49	-48.747,49			-48.747,49
D. Impact of the agriculture above ground		11.307,76	0,00	11.307,76			11.307,76
E. Others		0,00	0,00	0,00	0,00	0,00	0,00
Total Emissions of CO_2 Equivalent from Land Use Change and Forestry		**20.556,75**	**-64.497,63**	**-43.940,88**	**583,78**	**59,25**	**-43.297,85**

Total CO_2 Equivalent emissions – Excluding LUCF (a)	**282.000,75**
Total CO_2 Equivalent emissions – Including LUCF (a)	**238.702,89**

(a) The information in this row is required to facilitate the comparison of the data, because the Parties differs in the form in which they report the emissions and absorptions from the land use change and forestry sector.

b. Vulnerability of various ecosystems to climate change

Argentina is a country with high potential to be vulnerable by climate change: it has a high percentage of primary and farm based product exports. Additionally, there's a high dependency on hydro resources for the generation of electricity. In this context, several vulnerability studies were carried out to assess the impacts of climate change on the water resources of the humid region of the country, where most of the country's population is located and most of the economic activity of the country occurs. These studies will be the base for the future development of a Long-term Adaptation Plan. Also, this component supported the generation of regional climate change projections using high-resolution atmospheric circulation models. The regional climate change projections were used to describe potential changes in climate in a horizon of 10 to 40 years.

The following studies were completed under this component:

- Vulnerability of the coastal zone;
- Vulnerability of the hydro resources in the El Litoral-Mesopotamia region;
- Vulnerability of the hydro resources in the Pampa Humeda region;
- Vulnerability of the agriculture production area at la Pampa;
- Vulnerability of the Patagonia region;
- Socio-economic impacts of climate change;
- Vulnerability of the energy sector;
- National adaptation plan and regional adaptation plan;
- Regional circulation models.

Below is a list of the country's main vulnerabilities for the period 2020-2040, as described in the Draft National Adaptation Plan.

- The volume of water of the La Plata river basin is expected to decrease due to an increase in temperature. This will bring problems such as a reduction in hydroelectric power generation, increase in pollutants, and difficulties with river navigation;
- Increase in temperatures is also expected to bring water stress in the northern and northwestern part of the country. This would affect farming and the supply of drinking water;
- Precipitation levels are expected to decrease in the Andes, disrupting hydroelectric generation in the provinces of Mendoza, Rio Negro and Tucuman. Additionally, the existing economic development model in Mendoza and San Juan is expected to be severely conditioned—this model is based on irrigation from rivers born in the Andean oases;
- Glaciers are expected to continue their retreat tendency in the Patagonia and Cuyo regions;
- The high frequency of intense rainfalls and floods is expected to continue in the areas currently affected by these;
- The expected increase in the sea level is expected to affect the country's coastline as well as the coast in the Rio de la Plata.

A special circumstance in Argentina needs to be mentioned—the significant climate changes that have occurred over the last 40 years have lead to an increase of the agricultural and livestock sectors frontiers to the north and west of the traditional agricultural area. This adaptation measure has been successful in economic terms in the short term, but can have significant environmental impacts according to climate projections for the coming decades.

c. Mitigation studies

A National Mitigation Program (NMP) was formulated in the SNC, which included proposals for measures aimed at reducing national GHG emissions. The NMP helps identify opportunities for mitigation of

emissions through (i) measures that promote energy efficiency and energy savings, (ii) measures that promote renewable energy sources, (iii) programs aimed at reducing emissions in the transportation sector, and (iv) programs aimed at promoting carbon sequestration and substitution programs. It will also consider options to reduce methane emissions from both waste and enteric fermentation.

The following studies on mitigation measures were completed:

- Energy efficiency measures;
- Mitigation measures in the energy and transportation sectors;
- Mitigation of greenhouse gas emissions through the use of renewable energy sources;
- Mitigation of greenhouse gas emissions through carbon sequestration;
- Mitigation of greenhouse gas emissions through reduction in the emissions of enteric methane.

These studies have identified feasible measures and mitigation policies that could reduce GHG emissions by more than 60 million tons of CO_2-eq over a 15 to 20 year time horizon. Table C-1 gives a summary of the mitigation measures analyzed and their expected impacts in terms of tons of CO_2-eq eliminated or avoided. The main problem with these measures is that they typically have a high initial cost and, given the limited financial resources available in the country and the priority given to social programs and to reducing poverty, it will be difficult for these measures to take shape without outside support.

Table A2-1. Mitigation options and its estimated impact

Sector	Impact on resources	Estimated reduction GHG emissions, in million tons of CO_2-eq
Energy efficiency measures		
Improve insulation in buildings	- Reduce consumption of natural gas for heating. - Reduce consumption of electricity for space cooling.	1.17
Compact fluorescent lamps	Save electricity consumption	1.11
Efficient refrigerators	Reduce electricity consumption	0.16
Cogeneration in the industrial sector	Increase energy efficiency	7.80
Measures in the transportation sector		
a.) Inter-urban corridors		
Good driving practices	Reduce fuel consumption	2.62
Speed control	Reduce fuel consumption	8.87
Mode shift (from truck to rail), for the transfer of products	Reduce fuel consumption	11.73 (1)
b.) Urban corridors (2)		
Good driving practices	Reduce fuel consumption	15.27
Establish schedules for commercial vehicles (freight transport)	Reduce fuel consumption	9.28
New technologies	Reduce fuel consumption	0.27
Modal shift	Reduce fuel consumption	0.72
Renewable energy		
Solar energy	Residential, Industrial, and commercial sectors	4.10
Biogas	Residential and commercial sectors	7.65
Geothermal	Agricultural, Industrial, generation, and commercial sectors	1.79
Wind energy	Generation sector	11.41
Mini-hydro	Generation sector	1.74
Biomass	Generation sector	2.48
Biodiesel	Transportation sector	14.00

Table A2-1. Mitigation options and its estimated impact

Sector	Impact on resources	Estimated reduction GHG emissions, in million tons of CO_2-eq
Carbon sequestration		
Mesopotamia region	Increase forest cover	19.65
Buenos Aires region	Increase forest cover	12.46
Andean Patagonia	Increase forest cover	6.00
Irrigated forest plantations	Increase forest cover	1.60
Western Parana	Increase forest cover	2.16
Other	Increase forest cover	1.00

Notes:
(1) This option has a very high marginal mitigation cost, and is therefore not recommended as a short run solution.
(2) Marginal mitigation costs vary by region. While some options may be attractive in one region, they may not be in another. Chapter VII of the SNC has detail on the costs by region.
(3) Total GHG emissions eliminated for the period 2005-2015

d. Capacity building and public awareness

The objective of this component was to encourage the development of education plans and outreach programs centered on the issue of climate change. The program consisted of two major subcomponents, (i) Training program for government officials and interested individuals, and (ii) Promotional campaign to disseminate information on climate change, and to promote the activities of the training program. A total of four seminars were carried out where individuals from all sectors of society (NGOs, academia, government, international organizations) were invited to participate. Additionally, the results of all the work done by this project was made publicly available on the Secretariat of Industry's website. (http://www.ambiente.gov.ar/default.asp?IdArticulo=1124) and the Fundación Bariloche website (http://www.fundacionbariloche.org.ar/2cn.htm).

e. Drafting of the Second National Communication to the UNFCCC.

This component addressed the actual generation of the Second National Communication to the UNFCCC. The document compiles results from the various project subcomponents and other publicly available information, such as national statistics on population, social and cultural characteristics, economic indicators, and institutional settings.

Annex 3. Economic and Financial Analysis
(including assumptions in the analysis)

The economic loss in Argentina associated to climate change is difficult to determine, due to the lack of data and the complex linkages among sectors. Costs could be structured into two categories: (i) Productivity losses derived from climate changes. Weather changes affect temperature and hydrologic balance, and have influence in floods and economic activities such as agriculture and tourism. Argentina is one of the 14 countries of the world most affected by flooding events, reaching economic losses greater than 1.1% of GDP. Impacts on agricultural production derived from climate change are difficult to ascertain, as production practices may help exacerbate or diminish climate impact; soil salinization, and erosion are linked to poor irrigation and land management practices. (ii) Economic costs associated with cleaner production of energy, and energy use, resulting from emission standards and regulation. High upfront costs, and market and regulation barriers prevent investments in energy saving activities. Clean transport technologies involve higher costs not necessarily recoverable in the short term.

While the greater frequency of storms causes flooding and damages to physical assets, it can also deliver more freshwater as the storms move inland to replenish reservoirs including those for hydropower and recharge groundwater.

This is a GEF Enabling Activity, thus a formal economic analysis for investment was not done neither at appraisal nor at completion.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Supervision/ICR			
Walter Vergara	Lead Chemical Engineer	LCSEN	TTL
Antonio Leonardo Blasco	Financial Management Specialist	LCSFM	FM Specialist
Jose Ramon Gomez Guerrero	E T Consultant	LCSEN	
Hernan M. Gonzalez Figueroa	Consultant	LCSEN	
Ana Maria Grofsmacht	Procurement Analyst	LCSPT	Procurement
Andres Mac Gaul	Sr Procurement Spec.	LCSPT	Procurement
Keiko Ashida	Operations Analyst	LCSEN	Operational Issues

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY03		69.35
FY04		18.98
FY05		0.00
FY06		0.00
FY07		0.00
Total:		88.33
Supervision/ICR		
FY03		0.00
FY04		1.83
FY05		28.83
FY06		19.11
FY07		3.55
Total:		53.32

Annex 5. Beneficiary Survey Results
(if any)

Not Applicable.

Annex 6. Stakeholder Workshop Report and Results
(if any)

Not Applicable.

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

Summary in English

STEERING COMMITTEE (SC): Positive: Composed by representative areas of the government for the project. Members had great curricula and relevant expertise and prestige. The experience of the members of the SNC allowed for sound studies and evaluations of the studies. The establishment a Directive Board for the SC allowed for a more agile management. Negative: The role of the SC in the beginning of the project (evaluation of TOR, long lists, criteria for the selection of consultant, evaluation of short lists) caused several delays in the execution of the project. Its participation in the former areas should be limited in time and explicitly included in the project schedule. It is necessary to include the possibility of an “un-tying” vote in the rules of the SC. Delays were also repeated at the end of the project as SC had to review and approve final reports.

PROJECT IMPLEMENTATION UNIT: Positive**:** Excellent operational group dynamic during the first stage of implementation, with direct links to FB, the SC, the World Bank, and the consultants. This allowed the project to develop quickly and recover time lost by the SC. Negative**:** Changes in the composition of the PIU due to differences in opinion between the coordinator and some members of the SC, and not necessarily due to issues related to the project. The new project Coordinator shared this function with other responsibilities in and out of the country. The PIU was initially an academic body of five members plus an assistant, and ended up having only two members in the final stages of the project. One of the two remaining members was the only one of the active members in the project, but did not participate in any meeting relative to the project even though he was the only one knowing the history of the project. The negative aspect was exacerbated by the fact that his wages were reduced after contracts expired and were renewed. Wages were very low from the beginning of the project due to reasons related to the project and because the World Bank did not want to include a clause in the contracts allowing the contracts to be adjusted over time, even though the members worked for more than 3 years. Once the project concluded, this member continues actively participating in issues related to the project, even though he does not have a contract, including the drafting of the text included in this annex.

Evaluation teams: Selected by the SC, some of them, mainly for the evaluation of final reports should have been compensated for their services. This was not originally planned in the project. Evaluators should be compensated in order to have access to better technical individuals.

Project Schedule: Some activities that take place alter the drafting of the final report need to be included in the schedule. This includes a final session of the SC finalizing the duties of the PIU, the FB, and the SC. It also includes determining who are the recipients and custodians of the final project documents, as well as who is in charge of releasing the final report. Contracts of the PIU should last until the final reports has been released to the public.

Moving of the PIU. Changing the location of the PIU is not good for the project, especially during project execution. It can only bring delays, administrative problems, and possible loss of documentation.

World Bank. The permanent and flexible contact with World Bank authorities is a very positive aspect of the experience. This contact allowed the team to carry out those activities and details not originally included. It also allowed the group to have peace of mind knowing that the project is operational and that all parts are in agreement in relation to having all necessary documentation to handle all contracts. This includes the entire process from the design of TORs to the delivery of the final reports. In a couple opportunities there were some delays from the World Bank regarding requests for no objections. This work approach gives the team confidence and security in the handling of complex issues related to the project.

In general:
Experience acquired during the design of the Second National Communication is very important and necessary in the planning for the Third National Communication. It is of utmost importance to capitalize on the formats and contents obtained during the SNC given the increasing importance of the climate change topic, and the necessary continuation in project management.

Comments in Spanish

COMENTARIOS SOBRE LA EJECUCION DE LA 2daCNCC.

COMITÉ DE CONDUCCION: ***Positivo*****:** Integra de modo transversal a las áreas de gobierno representativas para el proyecto. Participan miembros individuales de gran trayectoria profesional y con prestigio relevante. Esto permitió mayor solidez en los estudios y evaluaciones a realizar. La constitución de una Mesa Directiva, le dio mayor agilidad a la gestión. ***Negativo:*** Su intervención al principio del proyecto (evaluación de TDR, listas largas, criterios para la selección de consultores, evaluación de listas cortas) produjeron muchos atrasos en los cronogramas del proyecto. Su participación debería estar para estos tópicos pautada en sus tiempos y estos estar incluidos específicamente en los cronogramas del proyecto. Es necesario contemplar voto desempate dentro del reglamento del Comité de Conducción. Los atrasos se repitieron al final del proyecto con la necesaria participación en el estudio y aprobación de los Informes Finales.

UNIDAD DE IMPLEMENTACION DEL PROYECTO: ***Positivo:*** Excelente dinámica operativa durante la primera etapa de gestión de la UIP, con vínculos directos tanto con la FB como con el CC y el WB y los contratistas. Esto permitió corregir en gran medida los atrasos producidos en el CC. ***Negativa:*** Cambios en su conformación por discrepancias con algunos miembros del CC y no por temas propios del proyecto en sí. El nuevo Coordinador General compartía esta función con otras responsabilidades dentro y fuera del país. La UIP de ser un cuerpo colegiado de cinco miembros más un auxiliar pasó a tener dos miembros y solo uno de ellos con presencia y actividad permanente sin participar más en ninguna reunión relativa al proyecto pero siendo el único con conocimientos específicos de toda su gestión. Este aspecto fue agravado por reducirse los montos de los honorarios en lugar de su incremento como hubiera sido lo normal al vencimiento de los primeros contratos y oportunamente se solicitara. Los valores contractuales estuvieron desactualizados desde origen por razones propias de la economía del país y negativa del WB de establecer alguna cláusula de ajuste, incluso teniendo en cuenta el tiempo de contratación de más de tres años. Concluido el proyecto se continúa en actividad, sin vínculo contractual, incluso para la ejecución del texto aquí trascripto.

Cuerpo de evaluadores: Seleccionado por el CC, algunos de ellos, fundamentalmente para las evaluaciones de los informes finales han debido ser remunerados por sus servicios, esto no estaba contemplado originalmente en el proyecto y es necesario que así se haga para acceder más libremente a los mejores evaluadores que sea factible disponer.

Cronograma del Proyecto: Deben tenerse en cuenta los tiempos posteriores a la redacción del trabajo final, una vez entregado oficialmente el documento a la UNFCCC, debería realizarse una última sesión del CC cesando funciones a la UIP, a la FB y a sí misma y dejando en claro quienes son los receptarios y custodios de los documentos del proyecto y encargados de la difusión de su informe final. Hasta ese momento deberían tener vigencia los contratos de la UIP,

Mudanza de la UIP. No es positivo producir este tipo de cambios durante la ejecución de un proyecto, siempre resultará un trastorno administrativo y generar atrasos y posibles extravíos de documentos.

Banco Mundial. Se considera muy positivo el permanente y flexible contacto con las autoridades del WB, esto ha permitido llevar a adelante todas aquellas actividades y detalles no contemplados previamente, tener

la tranquilidad de estar operativa y documentalmente de acuerdo en relación a toda la documentación requerida para el manejo de múltiples contratos, desde la confección de los TDR hasta la entrega de los Informes Finales. En solo un par de oportunidades hubo un pequeño atraso de gestión en el trámite de No Objeción requerido. Este modo de trabajo genera confianza y seguridad en el manejo de temas complejos como este proyecto.

En general:

Se consideran de gran importancia las experiencias adquiridas durante la confección de la 2da CNCC y su necesaria aplicación para la programación de la 3raCNCC es fundamental para capitalizar formas y contenidos y dada la creciente importancia de la temática, la necesaria continuidad a la gestión de los proyectos.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

Not applicable.

Annex 9. List of Supporting Documents

- Second National Communication of the Government of Argentina to the UNFCCC.
- Estimación de escenarios regionales de cambio climatico mediante el uso de modelos climaticos regionales, October 2005, Fundación Bariloche
- Estudio Estrategico Nacional Para Hacer Uso de los Mecanismos Flexibles del Protocolo de Kioto, December 2002
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- Informe final B3 - Vulnerabilidad produccion agricola Pampa humeda, June 2006
- Informe final componente D2 - Programa de entrenamiento, June 2006
- Informe tecnico Subcomponente D2- Campaña Inf. Sociedad Civil, April 2006
- Infomes Finales Inventarios (A) y Modelos (B9), January 2006
- Informe final componente C4 Captura de Carbono, August 2005
- Informe final componente C3 Energía Renovables, August 2005
- Informe final componente C2 Efic Energ Transporte, July 2005
- Informe final componente C1 Eficiencia Energetica, July 2005
- Informe final componente vulnerabilidad sector energetico B7, July 2005

Annex 10. Summary of Adaptation Strategy

Argentina is a large country with great variety of geographical environments and diverse climates where human activities have different degree of dependence of climate and where climatic adaptation is also diverse and complex. This, added to the gradual nature of the Climate Change, to its uncertainties and to the fact that its impacts in the next years will not be as huge as to considerably hurt the economic development, makes difficult the adoption of a program only centred on the adaptation to Climatic Change. However, this does not imply that the climatic changes should not been considered in the public politics of socioeconomic sectors or regions, in which adaptation to future climatic changes is necessary to avoid considerable damages or for taking advantage of possible opportunities. Therefore, the guideline features of a public adaptation policy of to Climate Change developed in this Report were drawn on the basis of sectorial and/or regional analysis.

The conceptual framework and the methodological approach adopted for the development of the draft National Adaptation Strategy contain central concepts of the Adaptation Policy Framework like the mechanisms of interactive participation with relevant stakeholders and the consideration, not only of adaptation to future climate, but also to present climate variability. However, a distinctive conceptual aspect of this study is the consideration of the adaptation to climatic changes that already occurred. This was necessary because in southern South America have been climate trends that already had important impacts, aggravating, in certain cases, the vulnerability to climate extremes. In turn, these trends have stimulated important answers in the form of autonomous adaptation that should be improved and eventually corrected.

The selection of the systems, object of a more detailed analysis, took in consideration a set of criteria, which respond to the conceptual framework and to the purpose of the Report. These systems are sensitive to potential climate changes, and will require important adaptation to them. Likewise, they incorporate the bond between adaptation and development policies. The four systems that were analyzed with greater detail are agriculture, urban settlements, water resources and energy. Other systems were treated with less detail: the maritime and the Plata River coasts vulnerability to sea level rise; the problems, needs and opportunities of the transport system arising from present and future climatic trends; the vulnerability of the oasis of the Andes mountain foots in Cuyo; the vulnerability of the Patagonia and the impacts in tourism and health as well as the need to undertake studies of the vulnerability of the ecological systems.

In all the analyses, the year 2040 has been taken as time horizon to consider the vulnerabilities as well as the measures and policies of adaptation. This horizon is required in certain activities, like forestry, the territory planning and infrastructure works in general. It is unreasonably to propose measures to exclusively attend changes beyond that horizon; not only because of the lack of strong contemporary motivations, but because the related technological and economic national and international changes are of very difficult prediction. Although, the analysis period extends to the year 2040, it begins at present time, including adaptation measures to the climate variability and to the current climate trends.

As a first step, it was made the revision of vulnerability to climate change studies of the Second National Communication to the UNFCCC and of other Projects. The more relevant of these Projects, ordered by time, were:

(1) the First National Communication to the UNFCCC, in those sectors not covered by the Second;
(2) the AIACC Projects LA 26 (UBA), LA 27(INTA) and LA 29 (UNRC);
(3) the Strategic Project on Floods of the UBA;
(4) the Regional Environmental Agenda/Improvement of the Governability for Sustainable Development. PNUD ARG/03/001, T. Di Tella Foundation and SAyDS;
(5) the IAI SG II 057 Project on Climatic Change in the Plata Basin;
(6) the Vulnerability Studies of the Second National Communication;
(7) the Climate Scenarios Project developed by the T. Di Tella Foundation for the SAyDS.

Those studies identified the most important vulnerabilities to future climate change and current climate variability and trends as well as their geographical distribution. These vulnerabilities are discussed for each sector together with measures of adaptation, institutional aspects and, in some cases, associated costs.

The most important of these vulnerabilities (or in some cases, opportunities) due to the climatic and hydrologic changes of the last decades are:
a) Increase of the mean annual precipitation in almost every Argentina and especially in the Northeast and in the marginal western zone of the traditional humid region.
b) Increase of the extreme precipitation frequency in most of the east and centre of the country.
c) Increase of temperature in the Andean region of Cuyo and Patagonia with glacier retreats.
d) Increase of the river streamflows and floods in all the country except in San Juan, Mendoza, Comahue and north of the Patagonia.
e) Decrease of discharges in the rivers of Andean origin in San Juan, Mendoza and Comahue.

Vulnerabilities projected for the period 2020/2040 are:
f) Streamflow reduction in the Plata Basin rivers because of surface and air warming.
g) The increase of the water stress in all the north and part of the west of the country due to the same cause.
h) Potential crisis of the water in Mendoza, San Juan and Comahue.
i) Maintenance of the high frequency of intense precipitation and floods in the zones currently affected.
j) Furtherance of the glacier retreats.
k) Vulnerability of some locations on the maritime seaboard and on the coast of the Plata River by the sea level rise.

The four sectors analyzed with more detail include an overview of the system, its recent evolution, the climate influence and, when they had been important, how climate trends affected the development of the sector. In addition, it is included a brief outlook of future developments of the sector to assess its vulnerability according to the projected changes in the time horizon. As a consequence, a set of measures and policies of adaptation were proposed for each sector discerning those necessary to attend present variability and climate trends from those oriented to future changes. However, many measures serve both purposes as they attend present trends of climate that would be accentuated in the future. Due to the uncertainties, still important, of climate projections, not regret options adaptation measures have been prioritized since them will be convenient, even without considering Climate Change. The proposed measures are numerous

and various, covering an extensive spectrum of sub-sectors, regions and actors that cannot be enumerated in this Executive Summary.

For the analysis of the adaptation policies, the institutional and regulatory framework in force was analyzed. The advance of science, reducing uncertainties on future climate, together with the technological and socioeconomic evolution, requires a dynamic adaptation to Climate Change policy. This may imply modifications of the impacts of the Climatic Change or of the response capacity of sector or regions. Therefore, it is required of a continuous revision and elaboration of the measures of adaptation being undertaken. In view of this circumstance, it is proposed that the adaptation to Climatic Change policies be structured in a Program with continuity in time. This continuity requires that stakeholders have an adequate participation in the planning of the strategies and measures of adaptation.

Argentina faces serious social problems that require priority and rapid economic growth. In this context, a realistic adaptation to Climate Change policy cannot be a main reason for planning, but should respond and contribute to the regional and national strategies of development. Because of it, the distinctive feature of the Program should be its insertion in the mainstream of sectoral and/or regional policies as one of many variables, although in some cases, a relevant one.

Due to the strong climate trends of the last decades in Argentina, the adaptation policies should consider the autonomous adaptation processes to help and to correct them when necessary. Due to the weaknesses of the environmental monitoring system, it is proposed to reinforce it to watch the regional climate evolution, as well as to increase the research on Climate Change impacts. It is emphasized the need for new research to achieve, in not very long time, a substantial reduction of the regional climate scenarios uncertainties.

As a summary of the proposals, this document ends with the features of a National Program of Adaptation al Climatic Change that proposes an institutional structure centralized for coordination in a National Commission of Climatic Change (CNCC), but with planning and implementation strongly based on the institutions that attend the sectors and regions concerned by the Climatic Change. Exception to this feature would be some subprograms as those of information and awareness-raising that would be executed directly by the CNCC. In the majority of the subprograms, the CNCC's role would be that of support with information and training, the facilitation of funding identification and the monitoring and evaluation. Finally the funding alternatives, both national and international sources are discussed

Annex 11. Map


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BOLIVIA
PARAGUAY
CHILE
BRAZIL
URUGUAY
ARGENTINA
PACIFIC OCEAN
ATLANTIC OCEAN
JUJUY
SALTA
TUCUMÁN
CATAMARCA
SANTIAGO DEL ESTERO
LA RIOJA
SAN JUAN
MENDOZA
SAN LUIS
CÓRDOBA
SANTA FE
ENTRE RÍOS
CORRIENTES
MISIONES
FORMOSA
CHACO
BUENOS AIRES
LA PAMPA
NEUQUÉN
RIO NEGRO
CHUBUT
SANTA CRUZ
TIERRA DEL FUEGO
BUENOS AIRES
San Salvador De Jujuy
Salta
San Miguel De Tucumán
Santiago Del Estero
Catamarca
La Rioja
San Juan
Mendoza
San Luis
Córdoba
Santa Fe
Paraná
Rosario
Resistencia
Corrientes
Posadas
Formosa
Santa Rosa
Mar del Plata
Bahía Blanca
Neuquén
Viedma
Rawson
Comodoro Rivadavia
Río Gallegos
Ushuaia
Stanley
Cerro Aconcagua (6960 m)
FALKLAND ISLANDS (ISLAS MALVINAS)
A DISPUTE CONCERNING SOVEREIGNTY OVER THE ISLANDS EXISTS BETWEEN ARGENTINA WHICH CLAIMS THIS SOVEREIGNTY AND THE U.K. WHICH ADMINISTERS THE ISLANDS.
To Tarija
To Calama
To Copiapó
To La Serena
To Valparaíso
To Talca
To Los Ángeles
To Coihaique
To Puerto Montt
To San Pedro
To Cascavel
To Santa Rosa
To Santa María
To Artigas
To Tacuarembó
To Montevideo
Pilcomayo
Paraguay
Paraná
Uruguay
Salado
Colorado
Negro
Chubut
Chico
Deseado
Desaguadero
Laguna Mar Chiquita
0 100 200 300 400 500 Kilometers
0 100 200 300 Miles
70°W
60°W
50°W
30°S
40°S
50°S
80°W
ARGENTINA
ENABLING ACTIVITY FOR THE SECOND NATIONAL COMMUNICATION OF ARGENTINE REPUBLIC TO THE CONVENTION ON CLIMATE CHANGE
SELECTED CITIES AND TOWNS
PROVINCE CAPITALS
NATIONAL CAPITAL
RIVERS
MAIN ROADS
RAILROADS
PROVINCE BOUNDARIES
INTERNATIONAL BOUNDARIES
DECEMBER 2007