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FINAL REPORT

**STUDY
REVIEW OF NICARAGUA'S WILDLIFE TRADE
POLICY**

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Authors

Technical and Institutional Coordinator, MARENA

Engr. René Castellón.

Consultancy team, University of Central America, UCA

Stern N. Robinson S., MSc. Coordinator

Mario A. Gutiérrez G., MSc.

José V. Morales M., B.Sc.

Octavio A. Saldaña T., B.Sc.

Editors

Engr. René Castellón	MARENA-CITES Ni.
Engr. Humberto Méndez	INAFOR
Jacobo Sánchez, MSc.	MARENA
Manuel Pérez, MSc.	INPESCA
César Otero, MSc.	UNAN-MANAGUA
Sandra Tijerino, MSc.	Ex CITES Administrative Authority
Fátima Vanegas, MSc.	Ex CITES Administrative Authority
Dr Orlando Rey	Cuban Academy of Science and Technology

Publisher

Mario Urtecho Olivares, B.Sc.

Cover design

Karla Sánchez Lorio, B.Sc.

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Acronyms and abbreviations

Acronym	Meaning
ADPESCA	Administración Nacional de Pesca y Acuicultura (National Fisheries and Aquaculture Authority)
AMUNIC	Asociación de Municipios Nicaragüenses (Association of Nicaraguan Municipalities)
AP	Protected area
ATLANOR- INVERNIC	Atlántico Norte – Inversiones de Nicaragua (Atlántico Norte - Nicaraguan Investment Authority)
AVENICA S.A.	Empresa Exportadora Aves de Nicaragua–Avenica S.A. (Birds of Nicaragua Export Company-Avenica S.A.)
BCN	Nicaraguan Central Bank
BICU	Bluefields Indian and Caribbean University
CAMs	Comisiones Ambientales Municipales (Municipal Environmental Commissions)
CAP	Permissible Annual Quota
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Tropical Agronomic Research and Higher Education Centre)
CBD	Convention on Biological Diversity
CCAD	Central American Commission on Environment and Development
CoP	Conference of the Parties
CEDOC	Documentation centre
CETREX	Centro de Trámites de las Exportaciones (Export Processing Centre)
CINCO	Centro de Investigaciones de la Comunicación (Communication Research Centre)
CIP	Centro para las Políticas Internacionales (Centre for International Policies)
CIPA	Centro de Investigación de productos Pesqueros y Acuícola (Fisheries and Aquaculture Research Centre)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNEA	Comisión Nacional de Educación Ambiental (National Environmental Education Commission)
COMPROVISA	Cooperativa Comercializadora de Productos de Vida Silvestre (Wildlife Products Sales Cooperative)
CONDEMINA	Corporación Nicaragüense de Minas (Nicaraguan Mining Corporation)
DANIDA	Danish International Development Agency
DAP	Diameter at chest height
NDFs	Non-detriment findings
DGA	Dirección General de Servicios Aduaneros (Directorate-

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	General of Customs Services)
DGAP	Dirección General de Áreas Protegidas (Directorate-General for Protected Areas)
DIGEPESCA	Dirección General de Pesca y Acuicultura (Directorate-General of Fisheries and Aquaculture)
DMC	Minimum logging diameter
DR-CAFTA	Dominican Republic-Central America Free Trade Agreement
DRNR	Dirección de Recursos Naturales Renovables (Directorate of Renewable Natural Resources)
EDAN	Damage assessment and needs analysis
EIA	Environmental impact assessment
ETEDPI	Education in Labour, Employment and Rights of Indigenous Peoples
FAO	Food and Agriculture Organization of the United Nations
FFI	Fauna & Flora International
FOB	Free On Board
FONADEFO	Fondo Nacional de Desarrollo Forestal (National Forest Development Fund)
FSC	Forest Stewardship Council
FUNDEVERDE	Fundación Reserva Esperanza Verde (Green Hope Reserve Foundation)
GDP	Gross domestic product
IDH	Human Development Index
IDR	Rural Development Institute
ILO	International Labour Organization
INAFOR	Instituto Nacional Forestal (National Forestry Institute)
INC	Instituto Nicaragüense de Cultura (Nicaraguan Cultural Institute)
INE	Instituto Nicaragüense de Energía (Nicaraguan Energy Institute)
INEC	Instituto Nacional de Estadísticas y Censos (National Institute of Statistics and Census)
INETER	Instituto Nicaragüense de Estudios Territoriales (Nicaraguan Geosciences Institute)
INIFOM	Instituto Nicaragüense de Fomento Municipal (Nicaraguan Municipal Development Institute)
INPESCA	Instituto Nicaragüense de la Pesca (Nicaraguan Institute for Fisheries and Aquaculture)
INPYME	Instituto Nicaragüense de Apoyo a la Pequeña y Mediana Empresa (Nicaraguan Institute for Support of Small and Medium-sized Enterprises)
INTECFOR	Instituto Nacional Técnico Forestal (National Forestry Institute)
INTUR	Nicaraguan Tourism Institute

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IRENA	Instituto Nicaragüense de Recursos Naturales (Nicaraguan Natural Resource Institute)
ITTO	International Tropical Timber Organization
IUED	Graduate Institute of Development Studies, Geneva
MAB	Man and the Biosphere (UNESCO programme)
MAG	Ministry of Agriculture and Livestock
MAGFOR	Ministry of Agriculture and Forestry
MAPRENIC	Maderas Preciosas de Nicaragua (Valuable Timber of Nicaragua)
MARENA	Ministry of the Environment and Natural Resources
MECD	Ministry of Education, Culture and Sport
MHCP	Ministry of Housing and Public Credit
MIFIC	Ministry of Development, Industry and Trade
MINSA	Ministry of Health
NGO	Non-governmental organization
NIPCO	Nicaragua Long Leaf Pine Lumber Co
NORAD	Norwegian International Development Authority
NTON	Norma Técnica Obligatoria Nicaragüense (Nicaraguan Mandatory Technical Standard)
PERCBM	Regional Strategic Plan for the MesoAmerican Biological Corridor
PGMF	General forest management plans
PN	National Police
POA	Annual operating plan
POSAF	Programa Socio Ambiental y Desarrollo Forestal (Social Environment and Forest Development Programme)
PROFOR	Program on Forests (International)
RAAN	Autonomous Region of Atlántico Norte
RAAS	Autonomous Region of Atlántico Sur
RAMSAR	Convention on Wetlands of International Importance
REPTINIC	Reptiles de Nicaragua (Reptiles of Nicaragua)
SIG	Geographical information system
SINAP	Sistema Nacional de Áreas Protegidas (National System of Protected Areas)
SINAPRED	Sistema Nacional de Prevención y Mitigación de Desastres (National Disaster Prevention and Mitigation System)
SINIA	Sistema Nacional de Información Ambiental (National Environmental Information System)
SNIP	Sistema Nacional de Inversión Pública (National Public Investment System)
SPDMR	Proyecto de Municipios Rurales (Rural Municipalities Project)
SPN	National Parks Service
TRAFFIC	Trade Records Analysis of Flora and Fauna in Commerce

UICN	International Union for Conservation of Nature
UNCTAD	United Nations Conference on Trade and Development
UNEP-UNCTAD	UNEP-UNCTAD Capacity Building Task Force on Trade, Environment and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
URACCAN	University of the Autonomous Regions of the Caribbean Coast of Nicaragua
US-AID	United States Agency for International Development
USD	United States dollar
WCMC	World Conservation Monitoring Centre
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature
ha	Hectare
m³	Cubic metre
km	Kilometre
masl	Metres above sea level

Executive summary

Nicaragua's biowealth and biodiversity are of national, regional and world importance. This has led to significant legal, but also illegal species trade, with consequences for the survival of many species of flora and fauna. The declines in wildlife populations have in turn adversely affected the living conditions of Nicaraguans, especially the poorest among them, who are directly dependent for their subsistence on natural resource use.

The Government has tried to establish a framework of biodiversity-related environmental policies and has therefore put into effect a large number of regulations that directly or indirectly impact species trade. In addition, to bolster its efforts, it acceded in 1977 to CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and has developed extensive relations with the CITES Secretariat.

For the purposes of reviewing national wildlife trade policy, identifying its shortcomings and limits and proposing the measures needed for its effective implementation at the national level and its proper alignment with the provisions and recommendations of CITES, Nicaragua undertook the present study, entitled "Review of Nicaragua's Wildlife Trade Policy", so becoming one of the first four countries to make an assessment of this kind.

The study was carried out between May 2007 and March 2008 thanks to the invaluable technical and financial support of the CITES Secretariat and UNEP.

It gave rise to the following conclusions and recommendations:

Conclusions

- Nicaragua's membership of CITES has enhanced its ability to manage and regulate domestic and international wildlife trade, particularly as regards threatened and endangered species (CITES species);
- Current laws are inadequate to protect and sustain domestic and international trade in CITES species. They are unfocused and lack provisions on habitat degradation and biological productivity;
- The country has neither a written wildlife trade policy nor laws to underpin sustainable species management in domestic and international trade. The regulatory instruments pertaining to sustainable management of wildlife trade are relevant and coherent and provide a basis for the formulation of such a policy.
- The non-regulatory instruments for measuring the commercial sustainability of wildlife trade are little used. The most important of them are: monitoring, research, education and information.
- Study of the value chain for wildlife harvesting shows that the income from trade in harvested species goes principally to external actors, with little or no benefit to rural communities or populations.
- Decentralization of the functions of CITES-Ni to local offices without sufficient additional technical and operational resources hinders effective application of the laws on wildlife

trade.

- The severe degradation of some high-commercial-value CITES species, such as the bigleaf mahogany (*Swietenia macrophylla*), is attributable to illegal logging, the inconsistency of the laws on harvesting and the lack of capacity for *in situ* monitoring. The result is a loss to the Nicaragua economy of some USD 8 million a year.

Recommendations

- Draw up a wildlife trade policy and law containing among their key elements: species sustainability, replacement, incentives, fairness and viable financial mechanisms. The policy should cover agriculture, forestry, fishing and trade, activities that, if properly managed, generate excellent social and economic opportunities. It should take into account the threats that uncontrolled trade poses to flora and fauna and restate the object, principles and goals set out in the country's General Environmental and Natural Resource Law (*Ley General del Medio Ambiente y los Recursos Naturales*), the Environmental Policy of Nicaragua (*Política Ambiental de Nicaragua*) and the National Biodiversity Strategy (*Estrategia Nacional de Biodiversidad*);
- The policy should include provision for the resources – human, financial and operational – needed for its effective application and ensure the continuation of population monitoring studies with a view to finding solutions that will result in the better management and sustainable harvesting, with community participation, of psittacines, the spectacled caiman (*Caiman crocodilus chiapasius*) and other internationally traded species;
- Strengthen institutional capacity, including the capacity of local offices, for the sustainable management of wildlife trade, focusing on effective use of the tools of monitoring, research, education, and information;
- Enter into strategic alliances with universities, research centres and other bodies with the capacity to carry out monitoring, research and education conducive to the effective use of wildlife trade sustainability management tools;
- Unify and standardize, for use in monitoring and research systems, indicators and methodology for assessing the sustainability of CITES species in domestic and international trade;
- Design and implement a system of education, communication and information for rural development actors that will help to change attitudes and so contribute towards sustainable wildlife use;
- Institute, as a preventive rule, studies and research to secure the biological criteria for the setting of quotas;
- Undertake pilot projects to establish systems for the management of high-commercial-value species in local communities, bearing in mind the harvesting of the species in their natural habitats.

- Strengthen and redefine the operation of the Scientific Committee;
- Review decrees, rules and procedures and update technical standards for wildlife management;
- Strengthen cooperation between institutions and alliances with local and regional authorities and NGOs;
- Step up information and intensive training for all sectors and actors involved in wild flora and fauna harvesting and trade.

I. INTRODUCTION

Nicaragua's biowealth and biodiversity are of national, regional and world importance. This has led to significant legal, but also illegal species trade, with consequences for the survival of many species of flora and fauna. The declines in wildlife populations have in turn adversely affected the living conditions of Nicaraguans, especially the poorest among them, who are directly dependent for their subsistence on natural resource use.

The Government, aware of the importance of the country's biodiversity, of its potential to contribute towards national economic development and of the adverse effects of uncontrolled trade, has tried to establish a framework of biodiversity-related environmental policies to protect biodiversity and has therefore put into effect a large number of regulations that directly or indirectly impact species trade. It acceded in 1977 to CITES and has developed extensive relations with the CITES Secretariat.

The attempts to develop policies, and the broad range of legal instruments that now exist, have had positive effects, but have also run into constraints, particularly as regards implementation.

For the purposes of studying and assessing the country's policies and identifying their shortcomings and limits and ways of improving them so that they are efficient and effective and properly serve the national interest, Nicaragua undertook the present study, entitled "Review of Nicaragua's Wildlife Trade Policy", so becoming one of the first four countries to make such an assessment. The study was carried out between 17 May 2007 and March 2008 with the invaluable financial and technical support of the CITES Secretariat and UNEP.

1.1 CITES in brief

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a binding international treaty that affords varying degrees of protection to selected species of wild animals and plants and makes international trade in the species that it covers subject through a licensing system to controls on export, re-export and introduction (CITES, 2007).

The text of the Convention was agreed at a meeting of representatives of 80 countries in Washington D.C., United States of America, on 3 March 1973 and came into force on 1 July 1975. The States that have signed the Convention are known as Parties. The Convention is legally binding on the Parties, who must apply it, but it does not take the place of national laws (CITES, 2007).

The species protected by the Convention are listed in three Appendices, according to the degree of protection they require.

- **Appendix I** - Includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances.
- **Appendix II** - Includes species not necessarily threatened with extinction but trade in

which must be controlled in order to avoid utilization incompatible with their survival.

- **Appendix III** - Includes species that are protected in at least one country which has asked other Parties to the Convention for assistance in controlling trade in them.

Each Party to the Convention is required to designate one or more Management Authorities to manage the permit system and one or more Scientific Authorities to advise on the effects of trade on species' status (CITES, 2007).

1.2 CITES in Nicaragua (CITES-Ni)

The history of the management of international trade in endangered species of flora and fauna in Nicaragua can be divided into two periods:

- Before the signing of the Convention (1974-1976): natural resources were managed by the Ministry of Agriculture and Livestock (*Ministerio de Agricultura y Ganadería*, MAG) and the Convention was not applied.
- Since the signing of the Convention (1977-2008): Nicaragua ratified CITES on 6 August 1977 and the relevant presidential decree came into force on 4 November 1977 (official gazette *La Gaceta* No. 183, 15 August 1977).

The above period saw structural changes in public administration as a result of the war and the accession to power of a revolutionary government. The Nicaraguan Natural Resource Institute (*Instituto Nicaragüense de Recursos Naturales*, IRENA) was set up at the end of the period and took over management of the country's natural resources.

The Convention was not applied after its ratification because of the existence of Decree No. 625 of 1977 prohibiting the export of wild fauna, which the next Government kept in force until, in 1982, new taxes were established for traded species of fauna and pet export permits were made more expensive and redesigned. These regulations remained in force until late 1985.

International wildlife trade, in psittacines and coordinated by IRENA, began in 1986 through the European Economic Community under small export quotas. The income helped to strengthen the regional inspectorates through the provision of vehicles and communication equipment for resource monitoring, etc.

In the period beginning in 1989, private wildlife export businesses were created and new tax rates were set by the Nicaraguan Central Bank (*Banco Central de Nicaragua*, BCN). MARENA set annual export quotas in cooperation with the CITES Secretariat.

The national CITES office, CITES-Ni, was set up in 1992 as a *de facto*, not *de jure* structure under the authority of the Deputy Minister for the Environment and Natural Resources and the national Management and Scientific Authorities were designated. This decision strengthened the application and implementation of the Convention in Nicaragua, making the country one of the first in the region in this respect.

Decree No. 8-98, "Rules and Procedures for the Export and Import of Species of Wild Flora and Fauna" (*Normas y procedimientos para la exportación e importación de especies de flora y fauna silvestre de Nicaragua*), dated 27 January 1998, officialized in law the designation of the national CITES Management and Scientific Authorities.

MARENA subsequently underwent a series of structural changes affecting the implementation of the Convention in Nicaragua. In 1999, the CITES-Ni office became part of the Directorate-General for Protected Areas (*Dirección General de Áreas Protegidas*). When the Directorate-General for Biodiversity (*Dirección General de Biodiversidad*) was set up, the CITES office was transformed into a Special Directorate for Wildlife Trade (*Dirección Específica de Comercio Internacional de Vida Silvestre*) dealing with domestic and international wildlife trade. In 2003, MARENA was again restructured with the establishment of the Directorate-General for Trade and Environment (*Dirección General de Comercio y Medio Ambiente*) and the placing within that directorate of the Special Directorate for Wildlife Trade, whose functions include the implementation of CITES.

In 2008, MARENA was further restructured. Management of CITES-Ni is now one of the functions of the Biodiversity Directorate (*Dirección de Biodiversidad*), which includes as part of its specialist team the CITES Management Authority and two full-time technicians to follow up all activities connected with the implementation of the Convention in Nicaragua.

It is important to note that, despite the various restructurings of MARENA, CITES has always been implemented. That is proof of the importance that higher authorities attach to the putting into effect of the Convention.

II. OBJECTIVES OF THE POLICY REVIEW

2.1 Overall objective

Review national wildlife trade policy, identify its shortcomings and limits and propose the measures needed for its effective implementation at the national level and its proper alignment with the provisions and recommendations of CITES.

2.2 Specific objectives

1. Assess the degree to which the components of wildlife trade policy are consistent with each other and the effectiveness of their implementation;
2. Identify the legal instruments that make up the current "wildlife trade policy" and their connection with policy development.
3. Analyse and evaluate the application by CITES-Ni of legal instruments relating to wildlife trade and their environmental, economic and social impact.
4. Propose measures and recommendations for developing an appropriate wildlife trade policy, particularly as regards CITES species, taking into account the requisite legal instruments.

III. METHODOLOGY

In preparation for the study, a two-day training workshop was held for the technical team. The subjects covered were the scope of the policy review and the approach to the work.

Agreement was reached with the representative of the Geneva Graduate Institute of Development Studies (IUED) on tool design and use. Following this, a launch and consultation workshop on the wildlife trade policy review was held with the various actors involved, including:

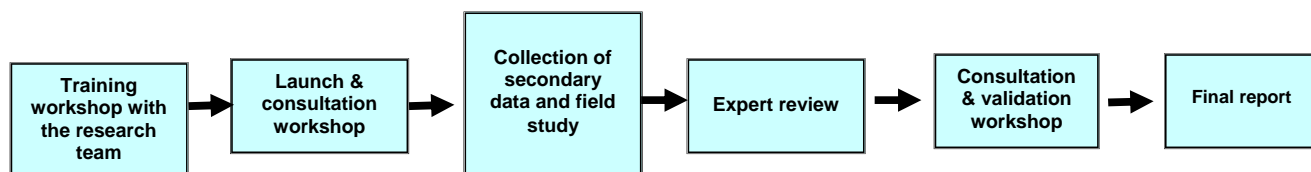
- Representatives of private businesses exporting bigleaf mahogany (*Swietenia macrophylla*), vertebrate wildlife and queen conch (*Strombus gigas*);
- Flora and fauna researchers;
- Non-governmental organizations;
- Representatives of universities;
- Representatives of State bodies:
 - Office of the Prosecutor-General of the Republic (*Procuraduría General de la República*, PGR)
 - National Forestry Institute (*Instituto Nacional Forestal*, INAFOR)
 - Export Processing Centre of the Ministry of Development, Industry and Trade (*Centro de Trámites de las Exportaciones*, CETREX-MIFIC)
 - Economic Crimes Division of the National Police Force (*División de Investigaciones Económicas de la Policía Nacional*, PN)
 - Nicaraguan Army
 - Local offices of MARENA.
 - CITES-Ni Management Authority.
 - Directorate-General of Customs (*Dirección General de Aduanas*, DGA).

In addition to the compiling of information, use was made, with the participation of policy implementers, manufacturing, wildlife and timber businesses and hunters, of tools designed for obtaining opinions and ideas from, and of interviews with actors at 11 points in the country.

Lastly, a consultation, results validation and feedback workshop was held with the actors in/those involved in wildlife harvesting and trade

Figure 1 below shows the various stages of analysis in the review of wildlife trade policy.

Figure 1. Stages of analysis



3.1 Data Collection

3.1.1 Collection of secondary data

Information on natural resources management and institutional powers in Nicaragua was collected through a review of the relevant legislation, including detailed study of all the legal provisions and rules having an influence on wildlife trade in the country. All of these rules were collected together and systematically examined.

The data sources were reports on the state of the environment in Nicaragua, as well as other official sources listed at the end of the present report that were used to provide information on legal and illegal species trade.

Use was also made of consultants' studies, academic research and press reports listed in the bibliography below.

The data collected included information on: wildlife production provided by producers; production costs; compliance with Nicaraguan technical standards (NTON); world market prices; income from activities; benefits for indigenous communities, and the environmental and social impacts of wildlife trade legislation.

3.1.2 Field study

Information gaps were filled by means of visits to the bodies having to do with wildlife permits, export and control.

Among the bodies visited and consulted at the central and local levels were: the CITES-Ni Management Authority, MARENA, CETREX; INAFOR, the mayoral offices in Puerto Cabezas, Siuna and Bluefields, and the natural resources secretariats of the governments of the Autonomous Regions of Atlántico Norte (RAAN) and Atlántico Sur (RAAS).

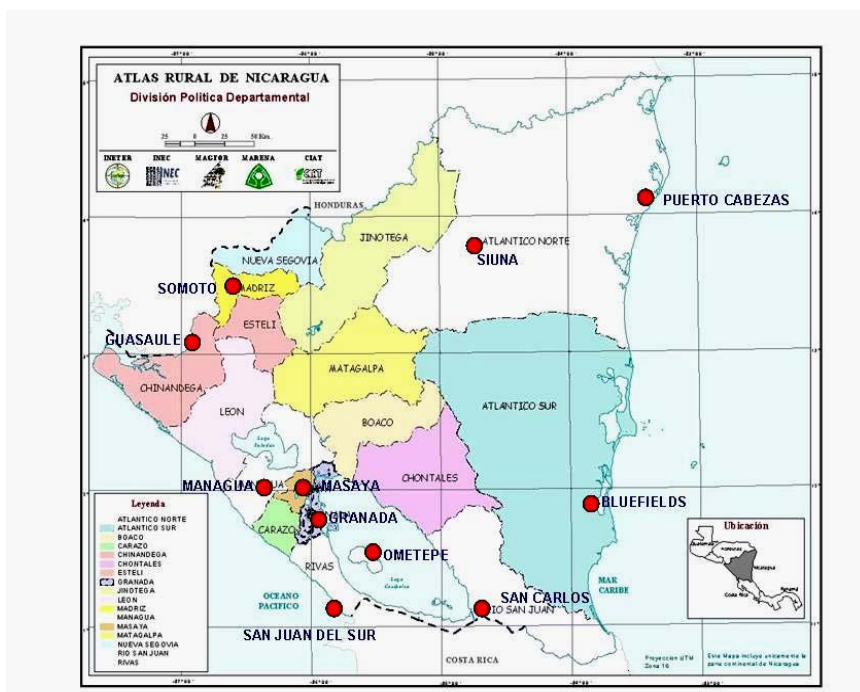
Information was also collected from the local offices of MARENA, from RAAN and RAAS and from the DGA, local representatives of the Office of the Environmental Prosecutor (*Procuraduría Ambiental*) and former CITES-Ni Management and Scientific Authorities.

The information on trafficking and environmental crime was collected from local offices of MARENA, the Office of the Environmental Prosecutor, mayoral offices, the National Police and the Army.

In all, visits were made to 11 places, including the departments of: Rivas (San Juan del Sur, Isla de Ometepe), Granada, Masaya, Managua, RAAS (Bluefields), RAAN (Puerto Cabezas y Siuna), and Río San Juan (San Carlos). Visits were also made to exporters in the forestry sector, wildlife farms, former fauna exporters, craft workers specialising in skin products, collectors, etc. (see Figure 2 below).

In RAAN and RAAS, the inquiries and interviews focused on hunters, community leaders, representatives of civil society and members of the National Police and the Army having to do with wildlife harvesting.

Figure 2. Places where field consultations took place (red dots).



Source: Sinia- MARENA (<http://www.sinia.net.ni/mapoteca/intro.htm>)

3.1.3 Data analysis

The state of flora and fauna, the implementation of policies, the situation regarding wildlife trade and the other issues covered in the study were examined on the basis of the supplementary information referred to in section 3.1 above.

The study also analysed the value chains for traded species and the application of legal instruments, with the identification of strengths and weaknesses.

The approach taken in analysing the data was participatory, drawing on the workshops held at the various stages of the process and the field activities. As a result, all the actors relevant to the legal framework for wildlife trade in Nicaragua were involved.

The figures, symbols, units of measurement and numerical expressions employed in this document are based on NTON 07004-01 (the national Metrological Standard on the International System of Units) and the recommendations of MIFIC for the proper use of the International System of Units.

IV. RESULTS

4.1 Description of the context

4.1.1. Country profile

4.1.1.1 Geographical position

Nicaragua lies in the central part of the Central American isthmus, between 10° and 15° 45' North and 79° 30' and 80° East. It is the largest republic in Central America, measuring 130,373.47 km². It is bordered on the north by Honduras, on the east by the Atlantic Ocean, on the south by Costa Rica and on the west by the Pacific Ocean. Its capital is Managua. See Figure 3 below (MARENA, 2007)

4.1.1.2 Climate

There are three climate zones in Nicaragua:

- A dry tropical zone comprising the Pacific plain to a height of 500 meters above sea level (masl), with precipitation of between 700 and 1,500 mm and an average annual temperature between 25°C and 30°C;
- A subtropical transition zone in the north and centre of the country between 500 and 1,500 masl, with precipitation of between 1,500 and 2,500 mm and an average annual temperature between 22°C and 27°C;
- A humid tropical zone comprising the Caribbean and Río San Juan Plains from 0 to 500 masl, with precipitation of between 2,500 and 5,000 mm and an average annual temperature of 30°C.

4.1.1.3 Biodiversity

While Nicaragua is famous for the great diversity of its flora and fauna, scientific knowledge about them is limited. Most of the research into animal species was undertaken over 40 years ago by foreign organizations, so that most of the information is also in the possession of foreign institutions.

According to Biodiversity in Nicaragua: A country study (MARENA, 1999), some 1,800

species of vertebrates and 14,000 species of invertebrates have been identified in Nicaragua. Regarding flora, the same report speaks of 6,500 species of vascular plants, including ferns, angiosperms and gymnosperms, with backup material in the National Herbarium at the Central American University.

There are no systematic records of the state of species affected by the advance of the farming frontier, ecosystem degradation and habitat destruction (MARENA, 1999). However, to counter the unsustainable harvesting of fauna and flora and in keeping with the mandate in the General Law on the Environment, MARENA has drawn up a list of threatened and endangered species and has established a closed period schedule. To ensure species preservation and in application of the precautionary principle, Nicaragua has taken measures to monitor and regulate wildlife harvesting.

The country currently has 72 protected areas. These account for 17 % of its territory (MARENA, 2007) and constitute an important ecosystem management tool.

The two largest bioreserves are the Río Indio Maíz reserve and the Bosawás Biosphere Reserve.

- The Río Indio Maíz reserve is in the southeast of the country, on the border with Costa Rica. Of particular note among its varied flora and fauna are CITES Appendix species, such as the jaguar (*Phantera onca*), the manatee (*Trichechus manatus*), *Caiman crocodilus chiapasius* and psittacines (*Ara* spp., *Amazona* spp., etc.) and more than 700 other species of bird.
- The Bosawás Biosphere Reserve in the north-east of the country, on the border with Honduras, is rich in wildlife and ecosystems typical of the country's humid zone.

4.1.1.4 State of the environment

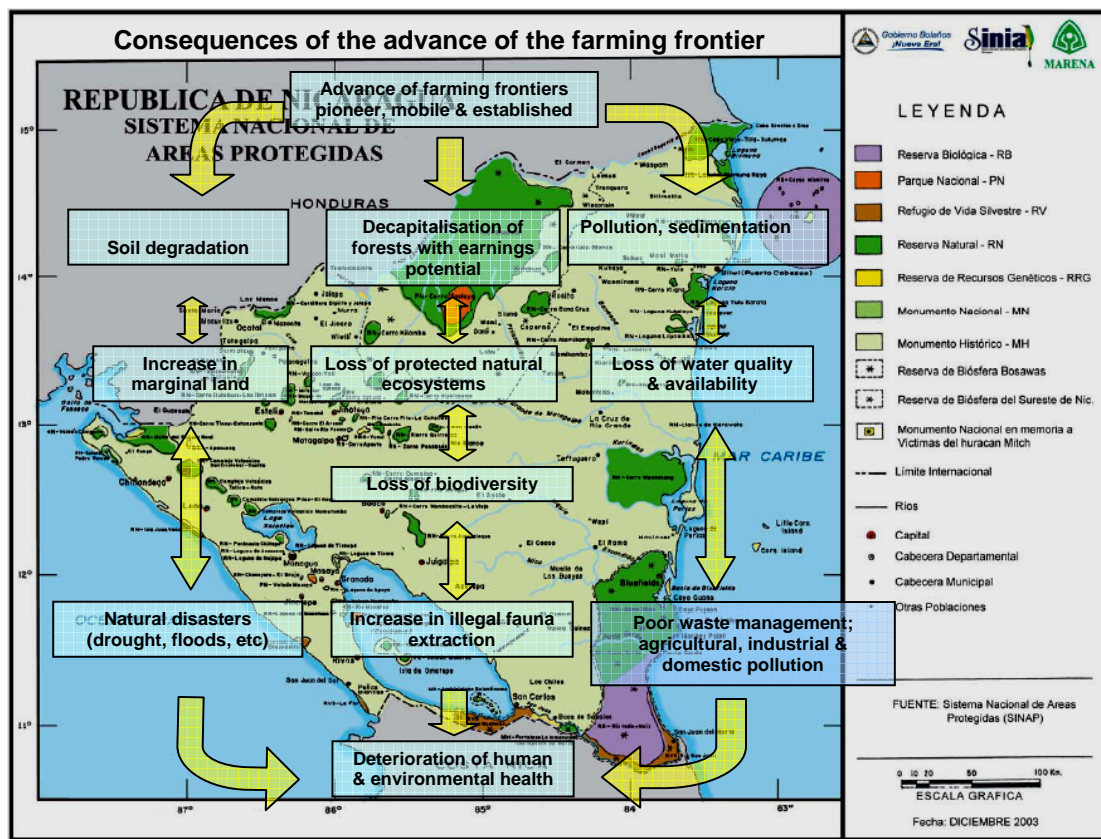
Nicaragua's economic development is still based on production systems that do not include a sustainable model. As a result, the potential for the supply of goods and services from the country's natural ecosystems is diminished by ecosystem degradation. Many sectors' strategies and policies incorporate the sustainability concept, but that has not yet reversed the trend towards the rapid degradation of natural resources.

Consequently, the most urgent environmental problems facing Nicaraguan society are:

- Decapitalization of forests and their conversion into unsustainable agricultural systems;
- Increase in the amount of marginal land with low agricultural and forestry productivity;
- Poor solid waste management and discharge of untreated wastewater in most municipalities;
- Shrinkage and fragmentation of protected areas, with consequent loss of their biodiversity and of ecosystems of key importance for the generation of environmental goods and services;

- Expansion of illegal wildlife extraction for the purposes of trade;
- Water shortages and reduced access to water;
- Deterioration of environmental and human health as a result of pollution from industrial, domestic and agricultural sources (MARENA, 2006).

Figure 3
Main environmental problems caused by the advance of the farming frontier



Source: SINIA-MARENA Atlas, updated from the GEO III report, (MARENA, 2007)

4.1.2 Socio-economic context

4.1.2.1 Population

Nicaragua's population numbers 5,142,098 people, of whom 50.7 % are females and 49.3 % males. Population growth is estimated at 1.7 % a year and population density is 47 persons per square kilometre (BCN, 2007).

4.1.2.2 Poverty

According to United Nations figures, 46.2% of the population, or 2.4 million people, are poor. Of this total, 1.7 million people (67.9 %) live in rural areas with a per capita income of less than USD 1.00 and are thus at the poverty line. An estimated 600,000 people live in extreme poverty, with incomes below USD 0.50. That is equivalent to saying that one in every ten people in Nicaragua is poor (United Nations, 2006).

Poor households, especially those classified as extremely poor, derive 62 % of their income from agriculture, either as wage earners (30 %) or as producers for personal consumption from their own land (32 %). Poor households not classified as living in extreme poverty are less dependent on agriculture since they derive part of their income from non-agricultural activities such as the production from wild flora and fauna of foodstuffs which they also sell to obtain other resources (MARENA, 2006).

Most rural dwellers are therefore dependent for their basic food security on agricultural productivity and forest products. The farming and forestry sector employs approximately 38% of the economically active population and generates 65 % of the country's exports. Farming activities use a total of almost one million ha, with products for internal consumption accounting for 80 % of the cultivated area (United Nations, 2006).

The poverty is a consequence of factors including a lack of income, which limits access to food, and a lack of capacity to produce for oneself and the wider population. Faced with the difficulty of obtaining funds to work in agriculture, rural dwellers opt for their survival for the harvesting of flora and fauna since they do not have to pay for their use (United Nations, 2006).

4.1.2.3 Health

The crude death rate per 1,000 live births is 5.2 and the infant mortality rate (deaths of children less than one year old per 1,000 live births) is 30.1. The maternal mortality rate is 115 per 100,000 live births (INEC, 2001; MINSAL, 2002; INEC, 2005).

4.1.2.4 Education

The illiteracy rate is 22 % and is linked to poverty: every second person living in poverty is illiterate. Of members of indigenous communities, only one in two completes primary education (MARENA, 2006).

The poor (46.2 % of the population) have an average of 2.2 years of education; the non-poor have 5.5 years of education and the illiteracy rate among people over 10 years of age is 20.5 % (United Nations, 2006).

4.1.2.5 Employment

According to figures from the annual employment survey, made in November, the economically active population numbers 2,204,300, or 42.8 % of the overall population of 5,142,098. A total of 2,089,800 people have jobs and the unemployment rate is 5.2 % (BCN, 2007).

In the period 2003-2006, the main areas of employment were: the agricultural sector; trade; social, communal and personal services, and manufacturing industry. Together they accounted for more than 80 % of all employment.

4.1.2.6 Gross domestic product

For 2006, the BCN reported real GDP growth as 3.7 % and nominal per capita GDP as USD 958.60, the lowest in Central America. For the same year it recorded the principal contributors to GDP as being crop farming, livestock farming, fishing and silviculture. It made no mention of the contribution of wildlife trade, which perhaps indicates this activity's lack of importance for communities' economies and as an alternative means of local economic development.

Nicaragua's main export products are: coffee, USD 200.7 million; meat, USD 147 million; dairy products, USD 63 million; sugar, USD 58.4 million; gold, USD 55.3 million; shrimps, USD 47.5 million; peanuts, USD 42.5 million, and cattle on the hoof, USD 39.1 million.

4.1.3.-Wild flora and fauna trade

4.1.3.1 Nature of the trade

Wildlife trade in Nicaragua dates back to colonial times. Despite the paucity of records, laws to regulate it can be said to have existed since the late 19th century.

Wildlife has been used in various ways that persist today and are described below.

- **Subsistence hunting and food source.** As a source of dietary protein, wildlife is one of the main food options for poor rural dwellers. It is, in addition, the sole source of animal protein for the indigenous communities in the Autonomous Regions and the other parts of the country where indigenous communities still exist. It should be noted that on the Caribbean coast, and particularly in the RAAN, there is an ancestral custom of using the green turtle (*Chelonias mydas*) for food.
- **Sport hunting.** Sport hunters also derive benefits from cynegetic species as food, hunting trophies, bush meat for sale in local markets, material for the making of finished products by leather workers or taxidermists and, especially in the case of birds, as pets. Subsistence and sport hunters' preferred species are peccaries (*Tayassu pecari*, *T. tajacu*), deer (*Odocoileus virginianus*) and the paca (*Cuniculus paca*).

- **Medicinal and cultural use.** The indigenous communities in the Autonomous Regions and elsewhere in the country and other members of the rural population are very knowledgeable about the use of wildlife in alternative medicine. The substances used include: nine-banded armadillo (*Dasypus novemcinctus*) oil for respiratory infections, rattlesnake (*Crotalus durissus*) oil for arthritic pain, *Caiman crocodilus chiapasius* musk for earache, etc.

Cultural use includes the keeping of animals as domestic pets to provide company for children and adults. The harvesting of species with cynegetic value to feed pets or for sale in local markets is also common.

- **Commercial use.** Fauna has become an important source of income for many households, especially in rural areas, where there are few other employment opportunities and the poverty rate is 46.2 %. In the Atlantic coastal area, especially at Puerto Cabezas and Bluefields, fishermen engage in commercial harvesting of *Strombus gigas*.

Wildlife trade benefits those links in the chain that have the greatest purchasing power, such as the traders in wildlife products and exporters.

Another service that wildlife provides is as a source of scientific samples for university collections.

It should be noted that the value placed on wild flora and fauna/view of wild flora and fauna in Nicaragua as an important economic resource for many people takes no account of the ecosystems on which the species depend.

4.1.3.2 Present-day wildlife trade

In the past few decades, wildlife trade has become an important source of income for many Nicaraguan households, particularly in rural areas.

In 1986, Nicaragua opened the way for the commercial export of fauna on the basis of sustainability criteria or minimum export quotas. A firm known as Cofradía was set up under the auspices of IRENA to export species of fauna intended for international trade. IRENA used the firm's profits to strengthen the national flora and fauna inspectorates and the firm's operations. In other words, IRENA set up a sort of independently managed enterprise to subsidise its own operations as the sole beneficiary of the harvesting and sale of fauna.

In mid-1989, IRENA signed agreements with new private fauna exporting companies transferring to them the quotas allotted to Cofradía. The agreements specified that pilot projects for the captive breeding of wildlife species would be started using the companies' profits.

Following the ending in 2004 of the wild (W) quotas for species in Appendices II and III (birds, reptiles and amphibians), only *Caiman crocodilus chiapasius* is currently subject to a precautionary national quota of 1,500 skins a year. This precautionary quota was established following the cancellation of the quota allotted to the REPTINIC company and is reserved for

local craft workers.

On the Caribbean coast there is commercial harvesting of species such as macaws, parrots; toucans, chachalacas and parakeets. They are not currently subject to a harvesting quota; and are sold on the local market.

Wildlife trade in the country's central and Pacific regions differs from that on the Caribbean coast. The species traded are: macaws and parakeets (Psittacidae), toucans (Ramphastidae) and some reptiles (Boidae, Iguanidae). People buy animals to eat and as pets. Consequently, live animals continue to be offered for sale on the local markets. That is the case of a terrapin; the common slider (*Trachemys scripta*), the black iguana (*Ctenosaura similis*) and the green iguana (*Iguana iguana*), which are part of Nicaragua's cultural traditions.

Handicrafts trade in CITES species, including *Caiman crocodilus chiapasius*, the hawksbill turtle (*Eretmochelys imbricata*), *Strombus gigas* and black coral (*Antipatharia* spp.), is another aspect of harvesting. Fauna products such as luxury goods (belts, wallets, cigar cases, etc) and taxidermy specimens are mainly sold on the markets in Managua (e.g., the Roberto Huembes Market) and the municipal market in Masaya.

4.1.3.2.1 Legal trade

In Nicaragua, the body responsible for issuing CITES wildlife export permits is the CITES-Ni office within MARENA. Until 2004, the species of fauna marketed and exported through this office included animals taken in the wild and a few captive-bred species, especially amphibians and reptiles. Since 2004, they have mainly been species bred in captivity according to the requirements of Nicaraguan Mandatory Technical Standard NTON 05 020 02.

Exports continue of live reptiles (boas, iguanas, lizards and basilisks) as well as of products made from the skins of *Caiman crocodilus chiapasius*, boa constrictors and toads. The exported live fauna come from farms, while the *Caiman crocodilus chiapasius* skins for use in finished products come from the wild under a national harvesting quota set by CITES-Ni. The countries that import live animals and finished products include Belgium, Canada, France, the Netherlands, Spain, the United States of America and others.

Table 1 below shows the main species that are legally traded.

Table 1
Main internationally traded captive-bred species

Species	Company									
	CIPA	EXFAUSA	NATUANEX	RANICA	BIO-EXPORT	FAUMARNICA	EXANNIC, S.A.	MICOHERP, S.A.	FUNDEVERDE	COMPROVISSA
<i>Boa constrictor</i>	X	X		X		X	X	X		
<i>Lampropeltis triangulum</i>				X	X	X				
<i>Basiliscus plumifrons</i>				X		X	X			
<i>Sceloporus variabilis</i>				X						
<i>Ameiva</i> spp.				X						
<i>Cnemidoporus depii</i>				X						
<i>Coleonyx mitratus</i>				X		X				
<i>Ctenosaura quinquecarinata</i>				X		X				
<i>Sceloporus malachiticus</i>				X		X				
<i>Iguana iguana</i>						X			X	
<i>Rhinoclemmys</i> spp.	X			X		X				
<i>Agalychnis callidryas</i>		X	X		X		X	X		X
<i>Trachemys scripta</i>										X

Source: CITES-Ni 2007

The table lists 10 companies that currently engage in captive breeding. Between them they manage 13 species. It should be noted that RANICA manages the largest number of species (10), whereas FUNDEVERDE and COMPROVISSA manage only one each. That is a reflection of the fact that most of the companies operate on a small scale.

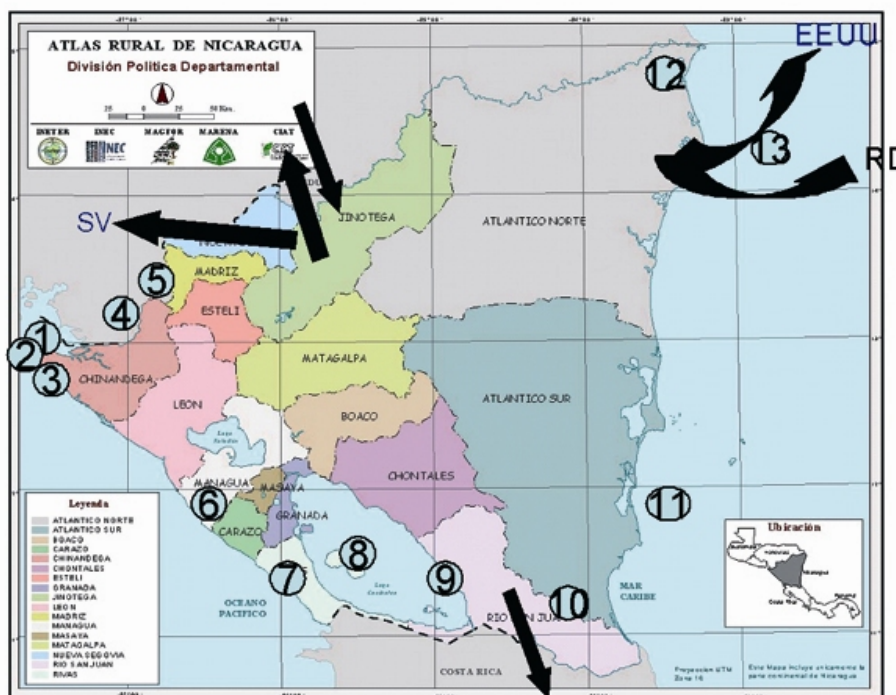
4.1.3.2.2 Illegal trade

Illegal fauna trade goes on alongside its legal counterpart and is supplied, particularly as regards CITES Appendix species, by the same registered collectors as work for the companies.

The main CITES species harvested for illegal trade are: macaws (*Ara* spp.), the yellow-naped Amazon parrot (*Amazona auropalliata*), the green basilisk (*Basiliscus plumifrons*), the green iguana (*Iguana iguana*), the two-toed sloth (*Choloepus hoffmanni*), monkeys of the Cebidae family, and eggs of the Olive Ridley turtle (*Lepidochelys olivacea*) (Gutiérrez y Gómez, 1996).

Among the non-CITES species are the pustulose ark (*Anadara tuberculosa*) and eggs of the shrimps *Litopeneus vannamei* and *L. stillostris*. Table 4 below shows the wildlife trafficking routes from Nicaragua.

Figure 4 Routes of illegal wild flora and fauna trade



No.	Localidad de salida	Destino de las especies
1.	Punta de San José (NI)	Cedeño, San Lorenzo (HN), La Unión(SV)
2.	Cosiguina, El Chorro (NI)	Cedeño, San Lorenzo (HN), La Unión(SV)
3.	Jiquillillo, Padre Ramos (NI)	Cedeño, San Lorenzo (HN), La Unión (SV)
4.	Palo Grande (NI)	El Triunfo (HN)
5.	El Guasaule y puntos ciegos (NI) (La Bocana, El Pilón, La Reforma, El Siete)	Choluteca (HN)
6.	R.V.S. Río Escalante-Chacocente	La Unión (SV)
7.	R.V.S. La Flor	El Naranjo (CR)
8.	Sapoa-Cardenas	
9.	Lago Cocibolca y Ríos tributarios	Caño Negro (CR)
10.	Río San Juan (NI)	Barra de Colorado (CR)
11.	Punta Gorda (NI)	Barra de Colorado (CR)
12.	Bismuna (NI)	(HN)
13.	Cayos Mismitos, Kayos Perla (NI)	Isla Laguna de Barata (HN)

(Localidad de salida = Exit point; Destino de las especies = Destination)

The most significant places in the case of eggs of *Lepidochelys olivacea* are the Río Escalante-Chacocente Wildlife Sanctuary and La Flor.

In southern Nicaragua, the most significant exit points for illegal fauna trade are Sapoá-Cárdenas (8) and rivers in the south of Lake Nicaragua (9) and the traffic concerns mostly parrots and *Caiman crocodilus chiapasius* skins. At places along the banks of the Río San Juan (10), the species most affected by trafficking are the scarlet macaw (*Ara macao*), *Caiman crocodilus chiapasius*, and *Swietenia macrophylla* and other species of crop tree.

Camacho (1980) reports the points of exit from the country for trafficking in *Caiman crocodilus chiapasius* skins to be Punta Gorda (11) y Bismuna (12) and the destinations to be Barra del Colorado (Costa Rica) and the Pieltro processing plant on an island in Karatá Lagoon (Honduras).

Other trafficking points are Palo Grande (4), Guasaule (5) and unmanned border crossings near them such as La Bocana, El Pilón, La Reforma and El Siete. The species most frequently trafficked through these points are parrots (Psittacidae) and iguanas (*Iguanidae*).

According to Morales (1891), the Republic of El Salvador exported in one year alone, mainly to Italy and Germany: 7,881 skins, 180 flanks and 2,967 skin products (shoes, bags, belts and wallets) from *caiman crocodilus chiapasius*. It can be concluded from earlier data that during the period in which exports were prohibited under Decree No. 625 illegal trade increased in Nicaragua, with an adverse impact on the caiman population.

People from La Concepción in the department of Masaya trade on an *ad hoc* basis, especially at road junctions in Managua. The illegal traders mostly buy their specimens for sale at Managua's Mercado Oriental (Eastern Market). Some country people come directly from extraction areas to sell one or two specimens on the fringes of markets in the departments of Chinandega and Granada, at Managua's Mercado Mayoreo (Wholesale Market) and Mercado Central (Central Market) and at the bus station in León.

In Nicaragua, indigenous people such as the Mayagnas, the Miskitos and the Ramas, harvest some CITES species as an ancestral custom for their own consumption and for trade. Exploitation of the turtle population has reduced it to an alarming condition.

Turtle eggs and meat are part of the traditional diet of almost the entire population of the Caribbean part of Nicaragua and there are a number of delicious dishes typical of the area.

The coastal indigenous communities have the right under Law No. 28 to hunt turtles within their territory for their own consumption. However, outsiders often come to the indigenous areas to hunt or the indigenous populations sell turtles themselves to obtain money.

Other very serious problems are: fishing nets, in which large numbers of turtles become trapped and so drown; the destruction of turtles' habitat, and the use of turtles for their products: tortoiseshell (used in the making of numerous craft products and much sought after), oil, calipee (cartilage), skin, carapace and other curios.

Nicaragua has marine turtle management and conservation programmes. The Government has put most emphasis on *Lepidochelys olivacea* in order to maintain their presence on the beaches of the Pacific coast.

On the Caribbean coast, the problem is more acute because culturally turtle meat is a prized dish. Organizations like the Wildlife Conservation Society (WCS) work to protect turtles in danger of extinction.

WCS, in partnership with MARENA, has a programme covering research and monitoring of turtle fishing and nesting, environmental education, training, community participation and conservation. The turtles concerned include the green turtle (*Chelonia mydas*) and the hawksbill turtle (*Eretmochelys imbricata*) (González, 2001).

Eretmochelys imbricata has traditionally been exploited on Nicaragua's Caribbean coast, especially for its carapace, and even though there is no record of significant domestic trade in hawksbill products, buying and selling of a variety of articles are known to occur. A hawksbill carapace weighs between 0.75 and 1.5 kg, with an average of 1 kg, and comprises 13 scutes (Groombridge y Luxmoore, 1989).

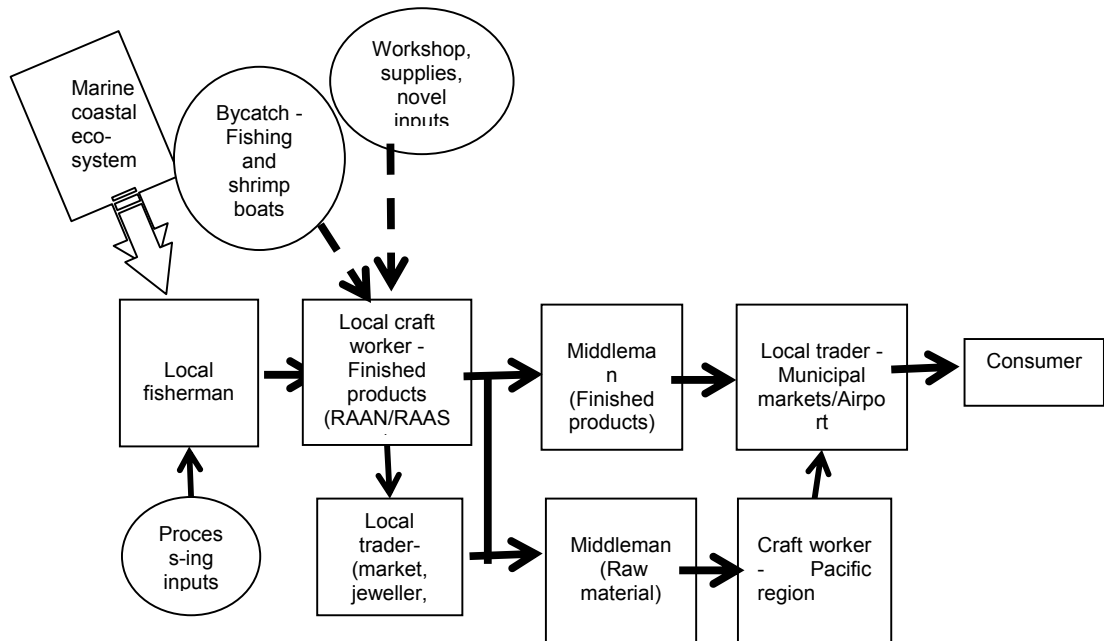
The measures taken by the Government (indefinite national moratoria, technical standards for fishing gear and, as with WCS, conclusion of international agreements on turtle conservation and protection) have helped to reduce local trafficking to craft workers, in particular residents of Managua. On the Caribbean coast, however, the harvesting and sale of *Eretmochelys imbricata* carapaces are still common.

There follows a description of the income chain, from the fisherman to the end-consumer, for the illegal trade in *Eretmochelys imbricate*. The information was obtained during field visits.

- ✚ **Local fishermen** catch turtles for home consumption, sell part of the meat, and sell the carapaces to local craft workers. Carapaces are sold to craft workers in Bluefields and Puerto Cabezas at a price of USD 10,00;
- ✚ **Bycatch** is taken by fishing boats, especially shrimp trawlers. Turtles taken as bycatch are sold to local craft workers;
- ✚ **Local craft workers** process turtles and sell finished products directly to local traders within RAAN and RAAS and to middlemen dealing in finished products and raw material;
- ✚ **Middlemen for finished products** buy finished products from local craft workers and sell them to local traders;
- ✚ **Middlemen for raw material** buy raw material from local craft workers and traders within RAAN and RAAS and sell it to craft workers in the Pacific coastal region. The latter sell it on municipal markets and at sales points in Managua's Augusto C. Sandino International Airport.

- Local traders sell products to the end-consumer at shops in the markets of Managua and Masaya and at the Augusto C. Sandino International Airport, where the consumer pays between USD 8.00 and USD 10.00 per item.

Figure 5 Pattern of illegal trade in *Eretmochelys imbricata*



Source: Our conclusions from interviews, 2007

4.1.3.2.3.- Volumes of wildlife exports

Table 2 below shows the volume changes in wildlife exports over the period 1996-2006. It will be seen that the exports come from wild quotas (W) and captive-breeding quotas (C).

Reptiles were the most heavily exported (694,432 specimens), followed by amphibians (222,376 specimens), birds (47,147 specimens) and arachnids (41,568 specimens). Insects (75 specimens) were the least frequently exported taxonomic groups. In 2008, only captive-bred (C) reptiles and amphibians were exported. In 2004, wild quotas (W) were suspended for the traded groups other than *Caiman crocodilus chiapasius*, which is subject to a precautionary W quota.

Table 2. Exports of live specimens (units), 1996-2006

Year	Mammals		Birds	Reptiles		Amphibians		Arachnids		Insects
	W	C	W	W	C	W	C	W	C	W
1996	19	0	8 449	33 536	61 267	4 102	36 023	6 338	0	0
1997	307	0	8 142	13 617	60 313	4 230	16 544	5 495	0	0
1998	117	2	6 997	11 944	63 460	3 649	10 338	3 931	25	0
1999	117	2	6 646	11 751	61 210	8 934	14 703	6 763	0	0
2000	NO DATA									
2001	0	10	5 932	3 876	84 594	1 830	20 558	6 673	0	0
2002	0	13	5 406	11 190	71 509	745	20 685	8 183	0	71
2003	3	20	3 310	13 785	62 058	100	22 664	4 170	0	0
2004	0	13	1 581	7 146	59 908	0	21 345	0	0	4
Subtotal 1	563	69	46 463	106 845	524 319	23 599	162 860	41 543	25	74
Total W+C	632		46 463	631 164		186 459		41 568		75
2005*	0	0	617	0	36 954	0	17 823	0	0	0
2006*	0	0	67	0	26 314	0	18 094	0	0	0
Subtotal 2	0	0	684	0	63 268	0	35 917	0	0	0
Total C	0	0	684	0	63 268	0	35 917	0	0	0
Grand total	632		47 147	694 432		222 376		41 568		75

W: taken from the wild; C: captive-bred

Source: CITES-Ni/ * Data in GEO III report 2003-2006

4.1.3.2.4 Main extraction zones

CITES records and maps of wildlife-collection points show the identified wildlife extraction zones in Nicaragua to be in RAAS and RAAN. Extraction occurs in other areas too, such as Río San Juan, but it is illegal.

4.1.3.3 Wild flora trade (forest resources)

Until 2001, Nicaragua's forests were traditionally managed, i.e., without incentives for the creation of added value, without the application in practice of any kind of policy for sustainable harvesting and without guidelines to support sustainable international trade in the main tree species: *Swietenia macrophylla*, West Indian cedar (*Cedrela odorata*) and Nicaraguan pine (*Pinus caribaea* var. *hondurensis*]. (NICAMBIENTAL – ODI, 2002).

A forest policy aiming at sustainable development of the forest sector was drawn up in 2001. The Forest Sector Conservation, Promotion and Development Act (*Ley de Conservación, Fomento y Desarrollo Sostenible del Sector Forestal*) came into force in 2003.

There was no sign of any kind of restriction on the exploitation, trade or harvesting of crop trees following Nicaragua's ratification of CITES in 1977. That is perhaps due to the fact that there were few crop trees in the CITES Appendices in 1990. *Swietenia macrophylla* was not included in CITES Appendix III until the mid-90s (Johnson, 2007).

Growth in the Nicaraguan timber trade has been very rapid, necessitating regulatory measures to prevent greater impacts on forest ecosystems and their environmental services. Forest degradation and the advance of the farming frontier have led the State to create legal instruments needed for a forest policy.

Timber trading generates high profits for everyone involved in the trade chain. That has given rise to illegal domestic and export trade, principally in large quantities of *Swietenia macrophylla*. For that reason, Executive Decree No. 30-97 prohibiting the exploitation and export of *Swietenia macrophylla* and *Cedrela odorata* was issued in 1997.

The ban, however, failed to have the desired effect. The owner-manager of the firm "Maderas Preciosas de Nicaragua" (MAPRENIC, Valuable Timber of Nicaragua) said, in statements to the Communication Research Centre (CINCO) and the Centre for International Policies (CIP), that the amount of timber from these two species that left the country during the first year of the ban was five times the annual average.

The illegal traffic in *Swietenia macrophylla* and other crop trees is more complex than that in wild fauna since the flow is from one country to another and vice versa, with the cross-border movement helping to hide the illegality (Del Gatto *et al.*). One example is the tendency for pine to be trafficked from Honduras to Nicaragua, from where, after being legalized by timber dealers, it is exported back to Honduras.

Illegal logging is one of the main subjects of concern in the forest sector. It is estimated that it may be equivalent to 60 % of the volume of logging registered by INAFOR. For the year 2000, INAFOR authorized the harvesting of 56,100 m³ of roundwood, but exports amounted to 70,392 m³ of sawnwood. That is clearly a reflection of the size of the problem of illegal logging, since achieving that level of exports must have required some 140,784 m³ of roundwood (Guevara, M. 2004). The fact that exports exceed the authorized level is proof of the existence of illegal trafficking.

A recent study financed by the World Bank suggests that illegal logging in Nicaragua concerns between 30,000 and 35,000 m³ of broadleaved timber and between 110,000 and 135,000 m³ of coniferous timber. It also estimates the tax loss to the Government from the illegal logging at between USD 4 and 8 million per year in terms of discounted net current value and the total loss at between USD 30 and 60 million (CINCO and CIP, 2006).

4.1.3.3.1 Exports of forest resources

According to the country's third State of the Environment Report 2003-2006, sawnwood exports in the period 2002-2006 were of the order of 28,339.0503 m³ of *Swietenia macrophylla* and 1,755.370 m³ of *Cedrela odorata*. The pattern of exports can be seen from table 3 below.

Table 3. Timber exports (m³), 2002-2006

Year	<i>Swietenia macrophylla</i>	<i>Cedrela odorata</i>	Old man's beard (Lbs)
2002	7 199.8284	-	-
2003	7 211.6143	1.084.710	25
2004	5 271.6287	37.585	-
2005	7 011.6282	29.481	-
2006	1 644.3507	-	-
Totals	28 339.0503	1 151.776	25

Source: DGCMA-MARENA in GEO III report 2003-2006

It should be noted that, because of the problem of illegal trafficking of big-leaf mahogany, the Government promulgated on 7 June 2006 Law No. 585, the Cutting, Harvesting and Sale of Forest Resources (Prohibition) Act (*Ley de Veda para el Corte, aprovechamiento y comercialización del recurso forestal*), with the aim of putting an end to the disorderly use of Nicaragua's forests.

4.1.4 Wildlife trade value chain

4.1.4.1 Value chain for *Caiman crocodilus chiapasius*

Harvesting of *Caiman crocodilus chiapasius* -- solely for domestic processing and the manufacture of skin products -- was permitted from 1979 to 1982, but a size limit of 4.5 feet or more overall length per specimen was set in 1981. This change caused annoyance among hunters and collectors, who disagreed with it, but it reduced the potential for the hunting of adults considered as potential reproducers.

Current situation

The regulations implemented by the Government in 2007, together with population studies, have led to the quota for *Caiman crocodilus chiapasius* being reduced to a "precautionary quota" of 1,500 skins with a minimum length of 4 feet (NTON 05 011–01).

Income distribution

Field study has shown that hunters capture an average of 8 specimens of *Caiman crocodilus chiapasius* of overall length 4-5 feet per night. This represents a gross income of 1,000 córdobas (NIO) (USD 52.00) per night, from which must be deducted the operating costs of around NIO 300 (USD 16.00), leaving the hunter with net earnings of 700 córdobas (USD 36.00) per night. The precise amount depends on supply and demand, meaning that how well a hunter eats is dependent on product sales.

Field study also showed that the prices at which collectors sell skins to leather workers currently range from USD 15.00 for skins less than 5 feet long to USD 30.00-35.00 for skins of 5 feet.

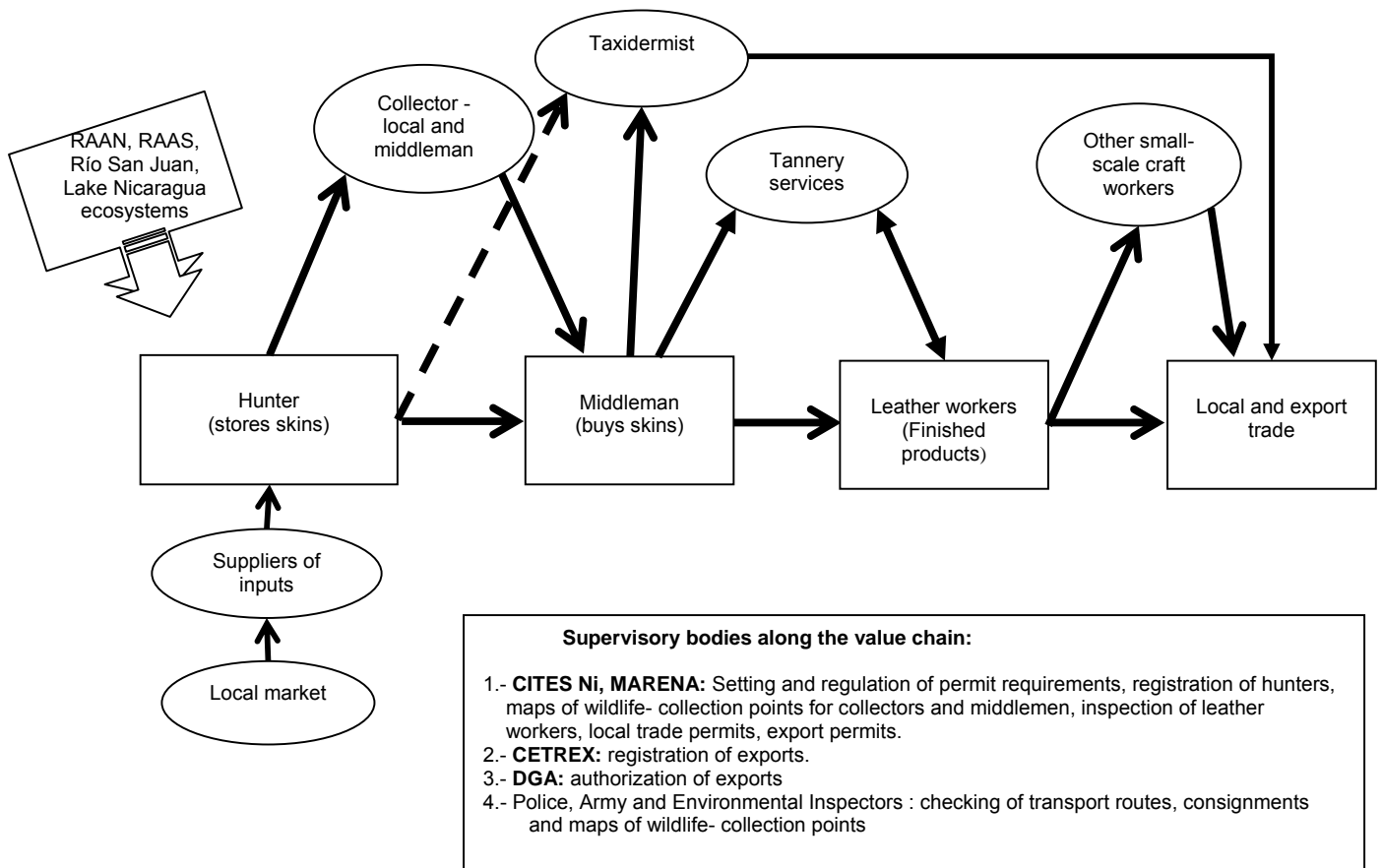
Leather workers claim that, despite the increase in the value of skins, they cannot make a profit because of the high costs of the inputs needed to make the final product. This has forced them to diversify their activities and, in some cases, to close down their businesses.

There follows a description of the value chain or economic flow from the hunter to the end-consumer:

- ✚ **Hunters** sell directly to middlemen, local collectors or taxidermists. The selling price for a skin varies between USD 5.00 and USD 8.00;
- ✚ **Middlemen** sell to leather workers and saddlers at prices of USD 15.00 -30.00 for skins less than 5 feet long and USD 35.00 for skins of 5 feet;
- ✚ **Leather workers** process skins and sell the finished products directly to customers abroad or to local shops in the three main handicrafts markets of the country's Pacific region: Managua's Central or Roberto Huembes Market and the handicrafts markets and municipal market in Masaya;
- ✚ **Small-scale craft workers** carry out processing and sell articles to local traders. Their principal raw materials are offcuts unused by, or skins they purchase from leather workers;
- ✚ **Local shops** sell finished products to the public.

See Figure 6, Value chain for *Caiman crocodilus chiapasius*, below.

Fig. 6 Value chain for *Caiman crocodilus chiapasius*



Source: Interviews, 2007

4.1.4.2 Value chain for *Strombus gigas*

A *Strombus gigas* fishery exists in Nicaragua as an alternative to fishing for the Caribbean spiny lobster (*Panulirus argus*). It became commercially very important in the late 1990s and official landing and export statistics have been kept since 1997.

Because the quantities taken prior to 1997 were low, catches were recorded in the country's overall fishing statistics in the "Other species" category. Landings and exports of *Strombus gigas* began to rise in the late 1990s and ADPESCA has kept dedicated statistics for them since 1997.

The legal framework for harvesting of *Strombus gigas* is set out in Ministerial Agreement No. 407-05 issued by MIFIC on 14 April 2005. This provides for the following management measures:

- Total ban on harvesting of the species *Strombus gigas* during the period from 1 June to 30 September inclusive in 2005 and 2006;

- A minimum legal size for the capture, processing, storage and export of *Strombus gigas*, namely a siphonal length of at least 200 mm as measured from the apex of the spire to the end of the siphonal canal, together with a lip thickness of at least 9.5 mm as measured at the thickest point of the lip;
- A requirement that all conches be landed intact, with the flesh adhering to the inside of the shell;
- Ministerial Resolution No. 037-2005 lays down the administrative procedure for obtaining permits for the export of *Strombus gigas*.

Industrial fishing for *Strombus gigas* is practised by divers working on lobster boats, backed up by small outboard-motor boats (pangas) and dugouts that go to the fishing areas every day. Most of those involved belong to the indigenous communities, the divers and the fishermen being the same people who engage in fishing for the spiny lobster (*P. argus*) and marine corals.

The lobster boats go out twice a month for an average of 12 days at a time. They carry one or two compressors and some 150 compressed air bottles that are normally filled with 2,500 pounds of air. Each diver makes an average of nine dives a day.

The artisanal fishermen stay in the fishing areas close to the other boats and generally return home each evening. Other fishermen stay in the area for six days a week. (Barnutty N. Renaldy, 2006).

Industrial lobster boats used for conch fishing can carry 64 people, of whom 26 are divers, 26 their helpers in the dugout canoes from which they dive and 12 crew members, in keeping with Law No. 489, the Fishing and Aquaculture Act (*Ley de Pesca y Acuicultura*).

The fishing team works under contract to the boat owner, delivering the catch to the boat, where it is semi-processed, in contravention of Ministerial Agreement No. 407-05, which states that " all conches must be landed intact with the flesh adhering to the inside of the shell".

Artisanal fishermen sell their catch to the larger boats, which function as collection centres (industrial boats). In some cases, they sell their catch to processing plants on land

Income distribution

The description covers the value chain from the fishermen to the end-consumer. To determine the operation of the chain, use was made of information collected during field visits.

The process is described using as the example the ATLANOR-INVERNIC company, which works by purchasing the services of three industrial fishing vessels that are used by artisanal fishermen. The company provides the vessel owners with initial funding estimated at USD 10,000.00 per vessel for each fishing campaign. This covers wage advances for the crew, operating expenses, and the pay of the divers and their helpers on the basis of the catch per head.

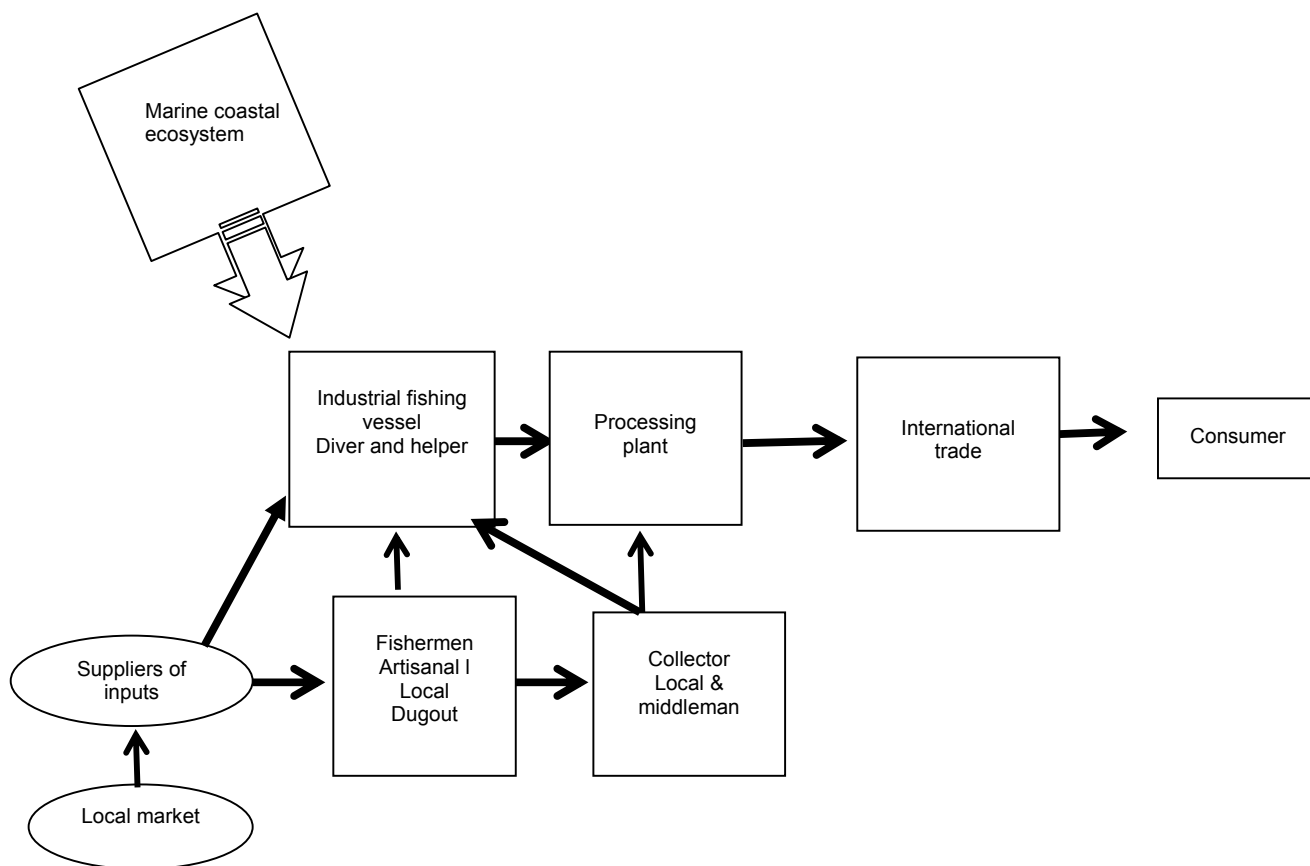
Processing plants employ workers on temporary contracts whose length depends on the fishing period. As a rule, 50 people are employed on cleaning, filleting and packing and 20 on administrative tasks. No information was obtained on their rates of pay.

ATLANOR-INVERNIC is the principal beneficiary of this activity. Next comes the owner of the fleet or vessel. It is he who, together with the captain, hires the crew and the divers and their helpers. At the end of the fishing campaign, the vessel owner pays the company with the catch.

Divers and their helpers are paid and share equitably USD 1.25 per pound (454 g). The artisanal fishermen are also paid at this rate per pound delivered, either to the boat or to the processing plant.

Because of their reluctance to be interviewed, no more detailed information could be obtained on the financial returns to the links in the chain (vessel owners, captains, crew, divers and helpers).

Figure 7 Value chain for *Strombus gigas*



Source: Our conclusions from interviews, 2007

4.1.4.3 Value chain for *Swietenia macrophylla*

Current situation

There are many closely connected participants in the *Swietenia macrophylla* marketing process: owners of forests (communal or private), timber merchants, field workers (chain-saw operators, road-builders, skidders, loaders), hauliers, mayoral offices, regional governments, INAFOR (the regulatory authority), the National Police, etc.

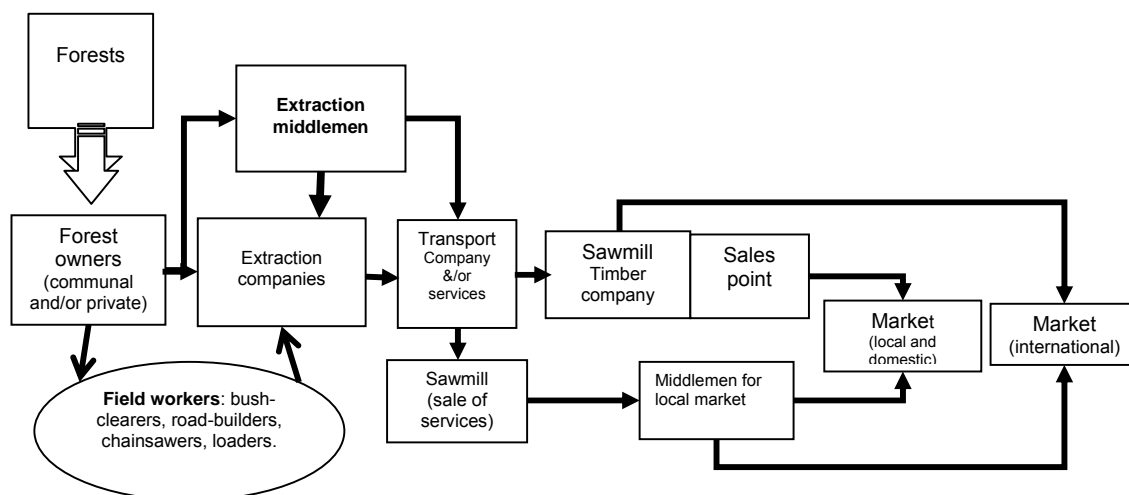
Income distribution

The value chain described below, running from the forest owner to the market, has been constructed from the results of the field visits and interviews with actors in the chain:

- ✚ **Forest owners** sell trees and cede forest rights to middlemen or timber companies. Forest owners include indigenous communities, indigenous forestry cooperatives, communal leaders (*síndicos*, whose responsibilities include natural resource use, and communal judges), and private owners of forest land (farmers);
- ✚ **Timber extraction companies** exploit forests through the purchase of trees and the cession of forest rights; extract, transport and sell timber;
- ✚ **Extraction middlemen** buy felled timber from forest owners or timber extractors; do not necessarily have a connection with forestry;
- ✚ **Transport.** This activity comprises the hiring of the services of vehicles belonging to a middleman, the owner of a timber extraction company or a private haulier;
- ✚ **Sawmills** provide sawing services or buy roundwood which they then process and sell. The sawmills in Nicaragua are generally owned by the export companies;
- ✚ **Timber export companies (merchants and/or processors)** buy timber from forest owners and sell it. Depending on the quality, the timber goes to the local or the international market (United States of America, the Dominican Republic, Cuba, Germany);
- ✚ **Sales points** sell timber on the local and domestic markets. Sell *Swietenia macrophylla* of medium quality and whitewood.

Figure 8 below is a simplified diagram of the value chain for *Swietenia macrophylla*.

Figure 8 Value chain for *Swietenia macrophylla*



Source: Our conclusions from interviews, 2007

Income analysis for the timber trade

The extraction of *Swietenia macrophylla* entails the harvesting of other forest species; prices are set by negotiation. The table below shows prices and earnings for the harvesting and sale of *Swietenia macrophylla*.

Figure 4. Income from redwood at the various levels of the chain (price per cubic metre, August-November 2002)

Indicator	Price to forest owner	Preparation of Annual Operating Plan	Extraction team						Sawing	Taxes			Other costs and brokerage margins	Value exported or price FOB
			Felling	Skidding	Loading/un-loading	Transport				INAFOR	Mayoral office	D.G.I.* (7.5 %)		
						Mountain landing	All-weather landing	Sawmill						
US \$	11.4	1	0.59	29.2	14	29.2	14	12	43.8	14.8	13.05	45.16	373	602.13
%	1.89	0.2	0.098	4.85	2.32	4.85	2.32	1.99	7.27	2.46	2.17	7.5	62.1	100

Source: Tomado de Álvarez, V., Martínez, S. and Y. Escobar. (2005).

*D.G.I. - Directorate-General of Revenues

4.1. 5 Reasons for trade

There are a number of socio-economic and cultural factors behind legal and illegal wildlife trade in Nicaragua. Those that stand out are the lack of economic alternatives, the policy measures that have been taken, poverty and cultural customs and beliefs.

- a- **Lack of economic alternatives.** Alternative sources of income are particularly scarce in marginal rural areas, in zones with limited potential, and where there is subsistence agriculture and an absence of financial support for production by small farmers. Having no economic alternatives or sources of funding, a high percentage of poor rural people dependent on agriculture diversify into non-farming activities such as the sale of local resources. For example, loggers buy species of forest flora from peasants or owners of the resource or extract wild fauna of commercial interest.
- b- **Poverty.** Poverty is another factor behind the harvesting and sale of wildlife. Its causes include a shortage of income; that limits access to food, which in turn affects children's physical and mental development and people's capacity to produce and generate income for themselves and the country as a whole. In those circumstances, illegal hunting is an alternative livelihood.
- c- **Cultural customs and beliefs.** Part of the trade in local wildlife is attributable to the keeping of pets, the eating of the flesh of species reputed to have aphrodisiac properties that will increase the consumer's sexual potency, and the custom of eating green turtles, which are considered a delicacy in indigenous communities.
- d- **Policy measures** taken by the Government, such as the suspension of harvesting quotas for fauna (birds, amphibians and reptiles), *Swietenia macrophylla* and *Cedrela odorata* and the introduction of national moratoria and other instruments that are restrictive and offer no economic alternatives, have contributed in some degree towards illegal wildlife trade.

4.2. Policy content

For the purposes of this study, "policy" was taken to mean an official document duly approved by decree by the Government of the Republic and clearly identifying the policy in question and its basis in law and setting out its aims and principles and the associated guidelines. No such written wildlife trade policy could be found and the study was therefore made on the basis of the existing legislation and policy statements.

4.2.1. History

The history of the management of international trade in threatened species of wild flora and fauna in Nicaragua can be divided into two periods:

1. Before the signing of CITES (1955-1977): In this period, natural resources were managed by the Ministry of Agriculture and Livestock and the Convention was not

applied. Policy regarding wild flora and fauna trade was regulated by discrete sectoral instruments serving the interests of the State, with forest conservation and protection predominant in the forestry sector (Decree No. 206, Hunting Act (*Ley de Caza*), in the official bulletin *La Gaceta* No.250 of 3 November 1956).

Legal instruments from this period include:

- + Decree No. 316: General Law on the Exploitation of Our Natural Resources (*Ley General Sobre Explotación de Nuestras Riquezas Naturales*) (*La Gaceta*, No. 83, 17 April 1958);
- + Decree No. 5: Indefinite Ban on Export of Ocelot, Deer and Caiman Skins (*Prohibición Indefinida de Exportación Pieles de Tigrillo, Venado y Caimán*) (*La Gaceta*, No. 95, Thursday, 2 May 1958);
- + Regulation No.15: Regulation concerning the Hunting Act (*Reglamento de la Ley de Caza*) (*La Gaceta*, No. 200, 2 September 1958);
- + Agreement No. 2: Closed Periods for Hunting and Trading of Wild Animals (*Períodos de Veda para Caza y Comercio de Animales Silvestres*), *La Gaceta*, No.170, 29 July 1972 (closed periods were established for 16 species of mammals, 21 species of birds, and two species of reptiles, including green and black iguanas);
- + Law Act No. 235: Emergency Act on Sound Use of Forests (*Ley de Emergencia sobre aprovechamiento racional de los bosques*), 1976;
- + Decree No. 625: Ban on the Catching and Hunting of All Types of Wild Animal and on the Export of Turtle Eggs (*Prohibición, aprehensión y caza de toda clase de animales silvestres y exportación de huevos de tortugas*) (*La Gaceta*, No. 106, Monday, 16 May 1977), which instituted an indefinite ban on the catching and hunting of all types of wild animals and subproducts thereof for export and a 10-year ban on the export of turtle eggs.

In keeping with the laws and other legal provisions of this period, the majority of legal instruments were aimed at regulating the harvesting of wildlife primarily from the point of view of its value as a hunting resource.

2. Following the signing of CITES (1977-1985): Nicaragua issued the Decree of Accession to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), as approved by the National Congress in Resolution No. 47 of 11 June 1977 and ratified by the President of the Republic in Decree No. 7 of 22 June 1977 (*La Gaceta*, No. 183, 15 August 1977). In this period, Decree No. 625 was suspended and the price of pet export permits was increased.

International wildlife trade began in 1986, with species of psittacines. Small export quotas were established and coordination was exercised by IRENA through the European Economic Community because of the United States Government's economic blockade of Nicaragua. The income helped to strengthen the regional inspectorates through the

provision of vehicles and communication equipment and resource monitoring, etc.

In the period beginning in 1989, private wildlife export businesses were created and BCN set new tax rates for species of fauna. MARENA set annual export quotas in cooperation with the CITES Secretariat in Switzerland.

The promulgation of the Forest Action Plan (*Plan de Acción Forestal*) and the Environmental Action Plan (*Plan de Acción Ambiental*) in Decree No. 45-93 constituted the first efforts at forest management and resulted in the drawing up of management plans for around 200,000 ha. The forestry legislation in force at the time contained few restrictions on cutting, harvesting and export, with the result that extensive areas were exploited, with drastic changes in land use.

The national CITES office, CITES-Ni, was set up in 1992 under the authority of the Deputy Minister for the Environment and Natural Resources and the national Management and Scientific Authorities were designated. This decision strengthened the application and implementation of the Convention in Nicaragua, making the country one of the pioneers in this respect.

The following are the most significant legal instruments concerning wild fauna to have been promulgated since Nicaragua acceded to CITES in 1977:

1. Decree No. 8-98, "Rules and Procedures for the Export and Import of Species of Wild Flora and Fauna", 26 January 1998;
2. Ministerial Resolution No. 007-99, "System of Closed Seasons for Nicaraguan Wild Species" (*Sistema de Vedas de Especies Silvestres Nicaragüenses*) (*La Gaceta*, No. 109, 9 June 1999);
3. Ministerial Resolution No. 013-99, "System of Licences and Permits for Access, Local Sale, Export and Reproduction of Biodiversity Resources" (*Sistema de Licencias y Permisos para el Acceso, Comercialización Local, Exportación y Reproducción de los Recursos de Biodiversidad*) (*La Gaceta*, No. 139, 22 July 1999);
4. Ministerial Agreement No. 03-2000, "Criteria for the Allotment of Psittacine Quotas" (*Criterios Para la Asignación de Cuotas de Psitácidos*) (*La Prensa*, 25 February 2000).

Following the country's accession to the Convention, the view of the value of fauna and flora species changed and rules, procedures and systems of licences for access, sale, export and the application of annual export quotas came into being.

4.2.2. Instruments for the application of the Convention by CITES-Ni

A retrospective review of the country's wildlife legislation revealed the existence of 29 regulatory instruments -- laws, decrees and ministerial resolutions, standards and agreements, of which 14 are in force. These instruments were issued in three distinct stages, each with its own characteristics:

During the 1990s, MARENA issued a series of ministerial decrees, agreements and resolutions expressing the political will to avoid the over-exploitation of wild fauna and flora;

The instruments currently used and applied by MARENA's CITES-Ni secretariat are as follows:

- Decree No. 8-98, "Rules and Procedures for the Export and Import of Species of Wild Flora and Fauna";
- Ministerial Resolution No. 007-99, "System of Closed Seasons for Nicaraguan Wild Species";
- Ministerial Resolution No. 013-99, "System of Licences and Permits for Access, Local Sale, Export and Reproduction of Biodiversity Resources";

Instruments are classified as regulatory or non-regulatory, as shown below::

Regulatory instruments

These are formal policy documents, national strategies, action plans and programmes, the Constitution, treaties, laws and regulations, administrative decrees, directives or procedures, technical standards, etc. They reflect a command-and-control approach to wildlife trade and identify the possible offences and the penalties for, and deterrents to non-compliance. Other regulatory instruments include incentives, subsidies, property rights, and mechanisms for profit-sharing and reinvestment in conservation.

The principal regulatory instruments to concerning fauna are:

Laws, decrees and regulations

1. General Law on the Environment and Natural Resources (Law No. 217, *La Gaceta*, No. 105, Thursday, 6 June 1996);
2. Executive Branch (Organization, Powers and Procedures) Act (*Ley de Organización, Competencias y Procedimientos del Poder Ejecutivo*) (Law No. 290, *La Gaceta*, No. 102, Wednesday, 3 June 1998);
3. Green and Black Iguanas (Conservation and Protection) Act (*Ley para la Conservación y Protección de Iguanas Verdes y Garrobos*) (Decree No. 547, *La Gaceta*, No. 240, Saturday, 18 October 1980);
4. Executive Decree No. 30-97 prohibiting the explication and export of *Swietenia macrophylla* and *Cedrela odorata*;
5. Decree No. 50-2001, Forest Policy of Nicaragua (*Política Forestal de Nicaragua*);
6. The Forest Regulation (*Reglamento Forestal*) (Decree No 45-93), which is considered the modern version of Law No. 235 of 1976;
7. Regulation concerning the General Law on the Environment and Natural Resources (*Reglamento de la Ley General del Medio Ambiente y los Recursos Naturales*) (Decree No. 9-96, *La Gaceta*, No. 163, Thursday, 29 August 1996);

8. Rules and Procedures for the Export and Import of Species of Wild Flora and Fauna (Decree No. 8-98, *La Gaceta*, No. 27, Tuesday, 10 February 1998);
9. Ministerial Agreement No. 33-2000 for the legalization of illegally cut timber;
10. Law No. 585, Cutting, Harvesting and Marketing of Forest Resources (Moratorium) Act (*Ley de Veda para el Corte, aprovechamiento y comercialización del recurso forestal*), 7 June 2006.

Administrative provisions

1. System of Licences and Permits for Access, Local Sale, Export and Reproduction of Biodiversity Resources (Ministerial Resolution No. 013-99, *La Gaceta*, No. 139,, Thursday, 22 July 1999);
2. Ministerial Resolution No. 039-2006 establishing administrative measures for international trade in finished products and products of taxidermy in order to ensure the sustainable use of species of wildlife fauna;
3. Ministerial Resolution No. 056-2006 providing that every species of wild fauna used as raw material in the food trade must come from a captive-breeding establishment duly regulated by MARENA and having a valid licence or permit;
4. Ministerial Resolution No. 020-2006 establishing the guide for the preparation of project documents for the management of wildlife in captivity;
5. Ministerial Resolution No. 029-2006 including the forest almond tree (*Dipteryx panamensis*) in the indefinite national closed season category of the system of Nicaraguan wildlife closed seasons;
6. Ministerial Resolution No. 037-2005 establishing the administrative procedure for obtaining permits for the export of the species *Strombus gigas*.

There follow detailed descriptions of a number of important regulatory instruments concerning wild fauna and flora.

1. Convention for the Conservation of Biological Diversity and the Protection of Priority Wildlife Areas in Central America

The Convention for the Conservation of Biological Diversity and the Protection of Priority Wildlife Areas in Central America was signed in 1992. Its principal objective is to conserve the terrestrial and coastal biological diversity of Central America as far as possible for the benefit of present and future generations.

2. Convention on Biological Diversity

Three international legal instruments were signed at the 1992 Río de Janeiro summit meeting, or "Earth Summit". Among them was the Convention on Biological Diversity (CBD). It has three main objectives: the conservation of biological diversity and the sustainable use of its components and the equitable sharing of the benefits arising out of such use.

3. Convention establishing the Central American Commission on Environment and Development (CCAD)

This instrument was signed at San Jose, Costa Rica, on 12 December 1989, for the purpose of establishing a regional system of cooperation for the optimal and rational use of the region's natural resources, pollution control and the restoration of the ecological balance, in order to ensure that the peoples of the Central American isthmus enjoy a better quality of life.

The Central American Commission on Environment and Development was set up by the Convention as an international administrative body with specific functions regarding the environment and natural resources of Central America.

4. Tegucigalpa Protocol to the Charter of the Organization of Central American States (ODECA)

The Tegucigalpa Protocol to the Charter of the Organization of Central American States was signed at the 11th Summit of Central American Presidents, held in the Republic of Honduras in December 1991. The signatories were the Presidents of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

The purpose of the Protocol was to establish the Central American Integration System as the institutional framework for the integration of Central America and its establishment as a region of peace, freedom, democracy and development.

It is noteworthy that among the objectives reaffirmed in article 3 of the Protocol are "the promotion of sustained development [and] protection of the environment" and the carrying out of "concerted action to protect the environment through respect for and harmony with nature, while ensuring balanced development and the rational exploitation of the natural resources of the area, with a view to establishing a new ecological order in the region" (Hernández, 2002).

National strategies

National biodiversity strategy

This strategy aims at conserving flora and fauna by promoting: the establishment of national and private ecoparks; economically viable sustainable use of biodiversity and economic assessment of species use; the strengthening of the information and monitoring system; the harmonization of policies and legislation, etc.

Protected areas strategy

This strategy aims at conserving flora and fauna *in situ* by promoting sustainable management and economically viable sustainable use of biological diversity through the establishment of research, monitoring and education as basic tools.

Non regulatory instruments

Non-regulatory instruments include: voluntary certification schemes; financial assistance for the promotion of sustainable production, artificial propagation, ranching, research and development and export and import programmes.

They also include awareness-raising and educational media such as brochures, posters, video films, press releases and the like, curricula, school and training materials, reports and guides.

Wildlife information systems

The purpose of such systems is to systematize information on, and appraise the condition, diversity and distribution of ecosystems and flora and fauna species, with an emphasis on threatened, endangered, endemic, migratory and pollinizing species.

It is in this context that Nicaragua established SINIA, its national environmental information system. Among the priority topics is biodiversity, defined as a thematic node and conceptualised as a tool for the systematization, organization, analysis and interpretation of information on biodiversity condition and management with a view to the production of reports, statistics and indicators concerning ecosystem condition and dynamics. The country's academic and scientific institutions are participating in this process.

Monitoring and research system

Although monitoring of the condition of key species of flora and fauna, including CITES species, is guided by the general legal framework and the policy, laws and strategies relative to biodiversity conservation, it has not been possible to institutionalise a monitoring system that matches the needs and commitments in this domain.

Population studies concerning CITES species, e.g. psittacines and *Caiman crocodilus chiapasius*, have been made with the aim of providing a basis for the setting of export quotas. There have been unofficial studies supported by international organizations, including studies of the green, Olive Ridley and hawksbill turtles financed by the World Wide Fund for Nature.

In January 2007, INPESCA and MARENA gave their institutional approval for a *Strombus gigas* population study by INPESCA's Fisheries and Aquaculture Research Centre (*Centro de Investigaciones Pesqueras y Acuicola*). The research protocol for the study was approved by FAO and the CITES Secretariat and set a scientific quota of 100,000 lbs (45,359.24 kg), as compared with the national quota of 250,000 lbs. Pending determination of its economic benefits, the scientific quota has not been implemented.

The study of *Swietenia macrophylla* was funded by the Inter-American Development Bank (MARENA-CITES-Ni, 2004).

Among the non-regulatory instruments that are or have been used are the following:

▪ **Financial sustainability**

National budget funds are earmarked for the payment of central office wages and operating costs. Although supervision is one of the 36 functions decentralised to the local offices of MARENA, it does not result in any additional costs for them.

Three psittacine population studies have been made (in 1994-1995, 1999 and 2004 respectively) using funds generated by the CITES-Ni/MARENA office. There have also been two caiman population studies, the second of them in the year 2000.

A caiman population study funded under the first CAFTA-DR Environmental Cooperation Agreement is currently programmed.

▪ **Financial assistance for captive breeding**

In the 1980s, three institutional-level studies of captive breeding of green iguanas were made using own funds. A study of reproduction indicators for captive-bred species of amphibians and reptiles was made in 2006. In addition, disease manuals have been compiled for captive reptiles and herpetofauna. There are currently 11 private breeding companies financing their activities from their earnings from the export of captive-bred specimens.

▪ **Education, communication and information programme**

CITES-Ni has concentrated in the past three years on the dissemination of studies of the species of the greatest economic value for exporters, of manuals and of information on the systems of closed seasons. Aspects of the institutional legal framework are publicised on web pages (www.marena.gob.ni, www.sinia.net.ni), but there is a shortage of biological, ecological and economic information.

MARENA uses its own export-derived funds to pay for announcements, mostly in newspapers, during closed seasons. The State has little money for environmental education and awareness-raising.

▪ **Training and awareness-raising programmes**

Funds obtained from the issue of wildlife trade permits have been used to run a number of national-level training seminars on the application of CITES, including the following:

- Training in species management and identification with local and institutional actors;
- Training in trade regulation, institutional regulations, etc, for military, customs and other departmental authorities.

- Nicaragua and Costa Rica and Nicaragua and Honduras respectively have produced two manuals on regulation of wildlife trade and trafficking with funding from the Mesoamerican Biological Corridor (MBC) project.

4.2.3 Objectives and principles

The objectives and principles of the legal framework are identified in the National Environmental Policy (Decree No. 25-2001), laws and a number of ministerial resolutions.

The aim of the National Environmental Policy as set out in Decree No. 25-2001 is:

"To guide coherent action by the public administration, at its central, regional and municipal levels, and the activities of civil society organizations and the Nicaraguan population in general so as to preserve, improve and restore environmental quality suitable for life by ensuring environmental management that is consistent with economic growth, social equity, improvement of the quality of life and the sustainable preservation of the environment".

Articles 1, 2 and 3 of the Decree provide for the preservation, management, improvement and restoration of sustainability and the environment, the right to ensure the sustainable use of natural resources, ecosystems and wild flora and fauna (biodiversity), and the putting into effect of a system of information, education, research and environmental monitoring to achieve those aims.

A clearer statement of the country's environmental aims came about with the adoption of Law No. 217, the General Law on the Environment and Natural Resources, which provides that its purpose is to "establish the rules for the conservation, protection, improvement and restoration of the environment and the natural resources that comprise it by ensuring their sound and sustainable use in accordance with the Political Constitution".

The General Law also sets out the principles on which it is based:

- ◆ The environment is the common heritage of the nation and the basis for sustainable development of the country;
- ◆ It is the duty of all Nicaraguans to protect natural resources and the environment;
- ◆ The precautionary principle will prevail over all others in public and private management of the environment;
- ◆ The principle of solidarity with the indigenous peoples and communities of the Autonomous Regions and the Pacific and central areas of the country;
- ◆ Principles for the sustainable use of natural resources.

Article 17 of the General Law established the National System of Protected Areas (*Sistema Nacional de Áreas Protegidas*, SINAP) and article 22 refers to the setting of rules for, and the supervision of such areas, activities whose objectives are to preserve and protect the

diversity of flora and fauna and natural and genetic resources in order to promote education, research and monitoring, with priority being given to CITES species.

Articles 8 and 23 of Law No. 28 (the Autonomy Act, *Ley de Autonomía*) provide for the sound use and the enjoyment of the water, forests and communal lands and the defence of the ecosystems in RAAN and RAAS, where the widest range of ecosystems and the greatest variety of CITES species are concentrated.

Ministerial Resolution No. 10-2000 has as its purpose the establishment of the administrative procedure for the return to their habitats of live animals and botanical samples illegally extracted from the country's protected areas. It applies whether the extractors are private individuals or legal persons and whether they are Nicaraguan or foreign.

Relations with other policies

Within the context of environmental policy, Nicaragua has developed sectoral policies that strengthen environmental management, including the conservation and sustainable use of wild flora and fauna, and have components of the following:

- ◆ Management of catchment areas and natural resources;
- ◆ Conservation and management of protected areas and biodiversity;
- ◆ Improvement of environmental quality;
- ◆ Adjustment and mitigation in the face of climate change;
- ◆ Development of environmental management instruments;
- ◆ Environmental services.

The following are other policies connected with trade in, and sustainable use of wildlife:

- Forestry development policy;
- Biodiversity policy (to be approved);
- Fisheries policy;
- Policy and strategy for productive rural development;
- Land policy.

The proper application of those policies is crucial to sustainable wildlife trade since they indirectly affect natural systems and CITES species in particular.

4.2.4 Implementation of the legal framework

4.2.4.1 Actors

The principal institutions involved in the application of instruments for regulating trade in CITES species of flora and fauna are: MARENA, INPESCA and INAFOR and their local offices.

These governmental actors each have roles and responsibilities in their particular domain. At the national level, the administrative functions in connection with wildlife trade fall to the

CITES-Ni secretariat, which is part of the Biodiversity Directorate of MARENA's Directorate-General of National Heritage (*Dirección General de Patrimonio Natural*). Following the amendment of Law No. 290, MIFIC no longer has any functions regarding wildlife trade; they have been transferred to autonomous institutions.

Enforcement of the law and of penalties in the event of breaches are the responsibility of the Office of the Environmental Prosecutor within the Office of the Prosecutor-General and of the National Police and the Army.

There are other important bodies with environmental management responsibilities. Their functions depend on their own mandates and on the coordination with MARENA. They include:

- 1) the Ministry of Agriculture and Forestry (MAGFOR) (Law No. 290, article 24; The Forest Regulation, Decree No 45-93, articles 6, 7 and 8);
- 2) The Ministry of Education, Culture and Sport (Law No. 290; Law No. 217, articles 34, 35 and 36);
- 3) The Nicaraguan Geosciences Institute (INETER) (Organic Law No.311);
- 4) Mayoral offices and municipal councils (Law No. 217; Law No. 40, Municipalities Act, as amended by Law No. 261).
- 5) The Regional Councils of the Autonomous Regions of the Atlantic coast (Law No. 28, Statute of Autonomy of the Autonomous Regions of the Atlantic Coast, article 9; Decree No. 9-96, articles 4, 5 and 6);
- 6) The National Assembly, which approves laws and policies;
- 7) The Public Prosecutor's Office.

4.2.4.2 Means and resources

Application of the legal instruments relating to wildlife trade requires an administrative structure with economic resources, clear and effective tools and technical capacities appropriate to the functions of supervising and regulating domestic and international trade.

To implement the instruments relevant to the Convention, the CITES-Ni secretariat has only a Management Authority and two field technicians, whose duties are confined to tasks connected with the Convention.

The low institutional capacity is a consequence of the office's small budget allotment, which limits the development of key tools such as monitoring, research and recording of the condition of CITES species under heavy commercial pressure *in situ* and *ex situ*. However, CITES-Ni-MARENA receives support from other government bodies with respect to coordination, regulation and administration for access to wildlife resources for the purpose of their export.

The decentralisation of CITES functions to MARENA's departmental and regional offices has added to the 35 functions already decentralised with a limited budget. The departmental and regional offices do not have enough technical personnel and need more training in order

to carry out the new functions. Their staffing is more appropriate to dealing with complaints than to pursuing an institutional strategy and this results in inefficient implementation of the body of wildlife trade law, with shortcomings as regards field checks.

4.2.4.3 Monitoring of the application of the legal framework for wildlife trade

The CITES-Ni Management Authority prepares annual operating plans and they are subject to institutional appraisal, but there is no review of the application of wildlife trade law. There is no institutional culture of assessing the efficiency of the application of policy instruments, laws or other measures. There are forms for use in the assessment and sectoral follow-up of the regulation of captive-breeding activities, but very few for use in monitoring and evaluating wildlife trade at the national level.

The unawareness of, and the gaps in information concerning the efficiency and effectiveness of the application of the laws, standards and other instruments hamper the measurement and assessment of achievements in regulating wildlife trade. The results are wrong decisions and a poor grasp of the priorities in terms of pressure, condition and trends with respect to CITES species.

There is no officially established methodology, machinery or practice for determining the degree of applicability or the effectiveness or impact of wildlife management and conservation laws and policies.

4.2.5.- identification of the impacts of the legal framework

4.2.5.1-Environmental impacts

it can be concluded from an FAO study that in the period 1950-2000 Nicaragua lost 29,628.33 km² of forest at a rate of 59,267 ha/year (State of the Environment Report, 2001), directly affecting ecosystem integrity and species' habitats because of the shrinkage of feeding, nesting and breeding zones and the reduced carrying capacity of smaller areas.

As the farming frontier advanced, forests were subjected to unsustainable levels of harvesting and production and, because of deforestation and fires, became degraded, undervalued and underutilised. They were transformed into inefficient farming systems, with an increase in human settlements lacking access to services and basic social infrastructure and marked by the predominance of subsistence production, extreme poverty and food insecurity.

Changes in the populations of some wildlife species because of the impacts of the legal framework

Studies of the condition and harvesting of wildlife species are essential to the creation of a technical and scientific basis not only for setting harvesting quotas but also for measuring the impact of policy measures.

In the case of psittacines, there have been three population studies, two by Wiedenfeld *et al.* (1995 and 1999) and one by Lezama (2004). Comparison of the data from the 1994-1995 and 1999 studies shows a decline of 1,547, or 43 %, in the number of birds recorded per count. Lezama's figures from 2004 show a fall of 61 %, or 2,171 individuals, by comparison with 1994-1995 (table 5 and figure 9 below). The results of this latest study were perhaps the decisive factor in the ending of psittacine export quotas.

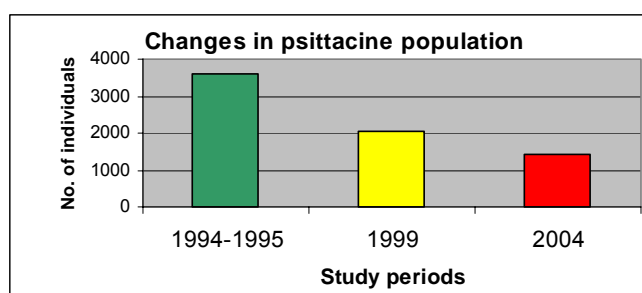
Table 5 Results of psittacine population studies

Study period	Counts	Number of individuals	Population decline, %	Number of individuals not recorded
1994-1995	237	3,592		
1999	227	2,045	43	1,547
2004	217	1,421	61	2,175

(Wiedenfeld *et al.*, 1995 & 1999; Lezama *et al.*, 2004)

Because of the destruction of nesting areas as a result of the advance of the farming frontier, the population of psittacines has probably been declining since the suspension of the export quotas, even without extraction from the wild.

Figure 9 Changes in the population of psittacines, 1999-2004



Concerning populations of *Crocodylia*, Buitrago (2002) reported that, compared with the findings of earlier studies, the average number of individuals of the order *Crocodylia* in the country's water bodies had fallen significantly in the previous seven years. The number of caimans had declined at 9.6 % a year, while the number of alligators had risen slightly, at 4.9 % a year. The changes were the consequence of quotas.

Hunting

According to Martínez-Sánchez *et al.* (2001), there is virtually indiscriminate hunting, both by rural dwellers in search of food and by alleged sportsmen, who shoot solely for the pleasure of seeing the animal drop. All kinds of hunting are quite harmful in the way they are currently practised and few hunters restrict themselves as to where, what and how much they hunt.

Hunting has a variety of impacts. The most obvious is the one resulting from the extraction of a certain percentage of the population. It can be mitigated by means of a series of strict rules concerning closed seasons, hunting quotas per season, permitted types of weapon and hunting technique, etc. Rules of this kind are in widespread use in countries with a strong hunting tradition. There is a need in Nicaragua for a system that would be binding on the entire hunting community through hunting or shooting clubs and under which their members would adopt a code of ethics consistent with the practice of this activity.

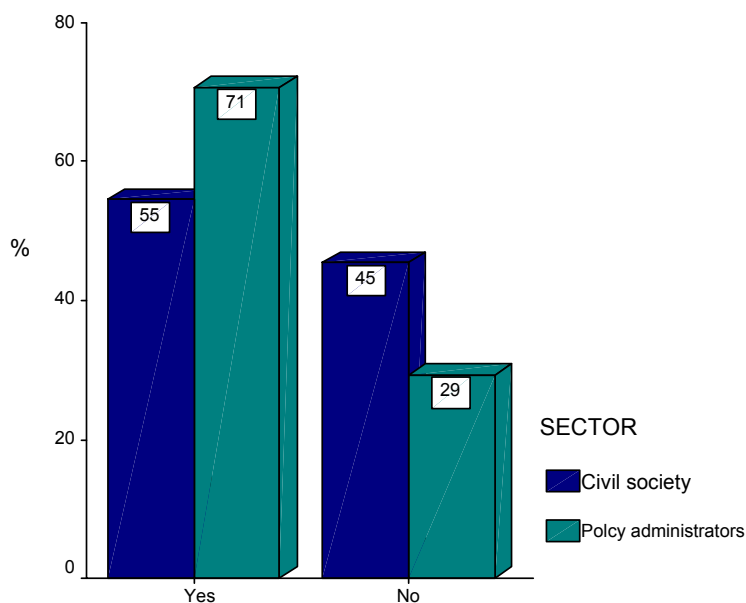
The second type of impact has to do with the conflict between the use of wildlife by hunters and by nature watchers. Most tourists who visit Nicaragua, and Nicaraguan tourists too, belong to the second group and want as far as possible to see animals in their natural habitat. Nature watching is incompatible with hunting, not because hunting eliminates the animals but because it makes them so timid that they are much harder to spot.

Opinions concerning the application of trade policies and population recovery

Notwithstanding the existence of illegal species trade, inquiries in the field among members of civil society and policy administrators showed that, of the 74 people questioned, 63.5 % (47) thought populations of traded animals had recovered, whereas 36.5 % (27) thought they had not.

Figure 10 below shows the breakdown of opinions concerning the application of trade policies and population recovery. The persons questioned were members of civil society (university students, owners of small workshops, tourist guides, etc) and policy administrators (staff of local offices of INAFOR and MARENA) or workers for bodies with control-related functions (the Army, the National Police, the Environmental Prosecutor's Office, mayoral offices, the natural resources secretariats of RAAN and RAAS, the Customs service, etc).

Figure 10
Opinions of 74 members of civil society and
policy administrators concerning the application
of wildlife trade legislation and flora and fauna
population recovery



4.2.5.2 Social impacts

Because of the absence of indicators, it is hard to quantify the social impacts on rural families. In rural areas, forestry, whether legal or illegal, yields no tangible improvement in the social situation, since poverty persists or grows worse, with malnutrition, food insecurity, high disease vulnerability, little or no access to education and information, break-up of households with a consequent increase in women's and children's domestic workloads, exacerbation of disputes over ownership of valuable forest land and, where forests represent a means of personal enrichment, abuse by indigenous leaders of their communities and the loss of indigenous ethnic values.

There are also conflicts between official structures, such as the disputes between municipal governments and the regulatory authority INAFOR concerning tax collection policy that, in municipalities like Rosita and El Castillo, give rise to corruption and illegality.

4.2.5.3 Economic impacts

Analysis of the impact of wildlife trade on the country's economy and development is extremely difficult because of the lack of indicators and up-to-date databases. However, some information is available on how the actors in the value chain see things and from that it

is possible to gain an idea of the economic impact on income, supply and demand, investment, employment and local economic development.

Income from wildlife trade

Morales (2008) reports the income that Nicaragua obtained from wildlife trade during the period 1990-1992 as:

- 1990, USD 97,410.00
- 1991, USD 612,751.75
- 1992, USD 656,388.44

making a total of USD 1,366,550.19, of which the Government took 35 % (USD 478,292.57) as payment for resource use. That sum was used to pay the salaries of CITES staff, purchase materials and equipment and cover the cost of studies and research and the fees of foreign wildlife management and reproduction experts.

Impact on demand

Wildlife law is an important factor in the shaping of the market's demand for wildlife products. In the 1970s, wildlife exports were high because of the strong demand from businesses outside the country. With Nicaragua's accession to CITES, however, came a series of regulations that have had some effect on the structure of demand.

The State permits wildlife exports through legally established export companies and sets harvesting quotas. There was the beginning of a monopoly in exports of birds, which were handled only by a small group that also dealt in other products (reptiles, amphibians, etc) coming directly from the wild or from farms or captive-breeding projects.

The disappearance of more than 17 fauna exporting companies between 2003 and 2007, the ending of wild quotas and changes in the activity of traditional wildlife collectors decreased export volumes, causing changes in the structure of demand and in the wildlife trade chain.

The changes have led to increases in local consumption and illegal fauna trade and the appearance of new, unlicensed collectors. The only wildlife export companies now operating are 10 that function as farms or captive breeders, mostly of reptiles and amphibians, 8 that export *Strombus gigas*, 23 that export *Swietenia macrophylla* and 1 that exports *Cedreia odorata*. There are also 17 licensed exporters of finished products (see annex below).

Impact on the structure of demand

Article 67 of Law No. 217 states that farms for species that are threatened or in danger of extinction are subject to regulation by law. MARENA regulates wildlife farming in general under Ministerial Resolution No. 013-99 establishing the System of Licences and Permits for Access, Local Sale, Export and Reproduction of Biodiversity Resources and captive

breeding under NTON 05 020 02.

Implementation of this legislation has reduced the number of export companies and extraction from the wild. Currently only two businesses, FUNDEVERDE and COMPROVISSA, both of which are in the Department of Río San Juan, are of benefit to the local community.

The wildlife sales businesses do not have a sustainable export capacity. Their supply is dependent on the number of individuals produced in captivity, export volumes are low and they have no specialised technical personnel.

In addition, they show no interest in increasing their production capacity because of the infrastructure and feeding costs that would entail. The average number of species kept as breeding stock varies between three and eight. Businesses with a more diversified supply have more sales opportunities, and therefore a chance of greater income.

Impacts on the level of private investment

At present, the businesses are operating with their own funds and the volume of their exports depends on demand and wildlife law. Banks do not facilitate access to funding and there is no relevant business promotion policy.

Income from trade in forest resources

Three families in the municipality of Rosita (Kukalaya, Siuna road and Kukalaya road) are estimated to have earned a profit of 80,500.00 córdobas (USD 5,573.24), or the equivalent of 34 % of their total income, from forestry in the period May 2001-April 2002 (NICAMBIENTAL-ODI, 2001).

Described below are some of the ways in which landowners in the Rosita municipality sell their resources:

- a. Sale under an *ad hoc* contract: for 350 m³ of prepared timber, the landowner receives 45 000,00 córdobas (equivalent to USD 3,150) per year (Selling price: 130.00 córdobas, or USD 9.00, per m³). All costs (road-building, felling, bucking, cooking and food, log rafting) are borne by the person issuing the contract. The landowner does not invest but runs the risk that he will not be paid and will find himself in debt;
- b. Sale of timber for collection at a truck landing: over the space of two months, the landowner prepares 40 m³ of timber, for which he receives 27,000.00 córdobas. From this sum he pays 5,000.00 córdobas for animal skidding, leaving him with a net income of 22 000,00 córdobas;
- c. Sale of standing timber: over the course of the year the landowner sells 40 trees at an average of 200.000 córdobas per tree, giving him an income of 8,000.00 córdobas.

Income from the “La Esperanza” (Hope) project, Puerto Cabezas 2006

The income forecasts in table 6 below are based on figures for the La Esperanza project, which envisaged -- before the moratorium on *Swietenia macrophylla* -- the harvesting of 2,077.50 m³ of *Swietenia macrophylla* and other wood. Because of the moratorium, the income has not been realised.

Table 6 Economic return from wildlife trade

Income distribution over the production chain			
Link	Amount per m ³ , USD	Volume of timber, m ³	Estimated amount, USD
Community	30.00	2,077.50	62,325.00
Lumberjack	15.00	2,077.50	31,162.50
"Bauchero"	15.00	2,077.50	31,162.50
Haulier	20.00	2,077.50	41,550.00
Chain-saw operators	20.00	2,077.50	41,550.00
Sawmills	30.00	2 077.50	62,325.00
Transport to market	20.00	2 077.50	41,550.00
	150.00		311,625.00

The volume that it was originally planned to harvest under the Project was 2,974 m³, but because of the application of the Economic Emergency Decree (*Decreto de Emergencia Económica*) of 3 May 2006, only 896,5 m³ were cut, leaving 2,077.5 m³ (equivalent to USD 311,625.00 for the 2006 crop) still standing.

Income from trade in fauna and finished products

The gross income from the sale of finished *Caiman crocodilus chiapasius* products is estimated at USD 34,635.00, including USD 17,012.48 (49 %) for leather workers and USD 17,622.68 (51 %) for retailers (shops).

The leather worker employs 5 workers and pays them an average of NIO 1,200 a month, equivalent to USD 765.12 a year. In the course of a year, he will pay the five of them USD 3,825.60, or 22.4 % of his income, leaving him with 26.6 % before he pays the costs of skins and chemicals and other expenses.

Shops generally have two employees with an average salary of NIO 1,000.00 a month, equivalent to USD 637.56 each a year. Total annual salary costs are thus USD 1,275.12, or 7.2 % of the retailer's income, leaving him with 43,8 % before payment of the cost of his shop and taxes.

Table 7 below shows sales income. The average price paid to craft workers and the average public selling price were obtained from field data. The average number of items sold per year was very hard to determine and use was therefore made of the information in Buitrago (2001).

Table 7
Gross income from sale of finished
***Caiman crocodilus chiapasius* products**

Item	Average price paid to craft worker		Average public selling price		Number sold per year	Gross income/yr, USD	Gross income/yr, Craft worker, USD	Gross income/yr, Retailer, USD
	C\$	USD	C\$	USD				
Belts	200.00	10.62	380.00	20.19	144	2 906.80	1 529.90	1 376.91
Wallets	130.00	6.91	380.00	20.19	180	3 633.50	1 243.04	2 390.46
Hair ornaments	15.00	0.80	80.00	4.25	625	2 656.07	498.01	2 158.06
Rings	15.00	0.80	100.00	5.31	120	637.46	95.62	541.84
Coin purses	50.00	2.66	120.00	6.37	72	458.97	191.24	267.73
Bags	600.00	31.87	1 200.00	63.75	24	1 529.90	764.95	764.95
	1 700.00	90.31	3 400.00	180.61		4 334.71	2 167.44	2 167.27
	3 000.00	159.36	5 600.00	297.48		7 139.52	3 824.74	3 314.78
Cigar cases	180.00	9.56	230.00	12.22	24	293.23	229.48	63.75
Sandals**	220.00	11.69	400.00	21.25	288	6 119.59	3 365.77	2 753.81
Spectacle cases	50.00	2.66	80.00	4.25	1 024	4 351.71	2 719.82	1 631.89
Handbags	200.00	10.62	300.00	15.94	36	573.71	382.47	191.24
Stuffed	No data	No data	No data	No data	No data	No data	No data	No data
Total					2 537	34 635.16	17 012.48	17 622.68

*Two sets of prices according to size and quality; **Per pair

Official exchange rate: (2007) C\$ (córdobas) 18,8248 x USD 1,00

Source: Interviews, 2007

Indigenous communities and local economic development

The country's third State of the Environment Report 2003-2006 (MARENA, 2006) notes that although the indigenous communities and ethnic groups in the Caribbean region live in an area where much of the country's biodiversity and natural resource potential is concentrated, their social, economic, ecological and cultural sustainability are in doubt because their region has one of the lowest human development indices and suffers from extreme poverty, rapid decapitalization of natural assets and severe impacts on natural resources of key importance for national development.

Indigenous communities' exclusion from regional development is reflected in the limited integration and encouragement of their capacity for forest development. They are affected by, but not participants in the process of industrialization of forest use. The only relationship is the sales-and-employment relationship between forest owners and timber purchasers, investors, hauliers and extractors. This results in decapitalized indigenous areas that have no capacity for replacement of their natural assets, short-term responses to the indigenous

communities' needs and no possibility of sustainable local development.

Since most of the country's forest potential is concentrated in indigenous areas, there is a need for a legally-backed policy under which forest development plans apportion responsibility for investing in the replacement and effective management of indigenous people's natural capital.

Indigenous communities, principally Miskitos, Mayagnas and Ramas, are involved in the conservation of approximately 2,055,570 ha of protected areas in the Atlantic region. In all, 80.6 % of the SINAP lies in the territory of indigenous communities (see table 8 below), so that their role in wildlife conservation and use is a key one.

Table 8 Indigenous communities in protected areas

Protected areas	Communities	Size of protected areas, ha
Cerro Silva	Rama/Garifona/Creole	339 400
BOSAWAS	Sumo-Mayagna/Miskito	774 190
Wawashan	Miskito/Creole/Mestizos/Garifonas	231 500
Cayos Miskitos	Miskito	412 500
Río Indio Maiz	Ramas/Creoles/Mestizos	263 980
Punta Gorda	Ramas/Creoles/Mestizos	54 900
Makantaka, Yulu, Kligna, Alamikamba, Limbaica, Karawala	Miskito / Mayagna / Miskito	9 100
	Total	2 085 570.00

Source: ILO/ETEDPI, 2005; CBA, 2005

4.2.6 Analysis of the legal framework and its impacts

4.2.6.1 Relevance of the legal framework

Initially, Nicaragua's legal framework for wildlife trade was based on species protection and conservation, with the predominant idea being that species of fauna were principally of interest for hunting. That stood out clearly in the 1956 Hunting Act and the associated Regulation of 1958. Other instruments of the same bent included: the Indefinite Ban on Export of Ocelot, Deer and Caiman Skins (1958); the Agreement concerning Closed Periods for Hunting and Trading of Wild Animals (1972); the Emergency Act on Sound Use of Forests (1976) and the Ban on the Catching and Hunting of All Types of Wild Animal and on the Export of Turtle Eggs (1977).

Following the country's accession to the Convention, the view of the value of fauna and flora species changed and rules, procedures and systems of licences for access, sale, export and the application of annual export quotas came into being.

The most noteworthy instruments from this period are:

- Rules and Procedures for the Export and Import of Species of Wild Flora and Fauna (1998);
- System of Closed Seasons for Nicaraguan Wild Species (1999);
- System of Licences and Permits for Access, Local Sale, Export and Reproduction of Biodiversity Resources (1999);
- Criteria for the Allotment of Psittacine Quotas (2000).

The General Law on the Environment and Natural Resources provides, in its articles 55 and 65, that the purposes of the Law are to regulate the use and sustainable harvesting of renewable natural resources on the basis of the criteria of sustainability and the preservation of biological diversity for use and harvesting, taking into account animal and plant biodiversity, endemic species and species in danger of extinction. Article 59 of the Law provides for the drawing-up of special laws to govern the ownership, uses and sustainable harvesting of natural resources.

Although CITES-Ni is the national authority for the approval of wild flora and fauna export quotas, other organs too are legally entitled to take part in quota-setting. They include INAFOR, which is in the case of *Swietenia macrophylla* the body competent to issue permits concerning forests subject to general management plans, and INPESCA, which has authority as regards the management of *Strombus gigas*. It is important to note that many of the quotas established by CITES are unsystematic and out of date, although some have been backed up by studies.

Importers saw the disappearance of export quotas for wild psittacines, reptiles and amphibians as unwillingness to regulate and monitor application of the instruments in the legal framework. CITES-NI, however, considered that the *Psittacidae* and crocodylian base studies were sufficient to justify the definitive ending of quotas for *Psittacidae* and the reduction of the national quota for crocodylia from 7,000 to 1,500 skins a year. The thinking as regards reptiles and amphibians is based on the precautionary principle and a wish to channel efforts towards support for a system of intensive and extensive management of species of wild fauna for international trade.

CITES-Ni handles the administrative tasks of receiving export applications, approving and making out export certificates, setting export quotas for species of fauna, and, when there is reason to suspect illegal trade or infringement of legal provisions, detaining shipments of wildlife products whether they originate in, or are in transit through Nicaragua and whatever stage they may have reached in their journey.

Checking of the production of "C" species (known to have been captive-bred) from export businesses in Nicaragua is the responsibility of CITES, while monitoring of species in captivity and regulation of wildlife trafficking are decentralized to MARENA local offices and effected in collaboration with CITES- Ni technical staff. These tasks are usually carried out together with bodies from outside the sector such as the National Police, the Office of the Environmental Prosecutor, the Army, INAFOR, INPESCA, etc.

Until 2002 the functions of the Scientific Authority were the responsibility of one person. Now they are discharged by a Committee of Scientific Authorities made up for the most part of members of academic institutions who act as advisers to the Management Authority. The Committee has not been effective in supporting management by the Administrative Authority. In view of this and of the provisions of Ministerial Resolution No. 042-2004, MARENA ought to step up its own operations. INPESCA and INAFOR should be made part of this Scientific Authority system. It should be noted that in practice INPESCA has acted, through CIPA, as the Scientific Authority for *Strombus gigas*.

The laws on wildlife trade are relevant but inadequate for coping with the strong pressure being generated by habitat degradation and falling biological productivity.

Management by CITES-Ni is focused on administration of permits and not on species sustainability. There is a need, therefore, to establish synergies with other Conventions, e.g. the Convention on Biological Diversity.

Although the general legal framework concerning the environment calls for the elaboration of specific laws to conserve biodiversity, they have yet to materialize as regards sustainability of wildlife. It would be desirable, therefore, for the country to have a wildlife policy and law.

4.2.6.2 Relevance

Nicaragua has a framework of sound and coherent environmental laws and regulatory instruments open to the elaboration of new laws and rules that would make for a stronger policy for managing sustainable wildlife use.

The present legal framework for wildlife trade sustainability is neither up-to-date nor adequate for the current situation. Although there is no written wildlife policy as such, the regulatory and non-regulatory instruments that do exist are sufficiently clear and could serve as the basis for the drafting of a policy for sustainable wild flora and fauna trade.

Decree No. 8-98, the framework instrument for the management of international wildlife trade, does not fully reflect the changes that have been made to the recommendations in the Convention and to the species lists in the Appendices. Efforts have been made, however, through the promulgation of ministerial resolutions to incorporate in Nicaraguan law the decisions of relevance to trade in CITES species. An example is Ministerial Resolution No. 36-2003, which lays down the procedure for obtaining export permits for the CITES Appendix II species *Swietenia macrophylla*.

An example of a shortcoming regarding the sustainability of wildlife trade is the fact that nowhere is there any reference to the equitable sharing with rural communities, particularly in the Autonomous Regions of the Atlantic coast, of the income from trade in wild fauna or flora. Such sharing should be widely reflected in a national wildlife policy, together with appropriate provisions on access to, and sale of wildlife.

In the Regulation concerning Law No. 217, articles 46, 47, 60, 61 and 102 provide for the annual publication of the updated list of CITES species and list of closed seasons on animals and for the elaboration and approval of technical standards for the sustainable use of wild flora and fauna and natural resources and classify the administrative offences of failure to comply with them.

4.2.6.3 Coherence

Nicaragua's legal framework for the regulation of wildlife trade includes the directives in the international conventions the country has signed, such as CITES, the Convention on Biological Diversity and the RAMSAR Convention.

Over the past decade, the bodies responsible for applying the framework have made great efforts to make the regulatory instruments (policy, laws, decrees and rules concerning sustainable management of wildlife) legally consistent. Notwithstanding, the current framework is applied only partially and the rules on application and discretionality are sometimes inadequate so that there is inconsistency between the law's formal requirements and its application.

For example. Law No. 462 creates a conflict of interests, since it is the Forest Superintendent (*Regente Forestal*) who has responsibility for appraisal, planning, harvesting and the making of sustainability reports. That all these functions should be concentrated in one person is contrary to the sector's institutional interests.

4.2.6.4 Effectiveness

Although Nicaragua has national and regional strategies and programmes for enhancing wildlife sustainability, the national organs' ability to implement them is severely restricted, in particular because of a lack of institutional, financial and operational capacity.

Among the regulatory and non-regulatory instruments concerned are:

Strategies and programmes

- ✚ The National Biodiversity Strategy, which covers *in situ* and *ex situ* conservation, protection and conservation, economic assessment and viability, monitoring, information system, research, diversification of use, genetic resources, participation and fairness;
- ✚ The National SINAP strategy;
- ✚ The Regional Strategic Biodiversity Monitoring and Evaluation Programme (PROMEBIO)
- ✚ The Regional Strategic Connectivity Program (PERCON);
- ✚ The Regional Strategic Program. of Work on Protected Areas (PERTAP);
- ✚ The Regional Strategy for the Conservation and Sustainable Use of Biodiversity in Mesoamerica (in which national CITES authorities participate);

- ✚ The declaration of 8 Ramsar Sites;
- ✚ The design, establishment and operation of an environmental information and indicators system in which biodiversity is a priority topic;
- ✚ Millennium Development Goals;
- ✚ The National Environmental Information System (SINIA) and the Regional Biodiversity Information System, in which the condition and distribution of species of wild flora and fauna listed in the CITES Appendices are priorities;
- ✚ Environmental Action Plan, 2007.

Many of these strategies and programmes have yet to be put into practice.

Monitoring and research system

The fact that research into, and monitoring of the CITES species under the greatest national and international commercial pressure are not systematic and not up to date hinders the setting of sales quotas appropriate to the actual circumstances and prevents assessment of the condition of species and local priorities and the measurement and appraisal of the state of conservation of CITES species.

Within the circle of rural development actors the tools of education, communication and information are little used for management of the sustainable use of CITES species. There have been education and training workshops on regulation of legal and illegal wildlife trade for staff of bodies present in border zones.

The budget for sustainable management of wildlife trade is very small, with serious gaps with respect to monitoring and research concerning CITES species that are under pressure and caught up in the sales chain. Priority is given to the central level of MARENA. The management budget is partly supplemented by external funds, but these have declined in recent years. A process of decentralization of resources to the regions is under way in order to strengthen their environmental management activities.

In article 8 of Decree No. 8-98 (Rules and Procedures for the Export and Import of Species of Wild Flora and Fauna); subparagraphs (b) and (h), concerning respectively monitoring of international and national trade and supervision of the packing and shipment of exported species, help to reduce the scope for trade in unauthorized species.

The licence classification system is not being properly implemented for all the established categories of wildlife harvesting licence. That is because very few categories of licence, other than captive-breeding licences and licences for fixed exhibitions, are taken out. Although many types of licence have been established, the activities concerned – those covered by sport hunting licences, for example – are undertaken without a permit by Nicaraguans and foreigners alike.

Licences which are not applied include those for game preserves and for hunting and fishing. The licence for commercial collection of wildlife is applied only for caiman skins since caimans are the only species for which there is a wild quota.

Another shortcoming in the permit system is the absence of registration and monitoring of domestic and foreign sport hunters. This makes it difficult to quantify their take and the States is deprived of income from hunting licences. The species of which hunting is allowed are not CITES species, but in practice they are illegally hunted.

While sport hunting could generate income, the system suffers from a shortage of personnel to supervise, monitor and regulate hunting activities in the field. There are no quotas per day and per hunter for specimens of species of which hunting is allowed. In the case of foreigners that concerns two migratory doves, *Zenaida asiatica* (the white-winged dove) and *Zenaida macroura* (the mourning dove).

As part of the process of decentralizing MARENA the functions of monitoring and supervising captive breeding have been transferred to the Ministry's local offices. They are, however, always carried out in cooperation with CITES-Ni.

Article 28, subparagraph (e) 1, of Law No. 290 (Executive Branch (Organization, Powers and Procedures) Act) entrusts MARENA with the monitoring of the sustainable use of renewable natural resources. Organs of the Ministry only perform that function with respect to the internationally traded species such as psittacines, *Caiman crocodilus chiapasius* and *Strombus gigas*, for which there is evidence from field studies of their proper use.

The system of closed seasons is among the legal instruments most applied by MARENA (CITES-Ni secretariat and local offices) since the Ministry can count in this regard on the full support of the National Police and the Army and the participation of the Office of the Public Prosecutor in the application of Law No. 559, the Environmental Offences Act (*Ley de Delitos Ambientales*).

In the past 5 years, CITES-Ni has halted wild export quotas for 77 internationally traded species, or some 90 % of the species that the country offered for sale. Remaining exports are principally of captive-bred species. This is attributable to the inadequacy of research and monitoring and the lack of effective application of the standards for species sustainability.

The inconsistencies and illogicalities affecting harvesting of CITES species can be illustrated by reference to the case of *Swietenia macrophylla*. There are rules providing for the confiscation of illegally extracted timber, but another rule legalizing such timber by means of auctions in which the offenders take part. And, while CITES-Ni does not issue export permits for this type of wood, it is trafficked.

In some regions, the local offices of MARENA and organs of the central government do not have the same powers as the regional governments regarding the application of regulatory instruments. This disharmony within government is becoming critical because most of the country's exportable natural resources are found in the Autonomous Regions and the indigenous and ethnic communities traditionally use and harvest many of the species in question.

On the other hand, there are good examples of cooperation between institutions, such as the relations between the National Police, the Army, the Customs service, local central-government offices and regional and municipal governments. This willingness to cooperate

was found in all 11 of the localities visited for the purposes of this study.

To sum up, there are shortages of people and financial and technical resources that hinder the optimum implementation of the legal framework for wildlife trade. On the other hand, there is good cooperation between the bodies with responsibility for enforcing the laws.

Shortcomings identified in the analysis

1. The country lacks a policy and specific law for the use and sustainable conservation of wildlife;
2. The present regulatory framework is biased towards wild fauna and pays little attention to minor species of flora – a pointer to the need for improvement of the legal framework in this respect;
3. The concept of sustainability does not include fair sharing of the profits from wildlife trade. Policy and the associated legal instruments should therefore embody the criteria of equity and participation by indigenous and non-indigenous communities in wildlife-related economic activity;
4. There is no system for the monitoring and assessment of the volume of trade in wild flora and fauna;
5. The applicability of the existing legal instruments has changed with time. Some that were once successful are now inapplicable. That should be borne in mind in drawing up the country's wildlife trade policy.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

1. Nicaragua's membership of CITES has enhanced its ability to manage and regulate domestic and international wildlife trade, particularly as regards threatened and endangered species (CITES species). Optimum implementation of the legal framework and the securing of trade sustainability are greatly hampered by capacity constraints in the areas of human, technical, financial and logistic resources.
2. Study of the value chain for wildlife harvesting shows that the income from trade in harvested species goes principally to external actors, with little or no benefit to rural communities or populations.
3. Decentralization of the functions of CITES-Ni to local offices without sufficient additional technical and operational resources hinders effective application of the laws on wildlife trade.
4. Current laws are inadequate to protect and sustain domestic and international trade in CITES species. They are unfocused and lack provisions on habitat degradation and biological productivity.
5. The country has neither a written wildlife trade policy nor laws to underpin sustainable species management in domestic and international trade. The regulatory instruments pertaining to sustainable management of wildlife trade are relevant and coherent and

provide a basis for the formulation of a policy.

6. The non-regulatory instruments for measuring the commercial sustainability of wildlife trade are little used. The most important of them are: monitoring, research, education and information.
7. The severe degradation of some high-commercial-value CITES species, such as *Swietenia macrophylla*, is attributable to illegal logging, the inconsistency of the laws on harvesting and the lack of capacity for *in situ* monitoring. The result is a loss to the Nicaragua economy of some USD 8 million a year.

5.2 Recommendations

1. Draw up a wildlife trade policy and law containing among their key elements: species sustainability, replacement, incentives, fairness and viable financial mechanisms. The policy should cover agriculture, forestry, fishing and trade, activities that, if properly managed, generate excellent social and economic opportunities. It should take into account the threats that uncontrolled trade poses to flora and fauna and restate the object, principles and goals set out in the country's General Environmental and Natural Resource Law, the Environmental Policy of Nicaragua and the National Biodiversity Strategy.
2. The policy should include provision for the resources -- human, financial and operational -- needed for its effective application and ensure the continuation of population monitoring studies with a view to finding solutions that will result in the better management and sustainable harvesting, with community participation, of psittacines, *Caiman crocodilus chiapasius* and other internationally traded species.
3. Strengthen institutional capacity, including the capacity of local offices, for the sustainable management of wildlife trade, focusing on effective use of the tools of monitoring, research, education, and information.
4. Enter into strategic alliances with universities, research centres and other bodies with the capacity to carry out monitoring, research and education conducive to the effective use of wildlife trade sustainability management tools.
5. Unify and standardize, for use in monitoring and research systems, indicators and methodology for assessing the sustainability of CITES species in domestic and international trade.
6. Design and implement a system of education, communication and information for rural development actors that will help to change attitudes and so contribute towards sustainable wildlife use.
7. Institute, as a preventive rule, studies and research to secure the biological criteria for the setting of quotas;
8. Undertake pilot projects to establish systems for the management of high-commercial-value species in local communities, bearing in mind the harvesting of the species in their natural habitats, e.g. the initiative for management of *Dendrobates* spp. with the communities of Río San Juan

9. Strengthen and redefine the operation of the Scientific Committee {agenda, arrangements for cooperation with other bodies, etc.);
10. Review decrees, rules and procedures such as Decree No. 8-98, "Rules and Procedures for the Export and Import of Species of Wild Flora and Fauna, and update technical standards for wildlife management;
11. Strengthen cooperation between institutions and alliances with local and regional authorities and NGOs;
12. Step up information and intensive training for all sectors and actors involved in wild flora and fauna harvesting and trade.

VI. FOLLOW-UP AND MONITORING

The present study, "Review of Nicaragua's wildlife trade policy", contains conclusions and recommendations to be taken into account in drawing up a national wildlife trade policy for Nicaragua. It has therefore been designed as a tool that can serve as the basis for drawing up such a policy.

As a first step towards putting the study's recommendations into effect, MARENA should endorse this document and promote its dissemination to all relevant bodies so that it can serve as an input to the process of strategic planning for the elaboration of the policy. It is suggested that the next step should be to secure specialized technical and financial assistance.

It will be essential for the elaboration of the policy to ensure the effective participation of the key actors involved, whether directly or indirectly, in wildlife trade. The process should be coordinated by MARENA with the participation of the following sectors: regional governments, INAFOR, INPESCA, representatives of wildlife trade, civil society and the scientific community.

Monitoring and follow-up of implementation should be effected through existing bodies and mechanisms within MARENA. The following will be of key importance in implementation and the subsequent follow-up: the Directorate-General of Planning (*Dirección General de Planificación*), the Directorate-General of Natural Heritage, the Office of the Legal Adviser (*Asesoría Legal*) and the National Environmental Information System. Grouped in a technical unit, they would have responsibility for follow-up, analysis of progress and achievements, and the biennial appraisal of the application and execution of the policy.

VII. OPTIONS

In view of the need to elaborate a national wildlife trade policy, consideration should be given to the following:

- ✚ Management by MARENA of financial support and specialized technical assistance for the drawing up of the policy;

- ✚ Strengthening the consensus among wildlife trade actors regarding a policy's benefits for sustainable wildlife use;
- ✚ Promoting broad participation by wildlife trade actors from civil society together with State bodies so as to guarantee a policy that will be accepted by all;
- ✚ Setting up an official Technical Committee for planning, implementation, follow-up and assessment of the recommendations for elaboration of a policy.

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IX. ANNEXES