



MEDIUM-SIZED PROJECT PROPOSAL

REQUEST FOR FUNDING UNDER THE GEF TRUST FUND

GEFSEC PROJECT ID:
IA/ExA PROJECT ID: 3690
COUNTRY: Uruguay
PROJECT TITLE: Implementing Pilot Climate Change Adaptation Measures in Coastal Areas of Uruguay
GEF IA/ExA: UNDP
OTHER PROJECT EXECUTING AGENCY(IES):
DURATION: 4 years
GEF FOCAL AREA: Climate Change
GEF STRATEGIC OBJECTIVES: SPA
GEF OPERATIONAL PROGRAM: NA
IA/ExA FEE: US\$ 100,000

CONTRIBUTION TO KEY INDICATORS

IDENTIFIED IN THE FOCAL AREA STRATEGIES: The project will contribute to the SPA objective in the biodiversity focal area by reducing the risk of loss of globally significant biodiversity along Uruguay's coast and increasing the resilience of key coastal ecosystems. The project will specifically contribute to the SPA Outcome (a) climate change adaptive capacities have been built and vulnerability to the adverse impacts of climate change has been reduced.

*Terminal Evaluation/Project Completion Report

Financing Plan (\$)		
	PPG	Project*
GEF Total	25,000	975,000
Co-financing	(provide details in Section b: Co-financing)	
GEF IA/ExA		170,000
Government	5,000	2,728,200
Others		24,700
Co-financing Total	5,000	2,922,900
Total	30,000	3,897,900
Financing for Associated Activities If Any:		

* If project is multi-focal, indicate agreed split between focal area allocations

FOR JOINT PARTNERSHIP**		
GEF PROJECT/COMPONENT (\$)		
(Agency Name)	(Share)	(Fee)
(Agency Name)	(Share)	(Fee)
(Agency Name)	(Share)	(Fee)

** Projects that are jointly implemented by more than one IA or ExA

MILESTONES	DATES
PIF APPROVAL	N/A
PPG APPROVAL	March 2006
MSP EFFECTIVENESS	February 2008
MSP START	March 2008
MSP CLOSING	March 2012
TE/PC REPORT*	March 2012

Approved on behalf of the UNDP. This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the [Review Criteria for GEF Medium-sized Projects](#).

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LIST OF ACRONYMS

AIACC	Assessments of Impacts and Adaptations to Climate Change
ALM	Adaptation Learning Mechanism
ANEP	National Administration of Public Education, Secondary Education Council
CBD	Convention on Biological Diversity
CNCG	National Committee on Global Change
DINAMA	National Environment Directorate
DINARA	National Directorate of Water Resources
DINASA	National Water and Sanitation Directorate
DINOT	National Territorial Planning Office
ECOPLATA	Program for Integrated Management of Uruguay's Coastal Zones
FREPLATA	Environmental Protection of the La Plata River and its Maritime Front
GCM	General Circulation Models
GEF	Global Environment Facility
GIS	Geographical Information System
GoS	Government of Spain
GoU	Government of Uruguay
IDRC	International Development Research Centre
IMC	Municipal Government of Canelones
IMR	Municipal Government of Rocha
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature and Natural Resources
MVOTMA	Ministry of Housing, Land Use Planning and Environment
NCSA	National Capacity Self-Assessment for Global Environmental Management
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
GDP	Gross Domestic Product
PMEGEMA	Program of General Measures for Mitigation and Adaptation to Climate Change in Uruguay
PROBIDES	Biodiversity Conservation and Sustainable Development Program for the Eastern Wetlands
SNC	Second National Communication
SLR	Sea-Level Rise
SNAP	National System of Protected Areas
TNC	Third National Communication
UCC	Climate Change Unit
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
US\$	United States Dollars

TABLE OF CONTENTS

PART I - PROJECT	5
1. PROJECT SUMMARY	5
1.1. Overview.....	5
1.2. Project rationale, objectives, outcomes/outputs, and activities.....	7
1.2.1. Geographical Context	7
1.2.2. Socio-economic and Political Context.....	7
1.2.3. Biodiversity Context.....	8
1.2.4. Climate Change Context and Impacts on coastal biodiversity	9
1.2.5. Climate Change Institutional and Regulatory Context	13
1.3. Project Baseline	14
1.3.1. Anthropogenic threats to coastal biodiversity.....	14
1.3.2. Baseline programming - actions in the business as usual scenario to protect coastal assets	14
1.3.3. Gaps and barriers for adaptation to reduce biodiversity loss under climate change	18
scenarios	18
1.4. Alternative GEF Scenario	20
1.5. Outcomes, Outputs and Activities.....	22
1.6. Key indicators, assumptions, and risks.....	32
2. COUNTRY OWNERSHIP	34
2.1. Country Eligibility	34
2.2. Country Drivenness.....	34
3. PROGRAM AND POLICY CONFORMITY	35
3.1. Program Designation and Conformity	35
3.2. Project Design (including logframe and incremental reasoning).....	35
3.2.1. Incremental reasoning.....	35
3.3. Sustainability (including financial sustainability).....	38
3.4. Replicability.....	38
3.5. Stakeholder Involvement.....	39
3.6. Cost Effectiveness.....	39
3.7. Monitoring and Evaluation	40
4. FINANCING PLAN.....	40
4.1. Project costs.....	40
4.2. Project management Budget/cost.....	41
4.3. Consultants working for technical assistance components:.....	41
4.4. Co-financing Sources.....	41
5. INSTITUTIONAL COORDINATION AND SUPPORT	42
5.1. Core Commitments and Linkages.....	42
5.2. Consultation, Coordination and Collaboration between IAs, and IAs and ExAs.....	42
5.3. Project Implementation Arrangements.....	43
ANNEXES	47
Annex 1: Project Intervention Structure	47
Annex 2: Logical Framework Matrix	48
Annex 3 Indicative Activities.....	52
Annex 4: Total Budget and Work Plan	54
Annex 5: Monitoring and Evaluation Plan.....	57
Annex 6: Stakeholder Analysis.....	63
Annex 7: Terms of Reference of Key Staff.....	69
Annex 8: Stakeholder Consultations.....	71
Annex 9: Using DIVA Tool For coastal impacts and adaptation indicators for Uruguay's coast...	75

<i>Annex 10: Figures</i>	77
<i>Annex 11: Biodiversity values and main features of pilot sites</i>	82
<i>Annex 12: Literature cited</i>	86

PART I - PROJECT

1. PROJECT SUMMARY

1.1. OVERVIEW

1. The coastal area of Uruguay includes the La Plata River Estuary and the Atlantic maritime front. From an economic point of view, 77.6% of the Gross Domestic Product is derived from activities in the coastal departments¹, which are home to domestic and international tourism, real estate development, industrial and small-scale fisheries, navigation, and port services. From an ecological point of view, Uruguay's marine domain is a complex mosaic of interacting ecosystems in the La Plata River estuary and adjoining maritime front. These fall within the Patagonian Shelf Large Marine Ecosystem -a highly productive ecosystem of global significance. Aquatic biodiversity peaks in the saline zone at the mouth of the La Plata River. Coastal biodiversity is particularly high along the maritime front of the Atlantic Ocean and includes globally renowned sites such as the Bañados del Este --a Ramsar site and Biosphere Reserve-- with high habitat diversity, including sandy beaches, cliffs, rocky cape, wetlands and coastal lagoons and high species biodiversity particularly of migratory bird species.

2. Uruguay is implementing a number of measures to protect coastal assets that are crucial to national development. These include national sectoral policies and practices that are being developed to control key activities along the coast such as transport and tourism infrastructure development that affect terrestrial and coastal habitats; and upland agricultural practices and urban sewage disposal systems that affect aquatic habitats and species key to fisheries. It also includes land use planning and coastal zone management initiatives that Uruguay is pursuing at national, regional and local levels to complement the sectoral policies governing land use. These are further strengthened by recent initiatives focusing specifically on the protection of the country's biodiversity that underlie the services vital to much of development (among them, the design and implementation of a national system of protected areas).

3. As a result of these collective actions, under present climatic conditions, anthropogenic pressures on biodiversity will be largely under control and Uruguay will be well poised to conserve its coastal environments with benefits for its own national development goals as well as the delivery of significant global benefits. However, most of the policies, projects, and programmes implemented to date have focused on addressing problems within a framework that essentially assumes "unchanging" climatic conditions, even though Uruguay has considerable exposure to climatic risks². Thus, under climate change scenarios, baseline measures to conserve coastal ecosystems will not be sufficient. Increased storm surges and sea-level rises will produce saline intrusions and increased beach erosion; increased rainfall will have the dual effect of increasing runoff in key areas and changes in the saline balance in the estuary that are critical to the maintenance of the complex La Plata River and maritime front ecosystem. Of particular importance is the change in position of the saline front in the La Plata River that would reduce the effectiveness of current measures to safeguard this biodiversity rich area from over fishing and domestic pollution. Similarly current conservation measures for the coastal wetlands and lagoons along the Atlantic Ocean coastline would have reduced effectiveness. The result is that the coping range of key coastal ecosystems will be exceeded and considerable losses of globally significant biodiversity and coastal assets can be expected.

4. Current norms, programmes, and policies on land use planning and coastal management that the Government is promoting at the national and local levels provide an opportunity for Uruguay to address the additional costs posed by climate change driven risks. In addition, the Government of Uruguay with

¹ Uruguay's administrative units are "departments": Six of the 19 departments are coastal.

² OECD 2004

support from UNDP Bureau for Crisis Prevention and Reduction (BCPR) is currently working towards strengthening the national emergency response system and disaster risk management. While such initiatives address current climatic risks, the proposed GEF project, building on existing foundations, will develop effective adaptation strategies, policies, and measures in coastal areas. It will draw on tools and insights that the existing body of experience can offer to advance adaptation to climate change in coastal areas that contains globally significant biodiversity in Uruguay.

5. A number of barriers hamper the country's capacity to adapt to climate change. This includes low levels of understanding of the implications of climate change on sustainable development in general, and specifically of coastal areas. Weak technical capacities among national and municipal staff for planning and implementing adaptation measures is another key barrier. In addition, there are limitations in the availability of/access to relevant information (e.g. of vulnerable sites and on the potential economic losses induced by climate change) to enable sound policy and decision making to reduce the anticipated additional risks.

6. Given the complexity of overcoming the abovementioned barriers, and in view of the global significance of the unique La Plata River and its maritime front ecosystems, the Government of Uruguay is seeking assistance from GEF through its Strategic Priority on Adaptation (SPA) Fund to strengthen adaptive capacities and build resilience of coastal ecosystems³ to climate change. This project qualifies for SPA because it will generate global environmental benefits in the GEF biodiversity focal area while implementing measures that strengthen long term adaptive capacity of ecosystems to climate change. It will focus its pilot demonstrations on interventions in the *estuarine (mixohaline or fluvio-marine) environment*, where freshwater and salt water meet and mix, and the *Atlantic Coast environment* at the mouth of the La Plata River estuary and along the Atlantic coastal platform where the aquatic environment is saline. These areas have been selected in light of their vulnerability to climate change and their biodiversity value (refer section 1.2.4 and also see Figure 2, Annex 10). In particular the *estuarine environment* has important feeding, nursery and growths area for estuarine and marine fish species (See Figure 4, Annex 10) and the *Atlantic Coast environment* has coastal wetlands of international importance.

7. The strategy selected is to increase ecosystem resilience to climate change by integrating climate risks into Uruguay's baseline land use planning and coastal zone management initiatives. The project will contribute to the long term *goal* of reducing vulnerability of Uruguay's coastal ecosystems to climate change. In order to support progress towards this goal, the project *objective* is to put in place adaptive land planning and coastal management policies and practices to enhance the resilience of Uruguay's coastal ecosystem to climate change. To achieve this, the project will deliver three specific outcomes. The first outcome will incorporate climate-change risks into national land-use processes and key sectoral regulations governing coastal areas. The second outcome will be to pilot at the local level specific policies and measures that can be included in current land-use planning processes to protect those coastal ecosystems that are particularly vulnerable to climate-change and that are important for biodiversity conservation. The third outcome will be capture lessons from this project and facilitate replication in other parts of Uruguay's coastline which will also likely be affected by climate change. Cross cutting these three levels would be a) training for relevant institutions to facilitate the implementation of new plans and policies; b) awareness building and lessons learning mechanisms for a broader range of stakeholder to facilitate implementation of new policies over time; and c) building on existing risk management actions at both the national and municipal levels to advance the identification and uptake of adaptation measures.

³ Coastal Ecosystems in Uruguay include the mixo haline environments of the La Plata River and the Atlantic coast marine environments.

8. Three *outcomes* are envisaged that collectively will enable the achievement of the project Objective. These are as follows:

- Outcome 1: The incorporation of climate change risks into national level policies and regulatory frameworks governing coastal area management strengthens Uruguay's systemic capacity for adaptation.
- Outcome 2: Pilot adaptation measures for coastal ecosystems at risk under predicted climate change are implemented at local levels
- Outcome 3: Knowledge management and evaluation systems facilitate the uptake and replication of coastal management adaptation experiences in Uruguay

9. Such measures are related to the assessments of vulnerability and adaptation to climate change that were carried out under the framework of national studies and Uruguay's National Communications to the United Nations Framework Convention on Climate Change (UNFCCC). They are also included in the comprehensive Program of General Measures for Mitigation and Adaptation to Climate Change (PMEGEMA) of Uruguay and incorporated in Uruguay's Second National Communication (SNC) to the UNFCCC. The initial findings obtained from the execution of this project shall be included in the Third National Communication of Uruguay to the UNFCCC, to be submitted in 2009.

1.2. PROJECT RATIONALE, OBJECTIVES, OUTCOMES/OUTPUTS, AND ACTIVITIES

1.2.1. Geographical Context

10. Uruguay is located on the south-eastern side of South America, between 30 and 35° S and 53 -58° W. It is bordered by Brazil to the North and Northeast; Argentina to the West; the wide estuary of the La Plata River to the South; and the Atlantic Ocean to the Southeast. It has a land area of 178,000 km² and another 138,000 km² of jurisdictional waters⁴. The coastal area of Uruguay is approximately 680 km long, with 452 km along the La Plata River and 228 km along the Atlantic Ocean. The La Plata River, a funnel-shaped tidal estuary, is 38,000 km²⁵ and drains the second largest river basin system in South America, covering about 3,170,000 km², and providing the major source of freshwater runoff in the southwest Atlantic (24,000 cubic meters per second in average)⁶.

1.2.2. Socio-economic and Political Context

11. Uruguay has a population of 3,41,0037. Of this, 91.7% is concentrated in the capital city Montevideo (with approximately 1,273,934 inhabitants) and about 20 towns with more than 5,000 inhabitants, resulting in extensive rural areas with very low population density, particularly in the North of the territory. Almost 70% of the population is concentrated in the coastal departments⁸ (i.e., from west to east, Colonia, San José, Montevideo, Canelones, Maldonado and Rocha; see Figure 1 in Annex 10). The metropolitan area of Montevideo --represented by the capital city itself and the departments of Canelones and San José-- comprises the largest part of the country's population. Internal migration from the capital city to the coastal zones of Canelones and San José is growing.

⁴ Territorial sea: 125,057 km²; La Plata River: 15,240 km², Merín Lagoon: 1,031 km², Uruguay River: 528 km²; insular area on the Uruguay River: 105 km². Total area: 318,413 km². Source: Servicio Geográfico Militar

⁵ Calliari *et al.* 2003

⁶ Framiñan & Brown 1996, Nagy *et al.* 1997; Calliari *et al.* 2003; Brazeiro & De Feo 2006.

⁷ National Institute of Statistics. Census, Phase I, 2004.

⁸ Gallicchio *et al.* 2004

12. In 2002 the economy suffered a major downturn, with serious deterioration of social indicators. Unemployment rose to nearly 20% in 2002. The number of poor in 2003 was 870,000 of which 380,000 were under 18 years of age. Half the children under the age of 5 and 40% of those between 5 and 13 are below the poverty line.⁹ Although the economy grew about 10% in 2004, the country has been unable to reverse the social consequences derived from the crisis and from decades of an increasing socio-economic segmentation of its population. The Human Development Index (HDI) ranking has recently fallen to 43, the lowest ever occupied by the country since the UNDP has been conducting this study (1987)¹⁰.

13. From an economic point of view, Uruguay's coastal ecosystems play an essential role in the national economy. A substantial portion of the Gross Domestic Product (GDP) of the country (77.6%) is generated from and depends on the activities carried out in coastal departments¹¹. The most important coast-dependent economic activities are related to domestic and international tourism, real estate development, industrial and small-scale fisheries, navigation, and port services (the latter, mainly in the La Plata River). For example, the seasonal tourism in the Uruguayan coast during the summer of 2007 generated an entrance of foreign currency of 388 million dollars (2% of the GDP, equivalent to around the 10% of the country's annual income due to exports).

1.2.3. Biodiversity Context

14. Uruguay is located at the convergence of different bio-geographical regions and as a result has a complex mosaic of biological diversity for its size and subtropical nature. Much of this biodiversity is of global significance¹². The marine domain of Uruguay comprises the La Plata River and the adjacent coastal shelf and sea basin in the Atlantic Ocean. It encompasses a large coastal and estuarine influenced area, a wide continental shelf, and a deep basin situated at the confluence of the Brazil Current and Falkland (Malvinas) Current. The La Plata River is fed by the rivers Paraná and Uruguay with a freshwater inflow into the estuary of 7-12 x 1,011 m³y⁻¹. It is a complex river-dominated and wind driven tidal coastal system that is nutrient-rich, stratified and plankton-based.

15. This complex system can be divided into five environments each with relatively different biota, and few shared species among them. (See Figure 2 in Annex 10). These are: the *freshwater environment* (< 2 salinity units); the *estuarine (mixohaline or fluvio-marine) environment* (2-25 salinity units); the *Atlantic coastal environment* (> 25 salinity units and depths < 50 m); the *continental shelf environment* (50-220 m in depth); and the *shelf-break environment* (220-2300 m in depth). The meeting of these zones of different saline concentrations is referred to as a *frontal zone* (See Figures 2, 3a and 3b in Annex 10) and these are key habitats for the aquatic biodiversity and functional integrity of the larger ecosystem. Because of the enhanced productivity and concentration of aquatic life in these fronts, the associated communities are particularly vulnerable to exploitation.

16. The coastal, estuary and marine ecosystems of Uruguay are included within the "**Patagonian Shelf**" *Large Marine Ecosystem* considered a Class I, highly productive (>300 gC/m²-yr) ecosystem¹³. They are also part of the *Subtropical Convergence Ecosystem* where warm, cold and temperate waters mix. The meeting of the Brazil Current with the Falklands (Malvinas) Current forms the subtropical

⁹ Last available data INE (2004)

¹⁰ UNDP (2005) with figures corresponding to 2003

¹¹ ECOplata, 2001

¹² Natural grasslands cover more than 70% of the territory and constitute a significant portion of one of the last extensive temperate grassland ecoregions in South America: the *Uruguayan Savannas* (Dinerstein et al, 2005) considered one of the richest areas in grass species worldwide Groombridge 1992: 281. Uruguay is also a terrestrial and marine ecotone of significant biodiversity value. It marks the southern limit of the natural distribution areas of many tropical and subtropical plants and animals and several Andean and Patagonian species reach Uruguayan territory.

¹³ Based on SeaWiFS global primary production estimates (LMEW 2005)

convergence¹⁴, where the upwelling generates an area of high productivity favoring a rich marine biodiversity. According to the world vegetation map of NASA¹⁵, the productivity (biomass production) in the marine, coastal and estuary areas of Uruguay attains the highest possible values at global scale.

17. The coastal fringes of the La Plata River and its maritime front show high habitat diversity, including sandy beaches, cliffs, rocky capes and islands, coastal lagoons, and vast wetlands, many of which have global significance. For example, Bañados del Este, a UNESCO Biosphere Reserve and Wetland of International Importance under the Ramsar Convention, comprise some of the most important freshwater and coastal ecosystems of the Neotropical Region. The Eastern Wetlands are under consideration by the Western Hemisphere Shorebird Reserve Network (WHSRN) as a site of Hemispheric Importance for migratory shorebirds. This is significant as it recognizes Bañados del Este as a crucial link in the migratory chain of sites of hemispheric importance for species of migratory shorebirds¹⁶. This area has also been classified by Conservation International as one of the Earth's Last Wild Places of the wetlands biome¹⁷, considered a high biodiversity wilderness area.

18. At the species level Uruguay's coastal and marine ecosystems are home to numerous species of outstanding global importance, from ecological, economic and social standpoints. These ecosystems provide a favorable reproductive habitat for the Atlantic anchovy (*Engraulis anchoita*), a key species in the trophic system which is central to the diet of primary and secondary carnivorous species of significant economic importance such as hake (*Merluccius hubbsi*) and squid (*Loligo sp.*)¹⁸. Other species of commercial relevance include, white croaker, hawfish, and several species of tuna. Marine mammals that live in or visit this area include 23 species of Cetaceans, including the endemic La Plata dolphin (*Pontoporia blainvillei*), bottlenose dolphin (*Tursiops truncatus*), the southern right whale (*Eubalaena australis*), and the killer whale (*Orcinus orca*). Huge colonies of sea lion (*Otaria flavescens*) --with 15,000 individuals-- and the largest colony of fur seal (*Arctocephalus australis*) worldwide --with 250,000 specimens-- are found in Uruguay's marine domain, occupying rocky headlands and small islands (e.g., Isla de Lobos, Cabo Polonio).

19. Some of the major nesting colonies of wetland and coastal fowl of southern South America, such as the kelp gull (*Larus dominicanus*) and the royal tern (*Sterna maxima*), are found in Isla de Lobos and in Isla Verde of La Coronilla, respectively. Four of the seven marine turtles of the world can be found in Uruguay's waters, including the endangered green turtle (*Chelonia mydas*) and the leather back turtle (*Dermochelys coriacea*). According to some studies¹⁹, Isla Verde represents an important feeding ground for the green turtle.

1.2.4. Climate Change Context and Impacts on coastal biodiversity

Current climate variability in Uruguay's coastal areas

20. Uruguay's climate is mild, temperate and humid, according to Koppen's classification. There are clearly defined winter and summer seasons, and intermediate or transitional seasons (fall and spring). Mean temperature for the coldest month ranges from -3 to 18°C. In the warmest month, mean temperatures may reach above 22°C. Precipitations in Uruguay are characterized by their irregularity and

¹⁴ Olson *et al.* 1988

¹⁵ It measures photosynthetic production at world level with information compiled over three years of satellite data. See: <http://www.hcs.ohio-state.edu/hcs300/planet.htm>.

¹⁶ Rilla, 1992; Blanco 2001

¹⁷ Conservation International. 2003. Wilderness: Earth's Last Wild Places. Robles, P. (Ed.). CI and Sierra Madre. CEMEX.

¹⁸ Bakun, 1993

¹⁹ Quirici & Caraccio 2003 in Brazeiro *et al.* 2003.

by their inter-annual variability; however the annual mean precipitation varies from a minimum of about 1,000 mm over the Plata River coast and a maximum of about 1,400 mm over the northeastern region. River flow also shows natural variability typically varying on both seasonal and interannual timescales between 22,000 and 28,000 m³-s⁻¹ during El Niño and La Niña respectively²⁰. These water discharge variations coupled with wind variation result in a seasonal variability of the salinity in the upper layer of the river. Salinity levels are lowest when the onshore winds are lowest and river runoff highest; conversely when onshore winds are high, and runoff low, the salinity levels are higher²¹.

21. The occurrence of storms over Uruguayan coast is frequent. Those storms associated with southeastern winds are characterized by waves of high intensity resulting in SLR during the storm or “storm surge”²². These often result in important floods on the coast with serious damage depending on the severity of the event and its location. Indeed Uruguay’s natural hazards are mainly related to climate events: droughts, floods, frosts, heat waves and other meteorological phenomena from micro to medium scale (hail, tornadoes, stormy downpours, etc.).

Projected climate change

22. Although a minor contributor to global warming --due to its small size, relatively low population level and density, and low degree of industrialization-- Uruguay is likely to be considerably affected by global climate change. Based on data provided by assessments of climate change and variability impacts in the coastal areas of Uruguay, long-term trends for changes in the coastal climate and environment have already been verified. Some of these changes are a 200 mm increase in annual rainfall in Montevideo since 1883, particularly during the period 1961-1990²³; an increase of 0.5°C in air temperature and a decrease of 0.5 mm Hg in atmospheric pressure²⁴; an increasing trend in mean summer temperatures in the period 1961-1990²⁵; a 30% increase in the stream flow to the La Plata River during the last decades and a reduction in mean annual salinity along the Uruguayan coast²⁶.

23. Furthermore, although Uruguay is naturally prone to extreme hydro and meteorological events, projections indicate that these will become more intense. Indeed in August 2005 a wind storm event hit the south and east regions (Canelones, Maldonado, Montevideo and Rocha) where most of the country population live and sectors of housing, energy, communications as well as public services in general were seriously affected. Then, in May 2007 extensive flooding occurred which represented the disaster with the highest impact in the last 50 years affecting 110,000 people and causing damages over US \$ 500,000 for roads infrastructure and much more in housing, drinkable water and sewage systems. The coastal departments were amongst the most affected areas as their low lying grounds are prone to suffer drainage problems and floods events.

24. In terms of projected climate changes in addition to increased variability and extreme events initial results from scientific studies, such as the LA-32 project of the AIACC (Assessing Global Change Impacts, Vulnerability, and Adaptation Strategies for Estuarine Waters of the Plata River) and the ECOPLATA project, point to the relatively high degree of vulnerability of Uruguay’s coastal resources to changes in precipitation and river discharges, changes in regional winds, and a new location of the

²⁰ Nagy et al. 2002 a,b

²¹ Guerrero et al. 1997

²² CNCG 1997

²³ Bidegain and Deshayes 1992

²⁴ Nagy et al. 1996

²⁵ Panario and Bidegain 1996

²⁶ Nagy et al. 1996

subtropical anticyclone²⁷ of the South Atlantic Ocean (Table 1).

25. The most recent and accurate studies on sub-regional climate change scenarios (including Uruguay) were based on four Global Climate Models (GCM) approved by the IPCC: HADCM3, ECHAM4, CSIRO y GFDL, and two global socioeconomic scenarios of emissions: SRES A2 and B2, used to build the 2020, 2040 and 2070 time lines as well as specific exercises run for 2030, 2050 and 2080. To assess the national scale scenario the PRECIS dynamic downscaling was used through the HADCM3 GCM. These studies and others developed for the La Plata River basin and estuary reveal a sequence of climate and oceanic adjustment of physical parameters along the Uruguayan coast.

26. In general terms and for the time scale 2020-2050 the following climate changes are expected:

- Temperature. The average temperature increase for the country over the past century was of about 0.8 ° C and it is expected to warm at a rate of 0.3 - 0.5° C (2020) and 1.0 - 2.5° C (2050).
- Precipitation. Rainfall has increased 23% in the La Plata River lower watershed over the past 30 years and this trend is expected to increase though at a lower rate. Increased precipitation in summer and winter is expected over the next three decades although there is not full agreement across all projections.
- Sea and river (estuary) level rise. Uruguay has a critical vulnerability, in terms of SLR and storm surges (OECD). SLR will be critical by 2025 in the low lying coasts such as the Santa Lucia mouth, but in the case of this country, different from many others, the influence of the La Plata River is significant as it seems to be a more significant hazard in terms of water level rise, than the sea, on a short to mid term basis. In the La Plata River basin a change of +25-40% in river flow is expected and the combined influence of sea and river level rise will increase the estuarine water level up to 7 cm for 2020. For the 2100 scenario, an increase between 20 and 65 cm in the freshwater and estuarine environments is expected. Current increasing trends of storm surges, river flow, SLR and erosion are expected to increase impacts along the Uruguayan coast systems.

Impact of projected climate change on Uruguay's coastal biodiversity

27. Predicted climate changes will occur to different degrees in the different areas of this complex marine-estuarine ecosystem and will thus have differential effects on biodiversity. The following table summarizes the relative effect of estimated climate changes in each of the two macro environments of the La Plata River and its maritime front covered by this MSP (i.e., the estuarine and the Atlantic coast environments) illustrated in Figure 2 (Annex 10).

²⁷ This has moved to higher latitudes and is prone to more intense activity that will affect the whole coastal area where the main cities and principal ecosystems of the country are located.

Table 1: Vulnerability of Uruguay’s estuarine and Atlantic coast ecosystems to projected climate change and effects on biodiversity

	Estuarine (Mixohaline) environment	Atlantic coast environment	References
Biological relevance and diversity	Feeding, nursery and growths area for estuarine & marine species	Transitional and feeding area for marine species. Wetlands of international importance	Brazeiro et al.
Susceptibility to eutrophication	High	Low to moderate	Nagy et al. 2003a
Harmful algae blooming	Moderate to High	Moderate to High	Nagy et al. 2003a; Nagy 2005
Vulnerability to storm surges	High	Moderate to High	Nagy et al. 2005b; UCC 2005
Vulnerability to changes in river flow	Moderate to High	Moderate	Nagy et al. 2005b; UCC 2005
Anthropogenic impacts	Medium to High/ Urban, domestic & agricultural	Medium Land occupation, Agriculture	EcoPlata, 2000; Nagy et al., 2004

28. *Increased temperature* will cause an increase in water temperature and this would affect a variety of aquatic species including fish. *Increased rainfall* will increase run-off and transportation of sediments and agrochemicals by the rivers to the estuary and the sea. Increased nutrients, coupled with temperature increase, would result in algal blooms and 20% increase in hypoxic events.

29. Impacts from an increase in storm water discharge and increased stress on drainage systems can be expected due to increased rainfall. The result will be changes in conditions of salinity and circulation. This is of particular importance in the La Plata Estuary where changes in salinity will affect the location of the estuarine frontal system or saline front (see Figure 3a in Annex 10), and with it, the location of fish stocks and fisheries fleets. Although the species living in the estuarine environment are *eurohaline*, i.e they are adapted to tolerate high variability in salinity levels in their habitat, changes in salinity would bring about impacts to biodiversity. For example, the reduction in the salinity level of the estuary due to increased precipitation during the last 25 years over the La Plata River watershed has favored the invasion of very aggressive alien species of mollusks from eastern Asia. It could also induce changes on harmful cyanobacterial blooms (freshwater and very low salinity species), movement of fish nurseries, further expansion of invasive alien species, changes in primary production of the estuarine ecosystems, eutrophication and water pollution (due to the influence of salinity on biogeochemical reactivity), flocculation processes and the bacterial presence in water along the estuary.

30. Moreover changes in the position of the saline front would reduce the effectiveness of current measures to safeguard this biodiversity rich area from over fishing and domestic pollution. For example, Montevideo’s sewage system discharges in areas that have saline concentrations high enough to kill harmful bacteria and changes in the position of the saline front would have serious consequences as discharges would occur in water with lower saline concentrations. Similarly nursery areas of fish species of commercial value (e.g. *Micropogonias furnieri*) are protected through no take zones that restrict fishing in nursery sites during certain periods. Change in location of these nurseries would generate additional risks for juvenile fish populations and increasing the complexity of their management.

31. *Sea level rise* in addition to causing changes in salinity of the La Plata Estuary and the Atlantic lagoons will have direct impacts on Uruguay’s low lying coastline. These include the following: saltwater intrusion of surface and ground waters, and destruction of important wetlands.

- **Shoreline erosion** (i.e. deterioration, reduction or loss of sandy beach areas): The degradation or loss of the sandy beaches that characterize the country, as well as changes in coastal morphology and infrastructure, will have vital consequences resulting in the loss of key nesting sites for migratory bird as well as the loss of revenues generated by the tourism industry and other activities developed along the coast (e.g. port activities). The use of the beaches by the Uruguayan population is also relevant. Sea level rise would change an important feature of the Uruguayan character -- summer at the beach²⁸, particularly beyond the year of 2040.
- **Increased flood risk**, associated to SLR is estimated, varying from 2 m (2020) to 40 m (2100 causing frequent openings of coastal lagoons to the sea producing increased saline intrusion and destruction of coastal habitats and forcing wetlands systems to migrate inland. Coastal wetland flora and fauna respond to small changes in water levels, according to their ability to migrate to other areas. However, this migration path could be obstructed by inland land uses or by the ability of these systems to migrate in time sufficient to survive²⁹. By 2050 flooding would become a major hazard along the whole coast line of Uruguay due to the combined effect of increased precipitation, SLR and increased storm frequencies, all of which are influenced by a high pressure nucleus (the South Atlantic Anticyclone), which has become more common and intense since the late 70s. This poses a significant threat to the aquatic systems productivity and related biological processes. Thus moderate to severe impacts are expected for the whole estuarine-marine system function and especially, for ecosystems and wetlands of the Atlantic coast and the Western Montevideo area.

32. In summary, the projected climate change will exacerbate the impacts of current threats on coastal and marine biodiversity, either by magnifying current sources of stress (see 1.3.1) or directly by the progressive destruction or impoverishment of habitat and species. Baseline measures to conserve coastal ecosystems, to ameliorate land degradation, enhance the resilience of biodiversity, reduce sedimentation or coastal erosion, and improve livelihoods in the short term, are likely to be undermined by climate change and its impacts in the medium to long term. The result is that the coping range of key coastal ecosystems will be exceeded and considerable losses of coastal assets and globally significant biodiversity can be expected, in particular regarding coastal wetlands and marine biodiversity. Therefore, under projected climate change scenarios, additional action will be required to strengthen the current baseline actions for the protection of coastal and marine biodiversity.

1.2.5. Climate Change Institutional and Regulatory Context

33. As a party to the UNFCCC, Uruguay is carrying out a wide range of activities to fulfill its commitments. Among them a Climate Change Unit was created in 1994 (Ministerial Resolution N° 505/94), within the framework of the National Environment Directorate (DINAMA) of the Ministry of Housing, Territorial Planning and Environment (MVOTMA). Since its creation, the Climate Change Unit has conducted several national exercises to fulfill Uruguay's commitments under the UNFCCC. In addition, the General Act for the Protection of the Environment of 2000 (Act. N° 17.283), through its Article 19, mandates MVOTMA to establish climate change adaptation and mitigation measures, calls for regulation of the release of greenhouse gas emissions, and outlines the need for coordination with other public and private entities related to those issues.

²⁸ Nicholls, 1994

²⁹ IUCN, 1999

1.3. PROJECT BASELINE

1.3.1. Anthropogenic threats to coastal biodiversity

34. Uruguay's valuable coastal areas are already threatened by a number of anthropogenic activities such as pollution, increasing resource demand, and non sustainable management practices. However, these activities and their impacts are not homogeneous along the different sectors of the coastline. A description of the main anthropogenic pressures and their impacts in the zones covered by this MSP is included below:

- Along the coastline in the *estuarine environment*, the main pressures stem from urban development, tourism development (following the traditional sun and beach model), and agricultural activities. Thus this environment is the final recipient of urban effluents from Montevideo city and its metropolitan area via sewage systems, creeks and rivers. In the Santa Lucía river basin (a major sub-basin of the La Plata River, including the coastal departments of Canelones, San José and Montevideo), run off with high levels of sediments and agrochemicals from fruit, horticulture and livestock holdings are affecting the natural balance of coastal and wetland ecosystems. Impacts include eutrophication, decrease in water quality, reduction of available refuge for fishes and other biological groups, increased mortality of fishes and other groups, and harmful algal blooms.
- In the *Atlantic coast environment*, the main threats stem mainly from unplanned tourism development, illegal construction, introduction of exotic plant species to stabilize sand dunes (*Pinus*, *Acacia*), and infrastructure development (e.g., roads, bridges). In upland areas, main pressures stem from rice plantations and livestock grazing. Impacts include beach erosion, soil erosion, habitat degradation or loss, decreased landscape quality, decreased water quality, and harmful algal blooms.
- In both these areas, fishing practices that are not always sustainable represent a threat of estuarine, inshore and offshore coastal ecosystems. Impacts include the capture (by-catch) of non-target species, such as fish, marine mammals, marine invertebrates and seabirds, and over harvesting of some species.

1.3.2. Baseline programming - actions in the business as usual scenario to protect coastal assets

35. To address these *non-climatic* pressures on coastal biodiversity, increase resilience of coastal ecosystems and protect coastal assets that are crucial to national development, Uruguay is implementing a number of initiatives. These can be divided into two main divisions a) a set of sectoral policies, regulations and programmes that control key sectoral activities along the coast (such as upland agricultural practices, urban sewage disposal, fisheries), and b) land use planning and coastal protection initiatives at national and municipal levels. These two groups are summarized in the following discussion and constitute an important baseline for the MSP. The first will directly reduce stresses to coastal biodiversity under present climate conditions. The second group will indirectly control the stress through land use planning and coastal management process. This last group represents an opportunity within the scope of an MSP to mainstream adaptation to climate change into current policies and practices that directly govern the spatial use of land along the coast and thus indirectly affect future sectoral policies thereby in the mid term controlling stresses biodiversity. A third set of activities is also described in this baseline section – Uruguay's risk management programs. While these are not currently affecting biodiversity conservation they offer a critical baseline on which adaptation measures can build to increase the uptake in the medium term by addressing climate risk in the short term.

Sectoral policies, regulations and programmes controlling coastal related activities

36. With respect to the *agricultural sector*, Uruguay has developed a range of national policies to improve agricultural practices. For example, following the Soil Conservation Law passed in 1982, (regulated through decrees in 1999 and 2004), the national bank of Uruguay has conditioned rural credit to farmers using soil conservationist technologies aiming at avoiding and/or reverting soil degradation and erosion. More recently the Responsible Production Project, a World Bank agriculture-related loan with an attached GEF component, is promoting mainstreaming biodiversity conservation measures in productive landscapes and systems -- mainly the agriculture, small fisheries and livestock sectors. This project, under implementation by the Ministry of Livestock, Agriculture and Fisheries, has identified a number of priority areas for developing experiences of integrated natural resource management and biodiversity friendly production systems at a larger scale, two of them in coastal areas: the Santa Lucia river basin --involving the Departments of Canelones, San José and Montevideo (estuarine environment) - and the Laguna de Castillos basin in the Department of Rocha (Atlantic coastal environment).

37. As for *water resources and sanitation sectors*, a transboundary diagnosis developed by the UNDP/GEF programme FREPLATA (a joint initiative of Uruguay and Argentina which develops actions focused on environmental protection, pollution control and prevention, and habitat restoration in the La Plata River and its Maritime Front) has identified the need for increased pollution control and both countries have made significant commitments to this endeavor. A general plan for water resources and two sub-sectoral plans for water and drainage are under preparation as a priority for the GoU, The municipality of Montevideo will start in 2007 a new sewage plan, including pretreatment of currently untreated waste water and disposition through a sub aquatic emissary. This will include several cities of Canelones. The total investment planned is 140 million USD, with an IADB loan of 118 million USD, for the period 2007-2011. This plan will provide sanitation and storm water drainage to regions previously uncovered. In particular, special provisions are being taken to reduce and minimize peak flows during storms, to avoid flooding and erosion.

38. Sectoral policies and regulations regarding *fisheries* include *closing seasons* and *no take zones*³⁰ (See Figure 5 Annex 10) regarding several areas in the La Plata River and the Atlantic Ocean to protect aquatic species (Decree 149/997, resolutions of the Technical Commission of the Maritime Front on no take zones; Fisheries Law N° 13.833, joint resolutions of the Administration Commission of the La Plata River and the Technical Commission of the Maritime Front). An action plan for reducing by catch of shorebirds has been prepared in the framework of FAO's Code of Conduct for Responsible Fisheries, which sets out international principles and norms to guide responsible practices for the conservation, management and sustainable development of living aquatic resources respecting natural ecosystems and biodiversity. In addition the GoU with FAO is discussing the possibility of GEF support for piloting ecosystem based approach to fisheries in Uruguay reducing fisheries stress in current climate conditions still further.

39. These baseline activities aimed at controlling stress on coastal biodiversity are affected by a number of policies for land use and coastal management which are described in the following section.

Planning and policy frameworks regarding land use and environmental protection

40. The National Territorial Planning Office (DINOT) of MVOTMA is the main authority regarding the formulation and control of national policies on land use planning (National Decree 256/97). However, the bulk of legislation on this subject is prior to the creation of DINOT and is mainly a dispersed set of

³⁰ These are areas in which fishing is prohibited during specific times of the year. The boundaries of these zones are normally fixed geographical coordinates and they rarely consider any change in the nurseries' position.

norms, inadequate for modern sustainable development and territorial planning. The institutional framework also shows weaknesses for effective land use management, including overlapping competencies (e.g. the local governments of the 19 administrative units of the country -- i.e., the “departamentos”-- have certain autonomy regarding land use³¹), inadequate links to other planning units, and inadequate coordination between the organizations concerned with sectoral and intersectoral aspects.

41. As a response to existing weaknesses the Government of Uruguay is taking important steps to update, complement and harmonize general norms regarding land use and strengthen systemic and institutional capacities through the *Sustainable Land Use Planning and Development Bill*, currently under discussion by the National Congress. This innovative legal instrument introduces key elements, such as the definition of principles, territorial rights³² and duties of citizens, competencies, and specific planning instruments (e.g., guidelines, programs, strategies, local plans, etc.). It also defines procedures for control, public participation and stakeholder involvement, and interinstitutional coordination and cooperation. Once enacted, the central government, through DINOT, will define general policies for land use planning but municipal governments (Intendencias) will remain responsible for designing and implementing land use plans for sustainable development at the level of each Department of the country.

42. With regards to coastal management, the Sustainable Land Use Planning and Development Bill, in its Article 51, states that the coastline along the La Plata, Uruguay, Negro, Santa Lucía, Cuareim and Yaguarón rivers, as well as the Merín lagoon, and the Atlantic shoreline will be especially protected through the new land use planning tools. This will add to existing norms, such as the Urban Center Law, which requires a 150 m setback from the shoreline in any land zoning for urbanizations , and the Water Act of 1978, requiring a 250 m setback.

43. Until the abovementioned bill is enacted, under the current legal framework the municipal governments have the power to define and implement land use regulations within their jurisdiction. At this level, some progress has been accomplished regarding the coastal departments of Uruguay. The most innovative regulation is the *Land Use and Sustainable Development Plan for the Atlantic Coast of the Department of Rocha*, in force since 2003³³. This plan includes most of the definitions and categories set out in the Sustainable Land Use Planning and Development Bill currently under study by Congress. The Plan seeks to reduce the urban development of the coastline to the maximum possible, discouraging linear and continuous urban development along the shoreline, and promoting norms to enhance the coastal buffer belts and severe restrictions for construction in non- or less urbanized areas. It outlines a strategic zoning defining protected areas and areas of special concern for conservation³⁴, which will require specific management plans. It also defines a number of sectors which will require special land-use plans³⁵.

44. Three of the remaining coastal departments, Montevideo, San José and Maldonado, also have regulations regarding coastal management, though not as complete as Rocha’s plan. With regards to Canelones, the local government is currently promoting the *Strategic Land Use Plan for the Ciudad de*

³¹ According to the Municipal Organic Act (Ley Orgánica Municipal)

³² Every citizen has the right to call for a territorial planning that benefits the general public.

³³ This plan was enacted by the municipal legislature (Junta Departamental) through Decree N° 12/2003. The enactment of this norm is one of the outcomes of a former GEF funded programme: PROBIDES -Programme for the conservation and sustainable development of the Eastern Wetlands (Bañados del Este)-. This is an on- going inter-institutional program launched in 1993 by the MVOTMA focusing on land planning in the departments of Rocha, Maldonado, Lavalleja, Treinta y Tres, and Cerro Largo. The development of regional land management plans along the Atlantic coast is a main objective. Since the conservation of the wetlands is seen as an integral goal, the program addresses actions in social, economic and institutional development, sustainable use of biodiversity, and local capacity building

³⁴ E.g., Laguna de Rocha, Laguna de Castillos - Cabo Polonio, the islands along the Atlantic coast of Rocha, all of them of significant global biodiversity value.

³⁵ As an example, the area between the coastal lagoons of Garzón and Rocha.

la Costa (i.e., the City of the Coast), an area which comprises a number of urban centers eastward of the capital city, along 40 km in the shoreline of the Plata River. The Costaplan, as this plan is known, sets out a zoning scheme, including development zones, protected areas, areas of environmental restoration, and other special areas.

45. Complementing national land-use planning and environmental protection policies there are additional activities that focus on improving the coastal zone management of specific areas through specific programmes. Of these the most significant one is the *ECOPLATA* programme that is the result of an inter-institutional agreement³⁶ to support integrated coastal zone management of the Uruguayan portion of the La Plata River, partially funded by the Canadian International Development Research Centre (IDRC). This programme fosters integrated coastal zone management, focusing on social and ecological problems related to coastal natural resource depletion under increasing pressure from social systems. Currently ECOPLATA is undertaking the preparation of a strategy on how to adapt, redesign or remove any coastal facility as required to protect the coastal ecosystems and resources. This report under preparation is intended to orient decision making and management by coastal municipalities. Up to now ECOPLATA has established a cooperation process for land planning and actions to reduce erosion with a group of mayors and technicians from the coastal municipalities covered by this programme. The Municipal Government of Canelones has subscribed an agreement with MVOTMA, through DINOT and ECOPLATA, to achieve an affective implementation of the land planning and sustainable development of the coastal zone of this Department. MVOTMA will provide technical support and financial support for capacity building (400,000 USD) and the Municipality will make necessary financial investments. Strategic coastal plans are about to be developed for each coastal department of the country.

46. A key tool for implementing land use planning at the site level, both within and outside protected areas, is Uruguay's environmental impact assessment (EIA) system. The current legal framework (the *EIA Act* --Law 16.466 of 1994 and its corresponding statutes) defines a number of activities in coastal areas which require an *early environmental clearance*³⁷ from DINAMA (the main authority according to this law), including national and municipal roads, bridges, harbors, docks, tourism resorts and constructions within the 250 meter setback from the shoreline, as well as any intervention in protected areas not included in the corresponding management plan. In 2005 the EIA Act was amended and a new instrument introduced: the *assessment of location feasibility*, which is required prior to the environmental clearance for a number of activities regarding coastal areas, such as the construction of commercial and passenger ports and tourism resorts. A range of fines, from USD 100 to USD 60,000, can be applied to infringements to this law.

47. Finally, under land planning frameworks and as part of the National Biodiversity Strategy, a National Protected Area System (NPAS) is being developed to strengthen land-use planning and protect representative samples of biodiversity. The GoU in partnership with GEF—through the Project Catalyzing the implementation of Uruguay's National Protected Area System-- will set up the overall framework for the system and develop capacities for its effective management in areas of global biodiversity. This does not specifically address only the coastal zone but rather the entire cohort of the nation's biodiversity; however it will provide a sound planning structure under current climate change conditions.

³⁶ Participant institutions include the National Environment Agency (DINAMA), the National Directorate of Water Resources (DINARA), the Oceanographic, Hydrographic and Meteorological Service of the Army (SOHMA), and the School of Sciences of the University of the Republic (UDELAR).

³⁷ This early environmental clearance regulation classifies proposals as "A" when no significant impacts are expected, "B" when moderate environmental impacts are expected, and "C" when significant environmental impacts are expected. Projects classified as "B" require a sectoral environmental impact study, and those classified as "C" a complete environmental impact study and public hearing

Risk Management and National Emergency System

48. A third component of the baseline relates to Uruguay's efforts to develop a National Emergency System (SNE) to increase the country's capacity to address disasters and emergencies. First established in 1995, climatic risk is now becoming the SNE's priority given the fact that the main hazards in the country are related to hydro and meteorological events. Indeed, after the August 2005 wind storm the GoU requested support from UNDP BCPR to strengthen its national risk policy and improve risk management through developing updated policies, strategies, and legal frameworks alongside institutional strengthening at national and local levels and the consolidation of risk related information needed for decision making and the national early alert system for disasters.

49. This risk management baseline programme will provide a strong basis on which to build adaptation measures as the SNE and subsequent risk management actions have increased the awareness and interest of local populations in regard to risk and disasters. This has been further heightened following the extreme events of 2004 and 2007 (winds, storms, and floods). There is thus an increased perception of climate related hazards in turn providing a more receptive audience to the effects that climate change could bring and the need to increase adaptive capacities. Furthermore, there is now a growing consensus that insights can be gleaned from the body of experience in risk management on how to reduce vulnerability and increase adaptation to climate change.

50. To explore these potential links further a workshop was convened recently in Montevideo on Climate Change Vulnerability and Adaptation and Climate Risk Management in Latin America. Amongst the lessons learnt in this workshop are the similarity of the hazards both fields address, the potential of tools feasible to apply to both and the basic idea of using risk management planning over a shorter time line to develop national and local expertise and awareness in order to reduce the current climatic risk and to prepare future strategies incorporating longer time lines of intervention and policies. Thus approaches to management of current day climate risks can provide solid baselines on which adaptation measures can build, particularly in terms of the development of information bases and changes in *mind-sets*. Conversely adaptation approaches could bring valuable insights to make these risk management more robust under climate change scenarios as baseline risk management actions will not be sufficient, as extreme climatic events are likely to become more intense and frequent.

1.3.3. Gaps and barriers for adaptation to reduce biodiversity loss under climate change scenarios

51. As a result of these collective actions, under "static climate conditions" the pressures described above would be largely addressed and Uruguay will be well poised to conserve its coastal environments with benefits for its own national development goals as well as the delivery of significant global benefits. However, most of the policies, projects, and programmes implemented to date have focused on addressing problems within a framework that essentially assumes "unchanging" climatic conditions and generally do not factor in higher sea levels or changes in climatic parameters.

52. Climate change represents an important additional stress, and under the baseline scenario Uruguay faces a number of important gaps in relation to adaptive management and systematic response to climate change vulnerability of its coastal ecosystems and resources. These gaps stem from a number of barriers, ranging from low levels of understanding regarding climate change and its implications for sustainable development, to inadequate technical information for long term planning in the context of climate change, to financial constraints. These gaps would need to be filled and barriers overcome to strengthen the current baseline actions to avoid biodiversity losses with the predicted climate change scenarios. The following paragraphs describe main gaps and related barriers.

Vulnerability and climate change issues are not adequately considered in current land use planning and policy frameworks.

53. As described above, the country is developing significant efforts to address coastal zone management, mainly through land use planning and environmental protection policies and regulations at the national and regional (“municipal”³⁸) levels. Furthermore it is strengthening its capacities to deal with risk disaster management particularly those related to climate hazards. However, climate change has not been mainstreamed in these instruments. In addition, most zoning plans of coastal departments do not include areas that are vulnerable to climate change (as the assessments carried out to date have been at a macro level rather than specific for each municipality). Land uses are thus being defined for their potential stresses without considering the impacts of future climate change on ecosystem resiliency. Under predicted climate change scenarios these instruments will not prove sufficiently effective for the conservation of coastal areas. For instance, the current 250 m setback would not be enough to allow inland migration of key habitats.

54. This gap stems mainly from low levels of understanding regarding climate change and projected SLR and their implications for sustainable development. Although there is some (uneven) awareness of climate change in government departments and agencies with mandates of environmental management, detailed knowledge of the science of climate change over particular time scales is often lacking. This, in turn, stems from problems in availability of relevant information to enable sound appreciation and understanding by policy and decision-makers of potential costs and benefits associated with climate change and climate change response³⁹. For example, there is a scarcity of information on the potential economic losses that could result from climate change both in terms of infrastructure and from the degradation of coastal ecosystems and services. As a result, Uruguay lacks a strategy to integrate climate risks into management plans and regulatory frameworks for coastal areas.

Current regulatory policies of sectors affecting coastal biodiversity (e.g., fisheries, tourism, and agriculture) do not address predicted climate change scenarios,

55. While comprehensive under the baseline, under predicted climate change this set of policies will not be robust enough to limit anthropogenic stresses on coastal ecosystems to keep within these systems’ coping ranges. With regards to *tourism*, in spite of the current 250 m setback, the development of new infrastructure without considering climate change would likely increase vulnerability and reduce resistance and resilience of coastal ecosystems to climate change (e.g., by limiting inland migration).

56. With regards to *agricultural systems* (widespread along the coast near the frontal zone) the Responsible Production Project, will serve to mitigate those threats to coastal biodiversity that emanate in upland watersheds. Though this current initiative represents a step forward into biodiversity conservation, climate risk are generally considered in relation to their impacts on production such as drought problems in farms and livestock holdings in the northwest region. However, under climate change scenario of likely increase in precipitation and run off, discharge of agrochemicals into coastal ecosystems may increase as well, thus posing a threat on biodiversity of national and global significance.

³⁸ In the Uruguayan context, the “municipal” level actually refers to the broadest political/administrative units in which the country is divided, i.e., the “Departments”.

³⁹ Although the volume of scientific research produced by ECOPLATA, FREPLATA and other institutions on various aspects of the La Plata River and its maritime front is significant, it was not designed to address climate change or to be relevant for developing related policies.

57. With respect to *fisheries*, current measures to protect near-shore fish nurseries and their associated biodiversity will not be sufficient under projected CC scenario. This is for two reasons. The first is that the position of the saline front and its associated up-welling will change under CC scenarios (due to increased turbidity, changing saline concentrations, and increased water temperature) and this will in turn modify the current characteristics of the sites that today act as nurseries to a range species of biological importance, including fish species of commercial importance. Thus, under CC scenarios, the location of current no-take zones would need to be adjusted according to the migration of the key habitats and associated species. This migration is already taking place and as a consequence artisan fisheries communities are moving eastward.

58. The second reason is that, as the fish nurseries are located near the shoreline, their integrity also depends on land based sources of pollution. Current policies and plans take into account the position of the saline front and the areas of high values for fisheries seeking to reduce the stresses on these areas. However if these locations are to migrate under new CC scenarios there is the potential that land based pollution sources (nutrients and micro pollutants) could exert high stresses (i.e., hypoxia) in these new locations affecting the physical conditions and reducing the viability of fish stocks and other important biodiversity features. Monitoring and better understanding are needed to determine the potential change in location of nurseries under different climate scenarios and generate relevant and timely data to inform and adapt policy.

Conservation planning frameworks do not adequately incorporate climate change considerations.

59. As explained above, the Government of Uruguay has given high priority to the implementation of a National Protected Area System (NPAS) for the conservation and sustainable use of the country's biodiversity, much of which is of global significance. To guide the design of an ecologically representative NPAS within modern concepts of protected area management, in line with the country's socio-economic context, a Strategic Plan will be developed. This Plan will integrate protected areas with other relevant territorial, social, economic, and institutional frameworks and systems. As such the NPAS will provide a strong framework for guiding land-uses.

60. In the face of climate change, protected areas will need to take on two distinct roles: preserving species that are particularly vulnerable to climate change in the short-term and facilitating the adaptation of biodiversity to climate change over a longer period. Thus, under climate change, protected area selection, design, planning and management (including buffer zones and connectivity across the landscape) will require new and specific information about species and ecosystem responses to climate change. However, in the baseline, relevant CC information on vulnerable areas and predicted changes in critical habitats will not be taken fully into account and, as a result, the conservation planning framework will continue to ignore the impacts of climate risks. Furthermore, in the baseline scenario, national and municipal legal, regulatory and planning frameworks and instruments will continue to have poor or no consideration of vulnerability and the need for actions to increase adaptive capacity in order to expand the coping range under the current and future impacts of climate change. Consequently, the systematic conservation planning process that will be followed for the NPAS will need to be bolstered so that climate change risks and adaptation options are factored in.

1.4. ALTERNATIVE GEF SCENARIO

61. Under the baseline scenario, capacity levels are insufficient to bridge the existing gaps in relation to adaptive management and the country's systematic response to the vulnerability of its coastal ecosystem to climate change. In spite of projected impacts of climate change in coastal and marine biodiversity, national efforts to combat the effects of these scenarios will naturally focus on urban areas

along the La Plata River which house much of Uruguay's population, as indirect impacts would include damage to coastal infrastructure, tourism, and recreation services. As the Uruguayan government would need to establish priorities, measures required for securing the protection of natural ecosystems and habitats are likely to be of secondary consideration. Furthermore, management decisions to address climate risks will continue to be reactive, rather than being supported by a proactive approach. It is also unlikely that these management decisions will be developed in a coordinated manner. This lack of coordination would affect the design and implementation of adaptation options that would recognize and protect the complexities and interrelations of Uruguay's coastal ecosystems. Thus, under projected climate change scenarios, additional action will be required to strengthen the current baseline actions for the protection of coastal and marine biodiversity.

62. Given the global biodiversity significance of the unique La Plata River and maritime front ecosystems, the Uruguay Government is seeking assistance from GEF through its Strategic Priority on Adaptation (SPA) Fund. The strategy selected is to increase coastal ecosystem resilience to the projected climate changes by building adaptation components into Uruguay's baseline land use planning and coastal zone management initiatives. To enhance resilience of Uruguay's coastal ecosystems to changing climate conditions, the project will focus on developing a planning structure through which, under future climate change scenarios, anthropogenic pressures on key coastal ecosystems will be kept to levels that do not exceed the coping range of key habitats and species.

63. To achieve this, the project will work at three parallel but interdependent levels. The first will be at the *national level* working to incorporate climate-change considerations into national land-use processes and regulations governing coastal areas. The second will be to pilot at the *municipal level* specific measures that can be included in current land-use planning processes to protect those coastal ecosystems that are particularly vulnerable to climate-change and that are important for biodiversity conservation. This will include piloting the inclusion of the climate change dimension in the development of two municipal land-use plans and supporting the ensuing negotiations required to adjust zoning. It will also include on site testing and defining climate sensitive approaches for protecting key ecosystems by looking at how no-take fisheries areas and the coastal protected areas of the NPAS within these municipalities could be redefined so that boundaries are adjusted over time to protect key habitats as conditions change. A third level of action will be to promote the uptake and replication of successful measures from municipal pilots across Uruguay's remaining four coastal municipalities and the broader adaptation community of practice.

64. Cross cutting these three levels would be a) training for relevant institutions to facilitate the implementation of new plans and policies; b) awareness building and lessons learning mechanisms for a broader range of stakeholder to facilitate implementation of new policies over time; and c) building on existing risk management actions at both the national and municipal level to advance the identification and uptake of adaptation measures. Together these cross cutting aspects would facilitate the achievement of Project Outcomes and Objective and would also contribute to a larger goal in which the vulnerability of Uruguay's coastal ecosystems to climate change is reduced overtime.

65. This MSP will focus its pilot interventions in the *estuarine (mixohaline or fluvio-marine) environment*, where freshwater and salt water meet and mix, and the *Atlantic Coast environment* at the mouth of the La Plata River estuary and along the Atlantic coastal platform where the aquatic environment is saline, due to their vulnerability to climate change and their biodiversity value (See Figure 2, Annex 10). In particular the *estuarine environment* has important feeding, nursery and growths area for estuarine and marine fish species (See Figure 4, Annex 10) and the *Atlantic Coast environment* has coastal wetlands of international importance.

66. It will adopt a policy based approach ultimately seeking to reduce vulnerability of Uruguayan coastal ecosystems to threats derived from climate change, as storm surges and sea level rise, by constraining anthropogenic stresses to coastal ecosystem. It pursues the adjustment of social structures through the implementation of incentives, disincentives and restrictions of coastal land use through land planning regulations, as well as facilitating the in-land migration of coastal ecosystems through setbacks of infrastructure, in order to protect the most vulnerable zones. Such approaches are in line with the adaptation policy framework description for policy based adaptation focus approach for both national and regional scales of implementation.

67. The long term *Goal (Development objective)* of the project is: The reduction of Uruguay's coastal ecosystems vulnerability to climate change. The *Project Objective (Purpose)* is: Adaptive coastal management and land use planning policies and practices enhance the resilience of Uruguay's coastal ecosystems to climate change. The project objective would be achieved through three different outcomes as follows. Each is described in detail in the next section along with related Outputs and indicative activities.

- Outcome 1: The incorporation of climate change risks into national level policies and regulatory frameworks governing coastal area management strengthens Uruguay's systemic capacity for adaptation.
- Outcome 2: Pilot adaptation measures for ecosystems at risk under predicted climate change are implemented at local levels
- Outcome 3: Knowledge management and evaluation systems facilitate the uptake and replication of climate risk management and adaptation experiences in Uruguay

68. The above outcomes follow the priorities emerging from assessments of vulnerability and adaptation to climate change that were carried out under the framework of national studies and the national communications of Uruguay submitted to the United Nations Framework Convention on Climate Change (UNFCCC). They are also included in the comprehensive Program of General Measures for Mitigation and Adaptation to Climate Change (PMEGEMA) of Uruguay and incorporated in Uruguay's Second National Communication to the UNFCCC. The initial findings from the execution of this project will contribute as an input to Uruguay's Third National Communication to be submitted in 2009.

1.5. OUTCOMES, OUTPUTS AND ACTIVITIES

OUTCOME 1: The incorporation of climate change risks into national level policies and regulatory frameworks governing coastal area management strengthens Uruguay's systemic capacity for adaptation (*Total cost US\$ 408,490; GEF US\$ 151,300; Other sources US\$ 257,190*)

69. This Outcome would take action at the *national* level to provide the essential capacities and strategies to advance national frameworks for incorporating climate change considerations into systems that govern land-use and coastal management practices that affect coastal ecosystems. The focus here would be on response systems that would enable stresses to be kept within the coping range of ecosystems under future climate change, thus increasing resilience and the conservation of key biodiversity and the services this provides. Existing policy systems regarding coastal areas would be adjusted over time to the changing conditions expected under different climate scenarios. This would be achieved through three Outputs as follows.

70. The first would focus on specific instruments that govern land use at the ground level, for example environmental impact studies. Specific guidelines and measures would be included in these procedures to ensure that climate change scenarios are adequately addressed and that those responsible for

their application and evaluation are fully trained to implement new approaches and standards. It will address as well specific activities to enhance regulations related to the National Protected Area System as a particular land planning policy with a high potential for coastal ecosystems protection from surrounding environmental stresses.

71. A second output would provide an enabling environment for the uptake of the adjustments to national level land-use planning procedures and policies proposed under the first output and set the scene for adopting policy changes at the sectoral level in the long term. For these purposes, the project will develop communication strategies aimed at reaching specific target groups whose decisions and behaviors affect coastal biodiversity and/or who are affected by climate change. Among them, policy and decision makers, natural resource managers, the media, and stakeholders from key economic sectors related to coastal resources (e.g. fisheries, tourism, and agriculture).

72. A third output would focus on maximizing the contribution of baseline risk management to adaptation by updating information and covering key gaps to strengthen the incorporation of climate change into the national level strategy. As illustrated in the recent workshop on V &A and Risk Management that addresses climate risk on a short/mid term basis provides a strong foundation for adaptation measures update in the longer term as it applies tools used to reduce vulnerability and will strengthening the structures dealing with climate related hazards. Furthermore, although risk management is primarily focused on the population, the benefits will affect biodiversity as well, as the coastal ecosystems would be protected by the national strategy of risk management emphasizing climate risk.

73. These Outputs are further detailed below along with indicative activities required for delivery.

Output 1.1: Climate change risks integrated into key national policies and regulations for land use planning and conservation of coastal areas

74. Adopting a landscape-scale vision of conservation is essential to increase the resilience of species and habitats to climate change and facilitate the movement and relocation of biodiversity that climate change will inevitably induce. Thus, a first action of this Output would be to strengthen the national legislative framework for land-use planning that is being developed in the baseline to address climate change. The project would develop specific guidelines to be included in the planning framework, seeking to reduce pressure on vulnerable areas arising from habitat fragmentation and land use changes.

75. The concern of municipalities regarding climate change is not only related to the most vulnerable coastal ecosystems but to people as well, as there is a significant potential harm linked to changes in future climate scenario. Therefore, guidelines and norms for urban development and tourism infrastructure will be reviewed to determine their effectiveness for both the safety of residents and the protection of susceptible ecosystems and biodiversity to the main hazards linked to climate change. This will be undertaken by experts from the building industry, DINOT - MVOTMA staff and risk and climate change experts. Where feasible, a list of conditions, restrictions and recommendations regarding the more suitable materials, designs and construction norms under projected climate change scenarios will be developed. Where this is not possible, guidelines for incorporating CC considerations and required risk evaluations during the design stages of such works would be developed.

76. A second level of action in this output would be to work with specific instruments that control on site interventions and infrastructure such as Environmental Impact Assessments. The project would define guidelines to ensure that these instruments adequately incorporate the consideration of climate change scenarios and risks over the expected lifetime of the specific project under review (e.g., banning new construction in vulnerable areas with high risk of flooding) and that implications of CC on coastal habitats are taken into account to assess land use change impacts. To enable this, some assessments would be

required to define the specific impact of different actions under climate change (for example, a further assessment of current domestic and industrial contamination effects on the wetlands and coastal ecosystems in different climate scenarios and hence provide a back drop for evaluation of new interventions proposed for waste disposal). This initiative will build on and extend, as opposed to duplicate, similar efforts through the National Communications process. The project will prepare as well a proposal for amendment of current EIA norm addressing the integration of climate change as another criterion for assessing land use change impacts in coastal developments. EIA practitioners at relevant institutions will be trained in the application of the guidelines. Regional and local level capacity building would be undertaken through Outcome 2.

77. Finally, as protected area managers will need to be ready to adopt alternative actions regarding the future effects of CC, a set of guidelines will be prepared to identify high risk ecosystems and regulations will be defined to feed into the National Protected Area System Strategic Plan. Relevant protected area staff will be trained to adapt and apply the new management regulations.

Output 1.2: Awareness and outreach programmes on climate change delivered to key stakeholders affecting and involved in coastal biodiversity conservation

78. The success of the Project in achieving its objective and long term goal depends, to a large extent, on raising key stakeholders' awareness and understanding about the potential impacts of climate change on coastal areas and on increasing their motivation to take action regarding climate risk management and adaptation. Thus, the project will develop communication strategies aimed at reaching specific target groups whose decisions and behaviors affect coastal biodiversity and/or who are affected by climate change.

79. A first target group to be reached through this output includes those who are actively involved in policy at the national level and those who will need to make operational decisions for coastal natural resources based on climate information: i.e., policy makers, decision makers and resource managers (e.g. legislators, officers from the MVOTMA and other institutions involved in coastal management and conservation). Specific awareness and communications strategies will be designed and implemented to ensure well-informed discussion and decisions; encourage the adjustments to national land-use planning regulations, procedures and policies where required; and promote the adoption of climate risk management, prevention and adaptation measures for coastal areas.

80. To reach them, key messages will be defined during project implementation and both direct and indirect communications strategies will be promoted. Direct communications strategies will include public relations; tailor-made field trips to vulnerable coastal areas; congressional briefings and seminars; hard copy documents and multimedia products, etc. Indirect strategies will be mainly through the mass media, considering its role in shaping public opinion and raising environmental awareness. It is envisaged that as a complementary measure to the lesson learning strategy under Outcome 3, the awareness building programme would also include information on the new reforms in land planning to be developed and the results of the pilot projects to be implemented under Outcome 2. Adjustment to the awareness strategy would be made based on results of the project monitoring system.

81. To set the scene for changes at the sectoral level in the long term, a second target group of this output consists of stakeholders from key economic sectors related to coastal resources that will have increased impact on coastal biodiversity under climate change scenarios and that would in the long term need to adopt modifications to sectoral policies (e.g fisheries, tourism, and agriculture). This target group is the most sensitive to what is being proposed in two senses: a) they are quite vulnerable regarding climatic and oceanic changes, since the resources they are based on are highly susceptible to modifications in climate signals (e.g. ENOS, storms increase, sea level rise and salinity front movements,

etc.); b) they are some of the strongest sectors from an economic point of view, developing activities deeply integrated to and supportive of the Uruguayan economy. Therefore, it has been estimated that fisheries, tourism and agriculture require an alternative approach addressing adjustments and furthermore, adaptation to climate change as it will directly affect their yields, profits and sustainability in time as well. These will be targeted through outreach campaigns illustrating the increased impacts under climate change, potential long-term economic losses and adaptation options drawing on the economic evaluation undertaken in Outputs 1.3, 2.2 and 2.3

82. Involvement of key representatives and decision makers of these sectors will be sought through the following outreach activities: information kits, small target-specific meetings and discussion groups, forums and lobbying to show potential impacts of their activities on coastal areas and biodiversity as well as their own likely losses in regards of assets depreciation and yields reduction under climate change, and potential opportunities for mainstreaming adaptation to climate change into each sectors' activities. The long term goal of this outreach would be for them to eventually put in place regulations that would keep the stresses on coastal biodiversity to within coping ranges in the future and may contribute to take advantage of opportunities in future climate change economical contexts.

83. As the mass media plays a crucial role in forming public opinion and raising environmental awareness, the project will build constructive relationships with journalists, other communicators, editors, and media producers through activities aimed at improving their understanding of climate change issues and their relation to sustainable development. For example, the project could organize workshops for science journalist, tailor made field trips to vulnerable coastal areas, and special awards (e.g., story contests and photograph contests for press photographers.)

84. These activities will build on the valuable work of public and private organizations already working to help raise public awareness of climate change (e.g., DINAMA, ECOPLATA). To avoid duplicating efforts, an interagency working group will be established to address awareness and outreach issues and coordinate the design and implementation of communications strategies. GEF resources would support the development of appropriate tools and materials for each target audience and co-funding would be provided for their dissemination.

85. Other key stakeholder groups at the municipal and local level (e.g., municipal policy and decision makers, municipal staff, residents and NGOs in coastal areas) will be addressed through communication efforts to be delivered through outputs 2.4 and 3.2.

Output 1.3: Climate change risks incorporated into the national risk management strategy for coastal areas

86. The project strategy will include a cross-cutting element that links the climate component of Uruguay's risk management of coastal area hazards with climate change. Under this Output these linkages will be explored at the *national* level developing a strategy for planning and decision making to address current vulnerability and adaptation over a mid term scale that will lay the foundation for climate change risk preparedness and prevention over the longer term. The project will work in partnership with the National Emergency System to incorporate coastal related information (e.g. SLR, beach erosion and changes in coastal line profiles and swell) into the national risk management strategies (such as early warning systems and risk maps), incorporating climate change considerations and hence increasing its effectiveness as a protection of key ecosystems. As climate risk management incorporates climate change, information would inform adaptation policy and also put in place information systems and responses that would be useful for future adaptation measures. It is also a cost effective way of raising awareness as people are being affected now by the influence of climate related hazards.

87. Some indicative targets of Outputs are i) to make an inventory of coastal hazards frequency, size, type and location and associated impacts, ii) to make a classification and typology of past coastal risks, iii) to develop a vulnerability and risk mapping and a dynamic GIS integrating SLR, winds, beach erosion and changes in the coastal zone, and water quality parameters under different climate scenarios and together with land use, v) to develop an early warning system involving all the environmental government agencies, local municipalities and private stakeholders of the coastal zone. A key benchmark will be that government agencies endorse operational arrangements to manage risks.

88. In addition under this output GEF resources will be used to inform policies on the basis of net economic costs of climate change impacts on sandy beaches along the eastern coast. This would provide key information for developing and mobilizing investments required for a broader set of interventions over the long term for reducing the vulnerability of the coast to climate change. Furthermore, increased knowledge of potential cost to national development would increase awareness of policy and decision makers of the importance of climate change.

OUTCOME 2: Pilot demonstration adaptation measures for ecosystems at risk under predicted CC are implemented at the local level (*Total cost US\$2,380,189; GEF US\$499,200; Other sources US\$1,880,989*)

89. This outcome would bring the project scope to the local scale and would provide specific on the ground examples of adaptation that would serve as replicable models for the La Plata River and Atlantic Ocean coastlines. It would also provide lessons for the adjustment of national policies governing land use planning and coastal zone management. Two Municipalities have been selected as principal pilots; Rocha (in the Atlantic coast environment) and Canelones (in the estuarine environment). They were selected from the six coastal municipalities as they offer a unique opportunity to implement a body of climate change adaptation measures at different stages of land planning management at the local level. Rocha is ahead of the other Uruguayan departments in land planning regulations, including the development of tools for specific environments protection. Coastal ecosystems in particular are a concern for the local authorities as they have some of the country's most valuable biodiversity with global significance along the Atlantic coast (wetlands and lagoons). Canelones is key for bird migration and its nurseries along the coastline. Although the local norm for land planning in Canelones is less developed, it is currently being revised through the Strategic Land Use Plan for the Ciudad de la Costa, an area which comprises a number of urban centers along 40 km in the shoreline of the Plata River. The Costaplan, as it is known, sets out a zoning scheme, including development zones, protected areas, areas of environmental restoration, and other special areas. It presents an opportunity to promote climate change adaptation measures for coastal ecosystems at the local level.

90. Through several outputs, some tools and activities will be developed to enhance the capacities of local institutions of these municipalities regarding stresses derived from climate change influence over the coastal biodiversity. A first output would be associated to specific regulations for land planning to control potentially harmful changes in land use and environmental impacts in a context of climate change. If the most susceptible places in selected sections of the coast are timely identified, actions could be undertaken to develop special management conditions and restrictions of land use to protect the resources and ecosystems. A second output will develop pilot approaches for near-shore fisheries that are vulnerable to climate change. A third output will develop these pilots for coastal protected areas. Output four would focus on the dissemination and awareness processes addressing differentiated audiences and actors in these two municipalities so as to facilitate consensus on the new land use plans and the eventual measures that these would put into place.

Output 2.1: Municipal plans updated to incorporate land use zoning and climate risk management strategies for coastal ecosystems at high risk from climate change

91. This output will involve two different phases and approaches: the first one is a technical phase addressing the identification and classification of coastal ecosystems according to the risk of being affected by climate change. The second one would address adjusting municipal land use planning to incorporate these findings including the required changes for risk management, land use regulations and restrictions in different zones of the municipality.

92. Under the first approach, the analyses of climate change effects and current climate risk conditions in coastal and marine ecosystems will provide a classification of key ecosystems under threat and will become a decision making reference for local authorities. The coastal vulnerability matrix defined in the SNC and the Dynamic Interactive Vulnerability Assessment (DIVA) methodology, (see Annex 9), will be applied to the coast of the two pilot municipalities to facilitate the zoning and classification of coastal ecosystems and their services according to their level of risk to current climate hazards and to climate change. DIVA is an interactive, computer-based tool that allows users to produce quantitative information on a range of coastal vulnerability indicators, for user-selected climatic and socio-economic scenarios and adaptation policies. It allows the exploration of the effects of climate change on coastal environments and societies and the costs and benefits of coastal adaptation options. Its application at the local level in Uruguay would feed into the definition and negotiating of modification in land use plans and also inform the risk management strategies to be developed at local levels in conjunction with UNDP-BCPR. Together both of these will inform adaptation and risk management policy analysis at the national level.

93. Although there is a great deal of interest in the region to use DIVA to support country-scale coastal vulnerability and adaptation analysis, for this to occur the underlying data used to drive the DIVA tool will require updating and adaptation for local use in Uruguay. The project will do this for the two municipalities updating the sea-level/climate change scenarios in DIVA, using the IPCC AR4 scenarios (DIVA currently uses TAR scenarios) and also uploading detailed coastal segment and socio-economic data for the DIVA coastline segments comprising the pilot sites.⁴⁰ At the same time it will re-assess the algorithms that combine these factors into vulnerability indices within the DIVA tool to allow detailed inter-comparison of coastal vulnerability within Uruguay.

94. Under the second phase technical information and DIVA related outputs would be used to update municipal land plans for ecosystems under climate risk through the addendum of special land plans in each case, as allowed by the new land planning legal framework under development. This will entail negotiations with municipalities and in close coordination with ECOPLATA and DINAMA, potential adjustments in norms and publishing of new zoning. Both municipalities have demonstrated strong interest in this process as shown through their letters of support and through the co-financing of proposed activities in this output. In addition the DIVA information will be used to strengthen the development of climate risk management strategies for each municipality and the institutional capacity building related to this supported by BCPR UNDP. It will also identify policy barriers, including macro and micro-scale economic barriers constraining the introduction of adaptation measures at the local level and pursue policy options to overcome them building on assessments undertaken in Outcome 1.

⁴⁰ This will require GIS analysis of local-level assessment of coastal data sets, including coastal geomorphology, ecosystems, coastal land-use and topography. Other data needed will be: mean sea level, wave and wind patterns for the specific coastal segments.

Output 2.2: Near shore fisheries management approaches adapted to address climate change risks in a site of globally significant biodiversity (Canelones Municipality)

95. The balance of oceanic and estuarine conditions in the larger La Plata River ecosystem is very fragile and dynamic. It is expected that under climate change the estuarine front – i.e. the area where freshwater and seawater mix- will be displaced from its current position (See figure 3a and 3b Annex 10). Concomitantly changes in species locations that are relevant not only for fisheries but for all marine biodiversity will occur. The current protection afforded through the no take zones in this estuarine front will not be sufficient to protect near-shore fish nurseries and their associated biodiversity. Firstly due to above mentioned changes resulting in the migration of the key habitats and associated species. Secondly due to potential land based pollution stresses that could be exerted in the new locations as current land use restrictions do not consider these shifts in nursery sites.

96. The project will set up a pilot demonstration that will address both these aspects and put in place a series of agreements that will provide biodiversity benefits to specific nurseries as climate scenarios change. It will also generate lessons and guidelines that can be incorporated into national level policies for fisheries and for coastal management that will replicate experiences in the long term along the coast of Uruguay. It will focus on *the estuarine environment along the coastline in the municipality of Canelones*; however it will also incorporate *some areas in the municipality of Montevideo* where the current position of saline front influences fish stocks and biodiversity See Annex 11a. It is estimated that 70% of the fish consumed in Uruguay is caught by artisan fishing communities, most of it in the coast of Montevideo and Canelones.

97. The pilot will consist of several steps. The first will focus on determining the potential change in location under the different climate scenarios for Uruguay of fish nurseries currently protected through the national no-take zone policy. This requires better forecast the changes in the saline front and the effect this would have on the conditions in the nurseries. Under current climate conditions there are fluctuations in the position of the saline front but data is not complete enough to feed into climate change models to accurately inform policy and decision making for fish nurseries protection in different scenarios. Thus during the first year of the pilot, current observation and update of data will be undertaken to fill in critical gaps. Based on this improved data and models the second step will be to run climate change models to determine the degree of migration of the fish nurseries. Using these projections, the probable location of nurseries under different climate scenarios will be identified and plans developed for changing the location of no take zones over time. Consultations with national and local stakeholders will be undertaken to determine the most effective way to implement dynamic no take zones over time for the specific nurseries under study. This experience will feed into the definition of more generic national level guidelines for adaptation of protection of aquatic habitats under climate change.

98. The third step would be to work with the relevant stakeholders undertaking land use planning in Montevideo and Canelones municipalities to incorporate the new locations of fish nurseries, as climate changes, into municipal land use plans and coastal zoning and management. This would include guidance to regulate the development of infrastructure (such as sewage outlets and or roads) that could have significant impact on the future nurseries. Emphasis would be placed on identifying measures that infrastructure works would need to consider to protect future sites and structures. In addition efforts would be made to determine the trade off between additional costs of specific design features or new locations and the potential loss of fisheries, artisan fishermen's livelihoods and ecological services associated with the biodiversity. Economic valuations of the ecosystem and its services would be carried out, particularly for those related to fisheries nurseries and associated biodiversity. A number of issues would be considered including uncertainty and risk, equity, and the assessment of non-market values.

Output 2.3: Coastal protected area management adapted to address climate change risks in a site of globally significant biodiversity (Rocha Municipality)

99. As the climate changes, patterns of biodiversity in the landscape are likely to change and species that are currently protected in reserves may not be adequately conserved in the future. Given the possibility of shifting species and changing ecosystem distributions, *in situ* conservation of species and ecosystems through protected areas in their current locations may need to be modified and their management adjusted to maximize biodiversity conservation in the long term. With regards to species, it would be crucial to predict future range shifts of species of special interest for conservation under different climate change scenarios.

100. In the face of global change, protected areas will need to take on two distinct roles: preserving species that are particularly vulnerable to climate change in the short-term and facilitating the adaptation of biodiversity to climate change over a longer period. Consequently, protected area selection, design, planning, and management will require new and specific information about species and ecosystem responses to climate change. The DINAMA is designing and implementing Uruguay's National Protected Area System (NPAS) in part through support from UNDP GEF. This process will need to factor in climate change issues; however, key information for this purpose is currently not available.

101. Thus the project will set up a pilot study that will address these issues. The pilot will be located in Laguna de Rocha, a Protected Landscape (IUCN Category V) comprised within Bañados del Este Biosphere Reserve (Eastern Wetlands), which houses a wealth of biodiversity values of national and global significance (See Annex 11b Biodiversity values and main features of pilot site "Laguna de Rocha"). In partnership with the NPAS Project, this output will provide key information and lessons to fine tune the delimitation and management of this protected area and feed into Uruguay's National Protected Area System Strategic Plan.

102. In particular, this output will assess present and projected future range of key species present in Laguna de Rocha, mainly migrating shorebirds. In addition, given the high vulnerability of coastal areas to climate change, potential losses of key habitat types in this region will be evaluated using appropriate tools⁴¹. For these purposes, existing databases of the NPAS project will be upgraded, in particular those regarding the distribution of priority species for conservation. In addition, to provide comprehensive habitat changes scenarios under climate change for vulnerable coastal wetlands of high biodiversity value, some short term assessments will be undertaken to update data critical for modeling. These will be undertaken in the first six months of the project and include assessments of coastal and lagoon erosion, of sea level rise (SLR) and of water quality). The information generated through this output would be used to adjust the design and management of the NPAS and specific coastal protected areas (e.g., design of connecting migration corridors, habitat restoration, adjustment of protected area boundaries, definition of buffer zones, etc.).

103. Coastal wetland flora and fauna generally respond to small changes in water levels, according to their ability to migrate to other areas. Sea level rise will likely force wetlands systems to migrate inland. However, this migration path could be obstructed by inland land uses or by the ability of these systems to migrate in time sufficient to survive⁴². Thus, at the municipal level, the information generated through this output will also be used to adjust the zoning system of the department of Rocha within the framework of its Land Use and Sustainable Development Plan for the Atlantic Coast. This plan outlines a strategic zoning defining protected areas and areas of special concern for conservation (e.g., Laguna de Rocha,

⁴¹ Such as the US EPA's Sea Level Affecting Marshes Model (SLAMM) or the Wetland Change model (a component module of the DIVA tool).

⁴² IUCN 1999

Laguna de Castillos - Cabo Polonio, the islands along the Atlantic coast of Rocha, all of them of significant global biodiversity value), which will require specific management plans. The results of this pilot study will guide the definition of specific guidelines for these zones and the development of their corresponding management plans to foster the adaptation of coastal biodiversity to climate change through upland migration over time. To facilitate the decision making related to potential new land use restrictions economic valuation studies of specific coastal wetland and lagoon ecosystems will be developed.

Output 2.4: Local forums established for exchanging lessons on adaptation and raising awareness of climate change risks on coastal areas.

104. Information needs to be used at many levels and address a heterogeneous audience if the project's goal is to be fully achieved in regards to the vulnerability reduction. This Output will address a wider public but still focusing on the local level, providing key information on the broad implications of climate change in coastal areas for both people and ecosystems. This will increase awareness of coastal inhabitants and provide timely information that enables them to fulfill their roles as key stakeholders at the local level of action. It is envisaged that with this increased awareness timely action and requests from local inhabitants to local governing bodies regarding the protection of their assets and welfare would increase, triggering needed action by local authorities as coastal conditions start changing.

105. Open local forums will be held in each pilot municipality for local leaders as well as regular audiences to discuss information on zones under risk and to advance understanding and acceptance on the need for new land-use plans. Municipal staff will take a leading role in this process and be the lead local authorities responsible for outreach to local stakeholders. By compiling this experience and based on the discussions in these fora, similar activities could be developed in other coastal areas other than Canelones and Rocha.

OUTCOME 3: Knowledge management and evaluation systems facilitate the uptake and replication of climate risk management and adaptation experiences for the coastal areas of Uruguay (Total cost US\$910,904; GEF US\$251,023; Other sources US\$659,881)

106. This outcome comprises the activities related to knowledge transfer, update and replication of successful experiences both within the project and across the adaptation community of practice in general. Four outputs are planned. The first one is related to the monitoring of accomplishment of project activities and evaluation systems to determine the short term impacts of adaptation measures piloted. This includes descriptive and quantitative assessments and indicators and methodologies specifically developed for adaptation projects to measure the increase of adaptive capacity and climate change vulnerability reduction. The second output would implement dissemination of lessons and experience-sharing among coastal municipalities other than Canelones and Rocha and through existing exchange initiatives among coastal municipalities covered by ECOPLATA. The third would disseminate lessons learned to a broader community through the GEF ALM. The fourth would focus on strengthening municipal capacities and building risk management strategies at the local level to transfer and replicate of measures on climate risk management piloted in Canelones and Rocha.

Output 3.1: Monitoring and Evaluation (M&E) of climate change adaptation measures undertaken

107. A number of monitoring and evaluation approaches will be adopted through this Output to determine the success of adaptation measures piloted and to inform the overall progress of project implementation. The overall framework for monitoring will be based on the indicators in the logical framework (see Annex 1). These draw from the Monitoring & Evaluation Framework for Adaptation to Climate Change (UNDP) and form a set of indicators useful to face the challenge of monitoring and evaluating climate change adaptation projects. These are based on criteria such as attribution (what the project itself can actually achieved in regard to the reduction of vulnerability and the increase of adaptive

capacities), relevance (indicators to measure vulnerability reduction) and calibration (the changing nature of hazards under climate change scenarios).

108. As part of this the Vulnerability Reduction Assessment (VRA) will be used to track the changes in vulnerability/adaptive capacity achieved in the project by applying qualitative based assessments during the project implementation. It measures the relative change against a baseline established at the start of the project and values determined twice during project implementation and once at the conclusion of the project. To apply the VRA discussions and/or awareness raising activities will be set up for the project's target stakeholder community and consensus reached among local stakeholders regarding the climate risks to be adapted. Subsequent assessments will be held with the same groups.

109. In addition and in accordance with UNDP and GEF procedures independent evaluation will be undertaken at mid term and at project closures. These will draw on the regular monitoring of indicators, the project annual reporting (PIR), as well as field visit to the pilot sites and discussions and consultation with project stakeholders.

Output 3.2: Dissemination programme implemented for all coastal municipalities

110. All Uruguayan coastal municipalities will need to know the threat that climate change presents to local assets including biodiversity. As such this project will seek to disseminate the experiences in Canelones and Rocha to increase awareness and information sharing among local administrations along the coastal territories. Thus, although the project cannot provide equal support to every coastal municipality, this output will involve them all in a national process of awareness, facilitating a common approach and fostering a base of coordination for further actions of adaptation at the local scale.

111. This will be accomplished through the design and dissemination of a programme by the ECOPLATA aiming to reach all Uruguayan coastal municipalities regarding the threat posed by that climate change on local assets. Under this activity, an information kit (based on knowledge and information produced in outcomes 1 and 2, especially outputs 1.1. and 2.2) will be prepared. This will include guidelines to identify ecosystems under risk of climate change threats as a first approach for municipal staff not directly involve in outcome 2. The organization and holding of meetings for key personnel of Uruguayan coastal municipalities to exchange lessons learned is another activity to be pursued. This will also facilitate reaching consensus on future plans that will be needed for interventions on coastal environment adaptation to climate change. It will also create a basis for the local authorities to develop follow up actions with local residents related to climate change.

Output 3.3: Learning mechanism (ALM) implemented

112. To contribute to the accomplishment of the global project GEF-UNDP "Adaptation Learning Mechanism" (ALM), this output will assess the experience gained through the specific actions that address adaptation to climate change at local, sectoral and national level. As a result of the linkages and information produced at different political levels between the public and private sectors and with several local and national institutions, critical lessons will be drawn from this policy integration approach. This would be relevant to other developing countries with exposed coastal ecosystems and wetlands and may serve as a model for them, adding a new global environmental benefit achieved from the implementation of this project. In order to do that, this of reports of project results and recommendations for future action will be prepared and reports prepared on lessons learned. Finally, a contribution to GEF's ALM will be prepared and submitted.

Output 3.4: Municipal staff trained on climate change risks management strategies and adaptation for coastal ecosystems

113. . In the output 2.1, and in conjunction with UNDP-BCPR risk management approaches will be applied to land planning analysis, the mapping of coastal high risk areas and risk management interventions and strategies for risk reduction and hazards mitigation in Canelones and Rocha. This will provide detailed experience of linking climate risk management and adaptation measures at the local level. In order to replicate this experience and to further increase uptake across the other four coastal municipalities, lesson learnt in Canelones and La Roche on climate risk management will be compiled and included in UNDP-BCPR programme strengthening municipal capacities in risk management in the remaining coastal municipalities.

114. Coastal ecosystems pose a critical resource for production, tourism and sustainability of biological and economic processes, staff of all the coastal municipalities must be aware of the risks linked to climate change and to current climate risk as well, as to be developed through the output 2.1. Thus in addition to the work focusing on climate risk management a broader training programme will be developed for those municipalities' units linked to the coastal zone management and protection to replicate lessons learnt from the various outputs of the project regarding options for timely adaptation measures to climate change. This will involve the setting up of the training curricula, organizing and delivering local training events in each municipality. In the two pilot municipalities of Canelones and Rocha, in addition to building local capacities to address future requirements on climate change measures that the municipalities will have to fulfill on a regular basis, this training will also include specific modules related to the new land use plans, zoning and coastal management practices that will be implemented in the municipal territory.

1.6. KEY INDICATORS, ASSUMPTIONS, AND RISKS

115. The project has defined a set of key indicators. These are indicated in the Logical framework Matrix in Annex 2 along with the baseline values, targets and means of verification. They include:

- Changes in vulnerability/adaptive capacity measured by the Vulnerability Reduction Assessment
- Number of recommendations adopted by existing coastal management plans seeking to enhance resilience to climate change of globally significant biodiversity
- Number of critical habitats incorporated into land use and management plans to address climate change risks
- Number of key national level policies and regulations governing coastal area planning and management that address climate change adaptation measures
- Perceived ability to respond effectively to future changes in coastal risks.
- Access of institutions to relevant information to develop informed adaptation strategies
- Understanding of climate change related coastal risks and costs among municipal and national policy-makers
- Number of awareness building activities on risks and costs of climate change for key stakeholders
- Number of municipal land use plans updated addressing risk of ecosystems to CC
- Number of municipal staff involved in coastal planning and management trained on climate change implications
- Number of sites/locations where resilience building measures are piloted
- Functioning knowledge management system
- Number of programmes, policies or projects incorporating project approaches, practices, or methods
- Number of queries from outside municipalities, programmes, NGOs or projects involved with coastal areas

116. The above listed indicators will be used to measure the project's final performance for the Objective and the outcomes required to achieve this. A series of assumptions were identified as external conditions that would be required during the project implementation for the outcomes to achieve the objective. These are based the political environment in regard to this proposal, commitment of national government and stakeholders in terms of the coordination, information and knowledge contribution, and key and timely decision-making. It is estimated that the risks that these assumptions will not hold is low to moderate. The main assumptions are summarized below, along with the level of risk of them not holding and the measures proposed for mitigation under the project approach:

Assumption	Risk*	Risk mitigation measure
Baseline initiatives addressing human induced threats to coastal biodiversity are successful in meeting their objectives.	L	The risk is low as current baseline initiatives to counteract such threats have resulted from long processes of inter-institutional engagement and consensus. Project implementation as supported by MVOTMA counts with a wide institutional base and key institutions and programs to address required interventions have been included in the process since the preparatory phase. This will help anticipate any changes in previously planned activities of institutions and programs and make the necessary adjustments in the execution of the Project to reduce potential negative impacts.
Government commitments in relation to land use planning and sustainable use of natural resources are maintained.	L	The risk is unlikely given current government activities, including the on - going reform of land planning national framework and the implementation of the Responsible Production Project (PPR), with a US\$ 30 million WB loan and US\$ 7 million GEF grant aimed at mainstreaming biodiversity conservation in productive sectors, which is intended to impact as well coastal protected areas (wetlands and lagoons). To abate any risks valuation studies as proposed in the project will help increase understanding of the role of biodiversity in providing environmental services and contribute to decision making according to the priorities for key coastal environments protection to climate change. Dissemination and other communication activities will increase awareness of decision makers and population and encourage support for future legislation and policies needs to coastal biodiversity conservation.
National and local authorities responsible for implementing policies and strategies respond positively to integrating adaptation measures	M	The present proposal has a favourable political environment as climate change is growing as a subject of concern among high and medium level authorities but adaptation options and measures are not. Therefore, the project will take advantage of existing engagement and will provide pilots and activities to translate concern into actions for adaptation that will directly benefit the coastal ecosystems and their biodiversity. Furthermore the project was designed and will be implemented with strong input from a broad range of stakeholders. Training strategies will be based on training needs assessments and will guide learners through activities in which they will be required to participate and apply their knowledge. In addition, the project has the full endorsement of key stakeholders, including the GoU and local authorities of coastal municipalities of Rocha and Canelones.
Official approval of legal and regulatory framework occurs within current predicted timeframe.	M	Although the level of country ownership of the project is high, legislative processes in Uruguay tend to be slow. This risk will be mitigated through the strategic use of lobbying and communications to inform and raise awareness of political representatives, decision makers, and policy makers. The project will build close relationships with the mass media, considering its role in forming public opinion.
Access to high-quality training resources can be effectively obtained	L	Training is a key part of several outputs of this project to increase stakeholders' knowledge in regard of climate change adaptation. The quality of training resources is guaranteed as Uruguay has developed scientific research in the field of national implications of climate change and the pilot activities proposed will complement the current knowledge by incorporating the local and coastal ecosystem perspective and data. Such information will be used by national experts in climate change and coastal environment to prepare the practitioners at the technical level of policy making (EIA, land planning).

* **RISK OF THE ASSUMPTION NOT HOLDING RATING: L – (LOW RISK); M – (MEDIUM RISK); H – (HIGH RISK)**

2. COUNTRY OWNERSHIP

2.1. COUNTRY ELIGIBILITY

117. Uruguay ratified the United Nations Framework Convention on Climate Change (UNFCCC) on July 22, 1994, making it eligible for receiving GEF support under the climate change focal area. The country has also signed a series of international agreements and conventions in the field of biodiversity conservation, among them, the Convention on Biological Diversity of 1992 (Law N° 16.408 of 1993). It is contracting party of the Ramsar Convention (Law 15337 of 29/10/82). It is eligible for technical assistance from UNDP. Letters of endorsement are provided in a separate file.

2.2. COUNTRY DRIVENNESS

118. As a party to the UNFCCC and the Kyoto Protocol, Uruguay is carrying out a wide scope of activities to fulfill its commitments. A Climate Change Unit (UCC) was created in 1994, within the framework of the National Environment Directorate (DINAMA) of the Ministry of Housing, Land Use Planning and Environment (MVOTMA). This Unit has conducted several national exercises as the country's follow up to the UNFCCC guidelines. It is also exploring strategies that would enable the country to better face the effects of climate change while generating benefits to both the local and global environments. Amongst these is the comprehensive Program of General Measures for Mitigation and Adaptation to Climate Change in Uruguay (PMEGEMA), which through inter institutional and multidisciplinary working groups under took a number of vulnerability and adaptation assessments. On November 2003, the implementation of the measures listed in the PMEGEMA was declared of Ministerial Interest by MVOTMA. In 2004 Uruguay submitted the Second National Communication to the UNFCCC and was the first developing country to do so.

119. Through the PMEGNA and SBC the Uruguayan government has defined concrete adaptation measures for coastal resources: a) to promote the integrated management of coastal areas of Uruguay, through inter-agency and inter-institutional coordination in segments of the coast that are vulnerable to the impacts of climate change; b) to establish a systematic monitoring system for tidal surges and beach profiles; and, c) to study degraded coastal areas with a practical proposal for the restoration and the reduction of future climate risks for coastal ecosystems and infrastructure. Uruguay is currently developing its Third National Communication (TNC) to the UNFCCC under the framework of the UNDP/UNEP in support programme. In preparation of this TNC, the MVOTMA is working to address the priorities identified in the two previous reports in regard to climate change adaptation for the sector of water and coastal resources and agriculture. This project will concentrate on adaptation measures necessary to preserve and restore coastal wetlands as it involves a number of interests for the country including biodiversity and many sectoral and economic implications.

120. Uruguay was also the first Latin-American country to complete its enabling activity for the National Capacity Self-Assessment for Global Environmental Management (NCSA), which has provided an important overview of the country's activities in fulfillment of its obligations under the UNFCCC, the United Nations Convention to Combat Desertification (UNCCD), and the Convention on Biological Diversity (CBD), as well as a roadmap to increase national capacities. Capacity enhancement derived from the execution of this climate change adaptation project will fulfill some of the capacity needs identified in the NCSA project. In particular, among the most important needs identified are those related to inter institutional coordination, information-sharing and to raising awareness on these issues among decision-makers and stakeholders

121. This project is also consistent with the boarder national environmental context including the General Environmental Protection Act that was passed in 2000 which provides a formal framework for environmental management and protection and incorporates specific provisions for climate change, such

as the identification of climate change adaptation and mitigation measures, the regulation of the release of greenhouse gas emissions and the coordination of the responsibilities and efforts of other public and private entities related to those issues, by MVOTMA. The country is also developing a number of reforms and policies to support coastal protection, such as the National Protected Areas Systems and the new land planning legal framework that provide the baseline on which this project will build.

3. PROGRAM AND POLICY CONFORMITY

3.1. PROGRAM DESIGNATION AND CONFORMITY

122. This proposal conforms to the Operational Guidelines for the Strategic Priority “Piloting an Operational Approach to Adaptation” (SPA)⁴³. As outlined in these operational guidelines, the project will contribute to the GEF’s stated objective of reducing vulnerability and increasing adaptive capacity to the adverse effects of climate change in the biodiversity focal area by focusing on the unique coastal ecosystems of the Rio de la Plata and the Atlantic maritime front. This pilot will address local adaptation needs in Uruguay to reduce risks of loss of coastal biodiversity which is of global significance. It will reduce the vulnerability of the coastal ecosystems to the adverse impacts of expected climate change

3.2. PROJECT DESIGN (INCLUDING LOGFRAME AND INCREMENTAL REASONING)

3.2.1. Incremental reasoning

3.2.1.1. Global environmental benefits of project

123. The project will develop adaptive capacities in Uruguay in line with UNFCCC objectives of promoting adaptation to climate change. The project focuses on an area that harbors globally significant biodiversity and will incorporate CC issues into the planning and regulatory frameworks that currently govern land-uses and coastal management of areas at high risk to climate change. This in turn will increase national and local capacities to maintain anthropogenic stresses to coastal ecosystems within their coping ranges as climate changes occur. The result would be increased resilience of key ecosystems to climate change and in turn a reduction in the loss of globally significant biodiversity under predicted climate scenario. Similarly global benefits would be incurred through the piloting of climate sensitive approaches to no take near-shore fisheries and coastal protected areas seeking to adjust the boundaries and locations of these to enable migration of species and habitats as changes occur. There will be direct benefit over the biodiversity of Canelones and Rocha ecosystems. The global significance of the biodiversity that would benefit through this project is provided in the Part I section 1.2.3. of this proposal.

124. National benefits can also be expected as Uruguayan institutions and nationals will acquire the skills to address adaptation which can be applied in other sectors and regions of the country. To the extent that the project will develop capacities to integrating climate concerns into the protection of coastal ecosystems that underpin some critical sectors it will benefit locals that rely on this natural resource base as a source of livelihood.

125. In synthesis, the project will provide key adaptation benefits as it will provide concrete inputs for the conservation of coastal environments through upgrading national and local administration structures as regards to climate change requirements at several levels. This will ensure that land planning and sectoral regulations are enhanced in the near future as climate change pressures increase and the preservation of coastal ecosystems of global significance require new interventions and adjustment of existing adaptation measures.

⁴³ GEF/C.27/Inf.10, October 14, 2005

126. This is expected to be the first potentially replicable case of adaptation strategies to protect globally significant biodiversity exposed to future climate change risks in Uruguay. It will provide lessons learnt and disseminate climate change concerns to other administrative departments and municipalities throughout the country, some of them showing common threats in relation to climate change. Those piloting activities to be initially developed in Canelones and Rocha will provide guidelines to help coastal ecosystems naturally adjust in response to the changes of coastal climate parameters. Such findings are expected to be included into the NPAS policy for coastal ecosystems planning and design and aquatic resources management frameworks for correspondent institutions.

127. The project will support the strengthening of adaptive capacity of the coastal ecological systems to climate change, once the proposed measures are implemented and sectoral and land planning regulations incorporate climate change amongst their reference criteria.

3.2.1.2. Incremental Cost Analysis

128. The underlying incremental cost rationale for this project is that under a business-as-usual scenario adaptation to climate change will not be incorporated into land use plans and coastal management that aim to protect Uruguay's coastal assets. This is principally due to the fact that national and local capacities to fully assess, predict and cost the impacts of climate change on the key coastal habitats that harbor globally significant biodiversity are weak. Furthermore, given the complexities of the broader Uruguayan coastal ecosystem that comprises a mosaic of fluvio-marine and coastal habitats current coastal management plans are insufficient to forecast and link impacts to biodiversity trends. Existing capacities to identify and implement appropriate adaptation response measures once the impacts have been more accurately determined are also sub-optimal.

129. Government and donor-funded activities to protect coastal assets in Uruguay do not explicitly incorporate adaptation into climate change. However, the baseline does offer several opportunities to integrate adaptation, as the GoU has recently embarked on several land use and coastal zone planning exercises that provide a framework for protection of coastal ecosystems. In addition there is a wide number of sector related programmes that are currently under implementation to keep anthropogenic pressures within the limits of ecosystem resilience. These efforts provide windows of opportunity for putting in place specific adaptation measures to preserve globally significant biodiversity in Uruguay's coastal areas.

130. Counting on this GEF supported project, Uruguay will timely develop the instruments and take the initial steps towards transforming and strengthening its land use policies to address climate change risks. Although the project focus is coastal biodiversity, it will have significant impacts at the national level, given that the biodiversity of the coastal ecosystems supports a chain of processes both natural and social, with high significance for the regional coastal and marine system and the national economy of Uruguay. High levels of co-funding have been secured to off-set national benefits.

131. By covering the incremental costs of removing barriers to adaptation, the GEF would play a catalytic role in advancing adaptation to climate change in Uruguay, generating global benefits and providing lessons and experience to other countries in the region

3.2.1.3. Incremental reasoning and costs per Outcome

Outcome 1. The incorporation of CC issues into national level policies and regulatory frameworks governing coastal area management strengthens Uruguay's systemic capacity for adaptation.

132. On going reforms of the Uruguayan land planning policy framework will strengthen existing baseline regulations and contribute to the protection of coastal biodiversity, as well as other actions

related to agriculture, pollution and tourism sectors normative framework under the present climate conditions. However, climate change poses threats to the coastal environment, as damage events of different intensity and frequency and constant SLR will deeply affect them if no adjustments are undertaken. The existing frameworks and on-going efforts would become less effective in protecting biodiversity, as additional environmental stresses from climate change will surpass thresholds, putting the survival of coastal and aquatic environments at a very high stake. As wetlands, beaches and aquatic ecosystems support many natural and social systems, their well-being is critical to the survival of their biodiversity and to the Uruguayan social and economic systems and the areas in which most of the country's population live. These SPA resources are therefore required as the additional component to reduce such impacts and lead Uruguay to an integral policy for updating land planning and linked sectors based on the introduction of climate change as a core criterion for decision making towards adaptation. The total cost of this outcome is US\$ 408,490 of which co- financing is US\$ 257,190.

Outcome 2. Specific adaptation measures for ecosystems at risk under predicted climate change are implemented at local levels through municipal land-use plans and coastal management approaches

133. The coastal municipalities of Uruguay are pursuing the enhancement of local policies for land planning and wastes treatment to counteract the impacts on natural environments and economic activities as part of on going efforts to protect coastal areas. These efforts have developed instruments (plans, programs and projects) and have strengthened local capacities to manage the coastal areas under current climate conditions. However, predicted climate change and SLR are expected to significantly alter the coping range of coastal environments, affecting wetlands, beaches, and other important marine and land ecosystems. Thus ground-based support to bring adaptation to the local scale is needed to enhance climate resilience of ecosystems and biodiversity at risk. This project is an opportunity to take adaptation to the local scale where landscape transformations and land use are actually happening. Under the proposed GEF intervention the aquatic systems – marine and land based – will increase their resilience to climate change as stresses related to human activities will be diminished under the baseline. The coastal ecosystems will then be able to naturally develop better answers to climate change effects. As result of this, Uruguay will implement piloting experiences and replication in other municipalities' coastal ecosystems and will include climate change adaptation within regional/local scale of land administration and planning. Several adaptation measures are to be developed and promoted through outputs addressing local land planning issues and pilot activities in coastal ecosystems located in different environments intended to reduce ecosystem vulnerability and exposure to the impacts of climate change. The cost of this Outcome is US\$ 2,380,189 of which co-financing is US\$ 1,880,989.

Outcome 3. Knowledge management and evaluation systems facilitate project follow up and the uptake and replication of climate risk management and adaptation experiences for the coastal areas of Uruguay

134. Existing processes for data gathering and knowledge transference in the baseline are contributing to the progress in activities for resource management among coastal municipalities through ECOPLATA and other governmental and local initiatives. They are working to improve landscape transformation controls and develop alternative land use approaches in benefit of coastal environments. At the same time, disaster reduction and prevention has been targeted under a current UNDP Project to increase national capacities when facing climate related hazards. However, longer-term climate threats in coastal areas under climate change scenario are different from those expected in inland territories, and are not currently addressed by any of these efforts. Therefore, SPA resources will support outputs addressed to evaluate the success of measure tested at ground –based activities, and replicate these to other coastal municipalities through lessons learned gathering and replicability and dissemination activities. The total cost of the Outcome is US\$ 910,904 of which US\$ 659,881 of co-funding including support to dissemination activities for climate change adaptation based through existing fora of coastal municipalities supported by ECOplata.

3.3. SUSTAINABILITY (INCLUDING FINANCIAL SUSTAINABILITY)

135. Upon project completion the continuation of the adaptation strategy developed by the project will depend on the extent and depth of stakeholder engagement in the project, the capacities that are developed, and the mainstreaming of adaptation in relevant policy-making processes. The project will therefore emphasize active engagement and capacity building among a wide range of stakeholders from the national to local level. The emphasis will be on raising awareness and policy reform and consolidation.

136. *Financial sustainability.* By integrating adaptation into existing land planning plans, policies and programmes, the financial cost of implementing measures will also be mainstreamed in the long-term. In such terms the project builds on existing programmes and plans that include the definition of financing strategies and mechanisms. It will also reinforce and enhance on going activities from diverse organizations – educational, environmental, etc. – thus, increasing possibilities of long term sustainability. In addition, as the proposal is targeting the key asset of biodiversity, it is expected that national and local institutions will not only provide support for the initial and implementation phases, but also for further actions regarding coastal ecosystems protection from climate change.

137. *Institutional sustainability.* As adaptation needs to address socio-economic and political structures influencing/affecting the coastal biodiversity, efforts to achieve policy and programme transformations at sectoral, national and local scale need to be well supported by an institutional network. Several governmental institutions have demonstrated their commitment to this adaptation initiative both as active counterparts and as co-financers of activities regarding the enhancement of ongoing actions on coastal management and protection. Amongst those institutions involved in the process are the ECOPLATA Project, DINOT, DINAMA and the National Education Council – through the Programme for Preventive Education for Environmental Health (PEPSA), all of them representatives of the Government of Uruguay, and the Spanish Government as external donor.

138. *Social sustainability.* A very favorable political environment has led this process, from national government stakeholders to authorities at the local level in coastal municipalities, especially the ones from Canelones and Rocha, to national networks of environmental NGOs. As baseline organizations have taken part of the preparatory process and others are getting involved as well for the implementation phase, the project has the conditions to be supported not only by an institutional network but also by a social one, which is a key requirement if local processes considered in outcome 2 are intended to last during and beyond the project time line itself. Awareness as proposed in outputs 1.3 and 2.4 is aimed to contribute in this sense.

3.4. REPLICABILITY

139. Adaptation measures are tools of increasing demand as stakeholders realize the implications and proximity of climate change effects predicted in the most recent models and scenarios. While developing such measures for a specific sector or geographical place, there are many others that require such tools to reduce the threats of climate change in the near future. Therefore, and recognizing the needs for optimizing and making the most of every initiative to enhance adaptive capacity at all levels, this project has proposed a number of outputs that focus on the replication of the specific findings, methods and achievements. Indeed, Outcome 3 is entirely focused on knowledge management and replication of experiences to all Uruguay's coastal municipalities.. In addition, the activities of outputs 1.1 (those regarding the NPAS), 1.3, 2.2, 2.3 aim to develop tools and elements with different replication approaches to address the protection of coastal biodiversity from climate change effects in the coastal municipalities. At a broader level Output 3.3 will replicate lessons to other regions and countries

3.5. STAKEHOLDER INVOLVEMENT

140. The basis for this proposal was established during the preparation of Uruguay's Second National Communication (2004). Some key stakeholders were part of that process and have been involved ever since (ECOPLATA, MVOTMA, among others). A working group within the Ministry of Housing, Land Use Planning and Environment was established (January 2006) comprising representatives from DINAMA (in particular, its divisions of Natural Protected Areas, Environmental Quality, and Climate Change) and DINOT so as to initiate the development of the proposal. All major stakeholders have been consulted in the project conceptualization and design phase before and during the PDF-A activities, as part of their mandates as key governmental counterparts of the process.

141. The draft proposal was presented to a wide range of stakeholders (national/local scales) at a national workshop in 2006 and their inputs used to develop the project design. A final intensive workshop with national experts from different institutions (MVOTMA, Universidad de la República, INIA) was organized (March 2007) and bilateral consultations with other key stakeholders were held during this final period of the proposal preparation. The design of the MSP was ground truthed fine-tuned through a workshop held in Montevideo on Climate Change Vulnerability and Adaptation and Climate Risk Management in Latin America. This highlighted the importance of linking adaptation measure to climate risk management.

142. As for the phase of project implementation, the stakeholders described as "institutional counterparts" will support the coordination of activities among governmental units as they belong to the national level of administration. Some of them are direct co-financers (i.e. ECOPLATA) and will be directly leading the implementation of one or more outputs. See Annex 5 for the list of these stakeholders, Annex 6 for stakeholder analysis and Annex 8 for details on the stakeholder consultations).

3.6. COST EFFECTIVENESS

143. The selected project design was considered to be the most cost effective approach to adaptation in Uruguay. The project will focus on the lower cost option of climate proofing land-use planning and coastal zone management processes rather than on wide scale and high investments of hard-measures to protect coastal ecosystem (such as sand beach restoration and structural protection measures). Building adaptive capacity through incorporating climate change considerations and disaster risk management into on-going land use planning process is expected to increase ecosystem resilience to climate change by reducing anthropogenic threats to ecosystems under predicted climate scenarios and by facilitating migration of key ecosystems. Furthermore it will provide the information necessary to make decisions and trade-offs regarding alternative land-use options. It will also inform future decisions regarding other forms of protection such as high investment structures in very specific cases where climate change cannot be addressed through increasing ecosystem resilience and where these measures may be valid in view of highly significant negative impacts on economic and or environmental attributes.

144. A number of alternatives were also considered to enhance cost effectiveness in terms of implementation costs. Selection of sites for pilot demonstrations and of implementing partners considered the need to reduce the costs of setting up and monitoring on the ground actions. Thus the project will maximize its cost effectiveness by building on existing initiatives and processes and by partnering with local institutions. For example ECOPLATA will provide its institutional capacities and experience to implement the activities related to integrated coastal zone management, and provides an economically effective way to work with municipal governments and institutions and actors on the ground, given ECOPLATA's expertise and infrastructure. By incorporating climate change consideration into existing land planning regulatory processes working with the national Land Planning Institution (DINOT), the project will build on existing national efforts of regulation and generation of norms and add very specific

norms through targeted and precise efforts. By working with existing risk management institutions, the project outcomes regarding the reduction of vulnerability to climate change will be enhanced through the current strengthening of the National Emergency System at the national and municipal level that is being supported by UNDP.

145. Similarly the project pilot demonstration activities will be implemented in Municipalities that have already in place legislative frameworks and municipal capacities regarding coastal management. Rocha has developed specific land planning regulation and Canelones is investing in its “Costa Plan”, a plan for its coastal zone. In this context, relatively small additional efforts in implementing climate change adaptation measures are expected to produce considerable results improving current management practices and the overall coastal development and management of those municipalities. This will allow for further replication of activities to all coastal municipalities at the national level.

146. Finally with regard to procurement of project inputs, standard procedures of the Government of Uruguay and of UNDP will be carefully applied to ensure value for money in all purchases of goods and procurement of services for the project, and the project will use strict internal and external audit controls that meet international standards

3.7. MONITORING AND EVALUATION

147. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and the UNDP Country Office (UNDP-CO) with support from UNDP/GEF. The Logical Framework (logframe) Matrix provides a summary of outcomes, outputs, activities, indicators, and means of verification to be performed by the project. These form the basis on which the project's monitoring and evaluation system will be built. The Project will also have a component of external evaluation in accordance with current UNDP/GEF procedures. This monitoring is devised to follow the Project's performance and provide external input, and to evaluate the final performance and impact of the Project in view of the objectives set forth. [Annex 5 Monitoring and Evaluation](#) details the Monitoring and Evaluation Plan and provides a table with responsibilities, and indicative budgets and timeframes.

4. FINANCING PLAN

4.1. PROJECT COSTS

Project Components/Outcomes	Co-financing (\$)	GEF (\$)	Total (\$)
1. The incorporation of climate change risks into national level policies and regulatory frameworks governing coastal area management strengthens Uruguay’s systemic capacity for adaptation	257,190	151,300	408,490
2. Specific pilot demonstration adaptation measures for ecosystems at risk under predicted climate change are implemented at local levels	1,880,989	499,200	2,380,189
3. Knowledge management and evaluation systems facilitate the uptake and replication of climate risk management and adaptation experiences for the coastal areas of Uruguay	659,881	251,023	910,904
4. Project management budget/cost*	124,840	73,477	198,317
Sub – total project costs	2,922,900	975,000	3,897,900
PDF A	5,000	25,000	30,000
Total project costs	2,927,900	1,000,000	3,927,900

* This item is an aggregate cost of project management; breakdown of this aggregate amount presented in the table b) below.

4.2. PROJECT MANAGEMENT BUDGET/COST⁴⁴

Component	Estimated Consultants weeks	GEF (US\$)	Other sources (US\$)	Project total (US\$)
Personnel	416	0	107,800	107,800
Local consultants	208	67,477	0	67,477
Office facilities, equipment, vehicles and communications		0	15,800	15,800
Professional services		6,000	0	6,000
Miscellaneous		0	1,240	1,240
Total	624	73,477	124,840	198,317

4.3. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Estimated Consultants weeks	GEF (US\$)	Other sources (US\$)	Project total (US\$)
Personnel	1,066	0	213,511	213,511
Local consultants	1,444	304,694	202,955	507,649
International consultants	32	64,000	0	64,000
Total	2,518	368,694	416,466	785,160

4.4. CO-FINANCING SOURCES

Co-financing Sources					
Name of co-financier (source)	Classification	Type	Amount (\$)	Status	
				Confirmed	Un-confirmed
Ministry of Housing, Land Use Planning and Environment (MVOTMA)	Government	Cash	215,000	Letter attached	
Ministry of Housing, Land Use Planning and Environment (MVOTMA)	Government	In kind	360,700	Letter attached	
Administration of Public Education (ANEP)	Government	In kind	195,000	Letter attached	
Municipal Government of Canelones (IMC)	Government	Cash	1,000,000	Letter attached	
Municipal Government of Canelones (IMC)	Government	In kind	562,500	Letter attached	
Municipal Government of Rocha (IMR)	Government	In kind	195,000	Letter attached	
ECOPLATA	Government	In kind	200,000	Letter attached	
UNDP-BCPR	International Agency	Cash	170,000	Funds available in UNDP CO	
Spanish Government	Donor	Cash	24,700	Funds available in UNDP CO	
Sub-total co-financing			2,922,900		

⁴⁴ For all consultants hired to manage project or provide technical assistance, please attach a description in terms of their staff weeks, roles and functions in the project, and their position titles in the organization, such as project officer, supervisor, assistants or secretaries.

5. INSTITUTIONAL COORDINATION AND SUPPORT

5.1. CORE COMMITMENTS AND LINKAGES

148. This project is consistent with the United Nations Country Common Assessment in Uruguay (CCA), which identifies the country's need to reduce its vulnerability to climate change and variability through adaptation programmes and by increasing its risk management capacities. In addition, adaptation to climate change and risk reduction is included in one of the United Nations Development Assistance Framework UNDAF (2007-2010) programme outputs and in one of the UNDP Country Programme outputs: "Measures for adaptation and mitigation to climate change and risk reduction plans implemented by the Government, the private sector and the civil society". This MSP also contributes to the local development strategy guidelines of UNDP Uruguay, as it will support institutional development of local governments and territorial and environmental development. It will contribute to Uruguay's efforts to achieve the Millennium Development Goals (MDG), specifically the Government's initiatives to *integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources* (MDG Target 9) and *ensure environmental sustainability* (Goal 7).

149. Besides the programmatic importance of climate change and risk management for UNDP, this project fits well within its current line of work. UNDP Country Office is supporting projects to strengthen national capacities for risk reduction and recovery after disasters. UNDP also supports the National Communication Programme, and the Regional Workshop on Vulnerability and Adaptation Assessment and Climate Risk Management for Latin America in August 2007 that brought together the Adaptation to Climate Change and the Risk Management communities. This workshop included training in tools such as DIVA that are relevant for this project. In addition, UNDP is the IA for the GEF FSP to catalyze the National System of Protected Areas, and the FREPLATA project.

5.2. CONSULTATION, COORDINATION AND COLLABORATION BETWEEN IAS, AND IAS AND EXAS

150. DINAMA, through its Climate Change Unit, is carrying out a National Climate Change Program, including a number of activities to fulfill Uruguay's commitments under the UNFCCC. The submission of National Communications is one of the main commitments, reflecting the efforts of the country in exploring strategies that would allow it to deal with climate change and benefit both the local and global environment. The initial findings of this UNDP/GEF MSP will contribute as an input to Uruguay's Third National Communication to be submitted in 2009

151. This proposal will be closely coordinated with other relevant GEF projects in Uruguay, including the final stages of the first Freplata programme - a joint initiative of Uruguay and Argentina that developed a trans-boundary analysis and strategic action programme for environmental protection, pollution control and prevention, and habitat restoration in the La Plata River and its Maritime Front, and the UNDP GEF National System of Protected Areas (SNAP) project. It will also be very closely coordinated with other existing coastal programmes in Uruguay, such as ECOPLATA and PROBIDES (Biodiversity Conservation and Sustainable Development Program for the Eastern Wetlands of Uruguay). Representatives of these four projects/programmes participated in a first workshop held for the development of this proposal during the PDF A phase. In particular, a co-financing of ECOPLATA has been obtained, which assures a close synergy with current initiatives.

152. Close coordination will also be sought with the UNEP GEF regional project "Sustainable Management of the La Plata basin with respect to the effects of climate variability and change". Although the current project focuses on increasing the resilience of Uruguay's coastal and marine ecosystems to Climate Change these ecosystems also depend on the flow and quality of the waters of the Rio de la Plata. is in turn is affected by human activities in the La Plata Basin and will also be affected by climate change.

The La Plata Basin drains approximately one fifth of the South American continent, and is home to more than 100 million people. The UNEP GEF regional project will contribute to Uruguay's MSP project by increasing the sustainability of water management in the basin and by providing information about the whole basin that can be used for locally-based management in the area of the MSP project. In particular, Component II "Integrated Water Resource Management" will address contamination problems in water resources, water balances, biodiversity management, land degradation control and identification of sustainable development opportunities. All these activities will contribute to improving the quality of the waters of the Rio de la Plata. Several pilot projects will be implemented in the basin. Some will be particularly significant to the Uruguayan coastal resources, such as a project to resolve water use conflicts in the Cuareim/Quarai basin. Component II will generate a hydro-climatic forecasting system for the La Plata Basin. The MSP project could help local management systems to use this and other information as an input for specific strategies regarding predicted hydrodynamic changes that include climate change information and considerations into local plans and practices.

153. The Ministry of Agriculture of Uruguay, through its fishing agency DINARA and FAO as GEF agency, is developing a PIF to be submitted to the GEF for "Piloting of an Ecosystem-Based Approach to Uruguayan Coastal Fisheries" in the focal areas of Biodiversity and International Waters, to enhance current fishing management schemes thus further reducing anthropic pressures to biodiversity under present day climate. This MSP will provide climate change knowledge to improve the FAO fisheries management and fisheries conservation. To facilitate this, the Ministry of Agriculture will be part of the Steering Committee of the project proposed herein. The information on fisheries and reproductive sites generated by the DINARA project will provide valuable information for this MSP. Regarding FAO/UNDP coordination, Uruguay is now one of the pilot countries for the One UN reform, where efforts are being made to achieve a stronger coordination between all U.N. System agencies. This will be an opportunity to work closely and within the framework of ONE UN in a specific area covering complementary aspects of a natural resource with biodiversity value.

154. Similarly very close coordination will be established with the new FREPLATA project that would begin implementation of the Strategic Action Program (SAP) for the "Maritime Front" treaty area that Argentina and Uruguay have negotiated over the last 5 years through the first GEF/UNDP FREPLATA project in the area. This will strengthen and harmonize the policy and legal frameworks in the two countries to achieve the SAP objectives for prevention and pollutants from point and non point sources, and implement agreed regional institutional reforms to address priority trans-boundary land-based pollution. As such there would be clear complementarities and synergies with the proposed MSP SPA and fisheries MSPs. To ensure these are maximized and to avoid duplication specific coordination mechanisms would be developed between these two UNDP projects and the FAO project on fisheries. These would include meetings to discuss annual operational planning and reporting (see separate annex submitted along with this revised document), information sharing mechanisms and lesson exchange. The specific mechanisms of this are under discussion and would be further explored in a joint document that would detail linkages coordination elements, collaboration and synergies in reporting processes.

155. Uruguay is developing a proposal of Adaptation to Climate Change in the Agricultural sector under the Special Climate Change Fund (SCCF). This proposal, which is at an early stage, is an indicator of the importance that the Uruguayan Government assigns to adaptation to climate change issues, in the three main lines developed under the PMEGEMA.

5.3. PROJECT IMPLEMENTATION ARRANGEMENTS

156. This Medium-Sized Project will be executed through the National Execution (NEX), modality implying that a governmental entity is responsible for the Project execution. This modality contributes to

strengthening the technical and managerial capacities of the project executing entity, and will improve the project sustainability and foster further replication.

157. The MVOTMA will serve as the Executing Agency (Associate in the Implementation) through its DINAMA, which will have full responsibility for the implementation of the project on behalf of the Government of Uruguay. MVOTMA has been mandated to coordinate climate change related activities with other public and private entities. The Climate Change Unit was created in 1994 within the framework of DINAMA to advance Uruguay's efforts in this area. In this regard, the Climate Change Unit will act as the Project Management Unit (PMU). It will be in charge of day-to-day implementation of the project. An expert on adaptation to climate change and a technical assistant will be appointed under the project to provide necessary technical and organization support to the Unit. The Climate Change Unit will be responsible inter alia for:

- Recruitment of International and National Consultants, following UNDP procedures and in collaboration with the UNDP-CO and UNDP-GEF-RCU for LAC including candidate search/selection, preparation of TORs, supervision;
- Project coordination, including organization of regular meetings with project implementing agency, financial management and accountability, issuance of payments, training staff on financial disbursements and reporting, ensuring completeness and timeliness of financial reporting;
- Technical reporting including preparation of progress reports;
- Monitoring and evaluation as requested by UNDP and UNDP GEF; organization of training/workshop activities.

158. Some of the activities could be implemented directly by institutions or projects that are partners in the project's activities. In particular those activities related to coastal zone management and training could be implemented by ECOPLATA due to its on-the-ground capacities for coordination among coastal actors and technical expertise.

159. There will be an Executive Board of the project, which will meet at least on a quarterly basis. This Board will be chaired by the MVOTMA and integrated by the institutions directly involved in the project. To avoid replication of coordinating bodies, existing entities such as the Executive Board of ECOPLATA could adopt this role, with the participation of Municipalities and other institutions as needed. The objectives of the Executive Board will be:

- Guiding the project-related work of the PMU
- Facilitating the implementation of project activities in their respective organizations
- Ensuring that cooperative activities are implemented in a timely manner
- Facilitate the integration of project-inspired activities into existing programmes and practices.

160. A Project Steering Committee coordinated by DINAMA consisting of representatives from DINOT, UNDP, the different Ministries, Institutions and Municipalities involved in the project will be set up to provide overall guidance to the project and ensure inter-institutional coordination and active involvement in the project. Regarding project supervision and management the PSC will be responsible for:

- Commenting on project work plans and progress reports;
- Mobilizing co-financing;
- Approving major project plans and outputs;
- Assuring coordination between this project and other ongoing activities and programmes;
- Assuring all stakeholders are appropriately involved in the project planning and management;

- Facilitating linkages with high-level decision-making.

161. The United Nations Development Program will be the GEF Implementing Agency and its Country Office will provide project support. UNDP Uruguay will monitor progress towards intended results through regular contacts with the Climate Change Unit and monitoring visits, on implementation matters and problem solving. UNDP will also provide administrative support upon request and ensure financial oversight. The project will be implemented following the standard UNDP National Execution Guidelines.

162. UNDP has a strong comparative advantage as the IA for this project. It is mandated to strengthen countries' development capacities, supporting conditions for development processes. Over the last decades the agency has consolidated a significant experience and a strong country-based supportive structure with a demonstrated expertise in the thematic areas of Democratic Governance, Poverty Reduction, Crisis Prevention and Recovery and Energy and Environment, among others. Specifically in Uruguay UNDP has proven its capacity to formulate projects in the environmental and social fields in Uruguay and implement them with a wide number of national counterparts, involving constant work with the National and municipal governments, the private sector and the civil society in the country. UNDP is also working with a wide array of bilateral and multilateral donors such as the GEF, aiming to strengthen capacities of the country that are directly related to this MSP.

163. In particular, UNDP supports the MVOTMA in the execution of Ecoplata, that will have a leading role in the execution of this MSP. It is also the IA of a project to catalyze the implementation of the National Protected Areas System recently approved by the GEF. It supports a number of initiatives in the selected regions, such as PROBIDES (that coordinates Departmental Governments in the region) and FREPLATA, acting in the Rio de la Plata and the maritime front. The Small Grants Programme (SGP) is also an example of good field-based practices that are being carried out by the civil society with the support of UNDP. Additional work is being done to strengthen the risk management capacities of the country, providing financial and technical support to the National Emergency System at the National and municipal levels. This support will constitute a co-financing source for this adaptation project. Furthermore, UNDP is generating new adaptation proposals for agriculture and livestock sectors together with the MVOTMA and the MGAP, promoting decision support systems (DSS) that include climate risk considerations at public and private levels

164. These initiatives are part of UNDP's effort to strengthen the country's capacities to conserve and manage the ecosystems and the natural resources on which the well-being of the population depends, and helping the country to adapt to and prepare for current and future climate risks, as a necessary way to secure development gains.

LIST OF ANNEXES

Annex 1: Project Intervention Structure

Annex 2: Logical Framework Matrix

Annex 3: Indicative activities and budget by outputs

Annex 4: Total Budget and Work Plan

[Annex 5: Monitoring and Evaluation Plan](#)

Annex 6: Stakeholder Analysis

Annex 7: Terms of Reference of Key Staff

Annex 8: Stakeholder Consultations

Annex 9: Using DIVA Tool for coastal impacts and adaptation indicators for Uruguay's coast

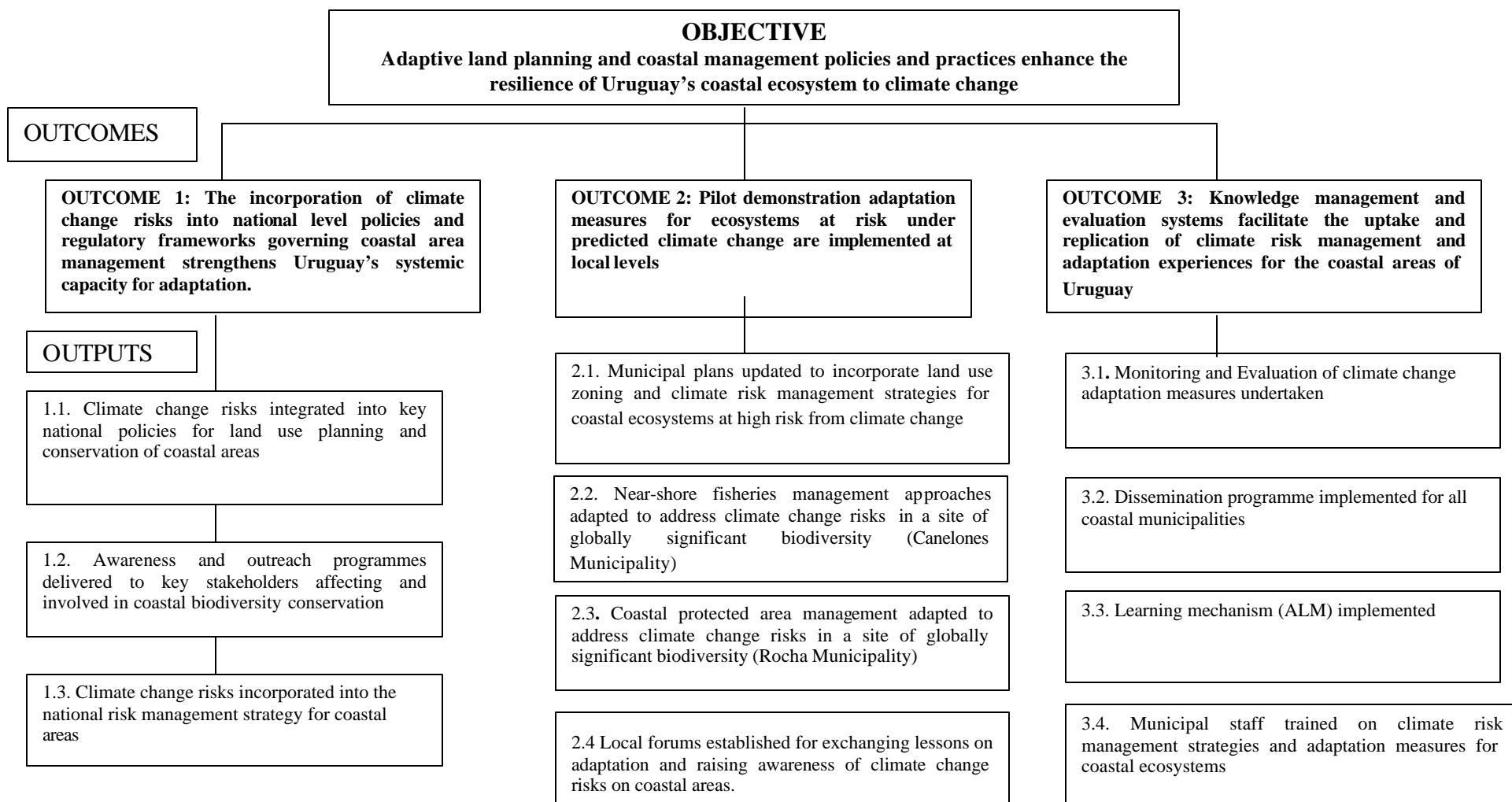
Annex 10: Figures

Annex 11: Biodiversity values and main features of pilot sites

Annex 12: Literature cited

ANNEXES

ANNEX 1: PROJECT INTERVENTION STRUCTURE



ANNEX 2: LOGICAL FRAMEWORK MATRIX

OBJECTIVELY VERIFIABLE INDICATORS					
PROJECT STRATEGY	Indicators	Baseline Value	Project end Targets	Sources of verification	Assumptions
GOAL: The reduction of Uruguay’s coastal ecosystems vulnerability to climate change					
OBJECTIVE: Adaptive land planning and coastal management policies and practices enhance the resilience of Uruguay’s coastal ecosystems ⁴⁵ to climate change	<ul style="list-style-type: none"> Number of recommendations adopted by existing coastal management plans seeking to enhance resilience to climate change of globally significant biodiversity 	<ul style="list-style-type: none"> Resilience enhancing recommendations to update existing BD and resources management policies considering climate change are not available 	<ul style="list-style-type: none"> Recommendations on how to address climate change and variability in relevant national biodiversity and resources management policies are available. 	<ul style="list-style-type: none"> Project reports including guidelines on adaptation measures 	<ul style="list-style-type: none"> Baseline initiatives addressing human induced threats to coastal biodiversity are successful in meeting their objectives. Government commitments in relation to land use planning and conservation and sustainable use of natural resources are maintained. National and local authorities responsible for implementing policies and strategies respond positively to integrating adaptation measures Official approval of legal and regulatory framework occurs within current predicted timeframe Access to high-quality training resources can be effectively obtained
	<ul style="list-style-type: none"> Number of critical habitats incorporated into management plans which address climate change risks 	<ul style="list-style-type: none"> There are no adaptation measures affecting critical coastal habitats 	Project adaptive measures will directly affect the following critical habitats: <ul style="list-style-type: none"> Sandy beaches critical for migrating birds Coastal wetlands Coastal lagoons Dunes Nursery grounds Note: This will be revised and quantified once the high risk areas methodology has been determined in project.	<ul style="list-style-type: none"> Zoning scheme and classification of coastal ecosystems for climate change risk for Rocha and Canelones Project reports including guidelines on adaptation measures DIVA application reports 	
	<ul style="list-style-type: none"> Number of key national level policies and regulations governing coastal area planning and management that address climate change 	<ul style="list-style-type: none"> Climate change adaptation is not addressed so far under existing national level policies and regulations governing coastal area 	<ul style="list-style-type: none"> Climate change adaptation is an integral part of at least 3 relevant national level policies and regulations governing coastal area planning and management. 	<ul style="list-style-type: none"> NPAS strategic plan Amendment reports of EIA regulations 	

⁴⁵ Coastal Ecosystems in Uruguay include the Atlantic marine coastline and the mixo haline coastline of the La Plata River.

OBJECTIVELY VERIFIABLE INDICATORS					
PROJECT STRATEGY	Indicators	Baseline Value	Project end Targets	Sources of verification	Assumptions
	adaptation measures	planning and management	(e.g. EIA, National Territorial Planning and Sustainable Development Bill, NPAS strategic plan)		
	<ul style="list-style-type: none"> Perceived ability to respond effectively to future changes in coastal risks. 	<ul style="list-style-type: none"> To be determined by survey in first 6 months of project implementation 	<ul style="list-style-type: none"> A 50% increase for municipal and 30% for central policy makers 	<ul style="list-style-type: none"> Survey reports 	
Outcome 1: The incorporation of climate change risks into national level policies and regulatory frameworks governing coastal area management strengthens Uruguay's systemic capacity for adaptation.	<ul style="list-style-type: none"> Access of institutions to relevant information to develop informed adaptation strategies 	<ul style="list-style-type: none"> Existing information is of limited usefulness and very difficult to access by institutions. 	<ul style="list-style-type: none"> Relevant information to enable sound appreciation and understanding of potential costs and benefits associated with climate change and climate change response is available to institutions. 	<ul style="list-style-type: none"> Reports on climate change scenarios Assessments of impacts of climate change on key coastal ecosystems Estimates of net economic costs of climate change impacts on key coastal ecosystems with and without adaptation measures 	<ul style="list-style-type: none"> National and local governments' interest in promoting adaptation objective under the UNFCCC remains as strong as it has been under the SNC. Key policy and decision makers continue to have at least the present levels of interest in acquiring and using the new knowledge and skills provided through the project
	<ul style="list-style-type: none"> Understanding of climate change related coastal risks and costs among municipal and national policy-makers 	<ul style="list-style-type: none"> To be determined by survey in first 6 months of project implementation 	<ul style="list-style-type: none"> A 50% increase for municipal and 30% for central policy makers 	<ul style="list-style-type: none"> Survey reports 	<ul style="list-style-type: none"> Implementing agencies maintain a co-operative, collaborative working relationship.
	<ul style="list-style-type: none"> Number of awareness building activities on risks and costs of climate change for key stakeholders 	<ul style="list-style-type: none"> There are no systematic awareness building activities on risks and costs of climate change for key stakeholders 	At least one awareness building activity per year is implemented for each of the following target audiences: <ul style="list-style-type: none"> The media Policymakers Coastal communities 	<ul style="list-style-type: none"> Activity reports Press releases Project annual reports 	

OBJECTIVELY VERIFIABLE INDICATORS					
PROJECT STRATEGY	Indicators	Baseline Value	Project end Targets	Sources of verification	Assumptions
Outcome 2: Pilot demonstration adaptation measures for ecosystems at risk under predicted climate change are implemented at local levels	<ul style="list-style-type: none"> Number of municipal land use plans updated addressing risk of ecosystems to climate change 	<ul style="list-style-type: none"> There are no municipal plans addressing risk of ecosystems to climate change 	<ul style="list-style-type: none"> The land use plans of Canelones and Rocha are updated to address risk of ecosystems to climate change 	<ul style="list-style-type: none"> Zoning scheme and classification of coastal ecosystems for climate change risk for each municipality 	<ul style="list-style-type: none"> Key policy and decision makers are open to integrating adaptation measures. Key stakeholders continue to have at least the present levels of interest in acquiring and using the new knowledge and skills provided through the project
	<ul style="list-style-type: none"> Number of municipal staff involved in coastal planning and management trained on climate change implications 	<ul style="list-style-type: none"> Municipal staff involved in coastal planning and management are few and poorly trained on climate change implications 	<ul style="list-style-type: none"> At least 80% of staff involved in coastal planning and management in Canelones and Rocha trained on climate change implications 	<ul style="list-style-type: none"> Workshop reports 	
	<ul style="list-style-type: none"> Number of sites/locations where resilience building measures are piloted 	<ul style="list-style-type: none"> 0 	<ul style="list-style-type: none"> At least two high risk sites of global significant biodiversity test climate sensitive approaches 	<ul style="list-style-type: none"> Evaluation reports of pilot experiences Project annual reports 	
Outcome 3: Knowledge management and evaluation systems facilitate the uptake and replication of climate risk management and adaptation experiences for the coastal areas of Uruguay	<ul style="list-style-type: none"> Availability of vulnerability reduction assessment of project results through the implementation of the VRA at the community level to measure local adaptive capacity Functioning adaptation climate change knowledge management system 	<ul style="list-style-type: none"> There is no available information on adaptive capacity at the community level There is no CC knowledge management system 	<ul style="list-style-type: none"> Adaptive capacity at the community level assessed through the measurement system provided by the VRA applied as part of M&E. Targets will be established on first application of VRA A functioning CC knowledge management system institutionalized and accessible to a wide range of stakeholders to ensure sustainability and replicability of achievements and lessons learned. 	<ul style="list-style-type: none"> National database on climate change and coastal risks integrated into the National System for Environmental Information, the National Emergency System and other relevant systems Number of users Best practice documents 	<ul style="list-style-type: none"> Key stakeholders continue to have at least the present levels of interest in acquiring and using the new knowledge and skills provided through the project National and local governments' interest in promoting adaptation objective under the UNFCCC remains as strong as it has been under the SNC.

OBJECTIVELY VERIFIABLE INDICATORS					
PROJECT STRATEGY	Indicators	Baseline Value	Project end Targets	Sources of verification	Assumptions
	<ul style="list-style-type: none"> Number of outside programmes, policies or projects incorporating project approaches, practices, or methods 	<ul style="list-style-type: none"> 0 	To be determined at project start	<ul style="list-style-type: none"> NPAS strategic plans Management plans of protected areas 	
	<ul style="list-style-type: none"> Number of queries from outside municipalities, programmes, NGOs or projects involved with coastal areas 	<ul style="list-style-type: none"> No municipalities, programmes or project involved with coastal areas in Uruguay are addressing adaptation to climate change 	<ul style="list-style-type: none"> At least 2 coastal municipalities other than Rocha and Canelones have requested information to mainstream adaptation in vulnerable areas At least one relevant program, project and NGO who are active in coastal areas of Uruguay have requested information on climate change and coastal risks. 	Project reports	

ANNEX 3 INDICATIVE ACTIVITIES

Indicative activities by outputs	Potential Implementing agency
Outcome 1: The incorporation of climate change risks into national level policies and regulatory frameworks governing coastal area management strengthens Uruguay's systemic capacity for adaptation.	
<p>Output 1.1: Climate change risks integrated into key national policies for land use planning and conservation of coastal areas and economic evaluation undertaken to inform policy</p> <p>Indicative Activities</p> <ul style="list-style-type: none"> Guidelines and norms for urban development and tourism infrastructure will be reviewed to determine their effectiveness for both the safety of residents and the protection of susceptible ecosystems and biodiversity to the main hazards linked to climate change Guidelines for incorporating climate change considerations and required risk evaluations during the design stages of such works would be developed Definition of guidelines to ensure that the EIA instruments adequately incorporate the consideration of climate change scenarios and risks over the expected lifetime of the specific project under review Economic valuation to inform policy on priority needs when integrating climate change risk on coastal areas. 	DINAMA
<p>Output 1.2: Awareness/outreach programs on climate change delivered to key stakeholders affecting and involved in coastal biodiversity conservation</p> <p>Indicative Activities</p> <ul style="list-style-type: none"> Design and implement a programme to address mass media, policy and other stakeholders to facilitate the incorporation of climate change consideration into decision making level and as part of public awareness. Development of specific campaigns for each target audience compounding this output stakeholders' groups. Development of appropriate tools and materials for each target audience and co-funding would be provided for their dissemination. Involvement of key representatives and decision makers of these sectors through outreach activities as information kits, small target-specific meetings and discussion groups, forums and lobbying 	DINAMA
<p>Output 1.3: Climate change risks incorporated into the national risk management strategy for coastal areas</p> <p>Indicative Activities</p> <ul style="list-style-type: none"> Development of a strategy aiming to be used as a reference for planning and decision making over a mid term scale for climate change risk Information update and gap filling through climatic and other physical data related to sea level along the coastal line to update the strategy on risk management at the national scale 	DINAMA
Outcome 2: Specific pilot demonstration adaptation measures for ecosystems at risk under predicted climate change are implemented at local levels	
<p>Output 2.1: Municipal plans updated to incorporate land use zoning and climate risk management strategies for coastal ecosystems at high risk from climate change</p> <p>Indicative Activities (general description of main activities)</p> <ul style="list-style-type: none"> Analyses of climate change effects and current climate risk conditions in coastal and marine ecosystems in the pilot municipality Implementation of the coastal vulnerability matrix defined in the SNC and the DIVA methodology in the coastal area of the two pilot municipalities to enable the zoning and classification of coastal ecosystems and their services according to their level of risk to current climate and to climate change. Update of municipal plans for ecosystems under climate risk through the addendum of special land plans in each case, as allowed by the new land planning legal framework under development. 	EcoPlata/IMC/IMR

<p>Output 2.2: Near-shore fisheries management approaches adapted to address climate change risks in a site of globally significant biodiversity (Canelones Municipality)</p> <p>Indicative Activities (general description of main activities)</p> <ul style="list-style-type: none"> • Observation and data update to fill in the gaps for the estimation of the saline front changes and nurseries behave projections and for the economic valuation of resources taking part in the pilot area and activities. • Working with relevant stakeholders undertaking the land use planning in Montevideo and Canelones municipalities to incorporate the new location of new fish nurseries into municipal land use plans and coastal zoning and management and negotiate restrictions for land based actions in these areas that could produce stresses to the new fishery sites under climate change 	DINAMA/ MC
<p>Output 2.3: Coastal protected area management adapted to address climate change risks in a site of globally significant biodiversity (Rocha Municipality)</p> <p>Indicative Activities (general description of main activities)</p> <ul style="list-style-type: none"> • Assessment of present and projected future range of key species present in Laguna de Rocha, mainly migrating shorebirds. • Evaluation of potential losses in key habitat types given the high vulnerability of coastal areas to climate change • Upgrade of existing databases of the NPAS project regarding the distribution of priority species for conservation. • Adjustment of the design and management of the NPAS and specific coastal protected areas 	DINAMA/ MR
<p>Output 2.4: Local forums established for exchanging lessons on adaptation and raising awareness of climate change risks on coastal areas.</p> <p>Indicative Activities (general description of main activities)</p> <ul style="list-style-type: none"> • Open local forums for local leaders held as well as public hearings to discuss information on zones under risk and to advance understanding and acceptance on the need for new land-use plans. 	DINAMA
<p>Outcome 3: Knowledge management and evaluation systems facilitate the uptake and replication of climate risk management and adaptation experiences for the coastal areas of Uruguay</p>	
<p>Output 3.1: Monitoring and Evaluation of climate change adaptation measures</p> <p>Indicative Activities</p> <p>Implementation of the Vulnerability Reduction Assessment (VRA) for tracking changes in vulnerability/adaptive capacity</p> <ul style="list-style-type: none"> • Monitoring of project impacts through Monitoring and Evaluation Framework for Adaptation to Climate Change (UNDP) • Evaluation of project progress at mid term and project closure 	DINAM A
<p>Output 3.2: Dissemination program implemented for all coastal municipalities</p> <p>Indicative Activities</p> <ul style="list-style-type: none"> • Design and dissemination of a programme by the ECOPLATA aiming to reach all Uruguayan coastal municipalities regarding the threat posed by that climate change on local assets. • Development of guidelines to identify ecosystems under risk of climate change threats as a first approach for municipal staff not directly involve in outcome 2. • Organization and holding of meetings for key personnel of Uruguayan coastal municipalities to exchange lessons learned 	EcoPlata
<p>Output 3.3: Learning mechanism (ALM) implemented</p> <p>Indicative Activities</p> <ul style="list-style-type: none"> • Development of reports of project results and recommendations for future action and reports on lessons learned 	DINAM A
<p>Output 3.4: Municipal staff from all coastal municipalities trained on current climate risk management, future climate change implications for the coastal ecosystems and feasible options for adaptation</p> <p>Indicative Activities</p> <ul style="list-style-type: none"> • Preparation of training tools based on previous outputs findings and considering the advice of climate change experts • Training programmes for all 6 the municipal institution divisions linked to the coastal zone management and protection 	DINAM A

ANNEX 4: TOTAL BUDGET AND WORK PLAN

Award ID:	00047972
Award Title:	PIMS 3690 Uruguay: Implementing Pilot Climate Change Adaptation Measures in Coastal Areas of Uruguay
Business Unit:	URY10
Project Title:	PIMS 3690 Uruguay: Implementing Pilot Climate Change Adaptation Measures in Coastal Areas of Uruguay
Implementing Partner (Executing Agency)	NEX

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)
OUTCOME 1: (as per the logframe)	DINAMA	62000	GEF	71300	Local Consultants	8,435	8,435	8,435	8,435	33,740
				72100	Contractual services	46,127	46,127	12,653	12,653	117,560
					sub-total GEF	54,562	54,562	21,088	21,088	151,300
		31700	GoU	72100	Contractual services	3,333	3,333	3,334	0	10,000
				72200	Equipment	17,200	0	0	0	17,200
				72400	Audiovisual and communication equipment	2,800	0	0	0	2,800
				72500	Supplies	2,500	9,167	9,166	9,167	30,000
				72800	Informatics equipment	7,800	0	0	0	7,800
				74500	Miscellaneous expenses	6,000	6,000	6,000	6,000	24,000
					sub-total GoU	39,633	18,500	18,500	15,167	91,800
	Total Outcome 1	94,195	73,062	39,588	36,255	243,100				
OUTCOME 2: (as per the logframe)	DINAMA	62000	GEF	71200	International Consultants	8,000	8,000	8,000	8,000	32,000
				71300	Local Consultants	42,432	42,432	42,433	42,433	169,730
				71600	Travel	4,000	4,000	4,000	4,000	16,000
				72100	Contractual services	67,868	67,868	67,867	67,867	271,470
				72500	Supplies	2,500	2,500	2,500	2,500	10,000
					sub-total GEF	124,800	124,800	124,800	124,800	499,200

		31700	GoU	72400	Audiovisual and communication equipment	2,500	1,500	0	0	4,000
				72500	Supplies	2,500	2,500	2,500	2,500	10,000
				72800	Informatics equipment	22,150	23,150	0	0	45,300
				74500	Miscellaneous expenses	4,475	4,475	4,475	4,475	17,900
					sub-total GoU	31,625	31,625	6,975	6,975	77,200
		31700	GoSpain	74500	Miscellaneous expenses	6,175	6,175	6,175	6,175	24,700
					sub-total GoSpain	6,175	6,175	6,175	6,175	24,700
					Total Outcome 2	162,600	162,600	137,950	137,950	601,100
OUTCOME 3: (as per the logframe M&E Plan and Budget)	DINAMA	62000	GEF	71200	International Consultants	8,000	35,360	8,000	49,040	100,400
				71300	Local Consultants	29,523	37,990	37,990	21,120	126,623
				71600	Travel	4,000	8,000	4,000	8,000	24,000
					sub-total GEF	41,523	81,350	49,990	78,160	251,023
		31700	GoU	72400	Audiovisual and communication equipment	500	0	0	0	500
				72500	Supplies	2,500	5,000	2,500	5,000	15,000
				72800	Informatics equipment	2,500	0	0	0	2,500
				74500	Miscellaneous expenses	7,000	7,000	7,000	7,000	28,000
					sub-total GoU	12,500	12,000	9,500	12,000	46,000
							Total Outcome 3	54,023	93,350	59,490
PROJECT MANAGEMENT UNIT (This is not to appear as an Outcome in the Logframe)	DINAMA	62000	GEF	71300	Local Consultants	16,870	16,870	16,870	16,870	67,480
				74100	Professional services	1,500	1,500	1,500	1,500	6,000
					sub-total GEF	18,370	18,369	18,369	18,369	73,477
							Total Management	18,370	18,369	18,369
PROJECT TOTAL						329,188	347,381	255,397	282,734	1,214,700

**Summary of
Funds:** ⁴⁶

GEF		239,254	279,081	214,247	242,417	975,000
GoU cash	MVOTMA	83,758	62,125	34,975	34,142	215,000
GoU in-kind	MVOTMA	90,696	93,943	93,943	82,118	360,700
GoU in-kind	ANEP	48,750	48,750	48,750	48,750	195,000
GoU in-kind	IMC	142,198	142,198	142,198	135,908	562,500
GoU cash	IMC	250,000	250,000	250,000	250,000	1,000,000
GoU in-kind	IMR	50,521	50,521	50,521	43,436	195,000
GoU in-kind	EcoPlata	36,940	54,353	54,353	54,353	200,000
UNDP cash	UNDP- BCPR	47,900	40,700	40,700	40,700	170,000
GoSpain cash		6,175	6,175	6,175	6,175	24,700
TOTAL		996,4193	1,027,866	935,999	937,999	3,897,900

Outcomes and Outputs as per the logframe

⁴⁶ Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in -kind, etc. etc

ANNEX 5: MONITORING AND EVALUATION PLAN

Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and the UNDP Country Office (UNDP-CO) with support from UNDP/GEF. The Logical Framework Matrix provides performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis on which the project's Monitoring and Evaluation system will be built.

The following sections outline the principal components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities. Emphasis is placed on harmonising, to the fullest extent possible, the project's M&E activities with routine M&E activities of the MVOTMA/DINAMA and ECOPLATA as implementing agencies. This will increase the chance of M&E results being fed back and implemented on the ground. The project's Monitoring and Evaluation Plan will be presented and finalized at the Project's Inception Report following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

Monitoring and Reporting

Project Inception Phase

A Project Inception Workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, the UNDP-CO and representation from the UNDP-GEF Regional Coordinating Unit as appropriate.

A fundamental objective of this Inception Workshop will be to assist the extended project team and relevant stakeholders to further understand and take ownership of the project's goals and objectives and operational procedures, as well as finalize preparation of the project's first annual workplan on the basis of the project's logframe matrix. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise finalize the Annual Operational Work Plan (POA) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project and with corresponding resource allocation in the first annual budget (Annual Work Plan Budget-AWP)

Additionally, the purpose and objective of the Inception Workshop (IW) will be to: (i) introduce project staff with the UNDP-GEF *expanded team* which will support the project during its implementation, namely the CO and responsible Regional Coordinating Unit staff; (ii) detail the roles, support services and complementary responsibilities of UNDP-CO and RCU staff *vis a vis* the project team; (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR), Tripartite Review Meetings, as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget rephasings.

The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed, in order to clarify for all each parties' responsibilities during the project's implementation phase.

Monitoring Responsibilities and Events

A detailed schedule of project reviews meetings will be developed by the project management, in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: (i) tentative time frames for Tripartite

Reviews, Steering Committee Meetings, (or relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities.

Day to Day Monitoring

Day to day monitoring of implementation progress will be the responsibility of the Project Coordinator based on the project's Annual Operational Workplan and its indicators. The Project Team will inform the UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.

The Project Coordinator will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the Inception Workshop with support from UNDP-CO and assisted by the UNDP-GEF Regional Coordinating Unit. Specific targets for the first year implementation progress indicators together with their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Operational Workplan. The local implementing agencies will also take part in the Inception Workshop in which a common vision of overall project goals will be established. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the project team.

Measurement of impact indicators related to global benefits will occur according to the schedules defined in the Inception Workshop. The measurement of these will be undertaken through subcontracts or retainers with relevant institutions or through specific studies that are to form part of the projects activities.

Periodic Monitoring

Periodic Monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the project proponent, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

UNDP Country Offices and UNDP-GEF RCUs as appropriate, will conduct yearly visits to the project's pilot sites, or more often based on an agreed upon schedule to be detailed in the project's Inception Report / Annual Workplan, to assess first hand project progress. Any other member of the Steering Committee can also accompany the field visits as requested. A Field Visit Report will be prepared by the CO and circulated no less than one month after the visit to the project team, all SC members and UNDP-GEF.

Annual Monitoring

Annual Monitoring will occur through the ***Tripartite Review (TPR)***. This is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to Tripartite Review (TPR) at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. The project proponent will prepare an Annual Project Report (APR) and submit it to UNDP-CO and the UNDP-GEF regional office at least two weeks prior to the TPR for review and comments.

The APR will be used as one of the basic documents for discussions in the TPR meeting. The project proponent will present the APR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The project proponent also informs the participants of any agreement reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary.

Terminal Tripartite Review (TTR)

The terminal tripartite review is held in the last month of project operations. The project proponent is responsible for preparing the Terminal Report and submitting it to UNDP-CO and LAC-GEF's Regional Coordinating Unit. It shall be prepared in draft at least two months in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The terminal tripartite review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation of formulation.

Project Monitoring Reporting

The Project Coordinator in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process. In the following list, items (a) through (e) are mandatory and strictly related to monitoring, while (f) through (g) have a broader function and the frequency and nature is project specific to be defined throughout implementation.

a) Inception Report (IR)

A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year / Annual Operational Work Plan divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include the dates of specific field visits, support missions from the UNDP-CO or the Regional Coordinating Unit (RCU) or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Operational Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months time-frame.

The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation.

When finalized the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, the UNDP Country Office and UNDP-GEF's Regional Coordinating Unit will review the document.

b) Annual Project Report (APR)

The APR is a UNDP requirement and part of UNDP's Country Office central oversight, monitoring and project management. It is a self -assessment report by project management to the CO and provides input to the country office reporting process and the ROAR, as well as forming a key input to the Tripartite Project Review. An APR will be prepared on an annual basis prior to the Tripartite Project Review, to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnerships.

The format of the APR is flexible but should include the following items. It is common that the APR is coupled with the yearly PIR exercise (see next item) as this reduces the number of reports to be prepared by the project team.

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome

- The constraints experienced in the progress towards results and the reasons for these
- The three (at most) major constraints to achievement of results
- AWP, SAC and other expenditure reports (ERP generated)
- Lessons learned
- Clear recommendations for future orientation in addressing key problems in lack of progress

c) Project Implementation Review (PIR)

The PIR is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a Project Implementation Report must be completed by the CO together with the project. The PIR can be prepared any time during the year (July-June) and ideally prior to the TPR. The PIR should then be discussed in the TPR so that the result would be a PIR that has been agreed upon by the project, the executing agency, UNDP CO and the concerned RC. UNDP has developed a joint APR PIR format that can serve for reports under section b and c thus reducing the number of reports to be produced annually by the project team.

The individual PIRs are collected, reviewed and analysed by the respective staff in the RCU prior to sending them to the focal area clusters at the UNDP/GEF headquarters. The focal area clusters supported by the UNDP/GEF M&E Unit analyse the PIRs by focal area, theme and region for common issues/results and lessons. The TAs and PTAs play a key role in this consolidating analysis.

The focal area PIRs are then discussed in the GEF Interagency Focal Area Task Forces in or around November each year and consolidated reports by focal area are collated by the GEF Independent M&E Unit based on the Task Force findings.

Quarterly Progress Reports

Short reports outlining main updates in project progress will be provided quarterly to the local UNDP Country Office and the UNDP-GEF regional office by the project team.

d) Periodic Thematic Reports

As and when called for by UNDP, UNDP-GEF or the Implementing Partner, the project team will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

e) Project Terminal Report

During the last three months of project implementation project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met or not achieved, structures and systems implemented, etc., and will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

f) Technical Reports

Technical Reports are detailed documents covering specific areas of analysis or scientific

specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary this Reports List will be revised and updated, and included in subsequent APRs. Technical Reports may also be prepared by external consultants and should be comprehensive, specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

g) Project Publications

Project Publications will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific or informational texts on the activities and achievements of the Project, in the form of journal articles, multimedia publications, etc. These publications can be based on Technical Reports, depending upon the relevance, scientific worth, etc., of these Reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if any of the Technical Reports merit formal publication, and will also (in consultation with UNDP, the government and other relevant stakeholder groups) plan and produce these Publications in a consistent and recognizable format. Project resources will need to be defined and allocated for these activities as appropriate and in a manner commensurate with the project's budget.

Independent Evaluation

The project will be subjected to at least two independent external evaluations as follows:

- Mid-term Evaluation

It is highly recommended that an independent Mid-Term Evaluation be undertaken at the end of the second year of implementation. The Mid-Term Evaluation will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the project team in conjunction with the UNDP CO based on guidance from the Regional Coordinating Unit.

- Final Evaluation

An independent Final Evaluation is mandatory for all GEF funded projects and will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the project team in conjunction with the UNDP CO based on guidance from the Regional Coordinating Unit and building on the current ToR guidance for final evaluation developed by the GEF.

Audit Clause

An annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals will be conducted. The Audit will be conducted by a commercial auditor engaged by the Government.

Table 1. Monitoring and Evaluation Work plan and Corresponding Budget

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team Staff time</i>	Time frame
Inception Workshop	<ul style="list-style-type: none"> ▪ Project Coordinator ▪ UNDP CO ▪ UNDP GEF 	2,000	Within first two months of project start up
Inception Report	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP CO 	None	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	<ul style="list-style-type: none"> ▪ Project Coordinator will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members 	To be finalized in Inception Phase and Workshop. Indicative cost: 7,000	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	<ul style="list-style-type: none"> ▪ Oversight by Project GEF Technical Advisor and Project Coordinator ▪ Measurements by regional field officers and local IAs 	To be determined as part of the Annual Work Plan's preparation. Indicative cost: 15,000	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP-CO ▪ UNDP-GEF 	None	Annually
TPR and TPR report	<ul style="list-style-type: none"> ▪ Government Counterparts ▪ UNDP CO ▪ Project team ▪ UNDP-GEF Regional Coordinating Unit 	None	Every year, upon receipt of APR
Project Management Meetings/Steering Committee	<ul style="list-style-type: none"> ▪ Project Coordinator ▪ UNDP CO 	None	Following Project IW and subsequently at least every six months
Coordination meetings with relevant GEF projects particularly UNDP Freplata and FAO Fisheries	<ul style="list-style-type: none"> ▪ Project Coordinator (s) ▪ UNDP CO and UNDP-GEF Regional Coordination Unit ▪ GoU GEF Focal Points 	4,000	At least twice yearly. During the PIR reporting period and at year start during project annual operational planning
Periodic status reports	<ul style="list-style-type: none"> ▪ Project team 	None	To be determined by Project team and UNDP CO
Technical reports	<ul style="list-style-type: none"> ▪ Project team ▪ Hired consultants as needed 	5,000	To be determined by Project Team and UNDP-CO
Mid-term External Evaluation	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP- CO ▪ External Consultants (i.e. evaluation team) 	18,000	At the mid-point of project implementation.
Final External Evaluation	<ul style="list-style-type: none"> ▪ Project team, ▪ UNDP-CO ▪ UNDP-GEF Regional Coordinating Unit ▪ External Consultants (i.e. evaluation team) 	35,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP-CO ▪ External Consultant 	None	At least one month before the end of the project
Lessons learned	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP-GEF Regional Coordinating Unit (suggested formats for documenting best practices, etc) 	12,000	Yearly
Audit	<ul style="list-style-type: none"> ▪ UNDP-CO ▪ Project team 	6,000	Yearly
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	<ul style="list-style-type: none"> • UNDP Country Office • UNDP-GEF Regional Coordinating Unit (as appropriate) • Government representatives 	8,000	Yearly
TOTAL INDICATIVE COST <i>Excluding project team staff time and UNDP staff and travel expenses</i>		US\$ 97,000	

ANNEX 6: STAKEHOLDER ANALYSIS

1. List of stakeholders of the project

Regional level:

- Environmental Protection of the La Plata River and its Maritime Front (FREPLATA)

National level:

- Ministry of Housing, Land Use Planning and Environment (MVOTMA) - Project Executive Unit from the GoU:
 - National Environment Directorate (DINAMA)
 - National Territorial Planning Office (DINOT)
 - National Water and Sanitation Directorate (DINASA)
 - Program for Integrated Management of Uruguay's Coastal Zones (ECOPLATA)
- Ministry of Housing, Land Use and Environment (MVOTMA) as GEF Focal Point
- Ministry of Livestock, Agriculture and Fisheries (MGAP) – Institutional Counterpart
- Ministry of Defence (MDN), National Meteorology Directorate - Institutional Counterpart
- Ministry of Foreign Affairs (MRREE), Environment Directorate
- University of the Republic (UdelaR), Institutional Counterpart
- Uruguayan Network of Environmental NGOs
- National Non-Governmental Organizations Association
- Secondary Education Council, National Administration of Public Education (ANEP)- Biodiversity Conservation and Sustainable Development Program for the Eastern Wetlands (PROBIDES)
- National Institute for Agriculture Research (INIA)
- Public and private coastal stakeholders and population

Local/national level:

- Local Governments: Canelones, Rocha, Colonia, San José, Montevideo and Maldonado
- Local community groups and public and private actors

2. Roles and Responsibilities of Stakeholders

The table below lists all main stakeholders of the adaptation process. During project development, stakeholders have been involved in discussing the project idea and providing background information.

Institution	Directorate/Units	Responsibility/ Field of Activities	Relevance/ reasons for inclusion
MINISTRY OF HOUSING, LAND USE PLANNING AND ENVIRONMENT (MVOTMA)	Ministry in general	<ul style="list-style-type: none"> MVOTMA is the main specialized governmental body responsible for housing, land use planning and environmental protection in Uruguay. Its main responsibility is the development and implementation of national policies in such sectors. MVOTMA is the national competent authority on climate change, biodiversity, land degradation and persistent organic pollutants. 	<ul style="list-style-type: none"> The responsibility of the GEF Operational Focal Point stands under MVOTMA The responsibility of UN Conventions, served by GEF as financial mechanism, stands under MVOTMA MVOTMA is the Executing Agency for UNDP-GEF projects in the focal areas of climate change, biodiversity, land degradation and persistent organic pollutants
	National Environment Directorate (DINAMA)	<ul style="list-style-type: none"> Drafts, implements, monitors and evaluates the governmental policies, strategies and action plans for environmental protection within a sustainable development framework Drafts, implements, monitors and evaluates policies and plans for the quality assessments of the environmental resources: water, air, ecosystems including protected areas and coastal zones Drafts, implements, monitors and evaluates plans for preventing the impact on the environment of human activities or projects Drafts, implements, monitors and evaluates plans to control public and private activities that affect the quality of environmental resources Raises awareness on environmental protection and related issues Coordinates the cooperation between relevant Ministries, local government, research institutions, and NGOs for the environmental protection Prepares agreements and MoUs, in the framework of bilateral and multilateral co-operation and attends to their implementation after their adoption Supervises the monitoring of the state of environment in collaboration with relevant Ministries, local government, research institutions, and NGOs Proposes measures, activities and standards to protect water, air and ecosystems diversity Designs and endorses projects for the protection and remediation of environment Issues environmental permission/ license for all activities that have an impact on environment Oversees the implementation process of all environmental conventions to which Uruguay is a Party 	<ul style="list-style-type: none"> DINAMA leads the Project Executive Board and the Project Steering Committee Provides policy advice regarding climate change and biodiversity Provides data for climate change and biodiversity Provides technical expertise on biodiversity, environmental impacts assessment Potential to recommend synergies with international conventions related to climate change, biodiversity, protected areas, etc.

Institution	Directorate/Units	Responsibility/ Field of Activities	Relevance/ reasons for inclusion
	National Territorial Planning Office (DINOT)	<ul style="list-style-type: none"> • Develops, implements and monitors the national policies for land use planning to promote the national land use planning in the context of a regional development , protecting it resources and preventing unbalances • Drafts national policies for land use planning, its plans and programmes in the national and regional level • Drafts and monitors norms for territorial regulation • Advices state institutions on land use issues • Advices local governments on land use local policies and infrastructure projects • Supports local governments territorial management • Promotes the participation for the civil society to allow the development needs to be structured and to prioritize the social role of the land property • Develops a permanent collaboration with local governments and other State institutions to develop and implement habitat, land planning and environmental management policies at national, regional and local level. • Coordinates the processes of collection, registration and monitoring of habitat, land and environment data, facilitating the universal access to it. • Collaborates with the local governments in the strengthening and development of local plans for land planning, environment and housing, to achieve a real decentralization 	<ul style="list-style-type: none"> • Integrates the Project Executive Board and the Project Steering Committee • Provides technical expertise on land use planning • Provides policy advise regarding land use planning • Provides data for land use planning • Facilitates mainstreaming of climate change issues into land planning policies
	National Water and Sanitation Directorate (DINASA)	<ul style="list-style-type: none"> • Develops and manages the services of drinking water and sanitation, taking care of its extension to maximize the outreach, the investments required, its efficiency and quality. • Take care of the extension, the goals for universalisation, the priority criteria, the level of services and investments required as well as the efficiency and predicted quality for the development and management of drinking water and sanitation services. In its proposals it will take care of the effective participation of the users and the civil society in all the instances of planning, management and control. 	<ul style="list-style-type: none"> • Provides technical expertise on water and sanitation • Provides policy advise regarding water and sanitation • Provides data for water and sanitation • Facilitates mainstreaming of climate change issues into water and sanitation policies
	Climate Change Unit (belongs to DINAMA)	<ul style="list-style-type: none"> • Executes, manages, evaluates and promotes in coordination with the corresponding institutions and persons, the activities related to the application of the UNFCCC in Uruguay. • It is the Focal Point of the UNFCCC and centralizes communications and exchange of data on the issue. • Executes all the activities that emerge from MVOTMA being the national competent authority on climate change, to comply with the obligations of the country under the Convention and its Protocol. • Identifies, elaborates and assess measures, programs and policies of climate change mitigation and adaptation. • Elaborates and maintains the National Inventory of Greenhouse Gas Emissions. • Promotes the application of appropriate technologies for the control and reduction of greenhouse gas emissions, in coordination with the pertinent public and private sectors. • Promotes and supports training and awareness activities related to climate change. 	<ul style="list-style-type: none"> • It is the Project Management Unit • Provides technical expertise on vulnerability and adaptation o climate change
Program for Integrated Management of Uruguay's Coastal Zones (EcoPlata)		<ul style="list-style-type: none"> • EcoPlata is a long term initiative aimed at strengthening public and private institutions, the scientific community, managers and the society in general to support Integrated Coastal Zone Management. • This undertaking is based on an inter-institutional agreement among MVOTMA through DINAMA and DINOT, the Ministry of Livestock, Agriculture and Fisheries through the National Directorate for Aquatic Resources (DINARA), the Ministry of National Defence 	<ul style="list-style-type: none"> • Provides technical expertise on Integrated Coastal Zone Management • Facilitates mainstreaming of climate change issues into Coastal Zone Management policies • Facilitates the relation with the local

Institution	Directorate/Units	Responsibility/ Field of Activities	Relevance/ reasons for inclusion
		<p>through the Oceanography, Hydrography and Meteorology Services of the Navy and the University of the Republic (UdelaR). It is also supported by IDRC, DINASA and the six coastal local governments (Colonia, San José, Montevideo, Canelones, Maldonado and Rocha).</p> <ul style="list-style-type: none"> • Within the Area of Governance, Ecoplata goals are: to articulate institutions and social actors, to develop a participative process and to generate knowledge at the service of the innovation in management policies. • Within the Area of Coastal Vulnerability, Ecoplata goals are: to identify risks and dangers, to assess and define areas of ecological, patrimonial and landscape value, to develop indicators (state, pressure and adaptation), to identify sectors at mayor vulnerability, to monitor. • Within the Area of Sustainable Production Development, Ecoplata goals are: to design participative strategies of research, development and communication that allow using the productive potential, and to strengthen and implement concrete actions. • Within the Area of Infrastructure, Ecoplata goals are: to make a diagnosis of the current infrastructure, to determine the potential impact and its effects on the natural resources, to eliminate or improve the coastal infrastructure, to analyze the viability of the constructions to be developed in the short term. • Within the Area of Coastal Environmental Information System, Ecoplata goals are: to collect and inventory data, to act as support for the dissemination of the information. 	<p>governments</p> <ul style="list-style-type: none"> • Develops training and awareness programs targeted to local governments • On the ground capacity for Integrated Coastal Zone Management implementation • Ecoplata boards will provide guidance and inter-institutional assessment to the project
SNAP (National Protected Area System) Project		<ul style="list-style-type: none"> • The SNAP Project is developed by DINAMA. • The Goal of SNAP project is that biodiversity and natural heritage of Uruguay is conserved, and supports national development goals. • The SNAP project will contribute to this goal through a focused intervention that has as the Immediate Objective (purpose): A National Protected Area System that effectively conserves a representative sample of Uruguay's biodiversity is designed and under initial implementation. 	<ul style="list-style-type: none"> • Provides technical expertise on biodiversity especially that related with national protected areas. • Provides data and information on national protected areas. • Provides support to the management of national protected areas
NATIONAL EMERGENCY SYSTEM (SNE)		<ul style="list-style-type: none"> • Plans, coordinates, executes, conducts, evaluates and understands the prevention and the necessary actions at every situation of emergency, crisis or exceptional disasters, that occur or are imminent, in the national territory, its aerial space or jurisdictional maritime or fluvial areas and that direct or indirectly affect in a significant way, the State, its habitants or assets, when exceeds the capacities of the originally competent institutions. 	<ul style="list-style-type: none"> • Generates risk management policies, coordinating national ministries and agencies • Facilitates mainstreaming of climate change issues into Risk Management policies • Provides technical expertise on Risk Management • Provides data and information on extreme events and disasters
MINISTRY OF DEFENCE	National Meteorology Directorate	<ul style="list-style-type: none"> • Systematically observes and monitors meteorological parameters from all national stations • Processes the data and information received from the observations • Develops data base and information system on the metrological indicators of the country • Develops weather forecast and provide it to the interested parties • Reports data to the World Metrological Organization and to other regional / sub-regional networks established 	<ul style="list-style-type: none"> • Provides meteorological data
MINISTRY OF FOREIGN	Environment	<ul style="list-style-type: none"> • Plans, steers, executes and coordinates the national foreign affair policy and the relations 	<ul style="list-style-type: none"> • The responsibly of the GEF Political Focal

Institution	Directorate/Units	Responsibility/ Field of Activities	Relevance/ reasons for inclusion
AFFAIRS (MRREE)	Directorate	with other Status and International Organisms on all international matters including the environment.	Point stands under MRREE
UNIVERSITY OF THE REPUBLIC (UDELAR)	Sciences and Professional Schools	<ul style="list-style-type: none"> • Among others, researchers and teaches in the following fields: science of the atmosphere, the oceans, water resources, biodiversity and environment 	<ul style="list-style-type: none"> • Provides data and information related to its fields of research • Develops climate change scenarios for the coastal zones • Develops assessments on vulnerability and adaptation to climate change
URUGUAYAN NETWORK OF ENVIRONMENTAL NGOS		<ul style="list-style-type: none"> • Formed by more than 60 NGOs from all over the country interested in the knowledge and defence of the environment and in the sustainable development. • Its objectives are to disseminate environmental issues, to promote nature conservation and to generate new strategies of sustainable development. 	<ul style="list-style-type: none"> • Civil society must be consulted, as is the beneficiary of the results obtained in the proposed project. • This entity was part of the consultation process during the elaboration of the Second National Communication to the UNFCCC. • Biodiversity and climate change awareness activities
NATIONAL ASSOCIATION OF NON-GOVERNMENTAL ORGANIZATIONS ASSOCIATION		<ul style="list-style-type: none"> • It is an Association formed by more than 70 NGOs from all over the country aimed at activities related with development. • It contributes to the relationship of civil society with State organizations, especially with those related with social policies, both national and local. 	<ul style="list-style-type: none"> • Civil society must be consulted, as is the beneficiary of the results obtained in the proposed project. • This entity was part of the consultation process during the elaboration of the Second National Communication to the UNFCCC. • Biodiversity and climate change awareness activities
NATIONAL INSTITUTE FOR AGRICULTURE RESEARCH (INIA)		<ul style="list-style-type: none"> • Contributes to the development of the National Agricultural Sector through the generation, mainstreaming and adaptation of knowledge and technologies, making them available for the benefit of the producers, taking into account state policies, sustainability, the agro-industrial chain and the consumers. • 	<ul style="list-style-type: none"> • Provides data about agricultural practices relevant to the studies of V&A to climate change in the coastal zone. • Generates technical management capacities for adaptation of the agricultural sector
BIODIVERSITY CONSERVATION AND SUSTAINABLE DEVELOPMENT PROGRAM FOR THE EASTERN WETLANDS (PROBIDES)		<ul style="list-style-type: none"> • PROBIDES is an Inter-institutional Programme formed by the Ministry of Housing, Land Use Planning and Environment, the municipalities of Cerro Largo, Lavalleja, Maldonado, Rocha y Treinta y Tres; and the University of the Republic, with the support of the United Nations Development Programme, aimed at the conservation and sustainable development of the East Region of Uruguay. • To contribute to this aim, the Programme supports the following processes within the region: the conservation and sustainable development of the biodiversity, the social and economic development, the land use planning and the development of local capacities within the region. 	<ul style="list-style-type: none"> • Provides information, expertise and experience on biodiversity of global significance, land use planning and capacity building, focusing on the articulation of local governments and stakeholders in the East region of Uruguay.
PROJECT ENVIRONMENTAL PROTECTION OF THE LA PLATA RIVER AND ITS MARITIME FRONT (FREPLATA)		<ul style="list-style-type: none"> • This is a bi-national (Uruguay and Argentina) GEF funded project with the long-term objective of mitigating of transboundary threats to the Rio de la Plata and its Maritime Front. 	<ul style="list-style-type: none"> • Provides data, information, expertise and experience on coastal and maritime ecosystems and resources of the Río de la Plata and its Maritime Front Region.
MINISTRY OF LIVESTOCK, AGRICULTURE AND	National Directorate of Aquatic Resources	<ul style="list-style-type: none"> • The National Directorate of Aquatic Resources is responsible for promoting the 	<ul style="list-style-type: none"> • Facilitates mainstreaming of climate change

Institution	Directorate/Units	Responsibility/ Field of Activities	Relevance/ reasons for inclusion
FISHERIES (MGAP)	(DINARA)	sustainable use of fishing resources, by means of responsible fishing to obtain the maximum possible benefit from the available resources, to preserve them in the long term and to maintain the harmony of the marine environment. In this context, it develops research activities on the state of the resources, to provide information on those factors that directly affect the fishing operation, and the need to take measures for planning	<ul style="list-style-type: none"> • issues into fisheries planning and policy • Provides data, information and expertise on fisheries
NATIONAL ADMINISTRATION OF PUBLIC EDUCATION (ANEP).	SECONDARY EDUCATION COUNCIL,	<ul style="list-style-type: none"> • The National Administration of Public Education (ANEP), is the institution responsible for the planning, management and administration of the public educational system, at its three levels: initial, primary, secondary. • The Secondary Education Council is responsible for the planning, management and administration of the secondary level of the public educational system. 	<ul style="list-style-type: none"> • Responsible for secondary teachers training on climate change and biodiversity • Participates in the education and awareness raising program
LOCAL GOVERNMENTS	Canelones Municipality	<ul style="list-style-type: none"> • General Directorate for Environment Management: The main objective of the General Directorate for Environment Management of Canelones Municipality is to contribute to the formulation of policies that include the environmental factors strengthening a municipal management that assumes the principles of sustainability. 	<ul style="list-style-type: none"> • Main local authority in Canelones with responsibilities on environment policy and management and local land planning. • Provides technical and on-the ground support for the implementation of measures at the pilot site in Canelones. • Mainstreams climate change into local management plans of coastal areas of Canelones. • Provides coastal data and information. • Participates in the education and awareness raising program
	Rocha Municipality	<ul style="list-style-type: none"> • Rocha Municipality manages its environment and land planning through the Hygiene Department and Land Planning Department respectively. Both departments have responsibilities on local management of coastal areas. 	<ul style="list-style-type: none"> • Main local authority in Rocha with responsibilities on environment policy and management and local land planning • Provides technical and on-the ground support for the implementation of measures at the pilot site in Rocha. • Mainstreams climate change into local management plans of coastal areas in Rocha. • Provides coastal data and information. • Participates in the education and awareness raising program
	Other coastal municipalities: Colonia, San José, Montevideo, Maldonado -	<ul style="list-style-type: none"> • The other four coastal municipalities have Departments for the management of the environment and land planning, which have responsibilities on local management of coastal areas. 	<ul style="list-style-type: none"> • Mainstream climate change into local management plans of coastal areas. • Provide coastal data and information. • Participate in the education and awareness raising program • Have the potential to replicate the pilot activities of the project

TERMS OF REFERENCE FOR TECHNICAL ASSISTANT

Position: Technical Assistant

Duties and Responsibilities:

The National Expert will assist the Climate Change Unit in the implementation of the project:

Specific duties will include amongst others the following task. Full terms of reference will be developed in conjunction with Project Coordinator and UNDP. Types and lengths of contract will depend on the further evaluation of needs.

1. Assist in the management of the project.
2. Support the Project Steering Committee (PSC) and other institutions involved or having an interest in the project
3. Assist the Climate Change Unit with the project administration.
4. Control the budget of the project according to the established norms of UNDP, GEF, etc.
5. Assist in the planning and coordination of activities implementation.
6. Participate in the selection of the required personnel and experts.
7. Support the national consultants appointed by the project.
8. Assist in the organization and execution of meetings and training activities.
9. Assist in the elaboration of the technical and financial progress reports of the project.
10. Assist the Climate Change Unit in other activities included in the Project, as needed.

QUALIFICATIONS AND REQUIREMENTS:

- Graduate degree in Engineering or related field.
- Minimum of 5 years experience in the development of environmental projects supported by international cooperation.
- Knowledge of the Uruguayan state management and administration
- Knowledge of the UNFCCC.
- Knowledge of the National Climate Change Program.
- Excellent command of the spoken and written English.

TERMS OF REFERENCE FOR EXPERT ON ADAPTATION TO CLIMATE CHANGE

Position: Expert on Adaptation to Climate Change

Duties and Responsibilities:

The National Expert will assist the Climate Change Unit in the implementation of the project as required. Full terms of reference will be developed in conjunction with Project Coordinator and UNDP. Types and lengths of contract will depend on the further evaluation of needs and could take the form of short term contracts for specific products depending on the expertise required.

Specific duties will include :

1. Advise the Climate Change Unit on technical aspects related to vulnerability and adaptation to climate change as needed for the implementation of the project.
2. Prepare the terms of reference for the contracting of consultants and services required for the implementation of the project activities.
3. Participate in the selection of the required personnel and experts.
4. Follow up the performance of consultants and services appointed by the project
5. Support the Project Steering Committee (PSC) and other institutions involved or having an interest in the project
6. Participate in the organization and activities of the project.
7. Organize and execute meetings and training activities.
8. Elaborate technical reports as well as national and international communications related with the development of the project.
9. Assist the Climate Change Unit in other activities included in the project, as needed.

QUALIFICATIONS AND REQUIREMENTS:

- Post Graduate degree in the environmental field
- Minimum of 3 years experience in vulnerability and adaptation to climate change assessments.
- Knowledge of the UNFCCC.
- Knowledge of the Coastal Resources Sector.
- Excellent command of the spoken and written English.

ANNEX 8: STAKEHOLDER CONSULTATIONS

1. National workshop

1.1 List of participants

Opening			
Name		Position	Institution
Ing. Agr. Alicia	Torres	Directora DINAMA	Medio Ambiente
Ec. Pablo	Martinez	Programación / Oficial de Programa	Programa Naciones Unidas para el Desarrollo
Ing. Quím. Luis	Santos	DINAMA	Medio Ambiente
Arq. Roberto	Villarmarzo	Director DINOT	Medio Ambiente
Presenters			
Name		Position	Institution
Ing. Agr. Laura	García Tagliani	Coordinadora Técnica Proyecto SNAP	DINAMA, MVOTMA
Lic. Mónica	Gómez Erache	Coordinadora	Programa ECOPLATA
Ing. Quím. Magdalena	Preve	Consultora Proyecto	Unidad Cambio Climático, DINAMA
Ing. Agr. Cecilia	Ramos Mañé	Consultora Proyecto	Unidad Cambio Climático, DINAMA
Ec. Hugo	Roche	Especialista Asuntos Económicos y Sociales	FREPLATA
Ing. Quím. Luis	Santos	Coordinador, Unidad Cambio Climático	Dirección Nacional de Medio Ambiente, MVOTMA
Ing. Agr. Guillermo	Scarlato	Coordinador General, Proyecto SNAP	DINAMA, MVOTMA - PNUD/FMAM
Participants			
Government Institutions			
Name		Position	Institution
Alicia	Aguerre	Asesora	DINAMA, MVOTMA
Pedro	Barrenechea	Consultor Económico	Unidad de Cambio Climático, DINAMA
Luis Mario	Batallés	Jefe, Areas Protegidas Costeras y Marinas	DINAMA, MVOTMA
Cecilia	Catalurda	Arquitecta	DINOT, MVOTMA
Ana	Cazzadori	Subdirectora, Depto. Inversiones	Oficina de Planeamiento y Presupuesto
Rafael	Cortazzo	Arquitecto	DINOT, MVOTMA
Jorge Luis	Cravino	Director Departamento de Fauna	RENARE, MGAP
José	Desiervo	Especialista Sociólogo	DINOT, MVOTMA
Nicolás	Failache Gallo	Asesor del Director	DINASA, MVOTMA
Pablo	Forcheri Mas	Jefe de Departamento, División Hidráulica y Fluvial	Dirección Nacional de Hidrografía, MTOP
Horacio	Germán	Jefe División Lucha contra la Contaminación	Prefectura Nacional Naval, MDN
Beatriz	Lesa	Directora, Dirección Pronóstico del Tiempo	Dirección Nacional de Meteorología, MDN
Jorge W.	López Laborde	División Geología Marina	Servicio de Oceanografía, Hidrografía y Meteorología de la Armada (SOHMA), MDN
Germán	Martella	Capitán de Corbeta, Jefe Depto. Oceanografía	SOHMA, MDN
Ana María	Martinez	Técnica Asesora	DINOT, MVOTMA
Silvia Marina	Méndez Calicchio	Encargada Programa de Monitoreo de Floraciones Algales Nocivas	Dirección Nacional de Recursos Acuáticos (DINARA), MGAP
Gustavo	Riestra	Investigador	Dirección Nacional de Recursos Acuáticos (DINARA), MGAP
Gustavo	Sacco	Director de Fauna y Areas Protegidas	MGAP
Sarita	Saragosa Ledesma	Subdirectora de Medio Ambiente	M.RR.EE.
Pablo	Urruti Ganduglia	Asesor Técnico Oceanógrafo	DINAMA, MVOTMA
Carlos D.	Victoria	Jefe Departamento Uso, Manejo y Conservación de Suelos, División Suelos y Aguas	RENARE, MGAP
Juan	von Cappeln	Gerente Hidráulico	Dirección Nacional de Hidrografía, MTOP
Gabriel	Yorda	Jefe Departamento Evaluación de Calidad de Agua	DINAMA, MVOTMA

International Organisms			
Name		Position	Institution
Carolina	Aguerre	Encargada Proyectos	Embajada Británica
Rafael	Bernardi	Oficial Programa	Programa Naciones Unidas para el Desarrollo
Alejandro	Brazeiro	Especialista Sectorial - Biodiversidad	FREPLATA
Julieta	de León		Programa Naciones Unidas para el Desarrollo
Denise	Gorfinkiel	Oficial Nacional de Programa	UNESCO
Gabriela Rosana	Molina	Sector de Asesoría Técnica	Secretaría del MERCOSUR
Ana	Perdomo	Especialista Sectorial Adjunto en Contaminación	FREPLATA
Jorge	Surraco	Oficial de Comunicación e Información	Programa Naciones Unidas para el Desarrollo
Alvaro	Boix	Consultor en Medio Ambiente	Corporación Nacional para el Desarrollo
Freddy E.	Casas	Departamento Marítimo	ANCAP
Local Governments			
Name		Position	Institution
Ethel	Badin	Directora Gestión Ambiental	Comuna Canaria
Adriana	Bentancur		Intendencia Municipal Montevideo
Antuanet	Calero Sónora	Asistente Técnico	Intendencia Municipal Montevideo
Hilda	Lingeri	Geógrafa	Intendencia Municipal Montevideo
Alicia	Raffaele Vázquez	Encargada, Dirección Unidad Efluentes Industriales - Punto Focal Uruguay Red Biocombustible CYTED	Intendencia Municipal Montevideo
Jose	Sciandro	Asesor Jurídico Ordenamiento Territorial	Intendencia Municipal de Rocha
Gerardo	Vanerio	Técnico Ambientalista	Comuna Canaria
Mary	Yafalian	Técnica Profesional, Unidad Efluentes Industriales	Intendencia Municipal Montevideo
Academia			
Name		Position	Institution
Washington F.	Baliero Silva	Profesor de Derecho Internacional Público	Grupo Interfacultades Manejo Costero Integrado (MCI), Facultad de Derecho, UDELAR
Emilio	Biasco	Docente, Derecho Público, Derechos Humanos	Grupo Interfacultades MIZC - Facultad de Derecho, UDELAR
Mario	Bidegain	Docente Investigador, Depto. Meteorología	Facultad de Ciencias, UDELAR
Ernesto	Brugnoli Olivera	Asistente Docente - Investigador, Sección Oceanología	Facultad de Ciencias, UDELAR
Daniel	Conde	Profesor Adjunto en Limnología, Coordinador Maestría en Manejo Costero Integrado	Facultad de Ciencias, UDELAR
Anita	de Alaoa	Honoraria, Undecimar	Facultad de Ciencias, UDELAR
Virgina	Fernández	Investigadora - Docente	Facultad de Ciencias, UDELAR
César	López Escobal	Investigador Independiente	Facultad de Ciencias, UDELAR
Eugenio	Lorenzo	Profesor Adjunto	Facultad de Ingeniería, UDELAR
Rodrigo	Menafrá	Docente Investigador	Grupo Interfacultades MCI - Facultad de Ciencias, UDELAR
Bethy	Molina Espinosa	Formadora	CERP del Este - ANEP
Gustavo	Nagy	Profesor Adjunto Oceanografía	Facultad de Ciencias, UDELAR
Rodolfo	Pedocchi	Profesor Adjunto Agrometeorología, Unidad Sistemas Ambientales	Facultad de Agronomía, UDELAR
Clara	Piriz	Coordinadora Programa Costas - Asistente Académica	Facultad Ciencias Sociales, UDELAR
Ingrid E.	Roche Lowczy	Investigador ITU	Facultad Arquitectura, UDELAR
Alejandra	Unanua Bello	Equipo directivo del "Proyecto Multidisciplinario de los Sitios de Interés Paisajístico a Proteger en el Uruguay"	Departamento de la UNCIEP, Facultad de Ciencias, UDELAR

NGOs			
Name		Position	Institution
Daniel	Bonora	Técnico Meteorólogo	Sociedad Civil Amigos del Viento
Ruben Mario	Caffera	Coordinador Académico	Sociedad Civil Amigos del Viento
Bernardo A.	de los Santos Simonelli	Técnico Meteorólogo	Sociedad Civil Amigos del Viento
Carlos W.	Maisonnave	Directivo	Asoc. Uruguay ExBecarios de la Repca. Fed. De Alemania (AUERFA)
Luis	Moresco	Directivo	RED Uruguay de ONGs Ambientalistas
Alvaro	Pinasco	Coordinador Proyecto Recuperación Costera (IMC - vecinos de la C. de la Costa)	Red Ambientalista - Comarca Costera
Genaro	Ribero	Coordinador - Profesor	Red Comarca Costera, Comisión Parque Costero
José	Sendín	Directivo	Asociación de Ingenieros Químicos
Media			
Name		Position	Institution
Marcel	Lhermitte	Periodista	La República
Darío	Valettute	Periodista	Radio Carve
Others			
Name		Position	Institution
Néstor	López	Estudiante	UDELAR
Gonzalo	Magnou	Arquitecto	Estudio de Arquitectura Magnou
Ramiro D.	Maldonado	Estudiante	E.M.U.
Ma. Elena	Mazzotti	Instituto de Enseñanza	particular
Silvana	Misol	Investgadora	CUI
Gonzalo	Napias	Asesor - investigador	CUI - VITA
Jorge	Pozzi	Diputado	Nuevo Espacio F. A.
Andrés	Silva Delgado	Técnico Meteorólogo	

1.2 Agenda

1. Introduction and welcoming remarks
2. Presentations:
 - a. National Program of General Measures for Adaptation to Climate Change, with emphasis on the Coastal Sector
 - b. Ongoing relevant initiatives on the coastal zones: EcoPlata, SNAP and FREPLATA
 - c. First draft of the project proposal for implementing pilot climate change adaptation measures in coastal areas.
3. Discussions

2. Experts meeting

2.1 List of participants

Name	Position	Institution
Rafael Bernardi	Professional Associate	PNUD
Flavio Scasso	Professional Associate	PNUD
Hellen Negret	Regional Technical Advisor	PNUD-GEF
Adriana Bonilla	Consultant	PNUD-GEF
Luis Santos	Technical Coordinator	Unidad de Cambio Climático-DINAMA-MVOTMA
Magdalena Preve	Advisor	Unidad de Cambio Climático-DINAMA-MVOTMA
Mariana Kasprzyk	Advisor	Unidad de Cambio Climático-DINAMA-MVOTMA
Pedro Barrenechea	Advisor	Unidad de Cambio Climático-DINAMA-MVOTMA
Laura García	Technical Coordinator	SNAP
Mónica Gómez	Technical Coordinator	ECOPLATA
Agustín Giménez	Technical Coordinator	Unidad GRAS - INIA
Gustavo Nagy	Researcher	Universidad de la República
Daniel Conde	Professor	Universidad de la República
Nicolás Failache	Advisor	Dirección Nacional de Aguas y Saneamiento (DINASA)-MVOTMA
Ana M ^a Martínez	Advisor	Dirección Nacional de Ordenamiento Territorial (DINOT)-MVOTMA
Agustín Canzzani	Meeting Facilitator	

2.2 Agenda

1. Welcoming remarks and meeting objective
2. Revision of the logical framework methodology
3. Status of the MSP proposal
4. Working sessions:
 - a. Analysis of positive aspects of the MSP proposal
 - b. Discussion on the gaps of the MSP proposal
 - c. Improvement of the MSP proposal focusing on the logical framework matrix

ANNEX 9: USING DIVA TOOL FOR COASTAL IMPACTS AND ADAPTATION INDICATORS FOR URUGUAY'S COAST

DIVA (Dynamic Interactive Vulnerability Assessment) is a global-scale coastal vulnerability assessment tool developed through the Dynamic and Interactive Assessment of National, Regional and Global Vulnerability of Coastal Zones to Climate Change and Sea-Level Rise (DINAS-Coast) project, funded by the European Commission amongst 2001 and 2004.

The DIVA methodology uses a database of features, both physical and socio-economic, based on segments of the coastline, within integrated modules to assess adaptation options under future climate change scenarios. The modules are flooding, relative sea level rise, erosion, wetland change, wetland evaluation and river effects.

The model is based on scenarios of sea level rise developed from climate models; the modules are run to calculate the effects of sea level rise on coastal systems, including direct coastal erosion, erosion within tidal basins, changes in wetlands and effects on rivers. This is followed by an assessment of socio-economic impacts, either directly because of sea level rise or indirectly via the above effects. The last module is the adaptation module, which implements adaptation measures based on preset or user-defined decision rules. These adaptation measures then influence the calculations of the geodynamic effects and socio-economic impacts of the next time step. The calculations are repeated over several time steps up to timescales of up to 100 years. The user is able to choose options of climate change scenarios and adaptation strategies. Generalized example outputs of the model are numbers of people flooded, wetlands lost, adaptation costs (including those relating to flood protection and beach protection) and the amount of land lost under the specified relative sea level rise scenario.

DIVA Modules:

Module Name	Author(s)	Description
Internal Drivers	Richard Tol	Produces socio-economic scenarios.
Relative Sea-Level Rise	Robert Nicholls, Loraine McFadden, Jochen Hinkel	Produces relative sea-level scenarios by adding vertical land movement to the climate-induced sea-level scenarios.
River Effect	Rob Maaten	Calculates the distance from the river mouth over which variations in sea level are noticeable.
Wetland Change	Loraine McFadden, Jochen Hinkel	Calculates area change due to sea-level rise for six types of wetlands, taking into account the effect of flood defences.
Flooding	Robert Nicholls, Jochen Hinkel	Calculates flooding due to sea-level rise and storm surges, taking into account the effect of flood defences.
Wetland Valuation	Luke Brander, Onno Kuik, Jan Vermaat	Calculates the value of different wetland types as a function of GDP, population density and wetland area.
Indirect Erosion	Luc Bijsterbosch, Zheng Bing Wang, Gerben Boot	Calculates the loss of land, the loss of sand and the demand for nourishment due to indirect erosion in tidal basins. This is a reduced version of the Delft Hydraulics ASMITA model (Stive <i>et al.</i> , 1998).
Total Erosion	Robert Nicholls	Calculates direct erosion on the open coast based on the Bruun rule. Adds up direct erosion and indirect erosion for the open coast, including the effects of nourishment where applied.
Tourism	Richard Tol	Calculates number of tourists per country.
Costing and Adaptation	Richard Tol, Gerben Boot, Poul Grashoff, Jacqueline Hamilton, Jochen Hinkel, Loraine McFadden, Robert Nicholls	Calculates socio-economic impacts and either user-defined or optimal adaptation.
World Heritage Sites	Richard Tol	Calculates whether a UNESCO world heritage site is threatened by sea-level rise.

Source: Jochen Hinkel, Richard J.T. Klein . DINAS-COAST: Developing a Method and a Tool for Dynamic and Interactive Vulnerability Assessment

DIVA tool comprises four major components: 1) A detailed global database with biophysical and socio-economic coastal data; 2) Global and regionalised climate and socio-economic scenarios; 3) An integrated model, enabling the interaction between modules that assess biophysical and socio-economic impacts and the potential effects and costs of adaptation; 4) A graphical user interface for selecting data and scenarios, running model simulations and analysing the results.

DIVA allows its users to produce consistent quantitative information on a range of coastal impact and adaptation indicators, for user-selected climate and socio-economic scenarios and coastal adaptation options on national, regional and global scales, covering all coastal nations.

The information produced by DIVA will enable its users: to explore the effects of climate change on coastal environments and societies; to explore the costs and benefits of coastal adaptation options; to set priorities for international co-operation with respect to climate change and development; and to use results for further scientific and policy analysis. DIVA is recommended for carrying out trial runs and exploring broad coastal adaptation strategies.

The DIVA database is a collection of data and coverage files within a file system. It has been generated from an external Arc-GIS database. To minimise the execution time of the DIVA tool, all GIS operations necessary to convert the raw input data into the DIVA database have been performed as pre-processing steps using Arc-GIS. The pre-processing involves converting all raw data into properties of one of the following seven feature types: coastline segments, administrative units, countries, rivers, tidal basins, world heritage sites and CLIMBER grid cells. The major type, on which most algorithms operate, is the coastline segment. The world's coastline was "intelligently" decomposed into variable-sized segments that are homogenous in terms of impacts and vulnerability to sea-level rise, although they vary in size (average length is 70 km). The segmentation was performed on the basis of a series of physical, administrative and socio-economic criteria, producing 12,148 coastline segments in total. In the case of Uruguay, DIVA includes 7 coastline segments.

As stated before, DIVA allows the exploration of the effects of climate change on coastal environments and societies and the costs and benefits of coastal adaptation options. The results could be used for scientific and policy analysis, especially when supplemented by local-scale analysis in Uruguay. Sea-level and climate change scenarios can be generated by users to their own specifications and saved as DIVA 'cases'.

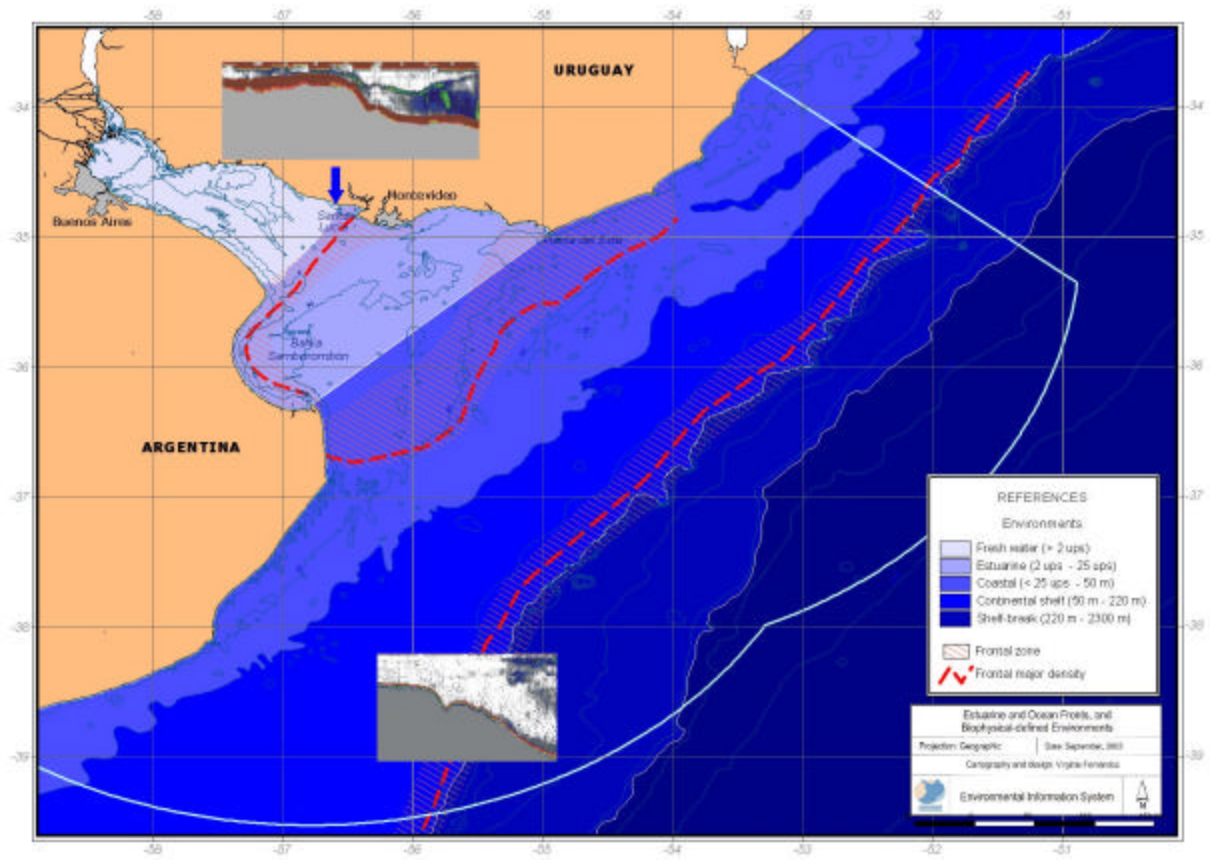
There is a great deal of interest in the region to use DIVA to support country-scale coastal vulnerability and adaptation analysis. For this to occur the underlying data used to drive the DIVA tool will be updated for use in Uruguay. This will be important to both provide a framework for coastal V&A in Uruguay and will have significant regional and global benefits in ensuring public availability of the methods used to update and enhance DIVA. This will require updating the sea-level/climate change scenarios in DIVA, using the IPCC AR4 scenarios (DIVA currently uses TAR scenarios) and also uploading detailed coastal segment data at a local level. This will require GIS analysis of local-level assessment of coastal data sets, including coastal geomorphology, ecosystems, coastal land-use and topography. Other data needed will be: mean sea level, wave and wind patterns for the specific coastal segments. In addition, the socio-economic data in DIVA will require being updated using 2007 data. Moreover, the project will provide an opportunity to re-assess the algorithms that combine these factors into vulnerability indices within the DIVA tool to allow detailed inter-comparison of coastal vulnerability within Uruguay.

The effective update and enhancing of DIVA for its use at a resolution required for local-level assessment will require performing a data audit process to assess the data needed for using DIVA against available data that would need to be collected.

Figure 1. Map of Uruguay

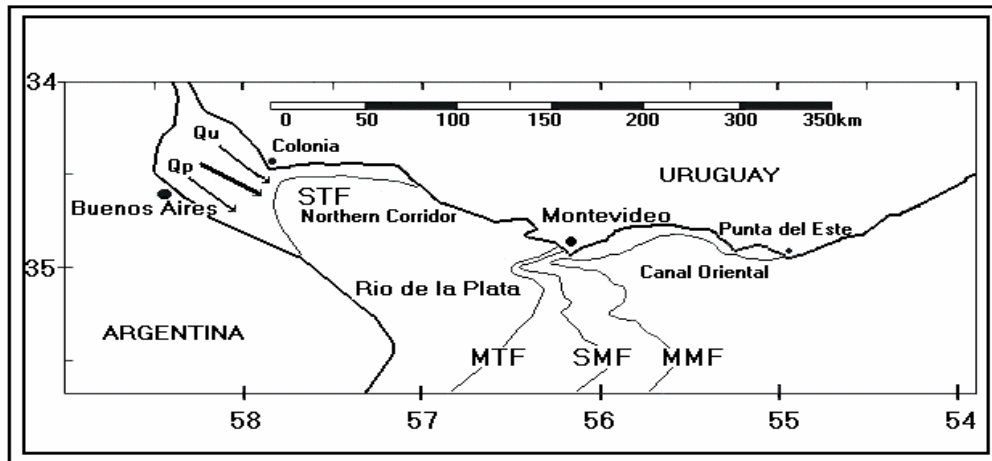


Figure 2. Zoning of Uruguay's coastal and marine ecosystems



Source: FREPLATA 2004

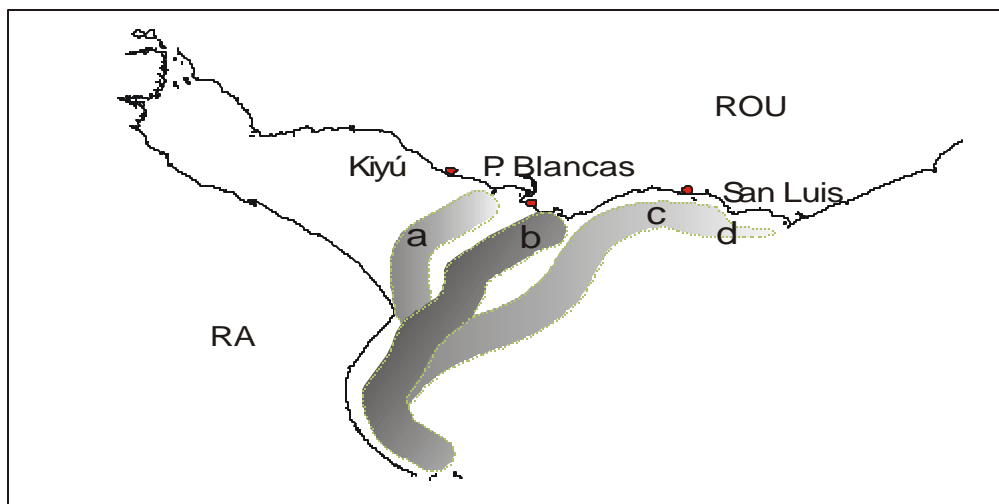
Figure 3a. Fronts of the La Plata River (based on a composite image from Sea-WIFS satellite observations and in situ measurements for November 17, 2003.)



The *Estuarine Frontal System* or *Saline Front* is delimited by **MTF** (Main Turbidity Front) and **SMF** (Secondary Marine Front). The discharge of the Uruguay River is responsible for most of the variability in salinity at Montevideo and the estuarine plume along the eastern shore. **MMF**: Main Marine Front. The front moves river- and sea-ward driven by prevailing on- and off-shore winds (E-SE and W-NW respectively) on synoptic and seasonal timescales and following river flow fluctuations on seasonal and inter-annual timescales. This front sustains relevant ecological processes (nutrient assimilation, denitrification), services (CO₂ fixation, fish reproduction) and fisheries. The estuarine waters are subject to environmental changes (symptoms of eutrophication such as oxygen deficit and harmful algal blooms) associated with human activities at the watershed level and triggered by climatic stimuli, such as floods and droughts, which are partly associated with El Niño/Southern Oscillation (ENSO) variability on inter-annual timescale.

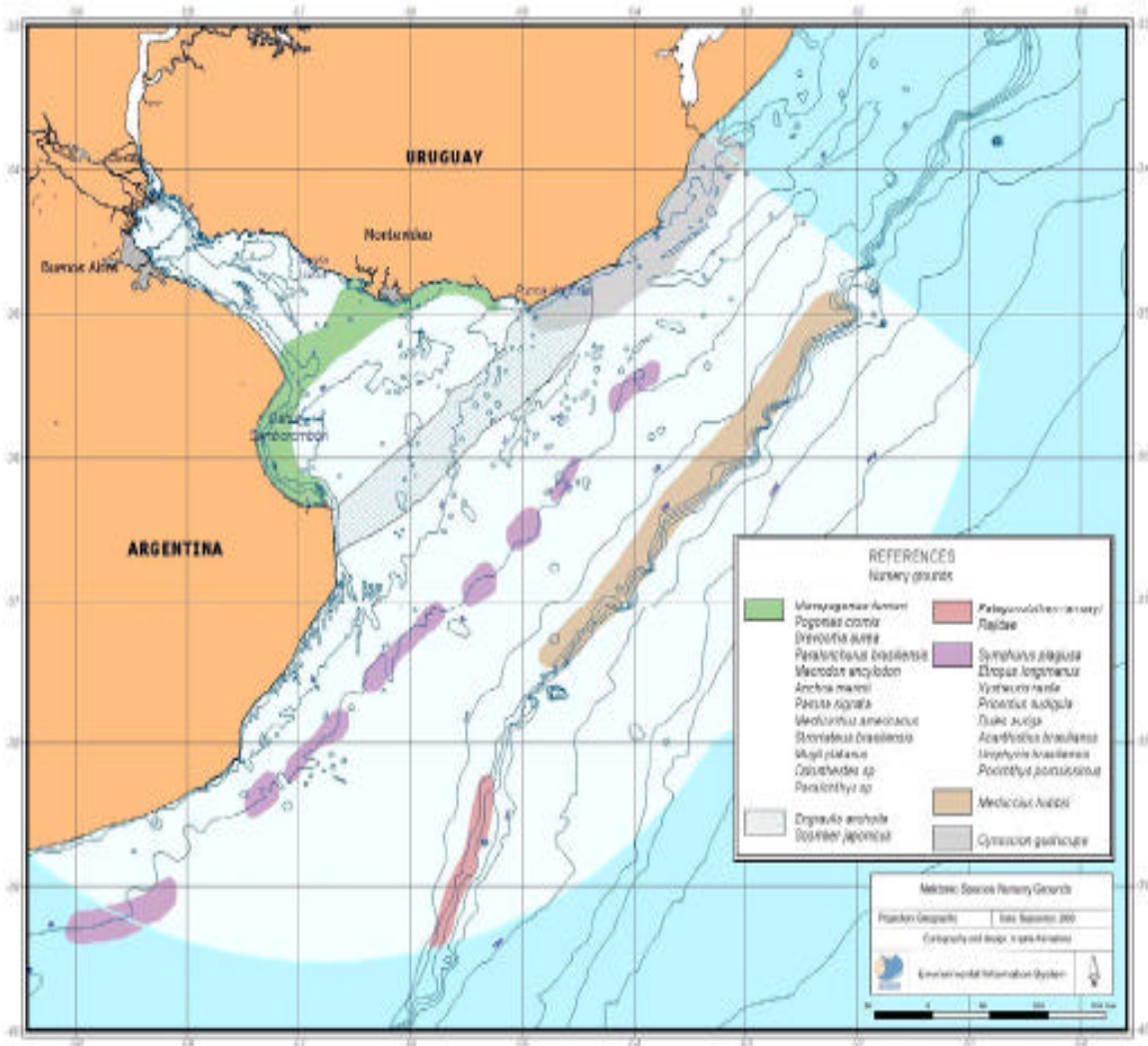
From Nagy et al., 2007, based upon Lappo et al., 2005; Severov et al., 2003, 2004; Mianzán et al., 2001; EcoPlata, 2003; Nagy et al., 2002a,b; Nagy, 2000.

Figure 3b. Estuarine Front location under different ENSO conditions



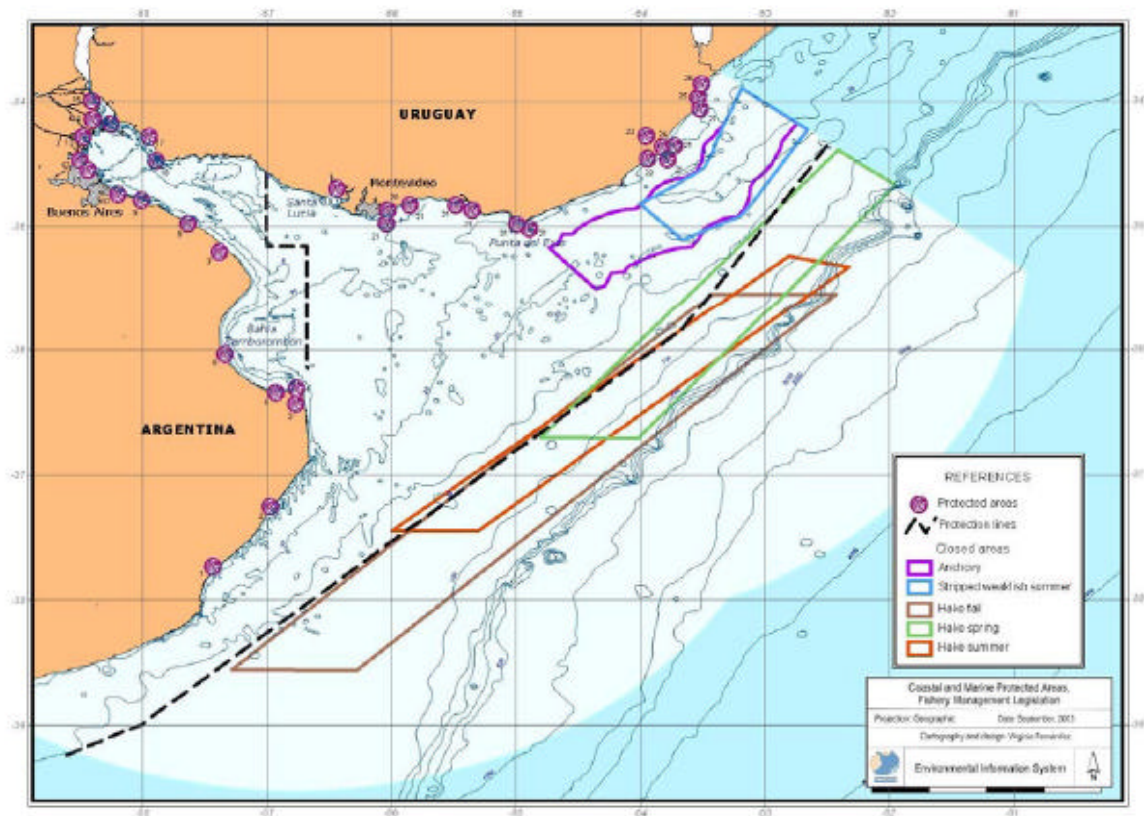
References: a) Strong La Niña event (1999-2000), b) Typical, c) Moderate El Niño (winter 1987), d) strong El Niño 1997-1998 / 2002 – 2003 (modified from Nagy et al., 2002b). RA: República Argentina and ROU: República Oriental del Uruguay.

Figure 4. Nursery grounds for nektonic species in the La Plata River and its maritime front



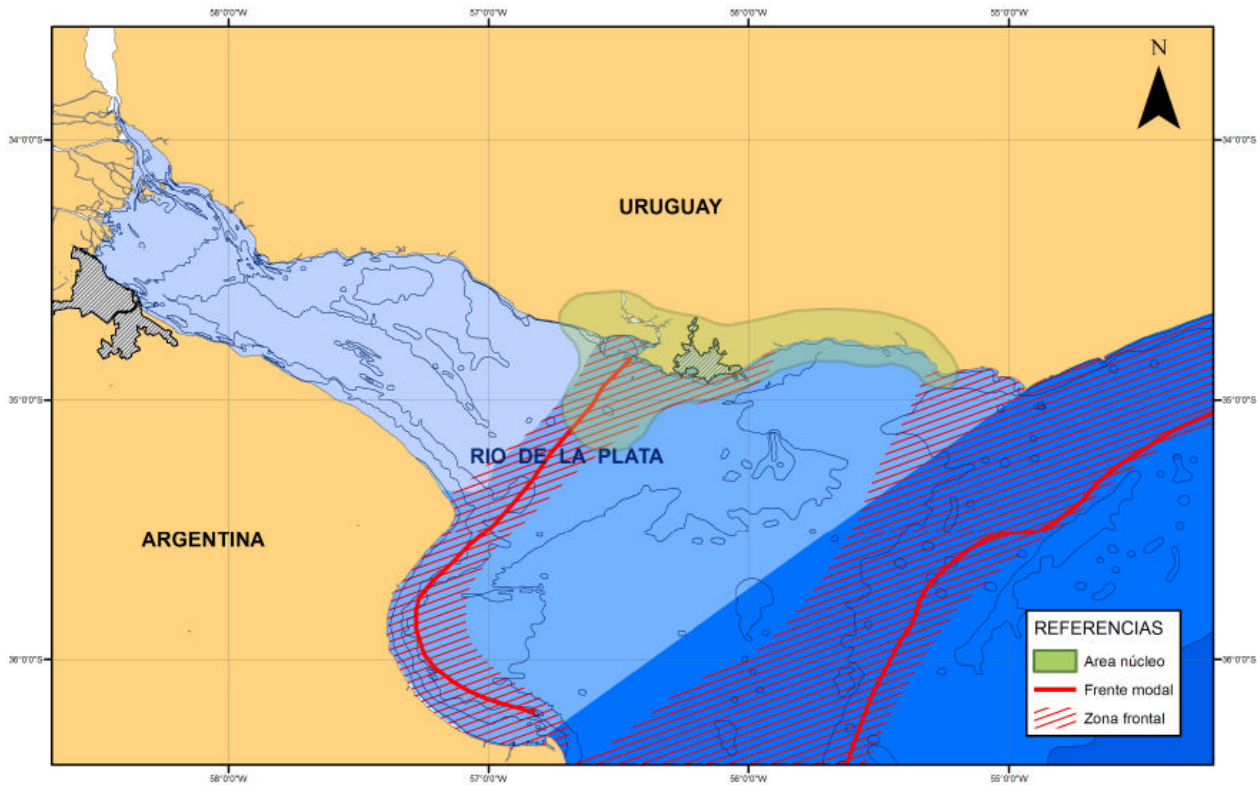
Source: Acha & Lo Nostro 2002

Figure 5. No take zones (closed areas for fisheries)



Source FREPLATA 2004

Annex 11a: FRONTAL ZONE PILOT AREA



References: “Área núcleo”: Zone where main biological processes take place, e.g., spawning, feeding and nursery areas of relevant fish species. “Frente modal”: zone with higher probability of finding the fronts

The proposed “Frontal Pilot Zone” study area encompasses the Estuarine Frontal System and the coastal zone along the estuarine region of Río de la Plata adjacent to the departments of Montevideo and Canelones (See figures 3a and 3b Annex 11)

The front moves river- and sea-ward driven by prevailing on- and off-shore winds (E-SE and W-NW respectively) on synoptic and seasonal timescales and following river flow fluctuations on seasonal and inter-annual timescales. This front sustains relevant ecological processes (nutrient assimilation, denitrification), services (CO₂ fixation, fish reproduction) and fisheries. The estuarine waters are subject to environmental changes (symptoms of eutrophication such as oxygen deficit and harmful algal blooms) associated with human activities at the watershed level and triggered by climatic stimuli, such as floods and droughts, which are partly associated with El Niño/Southern Oscillation (ENSO) variability on inter-annual timescale.

Specific biological information for this pilot area

Frontal zones are key habitats for the biodiversity and functional integrity of the whole coastal ecosystem. Biodiversity priority areas locate as bands parallel to bathymetry, and roughly coincide with the boundaries between the bio-physical environments related to fronts in the area (Turbidity Front, Salinity Front, Shelf-break Front). The enhanced productivity and concentration of aquatic life in these fronts

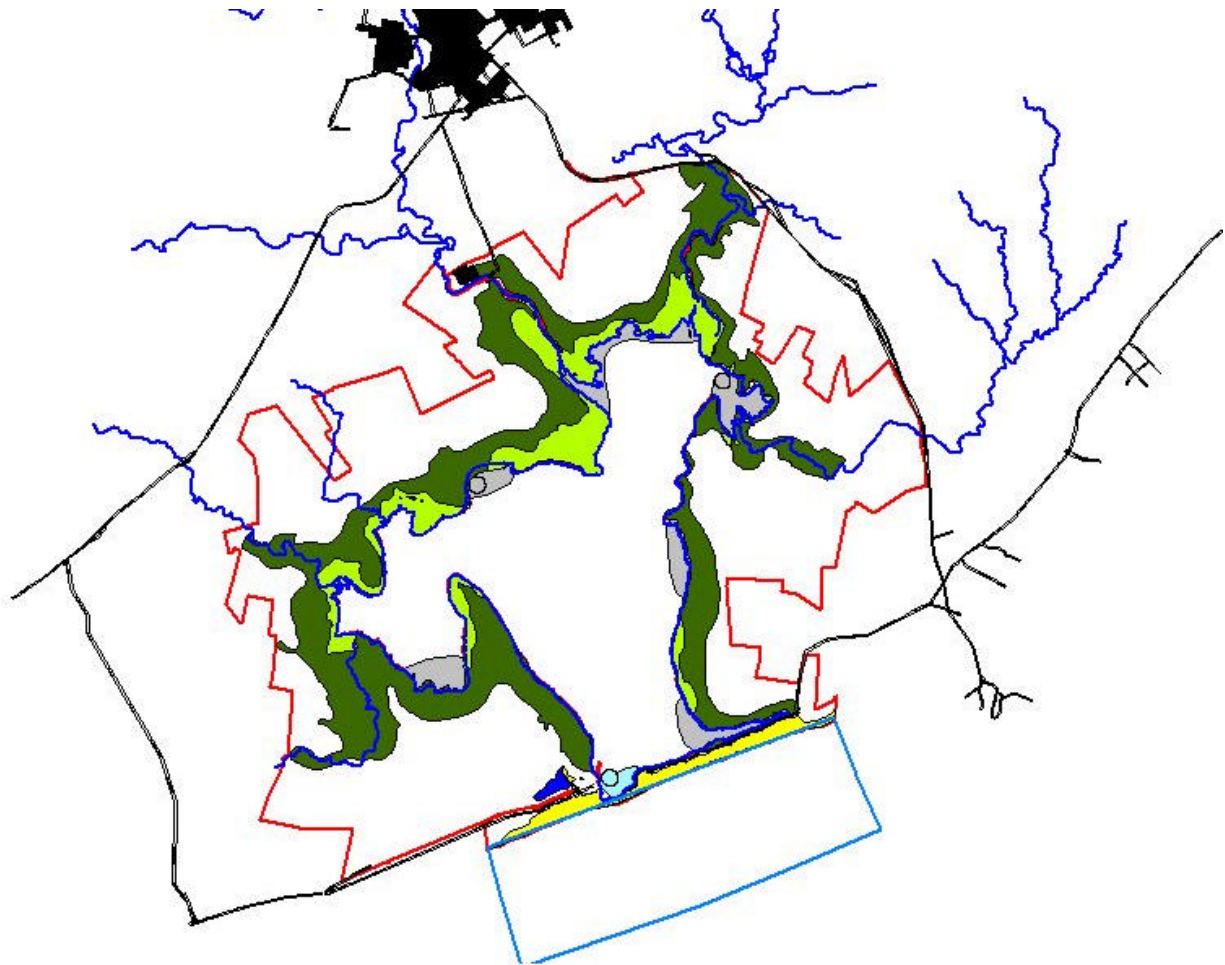
make the associated communities particularly vulnerable to exploitation. Moreover, human impacts which might be concentrated in these areas such as pollution incidents, industrial and domestic waste, and accumulation of aquatic litter in the vicinity of fronts, may have a disproportionate impact because of the focus of aquatic life around fronts.

This region in particular, represents the ecotone connecting the river and the mixohaline zone. Elevated levels of turbidity characterize it. Phytoplankton biomass increased along the salinity front and peaked at salinities above ca. 10, close to the Uruguayan coast (Calliari et al. 2005). Trophic webs are there detritus based.

This ecotone showed an increase in species richness moving from mixohaline to riverine waters due to the combination of riverine and mixohaline species, reaching very high abundances: high standing stocks for zooplankton were reported, and high fish abundances (mainly *Micropogonias furnieri*) sustain important coastal fisheries for Uruguay and Argentina (López Laborde et al. 2000, Brazeiro et al. 2004). Several fishes (*M. furnieri*; *Brevoortia aurea*; *Macrodon ancylodon*; *Pogonias cromis*) spawn at this zone taking advantage of the dynamics of the water masses convergence, which aids in the retention of the planktonic eggs and larvae inside the river. The priority areas for nektonic species are important for population processes like reproduction and nursery. The shallow waters of the fluvio-marine system (Barra del Indio and Uruguayan coast) provide refuge for several mixohaline species, such as *M. furnieri*, *P. cromis*, *Paralichthys brasiliensis*, *P. signata*, *M. ancylodon* and juveniles of *C. guatucupa* mostly occur in the shallow waters of the Uruguayan coast (Brazeiro et al. 2004). This is a zone of high food abundance for larval and juvenile stages, and moreover high turbidity could refuge juvenile fish from visual predators. These conditions explain the high abundance and diversity of fishes using the bottom salinity front and shallow adjacent waters, as reproductive and nursery grounds (Brazeiro et al. 2004).

For instance, the main exploited resource is the croaker (*Micropogonias furnieri*), which migrates to the estuarine front to spawn at the bottom waters from October to January. The spatial variability of the croakers and their recruitment strongly depends on the seasonal and inter-annual variability of river flow, whereas fishing activity is limited by S/SE/SW winds (), with frequency patterns changing over the last few decades (Norbis, 1995; Escobar et al., 2004; Nagy et al., 2006a).

Annex 11b: LAGUNA DE ROCHA



-  Rutas principales.shp
-  Urbano rocha.shp
- Rios.shp
 -  6
 -  5
 -  4
- Sitios de prioridad .shp
 -  Arenales
 -  Bahias lagunares
 -  Bancos lagunares
 -  Coneat 3.10 y pa
 -  Coneat 3.12
 -  Espejo de agua
 -  Laguna Nutrias
 -  Area marina
- Limite ap laguna rocha.shp
 -  2

Laguna de Rocha (Rocha's Lagoon) is part of a chain of six coastal lagoons along the Atlantic Ocean, with outstanding national and global biodiversity values due to their high levels of biodiversity and productivity. It falls within Bañados del Este, a UNESCO Biosphere Reserve, which hosts some of the most important freshwater and coastal ecosystems of the Neotropical Region. Laguna de Rocha is considered a site of Hemispheric Importance for migratory shorebirds by the Western Hemisphere Shorebird Reserve Network (WHSRN) and is under consideration to become part of the "Bañados del Este y Franja Costera" Ramsar site.

Laguna de Rocha is currently in the process to become a protected area of Uruguay's National Protected Area System, under the category Protected Landscape/Seascape (equivalent to IUCN category V). Laguna de Rocha is also considered a priority conservation area in the Land Use and Sustainable Development Plan for the Atlantic Coast of the Department of Rocha, the general framework for the territorial planning of the coastal area of this Department, in force since 2003⁴⁷.

The continental portion of the proposed protected area comprises 25,000 hectares: 16,000 hectares of land (mostly dedicated to extensive cattle grazing) plus 9,000 hectares of public water surface (corresponding to the lagoon itself). The marine portion of the protected area is part of the Subtropical Convergence Ecosystem.

Regarding ecosystem services Laguna de Rocha provides breeding areas for numerous species of fish and crustaceans, many of which have significant commercial value at the local, national and regional level, including shrimp *Farfantepenaeus paulensis*, Sirí crab *Callinectes sapidus*, white croaker (*Micropogonias furnieri*), *Mugil lisa*, and *Paralichthys orbignyanus*, among others. It also includes staging, resting and breeding areas for resident and nearctic migratory water bird species, mainly from the families *Charadriidae* and *Scolopacidae*⁴⁸. It hosts one of the largest populations of Black-necked swan and Coscoroba swan in southern South America and an endemic amphibian species (*Melanophryniscus montevidensis*).

Some species of outstanding biodiversity value in the marine zone of the proposed protected area include the endemic La Plata dolphin (*Pontoporia blainvillei*), the southern right whale (*Eubalaena australis*), and the green turtle (*Chelonia mydas*).

The area also hosts two small communities of artisan fishermen, with about 19 families (50 people) whose livelihoods depend on extraction of fish and crustaceans from the lagoon. One of these communities is located in the most fragile zone of the area (i.e. the sand bar which connects the lagoon with the ocean). There are no public services and infrastructure and rates of unsatisfied basic needs are quite high (mean household income is 70 US\$ per month).

Main threats include unplanned tourism development and use (e.g., all terrain vehicles, water sports) due to real estate value of coastal areas and proximity to the summer towns of La Paloma and La Pedrera, uncontrolled fishing, illegal hunting, and invasive alien species (*Cyprinus carpio*, *Pinus pinaster*). Potential threats include forestry with introduced species and increase in the demand of land for growing potato crops in the northern side of the lagoon.

Since 2003, a Provisional Advisory Commission has been working in the area, involving a broad spectrum of public and private stakeholders (local government, DINARA, DINOT, DINAMA, UDELAR, APALCO, private ranchers, local NGOs, and research institutions).

⁴⁷ Enacted by the municipal legislature (Junta Departamental) through Decree N° 12/2003.

⁴⁸ The coastal lagoons and wetlands of Uruguay host 78 % of the coastal population of *Pluvialis dominica* (goleen plover) in South America and 58 % of the whole Atlantic population of *Pluvialis squatarola*. The Canadian Wildlife Service has identified this zone as the most important coastal habitat in South America for migrant shorebirds (*Charadriidae*, *Scolopacidae*) from North America (Morrison & Ross 1989).

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