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FINAL REPORT  
CUBA-NCSA.

NATIONAL CAPACITY NEEDS  
SELF-ASSESSMENT FOR THE GLOBAL  
ENVIRONMENT MANAGEMENT IN  
CUBA: CONVENTION ON BIOLOGICAL  
DIVERSITY; THE UNITED NATIONS  
CONVENTION TO COMBAT  
DESERTIFICATION AND DROUGHT AND THE  
UNITED NATIONS  
FRAMEWORK CONVENTION ON CLIMATE  
CHANGE.

Ministry of Science, Technology and Environment (CITMA), 2011.

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## ACHRONYMS\*

ACNU	_____	Cuban Association of United Nations
ACPA	_____	Cuban Association of Animal Production
ACTAF	_____	Cuban Association of Agriculture and Forestry Technicians
AMA	_____	Environmental Agency
AMUMA	_____	Multilateral Environmental Agreements
ANAP	_____	National Association of Small Agricultures/Peasants
CBD	_____	Convention on Biological Diversity
CCCDF	_____	Canadian Fund for Development on Climate Change (acronym in English)
CDM	_____	Clean Development Mechanism
CECM	_____	Executive Committee of the Council of Ministers
CENBIO	_____	National Center of Biological Diversity
CGB	_____	Forest Rangers Body
CHM	_____	Enabling Mechanism of the CBD
CICA	_____	Center for Environmental Inspection and Control
CIDA	_____	Canadian Agency for International Development (acronym in English)
CIGEA	_____	Center of Information, Management and Environmental Education
CITMA	_____	Ministry of Science, Technology and Environment
CNAP	_____	National Center of Protected Areas
CNCH	_____	National Council of Hydrographic Basins
CNSN	_____	National Center of Nuclear Safety
COMARNA	_____	National Commission for the Protection of the Environment and Natural Resources
CPACC	_____	Project on Planning for Adaptation to Climate Change in the Caribbean (acronym in English)
CSB	_____	National Center of Biological Safety
DCI	_____	Direction of International Collaboration
DMA	_____	Direction of the Environment
ENBIO	_____	National Strategy for Biological Diversity
ENEA	_____	National Strategy for Environmental Education

ENPFF	_____	National Enterprise for the Protection of the Flora and the Fauna
FAO	_____	Food and Agriculture Organization (acronym in English)
FMC	_____	Federation of Cuban Women
FNMA	_____	National Fund for the Environment
GEF	_____	Global Environment Facility (acronym in English)
GSP	_____	Global Support Programme for NCSA (acronym in English)
IES	_____	Institute for Ecology and Systematics
INRH	_____	National Institute for Hydraulic Resources
INSMET	_____	Institute of Meteorology
IPCC	_____	Intergovernmental Panel on Climate Change (acronym in English)
IPF	_____	Institute of Physical Planning
IUCN	_____	World Conservation Union (International Union for Conservation of Nature (acronym in English)
MACC	_____	Project on Main Trends for the Adaptation to Climate Change in the Caribbean (acronym in English)
MEP	_____	Ministry of Economy and Planning
MES	_____	Ministry of Higher Education
MFP	_____	Ministry of Finances and Prices
MINAG	_____	Ministry of Agriculture
MINAL	_____	Ministry of the Food Industry
MINBAS	_____	Ministry of Basic Industry
MINCEX	_____	Ministry of Foreign Trade and Investment
MINCULT	_____	Ministry of Culture
MINED	_____	Ministry of Education
MINFAR	_____	Ministry of Armed Forces
MINJUS	_____	Ministry of Justice
MTNREX	_____	Ministry of Foreign Relations/Affairs
MINSAP	_____	Ministry of Public Health
MINTUR	_____	Ministry of Tourism
MIP	_____	Ministry of Fisheries **
MITRANS	_____	Ministry of Transport
NCSA	_____	National Capacity Needs Self Assessment for the Global Environmental Management (acronym in English)

NES	_____	National Environmental Strategy (acronym in English)
NGO	_____	Non Governmental Organizations (acronym in English)
OACE	_____	Bodies of the Central Administration of the State
OLPP	_____	Local Bodies of the Popular Power
ONIP	_____	National Office of Fisheries Inspection
ONN	_____	National Office of Standards
ORASEN	_____	Office of Environmental Regulation and Nuclear Safety
PAN	_____	National Programme against Desertification and Drought
PNCT	_____	National Programme of Science and Technology
PPD	_____	Small Grants Programme GEF/UNDP
PRCT	_____	Sectoral Programme of Science and Technology
PTCT	_____	Territorial Programme of Science and Technology
REDFA	_____	Cuban Network for Environmental Formation
SEAP	_____	Economic Society/Association of Friends of the Country
SEF	_____	State Forestry Service
SNAP	_____	National System of Protected Areas
UMA	_____	Environmental Units of the Territorial Delegations of CITMA
UNAICC	_____	National Union of Engineers and Architects of Cuba
UNCCD	_____	United Nations Convention to Combat Desertification and Drought (acronym in English)
UNDP	_____	United Nations Development Programme (acronym in English)
UNEP	_____	United Nations Environment Programme (acronym in English)
UNFCCC	_____	United Nations Framework Convention on Climate Change (acronym in English)
UNOPS	_____	United Nations Office for Projects Services (acronym in English)
WGIII	_____	Working Group III of the Intergovernmental Panel on Climate Change (acronym in English)

\* Acronyms in Spanish – meanings/names in English

\*\* Due to institutional changes, MIP became extinct as a Ministry and fisheries activity was absorbed by MINAL.

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## **CHAPTER 1. REPORT ON THE EXECUTION OF THE NCSA CUBA PROJECT**

### **1.1. Introduction**

Cuba, as Part of the Convention on Biological Diversity (CBD); the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Convention to Combat Desertification and Drought (UNCCD), has concluded the NCSA National Capacity Needs Self Assessment for the Global Environmental Management within the context of the three conventions mentioned above, based on the consultation and participation of a wide group of institutions and experts in the whole country.

Project No. GFL-2328-2740-4914 "Cuba - National Capacity Needs Self Assessment for the Global Environmental Management" was approved by GEF-UNEP in January 2006, with a starting date of June in that same year, to be executed in 18 months. Its actions are concluded with this Final Report, which was submitted for consultation to all Government Bodies of the Central Administration of the State (OACE) in June 2010, after a delay caused by several factors and barriers which were finally overcome, and that have been properly explained to the funding institutions.

This Chapter reflects the evolution of the project since its beginning to its conclusion.

### **1.2. Implementation activities**

In November 2006 the project was presented to the environmental structures of the Ministry of Science, Technology and the Environment (CITMA). The presentation took place during the National Workshop for the "National Environmental Strategy (NES) 2007 – 2010", making use of this frame to prepare and discuss the EAN to which all the results foreseen in the NCSA will be linked.

At this time, and under the supervision of the Vice-minister for the Environment of CITMA and the Direction of the Environment (DMA) in charge of the general coordination of the project, the national experts, the national coordinator and the structures for developing the project had been identified and nominated.

The work plan and the budget were presented and discussed; the steps for the NCSA were explained and defined. At the same time, the Government Bodies of the Central Administration of the State (OACE) acting as counterparts and the experts at the provincial level to be involved were identified.

Steps were then taken towards a successful development of the project, but a series of changes in the economic and institutional context of the country, made it advisable to make a stop in order to adjust the work plan and, among other things, renegotiate with GEF – UNEP the budget initially approved.

The initial budget did not take into consideration the decision on the Cuban side to assume all the personnel expenses, for a total of 50 000 USD (it included allotments of 1 100 USD for the project personnel; 1 200 USD for national consultants; and 1 300 USD for the administrative support personnel). This amount was renegotiated in its distribution and was accepted by GEF – UNEP.

The new version of the project included, unlike the previous one, the NES 2007 – 2010 guidelines and strengthened the provincial, regional and ecosystem approach in order to increase the role of the global environmental management at the local level. In this way, the project would center not only on the management of the three conventions, but on a wider range of the environmental management of the country.

This new version of the project was analyzed at the Latin American Regional Workshop that was held in Santiago de Chile, on September 2006, hosted by UNDP/GEF/UNEP and attended by the experts of the Global Support Program (GSP) of the NCSA of UNDP. At that time, it was advised to proceed with the projected changes, to include the approach of the base and by ecosystem, and in that sense, to carry out the pertinent modifications.

As a consequence, a wider analysis at the national, regional (ecosystem) and provincial scale of the needs for capacities for the management of biodiversity, soil degradation, and climate change, and of the synergies between them was carried out, according to the goals of sustainable development of the country.

The effective start of the project was on November 2008, with all the new approaches incorporated, and taking into consideration all the modifications to the norms and institutional bases that took place between 2007 and 2008.

### **1.3. Main lines of analysis developed**

The Cuba NCSA Project focused not only on the global environmental management at the national level, but also its regional and provincial approach. In this report we have taken into account the results of the implementation of NES 2007 – 2010 (ongoing) and interacted with the first drafts of NES 2011 – 2015, which will consider the outputs of the Project itself.

The capacity needs identified for each of the conventions and the synergies between them, will therefore have a national, ecosystem and territorial approach. That is why the results presented in the 5 products of the Project, that is: State of the global environmental management; Report on the capacity needs; Report on the synergies found, Action plan and Portfolio of project ideas, are reflected at the national level, at the main ecosystems and at each of the provinces of the country.

It should be remarked, that the Portfolio of project ideas is an additional product, not considered in the requirements of the initial project.

### **1.4. The approach for capacity assessment and its synergies**

The assessment of the project is based on the analysis of the situation of the global environmental management in Cuba, according to Law 81 of 1997 and NES 2007 – 2010.

The situation of the environmental management is presented regarding the following instruments:

- ☛ Convention on Biological Diversity (CBD).
- ☛ United Nations Framework Convention on Climate Change (UNFCCC).

- ☞ United Nations Convention to Combat Desertification and Drought (UNCCD).

The state of implementation of the obligations arising from each one of the conventions, and a deep analysis of capacity needs for their management, always from the standpoint of the Cuban environmental policy is presented.

- ☞ Capacity needs identified by CBD.
- ☞ Capacity needs identified by UNFCCC.
- ☞ Capacity needs identified by UNCCD.

The result of the analysis of the crossed relationships between these needs and the identification of the synergies found between them, which are expressed in the "Report of the synergies found at a national level" is presented.

For each one of the priority ecosystems identified, the report of the synergies found at that level is presented, including:

- ☞ Mountain ecosystems.
- ☞ Coastal marine ecosystems.
- ☞ Ecosystems in the hydrographic basins and bays.
- ☞ Agro-productive ecosystems.

Obtained from the analysis, the Action plan for the most effective solution of the synergies found, and the Portfolio of project ideas to carry them out is presented.

The Final Report, with all the outputs described at the national level, has as its main base the analysis that was carried out at each one of the provinces, enriched with the contributions of the national experts which represented the National Groups for attention to the conventions.

### **1.5. Institutional coordination and arrangements to execute the project**

The Cuba NCSA Project required multiple coordination activities and institutional arrangements, which allow us to state that the results obtained count with a wide national institutional recognition and support, which is validated by the Focal Point for the Project.

CITMA acted in its role of implementing agency, supervising, directing and supporting the execution through its already existing infrastructure. The Environmental Council, a coordination structure that brings together the environmental institutional instances of CITMA was involved in the project. The national coordinator, the national experts, as well as the coordinators for each one of the provinces and regions were approved within this frame.

CITMA designated the Direction of Economy and its Head of Accounting as accounting counterparts for the project, to ease banking procedures for issuing checks and the presentation on time of the Trimonthly Control Reports. Likewise, support was received from the Administrative Authorities of CITMA for the logistics of the project, including the purchase and payment of contracted services. Without

doubts, this support was a factor that allowed saving on budgeted resources, which were covered in part or fully by the Ministry. It should be pointed out the contribution of over 50 000 USD on personnel expenses that were covered fully by CITMA.

The conduction of NCSA has been deployed under the attention of a National Direction Committee, which with the direction of the Vice minister of CITMA, approved the budget, the work plans since the beginning, and gave continuity to the project. The Government Bodies of the Central Administration of the State (OACE) linked to the management of the conventions and to the implementation of the NES were represented in this Committee, facilitating the necessary levels of coordination at the national and local level.

Since the beginning, the Coordination Committee functioned at the expert's level, led by the Direction of the Environment through its national coordinator, and with the designated experts at a national level. They were supported by the National Groups for attention to the conventions under study.

The Coordination Committee provided guidelines, materials and orientation to carry out the work at the three levels (national, regional and local), insuring a wide participation of experts and associated institutions from the provincial level, so it could be stated that more than 200 experts were involved at one stage or another of NCSA.

The structure of these committees is presented in Annex I.

An important element to point out is that no specific administrative structures were created for the project. The project was developed on the base of already existing structures and drawing on the experience the country already has at all the levels of environmental management. In the process, not only administrative instances were included, but also universities and Non-Government Organizations (NGO). Annex II shows in detail the list of institutions that participated.

Fourteen (14) Provincial Project Coordinators were identified and approved along the country, and four (4) Coordinators were appointed among them for the regional level, with the following composition:

- ☞ West (for the four western provinces and the Special Municipality): Havana, City of Havana, Matanzas, Pinar del Río and the Special Municipality of the Island of Youth.
- ☞ Central West (for three provinces of the center of the country): Villa Clara, Cienfuegos and Sancti Spiritus.
- ☞ Central East (for three provinces at the central east of the country): Camagüey, Ciego de Avila and Las Tunas.
- ☞ East (for the 4 eastern provinces): Guantánamo, Santiago de Cuba, Granma and Holguín.

The Provincial Coordinators were in charge of directing the steps of the NCSA at that level, and they in turn, based themselves in groups of experts in each territory, involving institutions, NGO, universities and government agencies linked to the global environmental management at the territorial level.

As a result of the work in the project, each province had the following final outputs:

- ☞ Provincial assessment report on the environmental management of the conventions studied.
- ☞ Provincial report on the capacity needs for the management of each convention.
- ☞ Report on the synergies found.
- ☞ Action plan and portfolio of projects.

These outputs constitute the base for perfecting environmental management at their level and will provide vital elements for the territorial environmental strategies in their new implementation cycle.

The Regional Coordinators played an outstanding role in the analysis and synthesis of the ecosystem outputs of the project, as well as in the orientation to the Provincial Coordinators during the whole NCSA process.

Likewise, each region has the integrated output of the 5 steps of the project, which are useful as a base of information for future and coordinated actions in ecosystems shared by one or more provinces, as well as for integrating the results at a national level.

The reference terms were complied with at all levels, once they had been adjusted to the final structure of the project. The Environment Units (UMA), as territorial structures of environmental management, as well as their Directors and experts, combined the execution of the project with their daily tasks of environmental management at the base/local level, without causing additional expenses. It was achieved that all the structure of environmental management at the base/local level became involved in this evaluation, and gather from them the lessons learned for a better use of the synergies.

Finally, it should be remarked that the participation of the national experts was decisive. They transmitted to the project their wide knowledge of the management the conventions which with they are involved, prepared the necessary materials for territorial involvement, participated in the process of creating capacities at the base level/local level, compiled and synthesized all the information upwards and downwards, making possible for us to arrive at this Final Report.

## **1.6. Project execution**

As it has been explained above, the execution and development of the project required reiterated efforts of coordination to involve all the implicated parties. For the reason already stated, 2 initial workshops and seminars were held in 2006 and 2008 for the necessary updating of those participating in the project and for a full coherence of the national and provincial work structures, in environmental management that had been modified during that period.

Capacity creation and the preparation of all the participants in the use of the tools recommended by the Global Support Program (GSP) of UNEP was vital and were the foundation of the quality of the results achieved.

The two initial seminars at a national level, together with the definitive inauguration in 2008, enabled that on 2 occasions over 60 national and local experts, as well as representatives of different institutions, could acquire the logics of the 5 steps of NCSA.

**Frame No. 1.** List of materials prepared and distributed among the experts that participated in the project.

**1. TEXT OF THE CONVENTIONS**

- a. On Climate Change.  
I.Kyoto Protocol.
- b. On Biological Diversity.
- c. To Combat Desertification.

**2. PROGRAMMATIC AND POLICY DOCUMENTS**

- a. Law No. 81 of the Environment of 1997.
- b. National Environmental Strategy 2007-2010.
- c. Brochure with materials about the conventions.

**3. METHODOLOGICAL DOCUMENTS FOR THE PROJECT**

- a. NCSA guides (in English).
- b. Methodology and set of tools of NCSA.
- c. Assessment system of NCSA.
- d. Profiles of the conventions.
- e. Presentations of the Global Support Program to NCSA.

**4. DOCUMENTS OF THE PROJECT**

- a. Final Report phase PDF.
- b. National counterpart project.
- c. Final approved project.

Four seminars for initial capacity building were held, one in each region with the presence of the Provincial Coordinators and experts recruited by them for the project, bringing the number of experts to more than 70, both from CITMA and from other institutions. Those participating in these seminars got imbued with the work concepts and the principles of taking advantage of the synergies, which we consider to be the first immediate utility of this project.

In these capacitating actions, besides the indications on how to approach each NCSA step, and distributing the necessary materials to support the assessment of the capacity needs, instructions were imparted for gathering the information,

something that allowed having a report on the current state of management at the provincial and the region levels for each convention studied.

## **1.7. NCSA steps at the provincial level**

### **1.7.1. Gathering the information. Step No. 1 of NCSA**

Since December 2008, while the national experts updated the state of the management for each convention with a national approach, at each province a process of capacitating the participants in the project was in motion. This served as information and learning on how the NES and the Territorial Environmental Strategy reflected in that regard, on being able regarding the Global Environmental Conventions at that level, and above all, to identify the capacity needs, to comply with the commitments and the Law, as well as with the environmental policy at the provincial level.

In each province, this process was preceded by seminars and workshops to assess the status of management of each convention and its correspondence to what has been achieved in the territory.



### **1.7.2. Identifying capacity needs. Step No. 2 of NCSA**

Following the previous step, the next was to identify gaps and capacity needs. This process took into consideration the provincial reports on the status of the environment, the reports of compliance with work goals, and other environmental management reports as well as the mandates of the conventions and their concretion at the territorial level.

For this step at least one workshop was held at each province, which allows us to state that there was a wide participation at the base in the identification of the capacities needed.

### **1.7.3. Determining crossed relationships and identifying the most significant synergies. Step No. 3 of NCSA**

Arising from the previous step, analyses were developed within the provincial context, preceded by the capacitating provided at the initial seminars, with an explanation of the ways to determine crossed relationships. A basic element was the debate of what was understood as synergy, how to identify it and how to extract from it the approach in order to use it with a maximum efficiency.

Steps 2 and 3 of NCSA also identified the most significant ecosystems at the level of each province, and projected the manner in which the study of the synergies could be used by the neighboring provinces with shared ecosystems and identified the capacity needs and the synergies between them at this level.

### **1.7.4. Plan of action. Step No. 4 of NCSA**

Planning the use of the synergies in each territory was the next step of the project at the base/local level. Starting from the systematization of the needs of a synergic character, each province elaborated an action plan to foresee the process of facing the synergic capacity needs that had been identified.

The current level of organization of the structure for the attention to the environment in the country, and the changes that were taking place, made it impossible to define the action plan to the last detail, with insufficiencies like the lack of identification, in some cases by those responsible for it, others by not meeting the due dates of the actions, and in some others by the lack of the necessary funds for it.

The insufficiencies in the elaboration of the action plan reflect a lack of additional capacity that has been taken into consideration in the national compendium of this project, and in consequence will be compiled as such at the national level.

### **1.7.5. The portfolio of project ideas. The last step**

Just like it was conceived, the action plan at the level of each province offered the necessary information to foresee ideas of preliminary projects that would allow approaching the actions that is necessary to deploy to make use of the synergies.

The portfolio has identified a group of projects that, responding to the synergies and with adequate financing, could lead to their approach and solution in an integrated manner, with outputs in the three sphere of attention of the project.

Projects were identified to function with funding from the National Fund for the Environment and other projects could apply for funds to the Small Donations Program (PPD) of GEF – UNDP. Likewise, other projects were recommended to be included to the portfolio at the national level.

The NCSA steps developed at the provincial level were presented and discussed at the 4 Regional Workshops where the results reached by each province were debated. In the same way, the regional outputs of the project were analyzed in their ecosystem approach.

All the information gathered at the base was integrated with that provided and processed by the national experts of the project. In this sense a national report was prepared and debated at the National Meeting of the Environmental System, where over 60 officials from CITMA and directors of the main instances for the attention of the environment in the country were present.

This allows us to state that this current document has a high level of consultation, convocation and conciliation. In the following chapters, this report gathers the results derived from this project at a national level.

**Table No. 1.** List of validation seminars and workshops held during NCSA.

No.	Activity	Results	Number of experts and officials that attended *
1	Inaugural NCSA Workshop	Methodological, conceptual elements, tools and information, to carry out the work of the project.	40
2	Regional workshop (East Region)	The specialists, provincial and regional coordinators were capacitated and the capacity needs to improve environmental management were identified.	19
3	Regional workshop (Center East Region)	The specialists, provincial and regional coordinators were capacitated and the capacity needs to improve environmental management were identified.	18
4	Regional workshop (Center West Region)	The specialists, provincial and regional coordinators were capacitated and the capacity needs to improve environmental management were identified.	20

5	Regional workshop (West Region)	The specialists, provincial and regional coordinators were capacitated and the capacity needs to improve environmental management were identified.	19
6	Regional workshop (East, Central East and Central West Regions)	The provincial and regional reports were presented and discussed, identifying capacity needs, establishing the synergies, action plans and portfolio of projects, as well as a proposal for work at the national level.	39
7	Regional workshop (West Region)	The provincial and regional reports were presented and discussed, identifying capacity needs, establishing the synergies, action plans and portfolio of projects, as well as a proposal for work at the national level.	24
8	National Workshop with the Environmental System of CITMA	The national report was presented and discussed, identifying capacity needs, establishing the synergies, action plans and portfolio of projects.	60

\* Does not include participation of national experts and the directors of the territories that attended.

# CHAPTER 2

## CHAPTER 2. REPORT ON THE STATUS OF THE GLOBAL ENVIRONMENTAL MANAGEMENT

### 2.1. Environmental context

#### 2.1.1. Physical and socio-economic antecedents<sup>1</sup>

The Republic of Cuba is an Archipelago, which is part of the Greater Antilles, with a total surface of 109 886 km<sup>2</sup>. It is comprised by two main islands: the Island of Cuba and the Island of Youth and over 1 600 cays and small islands around it. The main island has 5 746 km of coasts. The island shelf has the relief of a submerged plain with a surface of 67 831 km<sup>2</sup>. Cuba is in the tropical climate zone, with a mean annual temperature of 25,4 °C and a mean annual rainfall of 1 287 mm.

The economy of the country is based on the exploitation of natural resources and is mainly agricultural, although in the last years beach and sun tourism has become the main drive of the economy. Agricultural land surface in the country is estimated in 6 619 thousands of hectares.

The total surface covered by forests is 2 932,3 thousands of hectares, which represents 26,69% of the total surface of the national territory (compared with the year 1959 when the forests surface was only 14%), of them 2 435,8 thousand ha correspond to natural forests and 496,5 thousand ha to plantations. 47% of the forests in Cuba are under a protection category, 22,1% are considered conservations forests and 30,9% are in the production category.

79% of the surface of the country has a flat-wavy relief and 21% are mountain ranges or mountain chains, with the highest altitude at Pico Real del Turquino with 1974 m above sea level. Cuban biodiversity is considered to be the highest in the Antilles.

Due to its long and narrow shape, it has a central watershed from East to West, so the rivers are short and with low flows. The longest one is the river Cauto, and the largest flow is that of the river Toa, both in the Eastern region of the country. Potential hydric resources are equal to 38 1000 millions of m<sup>3</sup>, those useful are 23 800 millions of m<sup>3</sup>, and available are 13 000 millions of m<sup>3</sup>, which gives an availability index of 1 215,9 m<sup>3</sup> per inhabitant/ year for all uses.

### 2.2. Specific environmental issues related to NCSA

Cuba has ratified CBD, UNFCCC, and UNCCD, and is part of other regional and international environmental conventions of great importance. Current critical environmental issues in Cuba include: soil degradation, loss of biological diversity, vulnerability to climate change and the raise in sea level, and to natural disasters like droughts and hurricanes.

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<sup>1</sup> Data was gathered from the Cuban Statistical Yearbook 2010. 2011 Edition. National Statistics Office (ONE). Information closure - December 2010.

### 2.2.1. Soil degradation and desertification

The last diagnose on desertification and drought in Cuba, carried out in the year 2000 as part of the Program to Combat Desertification and Drought, showed that 14% of agricultural lands are affected in different degrees by the process of desertification, which means the presence of extreme conditions for the production of food. Likewise 76% of agricultural lands are afflicted by factors that limit agricultural production, making these lands little or very little productive.

Drought, which becomes ever more intense, has doubled its frequency of occurrence in the last decades. The Isohyetical map published in 2005 by the National Institute of Hydraulic Resources (INRH) showed an increase of 146 400 ha in arid lands (semiarid and dry subhumid) as a result of the comparison with the arid index for the 1961-1990 and 1971-2000 periods. Drought events are occurring along the country; however, drought shows to be more intense in the eastern provinces.

The processes leading to desertification with the highest incidence in the national territory are erosion, salinity, compaction and loss of fertility of the soils. The anthropogenic factor has unleashed these processes in a more dynamic and extreme manner in those areas where climate conditions foster the emergence of such phenomena. Where climate conditions are less severe and the action of men is less aggressive, the emergence of degrading phenomena is less evident. The action of man has had a high incidence on degrading factors such as deforestation, overexploitation and change in the use of land, overgrazing, miss management of waters, of the irrigation technologies, of crops and the use of inappropriate technologies, among others.

The creation of the National Program to Combat Desertification and Drought (PAN) in 2000, responds to one of the commitments established by Cuba in 1997, when ratifying the United Nations Convention to Combat Desertification and Drought. Therefore, its implementation, financial support, as well as compliance with the planned actions are a responsibility of the Cuban Government. To fulfill such commitments, the Government makes available the means and its mobilizing capacity of all the sectors of the population to the structures established in the country.

Based on the work developed in the implementation of PAN, through the programs and sustainable development projects existing in the country, an Association Program of the Country was crated for a period of 10 years (2008 – 2010). Its main objective was to support the Program to Combat Desertification and Drought with funding from the Government of Cuba and from the Global Environment Fund. The Association Program has 5 projects aimed at strengthening the national capacities to apply to the sustainable management of soils and to promote related agricultural technologies.

### 2.2.2. Global climate change

After taking an active part in the negotiations for the adoption of United Nations Framework Convention on Climate Change (UNFCCC) the Republic of Cuba ratified the Convention on January 5<sup>th</sup>, 1994, and became a party of it on April 5<sup>th</sup>, 1994.

In 1991 the Academy of Sciences of Cuba established the Commission on Climate Change, which in 1992 carried out a preliminary assessment on the potential effects the climate change would have on Cuba. The sectors assessed were agriculture; hydrology and hydric resources; land natural ecosystems; ocean and coastal areas; human settlements; health and tourism. The method use was that of expert's judgment, based on the reports of the Intergovernmental Panel on Climate Change (IPCC) of 1991 and 1992, and available publications and studies carried out in Cuba.

The results were integrated in an evaluation report, of a preliminary character, taking into consideration the existing uncertainties regarding the climate scenarios used and the lack of regional and local scenarios. The results showed the high degree of vulnerability of the Republic of Cuba to the potential impacts of the climate change.

Afterwards, the projects finished within the frame of the National Program for Science and Technology (PNCT) "Global changes and the evolution of the Cuban environment" have provided important results and tools. Because of their relevance, many of those projects have received awards from The National Academy of Sciences of Cuba, among them the one entitled "Climate change impacts and adaptation measures in Cuba", which is the most complete evaluation on vulnerability and adaptation to climate change carried out in the country. The sectors evaluated were: hydric resources; coastal zones and marine resources; agriculture and silviculture; human settlements; biodiversity and human health, taking into consideration future climate projections at different time intervals.

Because Cuba is an archipelago, the potential impacts of climate change and the possible increase of natural disasters related to extreme meteorological events and sea level rise, point out that adaptation is the most important thing. The following is a list of areas that are approached on a continuous base:

- ☞ Strengthening the observation and research systems in areas related to the environment such as climate, hydrology and the ocean;
- ☞ Increasing public awareness in areas related to climate and meteorological impacts;
- ☞ Rational use and protection of hydric resources;
- ☞ Conservation and protection of beaches and coastal areas (mangrove forests);
- ☞ Increasing the capacity to adapt to climate impacts of Cuban agriculture and forest systems;
- ☞ Adequate use of land planning in human settlements and the use of soils;
- ☞ Protecting biological diversity; and
- ☞ Increasing the response capacity of the Cuban health system.

Among the strengths Cuba has as part of its capacity to adapt is having fully operational early warning systems, which are essential tools for taking the most adequate decisions in the face of situations created by variability and climate change, especially in the case of extreme events like tropical hurricanes, heavy rains or severe droughts. The early warning systems are by themselves preventive adaptation measures.

Another strength is the use of the science and technology potential available for research in this field. We also count with systems to observe the climate; both are components of the adaptation capacity, and which have to be in a constant process of strengthening. The education of the population and the best understanding of the problem by the actors at different levels must be part of an adaptation strategy, for which Cuba has sufficient strength.

Although the contribution of the Republic of Cuba to global warming is very reduced, programs such as the Energy Revolution in Cuba (in action since 2005) contribute to mitigate climate change. This program includes lines such as energy saving, developing renewable sources of energy, and raising awareness and environmental education of the general population on topics of energy and the environment. The increase of forests area after the triumph of the Revolution has been an important contribution to mitigate climate change due to the important role played by forests in the absorption of CO<sub>2</sub> from the atmosphere. At the end of 2010 the surface of the country covered by forests was 26,69%.

### 2.2.3. Biological diversity

The National Study of Biological Diversity of the Republic of Cuba<sup>2</sup>, funded by GEF – UNDP, concludes that biological diversity in our archipelago is characterized by outstanding values of the natural environment, the great diversity of existing ecosystems and the high degree of endemism in its resources, making the national territory a unique example of regional and world patrimony. It is the largest center of biological diversity in the Antilles, both in total number of species as on the degree of endemism.

The above mentioned study states that as Cuba is a small island state, with limited surface and natural resources for its development, the use of elements of the biological diversity is the basis of the country's programs, for the land areas as well as for the coastal and marine areas.

Regarding the flora, there are 17 different forest formations, 7 bush formations and 4 herbaceous formations. Taxonomists report the existence of 9107 known species<sup>3</sup>, which include 911 moss and liverleaf (hepatica) species, 557 of ferns and 6 519 of higher plants. Within this last group, flowering plants (Angiosperms) are represented by 6 500. The most relevant characteristic of the Cuban flora is its high degree of endemism, based on the fact that 52,4% of the total of higher plants are endemic<sup>4</sup>.

17 818 species are known for the Cuban fauna. Groups like the mollusks (2 913 known species), the arachnids (1 422 species) and insects (7 493 species) are outstanding for their diversity, and for which the estimates of yet to be discovered species are considerable<sup>3</sup>. At the species level we count with 15 endemic mammals, 28 bird species, 57 amphibian species, 21 fish species, 861 mollusk species and 124 reptile species<sup>4</sup>.

<sup>2</sup> Vales, M. A.; Álvarez, A. L. Montes y A. Ávila (Compilers) 1998: Estudio Nacional de la Diversidad Biológica en la República de Cuba. 488 pp. CESYTA Publishing House, Spain.

<sup>3</sup> Cuban Statistical Yearbook 2010. 2011 Edition. National Statistics Office (ONE). <http://www.one.cu/aec2010/datos/2.33.xls>

<sup>4</sup> Cuban Statistical Yearbook 2010. 2011 Edition. National Statistics Office (ONE). <http://www.one.cu/aec2010/datos/2.34.xls>

Comparing with the number of known species, out of 62 amphibian species, 57 are found only in Cuba (91,9%). In the case of the reptiles, there are 153 known species and 124 are found only in Cuba (81%).

Until today the number of marine invertebrates recorded in Cuba is over 5 700 species, and that of chordates is over 1 060 (mostly fishes). Including microorganisms and marine flora, over 7 650 species are currently known, all of them included in lists from December 2006<sup>5</sup>.

Regarding vascular flora, of 3 163 studied species, 24 are considered extinct, 413 species to be in critical danger, 442 species in danger and 332 vulnerable<sup>6</sup>. Regarding the fauna, of 948 species studied, 5 are considered extinct, 60 species in critical danger, 68 species in danger and 295 vulnerable species<sup>7</sup>.

Possibly, the main causes of the loss of biodiversity in the country are the alterations, fragmentation or loss of habitats/ecosystems/landscapes. Other processes that have affected it are: overexploitation of resources; introduction of exotic invading species; soil, land and atmospheric degradation and pollution.

The richness of the biological diversity of the Cuban archipelago has allowed to propose establishing a National System of Protected Areas (SNAP) which has 253 identified areas which represent 19,95% of the national territory including the marine island shelf. 91 of the areas have national significance and the other 162 have local significance.

By the end of 2010, 80 of these 253 areas are legally approved by the Executive Committee of the Council of Ministers (CECM), covering 13,68% of the national territory including the marine insular shelf. From these approved 80 areas, 53 are of national significance and 27 of local significance.

Up to 2008, it is known that 43,3% of the identified landscapes for the country are well represented, with more than 20% of their surface within protected areas; that the presence of wetlands in protected areas of the strictest categories is significant (25,7%); that the percent of plant formations represented in SNAP is still insufficient; that 25% percent of the island shelf is included in some type of protected area; that coral reefs are widely represented with a 57%. Regarding the flora, 89% of the autochthonous species, 85,3% of the endemic species, and 77% of the threatened species are covered. For the fauna, the legally recognized protected areas cover 75,1% of all the species of the analyzed Cuban vertebrate groups, 78,4% of the endemic species and 82,3% of the threatened species<sup>8</sup>.

Four National Reports to the Convention on Biological Diversity have been elaborated until today. In 2009 the IV report was finished, updating the information

<sup>5</sup> Claro, R. (ed.). 2007. La Biodiversidad marina de Cuba. (CD-ROM), Instituto de Oceanología, Ministerio de Ciencia, Tecnología y Medio Ambiente, La Habana, Cuba, 317 pp, + Anexos. ISBN: 978-959-298-001-3. Online version: <http://www.redciencia.cu/cdbio/>

<sup>6</sup> Cuban Statistical Yearbook 2010. 2011 Edition. National Statistics Office (ONE). <http://www.one.cu/aec2010/datos/2.36.xls>

<sup>7</sup> Cuban Statistical Yearbook 2010. 2011 Edition. National Statistics Office (ONE). <http://www.one.cu/aec2010/datos/2.37.xls>

<sup>8</sup> IV National Report to the Convention on Biological Diversity. 2009. Ministerio de Ciencia, Tecnología y Medio Ambiente.



### 2.3. National environmental policies, strategies and legislation

Sustainable development is conceived in the country as the primordial aim of general national chores. This is reflected in Article 27 of the Constitution of the Republic, a document of the highest legal existing level. Actions to achieve this are channeled through the Council of Ministers and the government network which embraces all the institutions in the nation.

Environmental policy in Cuba has its antecedents in the constitution of the Academy of Sciences of Cuba in 1960. The Academy of Sciences systematized the basic studies carried out in previous times and set the basis for a conservation and improvement policy and of sustainable use of natural resources.

The first high level regulation was Law No. 33 for the Environment and Natural Resources, passed in 1981, which established the foundations of the environmental policy of the country. It was implemented through the creation of the National Commission for the Environment and Natural Resources (COMARNA). Later in 1993, the government of Cuba adopted its national Program for the Environment and Development, a national adaptation of Agenda 21. Territorial plans were developed in each province.

With the creation of the Ministry of Science, Technology and the Environment (CITMA) in 1994, a significant step in the reorganization of the government institutions, national environmental policy and management were strengthened. It then became evident the need of structuring the key elements of that environmental policy within a strategic framework that would define clearly and concisely the main environmental problems of the country and the actions to deal with them.

In 1997 the government approved the National Environmental Strategy (NES). This rector document for the environmental policy of the country was a key tool for the environmental activities. It helped structure and project important advances in the national environmental management and to strengthen the concept of sustainable social and economical development stated in the Constitution of the Republic of Cuba. Later, sector and territorial strategies were developed. All these documents identified the need to create capacities as an essential element of their implementation.

Currently, the NES is being implemented in its 2007 – 2010 period. It contemplates identifying, integrating and coordinating the synergies as an essential element for the effective development of this cycle and of the national strategic framework. A new cycle for 2011 – 2015 of the NES is being elaborated and discussed. It will be enriched with the results of NCSA.

The approved strategies, programs and plans are a conceptual planning tool which allows a gradual construction of the Cuban environmental policy in an organic manner. At the same time and according to what is provided in the Law of the Environment, all economic and social development plans, programs and projects, be them of a national, provincial or municipal character, shall be developed or adjusted as needed in accordance with the guiding principles of that Law, to the environmental policies, strategies and programs established by the competent authorities and any dispositions they issue.

Table No. 2 shows some of the national programs related to the objectives of the NCSA project.

**Table No. 2.** Existing national programs linked to the aims of NCSA project.

National Programs	Description
Soil Improvement and Conservation	An integral program aimed at the sustainable use of the soil resources, taking into consideration the environment of the hydrographic basins of a national interest.
Food	Aimed at satisfying the alimentary requirements of the population without affecting the natural resources involved in it.
Hydraulic	Its aim is to satisfy in a rational manner, in quantity and quality, the demand of hydric resources for economic and social development, with consideration to the protection of land and coastal marine ecosystems.
Reconverting the sugar industry	Implements and organizes the change in the use of lands that were used for sugarcane cultivation into diversified areas for the production of food and forest resources. Includes actions to alleviate the social impact of such changes.
Forestry	It is aimed at fostering and improving forest coverage in the Cuban territory, at the protection of forests, of natural areas and the biodiversity in them. It has a projection up to 2015.

Due to its importance, the "Program for Facing Climate Change in the Cuban Society", approved by the Cuban government in October 2007 is presented in detail. Through this Program it is agreed to:

- ☞ Introduce as an internal environmental evaluation tool a regular inventory of the greenhouse effect gases (emissions and absorptions) in the programs of the Energy Revolution and other related activities linked to its mitigation.
- ☞ Give priority and conclude the studies on the danger, vulnerability and risk in the whole country, incorporating the technological, sanitary and social dimensions with the participation of the scientific potential and implementing the recommendations in each Central Government Agencies and Local Power Organs.
- ☞ Create an Environmental Monitoring network on the status and quality of the coastal zone which will allow a systematic evaluation for decision making.
- ☞ Incorporate a dimension for adapting programs, plans and projects linked to the production of food (includes plant and animal health), integral management of water, territorial planning of the coastal zone and hygiene and epidemiology.

- ☞ Include the topics of adapting to climate change in the environmental education plans of the different levels of education.

The different programs of the current Energy Revolution, besides being important steps towards our energy independence, have also been important contributions on the part of Cuba towards mitigating climate change due to the reduction in the emission of gases that cause it.

In the next stage efforts will continue in this purpose, in particular towards achieving higher energy efficiency and developing and using renewable sources of energy. Besides being a contribution to the energy independence of the country, it is a clear message of the political will of Cuba to make a contribution to mitigate climate change. At the same time it will be a contribution to the fulfillment of our current and future international commitments related to the subject.

In general, the country has made relevant advances in the studies of risks, dangers and vulnerabilities, and important tool of early adaptation to the effects of climate change and to the occurrence of extreme climatic events. These studies, currently in full development, have been taken up to the municipal level. At this stage they include foreseeing the impacts of floods from ocean penetrations, from heavy rains, as well as those caused by strong winds. The studies will have a real effect in the early adaptation to the impacts of climate change only if they are properly integrated in the Land Use Plans of each territory. They should constitute the base for decisions such as relocation or not locating human settlements nor any other works of social or economic interest in low coastal zones in the face of an expected higher occurrence of sea penetrations and extreme climatological events.

Due to their importance, it is also necessary to describe the actions relating to environmental education carried out in the country.

The National Strategy for Environmental Education (ENEA) has been implemented under the leadership of CITMA, in coordination with the Ministries of Education, of Higher Education, and of Culture, through programs, projects and action plans. These are executed in a concerted manner by the Cuban Network of Environmental Formation (REDFA), which groups entities from Government Bodies, organizations from the civil society, mass media, recreational institutions, communities, the business sector and other key actors, in order to work with the different goal groups. Currently the ENEA is being updated for the 2010 - 2015 period.

Environmental education has been recognized as a priority aim of the National Educational System and in the higher education plans for the initial and continuous formation of professionals up to the level of Masters and Ph.D. Special attention is given to the environmental formation of teachers, professors and educational officials. With this aim, the structures for the management of environmental education at the universities, in particular at the Pedagogical Sciences universities, have continued to be strengthened.

A wide ranging program of environmental communication is developed through the state radio and television, which includes national, provincial and municipal radio stations and TV channels. They have regular programs and sections dedicated to environmental topics of interest and prioritized by the different territorial levels.

Within the framework of REDFA, for mountain ranges, hydrographic basins and protected areas, special programs are held that promote capacitating directors, technicians, producers and communities on topics such as: sustainable use of land; protection of hydrographic basins; sustainable use of natural resources; integrated coastal zone management; use of renewable sources of energy; rational use of the water resource; prevention of disasters and facing climate change, among other topics.

An important element of a general character is the one related to the environmental legislation, with Law No. 81 for the Environment the main legal base for the environmental policy of the country, and the instrumentation of the three conventions analyzed.

Law No. 81 for the Environment was approved by the National Parliament in 1997. It provides the legal frame and mechanism to protect the environment, as well as for planning environmental management, coordinate the interrelationships of the environmental problems, and warrant proper implementation of government policies and the safety dispositions required for the protection of human health and of the environment.

Cuban environmental policy is executed through the following instruments defined by Law No. 81:

- a) The National Environmental Strategy, the National Program for the Environment and Development, the Territorial and Sectorial Strategies and all the other programs, plans and projects for economic and social development.
- b) Law No. 81, its complementary legislation and other legal regulations aimed at protecting the environment. This includes technical norms regarding environmental protection.
- c) Environmental planning.
- d) Environmental license.
- e) Environmental impact assessment.
- f) National system of environmental information.
- g) State environmental inspection system.
- h) Environmental education.
- i) Scientific research and technological innovation.
- j) Economic regulation.
- k) National Environmental Fund.
- l) The regimes of administrative, civil and penal responsibility.

**Table No. 3.** Interrelationships of Law No. 81 with the three conventions.

Relevant articles and clauses Description	Conventions
<p><b>Article 12.</b> - It is the responsibility of the Ministry of Science, Technology and Environment, in coordination with other competent agencies and bodies, to:</p> <p>g) Direct, evaluate and control meteorological and climatic surveillance, chemical composition and the general pollution of the atmosphere, radiological environmental surveillance, the seismological system as well as studies of seismic, meteorological and radiological hazards.</p>	<p>CBD, UNFCCC</p>

h) Effectuate environmental policy in matters regarding biological and nuclear security and to control its implementation.	
<p><b>Article 13.</b> - The agencies of the Central Administration of the State, and in particular those that are in charge of the management, state control, use and administration of natural resources, in carrying out their duties, powers and specific functions related to environmental protection, must:</p> <p>f) Adopt planned conservation and transformation measures for the use of natural resources, developing the required systems of surveillance and control;</p> <p>h) Propose and control, upon a scientific basis, compliance with technical standards required for environmental protection, in particular those intended to:</p> <ul style="list-style-type: none"> <li>- Establish the requisites, procedures and other specifications that must be accomplished in the development of activities that originate emissions or spills capable of damaging the environment.</li> </ul> <p>n) Elaborate, participate and carry on, as established by the National General Staff of Civil Defense, the plans for the prevention and confront of natural disasters or another type of catastrophes damaging the environment, offering the corresponding norms.</p>	CBD, UNFCCC
<p><b>Article 15.</b> - It is the responsibility of the Local Bodies of the Popular Power, in their respective spheres of authority, to direct, coordinate and control the actions, in matters of local concern and in accordance with applicable legislation in force, regarding:</p> <p>c) The use of soil, forestry, reforestation.</p> <p>f) Identification of local protected areas, participation in proposing those areas for approval and support of its administrative management.</p> <p>g) Preplanning, control and rehabilitation with respect to the occurrence of natural disasters or other types of catastrophes including preplanning of the resources necessary in order to accomplish these ends.</p>	CBD, UNCCD, UNFCCC
<p><b>Article 28.</b>- New projects and activities that follow will be required to be submitted to the Ministry of Science, Technology and Environment for its consideration, in order to evaluate the environmental impacts of the project or activity.</p> <p>o) Agricultural, forestry and aquaculture and mariculture installations, in particular those which involve the introduction of exotic species, the use of natural species with low regeneration rates, or the risk of species extinction.</p> <p>p) Changes in the use of the soil that may cause significant degradation to the soil or the degradation of other natural resources or that affect the ecological balance.</p> <p>z) Any other activities that take place in fragile ecosystems, that significantly alter ecosystems, their composition or balance, or affect public access to natural resources and to the environment in general.</p>	CBD, UNCCD

<p><b>Article 31.-</b> The Ministry of Science, Technology and Environment, in coordination with other competent agencies and bodies, may submit the plans or policies for urban or industrial development, forest management, water use, and development of tourism, mining, fishing, and soil management to environmental impact assessment. This assessment process does not require the granting of an environmental license.</p>	<p>CBD, UNCCD, UNFCCC</p>
<p><b>Article 90.-</b> The National System of Protected Areas has as its basic objectives:</p> <ul style="list-style-type: none"> <li>b) To conserve in-situ the flora and fauna and biological diversity in general, protecting it from the acts or omissions or vectors that may harm it.</li> <li>c) Conservation and rational use of fragile ecosystems such as mountains, wetlands, mangrove areas, karst formations, arid and semiarid zones and island groups.</li> <li>e) To maintain and manage biotic resources, whether terrestrial or aquatic, for long term availability of various goods and services for the population.</li> <li>f) To conserve and restore the soils and control erosion, sedimentation, salinization, acidification, and other processes of degradation.</li> <li>h) To manage and improve forestry resources so they can accomplish their role in regulating the environment and to provide for stable production and reproduction of forest products.</li> </ul>	<p>CBD, UNCCD, UNFCCC</p>
<p><b>Article 132.-</b> To guarantee the adequate nourishment of the population and agricultural product exports while preserving and improving the future productive capacity of these resources, agricultural production will take place in a sustainable manner based on the following provisions:</p> <ul style="list-style-type: none"> <li>a) The development of integrated management systems to manage cultivated ecosystems, which includes management of soils, biological diversity and, in particular, productive diversity, waters, nutrients and their recycling, insect plagues and diseases, and the establishment of a policy for the use of varieties.</li> <li>b) The rational use of biological and chemical means, according to local characteristics, conditions, and resources, in order to reduce environmental pollution to a minimum.</li> <li>c) The preparation of soils must conform to environmentally sound criteria fostering the use of techniques that avoid or diminish processes of degradation.</li> <li>d) The integrated and preventive management of plagues and diseases with special attention placed on use for these objectives of the resources of biological diversity.</li> <li>f) The integration of scientific and technical achievements with traditional local knowledge and genetic resources obtained in this manner.</li> <li>g) The establishment of economic regulatory mechanisms that stimulate the conservation of biological diversity and the</li> </ul>	<p>CBD, UNCCD</p>

use of agricultural practices favorable to the environment that avoid the improper use of soils and other natural resources and the irrational use of agricultural chemicals.	
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The need to develop a forestry legislation according to the Law on the Environment based on modern conceptions on sustainable development of forests led to the approval in 1998 of Law No. 85, law on Forests and its complementary legislation.

The next table shows through the articles selected how this legislation provides the legal bases to regulate the policy regarding the protection, increase and sustainable development of the resources of the forest patrimony and collection, processing and forest industry.

**Table No. 4.** Interrelationships of Law No. 85 with the three conventions.

Relevant articles and clauses Description	Conventions
<b>Article 27.-</b> No wood cutting for exploitation will be carried out regardless of the category. The following areas are subject to a special regime of protection: <ul style="list-style-type: none"> <li>- Forests located on slopes of more than 60% and in places where their presence prevents landslides or holds down the soil.</li> <li>- Forest strips at the coast line and forests at the cays.</li> </ul>	CBD, UNCCD, UNFCCC
<b>Article 35.-</b> Forestation or reforestation will be mandatory in the following areas: <ol style="list-style-type: none"> <li>a) Forest patrimony terrains where wood cutting has taken place.</li> <li>b) Terrains where surface mining has taken place.</li> <li>c) Recharge zones for underground waters, with a priority always to those corresponding to supply sources for the population and those surrounding karst caves and depressions.</li> <li>d) Terrains that help contain the desertification process or other types of environmental degradation.</li> <li>e) Terrains that make up the littoral zone.</li> <li>f) Terrains that because of their incline or any other factor are susceptible to any kind of erosion.</li> </ol>	CBD, UNCCD
<b>Article 46.-</b> Forests inhabitants have a right also to make use of it in activities that do not affect its integrity or the biological diversity resources associated with them. This right consists in the recollection of fruits, dead nature, dry firewood, food, ornamental and medicinal plants, as well as carrying out silvipastorage with animals of their property without causing damage to trees, bushes, and soils or to natural regeneration. All this is according to the regulations established for each type of forest.	CBD, UNCCD

### **2.3.1. Policies, strategies and legislation regarding soil degradation and desertification**

The National Program to Combat Desertification and Drought (PAN) was created between 1998 and 2000 in response to the commitments contracted by the Government upon signing and ratifying the Convention. It counted with the participation of government institutions, education and research entities and NGOs as well. Its general purpose was to prevent and control the causes that contribute to develop processes leading to desertification, by applying necessary and sufficient practical measures that stop and revert such processes, mitigate the effects of drought and make a contribution to the sustainable development of affected zones with the aim of increasing the quality of life among its inhabitants.

The National Program to Combat Desertification and Drought is a programmatic document that comprises four parts: diagnose, national strategy, action plan and portfolio of projects.

The mandate contained in the Action Plan has the following elements:

- ☞ To prioritize the topic of desertification and drought within the environmental policy linked to the social and economical development of the country.
- ☞ To integrate the National Program to Combat Desertification and Drought within the institutional policies, and the available legal instruments and tools.
- ☞ To create the necessary instances and instruments of coordination and to strengthen the existing ones.
- ☞ To contribute to the integration of actions carried out in the economic, political and social spheres of the country in order to achieve conservation and sustainable use of natural resources.
- ☞ To contribute to increase productivity of soils and the production of consumer goods as a strategic element of undisputed value for the sustainment of the current and future population.
- ☞ To increase public sensitivity through opportune and effective participation of local communities.
- ☞ To strengthen institutional capacities.

These elements are taken into consideration in the following work areas:

- I. - Economic and social development of the zones affected by processes leading to desertification.
- IA. - Early diagnose and preservation of ecosystems exposed to extreme climatic events, especially to drought.
- II. - Improving and applying legal and administrative instruments for applying, monitoring and control of the National Program to Combat Desertification and Drought.
- III. - Integration and coordination of policies and strategies.
- IV. - Information, environmental education and citizens involvement.
- V. - Scientific research and technological innovation.
- VI. - Institutional strengthening.
- VII. - International cooperation.



Based on the work of implementing the National Program to Combat Desertification and Drought through the sustainable development programs and projects existing in the country, a Program of Association of the Country was devised for 10 years (2008 – 2018). Its main purpose was to support the application of the National Program to Combat Desertification and Drought with funds provided by the Cuban Government and the Global Environmental Fund. The Program of Association has 5 projects aimed at strengthening national capacities to apply sustainable development of soils and to promote related farming technologies.

The following table shows other legal instruments that support actions to fight against desertification and drought.

**Table No. 5.** Current legislation to fight against desertification and drought.

Legislation	Dispositions	Institution in charge
Law No. 81, of July 11, 1997	Law of the Environment, it establishes the principles to comply with the goals of the Convention, among others.	CITMA, OACE
Law No. 85, July 21, 1998	Law on Forestry and its complementary legislation.	MINAG - Forestry Service (SEF)
Law No. 62 Penal Code, December 29, 1987. Title III: Crime against collective safety - Section Five of Chapter V "Crime against public health"	Pollution of waters and the atmosphere.	MINJUS
Decree Law No. 138, July 1st, 1993	Of Terrestrial waters, regulates among other aspects, the use, planning, exploitation, and conservation of waters.	INRH
Decree Law No. 201, December 23, 1999	Of the National System of Protected Areas.	CITMA
Decree No. 199, April 10, 1995	On the violations of the regulations for the protection and rational use of hydric resources.	INRH
Decree No. 211, August 9, 1993	On the violations of the aqueducts and drainage systems services.	INRH
Decree No. 179, February 26, 1993	Protection, use and conservation of soils and its violations.	MINAG
Resolution No. 25, October 27, 1993	Regulations for State Inspection of the National Institute of Hydric Resources.	INRH

Resolution No. 21, April 15, 1999	Net total norms and efficiency coefficient for establishing brute norms for the main agricultural crops.	INRH
Resolution No. 6, January 10, 1996	Rules for charging for the right to use and for services providing land waters.	INRH
Resolution No. 132, August 11, 2009	Regulations for the process of environmental impact assessment.	CITMA

### 2.3.2. Policies, strategies and legislation regarding climate change

The essential principle of the Strategy for Climate Change in Cuba has been the development and strengthening individual and institutional systemic capacities to be able to respond to this challenge. For this aim, the strategy is based on the existing capacities in the different programs, strategies and environmental, economic and social research projects such as:

- ☞ Program for Food Security;
- ☞ National Program to Save and make Rational Use of Water (PAURA);
- ☞ Reforestation Program;
- ☞ Energy Efficiency Program;
- ☞ Cuban Energy Saving Program (PAEC);
- ☞ Program for renewable energy sources;
- ☞ National Strategy for Biological Diversity and its action plan;
- ☞ National Action Plan to Combat Desertification and Drought;
- ☞ Research programs on global, environmental and energetic agriculture changes;
- ☞ Energy Revolution;
- ☞ National Environmental Strategy.

In NES 2007 – 2010 the effect of global changes, particularly climate change as one of the factors taken into consideration to define the main environmental problems is identified. Among the goals of this strategy we can mention several that contribute to adaptation to climate change, which are: to reduce 15% per hectare the volume of water applied to irrigated soils in the country and to reduce 30% the volume of water in production processes; reforestation of hydro-regulatory strips along rivers and water reservoirs; to achieve a 69% of forest areas made up of forests that protect littorals, soils and waters and conservation forests; and to maintain under a coastal zone management regime 10% of the coastal areas of the country.

Other goals that are foreseen in the NES and that also contribute to adaptation to climate change are: to maintain 25% of the vital areas of coral barriers under monitoring and conservation programs, and/or 10% of the mangrove areas under management plans; carrying out studies of endangerment, vulnerability and risk to natural disasters; to have adaptation measures and early warning systems to climate change (in relation to natural disasters); integration of environmental and territorial planning; improvement of the legal frame that insures an efficient introduction of the environmental dimension into territorial planning.

Mitigation has been approached directly or indirectly in the development plans and programs like the National Program for Reforestation and the Energy Revolution. Also, several goals of the NES 2007 – 2010 are contributions to mitigating climate change in a short term, among others: to carry out 80% of pest and disease control with natural products or bio-compounds; to increase national forest cover in 2010 so that the forest index reaches 26,7% of the national territory; to conclude the actions of the energetic forests subprogram; to diminish in 2 ha for every 1000 ha the damages caused by forest fires compared to the year 2000; that the energy from renewable sources is at least 20% of the national energy consumption; and to use 90% of the accompanying gas in oil extraction.

Guideline No. 1 of 2005 from the Vice-president of the National Defense Council on planning, organizing and preparing the country for disaster situations, was a first step in the actions for facing climate change.

Agreements 9207, 9307 and 9507 of October 2007 issued by the Council of Ministers, initiated the Program to face Climate Change and for strengthening incorporating the adaptation and mitigation dimensions into the Sector and Territorial strategies of the governmental bodies of the Central Administration of the State and the Provincial Administration Councils.

The main tasks of the Program for Facing Climate Change were described in item 2.3. The Governmental Bodies of the Central Administration of the State have identified short and middle term actions as part of the continuance and implementation of the Program. CITMA maintains a systematic follow up of the actions carried out and projected by the Central Government Institutions. The actions carried out until now have been essentially aimed at:

- ☞ Saving energy and energy efficiency of the processes.
- ☞ Increased use of renewable energies, particularly solar, wind and hydraulic.
- ☞ Introducing Cleaner Production Practices, aimed at achieving energy efficiency.
- ☞ Improving production processes with the consequent decrease in emissions of greenhouse effect gases.
- ☞ Better water management, including planning, saving, recovery and reuse.
- ☞ Establishing norms and regulations regarding type and locations for constructions.
- ☞ Strengthening monitoring and observation networks.
- ☞ Actions to reduce pollution, with a direct contribution to the reduction of emissions and better management of raw materials, and inputs through an efficient use, reuse and recycling.
- ☞ Carrying out danger, risk and vulnerability studies in the whole country as part of the compliance with Guideline No. 1 of 2005 of the Vice-president of the National Defense Council.
- ☞ Actions linked to reforestation, soil conservation and identifying resistant varieties.

**Table No. 6.** Legislation related to climate change.

Legislation	Dispositions	Institution in charge
Law No. 81, of July 11, 1997	Law of the Environment, it establishes the principles to comply with the goals of the Convention, among others.	CITMA, OACE
Agreement No. 4604. Council of Ministers, November 2, 2002	Establishes the group to attend the Mechanism for a Clean Development (CDM), charging the Ministry of Science, Technology and Environment with its implementation.	CITMA, MINREX, MEP, MFP, MINCEX
Resolution No. 76, May 15, 2003	Regulations for attention and implementation of CDM projects.	CITMA
Guideline No. 1, June 1, 2005	From the Vice-President of the National Defense Council for planning, organizing and preparing the country for disaster situations.	Civil Defense

### 2.3.3. Policies, strategies and legislation regarding biological diversity

After concluding in 1996 the National Study on Biological Diversity of the Republic of Cuba, the National Strategy on Biological Diversity (ENBIO) was written and published with its National Action Plan. This strategy is based on three basic pillars: conservation, knowledge and sustainable use of Cuban biological diversity resources, and like any strategic document, it contains the vision, the guiding principles, the aims and objectives, the diagnose and the Action Plan.

The Work Group for implementing the Action Plan of the ENBIO was created in 2002, which carried out its analysis and adjustment for a new implementation period from 2006 – 2010. The updated Action Plan includes a total of 91 actions grouped in 11 work areas:

- ☞ Conservation and sustainable use of biological diversity.
- ☞ Economic development, social and territorial planning.
- ☞ Legal planning.
- ☞ Integration and coordination of strategies.
- ☞ Economical instruments and social goals.
- ☞ Environmental education, citizen awareness and participation.
- ☞ Safe use and development of biotechnology.
- ☞ Scientific research and technological innovation.
- ☞ Monitoring and evaluating biological diversity.
- ☞ Institutional strengthening.
- ☞ International cooperation.

The ENBIO as well as the Action Plan 2006 – 2010 on Biological Diversity of the Republic of Cuba have identified important aspects that should be taken into consideration, namely: rehabilitation and restoration of degraded ecosystems, developing scientific-technical programs and projects to study, evaluate and monitor biological diversity, environmental education, economic incentives, intersectoral cooperation, the use of sustainable management systems, biotechnology programs and institutional strengthening,

It should be remarked that in the materialization of the Action Plan, actions related to "in situ" conservation measures through the SNAP are taken into consideration, complemented by "ex situ" conservation of biological diversity. Besides, the need to consider the elements provided by the biological diversity within the process of creating goods and services is widely recognized, and that to this, tools for measuring and planning that incorporate methodologically and conceptually these variables should continue to be developed. Likewise, it proposes to analyze not only a fair and equal distribution of the benefits obtained from the use of biological diversity, but also of the costs that are necessary for its conservation.

Besides ENBIO and NES 2007 – 2010, other plans, programs and strategies include biological diversity goals and indicators. These are:

- ☞ Strategic Plan of the National System of Protected Areas.
- ☞ National Strategy for Environmental Education.
- ☞ National Forestry Program until 2015.
- ☞ National Strategy for Management of Forest Fires.
- ☞ Strategy for the Conservation of Fungi Diversity in Cuba.
- ☞ National Action Plan for Phytogenetic Resources.
- ☞ Program for Biological Diversity in Prioritized Basins.
- ☞ National Action Plan of Biosafety.
- ☞ National Program for Improvement and Conservation of Soils.
- ☞ National Action Plan to Combat Desertification and Drought.
- ☞ Turquino Plan (Integral Development of Mountain Zones).
- ☞ National Plan for the Civilian Defense.
- ☞ Environmental strategies of the different sectors of the economy and of all the territories.

**Table No. 7.** Legislation regarding biological diversity.

Legislation	Dispositions	Institution in charge
Law No. 81, of July 11, 1997	Law of the Environment, it establishes the principles to comply with the goals of the Convention, among others.	CITMA, OACE
Law No. 85, July 21, 1998	Law on Forestry and its complementary legislation.	MINAG - Forestry Service (SEF)
Decree Law No. 136, March 3, 1993	On Flora and Fauna.	CITMA, MINAG-SEF
Decree Law No. 164, May 28, 1996	Fishing Regulations and its complementary legislation.	MIP

Decree Law No. 190, January 28, 1999	On Biological Safety.	CITMA
Decree Law No. 200, December 23, 1999	On the violations regarding the environment.	CITMA
Decree Law No. 201, December 23, 1999	On the National System of Protected Areas.	CITMA, SNAP
Resolution No. 111, October 14, 1996	Access to the resources of the biological diversity.	CITMA, MINAG
Resolution No. 34, April 2, 1996	Access to fragile ecosystems.	CITMA
Resolution No. 13, May 7, 1998	On the transfer of technologies.	CITMA
Resolution No. 12, 2007	Evaluation of technologies in the studies on feasibility of investments.	CITMA
Resolution No. 146, 2009	On the functioning of the Coordination Board of the National System of Protected Areas.	CITMA
Resolution No. 132, August 11, 2009	Regulations for the process of environmental impact assessment	CITMA
Resolution No. 33, April 2, 1996	Species under special protection. Protection to Black Coral.	CITMA
Joint Resolution No. 1, June 30, 1997	Protection and conservation of coral formations.	CITMA-MIP
Joint Resolution No. 1, (MFP-MEP), June 7, 2008	National Fund for the Environment.	MFP, MEP
Agreements of the Executive Committee of the Council of Ministers (3 in 2001, 1 in 2008 and 2 in 2010)	Legal approval of 80 of the protected areas identified in the SNAP.	

## 2.4. Institutional frame for global environmental management

CITMA is the Government Body of the Central Administration of the State responsible of activities related to the management and the global environmental conventions. The environmental system of the Ministry rules the implementation of the three pertinent conventions: UNCCD, UNFCCC and CBD, as well as other environmental conventions.

**Table No. 8.** Environmental system at the Ministry of Science, Technology and the Environment.

Direction for the Environment (DMA)	Develops and coordinates policies and environmental management, prepares public education and awareness, advises on norms, guidelines, legislation and environmental coverage, Its functions have a direct or indirect relevance in these three thematic areas.
Environmental Agency (AMA)	In charge of environmental management and research, technical direction of the main management actions including environmental conventions such as CBD and UNFCCC. It organizes research on the environment in the whole country, supported by a very complete network of research institutions, among which are: Institute of Tropical Geography, Institute of Ecology and Systematic, Institute of Meteorology, Institute of Oceanology, National Aquarium and others. It coordinates studies on danger, vulnerability and risks.
Center for Environmental Information, Management and Education (CIGEA)	National center in charge of environmental management, of coordinations to implement the National Program to Combat Desertification and Drought, of the sustainable management of the hydrographic basins, of the control of chemicals and the reduction of the pollution load affecting ecosystems. It is also the ruling center for environmental education in the country.
National Center of Protected Areas (CNAP)	Ruling center of the National System of Protected Areas (SNAP). In charge of designing the system, proposing the areas and coordinating all actions and the development of management plans and of the management in the areas.
Office for Environmental Regulation and Nuclear Safety (ORASEN)	Entity in charge of regulatory activities that include environmental regulation with departments of control and inspection (CICA), of biological safety (CSB), of technological and nuclear safety (CNSN) and of chemical safety (CEANPAQ).
Direction for International Collaboration	The Direction for International Collaboration is in charge of coordinating the international activity related to matters of science, technology and the environment. It establishes and follows up all the international processes on the environmental agenda, also for science and the peaceful use of nuclear energy. It coordinates and acts as counterpart of the main international funds that channel resources to solve these issues.

Territorial Units for the Environment of the CITMA Delegation	CITMA has delegations in the 14 provinces in the country and in the special municipality of the Island of Youth. In the structure of CITMA, the Environmental Units are the bodies of environmental management and control at the local level. These units have the support of the Centers for Environmental Studies that complement their management tasks.
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In executing its mandate, the Environmental System works closely linked to other government bodies and NGOs, which contributes to the protection of the global environment. Although these relationships are largely informal, these bodies have proven to be highly efficient in developing and implementing national policies and strategies for the environment. The functions of these bodies are:

**Table No. 9.** National coordination groups.

Bodies and National Programs	Functions
National Council of Hydrographic Basins	Coordinates the National Program of Hydrographic Basins. Its aim is to conserve, recover and manage these systems in an integral and sustainable manner. The work program for the National Council and for the Provincial Councils has been created.
Turquino Plan of Integral Development of Mountain Zones	It coordinates and guides all actions related to science, technology and conservation and sustainable use of the environment for the socio-economic improvement of the population inhabiting the 5 mountain ranges in the country (Guaniguanico, Guamuhaya, Bamburanao, Nipe-Sagua-Baracoa and Sierra Maestra) and also the fragile ecosystem of Cienaga de Zapata. It is supported by a National Commission at the highest government level and by the work of the Mountain Committees (local intersectoral structures that watch over the sustainable development of these systems).
National Group of Genetic Resources	A committee that presents answers to the needs of the country regarding genetic resources, except human resources.
National Group of Coasts	An intersectoral group that coordinates actions for the integrated management of coastal zones. Its main aim is to make proposals and recommendations to delimit, protect and for the sustainable use of the coastal zone and its protection according to the principle of integral management of the coastal zone.
National Group of Bays	An intersectoral group that coordinates actions for the integrated management of bays that have been selected according to their economic and ecologic importance.



National Group to Combat Desertification and Drought	It is the national organ under the guidance of CITMA, multidisciplinary and intersectoral, for the coordination of actions among the users of the land, the waters and forests, and with society in general. It comprises 36 representatives from 24 government, non-government, scientific and education institutions. Each one of its members represents and has the support of the institution he/she represents. It complied with the purpose of elaborating the National Program to Combat Desertification and Drought, and of coordinating the implementation of the actions emanating from the National Action Plan.
National Group of Climate Change	A state group of experts of a multidisciplinary character, coordinated by CITMA, and representing several sectors linked to the causes and impacts of climate change in the country. Its function is to coordinate technical activities related to climate change.
National Group of Biological Diversity	A group led by CITMA. It comprises representatives from government, scientific and education institutions related to the study, management and conservation of biological diversity. Each one of its members represents his/her institution. It is the national body of coordination of the national Action Plan on Biological Diversity.
Coordination Board of Protected Areas	An instrument of coordination, integration and action implementation that allows the member entities a better fulfillment of their state functions of guidance, management and control. This is achieved through collegiate decision making and the optimal use of the resources and capacities of its members. It is comprised by CNAP, which presides it, by DMA, CICA, the Body of Forest Rangers (CGB), the National Office for Fisheries Inspection (ONIP), the Direction of Science of the Ministry of the Food Industry (MINAL), the Ministry of Armed Forces (MINFAR) and the National Enterprise for the Protection of Fauna and Flora (ENPFF).

There is also a great collaboration and consultation with NGOs, universities and other research institutions in the country. Among the main ones we could mention: Network of Universities of the Ministry of Higher Education, Network of Botanical Gardens, Cuban Association for Animal Production (ACPA), Cuban Association of United Nations (ACNU), "Antonio Nuñez Jimenez" Foundation of Nature and Man, Cuban Association of Friends of the Country (SEAP), Cuban Association of Soil Science, Cuban Association of Zoology, Cuban Association of Botany, Meteorological Association of Cuba, National Association of Small Farmers (ANAP), Cuban Association of Agricultural and Forestry Technicians (ACTAF), CUBASOLAR, PRONATURALEZA and others.

#### **2.4.1. Institutional context regarding with the degradation and desertification of soils**

CITMA, the focal point of UNCCD, relies on its functional structure to fulfill its political and technical obligations through the Direction for International Collaboration (DCI), and through the Center for Environmental Information, Management and Education (CIGEA), respectively. In correspondence with the commitments acquired as Part, the National Group to Combat Desertification and Drought was created, which is an Organ for National Coordination (See Table No. 9).

This group functions from annual work plans and meets periodically (trimonthly) in order to check fulfillment of the different work stages, as well as for coordinating and evaluating the results of the actions applied. At the same time, the members of the group have created subgroups in each institution to analyze and collegiate the decisions adopted.

The group counts with a roster of international experts, 53 are highly qualified and experienced members belonging to government and non-government, educational, scientific and economy-productive institutions. This roster has the function of solving problems at a national level, to create committees and special work groups, as well as offering technical assistance at the international level and maintaining a close link with the Science and Technology Committee of the UNCCD.

The work of the National Group is linked directly to that of the National Council of Hydrographic Basins (CNCH), integrated by representatives from the highest level of the OACE. This Council constitutes a path for the compatibility of the actions to combat desertification, climate change, protection of biological diversity and other actions of the Agencies in the natural environment of the hydrographic basins.

#### **2.4.2. Institutional context related to climate change**

CITMA, the National Focal Point for the UNFCCC, sustains from its own functional structure in order to accomplish the political and technical commitments with the Convention. This is done through the Direction of International Collaboration (DCI) and the Institute of Meteorology (INSMET). INSMET also serves as the National Focal Point for the IPCC.

The support received from international projects and programmes, such as the CC: TRAIN represents a crucial element in the development of the technical capacities for accomplishment of different studies and assessments. In 1997, based on the experience acquired from the Commission on Climate Change, CITMA established the National Group of Climate Change. (See Table No. 9).

Three technical teams in charge of the national studies function under the coordination of the National Group of Climate Change: inventories of GHG, vulnerability assessments and adaptation to climate change, as well as studies on mitigation. These teams are integrated by specialists from different government agencies and the productive sector, universities and academic institutions for research on science and technology. The results of the work of the three teams are assessed by the National Group.

The set of activities carried out under the coordination of the national Group has facilitated the creation of a critical mass of national experts and the institutional strengthening. It has also ensured an ample dissemination of the knowledge on climate change. The most outreaching task was the consultation mechanism of the process for the elaboration of the First National Communication to the UNFCCC and the validation of the results, as well as the preparation of the Project for the Second Communication.

### **2.4.3. Institutional context related to biological diversity**

CITMA, focal point of the Convention, relies on its functional structure to fulfill its political and technical obligations through the Direction for International Collaboration (DCI) and on other of its dependencies.

The National Center for Biodiversity (CeNBio), attached to the Institute of Ecology and Systematic (IES), acts as technical focal point for the Cuban Mechanism of Facilitation (CHM), the Global Strategy for the Conservation of Plants and the World Taxonomic Initiative of the CBD. The primordial mission of the CeNBio is the capture, storage, processing, analysis and diffusion of information relevant to the topic of biological diversity.

The CNAP of CITMA is the methodological rector of the SNAP and functions as the technical focal point of the work group for protected areas within CBD. The National Center of Biological safety (CSB) has been designated as the National Authority and focal point of the BCH of the Cartagena Protocol on Biosafety.

The Center for Environmental Information, Management and Education (CIGEA), has been designated as the technical focal point for the Subsidiary Organ for Scientific, Technical and Technology Advisory for the CBD. Jointly with the Direction for the Environment (DMA), is in charge of implementing and following up on the Action Plan 2006 – 2010 on Biological Diversity.

In 2002 CITMA created the National Group for Biological Diversity (see Table No. 9). This work group undertook the revision of the National Strategy for Biological Diversity, the actions contained in its Action Plan, degree and feasibility of compliance with it, and identified empty spaces. Based on this, it updated the Action Plan for the 2006 – 2010 period. Currently, it checks periodically the level of its implementation.

Besides this, the National Group coordinates compliance with the different commitments assumed, mainly under CBD, through a revision of the decisions, thematic programs and inter-sectoral matters, adequates and incorporates them to the work programs, plans and strategies.

## **2.5. Projects and activities related to NCSA objectives**

Scientific Research and Technological Innovation are instruments of environmental policy and management of great importance. In our country there is a National System of Science and Technological Innovation that includes the System of Science and Technological Innovation Programs and Projects. Through this later one,

programs and projects at the national, sector and territorial level are executed. The environment is one of the priorities in scientific research and technological development in the country and knowledge about our natural resources, their degree of conservation, their rational use, and the scientific and economic evaluation of the main environmental problems of the country is within its guidelines or focal points.

The System of Science and Technological Innovation Programs and Projects comprises:

- ☞ National Programs of Science and Technology (PNCT). Basically under supervision by the highest level of science in the country. These programs develop the most significant priorities for the development of the country.
- ☞ Sectoral Programs of Science and Technology (PRCT). In charge of development of the sectoral interests in the different economic-productive spheres. These programs are ruled at the OACE level.
- ☞ Territorial Programs of Science and Technology (PTCT). At the level of each territory, they are in charge of the research priorities at the local level.

Besides, a wide set of international projects, listed below, are carried out:

**Table No. 10.** Current international projects and activities related to the objectives of NCSA.

Projects	Agencies
Support to the National Program to Combat Desertification and Drought. Project GEF (OP-15/UNDP) (A program that has 5 projects).	GEF / UNDP / FAO / UNEP
Creation of capacities for planning, decision making and regulatory system. Sensitization/Sustainable Management of Soils in Severely Degraded Ecosystems (Project 1 of OP-15).	GEF / UNDP
Coordination, monitoring and evaluation of the Program of Association of the Country. Support to the Program to Combat Desertification and Drought. (Project 5 of OP-15).	GEF / UNDP
Evaluation of Dry Lands Degradation (LADA).	GEF / FAO
To potentialize the management of the coastal zone in three productive sectors of the Sabana-Camaguey ecosystem (Phase III).	GEF / UNDP
To apply a regional approach to the management of protected marine and coastal areas in the archipelagos in the south of Cuba.	GEF / UNDP
Integrated management of hydrographic basins and coastal zones (IWCAN).	GEF / UNDP / UNOPS

Highly polluted bays of the Greater Caribbean.	GEF / UNDP / UNOPS
Invading exotic species.	GEF / UNDP
Support activities to prepare the second communiqué of the Republic of Cuba regarding UNFCCC.	GEF / UNDP
Strengthening capacities for the second phase of adaptation to climate change in Central America, Mexico and Cuba. Regional project.	GEF / UNDP

Additionally, an important group of projects from the Program of Small Donations of GEF –UNDP is being developed in the country. They have an incidence in the study object of this self-evaluation. (See Annex V).

### **2.5.1. Projects and activities related to soil degradation and desertification**

The Action Plan of the National Program to Combat Desertification and Drought comprises 156 actions. 11 OACE, educational and research centers, NGOs and territorial governments are involved in their implementation.

The portfolio of projects, created with the purpose of facilitating application of the Program of National Action, has 14 project profiles that respond to the main interests at a short, middle and long-term contained in the National Action Plan and in the territorial plans.

This portfolio of projects was the main source for the elaboration of the Program Association of the Country in "Support to the Program to Combat Desertification and Drought" that was set in motion with funding from the Government of Cuba, GEF and with the collaboration of FAO, UNDP and UNEP.

Since the year 2000, Cuba has presented to UNCCD 3 national reports through the Committee to Review Implementation of the Convention (CRIC). Preparation of those reports is a process that begins with the analysis of the application of the action programs of the provinces in the 15 territories of the country. All the actors involved at the base level take part in it. This exercise allows to evaluate the application and its results in the most objective manner, as well as to correct any deficiencies detected during the process of application at this level. The results from the territorial analysis are complemented with the results from a similar process carried out at the sectoral level in the OACE that are directly involved in the application of the Program of National Action.

The reports were prepared with a wide participation at all levels. They were based according to a methodological guide provided by the Secretariat of the Convention. The guide establishes 9 indicators related with:

- ☛ Strategies and priorities established within the frame of the plans or policies of sustainable development;
- ☛ Institutional measures adopted to apply the Convention, including legal frames or institutional arrangements, links and synergies with other environmental conventions and with national development strategies;

- ☞ Process with multiple participation to prepare and execute the action program, particularly involving the civil society, NGOs and other community organizations at the base;
- ☞ Consultation process for the preparation and execution of the national action program and the association agreements contracted with countries that are part and with other interested entities, particularly the mobilization of national and international resources;
- ☞ Measures adopted or foreseen within the frame of the national action programs, particularly those aimed at improving the economic frame, at preserving the natural resources, improving institutional, improve knowledge on desertification and observe and evaluate the effects of drought;
- ☞ Financial allocations from the national budget to support application of the convention, as well as financial assistance and technical cooperation received and necessary;
- ☞ Determining the needs and establishing priorities;
- ☞ Examination and evaluation of the parameters and indicators used to measure and evaluate the advances achieved.

The national report, submitted to consensus, once approved by the Government of Cuba has an official status. The IV National report, based on novel and quantifiable indicators that were approved at the 9<sup>th</sup> Conference of the Parts (Buenos Aires, 2009), will run its process in 2010 and 2011.

### 2.5.2. Projects and activities related to climate change

Under the auspices of the National Group of Climate Change several projects have been carried out and others are in the process. The projects have eased the execution of numerous activities for creating capacities and for research. It has allowed Cuba to fulfill its obligations within the frame of UNFCCC. A brief description of some of the projects in which Cuba is involved is made below.

**Table No. 11.** Projects related to climate change.

Projects	Description
Facilitating activities for climate change in Cuba.	<p>These activities provide the country with numerous possibilities for technological and human capacity to comply with its obligations with UNFCCC. The preparation of different reports (the national inventory of greenhouse effect gases; evaluation of the potential options for mitigation; evaluation of vulnerability and adaptation, among others) was combined with the activities of capacitating and workshops, facilitating the transfer of technology, knowledge and methodologies to carry out the activities.</p> <p>The main activity that has been carried out in the area of research studies was the adaptation to climate change.</p> <p>In 2001, Cuba presented its First National Communiqué to UNFCCC. The preparation process and the later activities have allowed increasing, systematizing and integrating knowledge on climate change. The process of national communication has become the main source of opportunities for capacitating of human resources and the creation of capacities at all levels, to insure sustainability of activities related to this topic.</p>

	Currently the Project "Support activities to prepare the Second National Communiqué of the Republic of Cuba according to United Nations Frame Convention on Climate Change" is being executed.
Program to extend WGIII of IPCC.	<p>It was an important contribution to inform and explain to the key actors (including decision makers, representatives from the industry, academic experts and the NGOs), the main findings of the Technical Evaluation Reports of IPCC and the similar summary reports, especially those that were related with Work Group III (Mitigation).</p> <p>The results from WGIII of IPCC were shared with different actors from different institutions, organizations and sectors. This was done through the National Group for Climate Change and the Center of Studies of World Economy which organized this task. Although the main aspects were focused on mitigating climate change, it was an excellent opportunity to provide information about the work carried out by IPCC and related aspects.</p>
Creation of capacities for climate change in Cuba.	<p>CIDA-CCCDF project aimed at creating capacities and transferring technical knowledge, increasing the ability of the country to adapt and respond to the risks that represents climate change, reduced poverty and struggle for a sustainable development.</p> <p>The aims of this collaboration effort are to cooperate with Cuban officials in: (i) design and deliver exercises for computer assisted strategic planning and capacitating, modules for education and adaptation in response to the needs and technical institutional and political priorities of Cuba to climate change; (ii) identify the key industries and/or sectors that contribute to climate change or are threatened by it and to facilitate the efforts of Cuba, through workshops, education and technology transfer, to integrate them into a national strategic initiative to respond to climate change; and (iii) to support the efforts of Cuba to integrate climate change into its broadest institutional, political and national objectives for sustainable development.</p> <p>The results of this project can be considered to be a good example of North-South collaboration. A success of this bilateral project was the transfer of technology in terms of methods and tools, of computers and equipment, and of adequate practices. The main lesson learned was proof of a well conceived approach to facilitate the development of sectoral strategies for climate change.</p>
Strengthening the links between development and climate change.	This CIDA-UNDP project offered an evaluation centered on the adaptation measures that could be employed in Cuba and in the Dominican Republic with the aim of reducing vulnerability to climate variability and extremes. With the aim of insuring that the results were concrete and manageable with the available resources, the evaluation was centered on the rural sector of the economy, particularly in the rural agricultural communities (human settlements).

	<p>The initiative could be considered as a South-South cooperation that incorporates development of the relationships with the Caribbean countries and works in the MACC and PACC projects. The Dominican Republic benefited with the experience and the research capacity of Cuba, while at the same time an exchange of knowledge with the countries of MACC took place. As a fact, Cuba carried out a very well conceived capacitating program to improve the skill of Dominican meteorologists to carry out climatic analysis and in the design of a monitoring system for meteorological and agro-meteorological drought. At the end of the project both countries have a cartographic system of the risks associated with drought.</p> <p>A capacitating course on regional climate modeling for the Central American and Caribbean countries was organized through this project. It allowed the participating countries to know, use and receive the PRECIS Regional Climate Model.</p>
Creating capacities for phase II of adaptation to climate change in Central America, Mexico and Cuba.	<p>Central America, Mexico and Cuba served as pilot region to elaborate and apply the frame of the adaptation policy for the preparation of strategies, policies and adaptation measures. The application of this frame had the aim of showing the manner in which the adaptation policy can be integrated into the national sustainable development in, at least, three human systems: hydraulic resources, agriculture and health.</p> <p>This demonstration project was based on Phase I of the evaluations of the vulnerability and the adaptation of the First National Communiqué of the eight participating countries of the region and will prepare them to go on to Phase III of Adaptation.</p> <p>This GEF-UNDP project concluded its execution in the eight countries that focused in the different climatic risks and the economy sectors. In the case of Cuba, drought again was the main risk approached. Current and prognosticated impacts of drought in the eastern region of Cuba are a good argument for this choice.</p>

The combination of some of the above projects has allowed Cuba to maximize the results and make better use of the available funds. This is possible only when there is a good coordination and when there is a clear priority of the activities that should be implemented. In fact, the existing institutional network for the matters of climate change in Cuba allows for the integration of all the efforts in one same strategy.

### **2.5.3. Projects and activities related to biological diversity**

The Action Plan of the National Strategy of Biological Diversity, financed by GEF-UNDP and created in 1998, had 134 actions, in each case indicating the institution responsible for it as well as the participants. The actions were classified in permanent, and short-term, middle-term and long-term.

As a result from its revision by the National Group of Biological Diversity, the Action Plan of Biological Diversity was up dated for the period 2006-2010, which currently



counts with 91 actions. Their implementations were checked with partial cuts in 2006 and 2008 and with a final cut in 2010.

For the implementation of these actions, at a national level are being developed: the PNCT "Global Changes and the Evolution of the Cuban Environment" and the PNCT "Sustainable Development of the Mountain"; the PCRT of CITMA "Protection of the Environment and Cuban Sustainable Development", "Systematic and Biological Collections, their Conservation, Maintenance and Exhibition" (1997-2007). "Biological Diversity" (begun in 2007) and "Analysis and Forecast of the Terrestrial and Spatial Weather and Climate" (2000-2008), as well as the PCRT of MINAG "Preservation of Natural Resources". The same thing happens at the territorial level: in the 15 provinces of the country projects framed within environmental programs are being carried out. They also contribute to topics related to biodiversity. Among some of the topics broached by these PTCT we could mention: sustainable urban agriculture; environmental management; food production; sugarcane agro-industry; mountain zone development; tourism; soil protection through sustainable methods; fisheries development; biomedicine; among others.

Also, projects with international funding, mainly on the topics of biosafety, marine-coastal ecosystems and protected areas have been developed.

During the 2006-2008 the following research lines have been given priority in the country:

- ☞ Inner waters ecosystem, with emphasis in their biology and population dynamics.
- ☞ Systematic and taxonomy of selected or prioritized groups in relationship to their ecology and geographical distribution.
- ☞ Methodologies that facilitate management, conservation and maintenance of biological collections.
- ☞ Terrestrial ecosystems, fragmentation, functioning, status, health and resilience levels of natural and anthropic ecosystems.
- ☞ Rescue and promotion of use of traditional knowledge and practices. Current use and perspectives of biological diversity resources with emphasis in pharmacological bioproducts and other applications.
- ☞ Environmental education and awareness on biological diversity.
- ☞ Creation software products on biological diversity.

At the beginning of 2008, Cuba took part as Pilot country in the IUCN-UNEP project "TEMATEA", developing the modules of invading exotic species and inner waters. This is a project that has as main objective to potentiate the synergies between the conventions related to biological diversity through the evaluation of the selected modules, to achieve a better implementation of the decisions and recommendations for the same.

As part of the project, a national workshop was held where the main results obtained were, identification of the weaknesses or action voids in these topics, and the creation and approval of a chronogram to follow up on the recommendations made at the workshop to insure their implementation. Among the approved recommendations is the creation of a National Action Plan for invading exotic species and for wetlands, under the National Strategy for Biological Diversity.

Cuba has made 4 national reports to CBD in the years 1998, 2001, 2005 and 2009, on the occasion of the respective Conferences of the Parts of the Convention<sup>9</sup>. Besides, a thematic report was created on protected areas and the implementation of the Cartagena Protocol on Biosafety.

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<sup>9</sup> Access at <http://www.ecosis.cu/chm/chmcuba.htm>

## CHAPTER 3. IDENTIFIED CAPACITY NEEDS FOR GLOBAL ENVIRONMENTAL MANAGEMENT

### 3.1. Identified capacity needs of a general character

The evaluation of capacity needs was supported by a wide consultation with the institutions involved and with the National Groups in charge of the three conventions under study. This evaluation allowed identifying the status of the environmental management of the conventions in the country, and the empty spaces that threatened not only the compliance with the international commitments assumed by the country, but also the environmental policy and Law of Cuba.

These needs that were identified are associated to the lack of capacity for the fulfillment of specific goals of environmental management, and from their evaluation will arise actions that the NCSA of Cuba will propose to be implemented.

Besides what UNEP/GEF/UNDP requested, the project evaluated this aspect at the local and regional level from an ecosystemic approach. It allowed us to identify the more general needs of a provincial character, whose solution is at that same level and is the most direct and useful product of NCSA at the provincial level.

The development of the 5 steps of the NCSA and the regional evaluation allowed us to bring an ecosystem approach to the outputs of the project. That gave us the possibility to find and define specific needs for each one of the key ecosystems in the country.

It is important to point out that Cuba has already completed successfully some initiatives of capacity building for the global environmental management in the country. The actions carried out before and after the Rio Conference in 1992, linked to the protection of the global environment are described in Chapter 2. Report on the Status of the Global Environmental Management.

Besides, some of the results of the PDF Phase that were considered to maintain their usefulness were used. Capacity needs, in a general sense, are presented below grouped at the political, legal, institutional and sectoral.

Set of needs are repeated at a national scale, and due to their importance, it is advisable to identify them in a separate manner for their consideration, not only for the project, but also for the betterment of the national environmental policy and management.

Starting from these identified capacity needs, an analysis was made of the crossed relationships and the more important synergies were determined, contributing to shape the next chapter.

**Political level.** It became evident the lack of policies aimed at:

- ☞ The use of tools and analytical frames to evaluate synergies according to the conventions, such as prospective analysis and multiple criteria methods and of other kinds.
- ☞ To foster the use of existing synergies in the national environmental management.

- ☞ Economic evaluation of the natural resources, biological diversity, soil management, hydric resources and other environmental goods and services obtained from ecosystems.
- ☞ Sustainable financial management of the protected areas and the ecosystems.
- ☞ Financial management of the environmental funds as a mechanism to increase and multiply the economic effect of international projects in these thematic areas.
- ☞ Increasing environmental awareness at the decision makers level.

**Legal level.** It became evident the lack of:

- ☞ Identification of synergies between related legislations between the conventions.
- ☞ Updated legal, coercive and technical instruments that take into consideration the concepts of sustainability for the management of natural resources.
- ☞ Mechanisms to socialize and spread the content of the environmental regulatory instruments.

**Institutional level.** It became evident the lack of:

- ☞ Technical-material, financial and legal recognition capacities of the National Groups for the attention to the conventions.
- ☞ Management of information, making public and transferring information among key institutional actors and the population.
- ☞ Inter-institutional coordination to increase efficiency and rationalize environmental performance of the economic and productive sectors.
- ☞ Effective coordination between the bodies for inspection and control of the different sectors, to apply environmental legislation.
- ☞ Mechanisms that insure informing the key actors of the opportunities that offer the use of financial resources available at the State Environmental Funds (Forestry Fund, National Fund for the Environment).

**Sectoral level:**

The holistic character of the environment conditions that all the sectors of society (social, productive and service sectors) are linked to its performance. The needs to create and strengthen capacities have been identified in economic sectors of a greater incidence in several thematic areas. These sectors are agriculture, livestock raising, forestry and tourism.

**Sector: Agriculture** It became evident the lack of:

- ☞ A system analysis in the changes of the use of the land.
- ☞ Inter-institutional integration and coordination between the productive sector and the specialized scientific institutions.
- ☞ Knowledge and capacity of the decision makers, the land users and the specialists linked to sustainable agro-ecological technologies and practices for agricultural and forestry production.

- ☞ Material infrastructure for an efficient management of the environment, control or eradication of introduced animal and vegetable species.
- ☞ Knowledge of the technologies and systems for the management of introduced animal and plant species.
- ☞ Financial and material resources to apply cleaner technologies and achieve a proper management of waste and residues.

**Sector: Tourism.** It became evident an insufficient or lack of:

- ☞ Sectoral policy that would favor a more integral environmental vision.
- ☞ Policies that would allow that natural areas receive direct or indirect benefits that would allow them self support and continue serving as a natural base of tourism.
- ☞ Recognition of the economic value of the goods and services from biological diversity and ecosystems, as well as the techniques for its economic evaluation.
- ☞ A proper understanding of the natural patrimony, unlike what occurs with the cultural patrimony.
- ☞ Strategic evaluations of the environmental impacts in the sector.
- ☞ Education and awareness on the need to develop other types of nature tourism and to preserve biodiversity.
- ☞ Strategies for the exploitation of nature tourism.
- ☞ A proper legal frame or nature tourism.
- ☞ Knowledge or applying the legal frame or regulations that facilitate synergies.

### **3.2. Identified capacity needs regarding UNCCD**

- ☞ Current legislation regarding soils, terrestrial waters, territorial planning and urbanism is not updated.
- ☞ Incomplete legislation regarding mining resources.
- ☞ Economic and social recognition incentives are not known and are not used, among others: forestry fund, fund for improvement and conservation of soils, and other mechanisms.
- ☞ Insufficient design and setting in motion of a mechanism for the legal declaration of the category of areas under Sustainable Management of Soils, in correspondence with the previously established parameters.
- ☞ Insufficient public awareness of the current legislation.
- ☞ Insufficient updating of the technical norms to introduce current concepts of degradation and sustainable management of soils in correspondence with the current situation.
- ☞ Insufficient official status of the National Group to Combat Desertification and Drought, so that it will become an association and coordination group with legal recognition, with operative and decision making capacity.
- ☞ Insufficient level of resources and funds that would allow the National Group the monetary backup that would give it financial autonomy to insure its functioning.
- ☞ Insufficient logistic and communications media support, provided by all the institutions that integrate the group.

- ☞ Insufficient institutionalization, recognition and operational capacity of the Technical Unit for Desertification and Drought, that centers its attention in: the functioning of the National Group and other activities inherent to the application of the Convention in the country.
- ☞ Insufficient promotion, elaboration and maintenance of a portfolio of projects that allows an immediate response to possible availability of finances.
- ☞ Insufficient institutionalization of alliances or work associations among the main actors.
- ☞ Insufficient potentiating of the capacities of the existing information networks in the country in order to establish a continuous communication process that would allow to relate all the actors, systematize projects and information, generate and update data bases, and to insure continuity and access to information.
- ☞ Absence of a national monitoring and integral evaluation system for desertification, that would count with indicators oriented towards decision making.

### **3.3. Identified capacity needs regarding UNFCCC**

- ☞ Insufficient monitoring of climate and air quality.
- ☞ Lack of preparation for designing and implementing branch and local adaptation strategies, as well as non existing consideration of these topics in the physical planning and its implementation.
- ☞ Insufficient studies for facing climate change.
- ☞ Non existing impact and vulnerability to climate change monitoring systems.
- ☞ Lack of strategic vision on the use of residuals as a source of renewable energy, as well as being a mitigation measure.
- ☞ Insufficient impact evaluation of extreme meteorological events on natural resources (soil, water, biodiversity, among others).
- ☞ Non existing of strategic environmental evaluations for development projects and programs that take into consideration the different climate scenarios.
- ☞ Insufficient improvement of greenhouse effect gases inventory evaluation methods.

### **3.4. Identified capacity needs regarding CBD**

- ☞ Insufficient identification of the goods and services offered by the ecosystems.
- ☞ Insufficient knowledge of methods for economical estimates of the ecosystems goods and services.
- ☞ Insufficient knowledge of the ecology of the main ecosystems in Cuba, among which we can consider the mangroves, coral reefs, coastal and xeromorphic ecosystems and dry lands zones.
- ☞ Insufficient knowledge of the ecology of native endemic and invasive species present in the ecosystems.
- ☞ Insufficient knowledge on the ecologic restoration of degraded ecosystems, among which stand out coastal, fresh water, and forest ecosystems, and zones on leas for mining, etc.

- ☞ Insufficient knowledge of the impact of using transgenic organisms.
- ☞ Insufficient treatment of environmental impact studies, and of the effect of the development programs on biodiversity.
- ☞ Insufficient infrastructure and equipping for regulatory and control activity.
- ☞ Insufficient legal and regulatory frame for the management of biological diversity.
- ☞ Insufficient community participation in the decision making process and to support the environmental management development, with a better diffusion and popular understanding of the benefits derived from it.
- ☞ Insufficient completion of autochthonous species in the species gene banks, as a support to the successful execution of reforestation programs.
- ☞ Insufficient ecotourism application as a way to economically and socially foster conservation and sustainable use of biological diversity.
- ☞ Insufficient diffusion, preparation and logistic infrastructure to reduce rural and forest fires, and other risks of environmental accidents, as well as effective mechanisms to face them.
- ☞ Insufficient studies of species bio-indicators of contaminants.
- ☞ Insufficient environmental data bases on the three conventions to identify and implement synergies among them.
- ☞ Insufficient study of agro-biodiversity and its sustainable use.
- ☞ Insufficient official status of the National Group of Biodiversity, so that it will become an association and coordination group with legal recognition, with operative and decision making capacity.
- ☞ Insufficient level of resources and funds to implement the actions contained in the National Action Plan.
- ☞ Lack of a monitoring and an integral evaluation system for biodiversity, with indicators aimed at decision making.

## CHAPTER 4. SYNERGIES FOUND BETWEEN THE CAPACITY NEEDS FOR GLOBAL ENVIRONMENTAL MANAGEMENT

This report shows the results obtained from the Regional and Provincial Workshops of NCSA, as well as those arising from the analysis in the Groups of Experts of the three conventions in study. It also considers the contributions of the representatives from the OACEs implicated in environmental management in the country.

The basis to determine the synergies found were the results of the project presented on Chapter 2. "Report on the status of the global environmental management" and in Chapter 3. "Identified capacity needs for global environmental management". These were a result from the consultation process carried out from the provincial to the national level.

Identification of the synergies will provide key information to the current process of elaborating the new cycle 2011-2015 for NES, which should be approved at the beginning of 2011.

Capacity needs of a synergic character are presented according to the spheres of influence on the environmental policy of the country. These are:

- ☞ Policy formulation.
- ☞ Institutional level (structural).
- ☞ Legal and regulatory frame.
- ☞ Control, monitoring and information for decision making.
- ☞ Management of knowledge and research.
- ☞ Environmental education and communication.
- ☞ Local level (provincial).
- ☞ Management of selected ecosystems.

### 4.1. Policy formulation

The synergic capacity needs that were identified will enable their inclusion in the environmental policies of the country. In turn, that will allow an increase in the global, as well as national, environmental management efficiency. These also contribute to the fulfillment of the goals of the NES and of the Law of the Environment of the country.

The needs identified were:

- ☞ Need to make explicit within the legal and the environmental policy programmatic frame of the country, the synergic approach to implement the AMUMA.  
economic, to respond in a synergic manner to the commitments acquired with the AMUMA.
- ☞ Need to eliminate the lack of integrality in the sectoral, institutional or local analysis in the application of the environmental policy and management instruments.
- ☞ Need to design incentives for the use of synergies in environmental management.



- ☞ Need to conciliate in a greater measure the local priorities when formulating branch, sectoral or national policies.
- ☞ Lack of a strategy to attract and channel financial funds for implementation of the three conventions, to institutional strengthening.

## 4.2. Institutional level (structural)

The use of identified synergies will increase the efficiency and the organization of the institutional forces to comply with the environmental objectives of the country.

The identified needs are:

- ☞ The need to use the opportunities offered by the existing synergies, must be considered in the institutional and structural changes in manner such as to avoid duplication and overlapping of actions.
- ☞ Lack of technical, material and financial capacities in the national groups for the attention of the conventions.
- ☞ Insufficient legal and functional support to the national groups of attention to the conventions.
- ☞ Insufficient approach of the national problems identified in the NES by the groups of the AMUMA.
- ☞ Insufficient interaction between the national groups for the attention of the conventions.
- ☞ Lack of impact at the base level of the work and the effect of the management of the conventions.
- ☞ Need of a greater use of the local structures and of clarification of the functions relative to the integrated management of the AMUMA.

## 4.3. Legal and regulatory frame

One of the main instruments of the Environmental Strategy and Law in Cuba is the environmental regulations, as through its means, the environmental policy mandates in the country are legalized and instructed at all levels down to the base.

This is valid not only for the consolidation of the AMUMA, but also for compliance with the environmental aims in the country.

The identified needs are:

- ☞ Insufficient updating and spreading knowledge of the legal and contravention frames.
- ☞ Insufficient and/or little updating of the technical norms related to the commitments emanating from the conventions.
- ☞ Insufficient technical and materials base to control compliance with the regulations.
- ☞ Insufficient degree of compliance and obeisance with the environmental regulations.
- ☞ Insufficient identification of the legal base common to the three conventions, for its potentiation and usage.

#### **4.4. Control, monitoring and information for decision making**

Monitoring capacity and opportune information are a neuralgic point for decision making, being one of the most important requirements to be able to carry out the environmental management on scientific bases. It is also one of the synergic capacity needs that claims a higher level of financial and material resources.

These capacity needs became evident at all steps of NCSA and at the three levels analyzed, which shows its importance and impact, mainly in the territorial environmental management.

The following were identified:

- ☞ Insufficient infrastructure, suitable equipment, supplies and qualified human resources for environmental monitoring and control.
- ☞ Insufficient control and monitoring, particularly on the effectiveness of the sustainable use of soils, rational use of hydric resources, pollution, biodiversity, and the biosafety authorizations for introducing exotic species of flora and fauna or to release modified live organisms into the environment.
- ☞ Insufficient work on early warning and risk evaluation.
- ☞ Lack of an adequate information system, networks, media and data transmission channels for opportune decision making, and to implement an early warning.
- ☞ Insufficient development of the integrality indicator systems.
- ☞ Dispersion, and in many cases, lack of systematization of the existing information.

#### **4.5. Management of knowledge and research**

Science and management of knowledge play a primordial role in the environmental management work, as they support adopting the required correction and rehabilitation measures, to insure the environmental goals of the country and with them compliance with the Global Environmental Conventions.

The following synergies were identified in this sphere:

- ☞ Insufficient development and lack of a research infrastructure for compliance of the conventions and their synergic approach.
- ☞ Insufficient information on the status and the relationship between the ecosystem's goods and services, for facing the challenges approached by the AMUMA.
- ☞ Insufficient development of the AMUMA, and of the elements that have an incidence on the continued professional training.
- ☞ Insufficient spread and socialization of the results of studies and research carried out, as well as a lack of an updated international bibliography (journals, books, etc.) and of methodologies.
- ☞ Insufficient socialization on the status of negotiations, reports rendered to the AMUMA, and of the elements that have an incidence on the environmental management in the country.
- ☞ Insufficient clarity regarding the use of the most proper technologies for environmental management and the means to identify them.

- ☞ Insufficient use of the environmental scientific and technical capacities existing in the country.
- ☞ Need to include integration and synergy at the designing stage of the research.

#### **4.6. Environmental education and communication**

A sphere of action where taking advantage of the synergies could have a multiplying effect is the environmental education and communication.

The following synergies were identified:

- ☞ Insufficient level of integration in the didactic programs and media for environmental formation.
- ☞ Non existence of the synergic perspective in the action plans of the National Network for Environmental Formation.
- ☞ Insufficient expression of the environmental dimension in the study programs of the schools for cadres and other capacitating programs for decision makers at the different levels of the OACE, OLPP and other political and mass organizations.
- ☞ Insufficient consideration for the topics related with the three conventions in the study programs of the different levels of education, focused from a local perspective.
- ☞ Lack of a synergic vision in the communication strategies for the different publics.
- ☞ Insufficiencies in the systematization of the spreading of the topics related to the three conventions in the mass communications media.

#### **4.7. Local level (provincial)**

The environmental policy, as well as the goals that it imposes through the NES, have their final reflection in the actions carried out in the country at the local or the provincial level. The consideration of this approach at the base, made it possible to discover the capacity needs that had not been identified at the national level, and allowed to know the capacity needs that respond to the peculiarities of the provinces.

A good part of these needs find a solution in the same province with actions that are decided and deployed within the frame of territorial environmental management. Others, because of their scope, have been taken into consideration in this report as they involve other higher levels of environmental direction in the country. These are:

- ☞ Insufficient socialization at the local level of the status of the negotiations, report presented to AMUMA and of the elements that have an incidence in the environmental management of the country.
- ☞ Lack of integrality, overlapping and absence of consultation mechanisms and usage of synergies in the design and implementation of existing provincial structures that implement the three conventions.
- ☞ Lack of a strategy to attract and channel financial funds for the implementation of the three conventions, for institutional strengthening.

- ☞ Insufficient knowledge for applying integrated management of ecosystems, and its contribution to the sustainable use of biodiversity, adaptation to the impacts of desertification and drought, as well as to climate change.
- ☞ Insufficient knowledge of the methodologies (tools) of Research-Action-Participation and of community work as a tool to support implementation of the three conventions.
- ☞ Insufficient knowledge, methodologies, and completion of the necessary infrastructures for the restoration and recovery of ecosystems.

#### **4.8. Management of selected ecosystems**

At the initial regional study, wherever the environmental management analysis of neighboring territories, where the geographic/administrative borders did not make it advisable to differentiate actions, where the environmental management should be treated in an integrated manner, the approach used was that of an ecosystem, being the most adequate method to identify the synergies that otherwise would not be identified at the territorial level.

Within the frame of this project, it is clear that it is impossible to discuss in depth the total number of existing ecosystems, because of their range and because of the different levels requiring attention by the national environmental management, and therefore, the global.

It was much debated at the workshops whether the analysis should have been made starting from the concept of the environmental management nucleus or that of physical/geographical region. In the end, both approaches were discarded because of the impossibility of linking afterwards concrete actions to solve the synergies found.

In this manner, some of the most relevant ecosystems were identified, and within them the capacity needs that should be giving attention in a synergic manner to insure compliance with the national environmental policy goals. It should be made clear that some of the identified needs are repeated in some of them, what could be an indication of the homogeneity of the needs and of the processes used for their identification. Nineteen (19) synergies were associated with four (4) ecosystems.

##### **4.8.1. Mountain ecosystems**

This ecosystem is considered to be environmentally and economically fragile. Actions corresponding to the three conventions are carried out in it, making it an important area for the study of the impact of the three conventions. Four (4) ecosystems were studied. West (Sierra del Rosario y Sierra de los Organos); Central West (Guamuhaya mountain range) y East (Sierra Maestra y Sierra Nipe Sagua Baracoa).

The Cuban state pays special attention to it because of its strategic importance for the economic and social development of the country.

The following limitations in the synergies were identified:

- ☞ Absence of specific guidelines for environmental management of the mountain zones in order to take advantage of the synergies between conventions.
- ☞ Lack of an integrated management of the environmental problems of the ecosystem.
- ☞ Insufficient integration of the environmental dimension into the territorial planning processes, expressed in the lack of balance in the use of natural resources.
- ☞ Absence of integrality in the research applied to these zones, including that of the social aspects.
- ☞ Lack of specific legislation and control on the access to the genetic resources it harbors.
- ☞ Lack of monitoring and evaluation capacities for species of a local interest.
- ☞ Insufficient integration of capacitating actions.
- ☞ Lack of knowledge or lack of application of the legal frame or regulations that facilitate synergies.

#### **4.8.2. Marine - coastal ecosystems**

As Cuba is an archipelago with an extensive island shelf, the marine and coastal ecosystems exist in the 4 regions studied. These are sensitive systems to climate change, to the loss of biological diversity, as well as to the soil degradation processes and to wetlands modifications.

These ecosystems are an important base for economic activities such as fishing, tourism and industry; many other economic and social activities take place in them, and most of the Cuban population is settled in them.

The capacity needs that manifested in a synergic manner were:

- ☞ Insufficient integration of the environmental dimension into the territorial planning processes, expressed in the lack of balance in the use of natural resources.
- ☞ Lack of monitoring and evaluation capacities for species of a local interest and of the erosion processes in the coastal zones, especially at the beaches.
- ☞ Insufficient integration of capacitating actions.
- ☞ Lack of an integrated management of the environmental problems of the ecosystem.
- ☞ Absence of integrality in the research applied to these zones, including that of the social aspects.
- ☞ Lack of knowledge or lack of application of the legal frame or regulations that facilitate synergies.

#### **4.8.3. Hydrographic basins and bay ecosystems**

The four regions studied have important hydrographic basins and bays present, of national signification. Important socio-economic activities take place inside them, which encompass a high percentage of the economic activity of the country, and of the country's population.

The Cuban state has given priority to the study of these ecosystems with a holistic approach, which is ideal for considering the synergies between the conventions studied, and for a better management of the hydric resources of the country.

In the regional analysis the following limitations in the synergies were identified:

- ☞ Insufficient integration of the environmental dimension into the territorial planning processes, expressed in the lack of balance in the use of natural resources.
- ☞ Lack of monitoring and evaluation capacities for species of a local interest in the basin, including the absence of measuring and monitoring instruments for water quality and spills.
- ☞ Insufficient integration of capacitating actions.
- ☞ Lack of an integrated management of the environmental problems of the ecosystem.
- ☞ Absence of integrality in the research applied to these zones, including that of the social aspects.
- ☞ Lack of knowledge or lack of application of the legal frame or regulations that facilitate synergies.

#### **4.8.4. Agro-productive ecosystems**

The four regions possess important inner plains that support the main weight of agricultural production in the country.

They constitute the base of the food security of the country and are also subject to environmental stress and pressures due to the level of human activity in them. They have an outstanding place in the fulfillment of the commitments with the conventions, having a group of synergies that should be taken advantage of in the environmental management.

In the regional analysis the following limitations in the synergies were identified:

- ☞ Lack of monitoring and evaluation capacities for species of a local interest, as well as for soil degradation and the impact of remedial actions.
- ☞ Insufficient integration of capacitating actions.
- ☞ Lack of an integrated management of the environmental problems of the ecosystem.
- ☞ Absence of integrality in the research applied to these zones, including that of the social aspects.
- ☞ Insufficient integration of the environmental dimension into the territorial planning processes, expressed in the lack of balance in the use of natural resources.
- ☞ Lack of knowledge or lack of application of the legal frame or regulations that facilitate synergies.

Many of these identified capacity needs were found to be repeated in some of the ecosystems studied. A more integral view can be found in Annex IV.

## CHAPTER 5. ACTION PLAN DEVISED ON THE BASIS OF THE IDENTIFIED SYNERGIES IN CHAPTER 4

### 5.1. The Action Plan: its preparation and scope

The Plan was elaborated from each of the identified synergies in the previous Chapter. This Plan has an indicative and approximate character; it allows having an idea of the best manner to approach synergies in the conditions in Cuba.

An important element to formulate possible actions is specifying those responsible for it. This specification is subject to modifications for any changes in the environmental attention structure in the country.

The NCSA process itself and the level of final approval to which the Action Plan is submitted, could become the main usefulness of it, since the actions and approaches it proposes are based in the capacity needs that were found in a synergic manner, and that will allow the best efficiency in their attention.

At the same time, the Plan will allow designing a Portfolio of Project Ideas that pretend to deal with different problems in an integrated manner and to the full advantage of these opportunities.

Due to the manner in which the project was developed, the Action Plan lists only the activities of a national character, since those identified at a territorial level will be considered at that level of environmental management in the country. However, some of the capacity needs identified at the local level are reflected in the current Plan, because their solution is not feasible at that level of decision making.

In the Plan, actions have been grouped according to the level of in which they are generated and developed. However, some of them refer to integrated actions associated with more than one synergy. It is specified in all the cases.

**5.2. Action plan for facing the capacity needs described in the NCSA, that tribute in a synergic manner to two or more conventions and the aims of the environmental policy of the country**

No.	Capacity needed to which it responds	Sphere of action	Identified actions	Probable date	Possible executor
1	Need to make explicit within the legal and the environmental policy programmatic frame of the country, the synergic approach to implement the AMUMA.	Policy formulation.	<ul style="list-style-type: none"> <li>To include policy indications for using synergies in the 2011 – 2015 version of the NES.</li> <li>To prepare specific indications on the conventions and their synergic treatment in the revision of the Law.</li> </ul>	2011 - 2012  PERMANENT	DMA (CITMA)  Legal Direction - DMA (CITMA)
2	Insufficient knowledge and proper tools for planning, including economic, to respond in a synergic manner to the commitments acquired with the AMUMA.	Policy formulation.	<ul style="list-style-type: none"> <li>To improve coordination processes with the global ministries so that when planning, the environmental topics and the peculiarities of the mandates of the conventions are considered.</li> </ul>	PERMANENT	CITMA
3	Need to eliminate the lack of integrality in the sectoral, institutional or local analysis in the application of the instruments of environmental policy or management.	Policy formulation.	<ul style="list-style-type: none"> <li>To prepare guidelines, methodological indications and mechanisms for the integrated acting of the three conventions.</li> <li>To take into consideration the synergic approach in the decision making at the local level.</li> </ul>	PERMANENT	DMA (CITMA)



4	Need to design incentives for the use of synergies in environmental management.	Policy formulation.	<ul style="list-style-type: none"> <li>To include the use of synergies within the requirements for awards and other recognitions of an environmental character.</li> <li>To study the use of economic incentives for the maximum use of synergies in environmental management.</li> </ul>	2011 - 2012	DMA (CITMA)
5	Need to conciliate in a greater measure the local priorities when formulating branch, sectoral or national policies.	Policy formulation.	<ul style="list-style-type: none"> <li>To foster integration of territorial priorities into the guidelines for making the territorial and sectoral strategies, therefore increasing the weight of the local in the design of the national.</li> </ul>	2011 - 2012	DMA (CITMA)
6	Lack of a strategy to attract and channel financial funds for implementation of the three conventions, to institutional strengthening.	Policy formulation.	<ul style="list-style-type: none"> <li>To prepare guidelines for environmental policy that would have an incidence when preparing a strategy to attract and channel national and international financial funds for this aims.</li> <li>An integrated use of financing in implementing actions of the AMUMA.</li> </ul>	2011 - 2015	DMA, DCI and Direction of Planning (CITMA)

7	The need to use the opportunities offered by the existing synergies, must be considered in the institution and structural changes in a manner such as to avoid duplication and overlapping actions.	Institutional level (structural)	<ul style="list-style-type: none"> <li>To consider NCSA recommendations regarding the use of synergies in the modification of structures, whether of a national or a provincial character.</li> </ul>	PERMANENT	CITMA
8	Lack of technical, material and financial capacities in the national groups for the attention of the conventions.	Institutional level (structural)	<ul style="list-style-type: none"> <li>To propose actions when planning resources for the environment that materially and financially supports the activity of the national groups of attention to the conventions.</li> </ul>	2011	CITMA
9	Insufficient level of functional support to the national groups of attention to the conventions.	Institutional level (structural)	<ul style="list-style-type: none"> <li>When revising Law 81, to include provisions that provide legal and institutional cover to the national groups of attention to the conventions.</li> </ul>	2011 - 2012	DMA (CITMA)
10	Insufficient approach of the national problems identified in the NES by the groups of the AMUMA.	Institutional level (structural)	<ul style="list-style-type: none"> <li>To elaborate work guidelines to develop activities for the national groups for the attention of the AMUMA, with mandates not only for international negotiation, but also for national management.</li> </ul>	2012	DMA, DCI (CITMA)

11	Insufficient interaction between the national groups for the attention of the conventions.	Institutional level (structural)	<ul style="list-style-type: none"> <li>In the previous action, indicate consultation and coordination mechanisms between the national groups of attention to the conventions.</li> </ul>	2011	DMA (CITMA)
12	Lack of impact at the base level of the work and the effect of the management of the conventions.	Institutional level (structural)	<ul style="list-style-type: none"> <li>Elaborate guidelines and procedures to evaluate at the base the impact of the conventions by the national groups for the attention of the AMUMA and submit them to higher levels.</li> <li>See actions 7, 10 y 12.</li> </ul>	2011	National groups for the attention of the AMUMA
13	Need of a greater use of the local structures and of clarification of the functions relative to the integrated management of the AMUMA.	Institutional level (structural).			
14	Insufficient updating and spreading knowledge of the legal and contravention frames.	Legal and regulatory frame.	<ul style="list-style-type: none"> <li>To incorporate the synergic approach into the process of revision of the environmental legal and contravention frame.</li> <li>To elaborate a program to spread the legal and contravention frame.</li> <li>To spread the elaborated program.</li> </ul>	2013  2013  2014	CITMA  Direction of Communication, CIGEA (CITMA) Direction of Communication, CIGEA (CITMA)

15	Insufficient and/or little updating of the technical norms related to the commitments emanating from the conventions.	Legal and regulatory frame.	<ul style="list-style-type: none"> <li>To evaluate the normative requirements for the deployment of the AMUMA.</li> <li>To conciliate with the respective committees of technical norms, the preparation of the required norms for the AMUMA.</li> </ul>	2011 2012 - 2013	National groups for the attention of the AMUMA, DMA, ONN (CITMA)
16	Insufficient technical and materials use to control compliance with the regulations.	Legal and regulatory frame.	<ul style="list-style-type: none"> <li>To develop actions to strengthen logistic capacities in the institutions that control the environmental norms.</li> </ul>	2012	DMA, ORASEN (CITMA)
17	Insufficient degree of compliance and obedience with the environmental regulations.	Legal and regulatory frame.	<ul style="list-style-type: none"> <li>See actions 14 and 16.</li> </ul>		
18	Insufficient identification of the legal base common to the three conventions, for its potential use.	Legal and regulatory frame.	<ul style="list-style-type: none"> <li>To identify the legal base common to the three conventions.</li> </ul>	2012	DMA (CITMA)
19	Insufficient infrastructure, suitable equipment, supplies and qualified human resources for environmental monitoring and control.	Control, monitoring and information for decision making.	<p>Action that responds in an integrated manner to the synergies identified in 19 and 20.</p> <ul style="list-style-type: none"> <li>To design a national system of integral monitoring that responds to</li> </ul>	2011 - 2014	Environmental System of CITMA, Civil Defense

20	Insufficient control and monitoring, particularly on the effectiveness of the sustainable use of soils, rational use of hydric resources, pollution, biodiversity and the biosafety authorizations for introducing exotic species of flora and fauna or to release modified live organisms into the environment.	Control, monitoring and information for decision making.	the requirements of the AMUMA and the environmental law of the country. (It should respond to the particulars listed in capacity need 20, specifying indications for prioritized ecosystems. It should identify the ways to strengthen the infrastructure, suitable equipment, supplies and qualified human resources).		
21	Insufficient work on early warning and risk evaluation.	Control, monitoring and information for decision making.	<ul style="list-style-type: none"> <li>To design a multi-sectoral integrated system of early warning that responds to the requirements of the AMUMA.</li> </ul>	2014	DMA, ORASEN CIGEA, AMA (CITMA)
22	Lack of an adequate information system, networks, media and data transmission channels for opportune decision making, and to implement an early warning.	Control, monitoring and information for decision making.	<ul style="list-style-type: none"> <li>To design an information system, including the transmission network and the means to insure an early warning and decision making.</li> </ul>	2014	CIGEA, DMA (CITMA)
23	Insufficient development of the integrality indicators systems.	Control, monitoring and information for decision making.	<ul style="list-style-type: none"> <li>To design an integrality indicators system that responds to the main environmental problems in the country.</li> </ul>	2012	DMA, ORASEN CIGEA, AMA (CITMA)

24	Dispersion, and cases lack of systematization of existing information.	many	Control, monitoring and information for decision making.	• See action 22.		
25	Insufficient development of a research infrastructure compliance of conventions and synergic approach.	lack	Management of knowledge and research.	<ul style="list-style-type: none"> <li>To identify lacks in the research infrastructure needed for compliance with the AMUMA.</li> <li>To prepare a program to respond to the deficiencies detected.</li> </ul>	2011 - 2012	AMA
26	Insufficient information on the status of the relationship between the ecosystem goods and services, facing the challenges approached by the AMUMA.	information	Management of knowledge and research.	<ul style="list-style-type: none"> <li>Preparation and development of materials on the goods and services of the ecosystems.</li> <li>To spread the materials among the groups of attention to the conventions.</li> </ul>	2011 - 2012	AMA, DMA (CITMA)
27	Insufficient incorporation of the results from research into the initial and continued professional training.	the	Management of knowledge and research.	<ul style="list-style-type: none"> <li>To create coordination mechanisms between the research institutions and the environmental education structures to spread the scientific results.</li> </ul>	2011	AMA, CIGEA (CITMA)
28	Insufficient spread and socialization of the results of studies and research carried out, as well as a lack of an updated international	and	Management of knowledge and research.	<ul style="list-style-type: none"> <li>To find ways that will allow making up for the lack of updated bibliography, journals, books, necessary for research, as well as methodologies.</li> </ul>	2011	AMA, CIGEA (CITMA)

	bibliography (journals, books, etc.) and of methodologies.				
29	Insufficient socialization on the status of negotiations, reports rendered to the AMUMA and of the elements that have an incidence on the environmental management in the country.	Management of knowledge and research.	<ul style="list-style-type: none"> <li>To organize ways to spread to the base the reports of the country and the reports presented to the AMUMA.</li> </ul>	2010	National groups for the attention of the AMUMA
30	Insufficient clarity regarding the use of the most proper technologies for environmental management and the means to identify them.	Management of knowledge and research.	<ul style="list-style-type: none"> <li>To make a balance of the most proper technologies that have been endorsed by the Group CITMA that carries out the evaluation of the Feasibility Studies of investments presented by the OACE or their representatives in the territories.</li> </ul>	2015	CITMA
31	Insufficient use of the environmental scientific and technical capacities existing in the country.	Management of knowledge and research.	<ul style="list-style-type: none"> <li>To make a list and analysis of the empty spaces regarding existing environmental scientific and technical capacities and services.</li> </ul>	2013	CITMA
32	Need to include integration and synergy at the designing stage of the research.	Management of knowledge and research.	<ul style="list-style-type: none"> <li>To elaborate methodological guidelines to include integration and synergy in the design of the research.</li> </ul>	2013	CITMA

33	Insufficient level of integration in the didactic programs and media for environmental formation.	Environmental education and communication.	Action that responds in an integrated manner to the synergies identified in 33 and 34.	2011 - 2013	CIGEA, National groups for the attention of the AMUMA
34	Non existence of the synergic perspective in the action plans of the National Network for Environmental Formation.	Environmental education and communication.	<ul style="list-style-type: none"> <li>Design and implementation of the integrated and synergies approach in the National Network of Environmental Formation and its strategy, including preparation of required technical means for its execution, specifying indications for prioritized ecosystems.</li> </ul>		
35	Insufficient expression, of the environmental dimension in the study programs of the schools for cadres and other capacitating programs for decision makers at the different levels of the OACE, OLPP and other political and mass organizations.	Environmental education and communication.	<ul style="list-style-type: none"> <li>To elaborate an assimilation program through formal and informal capacitating and education means that includes the OACE, OLPP, political and mass organizations, that deals sufficiently, and according to each level, the topics relative to AMUMA, taking advantage of the synergies between them.</li> </ul>	2011 - 2013	CIGEA, National groups for the attention of the AMUMA, MES, MINED
36	Insufficient consideration for the topics related with the three conventions in the	Environmental education and communication.	<ul style="list-style-type: none"> <li>To elaborate an assimilation program through formal means that includes topics related to</li> </ul>	2014	CIGEA, National groups for the attention of the



	study programs of the different levels of education, focused from a local perspective.		the three conventions, according to the different levels of education and local conditions.		AMUMA, MES, MINED
37	Lack of a synergic vision in the communication strategies for the different publics.	Environmental education and communication.	Action that responds in an integrated manner to the synergies identified in 37 and 38.	2012 - 1014	CIGEA, National groups for the attention of the AMUMA, MINCULT
38	Insufficiencies in the systematization of the spreading of the topics related to the three conventions in the mass communications media.	Environmental education and communication.	<ul style="list-style-type: none"> <li>In the environmental strategy it should be insured that the synergies between conventions are incorporated, with special attention to prioritized ecosystems.</li> <li>To elaborate communication strategies that contribute to spread, inform and sensitize the different publics.</li> <li>See action 29.</li> </ul>		
39	Insufficient socialization at the local level on the status of the negotiations and the reports presented to the AMUMA, and of the elements that have an incidence in the environmental management of the country.	Local level (provincial).			

40	Lack of integrality, overlapping and absence of consultation mechanisms and usage of synergies in the design and implementation of existing provincial structures that implement the three conventions.	Local level (provincial).	<ul style="list-style-type: none"> <li>When preparing the territorial environmental strategies version 2011-2015, it will be explicit in them the creation and use of consultation mechanisms in the management of the province.</li> </ul>	2010	Territorial delegations of CITMA, UMA
41	Lack of a strategy to attract and channel financial funds for the implementation of the three conventions, for institutional strengthening.	Local level (provincial).	<ul style="list-style-type: none"> <li>See action 6.</li> </ul>		
42	Insufficient knowledge for applying integrated management of ecosystems, and its contribution to the sustainable use of biodiversity, adaptation to the impact of desertification and drought, as well as to climate change.	Local level (provincial).	<ul style="list-style-type: none"> <li>To organize capacitating actions on the integrated management of ecosystems at the local level, aimed at taking advantage of the synergies between biodiversity, the topics of adapting to climate change and soil degradation; it should make specifications for prioritized ecosystems.</li> </ul>	2011 - 2013	AMA, CIGEA, Territorial delegations of CITMA, UMA
43	Insufficient knowledge of the methodologies (tools) of Research-	Local level (provincial).	<ul style="list-style-type: none"> <li>To organize capacitating actions on the methodologies (tools) of</li> </ul>	2013 - 2015	AMA, CIGEA, Territorial delegations of

	Action-Participation and of community work, as a tool to support implementation of the three conventions.		Research-Action-Participation and community work.		CITMA, UMA
44	Insufficient knowledge, methodologies and completion of the necessary infrastructures for the restoration and recovery of ecosystems.	Local level (provincial).	<ul style="list-style-type: none"> <li>To develop methodologies and evaluation of the infrastructures necessary for the restoration and recovery of ecosystems.</li> </ul>	2013 - 2015	AMA, CIGEA, Territorial delegations of CITMA, UMA
<b>ACTIONS RELATIVE TO THE SELECTED ECOSYSTEMS</b>					
45	Absence of specific guidelines for environmental management of the mountain zones in order to take advantage of the synergies between conventions.	Mountain.	<ul style="list-style-type: none"> <li>To elaborate specific guidelines for environmental management in mountain zones, with indications to take advantage of the synergies between conventions.</li> </ul>	2011	CNAP
46	Lack of an integrated management of the environmental problems of the ecosystem.	Mountain.	<ul style="list-style-type: none"> <li>To include an integrated vision in the environmental strategy of the territory and the specific action plans to deal with the environmental problems of the ecosystem.</li> </ul>	2015	DMA, Territorial delegations of CITMA

47	Insufficient integration of the environmental dimension into the territorial planning processes, expressed in the lack of balance in the use of natural resources.	Mountain.	<ul style="list-style-type: none"> <li>To include the environmental dimension at the phase of conception of the territorial planning at its different levels.</li> </ul>	2014	CITMA, IPF
48	Absence of integrality in the research applied to these zones, including that of the social aspects.	Mountain.	<ul style="list-style-type: none"> <li>Revision of the research plans carried out in the mountains and establishing of the thematic lines required to take advantage of the synergies identified.</li> </ul>	2011	Mountain bodies of CITMA, CNAP, UMA
49	Lack of a specific legislation and control on the access to the genetic resources in its harbors.	Mountain.	<ul style="list-style-type: none"> <li>Inserts in action 14.</li> </ul>	2013	Mountain bodies of CITMA, CNAP, UMA
50	Lack of monitoring and evaluation capacities for species of local interest.	Mountain.	<ul style="list-style-type: none"> <li>Inserts in actions 19 and 20.</li> </ul>		Mountain bodies of CITMA, CNAP, UMA
51	Insufficient integration of capacitation actions.	Mountain.	<ul style="list-style-type: none"> <li>Inserts in actions 37 and 38.</li> </ul>		Mountain bodies of CITMA, CNAP, UMA
52	Lack of knowledge or lack of application of the legal framework or regulations that facilitate synergies.	Mountain.	<ul style="list-style-type: none"> <li>Inserts in actions 14 to 18.</li> </ul>		Mountain bodies of CITMA, CNAP, UMA

53	Insufficient integration of the environmental dimension into the territorial planning processes, expressed in the lack of balance in the use of natural resources.	Marine - coastal.	<ul style="list-style-type: none"> <li>To include the environmental dimension at the phase of conception of the territorial planning at its different levels.</li> </ul>	2014	CITMA, IPF
54	Lack of monitoring and evaluation capacities for species of interest and of the erosive processes of the coastal zones, especially at the beaches.	Marine - coastal.	<ul style="list-style-type: none"> <li>Inserts in actions 19 and 20.</li> </ul>		Commissions for the integrated coastal zone management
55	Insufficient integration of capacitating actions.	Marine - coastal.	<ul style="list-style-type: none"> <li>Inserts in actions 37 and 38.</li> </ul>		Commissions for the integrated coastal zone management
56	Lack of an integrated management of the environmental problems of the ecosystem.	Marine - coastal.	<ul style="list-style-type: none"> <li>To include an integrated vision in the environmental strategy of the territory and the specific action plans to deal with the environmental problems of the ecosystem.</li> </ul>	2015	DMA, Territorial delegations (CITMA)

57	Absence of integration of the research to these zones including that social aspects	Marine - coastal.	<ul style="list-style-type: none"> <li>• Revision of the research plans carried out in the prioritized basins, bays, wetlands and coastal zones, and establishing of the thematic lines required to take advantage of the synergies identified.</li> </ul>	2011	Commissions for the integrated coastal zone management
58	Lack of knowledge or lack of application of the legal framework or regulations that facilitate synergies.	Marine - coastal.	<ul style="list-style-type: none"> <li>• Inserts in actions 14 to 18.</li> </ul>		Commissions for the integrated coastal zone management
59	Insufficient integration of the environmental dimension into the territorial planning processes, expressed in the lack of balance in the use of natural resources.	Hydrographic basins and bays.	<ul style="list-style-type: none"> <li>• To include the environmental dimension at the phase of conception of the territorial planning at its different levels.</li> </ul>	2014	CITMA, IPF
60	Lack of monitoring and evaluation capacities for species of interest in the basin, including the absence of measuring and monitoring instruments for water quality and spills.	Hydrographic basins and bays.	<ul style="list-style-type: none"> <li>• Inserts in actions 19 and 20.</li> </ul>		Councils of hydrographic basins, working groups on bays

61	Insufficient integration of capacitating actions	Hydrographic basins and bays.	<ul style="list-style-type: none"> <li>• Inserts in actions 37 and 38.</li> </ul>		Councils of hydrographic basins, working groups on bays
62	Lack of an integrated management of the environmental problems of the ecosystem.	Hydrographic basins and bays.	<ul style="list-style-type: none"> <li>• To include an integrated vision in the environmental strategy of the territory and the specific action plans to deal with the environmental problems of the ecosystem.</li> </ul>	2015	DMA, Territorial delegations (CITMA)
63	Absence of integrality in the research applied to these zones, including that of the social aspects.	Hydrographic basins and bays.	<ul style="list-style-type: none"> <li>• Revision of the research plans carried out in the prioritized basins, and bays, of national interest, and establishing of the thematic lines required to take advantage of the synergies identified.</li> </ul>	2011	Councils of hydrographic basins, working groups on bays
64	Lack of knowledge or lack of application of the legal frame or regulations that facilitate synergies.	Hydrographic basins and bays.	<ul style="list-style-type: none"> <li>• Inserts in actions 14 to 18.</li> </ul>		Councils of hydrographic basins, working groups on bays
65	Lack of monitoring and evaluation capacities for species of local interest, as well as for soil degradation and the impact of remedial actions.	Agro-productive ecosystems.	<ul style="list-style-type: none"> <li>• Inserts in actions 19 and 20.</li> </ul>	2013	CIGEA, CNAP, DMA (CITMA), MINAG

66	Insufficient integration of capacitating actions.	Agro-productive ecosystems.	<ul style="list-style-type: none"> <li>Inserts in actions 37 and 38.</li> </ul>	2012	CIGEA, CNAP, DMA (CITMA), MINAG
67	Lack of an integrated management of the environmental problems of the ecosystem	Agro-productive ecosystems.	<ul style="list-style-type: none"> <li>To include an integrated vision in the environmental strategy of the territory and the specific action plans to deal with the environmental problems of the ecosystem.</li> </ul>	2015	DMA, Territorial delegations (CITMA)
68	Absence of integrality in the research applied to these zones including the social aspects	Agro-productive ecosystems.	<ul style="list-style-type: none"> <li>Revision of the research plans carried out in the agro-productive zones of the country, and establishing of the thematic lines required to take advantage of the synergies identified.</li> </ul>	2011	CIGEA, CNAP, DMA (CITMA), MINAG
69	Insufficient integration of the environmental dimension in the territorial planning processes, expressed in the lack of balance in the use of natural resources.	Agro-productive ecosystems.	<ul style="list-style-type: none"> <li>To include the environmental dimension at the phase of conception of the territorial planning at its different levels.</li> </ul>	2014	CITMA, IPF
70	Lack of knowledge or lack of application of the legal framework or regulations that facilitate synergies.	Agro-productive ecosystems.	<ul style="list-style-type: none"> <li>Inserts in actions 14 to 18.</li> </ul>		CIGEA, CNAP, DMA (CITMA), MINAG



## ANNEX 1. Members of the Committees established to advise the implementation of the three conventions

### National Coordination Group for the Convention against Desertification and Drought.

- ☞ Ministry of Science, Technology and Environment
  - Direction of the Environment
  - Center of Information, Management and Environmental Education
  - National Center of Protected Areas
  - Environmental Agency (Institute of Meteorology, Institute of Tropical Geography, Institute for Ecology and Systematic)
  - Direction of International Collaboration
- ☞ Ministry of Sugar Cane Industry
  - Sugar Cane Research Institute
- ☞ National Institute for Hydraulic Resources
  - National Center for Hydrology and Water Quality
  - Direction of Hydrographic Basins
- ☞ Ministry of Agriculture
  - Institute of Soils
  - Direction of Science and Technology
  - Institute of Research on Horticulture "Liliana Dimitrova"
  - Institute of Fundamental Research on Tropical Agriculture
  - National Institute of Pastures and Forages
  - Institute of Research on Forestry
  - Institute of Research on Agriculture Mechanization
  - Institute of Research on Irrigation and Drainage
- ☞ Ministry of Public Health
- ☞ Institute of Physical Planning
- ☞ Ministry of the Interior
  - Forest Rangers Body
- ☞ Ministry of Higher Education
  - Direction of Science and Technology
  - National Institute of Agricultural Sciences
  - Center of Demographic Studies
  - Institute of Animal Science
- ☞ Non Governmental Organizations (see acronyms list)
  - ANAP
  - ACTAF
  - ACPA
  - FMC
  - UNAICC

**National Group of Climate Change.**

- ☞ Ministry of Science, Technology and Environment
  - Direction of the Environment
  - Environmental Agency (Institute of Oceanology, Institute of Ecology and Systematic)
  - Direction of International Collaboration
  - Research Center on the World Economy
- ☞ Ministry of Basic Industry (Chemical Industry, Mining, Energy)
- ☞ Ministry of Sugar Cane Industry
- ☞ National Institute for Hydraulic Resources
- ☞ Ministry of Agriculture
- ☞ Ministry of Construction
- ☞ Ministry of Fisheries\*
  - \* Due to institutional changes, MIP became extinct as a Ministry and fisheries activity was absorbed by MINAL.
- ☞ Ministry of Transport
- ☞ Ministry of Foreign Affairs
- ☞ Ministry of Higher Education
  - University of Havana
- ☞ Institute of Physical Planning
- ☞ Non Governmental Organizations
  - Meteorological Society of Cuba
  - Union of Lawyers of Cuba

**National Group of Biological Diversity.**

- ☞ Ministry of Science, Technology and Environment
  - Direction of the Environment
  - National Center of Protected Areas
  - Environmental Agency (Institute of Ecology and Systematic, National Center of Biodiversity, National Museum of Natural History, Sabana - ~~Central de Información, Manejo y Educación Ambiental~~ /GEF)
  - Center of Information, Management and Environmental Education
  - National Center of Biological Safety
  - Center for Environmental Inspection and Control
  - Direction of International Collaboration
  - National Office of Industrial Property Rights
- ☞ Ministry of Sugar Cane Industry

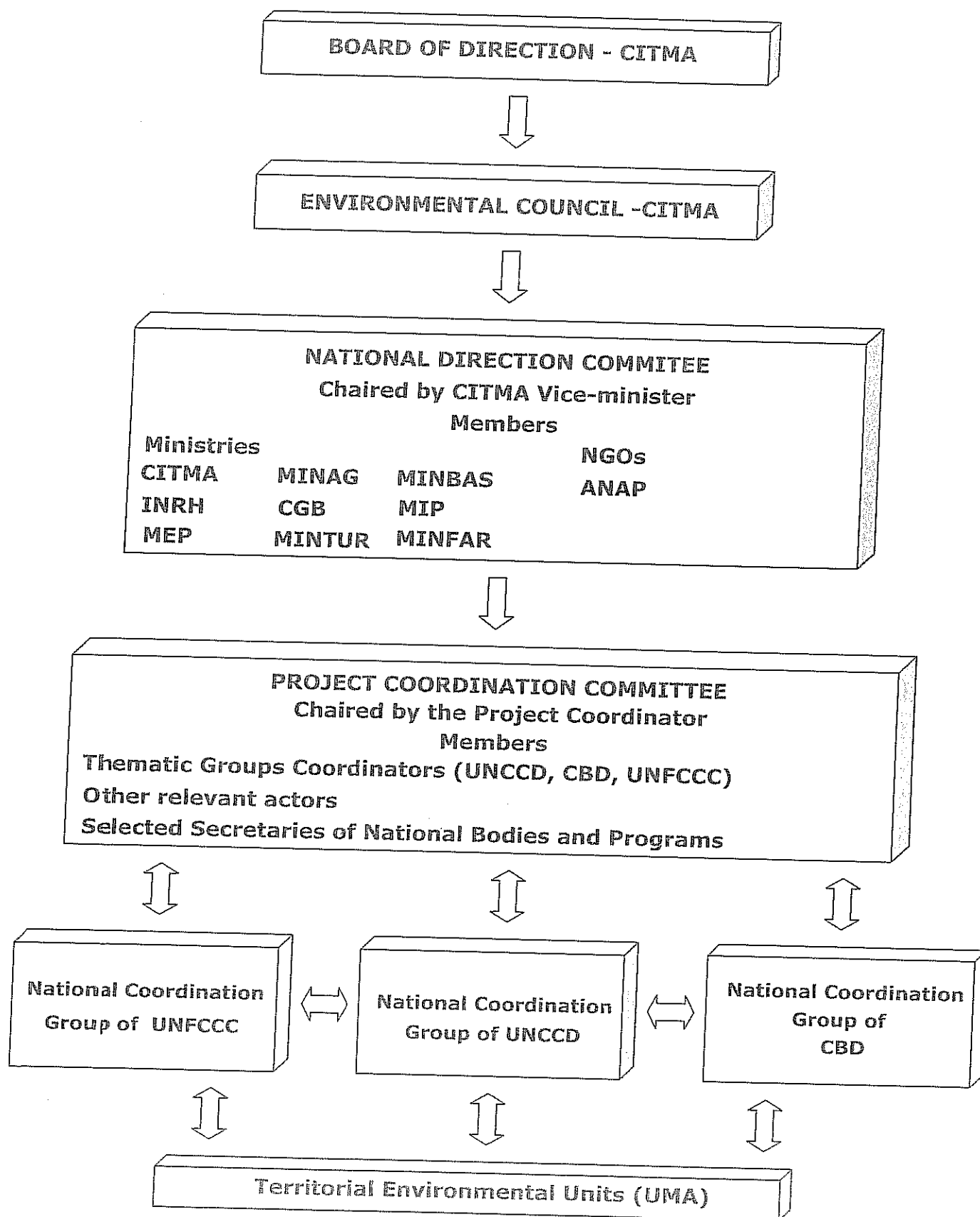
- ☞ National Institute for Hydraulic Resources
- ☞ Ministry of Fisheries\*
  - \* Due to institutional changes, MIP became extinct as a Ministry and fisheries activity was absorbed by MINAL.
- ☞ Ministry of Agriculture
  - Instituto de Suelos
  - Institute of Soils
  - State Forestry Service
  - Direction of Science and Technology
  - National Enterprise for the Protection of the Flora and the Fauna
- ☞ Ministry of Higher Education
  - National Botanic Garden
- ☞ Ministry of the Interior
  - Forest Rangers Body

# ANNEX II

## ANNEX II. Actors and institutions participating in the project

- ☞ All the actors listed in Annex I
- ☞ Ministry of Science, Technology and Environment
  - Environmental Agency (National Zoological Park and National Aquarium)
  - Environmental Units of the Territorial Delegations of CITMA
  - Eastern Center for Biodiversity and Ecosystems
- ☞ Ministry of Agriculture
  - National Institute of Plant Health
  - Research Institute on Tropical Fruticulture
  - Institute of Edible Roots, Tubercles and Bananas
  - Institute of Swine Research
  - Institute of Avian Research
- ☞ Ministry of Higher Education
  - Universities and Higher Pedagogical Institutes
- ☞ Non Governmental Organizations (of environmental scope)
  - Cuban Society of Botany
  - Cuban Society of Zoology
  - Cuban Society of Speleology
  - Cuban Society for the Protection of Nature "Pro-Naturaleza"
  - Man and Nature Foundation "Dr. Antonio Núñez Jiménez"

# ANNEX III. National structure for the implementation of the National Capacity Needs Self-Assessment for the Global Environment Management in Cuba



## ANNEX IV. Summary of the identified capacity needs in the prioritized ecosystems

Capacity need	Mountain ecosystems	Marine – coastal ecosystems	Hydrographic basins and bays ecosystems	Agro-productive ecosystems
Absence of specific guidelines for environmental management of the mountain zones to take advantage of the synergies between conventions.	X			
Lack of an integrated management of the environmental problems of the ecosystem.	X	X	X	X
Insufficient integration of the environmental dimension into the territorial planning processes, manifested in the lack of balance in the use of natural resources.	X	X	X	X
Absence of integrality in the research applied	X	X	X	X
including the social aspects.				
Lack of a specific legislation and control on the access to the genetic resources of harbors.	X			

Lack of monitoring and evaluation capacities for species of local interest.	X	and of the erosive processes of the coastal zones, especially of beaches.	including the absence of measuring and monitoring instruments of spills.	as well as for degradation of the soil and the impact of remedial actions.
Insufficient integration of capacitating actions.	X	X	X	X
Lack of knowledge or not applying the legal frame or regulations that facilitate synergies.	X	X	X	X

# ANNEX V

## ANNEX V. Projects of the Small Grants Fund Program that the GEF is developing in Cuba

1. **CUB/05/001.** Reduction of GHG emissions through the rehabilitation of the micro hydroelectric plant in Los Gallegos.
2. **CUB/05/02.** Reforestation and soil improvement with *Jatropha curcas* L. in the community of Macambo, semiarid region of Guantánamo province, Cuba.
3. **CUB/05/03.** The Nim tree (*Azadirachta indica* A. Juss), a sustainable solution for the reforestation, soil improvement and the production of natural insecticide in the semiarid region of San Antonio del Sur, Guantánamo, Cuba.
4. **CUB/05/04.** Reduction of the emissions of dioxins and furans, through the elimination of the uncontrolled burning of solid human waste in the community of Isleta.
5. **CUB/05/05.** Support to the protection of the mountain ecosystem and the local economy in the community of Victorino.
6. **CUB/05/06.** Support to the conservation of the agro-biodiversity and the rural development in the community of Peralejo.
7. **CUB/05/07.** Recovery and conservation of the Cuban (Criolla) goat: genetic resource in danger of extinction.
8. **CUB/05/08.** Direct planting, a new conservationist approach and soil improvement for a sustainable agriculture for small farmers.
9. **CUB/05/09.** Photovoltaic solar electrification of the rural settlement San Narciso in the mountain ecosystem of Guamuhaya.
10. **CUB/OP3/2/06/01.** Barrio Azul at the rescue of their river.
11. **CUB/OP3/2/06/02.** Support to the environmental conservation and empowerment of the economy of the Corralillo Popular Council.
12. **CUB/OP3/2/06/03.** Conservation and management of the diversity of the autochthonous palm trees, traditional resource of the community of Ojo del Agua, municipality of Majibacoa, province of Las Tunas.
13. **CUB/OP3/2/06/04.** Environmental sustainability and new opportunities for the communities of farmers of Santa María in the National Park "Alejandro De Humboldt", Natural Patrimony of Humanity.
14. **CUB/OP3/2/06/05.** Sustainable management of the ecosystem and natural resources in the rural settlement of Cimarrones, in the hydrographic basin of Hanabanilla, mountain ecosystem of Guamuhaya.
15. **CUB/OP3/2/06/06.** New opportunities for the support of the rural community of Zabalo, a premise for the sustainable management of a Ramsar site.
16. **CUB/OP3/2/06/07.** Energizing the rural settlement El Guiral Realengo 18, through the use of renewable sources of energy.
17. **CUB/OP3/2/06/08.** Sustainable management of the natural resources with the participation of the community in areas of the rural settlement Hoyo de Padilla in the mountain range of Guamuhaya.
18. **CUB/OP3/2/06/09.** Alternative use of the natural resources in the coastal community of Carahatas.
19. **CUB/OP3/2/06/10.** Community mitigation and adaptation to climate change in the Río Guaso basin.
20. **CUB/SGP/OP4/CORE/08/01.** Recovery of soil fertility in the coastal community Dolores of the Municipality of Caibarién, province of Villa Clara.



21. **CUB/SGP/OP4/CORE/08/02.** Conservation of natural resources in the mountain settlement of Manicaragua.
22. **CUB/SGP/OP4/CORE/08/03.** Program for participative management of natural resources in the community La Concepción.
23. **CUB/SGP/OP4/CORE/08/04.** Strengthening community actions for the reforestation and soil improvement in the semiarid region of San Antonio del Sur, province of Guantánamo. Cuba.
24. **CUB/SGP/OP4/RAF/08/01.** Fostering forest areas and use of sustainable practices by the farmers in the protected natural landscape Hanabanilla.
25. **CUB/SGP/OP4/RAF/08/02.** Reduction of greenhouse effect gases emission and increase of carbon sequestration through local actions in the rural settlement El Mamey in the mountain ecosystem of Guamuhaya.
26. **CUB/SGP/OP4/RAF/08/03.** Conservation of natural resources in the mountain settlement El Nicho.
27. **CUB/SGP/OP4/RAF/08/04.** Learning how to use the forest in a sustainable manner through the construction of firewood saving stoves in the community of El Oro.
28. **CUB/SGP/OP4/RAF/08/05.** Protection and environmental improvement of the mountain ecosystem in Guiral Arriba, Realengo 18, El Salvador, Guantánamo, Cuba.
29. **CUB/SGP/OP4/RAF/08/06.** Development of a participative agro-ecological system integrated to the management of the natural and socio-cultural resources in the locality of Capón, Viñales National Park. Pinar del Río, Cuba.
30. **CUB/SGP/OP4/Y2/CORE/2009/01.** Improvement of the environmental quality of the mountain community of Limonar de Monte Ruz through the implementation of a participative program for conservation and development of the natural and socio-cultural resources.
31. **CUB/SGP/OP4/Y2/CORE/2009/02.** Working for a sustainable management of natural resources at the community of La Jova.
32. **CUB/SGP/OP4/Y2/CORE/2009/03.** Conservation of natural resources in the mountain settlement of El Sopapo.
33. **CUB/SGP/OP4/Y2/CORE/2009/04.** Strengthening actions for the conservation of soils and their sustainability in the semiarid region of San Antonio del Sur.
34. **CUB/SGP/OP4/Y2/CORE/2009/05.** Strengthening local capacities for the production and commercialization of natural insecticides in the cooperative Rosa Elena Simeón.
35. **CUB/SGP/OP4/Y2/CORE/2009/06.** Reduction of land degradation in the community of Banao, through the implementation of practices for the recovery, management and conservation of agricultural soils.
36. **CUB/SGP/OP4/Y2/RAF/2009/01.** The community of Playa Florida to the rescue of its mangrove ecosystem.
37. **CUB/SGP/OP4/Y2/RAF/2009/02.** Conservation of the Palma Petate (*Coccothrinax crinita* subsp. *crinita*) as a traditional resource exclusive of the community of Las Pozas, Bahía Honda, Pinar del Río, Cuba.
38. **CUB/SGP/OP4/Y2/RAF/2009/03.** Santo Domingo for the conservation and biodiversity protection in the protected area of Turquino National Park.
39. **CUB/SGP/OP4/Y2/RAF/2009/04.** Capacity building for the management of the royal palm in the community of La Sabana.

40. **CUB/SGP/OP4/Y2/RAF/2009/05.** The community of Ortega for the rescue and conservation of its mountain ecosystem.
41. **CUB/SGP/OP4/Y2/RAF/2009/06.** The community of Yambeque for a sustainable management of hydrological energy and natural resources.
42. **CUB/SGP/OP4/Y2/RAF/2009/07.** Photovoltaic solar electrification of the rural community of San José in the mountain range of Escambray.
43. **CUB/SGP/OP4/Y2/RAF/08.** Demonstration project of the use of renewable energy in the processing of coconut copra in the communities in the protected area Yara-Majayara.
44. **CUB/SGP/OP4/Y3/RAF/1.** Reduction of methane emissions to the atmosphere through the use of tubular polyethylene bio-digestors in the management of swine manure.
45. **CUB/SGP/OP4/Y3/RAF/2.** Use of renewable sources of energy in the farmer's community of Manzanillo.
46. **CUB/SGP/OP4/Y3/RAF/3.** Introduction of renewable sources of energy in the community of Las Lechugas.
47. **CUB/SGP/OP4/Y3/CORE/1.** Reduction of degradation processes in areas of the hydrographic basin of San Juan, Matanzas.
48. **CUB/SGP/OP4/Y3/CORE/2.** Implementation of an integral system to halt soil desertification and degradation processes in the community of La Gloria.

## ANNEX VI. Portfolio of project ideas emanating from the steps of NCSA in Cuba

### Presentation.

This annex to the Final Report to the NCSA Project reflects the ideas that emanated from the whole process of national self-evaluation and represents the projects selected from those presented in the provincial reports made for this study.

The capacity needs identified for each of the conventions and the synergies between them will therefore have a national, ecosystem and territorial approach. That is the reason why the results expressed in the 5 products of the projects, that is: Status of the global environmental management; Report on the capacity needs; Report on the synergies found; Action plan; and Portfolio of project ideas, are reflected at the national, and main ecosystems levels, and at each one of the provinces.

It should be underlined that the Portfolio of project ideas is an additional result, not contemplated in the requirements of the project. It represents an opportunity to identify, within all the experience accumulated at the territories, projects that have a national character.

In the same manner, at the level of each region or provincial work group, another set of project ideas have been identified. It allows having in each territory a good foundation for preparing and guiding the actions that should be carried out to insure compliance of the Law of the Environment and the aims of the NES.

Below is a table with the ideas for projects obtained at the territorial level which can be used as a starting point for any other request.

Project idea	General aim	Institutions to involve	Duration	Estimated cost in USD	Probable source
Institutional strengthening of the National Environment Fund (FNMA) as a financial mechanism to promote the use of synergies in the Cuban environmental policy.	To provide for the FNMA the required financial and material base to support projects that by taking advantage of the synergies in the environmental work, will increase the effect of financing. Based on an initial fund of 2 millions USD to work from the annual interests that this will provide, and 500 000 USD to acquire equipment and transport.	CITMA, MEP, MFP, Central Bank of Cuba	1 year	2 500 000	European Union and other bilateral donors
Study, design and evaluation of the requirements of a national system of environmental monitoring with a synergic approach.	To provide the country with the monitoring facilities for topics related to the environmental conventions and the environmental policy. It should provide the information required to adopt more effective policies. Design and evaluation of these requirements are the first steps on the road for its completion.	CITMA, MITRANS, MINCEX, MINSAP	2 years	500 000	GEF
Institutional strengthening of the entities for an integrated management of the main bays in the country.	To foster sanitation and integrated management of the selected bays, Santiago de Cuba, Cienfuegos, Mariel and La Habana, with their respective hydrographic basins.	CITMA, MEP, MFP, MITRANS	3 years	1 000 000	European Union and other bilateral donors

Project idea	General aim	Institutions to involve	Duration	Estimated cost in USD	Probable source
To develop a national capacitating process for the producers, so they can apply the concepts of environmental economy.	To foster a training process in the use of new environmental technologies, and prove through pilot examples the economic effect of these technologies. They would be carried out in the spheres of energy, transportation, recycling and material economy.	CITMA, MINBAS, MITRANS, MINCEX, Raw Materials Recovery Enterprise, MEP, MFP, MES	4 years	500 000	GEF, UNEP
To introduce the analog reforestation technology and model forests in Las Tunas.	To achieve development and extension of the analog reforestation technology and model forests in Las Tunas.	MINAG, CITMA	3 years	45 000	PPD
Macro project of the great wetland of the North of Ciego de Avila. Applied research and coastal integrated management.	To obtain the necessary information to insure a decision making process that will lead to the sustainable development of the great wetland of the north of Ciego de Avila. To achieve greater integration on the part of the actors involved. To establish the degree of impact on the main biotic communities caused by development in the great wetland of the north of Ciego de Avila, and on that basis formulate proposals for environmental management and planning. To create new capacitating actions whose scope is aimed at solving the identified environmental problems.	CITMA, INRH, MES, MINAG (SEF and Soil Institute), Local Governments	5 years	50 0000	GEF, UNDP

Project idea	General aim	Institutions to involve	Duration	Estimated cost in USD	Probable source
	To elaborate plans to adapt to the expected changes caused by climate change and by extreme events, at the ecosystem level as well as at the population level.				
To create an integrated system for decision making for the management of the great soils in the great wetland of the North Ciego de Avila.	To identify the use and characteristics of the soils in the zone of the great wetland of the North of Ciego de Avila. To evaluate and propose the introduction of proper technologies in the agricultural lands, establishing demonstration areas where sustainable practices for agricultural production are used. Developing capacitating actions aimed at land owners, private sector producers and state producers.	Soil Institute (MINAG)	3 years	170 000	GEF, UNDP
To strengthen capacities for the conservation and sustainable use of biological diversity in the eco-region of the North-East of Cuba.	To strengthen mechanisms for the conservation and sustainable use of biological diversity with an integrating and participative vision.	Local Governments, CITMA (research institutes, UMA, environmental research institutions), universities, NGOs and civil society of the work area	3 years	100 000	PPD

Project idea	General aim	Institutions to involve	Duration	Estimated cost in USD	Probable source
To protect and reestablish biological diversity in the Nipe-Sagua-Moa-Toa mountains.	To insure protection and sustainable use of the mountain ecosystems of the Nipe-Sagua-Moa-Toa mountain range, as well as of its indirect influence area, included the water basins next to it, in harmony with the socio-economic development of the communities.	CITMA (CNAP, research institutes, UMA, environmental research institutions), MINBAS, universities, National Parks Alejandro de Humboldt, Pico Cristal y Mensura Piloto	3 years	190 000	PPD
Current status and conservation of the Antillean manatee ( <i>Trichechus manatus</i> ) and its habitats in the eco-region of the North-East of Cuba.	To establish a communitarian management plan for the Antillean manatee ( <i>Trichechus manatus</i> ) in the eco-region of the North-East of Cuba.	CITMA (CNAP, research institutes, UMA, environmental research institutions), National Park Alejandro de Humboldt	2 years	30 000	PPD

Project idea	General aim	Institutions to involve	Duration	Estimated cost in USD	Probable source
Participative management of the coastal zone resource in the Bay of Nipe.	To strengthen the management capacity of the local communities and the social actors involved directly or indirectly in the use of coastal zone resources in the Bay of Nipe, as an integrating alternative to revert the degradation process of the ecosystem.	CITMA (research institutions, UMA, environmental research institutions), Local Governments, Libraries, MINAL, Sports Federation, FMC and schools	2 years	44 300	PPD
To create an environmental facilitators system at the community level.	To capacitate community members to channel environmental issues and problems in their localities, through the creation of a network of environmental facilitators at the level of the local popular council, that would contribute to the observation of biodiversity.	CITMA	3 years	8 000	FNMA, GEF UNDP
To increase productivity in the agricultural areas affected by salinity through the introduction of resistant varieties.	Sustainable exploitation technologies are established for agricultural areas affected by salinity, through selection of tolerant genotypes to these conditions.	MINAG, ANAP	3 years	134 370	FNMA



Project idea	General aim	Institutions to involve	Duration	Estimated cost in USD	Probable source
Prioritized actions for the rehabilitation and integrated management of the coastal zone area of the Municipality of Bauta. Case study: Popular Council of Baracoa.	Identification and quantification of the actions that caused environmental pressures on the coastal zone area were made. The environmental impacts caused by anthropogenic pressures were evaluated with the aim of finding the fastest and most economic solutions to mitigate, recover or rehabilitate the affected ecosystems or habitats.	CITMA (Institute of Oceanology)	3 years	44 800	CITMA
Integrated management of biodiversity and soils in the protected areas of the province of Mayabeque (Escaleras de Jaruco).	To design an integrated management system for the sustainable use and conservation of the socio-natural resources on the basis of holistic studies of the protected area Escaleras de Jaruco.	CITMA, INRH, Centers of Risk Management, Local Governments	2 years	50 000	PPD, FNMA
Create and organize an agricultural drought monitoring system, to support sustainability of the food program in prioritized basins in the province of Guantánamo.	To obtain an agricultural drought monitoring system to support sustainability of the food program in the province, particularly in the Guantánamo/Guaso and Toa basins.	Meteorological Center of the Province of Guantánamo	2 years	30 000 National Currency 5 000 USD	PPD

General aim	Institutions to involve	Duration	Estimated cost in USD	Probable source
Monitor the behavior of marine ecosystems in the face of the effects of pollution or sea swells or surges.	CITMA	2 years	5 000	FNMA, PPD
To continue in depth current studies on biodiversity at the basins.	INRH, MES, CITMA	3 years	15 000	FNMA
To elaborate a program for the integrated management of the bay and the coastal zone areas.	CITMA, Local Governments	4 years	50 000	PPD
To evaluate the impact of soil degradation.	Municipal and Provincial Soil Department	3 years	67 581	FNMA

Project idea
Monitoring biodiversity in small marine grass ecosystems at the bay of Nispero in the bay of Santiago de Cuba and at the littoral.
Study of biodiversity the hydrographic basins.
Integrated management program for the bay and the coastal zone area of the province of Santiago de Cuba.
Local evaluation of the degradation of soils in mountain areas.