

2-1 Overview of Socio-Economic Environment

(1) Demographics

The population of the United Mexican States in 1999 is 97.4 million and its growth rate is 2.1% per annum during the period of 1975-2000. The total fertility rate of the same period is 2.8. The ratio of the population under the age of 15 years old is 36.6% and above the age of 65 years old is only 4.6% in 1999. Seventy-four percent of the total population lives in the urban areas.

(2) Economics

As a result of tight financing policy after the monetary crisis that took place in 1994, the Gross Domestic Product (GDP) declined by 6.9% in the following year. However, the annual growth rate has become plus due to high price of the crude oil, which is the major export of the country, as well as the business boom of the United States, which is the principal trade partner. The GDP per capita in 1999 stands at US\$ 8,297. The employment rate is 1.97% (in October 2000).

(3) Health and sanitation

In general the indicators of health and sanitation in Mexico is better than the averages of Latin American countries. In 1999, the life expectancy at birth is 72.4 (female 75.8 / male 69.8). The infant mortality rate is 27 at 1000 births and the mortality rate of the children under the age of 5 years old is 33 at 1000 births. The ratio of the population that uses adequate sanitation facilities, improved water sources, and has access to essential drugs is 73%, 86% and 92 % respectively.

(4) Education

Primary education is obligatory and is provided for free of charge. Although the ratio of primary enrolment is 100% in 1999, the ratio of net secondary enrolment stands at only 51%. In addition 86 % of the children reaches 5th grade during the period of 1995~97. Adult literacy rate in 1999 is 91 % (female 89.1% / male 93.1%).

2-2. 対象セクター全体の状況

メキシコでは、憲法第 27 条において、環境保全の重要性が唱われており、これを受けて 1988 年に環境保全基本法が制定されている。この法律では、生物多様性保全、自然資源の持続可能な利用、大気・水質等の環境保全等、環境に関する多くの内容が規定されているが、自然保護区についても、この法律に基づいて設定されている。

現在、自然保護区は、生物多様性条約の考え方を踏まえて、生物圏保護区、国立公園、天然記念物など 6 つのタイプに区分されており、国土（陸域）の約 6 % が自然保護区としての指定を受けている。

これらの自然保護区の大部分は 1970 年代後半以降に指定されたものであり、保護区の数と面積はここ 30 年程の間に急激な増加が見られる一方で、その管理体制については急増する保護区に十分な対応ができていないといえない。

現在、126 カ所ある自然保護区のうち、少なくとも 1 人以上の管理職員が配置されている保護区は 56 カ所のみであり、その他は放置されているのが現状である。また、管理計画が策定され、保護区技術評議会が設置され、資金計画があり、最低 5 名以上の管理職員が配置されているという条件を満たし、国家自然保護区管理システムに属している保護区は 38 カ所に過ぎない。

一方、自然保護区は、野生動植物の生息・生育地として重要であるだけでなく、持続的利用が可能な天然資源の供給地や環境教育の場所としても重要な価値を有しており、保護区の適切な管理は、保護区内並びにその周辺に住む住民にとって大きな利益をもたらす。自然保護区の管理体制の充実がメキシコ政府にとって重要な課題のひとつであるといえる。

2-3. 当該政府の戦略

メキシコにおいて、生物多様性の保全に関する政策を規定したものとして、前政権下の「生物多様性のためのメキシコ政府活動プログラム(1995-2000)」や「生物多様性戦略(2000)」などがある。これらにおける生物多様性の保全に係る基本的な考え方は、①生物資源を明らかにする、②地域住民の参加を促す、③資源を持続的に利用していく、というものである。

一方、2000 年 11 月に就任した現大統領の政権下においては、2001 年 5 月に国家開発計画が発表されたところであり、現在、各省庁でそれに基づいて計画を策定している段階であるが、生物多様性の保全に係る基本的な考え方は大きく変更されないものと思われる。

Project Document for the Conservation of wetland ecology in Northern Yucatan, Mexico
RECS INTERNATIONAL, INC.

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Main target area of the project: Ría Celestún Biosphere Reserve (RCBR)

The objective of the project is to improve management capacity of Ría Celestún Biosphere Reserve.

2-4 Activities related to wetland conservation and reserve management in the target area

Several organizations have been contributing to wetland conservation and reserve management in RCBR since the end of 1980s. The activities were initiated by local NGO, PRONATURA focusing on environmental education and conservation of sea turtles. The activities of PRONATURA have been boosted by Park in Peril program of USAID/TNC since 1991. The government (INE, presently transferred to CONANP, a decentralized organization of SEMARNAT) established an administrative office in RCBR with permanent staff in 1998. In RCBR, the government and NGOs are working closely towards wetland conservation using the limited available fund, although their formalities are significantly different. At this moment, PRONATURA is technically and financially supporting the reserve office since their capacity is so limited. Therefore, it is urgent to strengthen the reserve office economically by external support and politically by newly established CONANP together with state/municipal governments taking advantage of the field experience of NGOs.

2-4-1. Activities by the government and donor agencies

The activities of the administrative offices of Ría Celestún and Ría Lagartos, State government, and three programs by donor agencies are briefly explained here.

1) Ría Celestún Biosphere Reserve

Nature reserve of Ría Celestún was originally established as Refugee for Fauna in 1979. The administration office of RCBR was established in 1998. Ría Celestún was enacted as a biosphere reserve in 2000. Presently, the main activities of the administrative office are: 1) basic reserve management (e.g. vigilance), 2) establishment of political base such as consolidating management program, reorganizing advisory committee, etc., 3) coordination with local community, 4) infrastructure development for eco-tourism, 5) coordination with other institution.

The management program of RCBR was prepared in 1999. As of August 2001, the management

program is being reviewed by COFEMER¹ (Comision Federal de Mejores Regulatorias). RCBR has just become the 36th biosphere reserve in SINANP in August 2001. It is seems that the management program will be officially published in a few months.

Many activities are coordinated by the reserve office. For eco-tourism development, infrastructure were improved and restored (construction of piers for tourist boats at tourist spots, cleaning of freshwater spring and canales, etc.). In Celestún community, boatmen and salt farms were organized as cooperatives. Urban development plan to extend the land controlled by municipality were proposed with the conditions not to extend the residential area but to construct new residential area inside the peninsula. In order to restore mangrove forest, drainage under roads and freshwater springs were cleaned with coordination of the state government.² A nursery station for reforestation of mangrove is on the process to be installed.

Financial sources of RCBR are official funding from CONANP and income from tourist boats for flamingo tour.³ The income from tourist boats is mainly used to improve the tourism related infrastructure such as cleaning of canales, restoration of freshwater springs, etc. The reserve office has five technical staff (one is paid by PRONATURA) and one administrative staff. As part of financial strategies, RCBR is planning to establish social association (Asociacion Civil) to receive external funding.

Annual budget from SEMARNAT/CONANP (Peso)

	Fixed cost*	Cost for equipment
1998	388,134	
1999	350,600	863,500
2000	533,800	271,200
2001	505,750	

*This cost does not include staff salaries.

2) Ría Lagartos Biosphere Reserve (RLBR)

Ría Lagartos was established as a faunal refuge in 1979 and enacted to be biosphere reserve in 1999. RLBR became Ramsar site in 1986. Compared to Ría Celestún, the characteristics of RLBR are that RLBR has more land pressure from the south by cattle farms, but less pressure of tourism due to the distance from Merida and disperse locations of the three villages (San Felipe, Rio Lagartos, and

¹ Under Secretaria de Economia..

² The state government has available fund for wetland restoration from NAWCC (North American Wetland Conservation Council).

³ Approximately US\$20,000-30,000 /year. 10 peso/person for the boat tour is charged. The cost for the boat tour is collected by CULTUR (state government) and given to the reserve office.

El Cuyo). Main activities are eco-tourism development, environmental education, protection of nesting site of flamingos, improvement of economic activities such as ranching, fishing and salt farms, monitoring water quality and birds, etc. (see table below). Presently RLBR has mainly seven funding sources (see table below). Organization structure is presented in Annex 3.

Funding source of RLBR

Funding Source	Annual Budget, 2001 (Peso)	Use/Activities
CONANP (including GEF)	1,987,417	Personnel, operation cost watchmen etc.
PROFEPA	80,000	Inspection and vigilance
Centro regional de Investigaciones Pesqueras	100,000	Turtle camping
PRONATURA/USAID/TNC	330,000	Community promotion, environmental education
CINVESTAV	40,000	Hydrological monitoring
ISYSA	50,000	Hydrological monitoring
Niños y Crias	340,000	Flamingo Conservation Program
	177,000	Nursery of native palms
Conservation and Development AC	120,000	Eco-tourism
FMCN(EU)	930,000	Eco-tourism
Salinera Industria Yucatan	100,000	Environmental Education
Viajera de Golfo/Pronatura	120,000	Land issue
Total	4,376,418	

ISYSA: Industrial Salinera de Yucatan S.A.

Annual operational plan, 2001

Activities	Objective	Implementation
Monitoring water quality of Ría Lagartos Estuary	Identify the physical and chemical parameter, control the emission sources	CNA UADY CINVESTAV ISYSA
Monitoring birds	Realize 12 monitoring of birds at four core zone	Reserve office
Watch core zone and federal territories and water bodies	Realize 12 inspections at the borders of core zone once a month	Reserve office, PROFEPA, SEDEMAR, SEDENA
Program of conservation of Red Flamenco	Protect the reproductive population of red flamenco Maintenance of 2 water springs Remove 100 dangerous dogs	Reserve office, Niños y crias
Develop project of salt dealers	Develop one project to improve profitability of salt dealing	Reserve office, ISYSA, CTA, Municipalities
Limit the growth of urban area in the wetland	Develop the urban development plan in the municipal land	Reserve office, SEMARNAT, Municipalities
Intensify the livestock production	Maintain the index at 6 ranches	Reserve office, ranchers and NGO
Diversify the ranching activities	Diversity 2 ranches (deer, agroforestry, eco-tourism UMA, etc.)	Reserve office, ranchers and NGO
Diversify the fishing activities	Operate one project, Eco-tourism or Aquaculture	Reserve office, NGOs and CINVESTAV

SEDEMAR: Secretaria de Marina. SEDENA: Secretaria de Defensa Nacional.

3) Committee of restoration, conservation and wise use of the wetland of the coastal system of Yucatan State

In order to coordinate wetland conservation activities in state level, committee of restoration, conservation and wise use of wetland in the coastal system of Yucatan State was formed in 1996 by SEMARNAP, PEMEX, SECTUR (Secretaria de Turismo), Progreso municipality, CNA, Association of Palmar state reserve, CINVESTAV, etc. Main activities realized by the committee are: improvement of water flow through construction and cleaning of drainage, maintenance of portable water, rehabilitation of canales, etc. 66 million pesos were invested through the committee in 1997-98. In RCBR, 18 fresh water springs and 21 drainages were cleaned and maintained through the committee between 1997-2000.

4) Protected Area Management program

World bank has been supporting ten nature reserves including RLBR to strength management capacity through Global Environmental Facility (GEF) since 1996. The bank is planning to extend the project to Protected Area Management program II for another 12 reserves. Phase II will be implemented by CONANP (Phase I by FMCN). Ría Celestún is not included in the Phase II.

5) Mexico Mesoamerican Biological Corridor Project

World bank is planning to support improvement of conservation activities at selected corridors through CONABIO (Comision Nacional para el Conocimiento y Uso de la Biodiversidad). In Yucatan, the area between Ría Lagartos and Ría Celestún (8 municipalities, 245,000 ha with 15 communities) is one of the selected corridors. The phase I will be implemented at two focal areas: Hunucma municipality, and Sinache, Yobain, and Dzidzantun municipalities. The main activities are participatory design and monitoring, capacity building of government, and promoting sustainable use of biodiversity through pilot projects.

6) Parks in Peril Program

USAID has been supporting reserve management of northern Yucatan peninsula by Park in Peril Program through The Nature Conservancy (TNC) since 1991. The project improves the reserve management in a number of sites including Ría Celestún and Ría Lagartos through constructing infrastructure, integrating local communities into the reserve management, improving long-term financial security and environmental education. Currently, the activities of the program at RCBR include land tenure analysis for private land conservation, mitigation of critical threats, development of environmental education model, promotion of fundraising mechanism, training of grassroots

groups, support of eco-regional planning process, and eco-tourism promotion.

2-4-2. Activities by NGOs

1) PRONATURA P.Y.

PRONATURA is a Mexican NGO funded in 1981 for the conservation of biodiversity. PRONATURA started the activities in Yucatan in 1987 and became an independent NGO of the region, PRONATURA PY (Peninsula Yucatan) in 1990. Since then PRONATURA has been the leading NGO to support RCBR. Main activities are overall support of reserve management such as analysis of land ownership, formulation of vegetation map, threat analysis, consolidation of boundary of the biosphere reserve, development and implementation of monitoring program, elaboration of long-term financial strategies, etc. Majority of the activities are supported by US-based funding sources such as USAID, TNC, NAWCC, etc.

In 1997 PRONATURA PY undertook threat analysis for seven ecosystems in RCBR with technical advisors of local investigators (CICY, CINVESTAV, etc.) based on the site conservation planning developed by TNC. PRONATURA has developed the GIS system for RCBR with the data set of vegetation, land-use, landownership, zoning of the reserve, urban mapping and health data using 1998 satellite image and aero photos. Currently, PRONATURA PY is in the process to develop eco-regional plan⁴ of northwest Yucatan with CINVESTAV and CICY as a part of Park in Peril program.

Main Activities of PRONATUIRA PY.

Name	Year	Finance	Activities
Park in Peril Program	1990-	TNC/USAID	Overall supports of reserve management including analysis of land ownership, formulation of vegetation map, threat analysis, setting up border of biosphere reserve, development and implementation of monitoring program, elaboration of long-term financial strategies, etc.
System of environmental monitoring and data analysis (Biodiversity data center)	1993-96	NAWCC and US Fish and Wildlife Service	Conducted with CINVESTAV and Colorado University
Diagnostic of coastal dune in Ría Lagartos	1996		Diagnostic of actual status of coastal dune
Impact assessment for motorboat on sub-aquatic vegetation	1996-97		Environmental impact assessment of motorboat for sub-aquatic vegetation
Management standard of fishing of Crustacea, Ría Celestún	1996-99		Improvement of Crab fishing

⁴ Mexico is divided into 47 eco-regions. Northwest Yucatan is characterized as Mangrove of Petenes.

Program of ecological order of coastal wetland in Yucatan State	1997	CINVESTAV	Preliminary cartography about the coastal wetland
Theoretical Cartography of Coastal wetland in Yucatan State	1998-99	NAWCC US Fish and Wildlife Service	Cartography of coastal wetland 1/100.000 (base map, subsystem natural and diagnostic)
Program of management of Biosphere reserve, Ría Celestún	1999	Contract with INE	Support to formulate management program of Ría Celestún
Administration of fund of personnel service of annual operational program, Ría Lagartos	1998-99	FMCN	Administration of GEF project fund for personal services.

NAWCC (North American Wetland Conservation Council)

2) DUMAC

Ducks Unlimited de Mexico (DUMAC) is an international NGO that has been working for conservation of wetland and waterfowls since 1974. Main activities of DUMAC in the northwestern Yucatan are: holding training courses of nature reserves and wildlife management, restoration of hydrologic systems of mangrove at Isla Arena watershed, restoration of water flow regulation system at Carbonera and Chuburná Puerto, inventory studies of waterfowls and classification of wetlands. The GIS system for classification of wetlands is in the process to be developed. DUMAC offered 20 training courses for 160 participants from 21 countries throughout Latin America. Moreover, DUMAC has been proposing a conservation plan of pato real (*Cairina moschata*) that is considered to be endangered.

3-1 Institutional Aspects of Wetland Conservation in Mexico

National Strategies for Biodiversity in Mexico

In order to define the priority and coordinate interests of different sectors, SEMARNAT (SEMARNAP as of date of issue) issued the national strategies for biodiversity in 2000. The main lines of strategies are: 1) protect and conserve different component of biodiversity, 2) justify the value of biodiversity, 3) advance the knowledge and management of the information, and 4) diversify the use. The each line of strategies focuses on the following topics.

Main topics for each Strategic Line

Protection and Conservation	Valuation of the biodiversity	Knowledge management and of information	Diversification of use
In situ conservation Recovery of the elements of biodiversity Bio-security Exotic species and translocation	Importance of national culture Contribution of the biodiversity Institutional actualization	Investigation studies Inventory and collection Recovery and systematization of knowledge	Actual use Productive diversification Criteria and indicators Commercialization and market

Prevention and control of illegal actions Follow-up Attention for emergency		Interchange of information Diffusion Environmental education Training and academic formation Information Management	
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Source: National Strategies for Biodiversity in Mexico. 2000.

3-1-1 Legal framework of nature conservation in Mexico

Overall environmental policies of Mexico are described in General law of the ecological equilibrium and the environmental protection (LGEEPA). Internal regulation of the law describes the role, structure and functions of governmental agencies for nature conservation. CONANP, decentralized organization under SEMARNAT is the main governmental body for nature conservation. Law of wildlife, forestry, fishing and hunting define the sustainable use of each natural resource. The species under special protection is listed on the official norm under the law of wildlife (NOM-059-ECOL-94).

1) General law of the ecological equilibrium and the environmental protection (LGEEPA)

General law of ecological equilibrium and environmental protection (enacted in 1988 and largely revised in 1996) is the law to define overall environmental politics and concepts of the preservation and restoration for environmental protection of the governmental land. The public interests for sustainable development are treated as the right of all the people. The contents prescribed in the law include: 1) general issues such as zoning for environmental planning, environmental assessment, and environmental standards, 2) biodiversity conservation, 3) sustainable use of water, soil, forest and other natural resources, 4) prevention of contamination of air, water, and soil, 5) participation of related people, 6) provision of environmental information and 7) inspection, securities and sanction. The definition of each protected areas is prescribed in the law.

a) Protected Natural Areas (PNA)

Protected areas are categorized into seven different types by the law: namely biosphere reserves, national parks, natural monuments, protected areas of natural resources, protected areas of flora and fauna, sanctuaries and state parks and reserves. Presently there are 126 federal natural protected areas in Mexico. National parks occupy 54% of protected areas in number, while biosphere reserves occupy 71% of the area. 17% of the total area was increased between 1995-2000.